

# **GUAM HEALTH PLAN**

**1985-1990**

**PLANON SALUT PARA GUAHAN**

# **GUAM HEALTH PLAN 1985 - 1990**

**OCTOBER 1985**

**UAM HEALTH PLANNING AND DEVELOPMENT AGENCY  
AND  
GUAM HEALTH COORDINATING COUNCIL**



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# *Territory of Guam*

OFFICE OF THE GOVERNOR

AGANA, GUAM 96910

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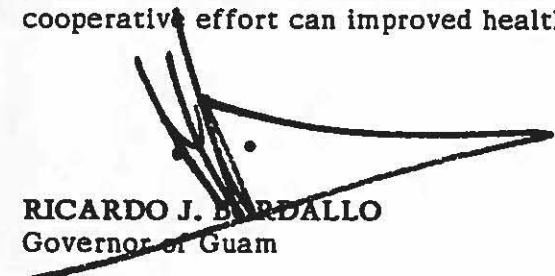
Dear Residents of Guam:

The attainment of a high level of health for our people and an effective, efficient health care system, remain among our highest Territorial priorities.

The GUAM HEALTH PLAN 1985-1990 represents the general health policy for the Territory of Guam. This five-year plan, jointly prepared by the Guam Health Coordinating Council and the Guam Health Planning and Development Agency, was developed as a reference for public officials, health care providers, and consumers in determining how best to allocate the community's health care resources. We are confident that this planning document provides a comprehensive framework for addressing key problem areas and priority issues surrounding the provision of health care for our island community.

The impact of this plan is dependent not only on government action, but also on public involvement. Our citizens must recognize and accept greater responsibility for their health and well-being. The major causes of illness and death on Guam are diseases for which medicine, as yet, has no cure. Many of these diseases can be prevented, or the risk of their occurrence greatly reduced by early adoption and maintenance of a healthy lifestyle.

Toward this end, we urge the various departments of government and the residents of the island to support the goals and objectives of the GUAM HEALTH PLAN 1985-1990 to ensure its fullest possible implementation. Only through cooperative effort can improved health of our people be realized.



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## FOREWORD

Hafa Adai!

The Guam Health Coordinating Council is pleased to present the **Guam Health Plan: 1985 - 1990**. Developed as a joint project of the Council and the Guam Health Planning and Development Agency, the Plan provides direction for improvement of our island population's health and enhancement of Guam's health care delivery system. We are confident that the information provided in the Plan will serve as an invaluable decision making tool for Guam's leaders and health officials in addressing the many complex issues surrounding health care for Guam's community.

Sincerely,

CARMEN L.G. PEARSON  
Chairperson  
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# GUAM HEALTH PLAN

## TABLE OF CONTENTS

|                                                                         | <u>Page</u> |
|-------------------------------------------------------------------------|-------------|
| <b>I. INTRODUCTION</b>                                                  | <b>1</b>    |
| A. The Need for Health Planning .....                                   | 1           |
| B. Planning Under Federal and Local Public Law .....                    | 1           |
| C. Planning Process .....                                               | 2           |
| D. Purpose and Use .....                                                | 3           |
| E. Plan Summary .....                                                   | 4           |
| <b>II. ISLAND PROFILE</b>                                               | <b>7</b>    |
| A. Geography and Climate .....                                          | 7           |
| B. Historical Background of the Territory .....                         | 7           |
| C. Unique Characteristics of the Territory .....                        | 9           |
| D. Demographic Information .....                                        | 13          |
| (1) Total Population of Guam .....                                      | 14          |
| (2) Guam's Civilian Population .....                                    | 21          |
| E. Summary .....                                                        | 30          |
| <b>III. HEALTH STATUS</b>                                               | <b>33</b>   |
| A. Definition of Health Status .....                                    | 33          |
| B. Health Status Indicators .....                                       | 34          |
| C. Mortality Indices .....                                              | 35          |
| D. Accidents .....                                                      | 41          |
| E. Morbidity .....                                                      | 45          |
| (1) Diseases Related to the Environment .....                           | 45          |
| (2) Communicable and Infectious Diseases .....                          | 48          |
| (3) Conditions Arising from Pregnancy,<br>Childbirth, and Infancy ..... | 61          |
| (4) Health Problems of Children .....                                   | 67          |
| (5) Chronic Diseases and Disabilities .....                             | 69          |
| (6) Mental Health .....                                                 | 72          |
| (7) Lifestyle-Related Health Problems .....                             | 78          |
| F. Summary .....                                                        | 80          |
| <b>IV. HEALTH STATUS PRIORITIES</b>                                     | <b>87</b>   |
| A. Cancer (Malignant Neoplasms) .....                                   | 88          |
| B. Alcohol and Drug Abuse .....                                         | 96          |

## Table of Contents

|                                                                                      | <u>Page</u> |
|--------------------------------------------------------------------------------------|-------------|
| C. Cardiovascular Disease .....                                                      | 103         |
| D. Lytico (Amyotrophic Lateral Sclerosis) and Bodig<br>(Parkinsonism Dementia) ..... | 110         |
| E. Diabetes .....                                                                    | 118         |
| <b>V. HEALTH CARE DELIVERY SYSTEM</b> .....                                          | <b>129</b>  |
| A. Overview of Health Care Delivery System .....                                     | 129         |
| B. Major Health Care Facilities .....                                                | 131         |
| (1) Guam Memorial Hospital Authority .....                                           | 131         |
| (2) Department of Public Health and Social Services .....                            | 135         |
| (3) Private Health Care Facilities and Services .....                                | 138         |
| C. Health Promotion and Protection .....                                             | 139         |
| (1) Health Education .....                                                           | 140         |
| (2) Environmental Protection Services .....                                          | 147         |
| (3) Highway Safety .....                                                             | 155         |
| (4) Occupational Health and Safety .....                                             | 156         |
| D. Prevention and Detection Services .....                                           | 159         |
| (1) Immunization .....                                                               | 159         |
| (2) Communicable Disease Control .....                                               | 160         |
| (3) Community Screening Programs .....                                               | 167         |
| E. Diagnosis and Treatment Services .....                                            | 172         |
| (1) Maternal and Child Health Services .....                                         | 172         |
| (2) Dental Services .....                                                            | 182         |
| (3) Emergency Medical Services .....                                                 | 186         |
| (4) Medical and Surgical Services .....                                              | 191         |
| (5) Diagnostic Radiology .....                                                       | 195         |
| (6) Medical Support Services .....                                                   | 198         |
| (7) Other Health Professionals .....                                                 | 201         |
| G. Mental Health Services .....                                                      | 203         |
| (1) Facility .....                                                                   | 204         |
| (2) Clinical Services .....                                                          | 204         |
| (3) Community Support Services .....                                                 | 206         |
| (4) Research and Development .....                                                   | 207         |
| (5) Staffing of the Department of Mental Health<br>and Substance Abuse .....         | 208         |
| (6) Utilization/Case Loads .....                                                     | 208         |



## Table of Contents

|                                                                                 | <u>Page</u> |
|---------------------------------------------------------------------------------|-------------|
| G. Chronic Care Medical Services .....                                          | 209         |
| (1) Care for Hypertension, Diabetes, and Arthritis .....                        | 210         |
| (2) End Stage Renal Disease (ESRD) and<br>Chronic Renal Dialysis Services ..... | 211         |
| (3) Chronic Care for Lytico (ALS) and<br>Bodig (PD) Patients .....              | 220         |
| H. Habilitation and Rehabilitation Services .....                               | 220         |
| I. Long-Term Care .....                                                         | 227         |
| (1) Long-Term Care on Guam .....                                                | 228         |
| (2) Gaps in the Continuum of Long-Term<br>Care Services .....                   | 230         |
| (3) Financial Considerations in Long-Term Care .....                            | 232         |
| J. Alternative Health Care Providers .....                                      | 238         |
| K. Mechanisms for Financing Health Care .....                                   | 242         |
| <b>VI. HEALTH CARE POLICY ISSUES</b> .....                                      | <b>251</b>  |
| A. Availability .....                                                           | 251         |
| B. Accessibility .....                                                          | 253         |
| C. Cost .....                                                                   | 256         |
| D. Quality .....                                                                | 267         |
| E. Acceptability .....                                                          | 270         |
| F. Continuity .....                                                             | 271         |
| <b>VII. PLANNING FOR THE FUTURE</b> .....                                       | <b>275</b>  |

## LIST OF TABLES

| <u>NUMBER</u> | <u>TITLE</u>                                                                                            | <u>PAGE</u> |
|---------------|---------------------------------------------------------------------------------------------------------|-------------|
| Table 1       | Ethnic Composition of Total Population,<br>Guam: 1920-1980 .....                                        | 15          |
| Table 2       | Annual Growth Rate of Total Population,<br>Guam: 1920-1980 .....                                        | 15          |
| Table 3       | Growth Rate by Village and Total Population,<br>Guam: 1960-1985 .....                                   | 17          |
| Table 4       | Total Population by Region,<br>Guam: 1960-1985 .....                                                    | 18          |
| Table 5       | Vital Indicators and Rates Per 1,000 Population,<br>Guam: 1974-1984 .....                               | 19          |
| Table 6       | Projection for Total, Civilian, and Military<br>Populations, Guam: 1980-1990 .....                      | 20          |
| Table 7       | Civilian Population Growth, Guam: 1970-1990 .....                                                       | 21          |
| Table 8       | Civilian Population by Resident Status,<br>Guam: 1980-1984 .....                                        | 24          |
| Table 9       | Civilian Population by Age and Sex, Guam: 1985 .....                                                    | 25          |
| Table 10      | Marital Status of the Adult Population,<br>Guam: 1920-1980 .....                                        | 29          |
| Table 11      | Infant Mortality Rates Per 1,000 Live Births,<br>Guam: 1973-1983 .....                                  | 35          |
| Table 12      | Crude Mortality Rates Per 1,000 Population,<br>Guam and U.S.: 1979-1983 .....                           | 36          |
| Table 13      | Years of Life Expectancy, Guam and U.S.: 1969-1982 .....                                                | 37          |
| Table 14      | The Ten Leading Causes of Death, Guam: 1983 .....                                                       | 38          |
| Table 15      | The Ten Leading Causes of Death by Percent of<br>Total Deaths, Guam: 1974-1983 .....                    | 39          |
| Table 16      | The Ten Leading Causes of Death, U.S.: 1980 .....                                                       | 40          |
| Table 17      | Motor Vehicle Fatalities of Civilian Population<br>by Age and Sex, Guam: 1979-1983 .....                | 41          |
| Table 18      | Deaths from Accidents and Adverse Effects for Total<br>Population by Age and Sex, Guam: 1979-1983 ..... | 42          |
| Table 19      | Deaths from Other Accidents and Adverse Effects for<br>Civilian Population, Guam: 1979-1983 .....       | 43          |
| Table 20      | Incidence of Salmonellosis, Guam: 1980-1984 .....                                                       | 46          |
| Table 21      | Incidence of Shigellosis, Guam: 1980-1984 .....                                                         | 47          |
| Table 22      | Incidence of Immunizable Diseases,<br>Guam: 1976-1980 .....                                             | 48          |

# List of Tables

| <u>NUMBER</u> | <u>TITLE</u>                                                                                                             | <u>PAGE</u> |
|---------------|--------------------------------------------------------------------------------------------------------------------------|-------------|
| Table 23      | Immunization Compliance Levels for<br>Pre-Schoolers and School Entrants,<br>Guam: School Years 1980-81 and 1984-85 ..... | 49          |
| Table 24      | Incidence and Prevalence of Tuberculosis for Total<br>Population, Guam: 1975-1980 .....                                  | 50          |
| Table 25      | TB Cases by Age and Sex of Patient, Guam: 1984 .....                                                                     | 51          |
| Table 26      | TB Cases by Ethnicity of Patient, Guam: 1984 .....                                                                       | 51          |
| Table 27      | Incidence of Influenza, Guam: 1975-1984 .....                                                                            | 52          |
| Table 28      | Incidence of Pneumonia, Guam: 1974-1983 .....                                                                            | 53          |
| Table 29      | Incidence of Hepatitis A, Guam: 1975-1984 .....                                                                          | 55          |
| Table 30      | Incidence of Hepatitis B, Guam: 1975-1984 .....                                                                          | 56          |
| Table 31      | Frequency and Incidence of Gonorrhea Per 1,000<br>Population, Guam: 1980-1984 .....                                      | 59          |
| Table 32      | Frequency and Incidence of Syphilis Per 1,000<br>Population, Guam: 1980-1984 .....                                       | 59          |
| Table 33      | Leading Causes of Infant Death, Guam: 1979-1983 .....                                                                    | 65          |
| Table 34      | Proportion of Low Birthweight Infants,<br>Guam: 1979-1983 .....                                                          | 64          |
| Table 35      | Proportion of Low Birthweight Infants by Ethnicity,<br>Guam: 1981-1983 .....                                             | 66          |
| Table 36      | Deaths Caused by Cerebro-Vascular Disease,<br>Guam: 1974-1983 .....                                                      | 70          |
| Table 37      | Deaths Caused by Liver Disease,<br>Guam: 1974-1983 .....                                                                 | 72          |
| Table 38      | Homicide Rates Per 1,000 Population,<br>Guam: 1974-1983 .....                                                            | 75          |
| Table 39      | Violent Crimes Against Persons, Guam: 1980-1984 .....                                                                    | 74          |
| Table 40      | Suicide Rates Per 1,000 Population,<br>Guam: 1974-1983 .....                                                             | 76          |
| Table 41      | Cancer Mortality Rates Per 1,000 Population,<br>Guam: 1979-1983 .....                                                    | 89          |
| Table 42      | Cancer Deaths by Age and Sex, Guam: 1979-1983 .....                                                                      | 90          |
| Table 43      | Cancer Mortality Rates Per 1,000 Population<br>by Age and Sex, Guam: 1979-1983 .....                                     | 90          |
| Table 44      | Estimated Number of Cancer Deaths by Site and Sex,<br>U.S.: 1984 .....                                                   | 91          |
| Table 45      | Cancer Deaths by Site and Year, Guam: 1979-1983 .....                                                                    | 91          |
| Table 46      | Estimated Proportion of Cancer by Site and Sex,<br>U.S.: 1984 .....                                                      | 92          |

## List of Tables

| <u>NUMBER</u> | <u>TITLE</u>                                                                                             | <u>PAGE</u> |
|---------------|----------------------------------------------------------------------------------------------------------|-------------|
| Table 47      | Cancer Cases Registered by Site, Guam: 1983 .....                                                        | 93          |
| Table 48      | Self-Reported Drug Use of High School Students,<br>Guam and U.S.: 1980 .....                             | 101         |
| Table 49      | Frequency and Mortality Rates of Heart Disease<br>Per 1,000 Population, Guam: 1974-1983 .....            | 105         |
| Table 50      | Heart Disease Mortality Rates Per 1,000 Population<br>by Age and Sex, Guam: 1979-1983 .....              | 107         |
| Table 51      | Confirmed Cases of Lytico and Bodig,<br>Guam: 1945-1982 .....                                            | 113         |
| Table 52      | Confirmed Cases of Lytico and Bodig by Ethnicity,<br>Guam: 1945-1982 .....                               | 114         |
| Table 53      | Frequency, Incidence, and Mortality Rates for<br>Lytico (ALS) by Sex, Guam: 1953-1982 .....              | 115         |
| Table 54      | Frequency, Incidence, and Mortality Rates for<br>Bodig (PD) by Sex, Guam: 1953-1982 .....                | 115         |
| Table 55      | Lytico and Bodig Patients Residing on Guam,<br>Guam: 1984 .....                                          | 116         |
| Table 56      | Diabetes Mortality Rates, Guam: 1974-1983 .....                                                          | 119         |
| Table 57      | Identified Diabetics by Age, Guam: 1978-1981 .....                                                       | 121         |
| Table 58      | Prevalence of Diabetes by Ethnicity,<br>Guam: 1978-1981 .....                                            | 121         |
| Table 59      | Identified Diabetics by Ethnicity and Sex,<br>Guam: 1978-1981 .....                                      | 122         |
| Table 60      | Diabetes Patients With Significant<br>Associated Diseases Listed in Rank Order,<br>Guam: 1978-1981 ..... | 122         |
| Table 61      | Blood Sugar Screening, World Health Day,<br>Guam: 1984 .....                                             | 123         |
| Table 62      | Prevalence Rates for Reported Diabetics<br>by Age, Guam: 1984 .....                                      | 124         |
| Table 63      | Guam Memorial Hospital Beds by Service .....                                                             | 133         |
| Table 64      | Patient Care Statistics, Guam Memorial Hospital,<br>Guam: 1982-1984 .....                                | 134         |
| Table 65      | Guam Memorial Hospital Authority Accounts<br>Receivable Analysis, FY1980-1984 .....                      | 135         |
| Table 66      | Health Service Programs and Providers, Department<br>of Public Health and Social Services, Guam .....    | 137         |
| Table 67      | Community Nursing Service Utilization,<br>Guam: FY1982-1984 .....                                        | 136         |



# List of Tables

| <u>NUMBER</u> | <u>TITLE</u>                                                                                                           | <u>PAGE</u> |
|---------------|------------------------------------------------------------------------------------------------------------------------|-------------|
| Table 68      | Occupational Injury and Illness Incidence Rates<br>Per 100 Employees by Industry,<br>Guam and U.S.: 1980-1983.....     | 157         |
| Table 69      | Guam Memorial Hospital Occupancy Rates in the<br>Pediatric Unit, Guam: 1979-1983.....                                  | 179         |
| Table 70      | Birth Rates for Teenage Women Per 1,000 Women<br>Between the Ages of 10 and 19,<br>Guam: 1979-1983 .....               | 181         |
| Table 71      | Dental Caries in Children by Age, U.S. and Guam .....                                                                  | 184         |
| Table 72      | Occupancy Rates and Average Length of Stay in Medical<br>and Surgical Units at Guam Memorial Hospital .....            | 192         |
| Table 73      | Service Utilization at the Department of Mental<br>Health and Substance Abuse,<br>Guam: March 1984-February 1985 ..... | 209         |
| Table 74      | Patient Flow in Hemodialysis Unit, Guam Memorial<br>Hospital, Guam: 1980-1984 .....                                    | 213         |
| Table 75      | Projected Number of Dialysis Patients, Guam<br>Memorial Hospital, Guam: 1985-1990.....                                 | 213         |
| Table 76      | Forecast of Additional Hemodialysis Stations Needed,<br>Guam: 1985-1990 .....                                          | 215         |
| Table 77      | Utilization of Occupational and Physical Therapy<br>Services at GMH, Guam: 1984 .....                                  | 221         |
| Table 78      | Civilian Population by Health Care Payment<br>Sources, Guam: 1985 .....                                                | 242         |
| Table 79      | Proportion of Health Status Survey Respondents<br>Covered by Health Insurance, Guam: 1984 .....                        | 243         |
| Table 80      | Projected Increase in Civilian Population,<br>Guam: 1985-2000 .....                                                    | 275         |
| Table 81      | Projected Increase of Senior Population 55 Years<br>and Older, Guam: 1985-2000 .....                                   | 276         |

## LIST OF FIGURES

| <u>NUMBER</u> | <u>TITLE</u>                                                                                                                         | <u>PAGE</u> |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Figure 1      | Guam in the Western Pacific .....                                                                                                    | 8           |
| Figure 2      | Guam in the Mariana Islands .....                                                                                                    | 10          |
| Figure 3      | The Island of Guam .....                                                                                                             | 11          |
| Figure 4      | Population Growth by Ethnicity,<br>Guam: 1920-1980 .....                                                                             | 16          |
| Figure 5      | Civilian Population by Age,<br>Guam: 1985 .....                                                                                      | 22          |
| Figure 6      | Civilian Population by Age and Sex,<br>Guam: 1985 .....                                                                              | 26          |
| Figure 7      | Ethnic Composition for the Civilian Population<br>16 Years and Older, Guam: 1980 .....                                               | 27          |
| Figure 8      | The Health Field Concept .....                                                                                                       | 33          |
| Figure 9      | 5-Year Average of Motor Vehicle Fatality<br>Rates per 1,000 Civilian Population,<br>Guam: 1979-1983 .....                            | 44          |
| Figure 10     | 5-Year Average of Fatality Rates from Other<br>Accidents and Adverse Effects per 1,000<br>Civilian Population, Guam: 1979-1983 ..... | 44          |
| Figure 11     | Total Reported Cases of Sexually Transmitted<br>Diseases by Type, Guam: 1984 .....                                                   | 61          |
| Figure 12     | Infant Mortality by Ethnicity,<br>Guam: 1979-1983 .....                                                                              | 63          |
| Figure 13     | Homicide Count by Sex of Victim,<br>Guam: 1974-1983 .....                                                                            | 77          |
| Figure 14     | Suicide Count by Sex of Victim,<br>Guam: 1974-1983 .....                                                                             | 77          |
| Figure 15     | Air Quality Trends, Guam: 1980-1984 .....                                                                                            | 152         |
| Figure 16     | Proportion of Mothers Beginning Prenatal Care<br>During First Trimester of Pregnancy by<br>Ethnicity, Guam: 1981-1983 .....          | 175         |
| Figure 17     | Proportion of Low Birthweight Infants by<br>Ethnicity, Guam: 1981-1983 .....                                                         | 175         |
| Figure 18     | Women in Family Planning Project by Age,<br>Guam: 1982-1984 .....                                                                    | 180         |
| Figure 19     | Location of Fire Stations and Ambulances,<br>Guam: 1985 .....                                                                        | 189         |
| Figure 20     | Frequency of Surgeries Performed,<br>All Surgeries and Outpatient Surgeries,<br>Guam: 1980-1984 .....                                | 194         |

# **I. INTRODUCTION**

## **I. INTRODUCTION**

### **A. The Need For Health Planning**

Guam's health care system has expanded rapidly over the past decades. From the initial U.S. Navy-administered hospital and public health programs, the delivery system expanded into a sophisticated network of governmental and private providers delivering health care to the island residents in various ways. This growth of the health care system has beneficially impacted on the health status of the island population. It has also altered disease patterns, moving away from the diseases caused by environmental conditions to those associated with more stressful living, faulty diets, excessive smoking and drinking, and lack of exercise.

A change in health status demands an evaluation of and a change in the availability of health resources and health services, as well as the use and the acceptance of these services by the island population. But any proposed change must proceed in an efficient and effective manner. Comprehensive health planning provides policies, guidelines, goals, and objectives for a change and for growth in the health care system, and sets priorities for improving the health status of the Territory.

### **B. Planning Under U.S. Public Law 93-641 And Local Public Law 14-150**

Public Law 93-641, The National Health Planning and Resources Development Act of 1974, was signed into law in January 1975. The Act states that "the achievement of equal access to quality health care at a reasonable cost is a priority of the Federal Government." Under Section 1523 of P.L. 93-641, each state or territory is required to produce a 5-year Health Plan, and to update this plan in the third year of the planning cycle.

Local Public Law 14-150 established the Guam Health Planning and Development Agency in 1978 as an Agency of the Executive Branch of the Government of Guam. Under Section 1536 of the federal Health Planning Act, GHPDA performs the functions of a State Health Planning and Development Agency as well as those of a Health Systems Agency. This unique designation of having state and local functions simultaneously was prescribed by the Federal Government for the Territory because of its geographical and political status.

The Guam Health Plan, prepared by the Guam Health Planning and Development Agency together with the Guam Health Coordinating Council, is a proposed 5-year policy statement and framework for improving the health of Guamanians through a healthful environment and accessible quality health care at reasonable costs. The fundamental purpose of Guam's health system should be to keep its population healthy and restore health to those who are ill.



### C. Planning Process

Health planning is a process to describe "what is" (the status of the community's health and its health care resources) rather than "what ought to be," and to specify how to attain "what is desired." This activity is a process because the element of change is implicit in every step. A planning process assumes that any proposed change is positive, and a proposed change which is directed is more effective and efficient.

The federal guidelines for plan development stress an analytical approach. They state: "...it is important that in the development of goals, the process begins with consideration of the needs of the Health Systems Agency's (GHPDA's) present and projected population, rather than the needs of the existing facilities and resources, based on current utilization patterns." Therefore, realistic projections of future demands for a variety of health care resources can only be developed by planning which is based on the needs of the population. By defining the health care needs of the population in relationship to health care system's needs appropriate alternatives for improving the health status of the population can be determined.

Health planning, as with any other planning process, is based upon information. The type of information in this process includes data on the health of the population that is being "planned for," and data on the health care services which are provided to that population.

In the planning process used for the development of this plan, the data used includes information on:

- (1) The geographical, historical, and cultural considerations of the island;
- (2) Information on the characteristics of the population, including the number of people, their ages, sex, ethnicity, education, income, etc.;
- (3) Information on the health status of the people, e.g., morbidity, mortality, etc.; and
- (4) Information which describes the delivery of health care services to the people of Guam, e.g., facilities and their locations, public health services and programs and their locations, and population groups served.

Once the information base is established, it is then analyzed for determination and prioritization of health problems or health concerns for the population and the health care delivery system. Several characteristics are used to identify problems and concerns:

- (1) Availability of the services to the population, or the capacity of the services to provide care to the population;
- (2) Accessibility of the services for the population's use;
- (3) The cost of the services or the economic value of resources expended to provide the services;
- (4) The quality of the services or the maintenance of acceptable standards

in health care delivery;

- (5) Acceptability of services to the population; and
- (6) The continuity of the services or how well the services meet the needs of the population over time, including how well a service is coordinated with other related services.

In further analysis of data on the population and its health care delivery systems, other factors are also taken into consideration. These factors include:

- (1) Congressional priorities for health planning as required by P.L. 93-641 and the amendments in P.L. 96-79;
- (2) Islandwide health problems and health concerns as prioritized by the Guam Health Coordinating Council;
- (3) GHPDA's purpose, policies, and principles relating to health plan development as stated in the 1982 edition of the Guam Health Plan; and
- (4) Program planning or evaluation by other health and health-related entities on island.

Based on all gathered information, the goals and objectives were developed for the Guam Health Plan by GHPDA staff in conjunction with the Plan Development Committee of the Guam Health Coordinating Council (GHCC). The goals and objectives were sent in draft form to the "participants" in the health planning efforts--including health providers, agencies delivering health care or health-related services, consumer groups, governmental agencies, and interested consumers from the community. These people, individually and collectively, examined the proposed drafts, and commented on additions or deletions appropriate to the material from their perspective. A new draft was reviewed in its totality by the GHCC and approved as the final Guam Health Plan after an islandwide public hearing.

#### **D. Purpose And Use**

The Guam Health Plan serves as a statement of the Government of Guam's policies and plans for improving the health status of the community. This document identifies the desired health status of the island population, assesses the population's current health status, and prioritizes the consumers' and providers' health concerns. It outlines the necessary actions to reduce the gap between the current and the desired level of health.

The Plan also serves as a guide for the development of the island's health system. As such, the Plan identifies the desired changes to the health system required for the delivery of an effective and efficient array of health services that are responsive to the community's needs. Consumers, private as well as public health care providers, and public officials are encouraged to use this document as a reference when determining how best to allocate the community's health resources.

## **E. Plan Summary**

This document, which is an update of the previous Guam Health Plan (1982 Edition) prepared for the island, reflects an effort to consolidate and expand the health information base for policymaking and program planning on the island. It contains a wide range of information relevant to health care planning through 1990. The Plan cannot address each individual component of the health care system. However, it does provide guidelines and a comprehensive framework for addressing those problem areas and priority issues that are currently addressed in the Plan, as well as for future consideration of additional health services components.

The Plan is organized into seven sections. The first three sections - Introduction, Island Profile and Health Status - present the primary information base from which all remaining sections are expanded. These preliminary sections describe the Territory's approach to health planning, national health guidelines and priorities, the nature of the Territory's population, and the health status of its residents.

Section IV of the Plan, Health Status Priorities, provides information about the health care issues deemed to be of utmost concern to the public (consumers and providers) - Cancer, Alcohol and Drug Abuse, Cardiovascular Disease, Lytico (Amyotrophic Lateral Sclerosis) and Bodig (Parkinsonism Dementia), and Diabetes. Goals and objectives to reduce these concerns are listed.

The remaining sections of the Plan, Health Care Delivery System, Health Care Policy Issues, and Planning for the Future, present information on the current availability of facilities and services within the health care system; identify issues and trends relevant to these areas and their impact on the health status of Guam residents; and present goals and objectives for future change in the system. In total, this Plan serves as a comprehensive planning reference for the health care system of the island of Guam.

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## **II. ISLAND PROFILE**

## **II. ISLAND PROFILE**

### **A. Geography and Climate**

Guam is situated in the Western Pacific. The United States' western-most territory lies 5,800 miles (12 hours flight time) from the U.S. mainland, and 3,300 miles (7 hours flight time) west of its closest U.S. neighbor, Hawaii. Guam, while being remote from the United States, is much closer to the Asian rimlands. Tokyo, Taipei, Manila, and Hong Kong are all within 3 hours flight time.

Guam is the largest and southernmost of the Mariana Islands and lines up along the 145 meridian, east of Greenwich at 13 degrees of north latitude. The island is formed by volcanic action, coral growth and uplift of submarine mountain ranges. It is 30 miles long, 4 to 8 miles wide, and encompasses 212 square miles.

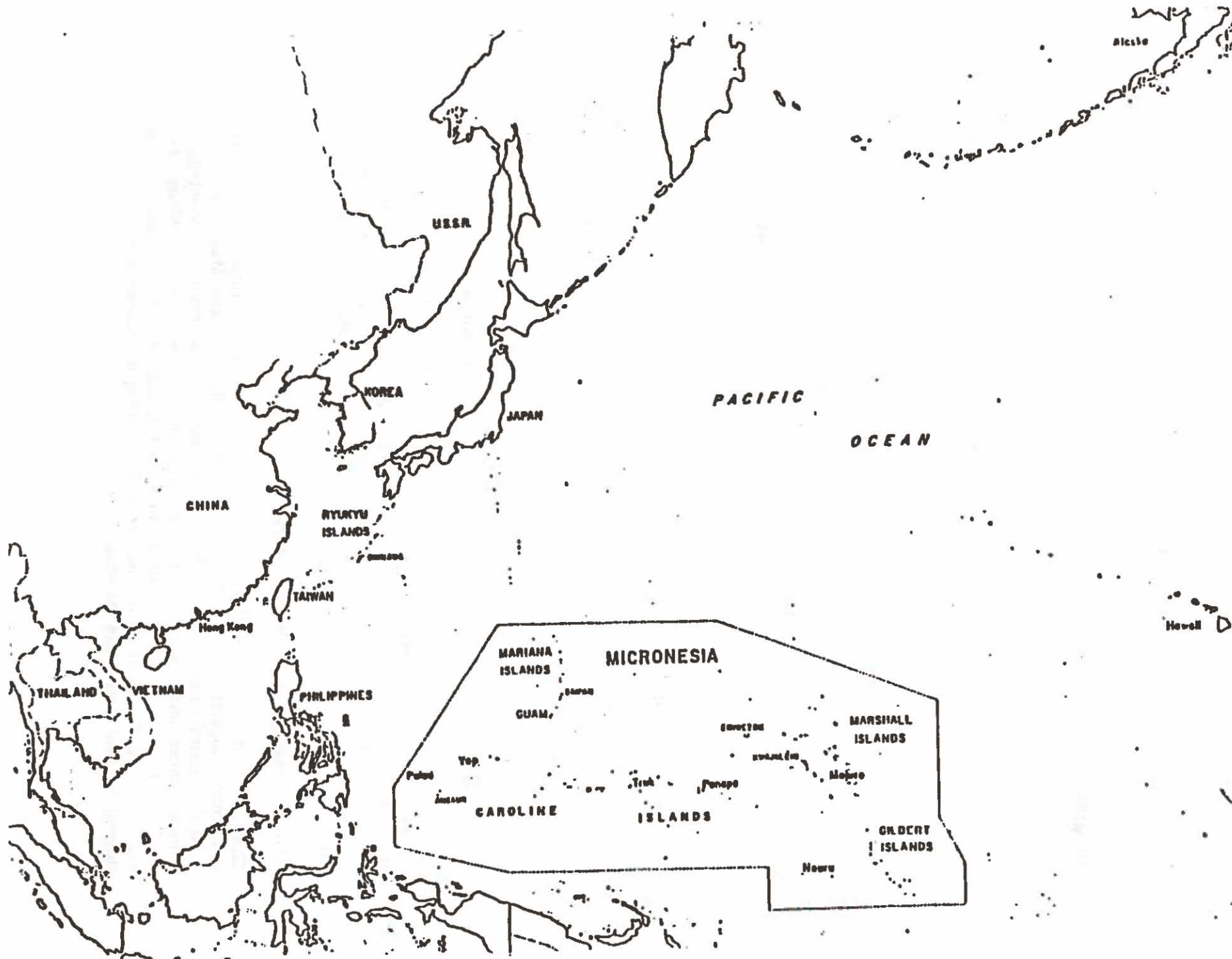
The northern third of Guam is a broad limestone plateau with steep coastal cliffs and no surface rivers. Most of this area is covered by military installations. The central part of the island, lies northeast of a fault line that crosses the middle of the island from the villages of Agana to Yona. Central Guam consists of coastal low lands and high limestone terraces; it is the most urbanized and heavily populated, especially in the Agana and Tamuning areas. The southern area of Guam is distinguished by a line of volcanic peaks. A mixed terrain slopes eastward from the peaks, with several rivers flowing through eroded valleys to the coast. The rural villages of Umatac, Merizo, and Inarajan dot the southern coast line, and represent the most culturally conservative part of Guam's population.

The climate is tropical, with high humidity and an average annual temperature of 82 degrees Fahrenheit (daily range, 74-96 degrees). The early months of the years, the "dry" season, are cooler due to the prevailing tradewinds from the east and northeast. The later months are dominated by monsoon winds from the south and southwest, bringing the warmer and wetter "rainy" season. Guam receives 90 inches of rainfall annually, 75 percent of which occurs in the wet season. Typhoons are a recurrent feature each year. The super-typhoons Karen in 1962 and Pamela in 1976 destroyed millions of dollars worth of property, but warning systems have prevented loss of lives or serious personal injuries.

### **B. Historical Background of the Territory**

The first settlers in the Marianas were the Chamorros, related by linguistic and archaeological evidence to people in the Philippines and Malaysia. Their arrival is tentatively dated at 1500 to 2000 B.C. It was achieved in outrigger sailing canoes and marked by the importation of a neolithic technology and food plants such as taro, coconut, yam, and breadfruit. When first seen by the sea-faring Europeans, the Chamorros were living in villages along the coast, dependent upon fishing and farming.

FIGURE 1  
GUAM IN THE WESTERN PACIFIC



With the landing of Magellan in 1521 in Umatac, the Spanish period (1521-1898) began. Spanish possession of Guam was proclaimed in 1565 and serious attempts at colonization were made in 1668. Guam had become a supply station of water and fresh foods for Spanish galleons sailing each year from Mexico to the Philippines. Between 1670 and 1695, the Chamorros engaged in open warfare with the Spaniards. By the end of the 17th Century, the Chamorros had been reduced by war, disease, and famine to some 3,000 survivors, one-tenth their number before European contact. Over the next two centuries there was a progressive hybridization of the Chamorro race and culture, as Spanish, Mexican, and Filipino forces acted on the Chamorros' native habitat.

During the Spanish-American War in 1898, the U.S. occupied Guam and retained it when the Spanish sued for peace. The U.S. Navy Department was given responsibility for maintaining Guam as a naval station, a fueling stop for warships plying between Hawaii and the Philippines. This started the American pre-war period: 1898-1941. At the beginning of that period, nearly 10,000 Chamorros lived on Guam; about half of them resided in Agana, the rest in 14 villages throughout the island.

On December 8, 1941, Japanese aircraft from Saipan bombed and strafed Guam as a prelude to the Japanese Occupation (1941-1944). The Chamorro way of life was severely curtailed and many Chamorros were killed during these years of hardship under Japanese rule.

In July 1944 U.S. Forces reoccupied the island in a battle that ended with the additional loss of Guamanian lives. The Naval Government was reestablished in 1946 and functioned much as it had before the war. The island was rebuilt, and the economy expanded with the high demand for goods and services by the civilian and military population.

In 1950 the U.S. Congress passed the Organic Act of Guam which established Guam as an organized unincorporated Territory and changed the status of Guamanians from nationals to citizens of the U.S. Responsibility for the island's administration was shifted from the U.S. Navy to the Department of the Interior. Congress authorized Guamanians to elect their own Governor in 1970, and a non-voting delegate to Congress in 1972. Negotiations for a new political status with the U.S. are underway to replace the Organic Act and to put Guam on a new footing. Whether the final outcome will be Commonwealth, Free Association, or other political status, it is expected to be more satisfactory than the present territorial status Guamanians now hold.

### **C. Unique Characteristics of the Territory**

The planning for, and provision of, health care services on Guam is affected by several factors not commonly found in communities of comparable size in the U.S. mainland. Some of these factors are presented below to provide a better understanding of problems in the island's health care delivery system.

#### **(1) Isolation**

While Guam has established frequent and reliable communication and transportation links, the island is relatively isolated from the U.S. mainland because of the high cost involved in overcoming distance. Isolation from



FIGURE 2  
GUAM IN THE MARIANA ISLANDS

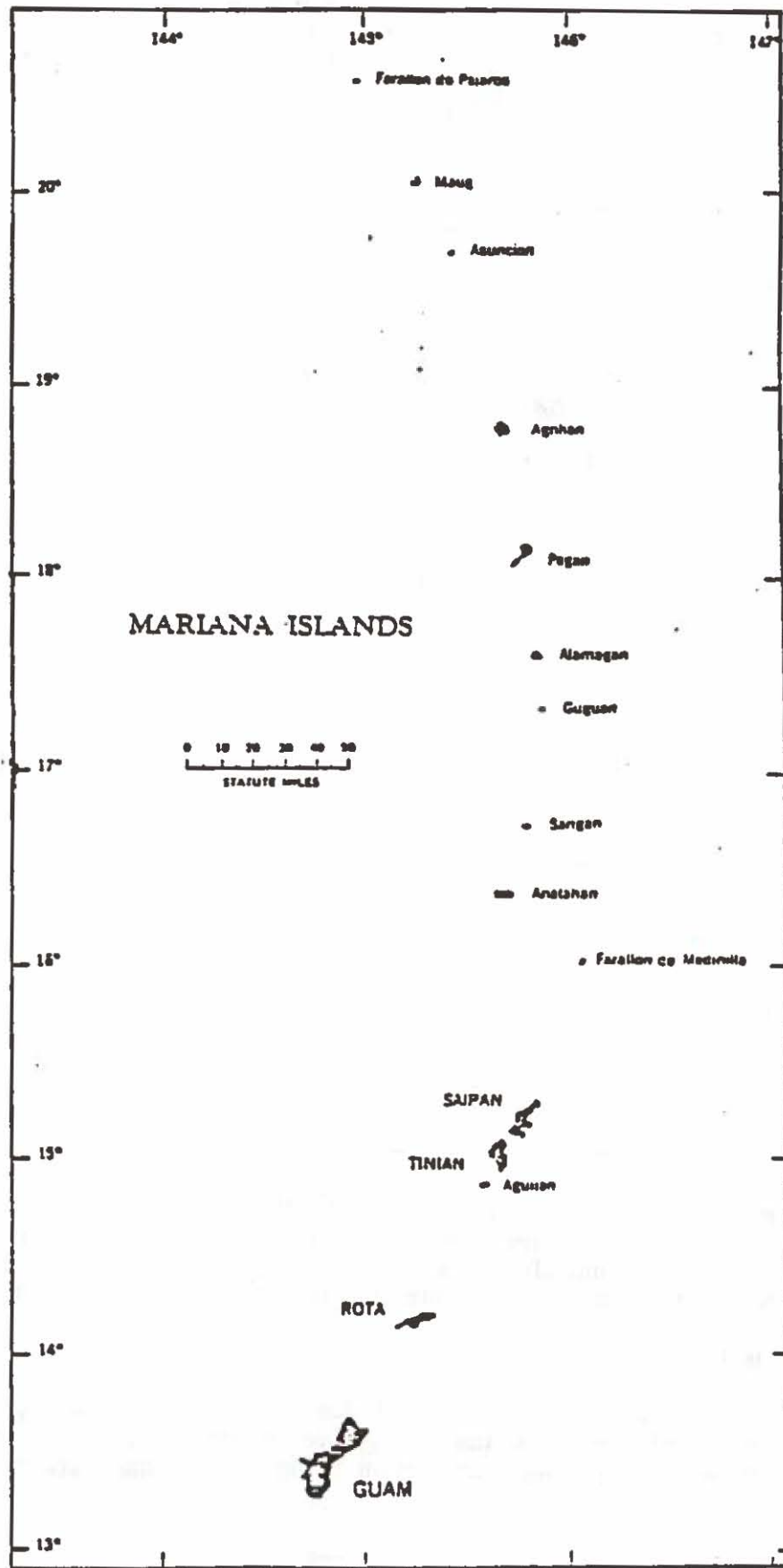
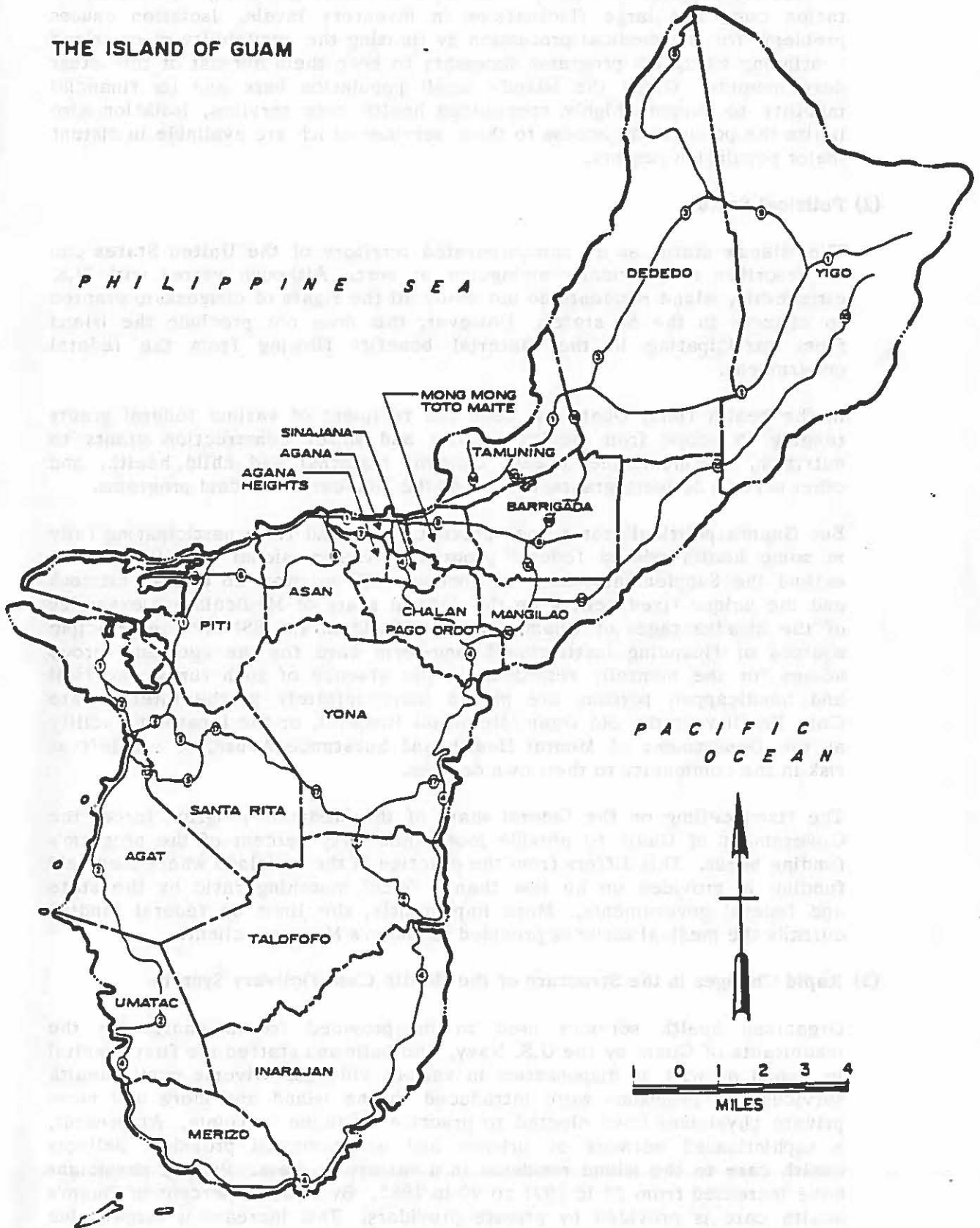


FIGURE 3

THE ISLAND OF GUAM



its main source of supplies poses numerous problems for the procurement of medical supplies and equipment, such as shipping delays, high transportation cost, and large fluctuations in inventory levels. Isolation causes problems for the medical profession by limiting the availability of on-island continuing education programs necessary to keep them abreast of the latest developments. Given the island's small population base and its financial inability to support highly specialized health care services, isolation also limits the population's access to these services which are available in distant major population centers.

## **(2) Political Status**

The island's status as an unincorporated territory of the United States can be described as politically ambiguous at best. Although vested with U.S. citizenship, island residents do not enjoy all the rights of citizenship granted to citizens in the 50 states. However, this does not preclude the island from participating in the material benefits flowing from the federal government.

In the health field, Guam has been the recipient of various federal grants ranging in scope from health facility and sewer construction grants to nutrition, communicable disease control, maternal and child health, and other service delivery grants, as well as the Medicare/Medicaid programs.

But Guam's political status does prevent the island from participating fully in some health-related federal programs. Congressional unwillingness to extend the Supplemental Security Income (SSI) program to Guam's citizens and the unique fixed ceiling on the federal share of Medicaid are examples of the disadvantages of Guam's status. Medicaid and SSI are the principle sources of financing institutional long-term care for the aged and group homes for the mentally retarded. In the absence of such funds, the frail and handicapped persons are placed inappropriately in the Intermediate Care Facility at the old Guam Memorial Hospital, or the Inpatient Facility at the Department of Mental Health and Substance Abuse, or are left at risk in the community to their own devices.

The fixed ceiling on the federal share of the Medicaid program forces the Government of Guam to provide more than fifty percent of the program's funding needs. This differs from the practice in the mainland where Medicaid funding is provided on no less than a 50:50 matching ratio by the state and federal governments. More importantly, the limit on federal funding curtails the medical services provided to Guam's Medicaid clients.

## **(3) Rapid Changes in the Structure of the Health Care Delivery System**

Organized health services used to be provided free-of-charge to the inhabitants of Guam by the U.S. Navy, who built and staffed the first hospital in Agana as well as dispensaries in various villages. Diverse public health services and programs were introduced to the island and more and more private physicians have elected to practice medicine on Guam. At present, a sophisticated network of private and governmental providers delivers health care to the island residents in a variety of ways. Private physicians have increased from 22 in 1971 to 90 in 1985. By now, 87 percent of Guam's health care is provided by private providers. This increase is largely due

to the establishment of such third-party payment mechanisms as Medicaid, Medicare, and prepaid health plans (HMO's) which encourage and enable individuals to seek treatment from private health care providers.

The government salaried physicians have been reduced from 16 in 1981 to 13 in 1985. This reflects the government's limited financial health care resources. Nevertheless, the government dominates the island's health system through its control of Guam's only civilian hospital; its operation of district public health centers; its participation in the federal Medicaid and Medicare programs; and its status as the island's largest employer providing health benefits to its nine thousand employees and their dependents.

This simplistic distinction between private and public sector health providers does not recognize the fragmented nature of the private and public health sectors. Coordinating the provision of needed health services for the community by the two health sectors in such a manner as to avoid duplication, and to insure that all segments of the community have ready access to health services, entails the development of a comprehensive plan for health services delivery.

#### **(4) Changing Disease Patterns**

The need to redefine the island government's role in maintaining and improving health also rises from the realization that an individual's lifestyle is one of the major determinants of health. Behavioral factors such as smoking, excessive drinking, poor dietary habits, and the lack of physical activity increase a person's chances for incurring hypertension, heart disease, stroke, cancer, and a host of other chronic diseases for which medical science has no ready cure. Yet the prevailing government policy equates better health with advanced medical treatment. This policy stems from earlier times when communicable diseases (over which the individual had little or no control) were the leading causes of morbidity and mortality, and is no longer consistent with the newer trends in preventive medicine. Health planning must now emphasize prevention and lifestyle education programs.

#### **(5) Vulnerability to Communicable Diseases**

Guam has become a center for commerce, education, and tourism in the Pacific. A substantial number of tourists, visitors, alien laborers, and temporary residents arrive daily on Guam from the neighboring Pacific Islands, Japan, the Philippines, and other Asian countries. All of these persons are possible users of the health care system; therefore, the system must be large enough to accommodate potential patients. Of greater importance, however, is the fact that this large influx of transitory people makes our island vulnerable to imported communicable diseases, such as tuberculosis, sexually transmitted diseases, cholera, leprosy, measles, etc., and puts an additional strain on Guam's Communicable Disease Control and health service resources.

### **D. Demographic Information**

Sound health system planning must be based not only on a careful analysis of local health status, services, and resources, but also on a thorough understanding of the population. In fact, meaningful health planning is



population based, integrating the demographic characteristics of a community into the planning process.

Demography is the study of human population, the factors which make it change, and the results of these changes. It focuses primarily on three variables--fertility, mortality, and migration. The additional characteristics of residency status, age and sex, marital status, ethnicity, and socio-economic status define the population more accurately. Fertility and mortality rates, along with overall migration rates, serve as predictors of future population growth. Characteristics such as age and sex are indicators of the specific health needs of the community.

The latest available statistics for these variables and characteristics are used in this Health Plan. However, estimates and projections for 1980 and onward are based on the official 1980 census information.

When discussing Guam's inhabitants, a distinction between total and civilian populations must be made. The total population includes a contingent of approximately 25,000 military personnel (active Navy, Air Force, and Marine servicemen, dependents, and support personnel). This military population fluctuates with the homeporting and deployment of large Navy carriers, and specific military activities. Local residents, stateside-hired persons, and temporary aliens comprise the civilian population.

Guam's health planning efforts are primarily concentrated on the civilian population.

#### **(1) Total Population of Guam**

Over the last 80 years, Guam's population has experienced rapid growth and a considerable shift in ethnic composition. The greatest changes occurred right after the last world war, when the population more than doubled with a large influx of Caucasian military personnel and Filipino contract workers.

##### **(a) Ethnic Distribution**

At the turn of the century, Guam's indigenous population, the Chamorros, was estimated to be approximately 10,000. In 1920, 12,216 Chamorros represented 92 percent of the total population, the remaining 8 percent were Filipinos, Caucasians, Asians, and others. When the 1980 census was taken, Chamorros numbered 48,675, but this number represented less than half (45.9 %) of the total population. During the same time, Chamorros shared their island with 22,447 Filipinos (21.2 %), 19,751 Caucasians (18.6 %) and 15,106 persons of various other races, mostly of Asian and of Pacific Island ethnicity (14.3 %).

**TABLE 1**  
**Ethnic Composition of Total Population**  
**Guam: 1920 - 1980**

| Year  | Total<br>Population | Chamorro<br>(And Part<br>Chamorro, 1980) | %    | Filipino | %     | Caucasian | %    | Other  | %    |
|-------|---------------------|------------------------------------------|------|----------|-------|-----------|------|--------|------|
| 1920  | 13,275              | 12,216                                   | 92.0 | 396      | 2.1   | 280       | 2.1  | 383    | 2.9  |
| 1930  | 18,509              | 16,402                                   | 88.6 | 365      | 2.0   | 1,205     | 6.5  | 537    | 2.9  |
| 1940  | 22,290              | 20,177                                   | 90.5 | 569      | 2.6   | 785       | 3.5  | 759    | 3.4  |
| 1950  | 59,498              | 27,124                                   | 45.6 | 7,258    | 12.2  | 22,920    | 38.5 | 2,196  | 3.7  |
| 1960  | 67,044              | 34,762                                   | 51.8 | 8,580    | 12.8  | 20,724    | 30.9 | 2,979  | 4.4  |
| 1970* | 84,996              | 47,472                                   | 55.9 | 10,172   | 12.0  | 23,934    | 28.2 | 3,418  | 4.0  |
| 1980  | 105,979             | 48,675                                   | 45.9 | 22,447   | 21.18 | 19,751    | 18.6 | 15,106 | 14.3 |

\*Ethnicity based on country of origin.

Source: Tung (1981) Table 7 Revised.

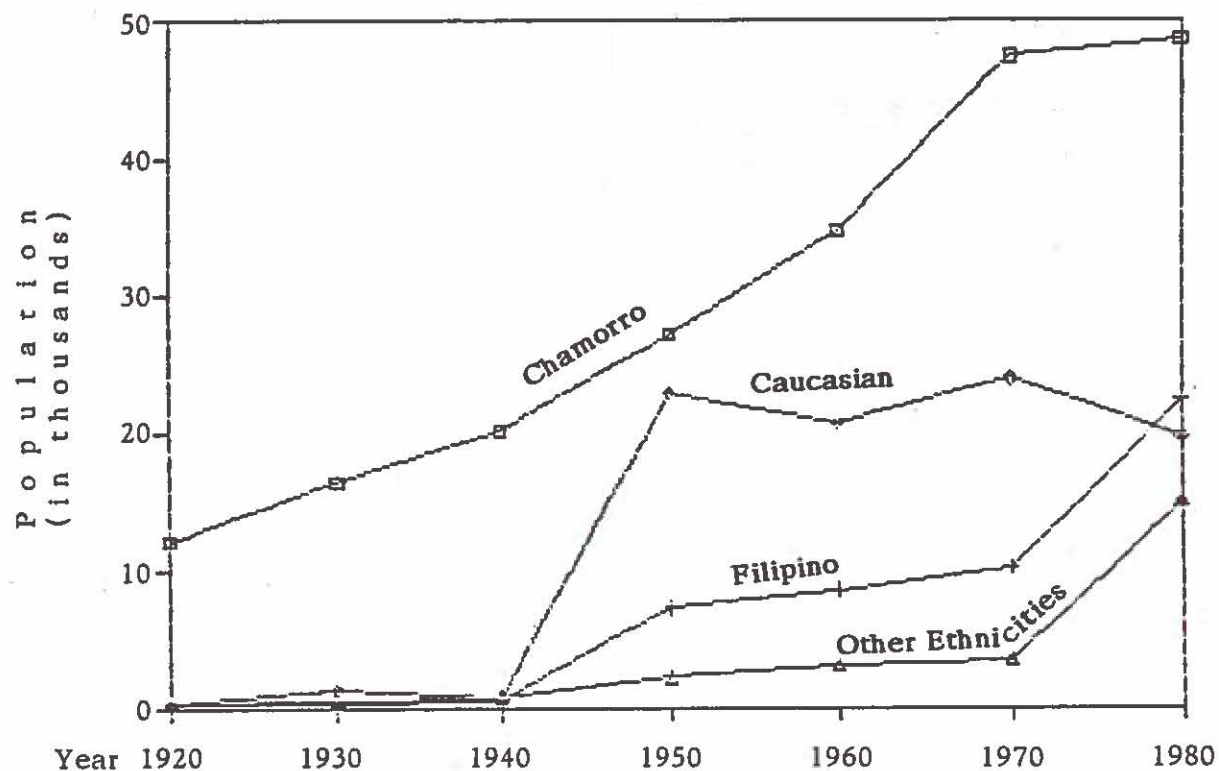
**TABLE 2**  
**Annual Growth Rate of Total Population**  
**Guam: 1920 - 1980**

| Period  | Total<br>Population | Chamorro | Filipino | Caucasian | Other |
|---------|---------------------|----------|----------|-----------|-------|
| 1920-30 | 3.3%                | 2.9%     | -0.8%    | 14.6%     | 3.4%  |
| 1930-40 | 1.9                 | 2.1      | 4.4      | -4.3      | 3.5   |
| 1940-50 | 9.8                 | 3.0      | 25.5     | 33.7      | 10.6  |
| 1950-60 | 1.2                 | 2.5      | 1.7      | -1.0      | 3.0   |
| 1960-70 | 2.4                 | 3.1      | 1.7      | 1.4       | 1.4   |
| 1970-80 | 2.2                 | .3       | 7.9      | -1.9      | 14.9  |

Note: Total population includes active duty military and dependents.

Source: Tung (1981), Table 7 Revised.

**FIGURE 4**  
**POPULATION GROWTH BY ETHNICITY**  
**GUAM: 1920 - 1980**



Source: Guam Health Planning and Development Agency.

**(b) Population Distribution**

Besides the shift in ethnic composition, Guam has also experienced a major change in population distribution. The choice of residency of the original inhabitants of Guam was dictated by the topography of the island. Since they subsisted on farming and fishing, they had to reside close to the arable land and the fresh water sources in the central and southern regions as well as in the coastal lowlands and accessible shoreline areas. After the war and due to the expansion of Guam's commercial economy, people tended to gravitate towards the north-central and northern areas of the island to be close to the places of employment and the amenities of urbanization. This trend has continued: in 1985, 74.5 percent of the total population reside in the north-central and northern regions of the island.

Tables 3 and 4 show in greater detail the changes in population distribution from 1960 through 1985. The estimated 1985 population was arrived at using growth rates between the 1970 and 1980 censuses, and in some cases, from the rate of growth between the 1960 and 1980 censuses. Allocations were made to some villages as well based on their percentage of the total population in the 1980 census.

**TABLE 3**  
**Growth Rate by Village and Total Population**  
**Guam: 1960 - 1985**

| Village                 | 1960<br>Pop.  | 1970<br>Pop.  | 1980<br>Pop.   | Est.<br>1985<br>Pop. * | Total Growth<br>1960-1985 | Average<br>Annual Growth |
|-------------------------|---------------|---------------|----------------|------------------------|---------------------------|--------------------------|
| Agana                   | 1,642         | 2,119         | 896            | 754                    | 54%                       | -2.2%                    |
| Agana Hgts.             | 3,210         | 3,156         | 3,284          | 3,542                  | 10                        | 0.4                      |
| Agat                    | 3,107         | 4,308         | 3,999          | 4,260                  | 37                        | 1.5                      |
| Asan                    | 3,053         | 2,629         | 2,034          | 2,369                  | -22                       | -0.9                     |
| Barrigada               | 5,430         | 6,356         | 7,756          | 8,578                  | 58                        | 2.3                      |
| Chalan Pago-<br>Ordot   | 1,835         | 2,931         | 3,120          | 3,584                  | 95                        | 3.8                      |
| Dededo                  | 5,126         | 10,780        | 23,664         | 31,111                 | 507                       | 20.3                     |
| Inarajan                | 1,730         | 1,897         | 2,059          | 2,374                  | 37                        | 1.5                      |
| Mangilao                | 1,946         | 3,228         | 6,840          | 8,399                  | 332                       | 13.3                     |
| Mongmong-<br>Toto-Maite | 3,015         | 6,057         | 5,245          | 6,022                  | 100                       | 4.0                      |
| Merizo                  | 1,398         | 1,529         | 1,663          | 1,737                  | 24                        | 1.0                      |
| Piti                    | 1,467         | 1,284         | 2,866          | 3,574                  | 144                       | 5.8                      |
| Santa Rita              | 12,126        | 8,109         | 9,183          | 9,478                  | -22                       | -0.9                     |
| Sinajana                | 3,862         | 3,506         | 2,485          | 2,092                  | -46                       | -1.8                     |
| Talofofo                | 1,352         | 1,935         | 2,006          | 2,042                  | 51                        | 2.0                      |
| Tamuning                | 5,944         | 10,218        | 13,580         | 16,167                 | 172                       | 6.9                      |
| Umatac                  | 744           | 813           | 732            | 729                    | -2                        | -0.1                     |
| Yigo                    | 7,682         | 11,542        | 10,359         | 10,467                 | 36                        | 1.4                      |
| Yona                    | 2,356         | 2,599         | 4,228          | 4,565                  | 94                        | 3.8                      |
| <b>TOTAL</b>            | <b>67,044</b> | <b>84,996</b> | <b>105,979</b> | <b>121,844</b>         | <b>82%</b>                | <b>3.3%</b>              |

\*Figures for 1985 are estimates.

Source: U.S. Bureau of the Census, General Population Characteristics;  
Guam Health Planning and Development Agency.



**TABLE 4**  
**Total Population by Region**  
**Guam: 1960 - 1985**

| Region        | 1960          | %            |         | 1970          | %            |         | 1985           | %             |         |
|---------------|---------------|--------------|---------|---------------|--------------|---------|----------------|---------------|---------|
| North         | 12,808        | 19.1         | } 59.23 | 22,322        | 26.3         | } 70.47 | 41,578         | 34.12         | } 74.45 |
| North-Central | 26,903        | 40.1         |         | 37,571        | 44.2         |         | 49,138         | 40.33         |         |
| South-Central | 23,461        | 35.0         | } 40.77 | 20,864        | 24.5         | } 29.53 | 26,288         | 21.58         | } 25.55 |
| South         | 3,872         | 5.8          |         | 4,239         | 5.0          |         | 4,840          | 3.97          |         |
| <b>TOTAL</b>  | <b>67,044</b> | <b>100.0</b> |         | <b>84,996</b> | <b>100.0</b> |         | <b>121,844</b> | <b>100.00</b> |         |

Source: U.S. Bureau of the Census, General Population Characteristics:  
Guam 1960, 1970, and 1980.

**Regional Definitions (by village):**

|               |   |                                                                                                         |
|---------------|---|---------------------------------------------------------------------------------------------------------|
| North         | = | Yigo, Dededo                                                                                            |
| North-Central | = | Agana, Agana Heights, Chalan Pago-Ordot, Mangilao<br>Mongmong-Toto-Maite, Barrigada, Sinajana, Tamuning |
| South-Central | = | Agat, Asan, Piti, Santa Rita, Talofofo, Yona                                                            |
| South         | = | Inarajan, Merizo, Umatac                                                                                |

**(c) Guam's Transient Population**

The nature of Guam's population composition makes it necessary to consider the transient population, since a growing tourism industry, a fluctuating temporary alien work force, and a large military presence impact to various degrees on the local health care system.

The number of visitors to Guam has increased rapidly due to the efforts to make the island a major tourist destination, particularly for the people from Japan, the Asian rim-countries, the U.S. mainland, and Australia. Visitors have increased from 291,133 in 1980 to 368,665 in 1984, with 77 percent coming from Japan. The average daily visitor census was approximately 1,010 in 1984, and visitors generally stayed from 3 to 4 days. About 64 percent of all visitors were tourists and concentrated in hotels along Tumon Bay. Health hazards, such as coral punctures, abrasions and fractures due to accidents, sunburn, sunstroke, and occasional drownings are associated with tropical island tourism and expected to occur with regular frequency.

Guam has a fluctuating number of temporary alien workers depending on the island's construction activities. There were 1,940 such workers

in the community in 1984. Health concerns of that particular population include the importation of undiagnosed communicable diseases and work injuries.

The military population ranged from 20,266 in 1980 to 23,600 in 1985, an increase of 16.45 percent over 1980. The health implications of such a large military contingent, 24.6 percent of the total population, are minimized by the fact that the military has developed a health care system that provides most of the necessary medical services to all personnel and dependents. However, as the military population interacts with the civilian population, there exists a continuing risk of spreading communicable diseases in the community.

#### (d) Vital Events

Vital events provide a fairly accurate means for establishing and estimating future population changes. To calculate such change, we look at the population at the end of a period, at the beginning of a period, at the births and deaths recorded during the period, and at in-migration and out-migration to arrive at a true figure for that period.

A review of Guam's vital events for the last 11 years, from 1974 to 1984 (Table 5), indicates a decline in birth and death rates. However overall population growth is expected to continue unless out-migration highly exceeds in-migration.

**TABLE 5**  
**Vital Indicators and Rates**  
**Per 1,000 Total Population**  
**Guam: 1974 - 1984**

| Year | Mid-Year Pop. | Live Births | Crude Birth Rate* | Total Deaths | Crude Death Rate* |
|------|---------------|-------------|-------------------|--------------|-------------------|
| 1974 | 93,874        | 3,226       | 34.4              | 449          | 4.8               |
| 1975 | 95,968        | 3,165       | 33.0              | 441          | 4.6               |
| 1976 | 98,109        | 3,048       | 31.1              | 446          | 4.5               |
| 1977 | 100,298       | 3,007       | 30.0              | 380          | 3.8               |
| 1978 | 102,535       | 2,903       | 28.3              | 424          | 4.1               |
| 1979 | 104,823       | 2,950       | 28.1              | 411          | 3.9               |
| 1980 | 107,780       | 3,003       | 27.9              | 423          | 3.9               |
| 1981 | 109,228       | 3,008       | 27.5              | 406          | 3.7               |
| 1982 | 110,580       | 2,992       | 27.1              | 443          | 4.0               |
| 1983 | 115,315       | 3,184       | 27.6              | 462          | 4.0               |
| 1984 | 120,094       | 2,957       | 24.6              | 450          | 3.8               |

\*Per 1,000 total population.

Source: Department of Public Health and Social Services, Guam;  
Guam Health Planning and Development Agency.

(e) Projection for Total Population: 1980-1990

In the late 1960's and early 1970's, various planners and demographers had originally foreseen a continuous acceleration of population growth for the decades of 1970, 1980, and 1990. After the final 1980 census figures were established, earlier predictions of a 4 percent overall growth rate fell short of the actual annual growth rate of 2.2 percent, established for the increase in total population from 84,996 in 1970 to 105,979 in 1980. The average annual growth rate of the civilian population for the same period of time was 3.01 percent.

Table 6 shows the 10-year projected total, civilian and military populations for 1980 through 1990. The projections for the total population from 1981 to 1985 are based on net natural increase and net military increase. The projections and estimates from 1986 through 1990 for this same population, are computed for 5-year age groups using growth rates from between either the 1970 and 1980 censuses, or between the 1960 and 1980 censuses. The growth rates between the 1960 and 1980 censuses are generally used for those age groups in which the military population is assumed to fall, since these rates smooth out the increases and decreases in the military population that had occurred during the Vietnam war.

**TABLE 6**  
**Projection for Total, Civilian,**  
**and Military Populations**  
**Guam: 1980 - 1990**

| Year | Total<br>Population | Civilian<br>Population |      | Military<br>Population |      |
|------|---------------------|------------------------|------|------------------------|------|
|      |                     | #                      | %    | #                      | %    |
| 1980 | 105,979             | 87,421                 | 82.5 | 18,558                 | 17.5 |
| 1981 | 109,581             | 89,075                 | 81.3 | 20,506                 | 18.7 |
| 1982 | 108,874             | 90,761                 | 83.4 | 18,113                 | 16.6 |
| 1983 | 112,285             | 92,479                 | 82.4 | 19,806                 | 17.6 |
| 1984 | 118,344             | 94,229                 | 79.6 | 25,115                 | 20.4 |
| 1985 | 121,844             | 96,011                 | 78.8 | 25,833                 | 21.2 |
| 1986 | 123,794             | 98,089                 | 79.2 | 25,705                 | 20.8 |
| 1987 | 126,547             | 100,212                | 79.2 | 26,335                 | 20.8 |
| 1988 | 129,362             | 102,381                | 79.2 | 26,981                 | 20.8 |
| 1989 | 132,240             | 104,597                | 79.1 | 27,643                 | 20.9 |
| 1990 | 138,606             | 106,858                | 77.1 | 31,748                 | 22.9 |

Source: Guam Health Planning and Development Agency.

The civilian population estimates for 1980 are calculated by subtracting the populations in the census designated places (CDP's) that contain military reservations and housing areas from the total population. These calculations are done for single years of age by sex. The resulting civilian population was survived forward to 1985 and 1990 using survival ratios



from Tung's life tables for the civilian population of Guam; and estimates for the intervening years were made using the exponential growth rates that resulted from this operation. the average annual growth rate from 1980 to 1990, using this method, is 2.14 percent.

## (2) Guam's Civilian Population

When looking at the island's health care needs and required services, the civilian population is the determining factor for planning. The following is a discussion of the population characteristics essential to the planning process.

### (a) Civilian Population Growth

Between the years 1970-1980, Guam's civilian population increased from 64,680 to 87,421 at an annual rate of 3.01 percent. This significant growth is attributed to natural increase and in-migration. Natural increase refers to the number of people added to the population given the number of births less the number of deaths in any particular time interval. Net in-migration is the number of people coming to the island in excess of the number of people leaving the island.

Temporary foreign laborers working on construction projects and permanent resident aliens making their home on Guam may also account for some of this increase. However, due to heavy out-migration of the civilian population (mytinger, 1981), the growth of the civilian population is attributed, for the most part, to net natural increase.

As shown in Table 7, there was a decline in the civilian annual growth rate for the years 1980-1985, down 1.87 percentage points from the 3.01 percent annual rate of increase between 1970 and 1980. An annual growth rate of 2.14 percent has been projected for the years 1985-1990.

**TABLE 7**  
**Civilian Population Growth**  
**Guam: 1970 - 1990**

| Year                                                            | Total   | Annual Growth<br>Rate Percent |
|-----------------------------------------------------------------|---------|-------------------------------|
| 1970                                                            | 64,680  |                               |
| 1975                                                            | 75,196  | 3.01                          |
| 1980                                                            | 87,421  | 3.01                          |
| 1985                                                            | 96,011  | 1.87                          |
| 1990* (Projected)                                               | 106,858 | 2.14                          |
| Overall Percent Change: 1970-1980: 35.16      1970-1990 = 65.21 |         |                               |
| 1980-1990: 22.23                                                |         |                               |
| Annual Growth (Percent): 1970-1980: 3.01      1970-1990 = 2.51  |         |                               |
| 1980-1990: 2.01                                                 |         |                               |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam;  
Guam Health Planning and Development Agency.



(b) Resident Status

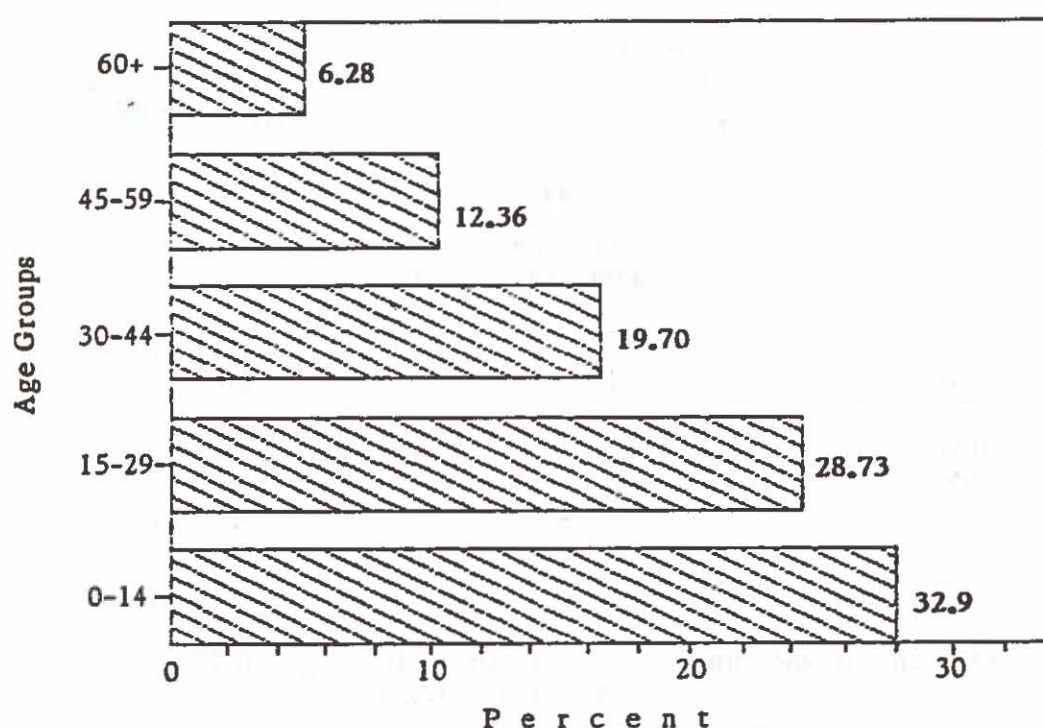
The civilian population of Guam can be divided into three distinct categories: permanent residents, temporary aliens, and stateside-hired contract employees. Table 8 details these categories for the years 1980-1984.

A decline in the number of stateside hired contract employees can be observed. The numbers of temporary alien workers have dropped over 50 percent from 1980 to 1981, but since then have remained stable. However, with the anticipated expansion of construction activities a sharp increase in the number of alien construction workers is expected in the next few years.

(c) Age Distribution

Figure 5 below shows that Guam has a very young population; the median age calculated from the 1980 Census for the total population was 22.2 years. In 1985, more than half, 53.5 percent of all civilian inhabitants, were under the age of 25 and one-third (32.9%) were children below

**FIGURE 5**  
**CIVILIAN POPULATION BY AGE**  
**GUAM: 1985**



Source: Guam Health Planning and Development Agency.

15. Since birth rates have steadily declined over the last decade (from 34.8/1,000 in 1974 to 24.6/1,000 in 1984), the proportion of the population aged 20 and below is likely to decline in the future. However, over the next decades there will still be a large demand for medical services as well as prevention and protection programs pertaining to maternal and child health.

The demand for senior care services is likely to increase in the near future. Whereas 2,938 or 3.4 percent of Guam's civilian population was age 65 or older in 1980, the proportion of the elderly has increased to 3.6 percent (or 3,423) in 1985. These figures are expected to rise further to 5,219 or 4.9 percent of the civilian population in 1990. The sharp increase in the senior population makes it necessary to investigate the available health and support services for seniors, since an older population consists of heavy users of the health system. Besides the physical and mental infirmities expected with old age, Guam's inhabitants have a much higher than national average incidence and prevalence of diabetes, hypertension, and neurological diseases with all the attending complications of these diseases. There is an urgent need for the planning of community and institutional long-term care services.

#### (d) Dependency Ratio

In a population with an unusually large number of children or elderly, calculating a dependency ratio becomes important. The dependency ratio is defined as the ratio of children aged 0-14 and persons 65 years or older to the persons between the ages of 15 and 64. The Guam dependency ratio in 1980 was 61.9, for the civilian population, which compares well with the developed countries. This ratio dropped to 57.5 in 1985, and is not expected to vary much in 1990. However, the composition of dependents will change; there will be a reduction in the 0-14 age groups and an increase in those over 65.

The implications of a dependency ratio are primarily economic, since the proportion of the population unable to provide for their needs must be sustained by the members of the community's formal work force.

#### (e) Sex Distribution

Table 9 and Figure 6 details the sex distribution of the Guam civilian population. The use of a sex ratio is a meaningful interpretation of this distribution. The overall sex ratio, defined as the proportion of males to females in a population, was 1.06 in Guam. This ratio, however, is not consistent through all age groups, as can be seen below:

| <u>Age Group</u> |                                              |   | <u>Sex Ratio</u> |
|------------------|----------------------------------------------|---|------------------|
| 0 - 19           | <u>21,500 males</u><br><u>20,156 females</u> | = | 1.07             |
| 20 - 34          | <u>12,493 males</u><br><u>12,380 females</u> | = | 1.01             |
| 35 - 65          | <u>13,636 males</u><br><u>12,415 females</u> | = | 1.10             |
| 65+              | <u>1,679 males</u><br><u>1,744 females</u>   | = | .96              |

**TABLE 8**  
**Civilian Population by Resident Status**  
**Guam: 1980 - 1984**

| Year | Local Residents |      | Stateside Hired* |     | Temporary Aliens |     | Total Civilian Population |     |
|------|-----------------|------|------------------|-----|------------------|-----|---------------------------|-----|
|      | #               | %    | #                | %   | #                | %   | #                         | %   |
| 1980 | 82,121          | 93.9 | 1,300            | 1.4 | 4,000            | 4.6 | 87,421                    | 100 |
| 1981 | 85,813          | 96.3 | 1,362            | 1.5 | 1,900            | 2.2 | 89,075                    | 100 |
| 1982 | 87,637          | 96.6 | 1,154            | 1.2 | 1,970            | 2.2 | 90,761                    | 100 |
| 1983 | 89,443          | 96.7 | 1,106            | 1.2 | 1,930            | 2.1 | 92,479                    | 100 |
| 1984 | 91,323          | 96.9 | 966              | 1.0 | 1,940            | 2.1 | 94,229                    | 100 |

\*Department of Defense employees and their dependents.

Source: Department of Commerce, Government of Guam;  
Commander Naval Force, Marianas Islands.

Guam's consistently male-dominated sex ratio is unusual when compared to the U.S. mainland where, after the age of 45, females usually outnumber males by a large margin (Table 9 below and Figure 6 on the following page).

**TABLE 9**  
**Civilian Population by Age and Sex**  
**Guam: 1985**

| Age         | Males  |       | Females |       |
|-------------|--------|-------|---------|-------|
|             | #      | %     | #       | %     |
| 0- 4        | 5,781  | 6.02  | 5,442   | 5.67  |
| 5- 9        | 5,186  | 5.40  | 4,822   | 5.02  |
| 10-14       | 5,376  | 5.60  | 5,020   | 5.23  |
| 15-19       | 5,157  | 5.37  | 4,872   | 5.07  |
| 20-24       | 4,996  | 5.20  | 4,726   | 4.92  |
| 25-29       | 3,933  | 4.10  | 3,899   | 4.06  |
| 30-34       | 3,564  | 3.71  | 3,763   | 3.92  |
| 35-39       | 3,475  | 3.62  | 3,302   | 3.44  |
| 40-44       | 2,513  | 2.62  | 2,294   | 2.39  |
| 45-49       | 2,248  | 2.34  | 2,136   | 2.22  |
| 50-54       | 1,949  | 2.03  | 1,880   | 1.96  |
| 55-59       | 2,024  | 2.11  | 1,628   | 1.70  |
| 60-64       | 1,427  | 1.49  | 1,175   | 1.22  |
| 65 and over | 1,679  | 1.75  | 1,744   | 1.82  |
| Total       | 49,308 | 51.36 | 46,703  | 48.64 |

Source: Guam Health Planning and Development Agency.

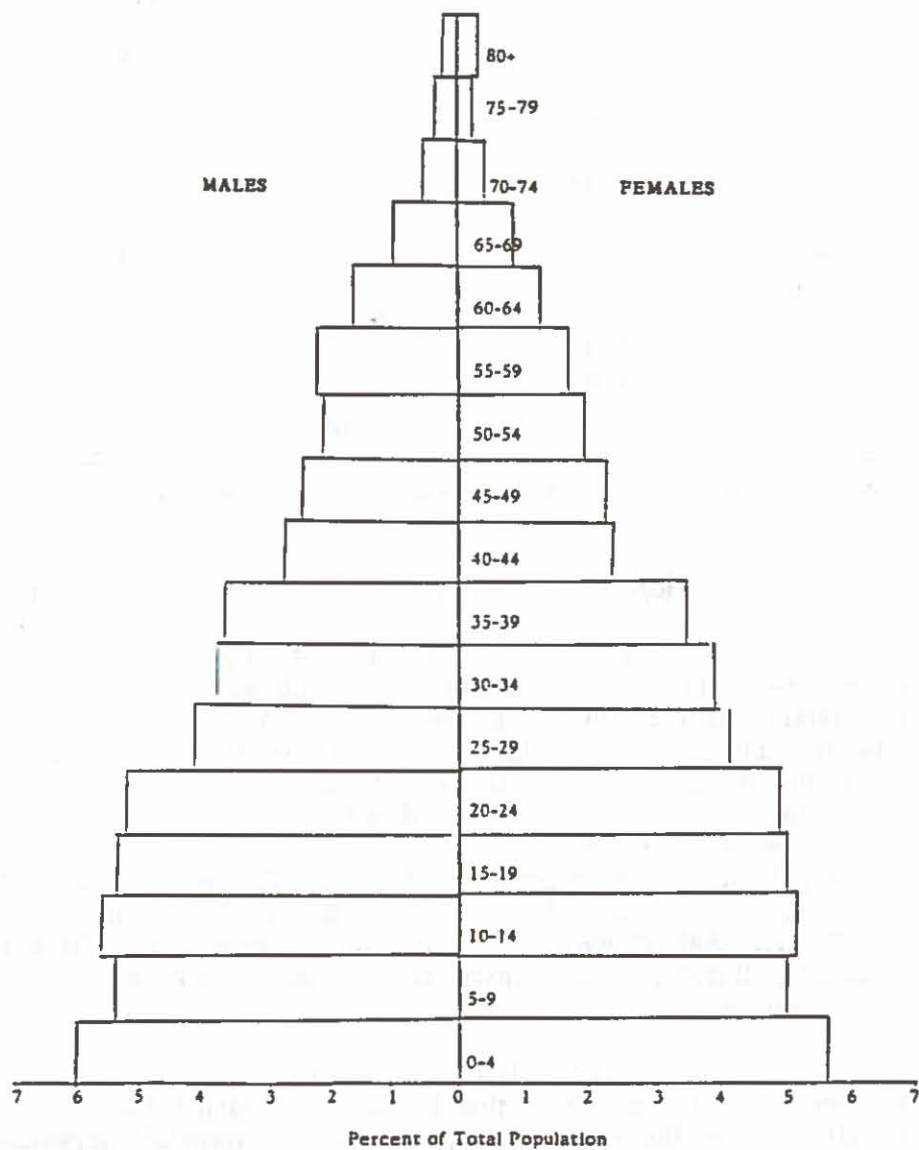
(f) Ethnic Composition of the Civilian Population 16 Years and Older

Guam is a truly multi-cultural island with the major ethnic groups of Chamorros (indigenous inhabitants), Filipinos, and Caucasians sharing the island with people from the various Asian countries, the Pacific Islands, and other countries. According to the official census figures of 1980, those persons reporting themselves to be of Chamorro or part-Chamorro heritage comprised 47 percent (26,707) of the civilian population aged 16 years and older. Filipinos over the age of 16 made up 26 percent of the population (14,429). The next largest ethnic group was Caucasians with 13 percent of the civilian population over age 16 (7,170). Asians were 4,546 in number (8%) and "Others" (Pacific Islanders, Blacks, etc.) constituted 6 percent of the population with 3,796 over 16.

Whereas all of Guam's civilian population has experienced a steady growth over the decades, the Filipino population has grown the most rapidly of any identified ethnic group. Substantial increases occurred after World War II, with the easing of immigration laws and regulations in the 1960's, and again during the years 1970 to 1980 when Guam experienced a heavy economic and construction boom. As mentioned

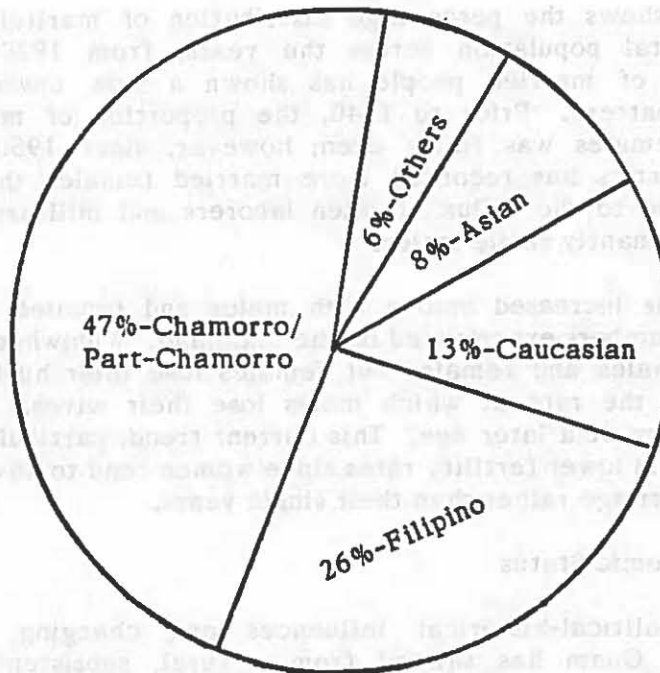


**FIGURE 6**  
**CIVILIAN POPULATION BY AGE AND SEX**  
**GUAM: 1985**



Source: Guam Health Planning and Development Agency.

**FIGURE 7**  
**ETHNIC COMPOSITION FOR THE CIVILIAN POPULATION**  
**16 YEARS AND OLDER\***  
**GUAM: 1980**



\*Figures for the ethnic composition of the population under age 15 were not made available by the official 1980 census report.

Source: U.S. Bureau of the Census, Department of Commerce, Detailed Social and Economic Characteristics, Guam, 1980.

earlier in this chapter, Guam's ethnic composition has changed drastically as a result of in-migration.

#### (g) Marital Status

In 1980, 63 percent of the population 15 years and older were married, and 7 percent were either separated, divorced, or widowed. The remaining 30 percent have reported themselves as being single.

Vital Statistics registered 1,636 marriages in 1980. The crude marriage rate was 15 per 1,000 population, and the general marriage rate per unmarried persons aged 15 and above was 66/1,000.

$$\text{Crude Marriage Rate} = \frac{M}{P} = \frac{1,636}{105,979} = 15.0 \text{ Marriages per 1,000 total population}$$

$$\text{General Marriage Rate} = \frac{M}{P_{15+}} = \frac{1,636}{24,966} = 65.6 \text{ Marriages per 1,000 population age 15 and older}$$

Table 10 shows the percentage distribution of marital status for the island's total population across the years, from 1920 to 1980. The proportion of married people has shown a slow upward trend in an irregular pattern. Prior to 1940, the proportion of married males to married females was fairly even; however, since 1950 the Office of Vital Statistics has recorded more married females than males. This may be due to the influx of alien laborers and military personnel who are predominantly single males.

Divorce has increased among both males and females, but is still far from the numbers experienced on the mainland. Widowhood has decreased for both males and females but females lose their husbands at almost four times the rate at which males lose their wives. It appears that people marry at a later age. This current trend, particularly for women, may result in lower fertility rates since women tend to have more children in their marriage rather than their single years.

#### (h) Socio-Economic Status

Due to political-historical influences and changing socio-economic conditions, Guam has shifted from a rural, subsistence farming and fishing economy to an urbanized, services-oriented, commercial economy. This development can be ascribed to the following factors: Guam's potential as a finance center as well as a transshipment and communications link between the U.S. and Asia; the expanding military presence in the Western Pacific, with a particularly large contingent stationed on Guam; a rapidly growing tourist industry; and the Government of Guam's ever increasing bureaucracy.

Statistics gathered by the Guam Department of Commerce show that in March 1984 33,490 people comprised the civilian labor force, out of which 30,670 were employed and 2,820 people were unemployed. The unemployment rate (percent of labor force) was 8.4 during that same period.

Per capita taxable income was a low \$4,000. The average hourly earning rate was \$5.17 in September 1984. The Consumer Price Index (CPI) during that time had risen to 192.7 (calculated from 1978 = 100), and the purchase power of the consumer dollar had decreased to \$0.52.

During that same period, a large segment of the population had been in need of public assistance which was provided by the Department of Public Health and Social Services. Below are listed the number of people who were receiving assistance from particular programs in September 1984, many of them from several programs, since assistance benefits are not mutually exclusive.

**TABLE 10**  
**Marital Status of the Adult Population**  
**Guam: 1920 - 1980**

| Marital Status | 1920* | 1930* | 1940      | 1950     | 1960 | 1970 | 1980* |
|----------------|-------|-------|-----------|----------|------|------|-------|
| MALES          |       |       |           |          |      |      |       |
| Single         | 41.7  | 46.9  | 44.7      | 55.1     | 36.0 | 34.1 | 33.3  |
| Married        | 51.8  | 47.8  | 49.5      | 39.7     | 60.9 | 62.3 | 62.2  |
| Separated      | u     | u     | u         | u        | 0.5  | 0.6  | 0.9   |
| Widowed        | 6.1   | 4.8   | { 5.8 **  | { 5.2 ** | 1.8  | 1.3  | 1.4   |
| Divorced       | 0.3   | 0.4   |           |          | 1.5  | 2.2  | 2.3   |
| FEMALES        |       |       |           |          |      |      |       |
| Single         | 39.7  | 35.7  | 41.6      | 31.5     | 26.2 | 29.6 | 26.2  |
| Married        | 46.9  | 53.0  | 48.2      | 59.0     | 66.2 | 64.3 | 63.4  |
| Separated      | u     | u     | u         | u        | 1.1  | 0.9  | 1.3   |
| Widowed        | 13.0  | 10.8  | { 10.1 ** | { 9.4 ** | 6.6  | 4.9  | 5.5   |
| Divorced       | 0.4   | 0.4   |           |          | 1.1  | 1.1  | 3.5   |

\*Population 15 years and older. All other figures pertain to the population 14 years and older.

\*\*Combined widowed and divorced.

u = Information for these years is unavailable.

Source: U.S. Bureau of the Census, 1932, 1953, 1961, 1972, and 1985.



| <u>Public Assistance Programs</u>                  | <u>Number of Recipients</u> |
|----------------------------------------------------|-----------------------------|
| Foodstamps                                         | 21,195                      |
| AFDC - Aid to Families with Dependent Children     | 6,497                       |
| APTD - Aid to the Permanently and Totally Disabled | 220                         |
| OAA - Old Age Assistance                           | 803                         |
| GA - General Assistance                            | 191                         |
| AB - Aid to the Blind                              | <u>7</u>                    |
| Total Public Assistance Recipients                 | <u>28,913</u>               |

The same were eligible for Medicaid, and 652 medically indigent persons required help with paying their medical bills.

Besides having a large number of people dependent on public assistance, Guam is faced with another problem: 30 percent, or approximately 28,000 persons, are not covered under any health insurance plan, and do not qualify for Medicare or Medicaid. This has far-reaching implications when planning for the health care delivery system, and is discussed in more detail in Chapter VI - HEALTH CARE POLICY ISSUES.

#### **E. Summary**

The island of Guam is faced with the challenge of developing and maintaining a health care system which will adequately meet the needs of a predominantly young and growing population, and which will also address the problems of the rapidly increasing number of elderly. Several factors will have to be integrated into the planning process:

- (1) Guam's civilian population is expected to grow at a rate of approximately 2 percent per year. At this rate, the island will have added about 10,847 persons to its population by 1990. Special attention needs to be focused on obstetric and pediatric services.
- (2) Guam's senior population will almost double in the next 5 years, necessitating an increase in the existing health and senior support services, as well as planning for community and institutional long-term care services.
- (3) There will be a continuous trend towards residing in Guam's north-central and northern areas.
- (4) Limited health resources and an insufficient population base will inhibit the planning and implementation of highly specialized health services, facilities, and equipment in the near future, but such specialized services must be considered as a long-range goal.

- (5) Off-island referrals are expected to continue for specialized diagnosis and treatment for the next several years.
- (6) Prepaid HMO services provided to approximately 50 percent of the population will continue to significantly impact on the delivery and utilization of health care on the island.
- (7) The trend to "westernize" local lifestyles will continue as will the health care system that is patterned after the U.S. models.
- (8) Regardless of the political status eventually negotiated between the Territory of Guam and the United States (be it Commonwealth, Free Association, Status Quo, or other), federal participation and assistance in the development of facilities and services will still be required in view of the island's limited financial resources.

Taking into account the above factors, the planning process is designed to develop and maintain a system which will provide adequate health care services in an equitable manner to all of Guam's inhabitants. The outcome will be dependent not only on the visions of health planners, but on the dedication and cooperation of the health services deliverers, and the political and governmental systems in carrying out these visions.

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### **III. HEALTH STATUS**



### III. HEALTH STATUS

#### A. Definition of Health Status

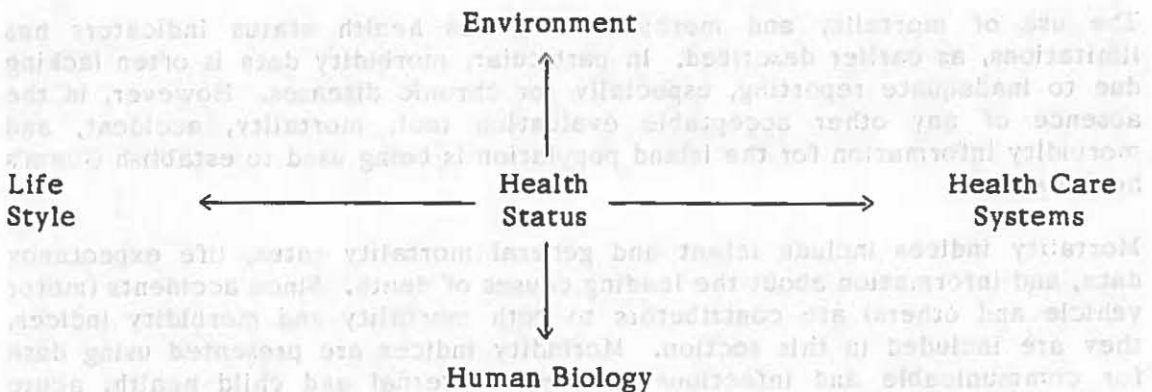
An investigation of health status identifies the level of health enjoyed by a person or population as measured by a specific set of data. Before such health status can be measured, however, it is necessary to define "health." A widely used and generally accepted definition is that of the World Health Organization:

Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.

Today, there is a growing realization that a definition of human health, characterized by negative implications (e.g., morbidity, mortality) is inadequate. With this realization comes a large interest in defining health in positive terms, to define what health is as opposed to what it is not; to seek solutions aimed at the promotion of health, not merely the alleviation of pain and eradication of illness, and to address not only the problems, but also those factors that contribute to the problems.

One successful effort to classify the different factors affecting human health, is the health field concept devised by Marc Lalonde. This model relates Health Status to the four broad elements of Human Biology, Environment, Lifestyle, and Health Care Systems, as illustrated below:

**FIGURE 8**  
**THE HEALTH FIELD CONCEPT**



Source: "Report from M. Lalonde - A New Perspective on the Health of Canadians," Ottawa, 1974.

**Human Biology** -Includes all aspects of health pertaining to the basic biology and the organic make-up of the individual, such as genetic inheritance, the processes of maturation and aging, etc.

**Environment** -Includes all those matters related to health which are external to the human body, such as air and water quality, and over which the individual has little or no control.

**Lifestyle** -Refers to the aggregation of complex decisions by individuals which affect their health and over which they have a certain amount of control.

**Health Care Systems** -Refers to the arrangement, quantity, quality, and nature of health services, as well as the relationship between people and the resources of people in the provision of health care.

Using the health field concept as a guide for an analysis of health status, it becomes obvious that problem solving must be sought not only through medical intervention, but also through environmental action, individual lifestyle decisions, educational and preventive measures, health system monitoring, and social reform.

## **B. Health Status Indicators**

While the status of a person's complete physical, mental, and social well-being is hard to measure, health officials and statisticians have developed certain methods for assessing health status. This section, therefore, examines the health of the Guam population in terms of the traditional measures of mortality and morbidity. Mortality indicators are static and thus believed to give a broad picture of ongoing health in a community. Morbidity measures, on the other hand, are dynamic indicators and as such provide a much better basis for facility planning than do mortality measures.

The use of mortality and morbidity rates as health status indicators has limitations, as earlier described. In particular, morbidity data is often lacking due to inadequate reporting, especially for chronic diseases. However, in the absence of any other acceptable evaluation tool, mortality, accident, and morbidity information for the island population is being used to establish Guam's health status.

Mortality indices include infant and general mortality rates, life expectancy data, and information about the leading causes of death. Since accidents (motor vehicle and others) are contributors to both mortality and morbidity indices, they are included in this section. Morbidity indices are presented using data for communicable and infectious diseases, maternal and child health, acute and chronic conditions, as well as disabilities.

## C. Mortality Indices

### (1) Infant Mortality

The infant mortality rate is widely used as an indicator of a community's health status. Rates are customarily reported for the neonatal period (birth to 28 days) and the post-neonatal period (29 days to 1 year). Infant mortality rates are affected by environmental and socio-economic conditions such as poverty, malnutrition, poor housing, and the quality of medical care in the pre- and postnatal periods.

Guam's infant mortality rates show a steady decline over the last 10 years with the exception of 1980. This can be seen from Table 11. In 1973, there were 23.2 deaths per 1,000 live births. A continuous downward trend was observed until 1979, when a rate of 10.2/1,000 was recorded. A significant increase to 14.3/1,000 occurred in 1980. However, in the following years, the downward trend continued and in 1983 there were only 9.1 infant deaths per 1,000 live births.

Available figures show that Guam's infant mortality rate compares favorably with that of the U.S. mainland. For instance, the U.S. rate for 1982 was 11/1,000 compared to Guam's rate of 9.4/1,000 in the same year.

TABLE 11  
Infant Mortality Rates Per 1,000 Live Births  
Guam: 1973 - 1983  
(Based on Deaths of Infants Born on Guam)

| Year | Neonatal<br>Death Rates | Post-Neonatal<br>Death Rates | Infant<br>Mortality Rates |
|------|-------------------------|------------------------------|---------------------------|
| 1973 | 16.1                    | 7.1                          | 23.2                      |
| 1974 | 18.3                    | 5.0                          | 23.3                      |
| 1975 | 17.4                    | 2.9                          | 20.3                      |
| 1976 | 10.5                    | 4.9                          | 15.4                      |
| 1977 | 10.0                    | 4.6                          | 14.6                      |
| 1978 | 10.0                    | 5.5                          | 15.5                      |
| 1979 | 7.5                     | 2.7                          | 10.2                      |
| 1980 | 10.0                    | 4.3                          | 14.3                      |
| 1981 | 9.3                     | 1.0                          | 10.3                      |
| 1982 | 4.7                     | 4.7                          | 9.4                       |
| 1983 | 6.6                     | 2.5                          | 9.1                       |

Sources: Office of Vital Statistics, Department of Public Health and Social Services, Guam;  
Statistical Abstract of the United States, 1984.

Neonatal deaths accounted for the majority of infant deaths in 1983, where 38.5 percent of all such deaths occurred in the first day of life. The major causes of neonatal deaths are prematurity, congenital anomalies, or injuries at birth. Deaths in the post-neonatal period are usually associated with infectious diseases and nutritional problems.



## (2) Mortality

When calculating and discussing mortality rates, a distinction must be made between crude, adjusted, and specific rates. The crude mortality rate refers to the total number of deaths in the total population, and in Guam's case the crude mortality rate has remained relatively stable for the years 1979-83. An average rate of 3.9/1,000 was calculated for this time period in which an average of 422 people died annually. Average male rates (4.3) exceeded female rates (3.2) by 34 percent. Table 12 provides more details and compares Guam's crude rates to those of the United States.

**TABLE 12**  
**Crude Mortality Rates Per 1,000 Population**  
**Guam and U.S.: 1979 - 1983**

| Year | # of Deaths | Total Population |      | Male |      | Female |      |
|------|-------------|------------------|------|------|------|--------|------|
|      |             | Guam             | U.S. | Guam | U.S. | Guam   | U.S. |
| 1979 | 377         | 3.6              | 8.5  | 4.2  | 9.6  | 2.9    | 7.5  |
| 1980 | 422         | 4.0              | 8.8  | 4.7  | 9.8  | 3.1    | 7.9  |
| 1981 | 406         | 3.7              | 8.7  | 4.3  | 9.6  | 3.1    | 7.8  |
| 1982 | 443         | 4.0              | 8.6  | 4.1  | n/a  | 3.5    | n/a  |
| 1983 | 462         | 4.0              | 8.6  | 4.2  | n/a  | 3.3    | n/a  |
| Avg. | 422         | 3.9              | 8.6  | 4.3  | 9.7  | 3.2    | 7.7  |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam 1979-1983;  
National Center for Health Statistics, 1976-1980.

In a comparison of Guam's crude rates to the U.S. rates, it appears at first glance that Guam has much lower rates. For instance, in 1980, the crude rate for Guam males was 52 percent lower and the female rate was 61 percent lower than those of the United States. These lower crude mortality rates stem from an age composition where more than 50 percent of Guam's population is under the age of 25.

Another way of comparing mortality rates is by the use of the standardized crude death rate. This is a rate for the total population which has been standardized for age distribution, so that it is, in effect, independent of the age structure of a population. Using this rate, again for the 1980 Guam and U.S. populations, we get the following results:

Standardized crude death rate for 1,000 population for 1980

|                   |             |             |
|-------------------|-------------|-------------|
| Total Population: | <u>Guam</u> | <u>U.S.</u> |
|                   | 9.67        | 5.96        |

Guam's standardized mortality rate is 62 percent higher than the U.S. rates.



For the most accurate comparison of mortality rates between countries, the age and sex adjusted rates serve best. If one standardizes the Guam rates for age and sex of the population and compares them against the U.S. age and sex standardized rates, a considerable change can be observed.

Sex and age standardized mortality rates per 1,000 population for 1980

|        |             |             |          |             |             |
|--------|-------------|-------------|----------|-------------|-------------|
| Males: | <u>Guam</u> | <u>U.S.</u> | Females: | <u>Guam</u> | <u>U.S.</u> |
|        | 9.72        | 9.80        |          | 9.34        | 7.80        |

As can be seen above, the 1980 Guam sex- and age-standardized mortality rate for males is now slightly lower (by 0.82%), and for females it is considerably higher (by 19.7%) than the comparable U.S. rates.

### (3) Life Expectancy

The number of years expected in a population's lifetime often reflects the population's environment, and is frequently used with other indicators to measure the population's health status. Life expectancy figures calculated by Tung for the years 1969-71 and 1976-78, and by Flores for 1980-82, are shown in Table 13.

The 1969-71 life expectancy at birth for females was 75.9 years and 65.6 years for males, as compared to the respective U.S. values of 74.6 and 67.0. The 1976-78 life table shows a significant increase of 2.8 years for females to 78.4 years, and of 3.8 years for males to 69.7 years, which compared favorably with the U.S. figures. The 1980-82 life table is computed from total population data and shows a decrease in life expectancy, particularly for females where a drop of 4.2 years occurred.

**TABLE 13**  
**Years of Life Expectancy**  
**Guam and U.S.: 1969 - 1982**

| Years    | Guam  |         | U.S.  |         |
|----------|-------|---------|-------|---------|
|          | Males | Females | Males | Females |
| 1969-71* | 65.5  | 75.9    | 67.0  | 74.6    |
| 1976-78* | 69.7  | 78.7    | 69.2  | 77.1    |
| 1980-82  | 69.6  | 74.5    | 70.4  | 77.9    |

\*Excluding military population.

Source: Tung, S., Economic Research Center, Department of Commerce, Guam;  
Flores J., Census and Population Division, Department of Commerce, Guam.

No analysis on longevity of the major ethnic groups has been performed to date, but the majority of older persons presently living in Guam seem to be Chamorros. However, this is more a reflection of the immigration pattern after the war rather than an indication of any extended life expectancy for this particular ethnic group.

#### (4) Leading Causes of Death

Vital statistics of 1983 (the latest available figures) have identified the leading causes of death as illustrated below.

**TABLE 14**  
**The Ten Leading Causes of Death**  
**Guam: 1983**

| Rank | Cause of Death                                     | Rate/1,000<br>Population | % of Total<br>Deaths |
|------|----------------------------------------------------|--------------------------|----------------------|
| 1    | Heart Disease                                      | 1.19                     | 29.6                 |
| 2    | Malignant Neoplasms                                | 0.52                     | 13.0                 |
| 3    | Motor Vehicle Accidents                            | 0.25                     | 6.3                  |
| 4    | Cerebro-Vascular Diseases                          | 0.19                     | 4.8                  |
| 5    | Other Accidents and Adverse<br>Effects             | 0.16                     | 3.9                  |
| 6    | Pneumonia                                          | 0.15                     | 3.7                  |
| 7    | Homicide                                           | 0.14                     | 3.5                  |
| 8    | Diabetes Mellitus                                  | 0.13                     | 3.2                  |
| 9    | Diseases of the Central<br>Nervous System (ALS/PD) | 0.13                     | 3.2                  |
| 10   | Conditions Originating in the<br>Perinatal Period  | 0.10                     | 2.6                  |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam, 1983.

Table 15 summarizes the leading causes of death on Guam for the last 10 years. There has been a steady increase in the number of deaths caused by heart disease and malignant neoplasms, or cancer. Deaths from cerebro-vascular diseases are fluctuating, but no major changes are seen over the years. Deaths from diseases of the central nervous system appear to have dropped slightly before fluctuating in its current upward and downward trend. Motor vehicle accidents have ranked consistently in the five leading causes of death, as have accidents and other adverse effects. Infant mortality shows a definite reduction, from 9.1 percent to 2.6 percent of all deaths over the 10-year period. Not much change however has been observed in deaths from diseases of the liver or diabetes, and deaths from pneumonia have declined. Deaths from homicide were listed for 7 years out of 10, as a leading cause of death, and suicide appeared on these lists for 3 years.

**TABLE 15**  
**The Ten Leading Causes of Death**  
**by Percent of Total Deaths**  
**Guam: 1974 - 1983**

|             | Heart<br>Disease | Cancer<br>All Sites | Cerebro-<br>Vascular<br>Diseases | Disease of CNS<br>ALS/PD | Motor Vehicle<br>Accidents | Accidents and<br>Adverse Effects | Infant<br>Mortality | Liver<br>Diseases | Homicide | Pneumonia | Diabetes | Suicide | Congenital<br>Anomalies |
|-------------|------------------|---------------------|----------------------------------|--------------------------|----------------------------|----------------------------------|---------------------|-------------------|----------|-----------|----------|---------|-------------------------|
| <b>YEAR</b> |                  |                     |                                  |                          |                            |                                  |                     |                   |          |           |          |         |                         |
| 1974        | 18.3             | 9.4                 | 5.8                              | 6.8                      | 5.6                        | 8.5                              | 9.1                 |                   | 2.9      | 4.7       |          |         | 2.4                     |
| 1975        | 21.8             | 9.5                 | 5.2                              | 4.8                      | 7.5                        | 5.7                              | 8.8                 | 3.2               | 3.0      | 4.5       |          |         |                         |
| 1976        | 20.0             | 8.8                 | 4.5                              | 4.1                      | 5.6                        | 15.2                             | 6.0                 | 3.9               |          | 4.9       | 3.9      |         |                         |
| 1977        | 18.7             | 8.4                 | 6.8                              | 5.3                      | 10.0                       | 5.5                              | 5.1                 | 3.4               |          | 4.5       |          | 4.0     |                         |
| 1978        | 21.2             | 9.9                 | 5.9                              | 4.5                      | 5.9                        | 6.6                              | 5.2                 | 4.3               | 6.6      |           | 3.5      |         |                         |
| 1979        | 26.3             | 11.9                | 5.9                              | 3.2                      | 9.5                        | 3.7                              |                     | 3.7               | 3.2      |           | 3.2      | 2.1     |                         |
| 1980        | 21.8             | 14.7                | 8.5                              | 5.5                      | 4.3                        | 6.2                              | 2.8                 | 3.1               | 3.6      |           |          |         | 2.8                     |
| 1981        | 23.6             | 14.3                | 7.6                              | 3.0                      | 5.2                        | 6.4                              | 2.2                 | 3.4               | 3.0      |           | 2.7      |         |                         |
| 1982        | 26.2             | 14.5                | 5.6                              | 5.4                      | 2.5                        | 3.6                              |                     | 3.4               |          | 2.3       | 3.8      | 2.0     |                         |
| 1983        | 29.6             | 13.0                | 4.8                              | 3.2                      | 6.3                        | 3.9                              | 2.6                 |                   | 3.5      | 3.7       | 3.2      |         |                         |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam, 1974-1983.



The ten leading causes of death for the United States, are detailed in Table 16. 1980 is the latest year for which data is available.

**TABLE 16**  
**The Ten Leading Causes of Death**  
**U.S.: 1980**

| Rank | Cause of Death                           | Rate/1,000<br>Population | % of Total<br>Deaths |
|------|------------------------------------------|--------------------------|----------------------|
| 1    | Heart Disease                            | 3.43                     | 38.4                 |
| 2    | Malignant Neoplasms                      | 1.86                     | 20.9                 |
| 3    | Cerebro-Vascular Diseases                | 0.77                     | 8.6                  |
| 4    | All Accidents and Adverse<br>Effects     | 0.48                     | 5.4                  |
| 5    | Chronic Obstructive Pulmonary<br>Disease | 0.25                     | 2.8                  |
| 6    | Pneumonia and Influenza                  | 0.24                     | 2.7                  |
| 7    | Diabetes Mellitus                        | 0.15                     | 1.7                  |
| 8    | Chronic Liver Disease and<br>Cirrhosis   | 0.14                     | 1.6                  |
| 9    | Arteriosclerosis                         | 0.13                     | 1.5                  |
| 10   | Suicide                                  | 0.13                     | 1.4                  |

Source: Statistical Abstract of the United States, 1984.

For the year 1980, Guam compared well with the United States when looking at the major causes of death. While heart disease, malignant neoplasms, and cerebro-vascular diseases were the leading causes of death in both countries, Guam experienced a much lower rate of death from these diseases than did the United States. However, a much greater proportion of the population on Guam died of diabetes, cirrhosis, and other liver diseases than in the United States; and likewise a considerably higher rate of death was seen from diseases of the central nervous system on Guam than in the United States. Amyotrophic lateral sclerosis (lytico or ALS) and Parkinsonism Dementia (bodik or PD) accounted for 5.5 percent of all of Guam's deaths in 1980, as compared to less than 1 percent in the United States. Guam reports mortality caused by motor vehicle accidents in a separate category from other accidents and adverse effects. If these categories had been combined into one classification which reported "all accidents," the combination would have been ranked as the third leading cause of death on Guam in 1983. Nonetheless, for 1980, the figure for "all accidents," 10.5 percent, was double that of the U.S., 5.4 percent.

If the deaths from homicide, suicide, motor vehicle, and other accidents had also been combined into one category, such as for "sudden and unexpected death," this category would have ranked first in 1976, and second in 7 of the remaining 9 years between 1974 and 1983.



## D. Accidents

Accidents were a leading cause of death in all age groups. The greatest number of accidental deaths were motor vehicle fatalities, but deaths caused by mishaps such as drowning, falls, shooting, etc. have been so high as to rank among the leading causes of death. Accidents have also caused a considerable amount of injury and disability; however, no reliable data as to the extent of such injury is available since accidents are not reported consistently.

### (1) Motor Vehicle Accidents

Motor vehicle accidents were the third ranking cause of death in 1983, killing 28 people. During the last 5 years, an average of 21 people per year lost their lives on Guam's roads and highways. Table 17 details the age and sex distribution for motor vehicle victims and Figure 9 shows the 5-year average of mortality rates by age and sex for these years.

**TABLE 17**  
**Motor Vehicle Fatalities of Civilian Population**  
**by Age and Sex**  
**Guam: 1979 - 1983**

| Deaths             | 1979      | 1980      | 1981      | 1982     | 1983      | Yearly Average |
|--------------------|-----------|-----------|-----------|----------|-----------|----------------|
| <b>All Ages</b>    | <b>33</b> | <b>16</b> | <b>20</b> | <b>9</b> | <b>28</b> | <b>21</b>      |
| Male               | 26        | 14        | 15        | 6        | 19        | 16             |
| Female             | 7         | 2         | 5         | 3        | 9         | 5              |
| <b>0-14 Years</b>  | <b>5</b>  | <b>5</b>  | <b>1</b>  | <b>0</b> | <b>3</b>  | <b>3</b>       |
| Male               | 2         | 3         | 0         | 0        | 3         | 2              |
| Female             | 3         | 2         | 1         | 0        | 0         | 1              |
| <b>15-24 Years</b> | <b>12</b> | <b>2</b>  | <b>7</b>  | <b>2</b> | <b>13</b> | <b>7</b>       |
| Male               | 9         | 2         | 6         | 2        | 10        | 6              |
| Female             | 3         | 0         | 1         | 0        | 3         | 1              |
| <b>25-44 Years</b> | <b>11</b> | <b>7</b>  | <b>7</b>  | <b>2</b> | <b>8</b>  | <b>7</b>       |
| Male               | 10        | 7         | 5         | 2        | 4         | 6              |
| Female             | 1         | 0         | 2         | 0        | 4         | 1              |
| <b>45-64 Years</b> | <b>4</b>  | <b>2</b>  | <b>3</b>  | <b>5</b> | <b>3</b>  | <b>3</b>       |
| Male               | 4         | 2         | 2         | 2        | 2         | 2              |
| Female             | 0         | 0         | 1         | 3        | 1         | 1              |
| <b>65+</b>         | <b>1</b>  | <b>0</b>  | <b>2</b>  | <b>0</b> | <b>1</b>  | <b>1</b>       |
| Male               | 1         | 0         | 2         | 0        | 0         | 1              |
| Female             | 0         | 0         | 0         | 0        | 1         | 0              |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam;  
Guam Health Planning and Development Agency.

It can easily be seen that males between the ages of 15 and 24 account for the majority of motor vehicle accidents with an average rate of 0.62/1,000 per year. This was closely followed by males aged 25-44 with an annual average rate of 0.46/1,000. Female rates for all age groups combined are only equivalent to one-third of the male rates.

## (2) Other Accidents and Adverse Effects

Accidental deaths by drowning and falling are the leaders in this category, which reported 18 fatalities for the total population in 1983. As with motor vehicle accidents, male victims outnumber females considerably. The male rate of 0.292/1,000 was more than four times higher than the female rate of 0.069. Male accident mortality rates increased with age, the highest rate, 1.227/1,000, was found in the 65 years and over male population, followed by males in the 45-64 age group with a rate of 0.471 per 1,000. The yearly average for the last 5 years was 20 deaths, with a rate of 0.183 accidents per 1,000 total population. More details are presented in Table 18 below and Figure 10 on the following page.

Table 19, on the other hand, lists the numbers and causes of accidents resulting in fatalities for the civilian population only (military accidental deaths are excluded). The numbers are widely fluctuating and present no discernible pattern, except that there were a number of drownings reported in every year.

**TABLE 18**  
**Deaths from Accidents and Adverse Effects**  
**for Total Population by Age and Sex**  
**Guam: 1979 - 1983**

| Deaths             | 1979      | 1980      | 1981      | 1982      | 1983      | Yearly<br>Average |
|--------------------|-----------|-----------|-----------|-----------|-----------|-------------------|
| <b>All Ages</b>    | <b>14</b> | <b>26</b> | <b>26</b> | <b>16</b> | <b>18</b> | <b>20</b>         |
| Male               | 11        | 25        | 22        | 13        | 11        | 16                |
| Female             | 3         | 1         | 4         | 3         | 7         | 4                 |
| <b>0-14 Years</b>  | <b>3</b>  | <b>3</b>  | <b>4</b>  | <b>7</b>  | <b>3</b>  | <b>4</b>          |
| Male               | 2         | 3         | 2         | 4         | 1         | 2                 |
| Female             | 1         | 0         | 2         | 3         | 2         | 2                 |
| <b>15-24 Years</b> | <b>5</b>  | <b>4</b>  | <b>7</b>  | <b>2</b>  | <b>3</b>  | <b>4</b>          |
| Male               | 3         | 4         | 7         | 2         | 3         | 4                 |
| Female             | 2         | 0         | 0         | 0         | 0         | 0                 |
| <b>25-44 Years</b> | <b>2</b>  | <b>10</b> | <b>7</b>  | <b>4</b>  | <b>6</b>  | <b>6</b>          |
| Male               | 2         | 9         | 6         | 2         | 5         | 5                 |
| Female             | 0         | 1         | 1         | 2         | 1         | 1                 |
| <b>45-64 Years</b> | <b>2</b>  | <b>6</b>  | <b>6</b>  | <b>2</b>  | <b>1</b>  | <b>3</b>          |
| Male               | 2         | 6         | 6         | 2         | 1         | 3                 |
| Female             | 0         | 0         | 0         | 0         | 0         | 0                 |
| <b>65+</b>         | <b>2</b>  | <b>3</b>  | <b>2</b>  | <b>3</b>  | <b>4</b>  | <b>3</b>          |
| Male               | 2         | 3         | 1         | 3         | 0         | 2                 |
| Female             | 0         | 0         | 1         | 0         | 4         | 2                 |

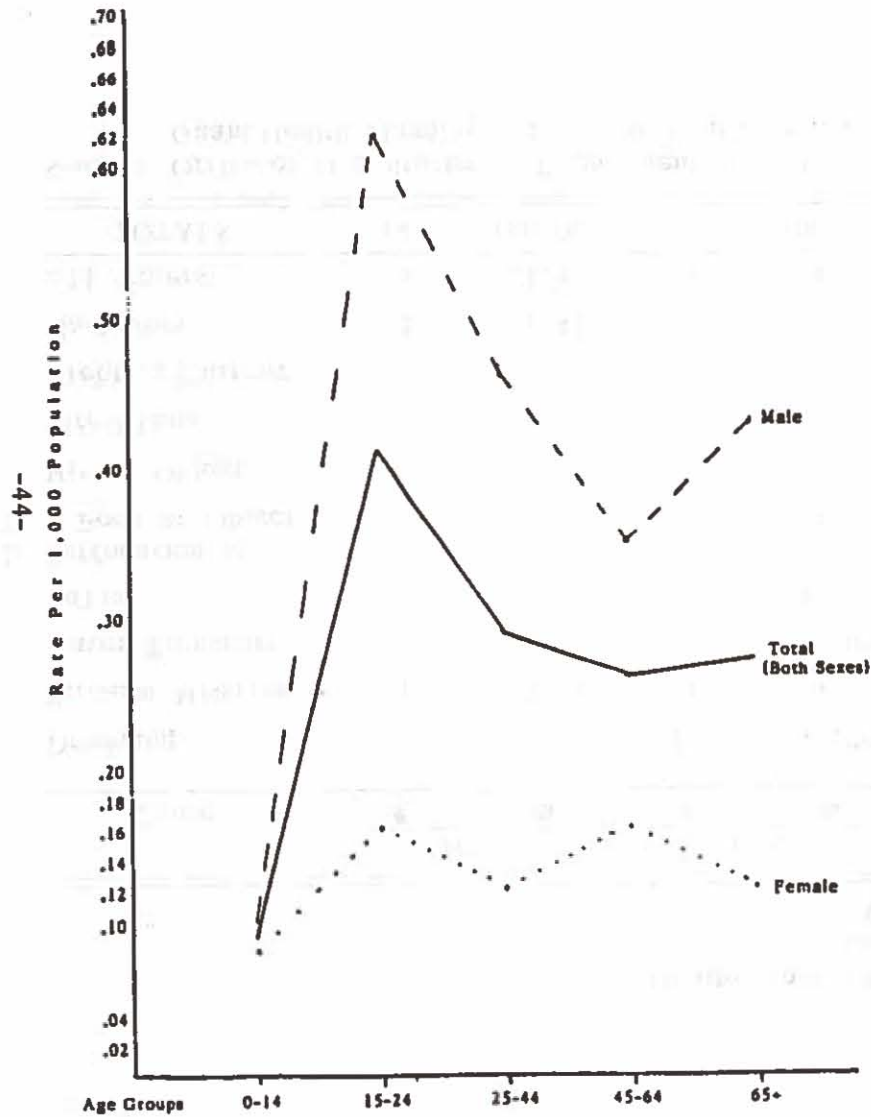
Sources: Office of Vital Statistics, Department of Public Health and Social Services, Guam;  
Guam Health Planning and Development Agency, Guam.

**TABLE 19**  
**Deaths from Other Accidents and Adverse Effects**  
**for Civilian Population**  
**Guam: 1979 - 1983**

| Cause                         | 1979      |               | 1980      |               | 1981      |               | 1982      |               | 1983      |               | Total 5 Yr. |               |
|-------------------------------|-----------|---------------|-----------|---------------|-----------|---------------|-----------|---------------|-----------|---------------|-------------|---------------|
|                               | #         | %             | #         | %             | #         | %             | #         | %             | #         | %             | #           | %             |
| Drowning                      | 7         | 50.00         | 10        | 40.00         | 11        | 44.00         | 3         | 20.00         | 4         | 25.00         | 35          | 36.84         |
| Firearm Missiles              | 1         | 7.14          | 1         | 4.00          | 1         | 4.00          |           |               | 2         | 12.50         | 5           | 5.26          |
| Water Transport               |           |               | 3         | 12.00         | 7         | 28.00         | 1         | 6.67          | 4         | 25.00         | 15          | 15.79         |
| Falls                         |           |               | 5         | 20.00         | 3         | 12.00         | 7         | 46.67         | 5         | 31.25         | 20          | 21.05         |
| Suffocation by Food or Object |           |               | 1         | 4.00          |           |               |           |               | 1         | 6.25          | 2           | 2.10          |
| Hit by Object                 |           |               |           |               | 1         | 4.00          |           |               |           |               | 1           | 1.05          |
| Fire/Flame                    |           |               |           |               |           |               | 3         | 20.00         |           |               | 3           | 3.16          |
| Electric Current              |           |               | 2         | 8.00          |           |               | 1         | 6.67          |           |               | 3           | 3.16          |
| Machinery                     | 3         | 21.43         |           |               |           |               |           |               |           |               | 3           | 3.16          |
| All Others                    | 3         | 21.43         | 3         | 12.00         | 2         | 8.00          |           |               |           |               | 8           | 8.42          |
| <b>TOTALS</b>                 | <b>14</b> | <b>100.00</b> | <b>25</b> | <b>100.00</b> | <b>25</b> | <b>100.00</b> | <b>15</b> | <b>100.00</b> | <b>16</b> | <b>100.00</b> | <b>95</b>   | <b>100.00</b> |

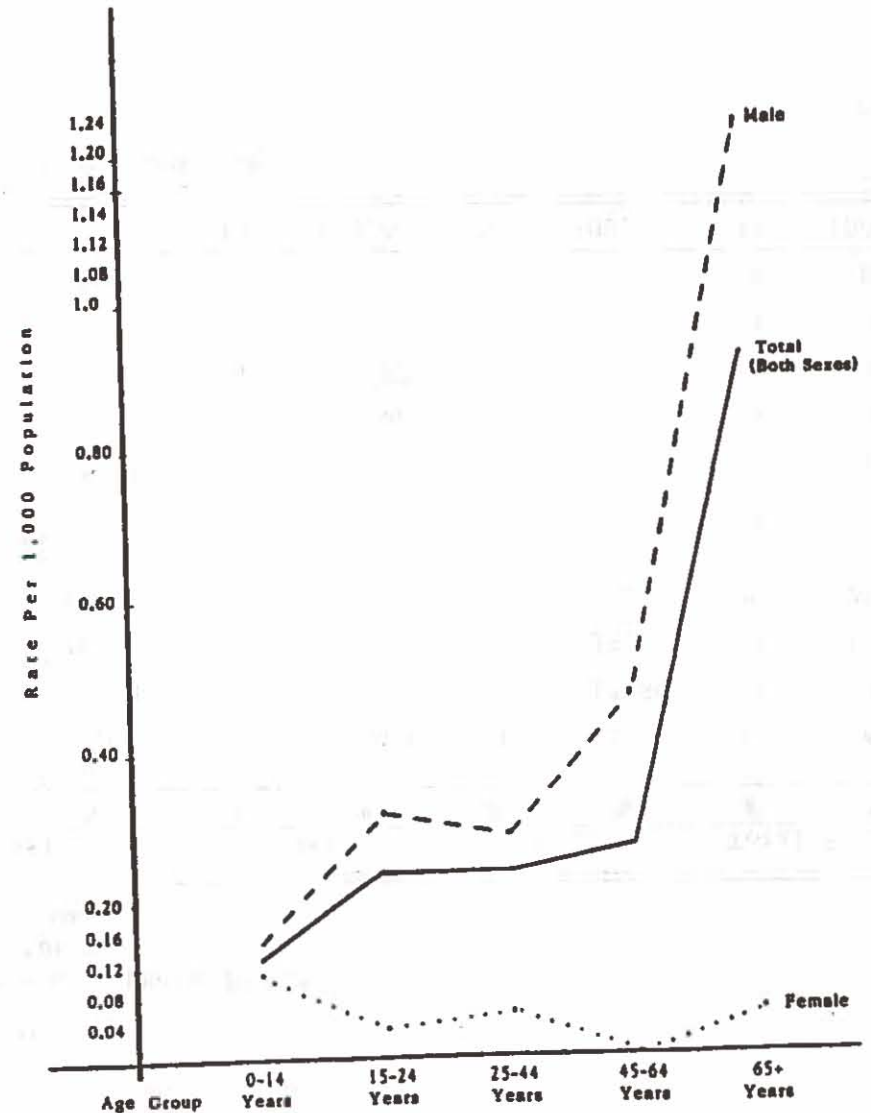
Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam;  
Guam Health Planning and Development Agency.

**FIGURE 9**  
**5-YEAR AVERAGE OF**  
**MOTOR VEHICLE FATALITY RATES**  
**PER 1,000 CIVILIAN POPULATION**  
**GUAM: 1979 - 1983**



Source: Guam Police Department;  
 Guam Health Planning and Development  
 Agency.

**FIGURE 10**  
**5-YEAR AVERAGE OF FATALITY RATES FROM**  
**OTHER ACCIDENTS AND ADVERSE EFFECTS**  
**PER 1,000 CIVILIAN POPULATION**  
**GUAM: 1979 - 1983**



Source: Guam Police Department;  
 Guam Health Planning and Development  
 Agency.



## **E. Morbidity**

Morbidity refers to the extent and frequency of illness or disability in a population, and is usually expressed in terms of the incidence or prevalence of certain conditions within the population. Morbidity data provides a basis for direct measurement of health status, and in many cases, is a highly significant indicator of the health problems and health care needs of the population. While this represents an improvement over mortality data, morbidity data is less readily available than mortality data.

There are several variables by which morbidity can be measured; severity, prognosis, and duration are some of them. Morbid conditions can have a short, acute phase which is severely disabling; they can be a chronic, long-term disability resulting from an acute illness or injury; or they can start insidiously with several years elapsing before a chronic disease is diagnosed.

Morbid conditions might have their etiology in human biology, environmental conditions, or certain lifestyles. In some diseases, all three factors play a role; often, genetic predisposition is impacted by the environment and an individual's lifestyle. It is therefore difficult to classify diseases according to their origin. This section presents morbidity indicators for diseases related to the environment, communicable and infectious diseases, morbid conditions arising from pregnancy, childbirth and early childhood, chronic diseases, and disabilities which are causing concern to Guam's population and health services providers. Mental health of the island population is also assessed and diseases related to certain lifestyles are discussed at the end of this chapter.

Five health status priorities were identified for in-depth analysis and recommendations. These are cancer, or malignant neoplasms; alcohol and drug abuse; cardiovascular heart disease; lytico and bodig, or amyotrophic lateral sclerosis and Parkinsonism dementia; and diabetes. Each of these health problems is discussed separately in Chapter IV - Health Status Priorities.

### **(1) Diseases Related to the Environment**

Historically, the great gains in human health--increased longevity, the reduction of communicable disease epidemics, and the reduction of deficiency diseases--have come through improvements in the standards of living, particularly from improvements in basic environmental sanitation. However, Guam has still a higher than average rate of intestinal infectious diseases which are related to the environment and which have their origin in adverse sanitary conditions. Salmonellosis and shigellosis are the diseases which claim the highest number of victims.

#### **(a) Salmonellosis**

Salmonellosis is an acute gastroenteric infection caused by the salmonella bacteria of which there are over 1,000 types. Symptoms include nausea and vomiting followed by abdominal pains and persistent diarrhea. The infection, however, may also be asymptomatic.

Traditionally it was believed that the disease was mostly acquired through the ingestion of undercooked meats, poultry, or poultry products, since animals are the principal reservoirs of the salmonella bacteria. Once

infected by the disease, an individual can spread salmonellosis through contact with others. This type of transmission often occurs in institutional settings such as hospitals, prisons, and child care centers.

The outcome of the infection is determined by a variety of factors including the type of bacteria, the number of bacteria infested, and the general health of the bacteria's host. Infants, the elderly, and persons with underlying diseases are most susceptible to salmonella infection. While death from salmonellosis occurs primarily among these groups, it is not a frequent occurrence.

For the past 5 years Guam has had the highest rate of salmonellosis in any U.S. state or territory. As reflected in Table 20, Guam experienced an average incidence rate of salmonella infection, from 1980 to 1984, of 1.58 per 1,000 population, as compared to the 1981 U.S. rate of 0.17/1,000. In 1984, however, the 251 cases reported represented a 68 percent increase in annual incidence from the 1983 rate of 1.24 per 1,000 population to 2.09/1,000.

**TABLE 20**  
**Incidence of Salmonellosis**  
**Guam: 1980-1984**

| Year           | Number | Rate/1,000  |
|----------------|--------|-------------|
| 1980           | 126    | 1.19        |
| 1981           | 202    | 1.87        |
| 1982           | 166    | 1.50        |
| 1983           | 143    | 1.24        |
| 1984           | 251    | <u>2.09</u> |
| 5-Year Average |        | 1.58        |

Sources: Office of Territorial Epidemiologist, Department of Public Health and Social Services, Guam;  
Guam Health Planning and Development Agency.

Food products have not been implicated as a significant source of infection on Guam. Only two of the laboratory-confirmed cases recorded from 1974 to 1984 were the result of known food poisoning outbreaks. Several studies suggest that a heavily contaminated environment may be responsible.

Many infants are exposed to the salmonella bacteria and, having the least resistance, are most likely to require medical attention and be recorded as cases. No distinct trends are apparent in the geographic distribution of cases by village of residence.

(b) Shigellosis

Shigellosis is an acute gastrointestinal infection caused by the four shigella group bacteria, s. dysenteriae, s. flexneri, s. boydii, and s. sonnei. Symptoms of the disease range from loose stools for several days to the more severe symptoms including cramps and convulsions. The majority of cases on Guam are manifested by the sudden onset of fever, vomiting, and diarrhea.

Man is the only significant reservoir of the shigella bacteria. The infection is primarily transmitted via the fecal-oral route. Factors contributing to the spread of the disease include crowded living conditions, inadequate sewage facilities, and poor personal hygiene.

Shigellosis is most often seen in children under 10 years of age, possibly due to the lack of knowledge regarding proper hygiene. The severity of infection is determined by the bacterial serotype and relative health of the bacterial host. The malnourished, debilitated, and elderly run the greatest risk of developing severe symptoms; infected healthy adults may remain asymptomatic. Infection with s. dysenteriae is more frequently associated with severe illness and fatality rates than is infection with other shigella serotypes.

Although somewhat erratically, the incidence of shigellosis has increased over a 10-year period. From 1975 to 1979, the average annual rate was 0.18/1,000. In contrast, the average annual rate from 1980 to 1984 was 0.41/1,000 population. This was more than four times higher than the reported U.S. rate of 0.09/1,000 for 1981. In 1984, 91 cases of shigellosis were reported, which represented a 133 percent increase over the 39 cases recorded in the previous year. This increase was largely due to the outbreak of 35 cases that occurred between June and October in 1984. The investigation initiated after the death of an Inarajan child being treated for shigellosis (s. flexneri 1) showed a high correlation between cases and the existence of waste water sanitation problems. Sixty-six percent of the outbreak cases resided in houses with inadequate sewage disposal systems.

TABLE 21  
Incidence of Shigellosis  
Guam: 1980 - 1984

| Year | Number | Rate/1,000 |
|------|--------|------------|
| 1980 | 30     | .28        |
| 1981 | 26     | .25        |
| 1982 | 49     | .44        |
| 1983 | 39     | .34        |
| 1984 | 91     | .76        |

Source: Office of Territorial Epidemiologist, Department of Public Health and Social Services, Guam.



## (2) Communicable and Infectious Diseases

Communicable and infectious diseases may be caused by bacteria, viruses, parasites, or other microorganisms, and are transmissible from one person to another. The major categories of such diseases are vaccine preventable communicable diseases, influenza, pneumonia, and sexually transmitted diseases.

### (a) Vaccine Preventable Communicable Diseases

The most effective means of preventing disease is by immunization. Over the last 30 years vaccines have been developed for major childhood debilities, and have resulted in a drastic drop in the infant mortality and morbidity.

At present, infants and children on Guam are vaccinated against the following diseases:

|            |                            |
|------------|----------------------------|
| Diphtheria | Pertussis (whooping cough) |
| Tetanus    | Polio                      |
| Measles    | Mumps                      |
| Rubella    |                            |

This immunization effort has lowered the incidence of these diseases on Guam considerably. There were no cases of Diphtheria, Pertussis, or Polio reported in the last 10 years, and only five cases of Tetanus. The number of cases for Mumps, Measles, and Rubella, also known as German Measles, are listed below in Table 22.

**TABLE 22**  
**Incidence of Immunizable Diseases**  
**Guam: 1976 - 1980**

| Year | Mumps | Measles | Rubella<br>(German Measles) |
|------|-------|---------|-----------------------------|
| 1975 | 36    | 33      | N.A.                        |
| 1976 | 26    | 16      | 8                           |
| 1977 | 12    | 6       | 12                          |
| 1978 | 40    | 28      | 5                           |
| 1979 | 15    | 13      | 4                           |
| 1980 | 11    | 7       | 2                           |
| 1981 | 11    | 6       | 5                           |
| 1982 | 5     | 9       | 2                           |
| 1983 | 2     | 3       | 0                           |
| 1984 | 13    | 104     | 4                           |

Source: Communicable Disease Control Unit, Department of Public Health and Social Services, Guam.



As can be seen from the figures above, mumps, measles, and german measles were well controlled through 1983. The year 1984 brought a sharp increase in mumps (from 2 to 13 cases) and measles reached epidemic proportions, rising from 3 to 104 cases. Older school children and young adults were the victims of the epidemic. The outbreak of the disease was traced to an imported case at one of Guam's schools, from which it spread to the community. Vigorous monitoring activities carried on by the Department of Public Health and Social Services and the Department of Education identified those children (many of them immigrants) without immunization for mumps, measles, and german measles, and subsequently vaccinated the children.

For children under the age of six, Guam has reached a very high level of immunity. As a 95 percent immunity level is considered the desired and achievable goal, the figures listed in Table 23 below show that Guam's children are indeed well protected against the Vaccine Preventable Communicable Diseases.

**TABLE 23**  
**Immunization Compliance Levels for**  
**Pre-Schoolers and School Entrants\***  
**Guam: School Years 1980-81 and 1984-85**

| Age Level                  | Percentage of Completion |         |
|----------------------------|--------------------------|---------|
|                            | 1980-81                  | 1984-85 |
| Day Care                   | 84                       | 97      |
| Head Start                 | 98                       | 99      |
| Kindergarten/<br>1st Grade | 98                       | 98      |

\*3 x DTP, 3 x TOPV, MMR

Source: Communicable Disease Control Unit, Department of Public Health and Social Services, Guam.

The immunization program has been very successful in accomplishing the primary purpose of public health services: that is, the prevention of disease. However, vigilance and diligence is required and a high priority has to be maintained in order to stay at the present high level. As Guam is a crossroad for people from many parts of the world, all children must be protected against childhood diseases which are inadvertently brought to the island.

#### (b) Infectious Diseases

Incidence and prevalence data of infectious diseases are useful measures of health status. Since such diseases have to be reported to the Department of Public Health and Social Services, as required by law, the data is readily available. Whereas some limitations are imposed

by incorrect diagnosis or incomplete reporting, particularly from the private sector, such data is nevertheless a good indicator of a community's health.

Tuberculosis, pneumonia, influenza, and hepatitis are examined in this section.

(i) Tuberculosis

Tuberculosis is a chronic, progressively infectious and communicable disease, that is potentially of life-long duration, and is caused primarily by mycobacterium tuberculosis. On Guam, mycobacterium tuberculosis proliferates, causing pulmonary tuberculosis and, in some cases, extra-pulmonary tuberculosis. In adults, pulmonary tuberculosis is the most common type of the disease and accounts for over 90 percent of the fatalities caused by tuberculosis.

In the early stages, tuberculosis might be completely symptomless, but if left untreated the disease will progress towards severe disability and death.

Incidence and prevalence rates for tuberculosis on Guam for the last 10 years are presented below in Table 24.

**TABLE 24**  
**Incidence and Prevalence of Tuberculosis**  
**for Total Population**  
**Guam: 1975 - 1980**

| Year | New Cases | Total Cases | Total Population | Incidence Per 1,000 | Prevalence Per 1,000 |
|------|-----------|-------------|------------------|---------------------|----------------------|
| 1975 | 79        | N.A.        | 94,836           | 0.83                | N.A.                 |
| 1976 | 46        | N.A.        | 96,937           | 0.47                | N.A.                 |
| 1977 | 67        | 114         | 99,084           | 0.68                | 1.15                 |
| 1978 | 65        | 113         | 101,280          | 0.64                | 1.12                 |
| 1979 | 62        | 128         | 104,048          | 0.61                | 1.23                 |
| 1980 | 55        | 107         | 105,979          | 0.52                | 1.01                 |
| 1981 | 47        | 94          | 109,581          | 0.43                | 0.86                 |
| 1982 | 49        | 82          | 108,874          | 0.45                | 0.75                 |
| 1983 | 48        | 69          | 112,285          | 0.43                | 0.61                 |
| 1984 | 47        | 67          | 118,344          | 0.40                | 0.57                 |

Source: Communicable Disease Control Unit, Department of Public Health and Social Services, Guam.

Guam's incidence and prevalence rates of tuberculosis show a steady decline. Sophisticated drugs and an effective outreach and surveillance program reduced incidence from 2.0/1,000 population in 1968 to a rate of 0.4/1,000 in 1984.

Even though Guam's annual tuberculosis rates have dropped significantly in the last 10 years, the rate is still twice that of Hawaii's 1984 rate (0.21/1,000 population) and more than four times the 1984 rate for the U.S. mainland, (0.09/1,000).

Incidence and prevalence is highest within the immigrant population, and among males over the age of 55 and in the Filipino ethnic group. (Tables 25 and 26.)

**TABLE 25**

**TB Cases by Age and Sex of Patient  
Guam: 1984**

| Age Group | Male | Female | Total |
|-----------|------|--------|-------|
| 0 - 4     | 1    | 0      | 1     |
| 5 - 14    | 0    | 0      | 0     |
| 15 - 24   | 0    | 2      | 2     |
| 25 - 34   | 2    | 7      | 9     |
| 35 - 44   | 5    | 5      | 10    |
| 45 - 54   | 9    | 3      | 12    |
| 55 - 64   | 15   | 8      | 23    |
| 65+       | 4    | 6      | 10    |
| Total     | 36   | 31     | 67    |

Source: Communicable Disease Control Unit, Department of Public Health and Social Services, Guam.

**TABLE 26**

**TB Cases by Ethnicity of Patient  
Guam: 1984**

| Ethnicity                     | # of Cases | % Distribution |
|-------------------------------|------------|----------------|
| Chamorro                      | 29         | 43.3           |
| Filipino                      | 31         | 46.3           |
| All Other (Asian & Caucasian) | 7          | 10.4           |
| Total                         | 67         | 100.0          |

Source: Communicable Disease Control Unit, Department of Public Health and Social Services, Guam.

It is not surprising to see a higher TB rate for Filipinos, as this ethnic group makes up nearly 90 percent of the immigrant population arriving on Guam. One-fifth (19%) of new TB cases were Class A Waiver Immigrants, e.g., those that come to the island with diagnosed active pneumonia.

The decreases in the incidence and prevalence of TB among the resident population can be attributed to the Department of Public Health's intensified monitoring activities. The Department has established mechanisms for identifying patients who have failed to keep an appointment, as well as for having patients return to the TB clinic. These direct outreach efforts have been initiated to further reduce indigenous TB incidence and prevalence on the island.

## (ii) Influenza

Influenza is an acute, contagious disease that is usually attended by fever and chills, body aches, and nausea. It is caused by a virus, and the primary and principal site of infection is the respiratory tract. The symptoms are severe for several days, but the outcome is usually benign.

Influenza, which usually strikes in epidemics or even pandemics, used to be a major killer. Effective vaccination has been developed to protect the very young, the frail, and the old in the face of an on-coming epidemic.

Influenza can have severe complications and lead to death. The death of 12 people was directly attributed to this disease over the last 10 years. However, the major impact on a community are the active days lost from school or work during an epidemic. The following table gives the frequency and incidence rates of reported influenza for the last 10 years.

**TABLE 27**  
**Incidence of Influenza**  
**Guam: 1975 - 1984**

| Year | Number<br>of Cases | Total<br>Population | Rate Per 1,000<br>Population |
|------|--------------------|---------------------|------------------------------|
| 1975 | 982                | 94,836              | 10.35                        |
| 1976 | 3,655              | 96,937              | 37.70                        |
| 1977 | 1,274              | 99,084              | 12.85                        |
| 1978 | 1,332              | 101,280             | 13.15                        |
| 1979 | 720                | 104,048             | 6.92                         |
| 1980 | 669                | 105,979             | 6.31                         |
| 1981 | 936                | 109,581             | 8.54                         |
| 1982 | 2,038              | 108,874             | 18.72                        |
| 1983 | 1,780              | 112,285             | 15.85                        |
| 1984 | 1,606              | 118,344             | 13.57                        |

Source: Communicable Disease Control Unit, Department of Public Health and Social Services, Guam.



The rates fluctuate, depending on particular influenza epidemics. As Guam is a major stop-over for people traveling from and to Asia and the U.S. mainland, the island population is vulnerable to epidemics or pandemics caused by different strains that are transported to Guam from different places of origin. It is therefore possible to find on Guam one strain of influenza traveling east and another one traveling west, with the population being infected by both strains.

### (iii) Pneumonia

Pneumonia is an inflammation of the lungs, that may be caused by any one of many infectious agents, including bacteria, viruses, fungi, and others. It can also be caused by the inhalation of chemical agents, by allergic reactions, through the exposure to radiation, or by the aspiration of liquid substances. Pneumonia can be present as a primary illness, or as a secondary by-product of another illness, such as with or after influenza.

Some of the causative agents of pneumonia are resistant to antibiotics, sulfa drugs, and corticosteroids, so a cure cannot always be effected. In fact, pneumonia has been a leading cause of death in 6 out of the last 10 years. An average of 14 persons have died from this condition each year.

The figures presented in Table 28 show a sporadic incidence of pneumonia over the last 10 years, first with a decline then followed by an increase.

**TABLE 28**  
**Incidence of Pneumonia**  
**Guam: 1974 - 1983**

| Year | Number<br>of Cases | Total<br>Population | Rate Per 1,000<br>Population |
|------|--------------------|---------------------|------------------------------|
| 1974 | 21                 | 94,836              | 0.22                         |
| 1975 | 20                 | 96,937              | 0.21                         |
| 1976 | 23                 | 99,084              | 0.23                         |
| 1977 | 17                 | 101,280             | 0.17                         |
| 1978 | 8                  | 104,048             | 0.08                         |
| 1979 | 5                  | 105,979             | 0.05                         |
| 1980 | 8                  | 109,581             | 0.07                         |
| 1981 | 9                  | 108,874             | 0.08                         |
| 1982 | 10                 | 112,285             | 0.09                         |
| 1983 | 17                 | 118,344             | 0.14                         |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam.

Meaningful comparisons between U.S. and Guam rates are not possible for the more recent years, since deaths from pneumonia and influenza on Guam are reported together. Furthermore, pneumonia is often the by-product of another disease, which means that deaths from pneumonia can be both overreported and underreported. Nevertheless, this disease is one of the leading causes of death, and is of concern to the health planners and health services providers.

#### (iv) Hepatitis

Hepatitis is an acute inflammatory disease of the liver caused by a viral agent. There are at least four types of viral hepatitis: type A (infectious) hepatitis, type B (serum) hepatitis, delta hepatitis, and a fourth form referred to as non-A, non-B (NANB) hepatitis. While the viruses of types A and B have been well characterized, the delta virus has only recently been identified and no reliable assays exist to identify NANB antigens or antibodies.

Symptoms of hepatitis infection include abdominal discomfort, fever, nausea, fatigue, and jaundice. Children and young adults are more frequently affected and may be asymptomatic. Individuals with relative immunity from a previous infection may also be asymptomatic.

##### Hepatitis Type A

Hepatitis Type A is spread predominantly by the fecal-oral route, usually through the ingestion of contaminated food and water. Spread of the disease is associated with overcrowding, poor hygiene, or breakdown in normal sanitary conditions. Groups at high risk of developing the disease include institutionalized persons, children in day care centers, male homosexuals, drug addicts, and travelers to areas of the world where the disease is endemic. Outbreaks of the type A on Guam have been traced to such sources as raw shellfish and infected food handlers.

Despite the increase in the incidence of Hepatitis A during 1984, Guam has seen an overall reduction in the infectious type of hepatitis. The average incidence rate of Hepatitis A on Guam from 1975 to 1979 was 0.58 per 1,000 population. In comparison, the 5-year average rate from 1980 to 1984 was 0.16 per 1,000 population. This general decrease in the disease could be attributed to recent improvements in sanitation facilities and services throughout the island. Efforts must continue to lower incidence to the U.S. rate of 0.11/1,000.

**TABLE 29**  
**Incidence of Hepatitis A**  
**Guam: 1975 - 1984**

| Year                            | Number of Cases | Rate/1,000 |
|---------------------------------|-----------------|------------|
| 1975                            | 115             | 1.19       |
| 1976                            | 58              | 0.59       |
| 1977                            | 37              | 0.37       |
| 1978                            | 46              | 0.38       |
| 1979                            | 42              | 0.40       |
| 1980                            | 49              | 0.45       |
| 1981                            | 14              | 0.13       |
| 1982                            | 2               | 0.02       |
| 1983                            | 6               | 0.05       |
| 1984                            | 16              | 0.14       |
| Average rate, 1975-1979:        |                 | 0.58       |
| Average rate, 1980-1984:        |                 | 0.15       |
| 10-year average rate per 1,000: |                 | 0.37       |

Source: Department of Public Health and Social Services, Guam;  
Guam Health Planning and Development Agency.

#### Hepatitis Type B

Type B hepatitis has previously been associated with the transfusion of blood or blood products, needlestick accidents, and with the use of contaminated needles or syringes. Multiply-transfused persons, drug addicts, medical personnel, and dialysis patients compose the high risk groups for this disease. However, non-parenteral transmission of type B hepatitis involving close personal or intimate sexual contact with an infectious individual have been reported and may become increasingly common.

Analysis of morbidity data for hepatitis type B shows the incidence rate on Guam is similar to the U.S. average of 0.05 cases per 1,000 population. As reflected in Table 30, the 5-year average incidence rate from 1980 to 1984 is 0.06 cases per 1,000 population. This represents a significant decrease from the 1975 to 1979 average incidence rate of 0.17 cases per 1,000 population. The high incidence during this period could be attributed to the illicit drug problems of the mid- and late seventies.



**TABLE 30****Incidence of Hepatitis B  
Guam: 1975 - 1984**

| Year                            | Number of Cases | Rate/1,000 |
|---------------------------------|-----------------|------------|
| 1975                            | 13              | 0.13       |
| 1976                            | 14              | 0.14       |
| 1977                            | 27              | 0.27       |
| 1978                            | 14              | 0.13       |
| 1979                            | 18              | 0.17       |
| 1980                            | 5               | 0.05       |
| 1981                            | 7               | 0.06       |
| 1982                            | 6               | 0.05       |
| 1983                            | 8               | 0.07       |
| 1984                            | 10              | 0.08       |
| Average rate, 1975-1979:        |                 | 0.17       |
| Average rate, 1980-1984:        |                 | 0.06       |
| 10-year average rate per 1,000: |                 | 0.12       |

Source: Department of Public Health and Social Services, Guam;  
Guam Health Planning and Development Agency.

Although encouraging from an epidemiological standpoint, the morbidity data should be viewed with caution. A recent study by the Communicable Disease Control Unit of the Department of Public Health and Social Services suggests that a significant number of cases remains unreported. Analysis of a cross section of the Department's clients showed that more than half (51.5%) had a history of Hepatitis B virus infection and that 5.5 percent were chronic carriers of the disease. In addition, the increased rise of cirrhosis and liver cancer has been associated with this persistent carrying of the disease and is of concern to health officials.

**(c) Sexually Transmitted Diseases (STDs)**

These are several diseases which are transmitted chiefly by sexual contact with an infected person. In addition to the two most common STDs, gonorrhea and syphilis, there are a number of other diseases in this group which include, but are not limited to, the following:

- Non-Gonococcal Urethritis (NGU)
- Trichomonas
- Candida, Monilia (genital yeast infections)
- Pubic Lice (crabs)
- Genital Warts
- Genital Herpes (Herpes II)
- Chancroid
- Gardnerella
- Chlamydia
- AIDS



Sexually transmitted diseases occur primarily among young people 15-30 years of age, but they can be contracted at any age. The risk for contracting STDs is greater for individuals with various sexual partners. More cases of STD tend to be detected in males, but this is due to the fact that women are often asymptomatic.

To date there is no vaccine which gives immunity from STDs and previous treatment for STDs does not create immunity from reinfection. Once someone has contracted a STD, proper diagnosis and treatment, including follow-up, is imperative if physical, and possible, psychological damage is to be minimized. Since it is possible to have more than one STD at a time, the timeliness of treatment is also of great importance.

As everywhere else, Guam's most prevalent STDs are gonorrhea and syphilis, with gonorrhea having the highest incidence rate.

#### (i) Gonorrhea

Gonorrhea is a bacterial infection of the sex organs which also can infect the rectum, throat, eyes, joints, and skin. It is transmitted by various forms of sexual intercourse. Incubation period for males is 3 to 7 days, and variable in women. In a male symptoms are obvious and provide discomfort, leading him to seek medical attention. Gonorrhea usually remains without symptoms in women unless complications set in.

Gonorrhea may be completely cured, without lasting damage to the body, if diagnosed and treated soon after infection. On Guam a significant problem had arisen in the last decade when a new strain, penicillin producing nisseria gonorrhea (PPNG), emerged. However, there has been a recent decline in the number of PPNG diseases among both the military and civilian populations. In 1983, only eight such cases were reported.

Table 31 provides frequency and rates of gonorrhea incidence for the civilian and military populations for the last 5 years. In 1981, the last year for which comparison figures are available, Guam's gonorrhea rates for both the civilian population and total population were lower than the U.S. rate of 4.30, but the military rate was almost twice that of the U.S. rate.

As detailed in Table 31, the incidence of gonorrhea has increased steadily over the last 5 years for both the civilian and military populations. As the table also indicates, the military population has a much higher rate than the civilian population, which impacts adversely on the total population rates used for comparison.

At present, Guam has a successful 90 percent follow-up rate of all persons treated for gonorrhea. This figure could be improved, if all private clinics and physicians would rigorously report all gonorrhea cases (as mandated by law) to the Communicable Disease Control Unit of the Department of Public Health and Social Services for monitoring, and for tracing possibly infected contacts.

If untreated, Gonorrhea can result in epididymitis in the male, as well as in pelvic inflammatory disease, ectopic pregnancy, stillbirth, and sterility in the female. It can also cause infections in the newborn, particularly in the eyes.

## (ii) Syphilis

Syphilis is caused by the spiral bacteria treponema palladium. It is primarily transmitted through sexual activity, enters the bloodstream and infects the entire body. The incubation period is from 17 to 21 days, but symptoms do not usually occur until 10 to 90 days or so after the infection has begun. The disease then progresses through the four stages of primary, secondary, latent, and tertiary (or late) syphilis.

During the primary stage a blister (chancre) develops and oozes a fluid which is highly contagious. This chancre is often painless and unnoticeable, particularly in women. At the same time lymph nodes may enlarge and be firm.

Secondary syphilis generally appears between 2 weeks and 5 months after infection, and long after the primary symptoms have disappeared. Body rashes characterize this stage of the disease. Other symptoms include headache, loss of appetite, sore throat, fever, joint pain, and loss of hair. Mucus patches, highly infectious lesions, are also often present.

During latent syphilis no symptoms are visible. Untreated syphilis may be latent for a life time, or progress to tertiary syphilis, which is the destructive stage of the disease. Any body organ may be involved; lesions called "gummas" may grow anywhere in the body and cause local destruction. Often the disease affects the brain and causes widespread damage to the nervous system. The end result of neurosyphilis may be blindness, deafness, insanity, crippling, and death.

Syphilis can be effectively treated at any one of the four stages, and if treatment commences in the first, second or latent stage (within 3 to 5 years of infection) the disease can be cured easily and completely. Most of Guam's cases are diagnosed and treated in the latent stage. Incidence is considerably higher for the civilian population as compared to the military population. Cases fluctuate for the civilian population, without showing a considerable improvement, but a downward trend is observed in the military population. Table 33 details numbers and rates for this disease.

No primary or secondary cases of syphilis have been diagnosed on Guam during the past 5 years. In fact syphilis generally goes undiagnosed until it reaches the latent stage. Hence when comparing the 1981 incidence rate of syphilis among Guam's total population, 0.57/1,000, with the 1981 figures from the U.S., 0.09/1,000, it can be seen that Guam has a much higher rate of latent syphilis than the United States.

**TABLE 31**  
**Frequency and Incidence of Gonorrhea**  
**Per 1,000 Population**  
**Guam: 1980 - 1984**

| Year | Civilian Population |                        | Military Population |                        | Total Population |                        |
|------|---------------------|------------------------|---------------------|------------------------|------------------|------------------------|
|      | # of Cases          | Incidence<br>Per 1,000 | # of Cases          | Incidence<br>Per 1,000 | # of Cases       | Incidence<br>Per 1,000 |
| 1980 | 162                 | 1.9                    | 190                 | 10.3                   | 352              | 3.35                   |
| 1981 | 141                 | 1.6                    | 236                 | 11.5                   | 377              | 3.44                   |
| 1982 | 164                 | 1.8                    | 248                 | 13.7                   | 412              | 3.78                   |
| 1983 | 194                 | 2.1                    | 244                 | 12.3                   | 438              | 3.90                   |
| 1984 | 271                 | 2.9                    | 403                 | 16.7                   | 674              | 5.61                   |

Source: Communicable Disease Control Unit, Department of Public Health and Social Services, Guam.

**TABLE 32**  
**Frequency and Incidence of Syphilis**  
**Per 1,000 Population**  
**Guam: 1980 - 1984**

| Year | Civilian Population |                        | Military Population |                        | Total Population |                        |
|------|---------------------|------------------------|---------------------|------------------------|------------------|------------------------|
|      | # of Cases          | Incidence<br>Per 1,000 | # of Cases          | Incidence<br>Per 1,000 | # of Cases       | Incidence<br>Per 1,000 |
| 1980 | 60                  | 0.69                   | 12                  | 0.65                   | 72               | 0.68                   |
| 1981 | 55                  | 0.61                   | 7                   | 0.34                   | 62               | 0.57                   |
| 1982 | 31                  | 0.34                   | 6                   | 0.33                   | 37               | 0.34                   |
| 1983 | 29                  | 0.31                   | 0                   | 0.00                   | 29               | 0.26                   |
| 1984 | 36                  | 0.38                   | 4                   | 0.16                   | 40               | 0.34                   |

Source: Communicable Disease Control Unit, Department of Public Health and Social Services, Guam.



(iii) Non-Gonococcal Urethritis (NGU)

This disease refers to an infection of the urethra (the tube that carries urine from the bladder to the outside of the body) which is caused by bacteria or viruses other than gonorrhea. Chlamydia causes 70 percent of NGU. Symptoms are milder than those of gonorrhea; females are frequently asymptomatic, or the symptoms are less specific and cause confusion with other diseases. Antibiotics are used for treatment. There were 54 cases in 1984, amounting to 7 percent of all treated STDs.

(iv) Trichomonas

This is an infection caused by a protozoa. It is often referred to as "Ping Pong VD" because a symptomatic female may give the disease to a partner, get herself treated, but is then reinfected by the partner. If this disease is to be cured, both partners must be cured at the same time. Fifteen such cases were identified in 1984.

(v) Other Sexually Transmitted Diseases

Diseases caused by fungi (vaginal yeast infection) such as monilia or candida, were diagnosed in five persons during 1984. In the same year, seven cases of pubic lice were treated, and five cases of gardnerella identified. One case of genital warts was reported, and two cases of herpes II were found. There was one case of chancroid and one case of STDs of non-specific origin. Altogether, there were 22 cases of differentiated STDs in 1984. Figure 11 shows a distribution of the total reported cases of sexually transmitted diseases for the year.

(vi) Acquired Immune Deficiency Syndrome (AIDS)

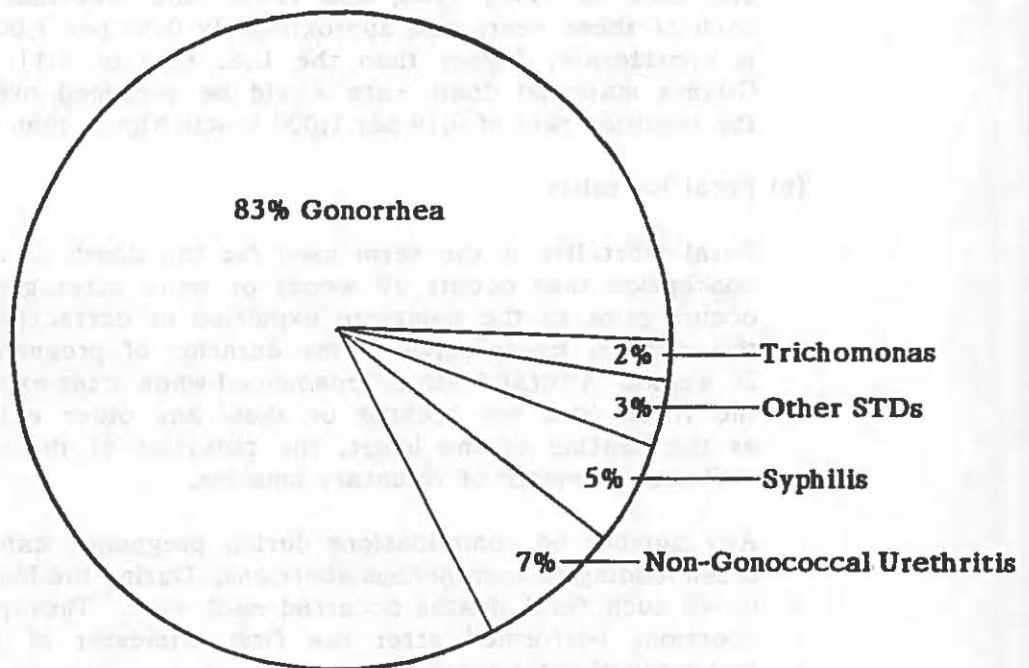
So far, two suspected cases of AIDS have been reported on Guam. Therefore this disease has become a matter of great concern to the island's health providers.

AIDS is a serious condition characterized by a specific defect or weakness in natural immunity against diseases. This weakness permits development of rare cancers and infections. At present there is no cure for AIDS. Persons diagnosed with this disease will not recover and may survive less than 3 years.

AIDS is seen primarily in sexually active homosexuals, intravenous drug users, Haitian immigrants (who are neither homosexual nor drug users), and hemophiliacs. Babies born to women with AIDS are also affected, and many cases have been reported which were caused by "contaminated" blood transfusions. As Guam sees many new arrivals and tourists in any given year, there is a very real risk of AIDS being imported to the island.



**FIGURE 11**  
**TOTAL REPORTED CASES OF SEXUALLY**  
**TRANSMITTED DISEASES BY TYPE**  
**GUAM: 1984**



Source: Communicable Disease Control Unit, Department of Public Health and Social Services, Guam.

Sexually transmitted diseases have increased nationwide and on Guam, where the military personnel has an extremely high incidence rate of gonorrhea. Public awareness of these diseases must be increased. Many people are not aware of the symptoms, treatment, transmission, and prevention of the STDs. Increased knowledge is expected to increase the utilization of preventive measures, and this then should decrease the spread of infection over a period of time.

### **(3) Conditions Arising From Pregnancy, Childbirth, and Infancy**

Pregnancy and childbirth are normal physiological processes. Most pregnant women are healthy individuals for whom birth is a welcome, familiar, and emotional event. However, physical, mental, social, and emotional changes that can occur during pregnancy, labor, and childbirth can also make the difference between life and death, or health and illness. The childbearing process can range from normal and safe deliveries without complications, to abnormal pregnancies ending in death or illness of either the mother, the infant, or both. Once delivery has occurred, the infant then requires comprehensive medical and social services through the first years of life.

#### **(a) Maternal Mortality**

Maternal mortality refers to a death attributed to complications of

pregnancy, childbirth, and the generally accepted 6-week post-partum period that follows childbirth.

Only three such deaths were reported in Guam over the last 6 years, one each in 1979, 1980, and 1983. The maternal mortality rate for each of these years was approximately 0.33 per 1,000 live births, which is considerably higher than the U.S. rate of 0.11 per 1,000. Even if Guam's maternal death rate would be averaged over the last 6 years, the resulting rate of 0.19 per 1,000 is still higher than the U.S. rate.

#### (b) Fetal Mortality

Fetal mortality is the term used for the death of a product of human conception that occurs 20 weeks or more after gestation. Such death occurs prior to the complete expulsion or extraction of the fetus from the mother, irrespective of the duration of pregnancy after the initial 20 weeks. A fetal death is pronounced when after expulsion or extraction, the fetus does not breathe or show any other evidence of life, such as the beating of the heart, the pulsation of the umbilical cord, or a definite movement of voluntary muscles.

Any number of complications during pregnancy can cause fetal death, often leading to spontaneous abortions. During the last 5 years an average of 40 such fetal deaths occurred each year. Therapeutic and voluntary abortions performed after the first trimester of pregnancy can also be causes of fetal death.

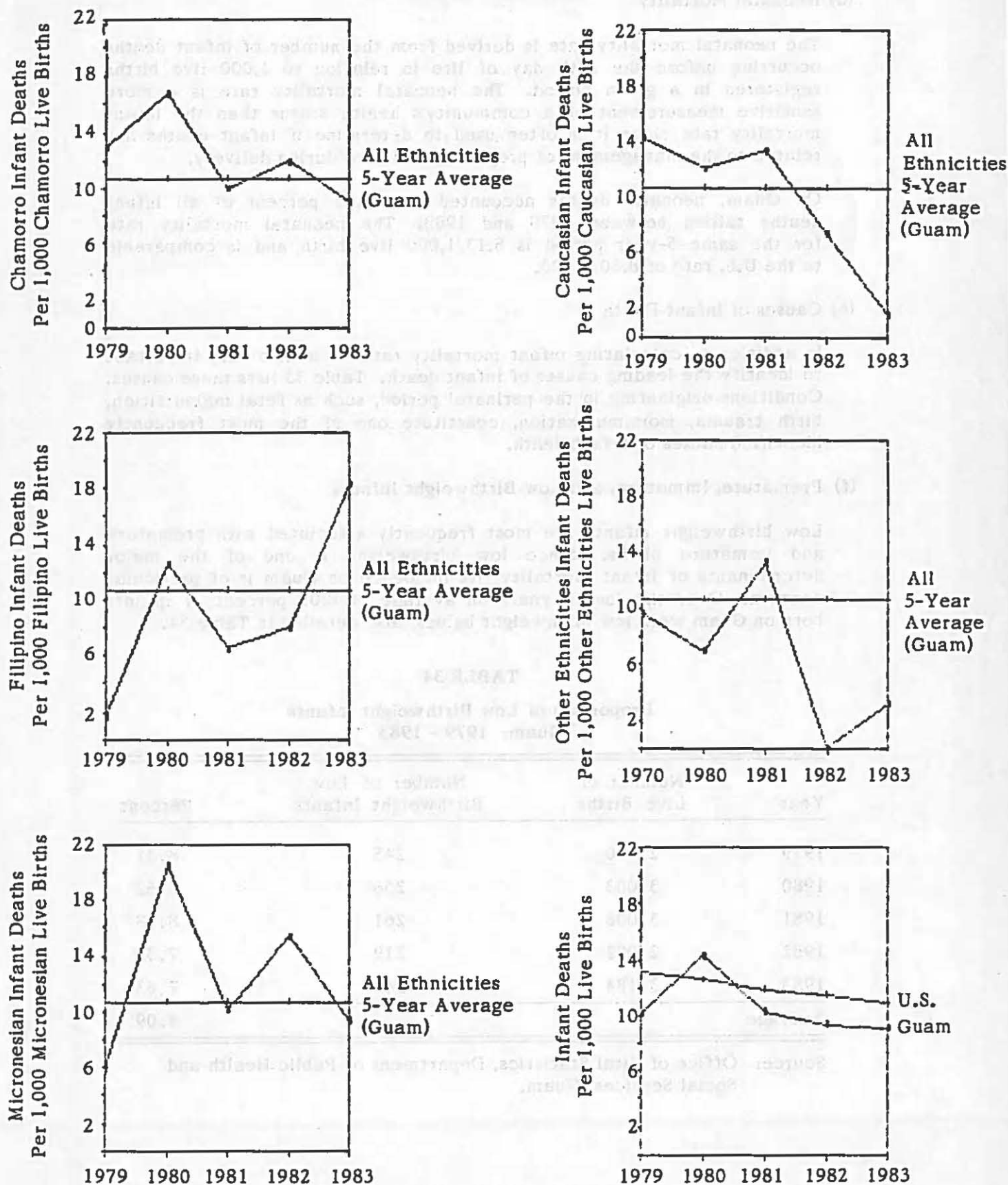
#### (c) Infant Mortality

The infant mortality rate is calculated by relating the number of infants who die during their first year of life to the number of live births that occur during a given period. This rate is an often used measurement of health status because of the close relationship between infant mortality and other indicators of the quality of life, such as education and income levels, and the quality and accessibility of medical care.

Rates for infant mortality are presented in Table 11 at the beginning of this chapter and described in detail. Overall, Guam's infant mortality rate for the period 1979-1983 is comparable to the U.S. infant mortality rate in 1980, 12.09 per 1,000 live births and 12.60 per 1,000 live births respectively. The rate of infant deaths among certain ethnic groups on Guam, however, is not as favorable.

The Chamorro and Micronesian infant mortality rates have improved overall, but are generally higher than the infant mortality rate for all ethnicities. On the other hand, the Filipino rate of infant deaths had consistently fallen below the rate for all ethnicities, but increased drastically in 1983. Caucasians currently exhibit the greatest improvement in infant mortality rates, while other ethnicities continue to fluctuate. Please see Figure 12 on the following page.

**FIGURE 12**  
**INFANT MORTALITY BY ETHNICITY**  
**GUAM: 1979 - 1983**



Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam; U.S. Statistics at a Glance, Bureau of the Census, U.S. Department of Commerce; Guam Health Planning and Development Agency.



#### (d) Neonatal Mortality

The neonatal mortality rate is derived from the number of infant deaths occurring before the 28th day of life in relation to 1,000 live births registered in a given period. The neonatal mortality rate is a more sensitive measurement of a community's health status than the infant mortality rate since it is often used to determine if infant deaths are related to the management of pregnancy and care during delivery.

On Guam, neonatal deaths accounted for 71.43 percent of all infant deaths tallied between 1979 and 1983. The neonatal mortality rate for the same 5-year period is 8.13/1,000 live birth and is comparable to the U.S. rate of 8.50/1,000.

#### (e) Causes of Infant Death

In addition to calculating infant mortality rates it is also very important to identify the leading causes of infant death. Table 33 lists these causes. Conditions originating in the perinatal period, such as fetal malnutrition, birth trauma, isoimmunization, constitute one of the most frequently identified causes of infant death.

#### (f) Premature, Immature, and Low Birthweight Infants

Low birthweight infants are most frequently associated with premature and immature births. Since low birthweight is one of the major determinants of infant mortality, its incidence on Guam is of particular concern. Over the last 5 years an average of 8.09 percent of infants born on Guam were low birthweight babies, also detailed in Table 34.

**TABLE 34**  
**Proportion of Low Birthweight Infants**  
**Guam: 1979 - 1983**

| Year    | Number of Live Births | Number of Low Birthweight Infants | Percent |
|---------|-----------------------|-----------------------------------|---------|
| 1979    | 2,950                 | 245                               | 8.31    |
| 1980    | 3,003                 | 256                               | 8.52    |
| 1981    | 3,008                 | 261                               | 8.68    |
| 1982    | 2,992                 | 219                               | 7.32    |
| 1983    | 3,184                 | 243                               | 7.63    |
| Average |                       |                                   | 8.09    |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam.



**TABLE 33**  
**Leading Causes of Infant Death**  
**Guam: 1979 - 1983**

| Rank | Cause                                                             | Percent of Deaths | Percent Occurring During Neonatal Period |
|------|-------------------------------------------------------------------|-------------------|------------------------------------------|
| 1    | Residual                                                          | 26.7              | 58.1                                     |
| 2    | Conditions Occurring in the Perinatal Period                      | 25.5              | 97.6                                     |
| 3    | Congenital Anomalies                                              | 16.8              | 63.0                                     |
| 4    | Disorders Relating to Short Gestation, Birth Trauma, and Asphyxia | 14.9              | 91.7                                     |
| 5    | Congenital Anomalies of the Heart                                 | 4.3               | 57.1                                     |
| 6    | Bacterial Meningitis                                              | 2.5               | 50.0                                     |
| 7    | Accidents                                                         | 1.9               | 0.0                                      |
| 8    | Certain Other Intestinal Infections                               | 1.2               | 50.0                                     |
| 8    | Septicemia                                                        | 1.2               | 0.0                                      |
| 8    | Acute Bronchitis                                                  | 1.2               | 0.0                                      |
| 8    | Chronic Bronchitis                                                | 1.2               | 50.0                                     |
| 8    | Intravascular Coagulation In Newborn                              | 1.2               | 100.0                                    |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam.

Guam's average proportion of low birthweight infants is considerably higher than the 6.8 percent of low birthweight infants in the United States. As is the case with infant mortality, certain ethnic groups on Guam experience a higher percentage of low-weight births than others.

Between 1981 and 1983, 10.41 percent of the Micronesian births were low-weight births; during the same period, the proportion of low birthweight infants among Chamorros was 9.73 percent. Both groups had more than twice the proportion of Caucasian low-weight births which, on the average, accounted for only 4.6 percent of all Caucasian births.

**TABLE 35**  
**Proportion of Low Birthweight Infants by Ethnicity**  
**Guam: 1981 - 1983**

| Race                 | 1981<br>(%) | 1982<br>(%) | 1983<br>(%) | 3-Year<br>Total<br>(%) |
|----------------------|-------------|-------------|-------------|------------------------|
| Chamorro             | 9.47        | 10.66       | 9.09        | 9.73                   |
| Filipino             | 8.66        | 8.61        | 8.15        | 8.48                   |
| Caucasian            | 6.02        | 3.51        | 4.24        | 4.62                   |
| Micronesian          | 12.69       | 10.77       | 7.98        | 10.41                  |
| Other (Mostly Asian) | 8.33        | 5.97        | 6.39        | 6.92                   |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam;  
Bureau of Planning, Guam.

Low birthweight infants are born in greater proportion by women below the age of 20 and over 40. Other risk factors which contribute to low birthweight are improper nutrition, cigarette smoking, alcohol and drug abuse, maternal hypertension, kidney disease, or pelvic inflammation. There is also a close correlation between inadequate prenatal care and low birthweight.

#### (f) Congenital Anomalies

Congenital anomalies, or birth defects, are present when a child is born. Though a specific case has not been identified for every defect, it is known that some of them are rooted in either human biology, environment, lifestyle, and/or health care related factors.

Genetic defects, the age of the mother, and the parity of births all contribute to the biological development of a child. Genetic defects are caused by an abnormality of chromosomes, and can result in Down's Syndrome (mongolism). Some of these defects are hereditary and are passed from parent to child. Cystic fibrosis, hemophilia, sickle cell

anemia, and tay-sachs disease are some of these hereditary defects. Developmental defects can result in deformities such as cleft palate, spina bifida, or major structural heart defects.

Some defects are induced environmentally, that is, by outside (teratogenic) agents. For example, exposure to ionizing radiation and heavy pollution have been found to be responsible for many cases of birth defects. Likewise, the exposure of a mother to rubella during the first months of pregnancy has also been known to result in defects.

There is growing evidence that maternal lifestyle is related to infant mortality, morbidity, and anomalies. Dietary pattern, the use of alcohol or drugs, and smoking have all been associated with congenital anomalies. Early access to and utilization of adequate health care services from the early months of pregnancy through labor and the postnatal period have been instrumental in the prevention or mitigation of birth defects as well.

The public usually associates congenital anomalies with obvious, even gross physical deformity. However, many metabolic defects, such as phenyl ketonuria, hypothyroidism, or cystic fibrosis are barely or not at all visible at birth. Whether visible or not, congenital anomalies are a leading cause of infant mortality. An average 20 percent of Guam's infant deaths are a consequence of such anomalies. Of the surviving Guam infants, approximately 3 percent have congenital anomalies that require one or more remedial activities to ensure a good quality of life.

#### **(4) Health Problems of Children**

##### **(a) Otitis Media**

Otitis media is the medical term for an acute or chronic inflammation, and/or infection of the middle ear. Allergies occasionally contribute to the inflammation and infection of the middle ear. However, middle ear infections are more often associated with upper respiratory infections (colds and flu) and are believed to occur when bacterial or viral agents from the throat enter the middle ear by way of the eustachian tube. When the eustachian tube becomes obstructed because of inflammation or infection, fluid collects in the normally dry middle ear cavity and impairs the conduction of airborne sounds. If the volume of the fluid increases, the built-up pressure leads to a rupture of the tympanic membrane (ear-drum), causing permanent damage.

It is difficult to establish the exact incidence of otitis media and the prevalence of hearing loss in children. Screenings to identify hearing difficulties are carried out for specific school-age groups and certain locations, but no islandwide efforts have been made to screen pre-schoolers. Furthermore, diagnosed cases of otitis media are not reported by medical practitioners, and therefore reliable data is not available.

Guam's children under the age 10 have a particularly high incidence of middle ear infections. It is estimated that approximately 30 percent



of all pre-schoolers suffer from acute or chronic otitis media, some of them with attendant hearing loss. For school-age children, this incidence lowers to approximately 20 percent.

While the consequences of hearing loss are hard to define or measure, studies have shown a relationship between hearing loss and developmental problems in children. Language skills of children who have hearing loss due to middle ear infection are delayed, and such children perform on average below their actual grade placement level.

The importance of increased screening activities for all children under the age of 12 cannot be emphasized enough. Community education on the signs and consequences of otitis media should be geared towards high school students, and aimed particularly at new parents.

#### (b) Dental Health

Children's dental problems are of national concern. This is emphasized by data from the National Center for Disease Control, which shows that 30 percent of all children under 18 have never been to a dentist. By age 10, the average American child has two decayed permanent teeth; by age 17, the average youth has six decayed, missing, or filled teeth.

The high prevalence of dental caries among Guam's children is of particular concern to the island's health providers. Dietary changes over the past decades, and a lack of information about the effects that food and soft drinks with a high sugar content have on one's teeth, are partially to blame for this condition. Insufficient intake of fluoride and inadequate dental hygiene practices are other contributory factors.

A rather unique problem on Guam is the nursing bottle mouth syndrome, which refers to the badly decayed primary teeth in young children caused by the practice of putting the child to sleep with a bottle filled with milk, fruit juice, or soft drinks (e.g., Pepsi, Coca-Cola). Although no islandwide data has been compiled, one of Guam's two pedodontists reports that the majority of his 1-3 year old patients are in the early or advanced stage of the disease. Many parents are unaware that baby teeth must be saved in order to maintain space in the jaw for the permanent teeth which may otherwise grow in crowded or crooked.

A recent survey at the Public Health Clinic identified an average of 8.14 DMF surfaces for each of the 1,495 children seen during this time period. Similar data from the dentists in private practice are unavailable. As there is such a high correlation between dental health and general health, it is desirable that the number of DMF surfaces be lowered considerably.

While the availability and accessibility of dental manpower and preventive dentistry programs are of utmost importance, dental health providers feel that the uniform fluoridation of the community's water system would have the greatest impact on the dental health of the island's children, and eventually, all the population.



## **(5) Chronic Diseases and Disabilities**

Chronic conditions generally develop over a period of years, require extensive remedial treatment, and cause recurring episodes of illness. While it is difficult to obtain substantive data on chronic diseases and disabilities, it can be stated that the impact of chronic conditions on the health care needs of a community is greater than that of acute and communicable diseases, and that chronic diseases pose a major, and growing, threat to health status.

Chronic diseases are not required to be reported to the Department of Public Health and Social Services, and as a result, their incidence and prevalence must be determined through surveys and estimates made from hospital and physician's office data.

Categories of chronic conditions are those of the circulatory system, of the neuromuscular system, of the musculoskeletal system, of the pulmonary system, and of the endocrine/metabolic systems. It is common for an afflicted person to suffer from multiple chronic conditions.

### **(a) Diseases of Circulatory System**

- (i) Cardiovascular disease and its precursor, hypertension, have been selected as a Health Status Priority problem and are discussed in Chapter IV.

#### **(ii) Cerebro-Vascular Disease**

This condition is caused when the blood and oxygen supply to the brain is severely reduced or totally compromised. This results in a cerebro-vascular accident (CVA) or stroke. Most commonly, strokes are due to thrombosis, embolism, or hemorrhage in the brain from ruptured blood vessels. The process of atherosclerosis, in which critical arteries become narrowed by fatty deposits, underlies the disease. As the arteries narrow, blood pressure increases, with stroke as an eventual consequence.

In 1983, cerebro-vascular disease was the third leading cause of death in the U.S. mainland. On Guam, cerebro-vascular disease was the fourth leading cause of death in 1983, but in the 4 previous years it was the third leading cause. The last 5 years reflect an increase over the years 1974-1978 as can be seen from the table on the following page.

As hypertension and lifestyle are major contributors to vascular disease, prevention efforts have to be directed to those cause in order to affect a measurable impact over the next decade.

### **(b) Neuromuscular Diseases**

The main two diseases in this category are Amyotrophic lateral sclerosis (ALS) termed lytico on Guam, and Parkinsonism dementia (PD) known as bodig. These conditions have also been selected as Health Status Priority problems and are discussed in Chapter IV.

TABLE 36

**Deaths Caused by Cerebro-Vascular Disease  
Guam: 1974 - 1983**

| Year         | Rank | #          | % of Total Deaths |
|--------------|------|------------|-------------------|
| 1974         | 6    | 26         | 5.8               |
| 1975         | 7    | 23         | 5.2               |
| 1976         | 4    | 21         | 4.5               |
| 1977         | 5    | 26         | 6.8               |
| 1978         | 4    | 25         | 5.9               |
| 1979         | 3    | 26         | 5.9               |
| 1980         | 3    | 36         | 8.5               |
| 1981         | 3    | 31         | 7.6               |
| 1982         | 3    | 25         | 5.6               |
| 1983         | 4    | 22         | 4.8               |
| <b>TOTAL</b> |      | <b>261</b> |                   |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam, 1974-1983.

**(c) Musculoskeletal Diseases**

Many conditions involving the muscular and skeletal system are known as arthritis, also known as rheumatoid disease. Arthritis means inflammation of a joint. Most forms of arthritis are usually chronic and last for years. The more serious forms involve inflammation, swelling, redness, warmth, and pain in the affected joints. The most common forms of arthritis are rheumatoid arthritis, osteoarthritis, and gout.

- (i) Rheumatoid arthritis is an inflammation of the joint membrane. It varies in severity and can cause severe crippling. It most frequently appears in the joints, fingers, wrists, elbows, hips, knees, and ankles. Any age group can be afflicted by this disease, but it is seen mostly in women over 30 years of age.
- (ii) Osteoarthritis, also called degenerative joint disease, generally appears late in life or after a joint injury. Knees, hips, and the spine are usually affected.
- (iii) Gout is a painful form of arthritis, linked to heredity and diet. This disease is associated with high uric-acid levels and therefore attacks of gout are related to the intake of certain foods and alcoholic drinks. Gout usually settles in the big toe and the bones of the foot and is extremely painful during an attack.

Arthritis does not kill people. However, it is painful and restricts activities of the people suffering from the disease. It requires close medical attention and expensive medication for pain relief. Arthritis



was the third leading cause for all visits to the doctor during the last year, as found in a recent health survey commissioned by GHPDA. No reliable data are available for this disease category; however, it is so widespread in the U.S. and throughout the world that it has become a global public health problem.

#### (d) Diseases of the Pulmonary System

Asthma, bronchitis, emphysema, and chronic obstructive pulmonary disease are classified in this category. While precise prevalence has not been established, it is known that those suffering from these diseases are often debilitated and incapacitated by their condition. Hospital admissions are frequent, and there are several deaths each year caused by one or the other of these diseases.

A variety of factors can lead to asthma; however, it is most likely to develop in individuals with allergies who are exposed to substances which cause bronchospasms.

The smoking of tobacco in any form is a causative or contributive factor in the chronic diseases of the pulmonary disease. Preventive measures must be geared to the control of smoking in order to achieve measurable declines in the morbidity and mortality rates of these conditions.

#### (e) Diseases of the Endocrine and Metabolic Systems

The major disease of the endocrine and metabolic systems is diabetes, which has been selected as a Health Status Priority problem and is described in Chapter IV. Other diseases of concern in this category are chronic liver disease and cirrhosis of the liver.

Cirrhosis is a disease marked by progressive destruction of liver cells. This is accompanied by the regeneration of liver substance and the increase in connective tissue. Upon examination, the liver is sometimes enlarged, but more often is shrunken and hard.

Cirrhosis and chronic liver disease can have many causes. Hepatitis A and B are linked with cirrhosis, but it is most strongly associated with alcohol consumption. Genetic and dietary factors may also be important in the etiology of this disease.

Each year, approximately 3 percent of all deaths are caused by these conditions. In 8 out of the last 10 years, they were included in the ten leading causes of death, with an average of 13.6 deaths per year. The deaths usually occur in the middle and later years, and claim many more males than females.

Prevention of morbidity and mortality of chronic liver disease and cirrhosis must be geared primarily toward the control of alcohol consumption.

**TABLE 37**  
**Deaths Caused by Liver Disease**  
**Guam: 1974 - 1983**

| Year | # of Deaths |
|------|-------------|
| 1974 | 7           |
| 1975 | 14          |
| 1976 | 18          |
| 1977 | 13          |
| 1978 | 18          |
| 1979 | 14          |
| 1980 | 13          |
| 1981 | 14          |
| 1982 | 15          |
| 1983 | 10          |

Source: Office of Vital Statistics,  
Department of Public Health  
and Social Services, Guam.

**(f) End Stage Renal Disease (ESRD)**

Chronic kidney disease or end stage renal disease (ESRD) is damaging to the kidneys and usually occurs over a long period of time. The condition can develop after a kidney is damaged through an accident, after a severe bout of glomerulonephritis, as a consequence of untreated diabetes or hypertension, and in some instances because of hereditary kidney malformation or malfunction.

Kidney disease impairs the kidney's major function of filtering waste products from the body. When the disease progresses to the point where management through diet modification and medication is no longer possible, a diagnosis of end stage renal disease is made. ESRD is fatal if left untreated. Hemodialysis or kidney transplantation are the accepted treatments to maintain life and conserve health in the patient.

Guam's rate for patients diagnosed with ESRD is considerably higher than that in the United States. Currently there are 33 patients enrolled in Guam's hemodialysis program; 10 percent of enrollees die each year. Even though these are not very large numbers, if one considers that the yearly costs per patient for hemodialysis are in the excess of \$30,000, and that a patient spends between 15-20 hours per week on the dialysis apparatus, then the impact of this disease on the patient, the community, and the health care system becomes substantial.

**(6) Mental Health**

There is neither a precise nor a scientific definition of mental health, and the exact incidence of mental illness is unknown. Consequently, mental health is considered to exist when no mental illness is diagnosed.



Traditionally, a diagnosis of mental illness followed the medical model and was classified into organic and functional disorders. At present, this no longer holds true. Most organic dysfunctions are now more appropriately called mental retardation, an area of specialization apart from the mental health system. Other organic disorders due to physical causes, chemical or biological, are more often treated within the traditional medical care systems. The broad class of functional disorders indicative of mental illness include psychosis, neurosis, character and personality disorders, psychosomatic illness, and trait and behavior disorders.

Mental health has been described as the ability to resist stress, to be autonomous (i.e., to make independent decisions), and to adapt satisfactorily to changing life circumstances. Specialists in the field of mental health suggest that indicators of positive mental health should be sought in the attitudes of an individual towards one's own self. Mental health professionals see the essence of mental health in an on-going process variously called self-actualization, self-realization, growth, or becoming self-sufficient. Mastery of the environment is considered yet another criterion of mental health. Such mastery includes efficiency in meeting situational requirements and problem-solving, adequacy in inter-personal relationships, and the capacity for adaption and adjustment.

Mental illness is seen as having complex causes. Life stresses, the quality of the total environment, the interactions of family and community, are equally important in understanding and treating mental illness. The increasing evidence correlating socio-economic status to the incidence and type of mental illness must also be taken into consideration.

A rapidly changing society, as it exists on Guam, is presenting stresses to both individuals and the community for which they are not prepared. It is important that a community's mental health is predicated on the quality of community life and on the interaction of people and social institutions.

If a community appears violent, disharmonious, and non-supportive, then people often adopt deviant means to survive in it. The growing incidence of alcohol and drug abuse, of violent crimes against persons, and suicide must be seen as both manifestations of individual and societal dysfunction and as extreme means of coping with the frustrations produced by this dysfunction.

#### (a) Alcohol and Drug Abuse

Alcohol and Drug Abuse is slated as a Health Status Priority problem and is discussed in detail in Chapter IV.

#### (b) Violent Crimes Against Persons

Such crimes are most often the ultimate expression of anger and frustration against other human beings. Usually they are performed in a state of rage and/or under the influence of alcohol or drugs.

(i) Homicide

The causes of homicide include various physiological and social conditions, and not all of them can be related to mental health problems. However, homicide was a leading cause of death on Guam in 7 out of the last 10 years, and claimed an average of 14 persons each year. It is therefore a serious problem in our community. The victims are usually young males; three times as many males lose their lives to homicide than females, as illustrated in Table 38 and Figure 13.

The 10-year average homicide rate of 0.13 per 1,000 persons for Guam's total population is somewhat higher than the U.S. rate of 0.11 per 1,000 persons for 1980. The rates for males, 0.18/1,000 population, as well as for females, 0.06/1,000, slightly exceed the U.S. rates of 0.17 and 0.05, respectively. On Guam, 25.7 percent of the homicide victims were female. This follows closely the national trend.

(ii) Other Violent Crimes

Forcible rape, aggravated assault, sex offenses, offenses against family and children, and simple assault are other crime categories by which a community's mental health can be assessed. Whereas one cannot use such rates as a direct measurement of the community's health status, they indicate that social conditions and mental stability are in jeopardy.

TABLE 39  
Violent Crimes Against Persons  
Guam: 1980 - 1984

| Crime Category                     | 1980 | 1981  | 1982  | 1983  | 1984  |
|------------------------------------|------|-------|-------|-------|-------|
| Forcible Rape                      | 36   | 32    | 35    | 48    | 71    |
| Aggravated Assault                 | 125  | 103   | 89    | 88    | 94    |
| Sex Offenses                       | 43   | 30    | 40    | 13    | 14    |
| Offenses Against Family & Children | 29   | 38    | 29    | 14    | 30    |
| Simple Assault                     | 896  | 1,099 | 1,025 | 1,010 | 1,074 |

Source: Guam Police Department.

As detailed in the above table, violent crimes against persons show an upward trend. The number of forcible rapes showed some fluctuation until 1983, but then increased by 48 percent between 1983 and 1984. This might, however, reflect more an increase

**TABLE 38**  
**Homicide Rates Per 1,000 Population**  
**Guam: 1974 - 1983**

| Year            | Total # of Homicides | Rate | Male | Rate | Female | Rate |
|-----------------|----------------------|------|------|------|--------|------|
| 1974            | 13                   | 0.14 | 11   | 0.22 | 2      | 0.05 |
| 1975            | 13                   | 0.13 | 12   | 0.23 | 1      | 0.02 |
| 1976            | 11                   | 0.11 | 10   | 0.19 | 1      | 0.02 |
| 1977            | 9                    | 0.09 | 9    | 0.17 | 0      | 0.00 |
| 1978            | 28                   | 0.27 | 19   | 0.35 | 9      | 0.19 |
| 1979            | 12                   | 0.11 | 9    | 0.17 | 3      | 0.06 |
| 1980            | 15                   | 0.14 | 12   | 0.22 | 3      | 0.06 |
| 1981            | 12                   | 0.11 | 9    | 0.16 | 3      | 0.06 |
| 1982            | 8                    | 0.07 | 6    | 0.10 | 2      | 0.04 |
| 1983            | 16                   | 0.14 | 12   | 0.21 | 4      | 0.07 |
| 10-year Average | 13.7                 | 0.13 | 10.9 | 0.20 | 2.8    | 0.06 |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam, 1974-1983.



in reporting than an increase of actual rapes. Aggravated assault increased by 7 percent, simple assault by 6 percent. Offenses against family and children have dropped sharply in 1983, but then doubled in 1984. As with the number of rapes, increased reporting may be resulting in rising numbers of offenses against family and children. Only sex offenses have appreciatively declined in the last 2 years.

### (c) Suicide

Suicide has been a leading cause of death for 3 years during the last decade and has claimed an average of 8 lives per year. The male suicide rates are considerably higher than the female rates. An upward trend, particularly for males, can be observed for the last 4 years, as demonstrated by Table 39 and Figure 14.

Mental health experts in the U.S. mainland claim that for each actual suicide, there are 8 unsuccessful attempts. Preliminary data shows that in Guam there were fewer reported attempts. For the last 10 years a ratio of 1 completed suicide to 1.4 attempts has been calculated.

There are many theories as to the causes of suicide; an important one centers on the degree of support which the individual receives from society. Stress is also a major factor in suicide and a close correlation between divorce and suicide has been shown in the U.S. mainland. When there are rapid changes in a person's life, whether cultural, social, or economic, various degrees of intolerance are created. The levels of frustration in individuals tend to increase, and those not equipped with healthy coping mechanisms will act out their frustration against themselves through suicide (or through homicide, wife or child abuse, or other forms of violence).

**TABLE 40**  
**Suicide Rates Per 1,000 Population**  
**Guam: 1974 - 1983**

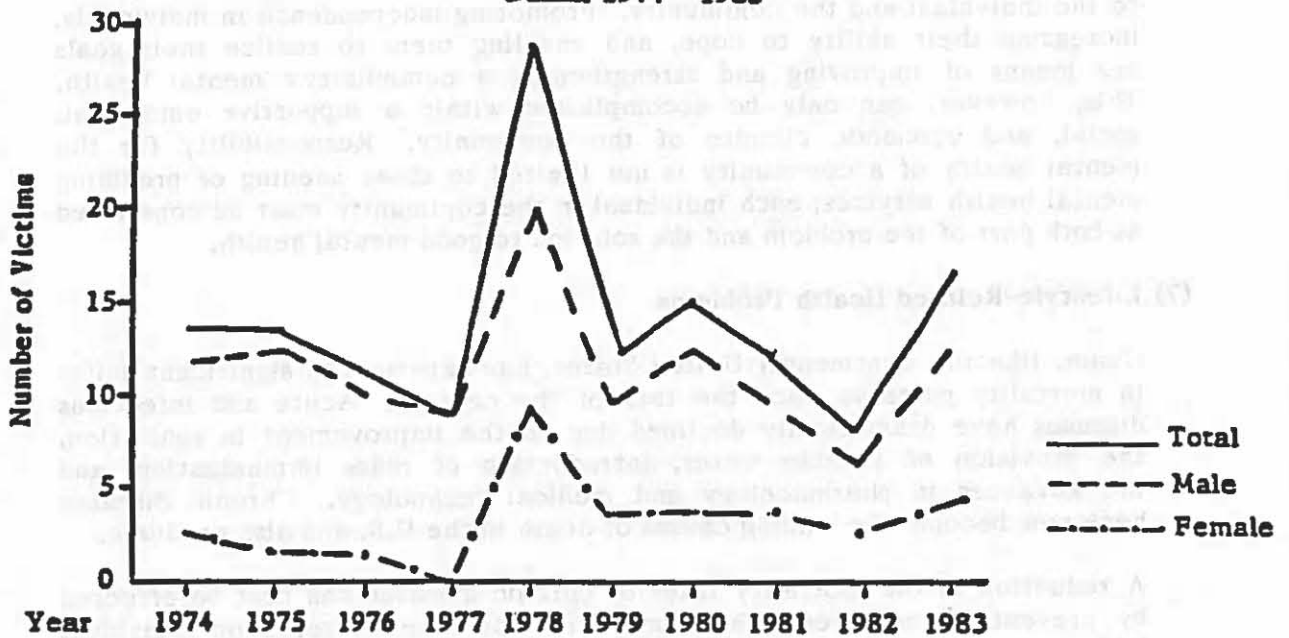
| Year               | Total # of<br>Suicides | Rate | Male | Rate | Female | Rate |
|--------------------|------------------------|------|------|------|--------|------|
| 1974               | 6                      | 0.06 | 6    | 0.12 | -      | 0.00 |
| 1975               | 9                      | 0.08 | 7    | 0.14 | 2      | 0.05 |
| 1976               | 3                      | 0.03 | 2    | 0.04 | 1      | 0.02 |
| 1977               | 15                     | 0.15 | 13   | 0.25 | 2      | 0.04 |
| 1978               | 7                      | 0.07 | 6    | 0.12 | 1      | 0.02 |
| 1979               | 8                      | 0.08 | 7    | 0.13 | 1      | 0.02 |
| 1980               | 5                      | 0.05 | 5    | 0.09 | -      | 0.00 |
| 1981               | 9                      | 0.08 | 7    | 0.12 | 2      | 0.04 |
| 1982               | 9                      | 0.08 | 8    | 0.14 | 1      | 0.02 |
| 1983               | 11                     | 0.10 | 10   | 0.17 | 1      | 0.02 |
| 10-year<br>Average | 8.2                    | 0.08 | 7.1  | 0.13 | 1.1    | 0.02 |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam.



**FIGURE 13**

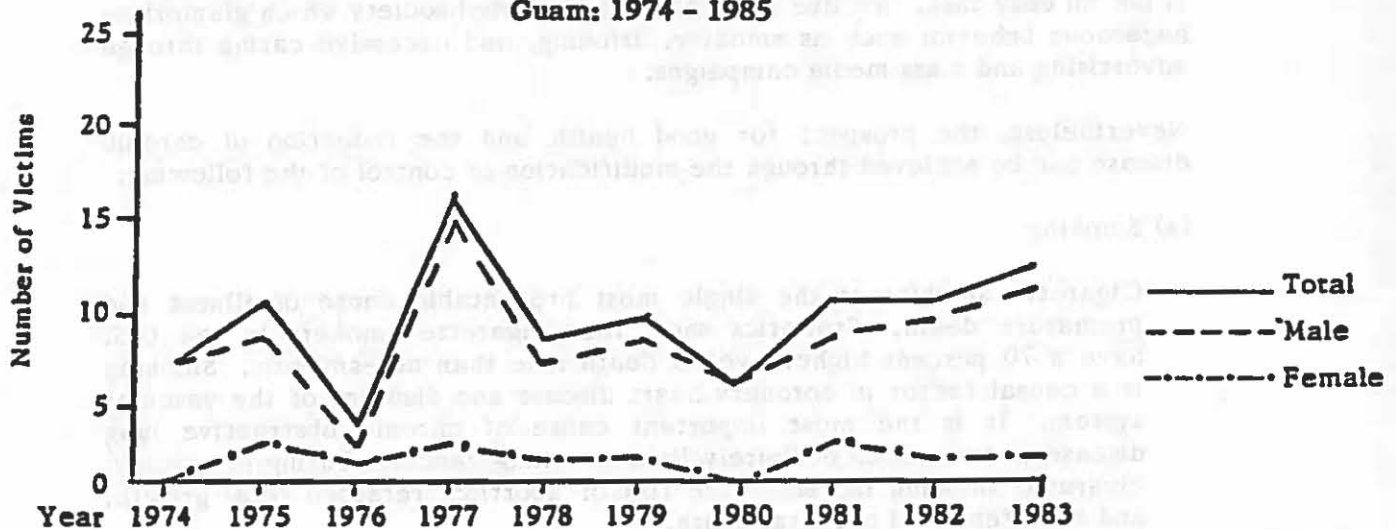
**Homicide Count by Sex of Victim  
Guam: 1974 - 1983**



Source: Guam Police Department;  
Guam Health Planning and Development Agency.

**FIGURE 14**

**Suicide Count by Sex of Victim  
Guam: 1974 - 1985**



Source: Guam Police Department;  
Guam Health Planning and Development Agency.

Despite the differences in their nature, the problems discussed above have many common elements. They represent extreme means of coping with situations over which a person has lost normal control and are reflective of impaired mental health of the individual and the community. It must therefore be recognized that mental health services have to be geared to the individual and the community. Promoting independence in individuals, increasing their ability to cope, and enabling them to realize their goals are means of improving and strengthening a community's mental health. This, however, can only be accomplished within a supportive emotional, social, and economic climate of the community. Responsibility for the mental health of a community is not limited to those needing or providing mental health services; each individual in the community must be considered as both part of the problem and the solution to good mental health.

#### **(7) Lifestyle-Related Health Problems**

Guam, like the continental United States, has experienced significant shifts in mortality patterns since the turn of the century. Acute and infectious diseases have dramatically declined due to the improvement in sanitation, the provision of potable water, introduction of mass immunization, and the advances in pharmacology and medical technology. Chronic diseases have now become the leading causes of death in the U.S. and also on Guam.

A reduction in the mortality rates of chronic diseases can best be effected by preventive measures. These measures must be centered on individual lifestyles or behavior, since behavior has substantial impact on health and well-being. Lifestyle patterns such as smoking, the lack of exercise, poor eating habits, excessive stress, as well as alcohol and drug abuse have proven to be causal factors of chronic disease.

A commitment by individuals to maintain their own health and a willingness to modify personal behavior towards a healthier lifestyle is seen as the ideal in the prevention and management of chronic diseases, particularly hypertension, heart disease, and diabetes. However, changing lifestyles is not an easy task. We live in a consumer-oriented society which glamorizes hazardous behavior such as smoking, drinking, and excessive eating through advertising and mass media campaigns.

Nevertheless, the prospect for good health and the reduction of chronic disease can be achieved through the modification or control of the following:

##### **(a) Smoking**

Cigarette smoking is the single most preventable cause of illness and premature death. Statistics show that cigarette smokers in the U.S. have a 70 percent higher overall death rate than non-smokers. Smoking is a causal factor in coronary heart disease and diseases of the vascular system. It is the most important cause of chronic obstructive lung disease and has been definitely linked to lung cancer. During pregnancy, cigarette smoking increases the risk of abortion, retarded fetal growth, and even fetal and neonatal death.

The remarkable aspect about the above presented information is that smoking is a voluntary action and theoretically all of the listed damages could therefore be prevented.

#### (b) Lack of Exercise

Although in the past decade a resurgence of interest in physical fitness and exercise has been exhibited, regular exercise programs are still not included in the daily activities of most of Guam's residents. Furthermore, exercise as a therapeutic regimen has also been largely ignored by health professionals.

The exact health benefits derived from regular, physical exercise have not been fully defined, but continuing research has suggested that appropriate exercise programs will enhance the treatment and prevention of heart disease, obesity, hypertension, diabetes, musculoskeletal problems, stress, anxiety, and depression. Besides this, people who exercise feel better, are more productive, and are generally happier than their sedentary peers.

Aerobic exercises such as walking, running, swimming, and bicycling are rhythmic and require a large intake of oxygen, and are therefore the most beneficial for the cardiovascular system and the whole body.

#### (c) Poor Eating Habits

Sensible nutrition is necessary for optimal growth and development, physical activities, reproduction, lactation, recovery from illness and injury, and maintenance of health throughout the lifecycle. Nutrition is particularly important for the population at risk, which include the very young, pregnant and nursing women, the elderly, and people with low incomes.

Guam is fortunate enough to have sufficient food for all its people. The Foodstamp, Women and Infant Care (WIC), and Senior Nutrition Programs are designed to ensure proper nutrition for particular populations. However, while the availability or quantity of food is not a problem on the island, the quality and the composition of the meals are of major concern to the health providers.

Obesity is a widespread problem not only on Guam but also in a large portion of other Pacific Islands, which now seem nutritionally less well off than in the past. Originally, most traditional Pacific Island diets seemed nutritionally sound. However, nutritional practices have generally deteriorated in recent times as a result of cultural and economic changes. The traditional natural foods of an agrarian society have, to a great extent, been displaced with imported, processed "western" foods that are high in refined sugars, salt, saturated animal fats, food preservatives, and additives, but low in fibers, minerals and vitamins. Meals high in carbohydrates and fats, and therefore high in calories, have contributed to a population which is largely overweight, if not obese.

Another factor has to be mentioned here. Many aspects of Guam's culture are closely linked to communal food preparation and consumption.



All personal and family events, such as births, baptisms, graduations, job promotions, marriage, and even death are commemorated with a "fiesta," a large feast featuring tables laden with many kinds of food from which family members, relatives, neighbors, villagers, and even passers-by partake to the fullest. Food always was, and still is, prepared in large enough quantities to be eaten whenever anyone is hungry and to be shared with any visitor, no matter what time of the day or night. In the pre-war days, large food intake was balanced by strenuous fishing and farming activities and housework requiring many calories. Over the past decades these activities have been replaced by a much more sedentary way of life, but the old eating patterns were carried on, resulting in an increase of obesity among the island population.

Obesity have been recognized as a causative factor, if not a precursor, of hypertension, cardiovascular disease, diabetes, gout and hyperuricemia, bowel and intestinal cancer, tooth decay, and some of the musculoskeletal conditions. For persons who weigh more than 15 to 20 percent of their recommended body weight, treatment is indicated to avoid the above mentioned diseases.

#### (d) Excessive Stress

Stress is a natural and inevitable part of life. Some stress is beneficial and leads to heightened awareness and increased productivity. However, when there is too much stress, and when this stress is not properly managed, physical or psychological dysfunctions tend to occur. Cardiovascular and coronary heart disease, gastrointestinal disorders, fatigue, obesity, and depression have all been linked to prolonged high stress, as have such mental health problems as personality disorders, suicide, homicide, and other violent behaviors.

For instance, each year in the U.S., thousands of deaths and millions of injuries to children are inflicted through parental abuses occurring partially as a result of stress. In recent years, considerable public and professional interest has focused on the relationship between stress and physical and mental health. Scientific inquiry has demonstrated various associations between stress and health and disease. As a consequence, stress management and stress coping programs have evolved and are now considered a necessary part of health promotion and prevention activities.

Health professionals have agreed that the incidence of chronic disease can best be lowered through prevention, and that individuals must assume greater responsibility for their own health. This, however, does not relieve health providers from the responsibility of guiding individuals in their prevention efforts. There is a particular need for increased health promotion activities on Guam. Public health and private medical providers must join in a cohesive and comprehensive effort to reduce lifestyle-related health problems.

#### F. Summary

The foregoing review of the available health status measures reveals the overall pattern of mortality, morbidity, and disability of the residents of Guam.



In summary it can be stated that the island's mortality and morbidity rates are similar to those of the continental United States, reflecting a westernized health care delivery system.

Guam's infant mortality has seen a steady decline over the last decade and is now lower than that of the U.S. Crude mortality rates for the total population are also lower, but sex- and age-specific mortality rates for males are equal to U.S. rates and about 20 percent higher than the comparable U.S. rates for females. Life-expectancy for males during the 1980-82 period was calculated as 69.6 years and for females 74.5 years; both are somewhat lower than the life expectancy for mainland residents.

Cardiovascular disease, cancer, and motor vehicle accidents have been Guam's leading causes of death, but rates for these diseases have been lower than in the U.S.

When examining morbidity data, it can easily be seen that Guam has a high incidence of diseases related to the environment, particularly salmonellosis with a rate of 2.09/1,000 for 1984, and shigellosis, for which a rate of 0.76/1,000 population was calculated in the same time period.

Immunization efforts for childhood diseases have been very successful: a higher than 95 percent immunity level has been reached for all children under the age of 6. There is also a steady decline in the incidence and prevalence of tuberculosis. However, the Guam 1984 rate is still twice that of Hawaii, and more than four times the rate for the U.S. mainland. Pneumonia and influenza claim several deaths each year, but Guam mortality rates for these diseases are lower than the U.S. rates. Even though the cases of hepatitis A and B have increased in 1984, the incidence rates show a considerable decline over the last 10 years.

Sexually transmitted diseases (STD) pose a problem to the island population. A marked increase of gonorrhea was observed in 1984; however, the majority of the cases (60%) were reported from the military population. There was also a 24 percent increase in syphilis from 1983 to 1984. An increase in non-gonococcal urethritis (NGU) and other diseases such as trichomonas, candida, etc. was also noted.

Guam has a somewhat higher proportion of low birthweight infants than is found in the U.S. Of particular concern are those infants born to mothers of Micronesian and Chamorro ethnicity who have more than twice the low birthweight incidence than babies of Caucasian heritage. In addition, Guam's health providers are concerned with the high number of congenital anomalies, which cause approximately 20 percent of all infant deaths and afflict 3 percent of the surviving infants.

Two of the health problems particular to children, otitis media, and dental caries, have a considerably higher incidence on Guam than is seen on the mainland.

Of the chronic diseases, cardiovascular disease, diabetes, Amyotrophic lateral sclerosis (lytico) and Parkinson's disease (bodig) were rated as Health Status

Priority problems and are fully discussed in the following Chapter IV. Guam has also a higher than national average number of persons suffering from chronic end stage renal disease (ESRD).

Major mental health problems are the high numbers of homicide, suicide, and other violent crimes. Alcohol and drug abuse is perceived as a major problem affecting the community and is also discussed in the next chapter.

Lifestyle habits detrimental to a healthy life have been identified as smoking, lack of physical exercise, poor nutritional habits, and excessive stress, and are considered the most important factors in the treatment or prevention of chronic diseases.

Guam's health status appears favorably well when measured against comparable U.S. mortality and morbidity data. Nevertheless, the island's health services providers and health planners aim to reduce the number of deaths and the amount of illness in the community. The following are Guam's general **Health Status Goals**:

- (1) Illness, injury, disability, and loss of life from conditions which are preventable should be reduced;
- (2) Mortality and morbidity differentials due to ethnic or socio-economic factors should be reduced;
- (3) Ethnic and economic differentials in neonatal and infant mortality and morbidity should be reduced through increased knowledge of and accessibility to comprehensive perinatal care, including adequate nutrition;
- (4) Federal and local policy and practices should improve environmental health, particularly as it pertains to water quality and sewage disposal, and therefore reduce preventable illness and death;
- (5) Policies of the public and private health providers should encourage individuals in their efforts to reduce self-imposed risks such as smoking, poor dietary and exercise habits, and stressful living;
- (6) The Health Education Curriculum of Guam's schools should include Sex Education, Parenting Classes, and also focus on the self-imposed risks of alcohol and drug use, smoking, and poor dietary and exercise habits. Such information should be available at all levels, but needs to be aimed particularly towards the early years;
- (7) Screening programs should be established in conjunction with Public Health programs, private medical providers, civic organizations, and government and private employees to identify as early as possible persons at risk for cardiovascular disease, diabetes, and cancer; and
- (8) Follow-up treatment for those persons identified at risk during the screening activities should be made available regardless of the ability to pay for such treatment.

More particular goals, objectives, and recommended actions are stated in the following chapters and are appended to particular health conditions, services, or policies.

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## **IV. HEALTH STATUS PRIORITIES**



#### IV. HEALTH STATUS PRIORITIES

The preceding chapter defined Guam's health status and discussed health problems of general concern. The amelioration of these problems, and with this the improvement of health status, is the ultimate goal of health planners and the health care delivery system.

Not all health problems can be attended to simultaneously. The quantity and quality of health care services are closely tied to available health resources. Sound health planning processes must therefore allocate the limited health resources to the most urgent problems in the community. To do so, problems must be prioritized. A number of methodologies have been developed nationwide for establishing such priorities, but it must be remembered that most of these methods are influenced to some degree by the subjective perception of consumers and providers as to what constitutes a health problem.

For this health plan a process as objective as possible was employed. The Plan Development Committee of the Guam Health Coordinating Council (GHCC) and GHPDA staff developed a questionnaire to elicit input from health consumers and providers about their perception of health problems on Guam. The surveyed population included consumers and providers from the island's various ethnic groups, as well as local leaders, such as Legislators and Village Commissioners. Special efforts were also made to identify persons with regard to the different age groups, economic categories, and resident villages on the island.

From the gathered information, a list of the ten highest ranking health-related problems was prepared as follows:

- |                                 |                                |
|---------------------------------|--------------------------------|
| 1. Alcohol/Drug Abuse           | 6. Lytico (ALS) and Bodig (PD) |
| 2. Diabetes                     | 7. Infectious Diseases         |
| 3. Heart Disease                | 8. Obesity                     |
| 4. Hypertension                 | 9. Accident/Trauma             |
| 5. Cancer (Malignant Neoplasms) | 10. Smoking                    |

This list was given to the GHCC members, who assigned point-values in correlation with variables such as severity and prevalence of the problem, prognosis and duration of an illness, and the impact such a problem has on the individual, his family, and community. Additional points were assigned to factors influencing the resolution of the listed health problems by the health system. These factors were: Is the problem/disease preventable? Curable? Are services for prevention and treatment available? Are manpower and financial resources available?

After an evaluation of the above variables and factors, the list of ten was narrowed down to the five Health Status Problem priorities under discussion in this chapter: **Cancer, Alcohol/Drug Abuse, Cardiovascular Disease, Lytico (Amyotrophic lateral sclerosis) and Bodig (Parkinson's disease), and Diabetes.** These problems were accorded priority ratings because of their magnitude as well as their social and economic impact, and because it was felt that at least a partial resolution of these problems was feasible within the parameters of existing local health resources.

## **A. Cancer (Malignant Neoplasms)**

Cancer is the disease most feared by Americans; one in four persons can expect to develop the disease during their lifetime. Cancer has been the second most common cause of death in the U.S.A. for the past two decades.

### **(1) General Information**

Cancer is a class of diseases which can be typified by an unrestricted growth of abnormal cells. These cells, in many situations, mature into tumors which invade and destroy normal cells. If left unattended, the tumors affect vital body organs, and death usually follows as a consequence.

The most common fatal cancers are: leukemia, kidney, and nervous system malignancies in children; lung, intestine, and breast cancer in adults; and cancer of the intestines, lung, prostate, and uterus in older people. Almost half of all U.S. cancer fatalities are from cancer in three sites: lung, large intestine, and breast.

Cancer strikes people of all ages, but the incidence among children is low when compared with adults. Overall, the elderly are most conspicuously at risk for cancer.

The progress of cancer can be relatively quick, as in some forms of leukemia. But for the most common types, including breast cancer, it is believed that 10, 15, even 25 years may pass before all steps in the biological chain of events leading to cancer are completed. Once they are complete, varying lengths of time may elapse before enough cancerous cells accumulate and can be recognized.

No definite cause of cancer has been identified. However, on the basis of epidemiological studies, it is estimated that 80 percent of human cancers are related to the environment and lifestyle factors. Only a few of the cancers show a tentative link to genetic predisposition.

It is now known that exposure to ionizing radiation, industrial pollution, and asbestos fiber makes people more vulnerable to cancer. A strong correlation exists between smoking and lung cancer, and between excess alcohol consumption and cancer of the liver. Coffee has been linked to cancer of the pancreas and cancer of the bladder. Breast cancer seems to occur more frequently in females who have a family history of this disease, as well as in obese females.

### **(2) Mortality**

Cancer is the second leading cause of death in the United States, which recorded 450,000 cancer deaths in 1984. On Guam, cancer was the second leading cause of death in the last 5 years. Statistics show that an average of 58 persons die annually of this disease, amounting to an average of 13.74 percent of all deaths for the last 5 years, and a mortality rate of 0.53/1,000 population.

**TABLE 41**  
**Cancer Mortality Rates Per 1,000 Population**  
**Guam: 1979 - 1983**

| Year           | Total Death | # of Cancer Deaths | % of Total Deaths | Rate |
|----------------|-------------|--------------------|-------------------|------|
| 1979           | 377         | 45                 | 11.94             | 0.43 |
| 1980           | 422         | 63                 | 14.93             | 0.59 |
| 1981           | 406         | 58                 | 14.29             | 0.53 |
| 1982           | 443         | 64                 | 14.45             | 0.58 |
| 1983           | 462         | 60                 | 12.99             | 0.52 |
| 5-Year Average |             | 58                 | 13.74             | 0.53 |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam.

The U.S. crude cancer mortality rate was 1.84 deaths per 1,000 population in 1980, accounting for 20.93 percent of all deaths. These rates are for the population across all age groups and are higher than the Guam crude rates. However, the U.S. age-adjusted mortality rate in 1980 was only 1.33/1,000 compared to Guam's age-adjusted rate of 1.63/1,000 for the same year, which was 22.56 percent higher than the U.S. rate.

The greatest number of cancer deaths were experienced in the age groups 45-64 and 65-74. There were considerably more male cancer deaths in all age groups except for those below the age of 15 and over the age of 75.

Males aged 75 and older constitute the age-sex group with the highest cancer mortality rate, with an average rate of 15.35/1,000, followed by males between the ages of 65 and 74, with 8.77 cancer deaths per 1,000 population. The group with the lowest average mortality rate during this 5-year period was males aged 0 to 14 years, with a rate of 0.01/1,000; females of the same age had a rate of 0.03 deaths/1,000. (Please see Tables 42 and 43.)

In the United States the most common form of cancer leading to death among males is cancer of the lungs and respiratory system; among females, cancer of the breast; and when both sexes are considered together, cancer of the colon and the rectum. Cancer of the skin is the most common type overall, but it rarely leads to major clinical problems or death, and is therefore excluded in Table 44.



**TABLE 42**  
**Cancer Deaths by Age and Sex**  
**Guam: 1979 - 1983**

| Year   | Cancer Cases |     | < 15 |   | 15-24 |   | 25-44 |    | 45-64 |    | 65-74 |    | 75+ |    | Totals |
|--------|--------------|-----|------|---|-------|---|-------|----|-------|----|-------|----|-----|----|--------|
|        | M            | F   | M    | F | M     | F | M     | F  | M     | F  | M     | F  | M   | F  |        |
| 1979   | 24           | 21  | 0    | 0 | 0     | 0 | 2     | 3  | 13    | 6  | 6     | 8  | 3   | 4  | 45     |
| 1980   | 42           | 21  | 1    | 0 | 0     | 1 | 4     | 4  | 18    | 9  | 13    | 3  | 6   | 4  | 63     |
| 1981   | 37           | 21  | 0    | 0 | 1     | 2 | 2     | 3  | 17    | 6  | 14    | 4  | 3   | 6  | 58     |
| 1982   | 35           | 29  | 0    | 2 | 0     | 0 | 3     | 2  | 21    | 11 | 8     | 4  | 3   | 10 | 64     |
| 1983   | 33           | 27  | 0    | 0 | 2     | 2 | 0     | 3  | 14    | 13 | 9     | 5  | 8   | 4  | 60     |
| Totals | 171          | 119 | 1    | 2 | 3     | 5 | 11    | 15 | 83    | 45 | 50    | 24 | 23  | 28 | 290    |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam, 1979-1983.

**TABLE 43**  
**Cancer Mortality Rates Per 1,000 Population by Age and Sex**  
**Guam: 1979 - 1983**

| Year           | Cancer Rate |     | < 15 |     | 15-24 |     | 25-44 |     | 45-64 |      | 65-74 |      | 75+   |       |
|----------------|-------------|-----|------|-----|-------|-----|-------|-----|-------|------|-------|------|-------|-------|
|                | M           | F   | M    | F   | M     | F   | M     | F   | M     | F    | M     | F    | M     | F     |
| 1979           | .54         | .51 | -    | -   | -     | -   | .17   | .27 | 1.94  | 1.08 | 5.73  | 7.80 | 11.54 | 8.99  |
| 1980           | .93         | .50 | .06  | -   | -     | .12 | .33   | .35 | 2.64  | 1.57 | 11.71 | 2.77 | 21.50 | 8.60  |
| 1981           | .80         | .49 | -    | -   | .11   | .23 | .16   | .21 | 2.44  | 1.01 | 12.23 | 3.59 | 10.10 | 12.82 |
| 1982           | .74         | .66 | -    | .13 | -     | -   | .24   | .16 | 2.95  | 1.79 | 6.78  | 3.49 | 9.49  | 21.14 |
| 1983           | .69         | .60 | -    | -   | .21   | .22 | -     | .24 | 1.96  | 2.05 | 7.40  | 4.23 | 24.10 | 8.37  |
| 5-Year Average | .74         | .55 | .01  | .03 | .06   | .11 | .18   | .25 | 2.39  | 1.50 | 8.77  | 4.38 | 15.35 | 11.98 |

Source: Guam Health Planning and Development Agency.

**TABLE 44**  
**Estimated Number of Cancer Deaths by Site and Sex**  
**U.S.: 1984**

| Cancer Site          | % of Deaths |        |
|----------------------|-------------|--------|
|                      | Male        | Female |
| Lung                 | 35          | 18     |
| Breast               | --          | 18     |
| Colon & Rectum       | 12          | 15     |
| Prostate             | 10          | --     |
| Leukemia & Lymphomas | 8           | 9      |
| Ovary                | --          | 6      |
| Uterus               | --          | 5      |
| Pancreas             | 5           | 5      |
| Urinary              | 5           | 3      |
| Oral                 | 2           | 1      |
| Malignant Melanoma   | 2           | 1      |
| All Others           | 20          | 19     |

Source: Cancer Statistics, 1984, American Cancer Society, Professional Education Publications, New York.

On Guam, lung cancer is the main killer in this category; 25 percent or an average of 15.8 people die annually of this disease, which shows a definite yearly increase. Cancer of the digestive tract follows closely with an average of 14.8 deaths per year. This is detailed in Table 45, which also identifies other cancer deaths by site.

**TABLE 45**  
**Cancer Deaths by Site and Year**  
**Guam: 1979 - 1983**

| Site of Cancer               | 1979 | 1980 | 1981 | 1982 | 1983 | 5-Year Total |
|------------------------------|------|------|------|------|------|--------------|
| Lung/Respiratory System      | 6    | 19   | 17   | 17   | 20   | 79           |
| Digestive Tract, and Colon   | 11   | 13   | 17   | 17   | 16   | 74           |
| Genito-Urinary System        | 7    | 12   | 8    | 9    | 5    | 41           |
| Other, Unspecified Sites     | 9    | 9    | 6    | 8    | 7    | 39           |
| Lymph System                 | 2    | 3    | 5    | 3    | 6    | 19           |
| Breast                       | 5    | 1    | 1    | 5    | 5    | 17           |
| Buccal/Pharynx (Oral Cancer) | 2    | 3    | 2    | 1    | 0    | 8            |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam.

### (3) Morbidity

In the U.S., the morbidity pattern for cancer (incidence of new cases) follows closely that of mortality, as can be seen from Table 46.

**TABLE 46**  
**Estimated Proportion of Cancer**  
**by Site and Sex**  
**U.S.: 1984**

| Cancer Site          | % of Incidence |        |
|----------------------|----------------|--------|
|                      | Male           | Female |
| Breast               | --             | 26     |
| Lung                 | 22             | 10     |
| Prostate             | 18             | --     |
| Colon & Rectum       | 14             | 15     |
| Uterus/Cervix        | --             | 12     |
| Urinary              | 9              | 4      |
| Leukemia & Lymphomas | 8              | 7      |
| Ovary                | --             | 4      |
| Oral                 | 4              | 2      |
| Pancreas             | 3              | 3      |
| Malignant Melanoma   | 2              | 2      |

Source: Cancer Statistics 1984, American Cancer Society,  
Professional Education Publication, New York.

On Guam, a precise incidence of the various kinds of cancer is not known. However, the new Guam Tumor Registry at the Guam Memorial Hospital is keeping track of cancer cases as reported to them by the island's physicians. Altogether 148 cases have been reported in 1983 as listed in Table 47, and it is estimated that there are additional cases still pending the completion of several doctors' reports.

The American Cancer Society estimates that the overall cancer survival rate is 51 percent, which means that out of the 148 persons diagnosed with cancer, 76 may be expected to survive. Yet it is the threat of death that continues to make a diagnosis of cancer so devastating to an individual.

### (4) Analysis of Problem

Cancer is feared by most people, particularly since it takes such a high toll. Although scientists have identified different causes of cancer in the past few years, there is still no cure for many persons diagnosed with cancer. A staggering amount of money is spent in the U.S. and abroad on cancer research, yet the number of cancer victims still increases every year.



Nevertheless, there have been changes nationwide in the pattern of cancer types and incidences for men and women. For males, cancer of the lung, the prostate, and intestines have increased, while cancers of the stomach and rectum have decreased drastically. There is a rather steep increase of cancer of the lung, and moderate increases in cancer of the breast and the uterus in females, yet sharp declines in cancer of the stomach and cervix.

**TABLE 47**  
**Cancer Cases Registered by Site**  
**Guam: 1983**

| Site                         | Number of Cases |
|------------------------------|-----------------|
| Lung                         | 20              |
| Breast                       | 14              |
| Cervix                       | 14              |
| Liver and Gallbladder        | 10              |
| Leukemia and Lymphoma        | 7               |
| Stomach                      | 5               |
| Mouth and Pharynx            | 5               |
| Large Bowel and Rectum       | 4               |
| Prostate                     | 4               |
| Pancreas                     | 4               |
| Ovary                        | 3               |
| Uterus                       | 2               |
| Bladder and Kidney           | 2               |
| Lip                          | 1               |
| Esophagus                    | 1               |
| Larynx                       | 1               |
| Miscellaneous Sites          | 12              |
| Skin                         | 25              |
| <b>Total Number of Cases</b> | <b>148</b>      |

Source: Guam Tumor Registry, Guam Memorial Hospital Authority, 1983.

From all the research performed over the years, one fact stands out clearly: there is a strong relationship between cancer and lifestyle. It is estimated that about 80 percent of cancer cases are tied to the way people lead their lives. For example, the foods they eat, the work they do, the way they spend their leisure time, and whether or not they smoke or drink alcohol all affect the likelihood of getting cancer. Consequently, influences or risk-factors which have been identified as potential contributors to cancer development are cigarette, cigar and pipe smoking, alcohol consumption, certain dietary patterns, radiation, sun light, occupational hazards, water and air pollutants, as well as hereditary and predisposing medical conditions.

| <b>Risk Factor</b>               | <b>Type of Cancer</b>                                                         |
|----------------------------------|-------------------------------------------------------------------------------|
| Cigarette Smoking:               | Lung (10 times higher than non-smokers), oral cavity, larynx, urinary bladder |
| Cigar and Pipe:                  | Mouth, lips, as well as lung                                                  |
| Alcohol:                         | Liver, larynx, oral cavity, esophagus                                         |
| Smoking and Alcohol combined:    | Intensifies risk particularly for cancer of esophagus                         |
| Diet: High Fat Content/Obesity:  | Breast, ovary                                                                 |
| Pickled and Preserved Food:      | Esophagus, stomach                                                            |
| Charcoal Broiling:               | Intestines, colon, rectum                                                     |
| Radiation:                       | Leukemia, lymphoma, others                                                    |
| Sunlight:                        | Skin Cancer (basal, squamous, and malignant melanoma)                         |
| Occupational Exposure: Asbestos: | Lung, Pleura (mesothelioma)                                                   |
| Vinyl Chloride:                  | Liver, lung, brain (angiosarcoma)                                             |
| Water Pollution:                 | Various sites                                                                 |
| Air Pollution:                   | Lung                                                                          |
| Heredity:                        | Breast (sisters and daughters of women with breast cancer)                    |
| Predisposing Medical Conditions: | Colon (multiple intestinal polyps), Breast (fibrocystic breast disease)       |

Since these risk-factors have been identified, it has been established that cancer and a great number cancer deaths can be prevented through two strategies: limiting exposure to cancer-causing substances, and early detection and treatment before cancer has spread.

Lung and urinary bladder cancers are amenable to the first strategy as more than 80 percent of lung cancer and up to 50 percent of all bladder cancer could be prevented if people stopped smoking. Skin cancer is also largely preventable through avoidance of excessive sun exposure. Modification in occupational exposure and diet may help to prevent other types of cancer.

Once cancer develops, many deaths could be prevented by early detection and screening. For this, screening procedures must accurately identify people with cancer still in early enough stages to allow effective treatment. Available screening measures, more widely applied, could probably prevent a third or more of the deaths due to breast cancer in women over 50, most deaths from cervical cancer, and many of those due to prostate and rectal cancer.

Screening and detection techniques include chest x-rays and sputum examination for early diagnosis of lung cancer. Self-examination, examination by a medical practitioner, and mammography have led to early diagnosis of breast cancer; and pap smears at regular intervals can lead to early detection and often the cure of cervical cancer.

Early detection of cancer can only come about with increased education about cancer risks, and heightened awareness of one's body and its function. The American Cancer Society has established a list of the seven cancer warning signals:

- Change in bowel or bladder habits;**
- A sore that does not heal;**
- Unusual bleeding or discharge;**
- Thickening or lump in the breast and elsewhere;**
- Indigestion or difficulty in swallowing;**
- Obvious change in wart or mole;**
- Nagging cough or hoarseness.**

Knowledge of these warning signals entails a certain responsibility of the individual for his own health. However, health providers must join with the individuals if the incidence and mortality rates of cancer are to be reduced. Medical practitioners must perform cancer-related check-ups at specific intervals, and must encourage their patients to learn self-examination techniques.

In addition to its health promotion and education efforts, the American Cancer Society also provides community support services. The local chapter makes equipment and supplies available for cancer patients, and conducts patient visits either at home or in the institutional setting as means of lending support to those afflicted with cancer.

### **Conclusion and Recommendations**

Guam has a higher than average age-adjusted mortality rate for cancer, and many of these cancer deaths could have been prevented. Yet prevention must come through knowledge of risk factors and how to minimize these factors; knowledge of the seven warning signs of cancer; and knowledge of the available screening and detection techniques. In addition, early diagnosis and timely, appropriate treatment will often lead to a cure of cancer. Therefore, maximum emphasis must be placed on coordinated public awareness programs and detection techniques.

### **GOAL 1: REDUCE THE MORTALITY, MORBIDITY, AND DISABILITY DUE TO CANCER AMONG ISLAND RESIDENTS.**

Target Population: All Guam residents, particularly heavy smokers, drinkers, and those with a family history of cancer.

**OBJECTIVE 1.1:** Increase public knowledge about cancer through education and information efforts which focus on the risk factors and the seven warning signs of cancer.



Recommended Action: Have all pertinent health entities join efforts with the American Cancer Society for having a public awareness program brought to the school, the place of work, and the home via the public media.

**OBJECTIVE 1.2.:** Stress the importance of self-examination and self-observation in the early detection of cancer. Provide information about the necessity for and frequency of cancer-related check-ups for the various age groups at risk. Place particular emphasis on pap smears and breast examination for women, rectal and prostate examinations for men.

Recommended Action: Encourage physicians to discuss the risks of cancer based on age, sex, and family history with their patient. For those persons without a primary or family physician, the Department of Public Health should provide such services. Both public and private providers should use the informational pamphlets developed by the American Cancer Society as supplements to the patient education.

**GOAL 2:           REDUCE THE PREVALENCE OF CIGARETTE SMOKING ON GUAM.**

**OBJECTIVE 2.1.:** Support the annual "Great American Smoke Out."

**OBJECTIVE 2.2.:** Encourage "smoke-free" employment in all Government of Guam agencies and departments as well as "smoke-free" public areas.

**GOAL 3:           IMPROVE DATA BASE OF CANCER MORBIDITY AT THE GUAM TUMOR REGISTRY.**

**OBJECTIVE 3.1.:** Encourage physicians throughout the community to report all suspected and confirmed cancer cases together with all pertinent information to the Registry in a timely manner.

**OBJECTIVE 3.2.:** Establish a committee of representatives from GHPDA, DPHSS, GMH, and the American Cancer Society to explore alternatives to facilitate the compilation and processing of data gathered at the Tumor Registry.

## **B. Alcohol and Drug Abuse**

Alcohol and drug consumption is rooted in our society. Throughout history it has been documented that mood alteration substances such as alcohol and other agents have been widely used. The usage was grounded in the culture of society, considered as part of a ritual, rite, or convention, and was accepted by the community as being beneficial. In fairly recent times however, alcohol and drug abuse have become widespread problems throughout western society.

The problems are fraught with substantial conflicts. A nation which gains enormous economic benefits through the alcohol and drug industries on the one hand, and decries the use of alcohol and drugs from a moral stance on the other, cannot help but confuse the issues and give conflicting messages. Frequently, alcohol and drugs are seen as beneficial in social interaction, treating illness, and dealing with stress. Messages from peers, the economic sector, and the entertainment media promote the use of drugs and alcohol, while the church, health care system, and government provide counter arguments. It seems, however, that the former message dominates, depicting the use of alcohol and/or drugs as correlates of being sociable, affluent, and sophisticated.

Changing these cultural patterns and associations is a tremendous task. There is a general consensus that a grave problem exists, but disagreement prevails as to the approach to be taken; whether to target individuals, or society as a whole. A consistent approach is necessary to ameliorate this problem.

### **(1) Alcohol Abuse and Alcoholism**

#### **(a) General Information**

Alcohol abuse is a generic term applied to the habitual and indiscriminate use of alcoholic beverages manifesting itself in a loss of control, with the consequences of impaired social or economic functioning and progressive deterioration of health. Alcohol is the most widely available and most abused drug in the United States. Although the majority of individuals can and do use alcohol responsibly, there is a sizeable portion of the population in the United States who are unable to do so. National estimates identify at least 10 million adult problem drinkers, roughly 7 percent of the total population. Additionally, there are an estimated 3 million youths who have problems with alcohol.

The economic costs to society that are associated with alcohol abuse and alcoholism are staggering: approximately 50 billion dollars per year. This figure includes the costs for lost productivity, health care, motor vehicle accidents, fire losses, violent crimes, and social programs. However, the other adverse effects of alcoholism, and alcohol abuse are not as easily measured since no dollar amount can be placed on broken homes, battered wives, or disturbed children.

Substantial health costs to society result from alcohol abuse or alcoholism. Alcoholism is the prime cause for cirrhosis of the liver which ranks among the 10 leading causes of death. Cancer of the liver, the pancreas, esophagus, and mouth are all associated with excessive alcohol consumption. There is growing evidence that an excess in alcohol intake contributes to damaged fetuses, neonatal deaths, and developmental disabilities in infancy. The misuse of alcohol leads also to increased risks of injury and death to self, family members, and others, particularly through motor vehicle, fire-related, and other accidents.

National statistics show that an estimated 50 percent of accidents occurring on the road are caused by drivers who are under the influence of alcohol, and that two-thirds of the motor vehicle fatalities are



alcohol-related. Fifty-three percent of fire deaths, 45 percent of drownings, 22 percent of home accidents, and 36 percent of pedestrian accidents are linked to alcohol misuse.

Of all arrests, 55 percent involve alcohol consumption. Violent behavior attributed to alcohol misuse accounts for 64 percent of murders, 41 percent of assaults, 34 percent of rapes, 29 percent of other sex crimes, 30 percent of suicides, 56 percent of fights or assaults in the home, and 60 percent of child abuse.

#### (b) Alcoholism On Guam

On Guam, as elsewhere, reliable and realistic prevalence data on alcohol abuse are not yet available. However, from such data as mortality rates and police accident and arrest records, one can infer that alcoholism is a severe problem on the island, particularly if one considers the impact that an alcoholic person has on his family, place of employment, and the community.

According to the Guam Police Department, there have been, over the last 4 years, an average of 580 arrests for drunk driving and an average 14 persons arrested for public drunkenness. Of 172 spouse assaults reported in 1983, 131 were alcohol-related. In fact, statistics for the last 6 years show that alcohol-related assaults comprised 75 percent of the total offenses.

Guam's Chief Medical Examiner recently reported that the majority of traffic accidents are due to drunk driving; from 1976 through 1984, 76 people have died on the island's roadways as a result of excessive alcohol intake. The Chief Medical Examiner also stated that alcohol was involved in 90 percent of all homicides. This data was corroborated by the Court's forensic psychiatrist, who also served as the psychiatrist for the Department of Mental Health and Substance Abuse on a part-time basis.

Cirrhosis of the liver develops in approximately 8 percent of all chronic alcoholics. Guam has a high number of deaths caused by cirrhosis. It ranked as a leading cause of death in 8 out of 10 years, with an average annual rate of 13.6/1,000 for the last 10 years.

Alcohol abuse among Guam's youth is of particular concern to the community. Again, no figures are available as to the prevalence of such abuse. However, during a survey conducted in 1981 by the then Mental Health and Substance Abuse Agency, 23.4 percent out of 785 randomly selected survey participants reported that someone in the family had an alcohol problem, and 3.3 percent reported that they had a alcohol problem themselves. Out of 632 arrests in 1983 for drunk driving, 104 persons or 16 percent, were youths between the ages of 15-20. Of all alcohol-related traffic deaths in the last 5 years, 54 percent of the victims were under the age of 24.



## **(2) Drug Abuse**

### **(a) General Information**

Drug abuse has become a social problem, as well as a health problem, only in recent years. The great concern has been the widespread use of heroin and the popularity of the illegal 'recreational' drugs, particularly marijuana, cocaine, and hallucinogens. In the last 20 years, the use of these drugs has increased tremendously.

Part of the problem stems from living in a drug-oriented culture. The use, even abuse, of drugs is a widely accepted part of our everyday existence. The predominant message from the health care industry, television, radio, newspaper, and entertainment is that drugs are good. Regardless of one's condition, licit and illicit drugs are readily available to cure headaches, colds, and backaches; to relieve depression; to give us energy; to curtail appetites; or to induce sleep. A society accustomed to finding easy answers for problems, as well as instant gratification, is susceptible to drugs. A low tolerance of stress, anxiety, and boredom is conducive to the practice of locating quick and easy remedies.

Nevertheless, drug use does not necessarily lead to drug abuse. There is a vague and shifting line which separates 'good' from 'bad' drugs, prescription from non-prescription drugs, and medicinal from non-medicinal use.

Currently, drug abuse is defined as "the non-medical use of any drug in a way that adversely affects some aspect of the user's life, e.g., by inducing or contributing to criminal behavior, by leading to poor health, economic dependency, or incompetence in discharging family responsibilities or by creating some other undesirable condition." Another definition states that drug abuse is the illegal use of a controlled substance, or use of a drug in a manner or to a degree that leads to adverse personal or social consequences.

In making a determination of drug use, or drug abuse, a distinction between experimental use, social or recreational use, circumstantial or situational use, intensified use and compulsive use must be made. Experimental use of drugs is short term, has no pattern, and is motivated by curiosity, or a dare by peers. Social or recreational use tends to be more patterned than experimental use, and involves family members or friends. Marijuana and cocaine are the drugs of choice used on these occasions; and "getting high" is a euphemism for such activities.

Circumstantial or situational use is promoted by a perceived need or desire to achieve a known effect that is deemed helpful in coping with a specific situation. For instance, a student studying for an exam might use amphetamines ("speed") in order to stay awake and alert. In most cases use of the drug is discontinued, once the particular situation has passed. If not, there is the danger that the user's system will quickly become accustomed to the drug's effects and will require higher and higher doses to reach the originally desired effect.

Intensified use involves long-term, patterned, low-level use, with drugs becoming a part of life, as with tranquilizers. Although this regular use of drugs may be defined as a drug dependency, the user in this category is generally able to function normally in the community.

Compulsive drug use is frequent and intense. Individuals in this category cannot discontinue use of the drug without experiencing severe physical and psychological discomfort. The user is "hooked" and becomes preoccupied with the task of obtaining the necessary drugs to prevent the withdrawal syndrome. Often the user lives from one "fix" to another, and in so doing represents the highest risk of adverse consequences to himself and society. Such a person is "addicted" to a particular drug, or has become, according to more recent terminology, "drug dependent." A drug dependent person will resort to crime in order to support his "habit."

Drug abuse is universal in today's society, touching all ages and social classes, and making no differentiation between sexes. However, there are generally more male than female users of illegal drugs.

It is difficult to classify the drugs themselves. Marijuana is considered a recreational drug. There is extensive argument whether cocaine falls into this category, or whether it should be considered a "hard" drug along with heroin and other opiates. Of the hallucinogens, LSD (lysergic acid) and PCP (angel dust) are the most widely known and used. There is such a wide array of amphetamines (uppers) and tranquilizers, barbituates and sedatives (downers), and the various combinations thereof, that they defy description, especially since new synthetic drugs have joined the illegal drug market.

#### (b) Drug Abuse On Guam

Guam's drug problem can be directly correlated to the Vietnam War. Soldiers from the military zone came to the island for rest and recreation, and Guam was also used as a transshipment point to and from Asia. The influx of military personnel, as well as the island's strategic location made it easy to import drugs. In the mid-1970's approximately 2,000 users of "hard" drugs (mostly heroin) lived on the island and often sustained their habit through illegal means. During those years an average of 20 to 30 drug-related deaths was common.

By 1980, joint efforts of the local police, the federal Drug Enforcement Administration, and the U.S. Attorney's staff had lowered the number of heroin users to approximately 650. This downward trend has continued, and less than 200 known heroin users are reported to be on island in 1985. No data, or even estimates, of the use of cocaine is available. Marijuana is smoked by a large number of the population, either habitually or on social and recreational occasions.

It is difficult to measure incidence and prevalence of drug use. Data is derived through self-reporting, police records, hospital admission sheets, or confidential informers, and is therefore sporadic.

In a study conducted by the former Mental Health and Substance Abuse Agency in 1980, 1,000 randomly selected highschool students were asked whether or not they used drugs, and if so, what kind. The results are shown in Table 48. Comparative percentages of drug use in the U.S. mainland for the same time period are also shown.

**TABLE 48**  
**Self-Reported Drug Use of Highschool Students**  
**Guam and U.S.: 1980**

| Type of Drug                        | # of<br>Guam Users | % of<br>Guam Users | % of<br>U.S. Users |
|-------------------------------------|--------------------|--------------------|--------------------|
| Narcotics                           | 31                 | 3.1                | 2                  |
| Solvents/Inhalants                  | 19                 | 1.9                | 11                 |
| Barbituates                         | 13                 | 1.3                | 16                 |
| Hallucinogens                       | 19                 | 1.9                | 14                 |
| Marijuana                           | 266                | 26.6               | 59                 |
| Cocaine                             | 14                 | 1.4                | 13                 |
| Anorexants<br>(Appetite Supressors) | 27                 | 2.7                | 23                 |
| Sedatives/Tranquilizers             | 15                 | 1.5                | 17                 |

Source: Alcohol and Drug Abuse 5-year Plan: 1981-1986;  
Mental Health and Substance Abuse Agency, Guam;  
National Institute on Drug Abuse, Rockville, Maryland, 1980.

Guam students reported a 55 percent higher use of narcotics; however, for all other drug categories the use was considerably lower on Guam than it was in the U.S.

### (3) Analysis of Problem

True incidence and prevalence of alcohol and drug abuse has not been established. However, morbidity and mortality data, as well as accident and crime statistics related to alcohol and drug abuse reveal that such abuse and its economic, health, and social consequences are a serious problem.

Drug and alcohol abuse, alcoholism, and their causes are still not well understood. Theories range from bio-chemical imbalances and heredity to purely psycho-social explanations. No single theory has proven adequate, for many factors contribute to the problem. A person "hooked" on narcotics will steal and rob to support his habit. He is vulnerable to malnutrition, infections (particularly Hepatitis B and AIDS), and premature death. The widespread prevalence of marijuana use, especially among the young, has raised much concern about the short- and long-term effects of use on health.



Another dominant concern about the use of alcohol, marijuana, and other drugs is the reduction in motivation and performance that the substances may produce when used chronically, particularly by children and adolescents. A special problem is the relationship of marijuana to automobile and other accidents, especially when it is used in combination with alcohol. Many crimes and acts of violence are performed under the influence of alcohol and drugs.

### **Conclusion and Recommendations**

Alcohol and drug abusers have social, emotional, and psychological problems, as well as physical complications to varying degrees. A program to deal with these problems must be composed of health and social services and must have sufficient resources to serve the affected population as well as the population at risk. In its simplest form, the continuum of care for alcohol and drug abuse should encompass prevention and education services on one end of the spectrum and residential detoxification and rehabilitation services at the other.

A broad spectrum is necessary to adequately meet the highly individualized needs of the alcohol or drug abuser. As the reasons or causes for alcohol and drug addictions vary for each individual, there is no one treatment or service protocol which will result in rehabilitation, or serve to arrest the development of all alcohol or drug abuse problems. Therefore, provisions must be made to accommodate individual needs.

However, the greatest gain in health status will be achieved through prevention and education measures directed at school children and young people. Programs should provide information about the nature and abuses of various harmful substances (drugs, alcohol) within the context of decision making and value clarification skills. They should particularly be concerned with each student's development of positive attitudes and with teaching resistance to peer group pressure.

**GOAL 1:           DECREASE THE INCIDENCE OF ALCOHOL AND DRUG ABUSE ON THE ISLAND OF GUAM.**

Target Population: All island residents, particularly those between the ages 12 and 30.

**OBJECTIVE 1.1.: Make all of the Junior and Senior high school students aware of the dangers of alcohol and drug use and abuse.**

Recommended Action 1.1.1.: Strengthen existing alcohol and drug prevention program currently being offered by the Department of Education Health Curriculum.

Recommended Action 1.1.2.: Train school counselors and school nurses in presenting the prevention program and in counseling methods appropriate to alcohol and drug abuse.

**OBJECTIVE 1.2.: Enhance parenting skills in preventing alcohol and drug abuse among their children through parent effectiveness training.**

Recommended Action 1.2.1.: Provide workshops or seminars for parents in each village to educate them about alcohol and drug problems and how to help their children withstand peer pressure.

**GOAL 2: EXPAND AND IMPROVE EXISTING ALCOHOL AND DRUG RELATED SERVICES AND INCREASE AWARENESS AND UTILIZATION OF THESE SERVICES.**

**OBJECTIVE 2.1.:** Develop an alcohol and drug prevention information system which lists all public and private services and programs.

Recommended Action: The Department of Mental Health and Substance Abuse, the Department of Public Health, the Department of Education, private providers, and AA Chapters should work together to develop an alcohol/drug information system consisting of a printed directory and a telephone information line staffed around the clock.

### **C. Cardiovascular Disease**

The cardiovascular system consists of the heart and all the blood vessels in the body. Heart disease, blood vessel disease, stroke, and related disorders are often interrelated and are usually classified as cardiovascular disease. Together these diseases, with heart disease as the major one, kill more of the United States population than all other causes of death combined.

#### **(1) General Information**

Cardiovascular disease is a broad term which covers a number of different problems such as congenital heart defects, acute and chronic rheumatic heart disease, ischemic heart disease, myocardial infarction, congestive heart failure, and hypertensive heart disease. Ischemic heart disease and hypertensive heart disease are the two major health care concerns in this category.

Ischemic heart disease is the condition wherein the blood supply to the body is reduced because of a constriction or narrowing of the coronary arteries, usually due to fatty deposits on the arterial linings. Ischemic heart disease has three major manifestations: angina pectoris, myocardial infarction, and sudden death.

Hypertensive heart disease is caused by prolonged elevated blood pressure, which causes the heart to deteriorate prematurely, causing heart attacks and heart failure. Many of the cardiac deaths fall into this category.

The major underlying conditions of cardiovascular disease are atherosclerosis and high blood pressure.

#### **(a) Atherosclerosis**

Atherosclerosis, more commonly known as hardening of the arteries, is a degenerative disease that can, in time, narrow or block arteries



in the heart, brain, and other parts of the body. It may begin early in life. The linings of the arteries become thickened and roughened by deposits of fat, cholesterol, fibrin (a clotting material), cellular debris, and calcium. As this buildup on the inner walls becomes hard and thick, arteries lose their ability to expand and contract. The blood moves with difficulty through the narrowed arterial channels, sometimes forming a clot which blocks the channel and deprives either the heart, brain, or organs of blood. When a complete blockage occurs in a coronary artery, the result may be coronary thrombosis, one form of heart attack.

Atherosclerosis is a complex disease with many causes. A high content of cholesterol and triglycerides, as well as lipoprotein abnormalities, have been identified as causative factors of this disease. Medical researchers established that a diet high in cholesterol and saturated fats may raise cholesterol levels in the blood and contribute to atherosclerosis.

#### (b) Hypertension

Hypertension (high blood pressure) is the second largest underlying cause of heart disease and as such is a major health care concern and public health problem in the U.S. and on Guam. Blood pressure is defined as the way the blood circulates after the heart pumps it into the arteries. Measurements of blood pressure are derived from the force the blood exerts against the artery walls while the heart is pumping (the systolic or higher number) as well as when it is resting (the diastolic or lower number). When the pressure against the arteries is deemed excessive, we talk of high blood pressure or hypertension.

The point at which someone is considered to have high blood pressure varies from expert to expert and according to the individual patient's circumstances. On Guam, the measurements of 160 systolic pressure over 95 diastolic pressure identify hypertension in a patient. The National Institute of Health's 1984 Joint Committee on High Blood Pressure categorized diastolic blood pressure of 90-104 as mild hypertension. Despite these differences, it is agreed that high blood pressure adds to the workload of the heart and arteries and thereby contributes to the development of other conditions like stroke, heart attack, and kidney failure.

There are two types of hypertension. The first, essential hypertension, is the most common one, seen in 85 to 95 percent of all cases. It has no known causes or cures, but must be controlled through medication and lifestyle modification. The second type, called secondary hypertension, can be linked to some type of organic malfunction, such as tumors of the adrenal glands or kidney disorders. Treatment consists of the correction of the malfunctions.

Because hypertension usually lacks symptoms, there is a large unaware and therefore undetected population afflicted with the condition. These people are at risk of the secondary complication arising from hypertension. The few specific symptoms (persistent headache, dizziness, fatigue, tension, shortness of breath) which indicate hypertension are



common symptoms in people suffering from the disease, but they may also result from a variety of other causes.

It is important to note that once hypertension is detected, it can be controlled, and thereby the risk of developing these conditions is reduced. If untreated, the disease will cause stroke, kidney failure, and in most cases, heart attacks and heart failure.

## (2) Mortality

Heart or cardiovascular disease was the leading cause of death on Guam for the last 10 years. In addition, a considerable increase in mortality from this disease was experienced in the last decade. There were 82 heart deaths in 1974, which amounted to 18.3 percent of all deaths during the year at a rate of 0.88/1,000. As can be seen from Table 49, in 1983 there were 137 deaths caused by heart disease, corresponding to 29.6 percent of total deaths during this period, at a rate of 1.22 per 1,000 population, and increasing the mortality rate by 38.6 percent in 10 years.

For the last 5 years (1979-1983) there was an annual average crude mortality rate of 0.99/1,000, accounting for 25.6 percent of all deaths on Guam. The U.S. crude mortality rate for heart disease in 1980 was 3.36/1,000 population. However, if adjusted to age, Guam's rate increased to 2.68/1,000, which was then 25 percent higher than the U.S. age-adjusted rate of 2.02 cardiac deaths per 1,000 population.

**TABLE 49**

**Frequency and Mortality Rates of Heart Disease  
Per 1,000 Population  
Guam: 1974 - 1983**

| Year | # of Cardiac Deaths | % of Total Deaths | Total Population | Rate |
|------|---------------------|-------------------|------------------|------|
| 1974 | 82                  | 18.3              | 92,838           | 0.88 |
| 1975 | 96                  | 21.8              | 94,836           | 1.01 |
| 1976 | 93                  | 20.0              | 96,937           | 0.96 |
| 1977 | 77                  | 18.7              | 99,084           | 0.77 |
| 1978 | 90                  | 21.2              | 101,280          | 0.89 |
| 1979 | 99                  | 26.3              | 104,048          | 0.95 |
| 1980 | 92                  | 21.8              | 105,979          | 0.87 |
| 1981 | 96                  | 23.6              | 109,581          | 0.88 |
| 1982 | 116                 | 26.2              | 108,874          | 1.07 |
| 1983 | 137                 | 29.6              | 112,285          | 1.22 |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam.

On Guam, as in the U.S., males are more likely to die of heart disease than females, as can be seen when comparing the average male rate of 1.46/1,000

to the average female rate of 0.94/1,000. The same holds true for most age groups, male mortality rates were consistently higher than female mortality rates.

On Guam, both males and females age 65 and over were at higher risk than other age categories. The average annual mortality rate for males 65 years and older was 19.36 per 1,000 males, while the female mortality rate for the same age group was 18.90 per 1,000 females. (Table 50.) Mortality rates for males and females in the 45-64 age categories were significantly higher than younger age groups, with males having a mortality rate of 4.86 per 1,000 and females and mortality rate of 1.52 per 1,000. Mortality rates in other age categories were consistently low.

If the age categories over age 65 are further divided into 65-74 and 75+, there is a shift in mortality rates. Male mortality rates at ages 65-74 were 13.57 deaths/1,000, and females were 12.23 deaths/1,000. However, at age 75 and over, female average annual mortality rates from heart disease rose to 57.69 deaths/1,000, 38.61 percent higher than the average annual male mortality rate of 41.62 deaths/1,000.

### **(3) Morbidity**

It is estimated that almost 25 percent of the adult U.S. population suffer from cardiovascular and hypertensive diseases, which are the leading causes of death. The prevalence of cardiovascular disease rises with age. In 1981, 12.3 percent of persons 45-64 years of age and 27.7 percent of persons over the age of 65 reported a heart condition in a national health interview study.

On Guam, prevalence data for heart disease is not tabulated by either public or private medical providers. However, the 1984 Health Status Survey commissioned by GHPDA identified 26 persons who reported themselves as suffering from heart disease. Six of these persons were in the age group of 0-39 years which comprised 1,385 persons, and 20 were aged 40 or older and contained in a group of 543 respondents.

There is also no accurate prevalence data for hypertension available on Guam, but various blood pressure screening programs have yielded some information. For instance, mass screening programs carried out by the Guam High Blood Pressure Council between November 1980 and October 1981 identified 850 (20.8%) persons out of 4,093 unduplicated persons screened as hypertensive, and necessitating a referral to a physician or the Public Health clinic. Figures generated by a long range FHP Clinic screening effort on Guam, between December 1976 and January 1980, identified 624 persons (10.4% of those screened) as having hypertension.

Data from blood pressure screening activities of the Department of Public Health and Social Services' Chronic Disease Prevention and Control Program yielded hypertension prevalence rates of 11.38 percent in 1982, 14.4 percent in 1983, and 17.74 percent in 1984. This data is not representative of the population, and is inconclusive, as the screenings often do not include those already being treated by a physician, nor those who fail to participate in the screening process.

**TABLE 50**  
**Heart Disease Mortality Rates**  
**Per 1,000 Population by Age and Sex**  
**Guam: 1979 - 1983**

|                 | 1979        | 1980        | 1981        | 1982        | 1983        | Average<br>Annual Rate |
|-----------------|-------------|-------------|-------------|-------------|-------------|------------------------|
| <b>All Ages</b> | <b>0.95</b> | <b>0.87</b> | <b>0.88</b> | <b>1.07</b> | <b>1.22</b> | <b>0.99</b>            |
| Male            | 1.55        | 1.17        | 1.31        | 1.39        | 1.87        | 1.46                   |
| Female          | 0.73        | 0.92        | 0.83        | 1.16        | 1.07        | 0.94                   |
| <b>0 - 4</b>    |             |             |             |             |             |                        |
| Male            | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00                   |
| Female          | 0.00        | 0.21        | 0.00        | 0.00        | 0.00        | 0.04                   |
| <b>5 - 14</b>   |             |             |             |             |             |                        |
| Male            | 0.19        | 0.00        | 0.00        | 0.00        | 0.09        | 0.06                   |
| Female          | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00                   |
| <b>15 - 24</b>  |             |             |             |             |             |                        |
| Male            | 0.11        | 0.00        | 0.00        | 0.00        | 0.00        | 0.02                   |
| Female          | 0.12        | 0.00        | 0.00        | 0.00        | 0.11        | 0.05                   |
| <b>25 - 44</b>  |             |             |             |             |             |                        |
| Male            | 0.43        | 0.33        | 0.57        | 0.32        | 0.31        | 0.39                   |
| Female          | 0.09        | 0.09        | 0.00        | 0.16        | 0.16        | 0.10                   |
| <b>45 - 64</b>  |             |             |             |             |             |                        |
| Male            | 5.37        | 4.40        | 4.02        | 4.22        | 6.29        | 4.86                   |
| Female          | 1.62        | 1.22        | 1.35        | 2.28        | 1.10        | 1.52                   |
| <b>65+</b>      |             |             |             |             |             |                        |
| Male            | 19.89       | 13.68       | 17.34       | 20.72       | 25.18       | 19.36                  |
| Female          | 12.93       | 19.37       | 17.69       | 21.60       | 22.91       | 18.90                  |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam;  
Guam Health Planning and Development Agency.



The above mentioned 1984 GHPDA study identified 78 persons as suffering from hypertension. Of these, 1 person was found in the 0-15 age group which was composed of 675 persons; 11 persons were found in the 16-39 group made up of 710 persons; and 67 persons were contained in the 40 and over age group (the population most at risk), which had 543 respondents. For the population most at risk there was a prevalence rate of 123 per 1,000 population.

All the screening efforts and survey findings have established that Chamorros have the highest rate of heart disease and hypertension, followed by Caucasians and Filipinos. Gender-specific prevalence rates show that males have a higher rate than females for both heart disease and hypertension.

#### **(4) Analysis of Problem**

Heart disease is the leading cause of death for persons over the age of 40 and often occurs prematurely. It does not only produce fatal heart attacks, but it is also the greatest cause of permanent disability among people under the age of 65, and responsible for more days of hospitalization than any other single disorder.

Yet many of these deaths and disabilities could be avoided if atherosclerosis and hypertension, the main causative factors of the disease, would be diagnosed early and treated aggressively. Scientists believe that the incidence and prevalence of heart disease could be considerably lowered by being attentive to the risk factors for this disease. Some of these risk factors cannot be altered, but others can be changed under the direction of a physician and by modifying lifestyle habits.

| <b>Risk factors that cannot be changed</b> | <b>Risk factors that can be changed</b> | <b>Contributing factors</b> |
|--------------------------------------------|-----------------------------------------|-----------------------------|
| Heredity                                   | Cigarette Smoking                       | High Salt Intake            |
| Sex                                        | High Blood Pressure                     | Obesity                     |
| Race                                       | Blood Cholesterol Levels                | Lack of Exercise            |
| Age                                        | Diabetes                                | Stress                      |

It appears that atherosclerosis and heart disease can be passed from one generation to another. Also, men are more vulnerable than women. This has been linked to the female hormone estrogen, but even after menopause, when estrogen diminishes, women's prevalence and death rates never reach that of men. Black persons on the mainland, and Chamorros on Guam, have a considerably greater chance of having high blood pressure (a contributor to heart attack) than Caucasians. People between the ages of 45 and 65 are most vulnerable to fatal heart attacks.

Cigarette smokers, particularly those smoking more than one pack a day, increase their risk for heart disease threefold. Untreated high blood pressure will lead to certain heart disease or stroke. Too much cholesterol in the blood can bring about clotting in the arteries, causing heart attack and stroke. Uncontrolled diabetes sharply increases a person's risk of heart attack.

A diet high in salt or soy sauce, as is customary on Guam, is known to increase high blood pressure. Obesity, a particular problem on the island, places a heavy burden on the heart. It influences blood pressure and blood cholesterol, and is known to precipitate diabetes. Lack of exercise, especially when combined with overeating, leads to excess weight and the above mentioned complications. Emotional stress, if excessive over long periods of time, will cause hypertension and heart disease.

There is nothing an individual can do about his heredity, sex, race, or age. But a person can minimize the risks of hypertension, heart disease, or heart attack simply by modifying his lifestyle. There is definite scientific proof that the cessation of smoking, the maintenance of normal weight, a diet low in fat (particularly in animal fat) and salt, regular physical exercise, stress control, and routine medical check-ups in conjunction with the treatment for existing hypertension or diabetes, will add years to a person's life. Of all the above, breaking the smoking habit has proven to be the single most important factor in avoiding heart disease.

### **Conclusion and Recommendations**

Heart disease as well as its main precursors atherosclerosis and hypertension could to a large degree be avoided if it was more widely known that certain living habits and medical conditions increase the risk of these diseases occurring. Many of these risks can be reduced with practical steps. Education and information measures which heighten public and professional awareness of the risk factors for heart disease are considered the first and most important steps in the control of this disease. Preventive measures should include mass screening and follow-up services for high blood pressure and diabetes.

### **GOAL 1:           REDUCE THE INCIDENCE AND PREVALENCE OF HYPERTENSION AND RELATED CARDIOVASCULAR DISEASE AMONG ISLAND RESIDENTS.**

Target Population: All island residents, particularly those who are at high risk, over the age of 30, overweight, and smoke heavily.

### **OBJECTIVE 1.1.: Increase the proportion of individuals screened for hypertension by 1988.**

Recommended Action 1.1.1.: Encourage private and public health physicians to screen for high blood pressure at initial encounters and periodic intervals as recommended by the National Institute of Health.

Recommended Action 1.1.2.: Encourage blood pressure screening activities at the place of employment in the Government of Guam and the private sector through joint efforts of the Department of Public Health and Social Services, private providers, the Guam Heart Association, and the Guam High Blood Pressure Council.



**GOAL 2: THROUGH THE EDUCATION PROCESS AND PUBLIC INFORMATION, MAKE ALL GUAM RESIDENTS AWARE OF:**

- (a) The effects of hypertension;**
- (b) Available treatments;**
- (c) Lifestyle factors which can contribute to the stabilization or reduction of hypertension (control over smoking, weight, salt intake, and exercise); and**
- (d) The necessity of professional follow-ups when hypertension is diagnosed.**

**OBJECTIVE 2.1.:** Ensure that information pertaining to high blood pressure (Hypertension) as it relates to scheduled screening activities, medical intervention, and lifestyle modification is available to all Guam residents by 1988.

Recommended Action: Urge the High Blood Pressure Council and its members to design a culturally acceptable education and public information program as well as to share the responsibility for the implementation of this program.

**GOAL 3: REDUCE THE PREVALENCE OF CIGARETTE SMOKING ON GUAM.**

**OBJECTIVE 3.1.:** Support the annual "Great American Smoke-Out."

**OBJECTIVE 3.2.:** Encourage "smoke-free" policies in all Government of Guam agencies and departments, as well as in public areas.

#### **D. Lytico (Amyotrophic Lateral Sclerosis) and Bodig (Parkinsonism Dementia)**

Lytico and bodig are found in such high concentration among the Chamorro population that they have attracted national and international attention. Extensive studies conducted by the National Institute of Neurological and Communicative Disorders and Stroke (NINCDS) over the past 30 years have yet to find the reason for the high incidence or the cause of these devastating diseases of the central nervous system.

##### **(1) General Information**

###### **(a) Lytico (Amyotrophic Lateral Sclerosis - ALS)**

Lytico (derived from the Spanish "paralytico," meaning paralysis) has been present on Guam for many years. It was first officially recorded by the Surgeon General of the Navy in 1900 as hereditary paralysis or progressive muscular atrophy. Amyotrophic lateral sclerosis (ALS) as a cause of death was not entered into official records until 1934, at which time a high incidence of such cases was also noted. In the early 1950's serious interest brought international clinical researchers



to the island for epidemiological studies. At the time Guam had incidence, prevalence, and mortality rates for lytico which were 50 to 100 times higher than those found elsewhere in the world. Researchers called it an "endemic disease" because it occurred chiefly among Chamorros. About 8-10 percent of all adult deaths were caused by ALS, which showed the same clinical features as those of "classical" ALS elsewhere.

Amyotrophic lateral sclerosis (ALS) is a disease of the central nervous system which causes the spinal cord to atrophy slowly and progressively over a period of time. At the onset of the disease most individuals develop a weakness or the wasting of hands and legs, and experience difficulty in walking. After a while the muscles in the neck as well as the tongue are affected; speech becomes slurred and eating and swallowing increasingly difficult. Eventually the general wasting and weakness are so severe that the patient becomes "skin and bones" with completely useless arms and legs. Although the body wastes away, good mental acuity is usually preserved until death. A healthy mind then is imprisoned in a helpless body devoid of expression and locomotion.

Lytico or ALS strikes people in their middle years. There is a high familial aggregation; that is, several members of the family are often afflicted, leaving researchers to speculate that there might be a genetic link or dominant inheritance pattern. The southern villages, particularly Umatac and Merizo, have the highest concentration of Lytico. The disease runs a progressive course, lasting from as short as 18 to 24 months to as long as 10 to 15 years. In general, 20 percent of Guam's ALS patients die within 2 years of diagnosis; 60 percent survive more than 4 years; and about 10 percent live longer than 15 years. The rest of the patients do not conform to any particular pattern, and cases are seen in which the normally relentless and progressive disease process has stopped for no apparent reason.

Unfortunately, no adequate treatment for lytico has been found. Because of the difficulties with swallowing, a great concern is the intake of sufficient and proper nutrition. Appropriate physical therapy to keep the patient mobile for as long as possible is also important, as is satisfactory medical and nursing care, with a maximum amount of psychological support for the patient and his care givers. So far, no medication has been found to prevent, halt, or even ameliorate the progress of the disease. Many persons ultimately die from bronchopneumonia or aspiration pneumonia.

(b) Bodig (Parkinsonism Dementia)

Reference to bodig (Parkinson's disease or Parkinsonism dementia) was first made in 1936 by a Japanese physician working in Saipan. No particular Chamorro name had been given to this disease previously, nor was there any documentation as to how long the disease had been observed on Guam. The Chamorros used the terms "mappot kalamten" (someone not in control of his actions) or "manman" (someone in a daze), for someone afflicted with the disease. The term now commonly accepted is "bodig," which has its origin with a Chamorro family who owned a

"bodega" (warehouse or store) and had a member afflicted with the disease. He was referred to as "bodig malangu," a sick person from the bodega, and this is the name by which the disease is now known among the island people.

Patients with bodig are afflicted with a progressive muscular rigidity or stiffness and mental deterioration. The first signs are usually tremors of the hands, which progress into shakes and a slowing down of daily activities. A typical patient initially appears aloof, absent-minded, careless, and generally disinterested in his surroundings. He may complain of dizziness, tiredness, or vague anxiety symptoms. He forgets things and frequently sits immobile, staring into space, and sleeps a great deal. The face develops a staring, unlined, mask-like appearance with little or no variation in expression. He walks slowly and unsteadily and is therefore prone to frequent falls. Along with this comes mental deterioration which mimic other senile conditions.

The symptoms of bodig usually appear in the early and mid-50's or later. It was originally seen more often in males than females, but this is evening out. Bodig also appears to run in families, which makes one conclude that there is some kind of genetic predisposition. The disease progresses slowly, but eventually incapacitates the patient totally; he becomes bedridden, with curled up limbs, totally demented, mute, incontinent of feces and urine, and develops multiple extensive decubiti (bed sores). Death usually comes about through infection because of a deficient immunity.

Patients afflicted with bodig are somewhat more fortunate than those with lytico, in that medication is available to them. Any of the Dopamine or L-Dopa compounds are effective, and Sinemet has become the drug of choice for Guam's bodig patients. This medicine loosens up rigidity and improves the slow movements; it also decreases shaking of limbs and helps the patient to stay alert. It cannot, however, restore any deterioration and is ineffective in the late stages. Sinemet has few side effects and has been proven effective with Guam's bodig patients.

#### (c) Cross-Over Cases (Guam Parkinsonism Syndrome)

There are several persons on island who exhibit the symptoms of both lytico and bodig at the same time. They were either stricken with both diseases at once, or had one and then developed the other. The outcome is the same, since both diseases are considered catastrophic or terminal.

#### (d) Research Efforts

Finding both lytico and bodig symptoms combined in individual patients was of particular interest to the researchers as they speculated that this may represent a linkage between the two diseases. This led to the inference that lytico and bodig have a common etiology, and that they are essentially a single disease manifesting itself in the different clinical symptoms and the expressions of either lytico, bodig, or the cross-over Guam syndrome.

Extensive studies since the early 1950's have investigated every aspect of daily living on Guam to find a cause for these dreaded diseases. Investigations into family trees, blood groups, and other genetic factors have not proven that the disease is hereditary. Plant life, soil, animals, fish, and the health history of the island as a whole have been examined as well.

After elimination of all other possible causes, there were indications that the diseases were and still are caused by past exposure to a common environmental factor of a toxic-metabolic nature. This is supported by two facts: there are now quite a few non-Chamorro cases, all of whom have lived on Guam for more than 15 or 20 years; there are also several Chamorros who had left the island 15-20 years ago and now live in the San Diego area, but are afflicted with the diseases. Therefore long-term exposure during the early years of life, most likely in the pre-war periods, are probably important factors in determining the causes of lytico and bodig. Furthermore, the decline in incidence and death rates over the last several years suggests that Guam's younger generations, those born after World War II, are far less likely to be stricken by these diseases than the older generations.

The above theories are supported by studies over the last two decades which definitely implicate a high concentration of some minerals in the drinking water, particularly aluminum, iron, and manganese, as well as a deficiency in calcium, magnesium, and zinc. The only other geographical localities with an above average incidence of neurodegenerative diseases, West New Guinea, Groote Eylandt in Northern Australia, and the Kii islands of Japan, have the same soil composition and a water supply with components similar to those listed above.

New water systems and the introduction of filters and chlorine to the drinking water, as well as the introduction of calcium-rich foods after the war, is held responsible for a lessening in the incidence of both diseases, particularly of lytico.

## (2) Mortality and Morbidity

The following tables show trends of incidence, prevalence, and mortality over the years, as well as an age and ethnic breakdown of the patients.

**TABLE 51**  
**Confirmed Cases of Lytico and Bodig**  
**Guam: 1945 - 1982**

| Diagnosis                   | Males      | Females    | Total      |
|-----------------------------|------------|------------|------------|
| Lytico (ALS)                | 269        | 152        | 423        |
| Bodig (PD)                  | 223        | 112        | 336        |
| Cross-Over Cases (ALS & PD) | 27         | 11         | 38         |
|                             | <u>519</u> | <u>275</u> | <u>797</u> |

Source: Chen, K.M., M.D. and Yushiro Uebayashi, M.D.: "Amyotrophic Lateral Sclerosis and Parkinsonism-Dementia on Guam," 1984.



**TABLE 52**  
**Confirmed Cases of Lytico and Bodig by Ethnicity**  
**Guam: 1945 - 1982**

| Racial<br>Descent | Lytico<br>(ALS) | Bodig<br>(PD) | Cross-Over Cases<br>(ALS & PD) | Total     |
|-------------------|-----------------|---------------|--------------------------------|-----------|
| Chamorro          | 396             | 315           | 35                             | 746       |
| Part Chamorro     | 16              | 13            | 3                              | 32        |
| Filipino          | <u>11</u>       | <u>8</u>      | <u>0</u>                       | <u>19</u> |
| Totals            | 423             | 336           | 38                             | 797       |

Source: Chen, K.M., M.D., and Yushiro Uebayashi, M.D.: "Amyotrophic Lateral Sclerosis and Parkinsonism-Dementia on Guam," 1984.

As can be seen from the tables presented above, most of the persons afflicted with lytico or bodig were Chamorros. Lytico cases prevailed, in the early years of the research, and consistently more males than females were diagnosed with either lytico or bodig. The peak annual average incidence rate for male lytico patients was 0.55/1,000 in the period 1958-1962. This lowered to a rate of 0.11/1,000 for the period 1978-1982, 20 years later. Female rates decreased from 0.31/1,000 to 0.17/1,000 during the same time. The decrease in male bodig cases from an average of 0.27/1,000 in 1958-1962 to 0.22/1,000 in 1978-1982 was less drastic; and females showed a considerable increase in incidence, from an average 0.08/1,000 to 0.21/1,000 during the same 20 years.

The mortality rates for the last 20 years, also shown in Tables 53 and 54, declined for male and female lytico patients, but showed an increase of Bodig deaths for both sexes.

Data gathered in 1984 (Table 55) show that almost all of the 95 lytico and bodig cases are Chamorro (or had at least one Chamorro patient), that the majority of patients are over the age of 45, and that there is now a higher prevalence of bodig than of lytico. Incidence rates for 1983 and 1984 have not yet been calculated, but through interviews with the Guam NINCDS staff it was estimated that approximately 10-12 new bodig patients are diagnosed each year, and that approximately 4-6 patients are found to have lytico. In 1983 5 persons died of lytico, and bodig was listed for 10 persons as the cause of death.

### (3) Analysis of Problem

Due to the extremely high incidence and prevalence of lytico and bodig and related neurological diseases on Guam, the National Institute of Neurological and Communicative Disorders and Stroke (NINCDS) established a research center on Guam to study the etiology and to perhaps find suitable treatment or even a cure for these dreaded and disabling diseases. As part of the research, all registered patients were monitored through lab tests and check-ups; and all those responding to medication (primarily bodig patients) were put on a regime of Sinamet free of charge.

TABLE 53

Frequency, Incidence, and Mortality Rates  
for Lytico (ALS) by Sex  
Guam: 1953 - 1982

| Period  | No. of Cases |    | Average Annual Incidence<br>Rate Per 1,000 Population* |      | Average Annual Mortality<br>Rate Per 1,000 Population |      |
|---------|--------------|----|--------------------------------------------------------|------|-------------------------------------------------------|------|
|         | M            | F  | M                                                      | F    | M                                                     | F    |
| 1953-57 | 32           | 19 | 0.34                                                   | 0.31 | 0.66                                                  | 0.20 |
| 1958-62 | 47           | 21 | 0.55                                                   | 0.32 | 0.40                                                  | 0.44 |
| 1963-67 | 34           | 22 | 0.35                                                   | 0.32 | 0.54                                                  | 0.22 |
| 1968-72 | 33           | 19 | 0.45                                                   | 0.18 | 0.44                                                  | 0.30 |
| 1973-77 | 23           | 18 | 0.26                                                   | 0.21 | 0.42                                                  | 0.23 |
| 1978-82 | 15           | 16 | 0.11                                                   | 0.17 | 0.21                                                  | 0.19 |

\* Age adjusted to U.S. population in 1970.

Source: NINCDS Guam Research Office, 1984.

TABLE 54

Frequency, Incidence, and Mortality Rates  
for Bodig (PD) by Sex  
Guam: 1953 - 1982

| Period  | No. of Cases |    | Average Annual Incidence<br>Rate Per 1,000 Population* |      | Average Annual Mortality<br>Rate Per 1,000 Population |      |
|---------|--------------|----|--------------------------------------------------------|------|-------------------------------------------------------|------|
|         | M            | F  | M                                                      | F    | M                                                     | F    |
| 1953-57 | 20           | 7  | 0.27                                                   | 0.08 | 0.14                                                  | 0.00 |
| 1958-62 | 43           | 19 | 0.51                                                   | 0.21 | 0.43                                                  | 0.14 |
| 1963-67 | 48           | 14 | 0.58                                                   | 0.13 | 0.49                                                  | 0.17 |
| 1968-72 | 41           | 22 | 0.55                                                   | 0.19 | 0.39                                                  | 0.09 |
| 1973-77 | 35           | 25 | 0.42                                                   | 0.25 | 0.51                                                  | 0.31 |
| 1978-82 | 16           | 14 | 0.22                                                   | 0.21 | 0.61                                                  | 0.28 |

\* Age adjusted to U.S. population in 1970.

Source: NINCDS Guam Research Office, 1984.

**TABLE 55**  
**Lytico and Bodig Patients Residing on Guam**  
**by Age and Ethnicity**  
**Guam: 1984**

| Disease                                                                                                                                   | Sex |    | Ethnicity |    | Age       |    |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----|----|-----------|----|-----------|----|
|                                                                                                                                           | M   | F  |           |    |           |    |
| Lytico (ALS)                                                                                                                              | 17  | 10 | Chamorro  | 90 | Under 45  | 5  |
| Bodig (PD)                                                                                                                                | 37  | 31 | Filipino  | 4  | 45-64     | 50 |
|                                                                                                                                           |     |    | Caucasian | 1  | 65 & Over | 40 |
| Total Cases                                                                                                                               | 54  | 41 |           | 95 |           | 95 |
| Youngest Case: 21 year old Filipino male with undifferentiated lytico (ALS);<br>Oldest Case: 93 year old Chamorro female with bodig (PD). |     |    |           |    |           |    |

Source: NINCDS Guam Research Office, 1984.

NINCDS is now phasing out its research activities on Guam; no new patients have been admitted since 1983, and it is expected that the lytico and bodig clinic in the old hospital in Tamuning will have to be managed with local funds. This puts a burden on the Government of Guam which has assumed through Public Law the responsibility for the medical care of the lytico and bodig patients.

While the emotional and social impact of someone afflicted with lytico or bodig cannot be measured in dollars and cents, the medical cost can be established. Below is an approximation for medical care for one year.

|                                            |                   |
|--------------------------------------------|-------------------|
| 6 Clinic Visits (@ \$20 each)              | \$ 120.00         |
| CT Scan                                    | 300.00            |
| EEG                                        | 100.00            |
| EMG                                        | 100.00            |
| Lab Tests                                  | 100.00            |
| Sinamet (100 tablets/month = \$60/month)   | 720.00            |
| Hospital admission (an average 5-day stay) | 1,000.00          |
| <b>TOTAL</b>                               | <b>\$2,440.00</b> |

The above figures do not include other medications, special lotions, disposable diapers, or the liquid nutritional formulas needed by most patients toward the end of their illness. Nor are the costs for terminal admission to the Skilled Nursing care or Intermediate Care facilities of the hospital included. There are currently 21 such patients admitted to these facilities, many of them for several months, who are continuously dependant on oxygen, suction machines, and intravenous feedings to stay alive.

Several issues are at stake here. The continued care of the lytico and bodig patients is of utmost concern. Such care should include all medical services, including vigorous physical therapy and social support for the patient and his family. A secondary consideration is the continuance of research geared towards treatment (reversal of symptoms) and prevention of these diseases.



Members of the national and international scientific community have expressed interest in such research if the necessary financing can be found.

Another issue to be considered is the finance mechanism for the medical and social care of the lytico and bodig patients. Until very recently, the Guam Memorial Hospital absorbed these costs for care which were not covered by NINCDS funds. The hospital can no longer afford this, and none of Guam's major health insurance companies (FHP, GMHP, Staywell), cover these diseases since "free" care is mandated by law. This "free" care puts considerable strains on the Government of Guam's health resources, which are already insufficient to provide medical care for the island's indigent population.

### **Conclusion and Recommendations**

About 100 patients are currently recorded as suffering from either lytico or bodig, and in some instances from both these diseases. In the past, research activities of the National Institute for Neurological and Communicative Disorders and Stroke have provided medical attention, laboratory tests and medication for a sizeable number of these patients. Patient care costs which were not covered by NINCDS had previously been absorbed by Guam Memorial Hospital's General Fund allocations.

NINCDS is phasing out its Guam activities in the near future. Guam Memorial Hospital, in its effort to be self-sufficient, no longer receives monies from the General Fund. The care of lytico and bodig patients is now the responsibility of the Medically Indigent Program.

In order to assure the continuity and quality of care Guam's lytico and bodig patients as received from the NINCDS clinic, it is recommended that this clinic will be continued by the Government of Guam and that sufficient funds for clinic operations will be allocated by the legislature. It is also recommended that the Government of Guam encourages further research efforts into lytico and bodig and investigate alternate funding sources for such research.

### **GOAL 1: ASSURE THE CONTINUITY OF QUALITY HEALTH CARE FOR PERSONS AFFLICTED WITH LYTICO OR BODIG.**

Target Population: Those affected with the disease, those at risk of having the disease, particularly middle-aged island residents of Chamorro background living in the southern area.

**OBJECTIVE 1.1.:** Support legislative efforts to reserve sufficient funds for the care of those patients after NINCDS has withdrawn from the Guam Research Center.

**OBJECTIVE 1.2.:** Provide continuance of treatment by maintaining the Guam Lytico and Bodig Clinic.

Recommended Action: If Government of Guam funds cannot be identified to keep the clinic in operation, investigate private foundations, such as the Kellogg Foundation and the Robert Wood Johnson Foundation for grants to finance clinic operations.

**OBJECTIVE 1.3.:** Add vigorous physical therapy to those diagnosed with Lytico and Bodig and measure the impact of such therapy at regular intervals.

**OBJECTIVE 1.4.:** Together with the Guam Lytico and Bodig Association organize a Family Support Group for family members caring for a Lytico or Bodig patient. Provide regular sessions pertaining to the practical aspects of caring for an invalid and the emotional stress involved in such care.

**GOAL 2:                    SUPPORT RESEARCH ACTIVITIES GEARED TO FINDING TREATMENT, CURE, OR PREVENTION FOR NEUROMUSCULAR DISEASES.**

## **E. Diabetes**

Diabetes is a metabolic disorder which inhibits the body's production of insulin or proper utilization of the produced insulin. Insulin is a protein hormone manufactured by the Beta cells in the pancreas's Islands of Langerhans, and is needed by the body to metabolize (burn) carbohydrates, fats, and proteins. If there is an insufficient amount of insulin present in the blood stream, an excess amount of glucose accumulates, and eventually leads to a number of complications.

### **(1) General Information**

There are two major types of diabetes: insulin-dependent or Type I, and non-insulin dependent diabetes or Type II. The former is associated with an absolute deficiency of insulin in the body. Non-insulin dependent diabetes, on the other hand, develops when the production and secretion of insulin into the bloodstream progressively decreases. It usually strikes people over 40; people who are obese; those with a family history of diabetes; and is seen more in women, especially those who have given birth to very large babies.

The following facts provide an indication of the severity of diabetes as a health problem nationally and on Guam.

- (a) The American Diabetes Association estimates that 10 million Americans have diabetes.
- (b) The incidence of diabetes is increasing 6 percent annually.
- (c) Diabetes lessens the chance of successful pregnancy and increases the frequency of birth defects.
- (d) When detected early and subsequently controlled, diabetics can lead normal lives, yet still:

- 1 in 5 develops a heart condition;
- 1 in 6 has impaired vision;
- 1 in 12 experiences kidney failure;
- 1 in 4 develops foot disorders; and
- some develop gangrene which necessitates amputation.

On Guam, almost all the diabetes diagnosed by physicians is Type II and is seen in people over the age of 40. Type I is seen only rarely, predominantly in the Caucasian population, and does not represent a health problem of serious magnitude.

## (2) Mortality

In the last 10 years, Guam had a total of 115 persons die of diabetes, with an average mortality rate of 0.11/1,000 per year, or 2.7 percent of all yearly deaths. Diabetes was a leading cause of death in 6 out of the last 10 years. (Table 56).

**TABLE 56**  
**Diabetes Mortality Rates**  
**Guam: 1974 - 1983**

| Year            | Total Deaths | Diabetes Deaths | % of Total Deaths | Rank Among Leading Causes of Death | Rate Per 1,000 |
|-----------------|--------------|-----------------|-------------------|------------------------------------|----------------|
| 1974            | 449          | 8               | 1.8               | -                                  | 0.09           |
| 1975            | 441          | 6               | 1.4               | -                                  | 0.06           |
| 1976            | 466          | 18              | 3.0               | 9th                                | 0.19           |
| 1977            | 380          | 7               | 1.8               | -                                  | 0.07           |
| 1978            | 424          | 15              | 3.5               | 10th                               | 0.15           |
| 1979            | 377          | 12              | 3.2               | 9th                                | 0.12           |
| 1980            | 422          | 6               | 1.4               | -                                  | 0.06           |
| 1981            | 406          | 11              | 2.7               | 9th                                | 0.10           |
| 1982            | 443          | 17              | 3.8               | 5th                                | 0.15           |
| 1983            | 462          | 15              | 3.2               | 8th                                | 0.13           |
| 10-year Average |              | 11              | 2.7               |                                    | 0.11           |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam.

The crude mortality rates for diabetes appear lower than the U.S. rates. However, when adjusted for age, Guam's rate is considerably higher. The 45-64 and 65-74 age groups have had the greatest frequencies of deaths



from diabetes, followed by the 75+ age group. The three groups accounted for over 90 percent of all deaths attributed to diabetes in the last 10 years.

On Guam, females are more likely to die of diabetes than males. The average yearly female mortality rate of 0.19/1,000 was twice that of the male rate, 0.09/1,000 population for the last 5 years. Considering that diabetes as a cause of death is underrepresented and under-recorded, the Guam mortality rate for those dying of diabetes, or of diseases with diabetes as an underlying cause, is probably higher.

Additional data on diabetes mortality was supplied by a study performed in 1979 under the auspices of the South Pacific Commission. Salient points for consideration are reported as follows.

- (a) Guam's crude mortality rate for diabetes was lower than the national rate; however, Guam's age-adjusted diabetes rate for the population over the age of 45 is twice as high as the national age-adjusted rate.
- (b) On Guam at least 25 percent of all deaths due to heart disease are associated with diabetes.
- (c) Diabetic gangrene was the underlying reason for amputation in 82 percent of lower extremity amputations performed at Guam Memorial Hospital in 1976.
- (d) Hypertension, arteriosclerosis, heart disease, and congestive heart failure are observed more frequently in diabetes-associated deaths.
- (e) Diabetes was the most common cause of end stage renal disease (ESRD or chronic kidney failure).

### **(3) Morbidity**

Several screening studies were performed on island to determine the incidence and prevalence of diabetes.

- (a) The first study surveyed the Chamorro population in Dededo, Mangilao, and Talofofo for diabetes in 1964. Collected data revealed an estimated diabetes incidence rate of 52 per 1,000 population, which was three times higher than the U.S. mainland incidence of 17/1,000.
- (b) Another screening study performed by the FHP clinic covered 12,000 periodic health examinations of FHP enrollees over age 12. Data was collected from March 1978 through March 1985. In this group, 436 diabetics were identified. The total rate of 36.33/1,000 was twice that of the U.S. rate of 17/1,000. As can be seen from Table 57, the highest incidence was found between the ages of 36 to 55, where 61 percent of all cases were identified. Those between 46 and 55 are the most vulnerable to diabetes; 38 percent of identified cases are in this age group.

**TABLE 57**  
**Identified Diabetics by Age**  
**Guam: 1978 - 1981**

| Age Groups      | Total Persons Screened | Diabetic Cases |              |
|-----------------|------------------------|----------------|--------------|
|                 |                        | #              | %            |
| 12 - 14         | 348                    | 0              | 0.00         |
| 15 - 25         | 3,149                  | 12             | 2.75         |
| 26 - 35         | 3,462                  | 40             | 9.17         |
| 36 - 45         | 2,377                  | 103            | 23.62        |
| 46 - 55         | 1,652                  | 164            | 37.62        |
| 56 - 65         | 831                    | 95             | 21.79        |
| 65+             | 181                    | 22             | 5.05         |
| <b>All Ages</b> | <b>12,000</b>          | <b>436</b>     | <b>36.33</b> |

Source: FHP Diabetes Screening Study.

Of those identified as having diabetes, Filipinos and Chamorros had equally high rates, but the rates for both of these ethnic groups were several times higher than those for Guam's Caucasians. Table 58 shows this in detail.

**TABLE 58**  
**Prevalence of Diabetes by Ethnicity**  
**Guam: 1978 - 1981**

| Ethnicity    | Total Examined | # of Diabetics | Rate Per 1,000 |
|--------------|----------------|----------------|----------------|
| Chamorro     | 7,131          | 313            | 44             |
| Filipino     | 2,072          | 91             | 44             |
| Caucasian    | 2,101          | 18             | 9              |
| Other        | 696            | 14             | 20             |
| <b>TOTAL</b> | <b>12,000</b>  | <b>436</b>     | <b>36</b>      |

Source: FHP Diabetes Screening Study.

If rates are adjusted by ethnicity and then compared to the U.S. rate of 17/1,000, it becomes obvious that diabetes is a serious health problem for both Chamorros and Filipinos.

The same study has also shown how diabetes affects males and females in all ethnic groups. The data is displayed in Table 59.

**TABLE 59**  
**Identified Diabetics by Ethnicity and Sex**  
**Guam: 1978 - 1981**

| Ethnicity    | Female     | Male       |
|--------------|------------|------------|
| Chamorro     | 179        | 134        |
| Filipino     | 36         | 55         |
| Caucasian    | 6          | 12         |
| Other        | <u>8</u>   | <u>6</u>   |
| <b>TOTAL</b> | <b>229</b> | <b>207</b> |

Source: FHP Diabetes Screening Study.

The gender of a patient is often a factor related to the prevalence of a disease, particularly when data is collected through self-reporting. Furthermore, the inclination to seek treatment must also be taken in consideration. It appears that females are more likely than males to self-report a disease and are also more apt to avail themselves of diagnostic and screening services. The diabetes prevalence rate for U.S. mainland males in 1981 was 21.7/1,000; for females it was 27/1,000, higher by one-fourth. In the 1985 screening study performed by FHP, cases were almost equally distributed between males and females, but rates could not be established, since an ethnic breakdown is only available for the diabetic group and not the entire screened population.

This study also pointed to a high correlation between diabetes and other medical conditions. The figures in the table below indicate some of the diabetes-related conditions.

**TABLE 60**  
**Diabetes Patients with Significant**  
**Associated Diseases Listed in Rank Order**  
**Guam: 1978 - 1981**

| Rank | Disease or Condition   | Number     | Percent    |
|------|------------------------|------------|------------|
| 1st  | Obesity                | 228        | 52         |
| 2nd  | Hypertension           | 182        | 42         |
| 3rd  | Hypercholesterolemia   | 74         | 17         |
| 4th  | Visual Problems        | 71         | 16         |
| 5th  | Arthritis              | 71         | 16         |
| 6th  | Skin Problems          | 69         | 16         |
| 7th  | Cardiac Problems       | 68         | 15         |
| 8th  | Genitourinary Problems | 27         | 6          |
| 9th  | Vascular Problems      | 21         | 5          |
| 10th | Impotence              | <u>13</u>  | <u>3</u>   |
|      |                        | <b>463</b> | <b>100</b> |

Source: FHP Diabetes Screening Study.



Quite a few patients were identified as suffering from more than one of the conditions.

It must be noted that the FHP-screened population is a special group, and not necessarily representative of Guam's population. It is special in that each person was covered by health insurance and had easy access to diagnosis, treatment, and follow-up.

- (c) A blood sugar screening for diabetics was performed as a co-joint project of the Chronic Disease Prevention and Control Program (DPHSS) and the Guam Diabetes Association at the 1984 World Health Day. Screening was limited to individuals 18 years and older; a total of 84 persons were screened. Two known diabetics were identified and several persons were found to have elevated blood sugars with no prior history of diabetes.

**TABLE 61**  
**Blood Sugar Screening, World Health Day**  
**Guam: 1984**

| Ethnicity    | Persons Screened |           |           | Persons With Elevated Blood Sugar |          |          |
|--------------|------------------|-----------|-----------|-----------------------------------|----------|----------|
|              | Male             | Female    | Total     | Male                              | Female   | Total    |
| Chamorro     | 3                | 27        | 30        | 0                                 | 3        | 3        |
| Filipino     | 18               | 14        | 32        | 3                                 | 1        | 4        |
| Caucasian    | 5                | 11        | 16        | 1                                 | 1        | 2        |
| Other        | <u>3</u>         | <u>3</u>  | <u>6</u>  | <u>0</u>                          | <u>0</u> | <u>0</u> |
| <b>TOTAL</b> | <b>29</b>        | <b>55</b> | <b>84</b> | <b>4</b>                          | <b>5</b> | <b>9</b> |

Source: Quarterly Report, Chronic Disease Program, Department of Public Health and Social Services, Guam.

Although the screened persons represent a very small sample of the total population, the findings and implications from this screening survey cannot be overlooked. Out of 84 persons, 9 (10.7%) were found to have elevated blood sugar. Filipino males had the highest incidence (3 out of 18, or 16%). Chamorro females followed with 11 percent (3 out of 27). From this data it can be inferred that a substantial number in the community might have diabetes without being aware of it.

- (d) In a recent Health Status Survey performed by the Community Development Institute for GHPDA, 400 households were surveyed and data on morbidity was collected. A total of 1,928 persons were found in these households, and out of those, 46 were reported to be suffering from diabetes. Prevalence rates rose sharply with age, as can be seen in Table 62.

**TABLE 62**  
**Prevalence Rates for Reported Diabetics by Age**  
**Guam: 1984**

| Age Group | # of Survey | # of Diabetics | Rate Per<br>1,000 Pop. |
|-----------|-------------|----------------|------------------------|
| 0 - 15    | 675         | 0              | 0.00                   |
| 16 - 39   | 710         | 5              | 7.04                   |
| 40 - 54   | 272         | 14             | 51.47                  |
| 55 - 64   | 158         | 10             | 63.29                  |
| 65+       | 113         | 17             | 150.44                 |

Source: GHPDA-CDI Health Status Survey, 1984.

In this study, Chamorros (34) had a diabetes incidence rate of 30.44/1,000. It was higher for females than for males, for whom rates of 32.87/1,000 and 15.23/1,000 were reported respectively. As stated previously, a lower male rate is most likely due to a male's greater reluctance to self-report a disease, to participate in screening events, or to seek treatment.

The association between diabetes and heart disease and hypertension was also substantiated in this 1984 study. Of the diabetics in the study, 24 percent suffered from hypertension and 7 percent had cardiac problems. Four percent reported having both hypertension and heart disease.

#### **(4) Analysis of Problem**

Diabetes is a leading cause of death on Guam, killing an average of 11.5 people per year. The prevalence rate of this disease is approximately four times higher for those persons past the age of 40 than for their U.S. mainland counterparts. Chamorros and Filipinos have a much higher rate than Caucasians residing on the island or in the U.S., and more females than males are afflicted. Diabetes leads to such disabling conditions as amputation of the lower extremities, blindness, heart disease, and end stage renal disease.

Once a person has been diagnosed, treatment and close monitoring of blood sugar levels must commence. A conservative estimate for maintenance therapy (physician visits, lab tests, insulin, needles, etc...) can range from \$48 per month to twice that amount, depending on the severity of the disease.

The Guam Diabetes Association, now in its 3rd year, does much to foster awareness of the disease, but apart from the previously described screening activities during World Health Day 1984, the Association only provides counseling and group education activities to diagnosed diabetics and health services providers. The Department of Public Health and Social Services through its Chronic Disease Prevention and Control Program provides initial screening, diagnosis, treatment, and follow-up to eligible persons. During fiscal year 1983, 121 persons were diagnosed as having diabetes, and 89 persons as having both diabetes and hypertension.

## **Conclusion and Recommendations**

Guam has an alarmingly high incidence and prevalence rate of diabetes. This disease was also a leading cause of death in several out of the last 10 years. Survey and screening results demonstrated that being Chamorro, overweight, middle-aged and female makes one most vulnerable to this disease; however, Filipino and male incidence rates are on the increase. Those with a family history of diabetes are especially at risk.

Diabetes, if untreated, can lead to blindness, amputation of extremities, and life-threatening conditions such as stroke and heart attack. It is a disease with an insidious onset. Diagnosis is often made during a routine examination, or while being tested for other medical conditions. A considerable number of Guam residents do not see a physician on a regular basis, which means that diabetes remains undetected and untreated in many cases.

There is at present no known way to prevent diabetes. However, if diagnosed, diabetes can be treated and controlled, allowing an afflicted person to lead a normal life. Weight control and early detection are considered the two most important factors in lowering the incidence and mortality rates of diabetes. Information and education programs geared towards the public as well as the medical profession, and mass blood sugar screening are advocated for Guam's population, particularly for persons at special risk.

### **GOAL 1:               REDUCE THE MORTALITY, MORBIDITY, AND DISABILITY RATES DUE TO DIABETES FOR THE POPULATION OF GUAM THROUGH EARLY DIAGNOSIS.**

Target Population: Persons over the age of 40, particularly Chamorros and Filipinos, females, obese persons, and those with a family history of diabetes; also pregnant females.

**OBJECTIVE 1.1.:** Support blood sugar screening activities at public gathering places as well as at the place of employment in the Government of Guam and the private sector at periodic intervals.

**OBJECTIVE 1.2.:** Encourage health care professionals to provide comprehensive patient education to each newly diagnosed diabetic to assure treatment compliance as well as to minimize the effects of the disease and to avoid complications.

### **GOAL 2:               RAISE PUBLIC AWARENESS OF THE RISK FACTORS OF DIABETES IN ORDER TO DECREASE THE INCIDENCE OF THE DISEASE.**

Target Population: The entire island population, particularly children and young adults.

**OBJECTIVE 2.1.:** Together with the Guam Diabetes Association, the Public Health Chronic Disease Prevention and Control Program, and private providers develop a community awareness program about diabetes and its consequences and complications if untreated.



**OBJECTIVE 2.2.:** Provide education in lifestyle modification, particularly as it pertains to nutrition and weight control, to reduce or prevent obesity. Bring such education lectures to village centers and the place of employment, and include such information in the school health curriculum.

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## **V. HEALTH CARE DELIVERY SYSTEM**

## **V. HEALTH CARE DELIVERY SYSTEM**

### **A. Overview of Health Care Delivery System**

Chapter IV discussed the close relationship between the individual and his or her environment and lifestyle. The fourth element, the health care delivery system, is discussed in this chapter as it relates to the health status of the population.

The health care delivery system includes those services, resources, programs, and financial mechanisms which can be used to positively affect the level of health in the population. Since the promotion of health and the prevention of illnesses often require consideration of lifestyle and environmental factors, the definition of the health care delivery system has been expanded to include components which are normally thought of as outside the medical care model, such as health education services and environmental quality management.

Guam's health care delivery system is pluralistic, distinguished by a public and private sector for the local civilian population, and a military system for the delivery of medical services to the 25,000 active military members and their dependents, as well as to the military retirees and veterans on Guam.

All the health services customarily found in a community of similar size in the U.S. mainland are available to the island population. The major health care facilities and health services and programs are detailed in this chapter. One unique problem setting Guam apart from the mainland communities is that specialized and tertiary medical services are thousands of miles away, necessitating medical referrals to Japan, the Philippines, Hawaii, or the U.S. mainland. Such referrals are often cumbersome, time-consuming, and almost always impact considerably on individual and government financial resources.

#### **(1) Public Sector**

The public sector is comprised of Government of Guam facilities and programs which serve the community. The Guam Memorial Hospital is the only civilian inpatient acute care facility on Guam. It provides 221 acute and long-term beds in addition to the medical services associated with a general hospital.

Through the Department of Public Health and Social Services, the government provides for preventive medical and dental services, health education, and diagnosis and treatment for communicable diseases, maternal and child health, chronic diseases, and dental problems of children. These programs and services are available in the three Public Health Centers located in the southern, central, and northern parts of the island.

The Department of Mental Health and Substance Abuse administers a 17-bed inpatient facility and provides numerous outpatient and follow-up programs. In addition, the Department provides drug and alcohol abuse services as well as prevention, education, and consulting programs to all Guam residents.

Emergency medical and ambulance services throughout the island are rendered by the Guam Fire Department in conjunction with the Guam Memorial Hospital.

Guam's Department of Education operates a school nurse program and provides rehabilitation services for handicapped children. Handicapped adults are served by the Department of Vocational Rehabilitation.

The University of Guam's School of Nursing offers programs leading to an Associate Degree of Nursing and a Second Step BSN for Registered Nurses. The Guam Community College's curriculum includes classes pertaining to safe drinking water, sewage disposal, and food safety.

## **(2) Private Sector**

The private sector caters more to the individual needs in the community, providing, on a one-to-one basis, outpatient medical and dental care, laboratory, radiological, and optometrical services, as well as pharmaceuticals. There are several multi-specialty medical/dental groups, among which the FHP clinic and the Seventh Day Adventist clinic are the two largest. In addition, there are specialty medical group practices and individual (solo practice) physicians and dentists. Auxiliary services are provided by independent laboratories, pharmacies, and optical retailers operating within the community.

Apart from the non-profit Seventh Day Adventist and FHP multi-specialty clinics, all of the above listed health care providers are privately owned and operated for profit.

## **(3) The Military Health Care System**

The military system consists of the U.S. Naval Hospital (USNH) and smaller outpatient clinics or dispensaries at the various military bases throughout the island. The U.S. Naval Hospital is the military's central facility for general acute care. The hospital also provides outpatient services in the various medical disciplines and maintains a dental clinic. The medical center is self-contained and provides all the auxiliary services needed in conjunction with the provision of medical care. It is staffed and equipped to deal primarily with the medical needs of active military personnel on Guam and their dependents; however, health care priorities address the needs of military retirees, veterans, and their eligible dependents as well. The U.S. Naval Hospital also provides services to the neighboring Federated States of Micronesia and the Commonwealth of the Northern Marianas.

For planning purposes, the USNH is not considered a functional component of Guam's civilian health care delivery system. However, there is some interaction between the two systems. Specialized Navy medical officers provide a limited amount of consultation, diagnosis, and treatment services to Guam's population and, in so doing increase Guam's medical manpower. Public Health nurses accept USNH referrals to their home health care program. During supply and pharmaceutical shortages at Guam Memorial Hospital or the Department of Public Health and Social Services, the



U.S. Naval Hospital can be depended on for furnishing the needed items. Navy and air/sea rescue units located on Guam serve the community as well as the neighboring islands. Furthermore, the USNH serves as a back-up which could be immediately mobilized during a man-made or natural disaster.

Conversely, military personnel use the private medical services providers whenever a medical specialty is not provided at USNH through the CHAMPUS (Civilian Health and Medical Program of Uniformed Services) program.

#### **(4) Health Services and Programs**

The above described major components of the health care delivery system are discussed further in the following Section, **Major Health Care Facilities**. The programs and services provided to Guam's population within these facilities are addressed in subsequent sections. The Health Systems Taxonomy was used in part to categorize programs and services as follows:

- Health Promotion and Protection Services**
- Prevention and Detection Services**
- Diagnosis and Treatment Services**
- Mental Health Services**
- Chronic Care Services**
- Habilitation and Rehabilitation Services**
- Long-Term Care**

The services are analyzed, where applicable, as to their availability, accessibility, acceptability, quality, continuity, and cost. Service gaps or deficiencies are identified, and goals and objectives to fill the gaps or rectify the deficiencies have been established.

This chapter will also investigate alternate and traditional health care providers. Furthermore, it will examine the different mechanisms through which Guam's health care services and programs are financed. Policy issues pertaining to these payment mechanisms will be discussed extensively in Chapter VI.

### **B. Major Health Care Facilities**

This section is a general overview of major medical facilities and services available to the civilian community. The scope of this inventory is limited to the local government facilities of the Guam Memorial Hospital and the Department of Public Health and Social Services, as well as the major private providers.

#### **(1) Guam Memorial Hospital Authority**

Guam Memorial Hospital (GMH) serves as the sole civilian inpatient medical facility on Guam. It is a 221-bed facility which provides acute and long-term care, including skilled and intermediate nursing care. The hospital offers all customary care and certain specialty services. It is located in Tamuning, which makes it within an hour's travel time from each village.

(a) Facilities

The Guam Memorial Hospital Authority provides services at two distinct facilities in Tamuning. The main and newer facility, formerly the Medical Center of the Marianas, consists of two main structures. One wing houses all administrative offices with the exception of support services, and the other contains all the patient care units. Hospital authorities are carefully considering an expansion of its main campus. Provisions for building an additional floor were made in the original construction plans. The hospital expects to build and use a new floor, in addition to areas within the existing facility that are currently underutilized. Such an expansion will allow for a hospital kitchen, a dining area, a laundry facility, and additional care units within the main campus; it will also include the enclosure of the stairways which currently spiral through the center and rear areas of GMH and are exposed to the elements.

The older facility currently houses the hospital's hemodialysis unit, Skilled Nursing Facility, and the Intermediate Care Facility. In addition, the Department of Mental Health and Substance Abuse as well as the Northern Regional Health Clinic are located there.

(b) Manpower and Services

Guam Memorial Hospital Authority (GMHA) personnel consisted of 685 FTE employees as of April 1985. The medical staff for GMHA are divided into two categories. The first includes a core group of eight (8) FTE physicians: one full-time Medical Director and 20 part-time physicians. The second category consists of the majority of Guam's physicians that have practice and admitting privileges at the hospital. The remainder of the GMHA personnel within the various professional and support services are shown below:

|                                   |     |
|-----------------------------------|-----|
| Nursing                           | 261 |
| Laboratory                        | 35  |
| Pharmacy                          | 17  |
| Therapeutic Services              | 19  |
| Radiologic Technology             | 13  |
| Medical Records                   | 5   |
| Other Health & Technical Services | 12  |
| Dietary                           | 24  |
| Social Services                   | 5   |
| Support Services                  | 266 |

The hospital offers some 26 services, generally on a 24-hour basis. The major ones are:

Primary Inpatient Care  
Surgical Services  
Intermediate Care  
Intensive Care  
Neonatal Care  
Long-Term Care

Laboratory Services  
Electro-diagnostic Services  
X-Ray Services  
CT-Scan Services  
Therapeutic Services  
Renal Dialysis

(Please note that descriptions and utilization of specific services are addressed in various sections that follow in this chapter.)

The table below identifies GMH's services and the corresponding number of beds at the two facilities.

**TABLE 63**

**Guam Memorial Hospital Beds by Service  
as of April 1985**

| Services                             | # of Beds  |
|--------------------------------------|------------|
| Pediatrics                           | 23         |
| Medical/Surgical                     | 70         |
| Obstetrics                           | 26         |
| Gynecology                           | 14         |
| Coronary Care/Intensive<br>Care Unit | 9          |
| Neonatal Intensive Care              | 4          |
| Skilled Nursing                      | 35         |
| Intermediate Care                    | 36         |
| Telemetry                            | 4          |
| <b>TOTAL</b>                         | <b>221</b> |

Source: Medical Records Department, Guam  
Memorial Hospital Authority.

Patient care statistics for the past 3 years are reflected on the following page.

**(c) Hospital Accreditation**

One of the major problems currently facing GMHA is its hospital accreditation status. In 1983 the Joint Commission on Accreditation of Hospitals (JCAH) cited 24 deficiencies found during a survey of the facilities in 1982 and revoked the hospital's accreditation. This raises concern in the quality of services provided, as well as in health care financing. Reimbursement from federal funding sources and various research grants are contingent upon the existence of adequate



facilities and medical care. Federal health officials have, subsequent to 1983, been prompted to make annual inspections to certify that the hospital provides quality services to Medicare, Medicaid, and MCH clients.

**TABLE 64**  
**Patient Care Statistics**  
**Guam Memorial Hospital**  
**Guam: 1982 - 1984**

| Services                   | Y E A R S |        |        |
|----------------------------|-----------|--------|--------|
|                            | 1982      | 1983   | 1984   |
| <b>Acute Care</b>          |           |        |        |
| Total Patients Admitted    | 7,395     | 7,796  | 8,113  |
| Total Patient Days of Care | 32,834    | 36,750 | 35,367 |
| Average Daily Admissions   | 20        | 21     | 22     |
| Average Daily Census       | 90        | 101    | 97     |
| Average Length of Stay     | 4         | 5      | 4      |
| Bed Capacity               | 155       | 155    | 155    |
| Actual Beds Used           | 149       | 149    | 145    |
| <b>Long-Term Care</b>      |           |        |        |
| Total Patient Days of Care | 23,347    | 24,675 | 22,832 |
| Average Daily Census       | 64        | 68     | 62     |
| Bed Capacity               | 72        | 72     | 72     |
| Actual Beds Used           | 72        | 71     | 71     |

Source: Guam Memorial Hospital Authority FY1984 Annual Report.

While the majority of deficiencies are related structural and safety defects, problems of quality in the following services have been identified:

|                                |                      |
|--------------------------------|----------------------|
| emergency patient care         | respiratory care     |
| anesthesia services            | rehabilitation       |
| nuclear medicine               | ambulatory care      |
| pathology & medical laboratory | diabetic services    |
| radiology                      | social work services |
| renal care unit                | special care units   |

GMHA is currently seeking provisional accreditation from JCAH through a resurvey of the hospital that is based on blueprints for facility expansion and certain corrections that have been made toward quality control. A \$5.6 million federal grant that was approved in early 1985 has been earmarked to correct structural and safety deficiencies and to expand hospital facilities. The expansion includes the addition of

a fifth floor, a transfer of the skilled nursing facility and the hemodialysis unit to the main GMH complex, and establishing an in-house kitchen for meal preparation. In addition, the hospital had established and documented an ongoing Quality Assurance Program in 1983 that has focused on resolving existing problems that impact directly or indirectly on patients, and has identified areas with the potential for substantial improvements.

**(d) Hospital Revenues and Collection Efforts**

The hospital derives the majority of its revenues from Medicare, Medicaid, health maintenance organizations (HMOs), health insurers, and self-payers. Unfortunately, one of the main problems of hospital financing has been the collection of these revenues. Reimbursements have generally been slow and may have lagged several months behind actual service or treatment. However, major strides have been made recently in streamlining the billing process. Computerized billing transmittals, an on-line admissions system, and an information retrieval system have helped to improve the overall financial stability of the hospital. As of April 1985, GMHA collected 65 percent or \$7.79 million of the \$11.8 million in bills that were incurred between October 1984 and March 1985. With the continued improvement of billing and financial records through the hospital's new computer system, GMHA officials expect to achieve an 85 percent collection rate.

**TABLE 65**

**Guam Memorial Hospital Authority  
Accounts Receivable Analysis (in millions)  
FY1980 - FY1984**

| Fiscal Year | Accounts Receivable | Collection | Collection Rate |
|-------------|---------------------|------------|-----------------|
| 1982        | \$17.1              | \$ 6.0     | 35%             |
| 1983        | \$18.3              | \$ 7.4     | 40%             |
| 1984        | \$20.5              | \$11.6     | 56%             |

Source: Guam Memorial Hospital Authority.

**(2) Department of Public Health and Social Services**

The mission of the Department of Public Health and Social Services (DPHSS) is to achieve and maintain the highest levels of independence and self-sufficiency in the health and social welfare of Guam's residents. The functions, responsibilities, and authority of the Department are defined by local and federal laws and regulations. Both local and federal monies fund the various diverse programs and services. Except for categorical programs governed by specific eligibility regulations, social and health care services are generally provided to low income individuals and families free of charge.

(a) Facilities

Services are provided at three district health centers. The Northern Regional Health Center is located in Tamuning and services residents in Yigo, Dededo, Harmon, Tumon, Tamuning, and Agana. (This clinic is expected to be replaced by a new center in Dededo as the construction of the new Northern Regional Health Center is completed.) The Central Regional Health Center, in Mangilao, provides medical services to those residing in Barrigada, Mongmong, Toto, Maite, Asan, Piti, Mangilao, and Yona. The third district clinic is the Southern Regional Community Health Center (SRCHC) and is located in Inarajan. The SRCHC offers medical services to residents of Talofofo, Malojloj, Inarajan, Merizo, Umatac, Santa Rita, and Agat. This southern area clinic is funded by a Community Health Grant while the other two clinics operate through DPHSS monies.

(b) Services and Manpower

Specific program services provided at each of the three regional health centers are: Maternal and Child Health, Nutrition and Health Education, Chronic Disease Control, as well as Community Health Nursing. Dental and certain medical support services are available only at the Southern and Central Regional Health Centers. Physician care under the Services for Handicapped Children Program and Communicable Disease Control are available only through the Central Regional Clinic. Home Care program services are available islandwide. (Utilization and description of these services are reflected under appropriate sections of Chapter V.)

Program clinics and services at each regional health center are listed on the following page. Primary care services are offered by physicians and nurse practitioners (NPs) where indicated; other services are provided by various specialized personnel.

Program clinics and health services are scheduled at different times between 8 a.m. and 5 p.m., Monday through Friday with the exception of the Southern Regional Health Center which is open from Tuesday through Saturday.

Utilization data for the programs at the regional centers were unavailable. However, utilization of community nursing services for the past three years is shown below. These figures include clinic services as well as home visits.

**TABLE 67**  
**Community Nursing Service Utilization**  
**FY1982 - 1984**

| Fiscal Year | No. of Patients | No. of Encounters |
|-------------|-----------------|-------------------|
| 1982        | 7,835           | 45,324            |
| 1983        | 6,947           | 38,964            |
| 1984        | 7,497           | 44,970            |

Source: Bureau of Community Health and Nursing Services,  
Department of Public Health and Social Services, Guam.



TABLE 66

**Health Service Programs and Providers,  
Department of Public Health and Social Services, Guam**

| Health Services<br>and Programs | Regional Health Centers |         |          | Types of<br>Provider             |
|---------------------------------|-------------------------|---------|----------|----------------------------------|
|                                 | Northern                | Central | Southern |                                  |
| Women's Health                  | Yes                     | Yes     | Yes      | Physician, NP                    |
| Child Health                    | Yes                     | Yes     | Yes      | Physician, NP                    |
| Youth                           | Yes                     | No      | No       | Physician, NP                    |
| Chronic Disease                 | Yes                     | Yes     | Yes      | Physician                        |
| Communicable Disease            | No                      | Yes     | No       | Physician                        |
| Immunization                    | Yes                     | Yes     | Yes      | RN, LPN                          |
| Services for the Handicapped    | No                      | Yes     | No       | Physician                        |
| Nutrition and Health Education  | Yes                     | Yes     | No       | Nutritionist,<br>Health Educator |
| Pharmacy                        | No                      | Yes     | Yes      | Pharmacist                       |
| Laboratory*                     | No                      | Yes     | Yes      | Lab Technician                   |
| X-Ray                           | No                      | Yes     | Yes      |                                  |
| Dental                          | No                      | Yes     | Yes      | Dentist, EFDA**                  |

\* Laboratory and EKG services available only in Central Regional Health Center.

\*\* Expanded Function Dental Auxilliary.

Source: Department of Public Health and Social Services, Guam.

A total of 512 employee positions were authorized to the Department in FY1985, 151 of which were allocated to the Division of Public Health. The number and type of personnel within the various health professional and support services are shown below.

|                      |    |
|----------------------|----|
| Physicians           | 5  |
| Nurses (NP)          | 4  |
| Nurses (RN)          | 24 |
| Nurses (LPN)         | 7  |
| Nurses (Aides)       | 12 |
| Laboratory           | 10 |
| Health Educators     | 7  |
| Pharmacists          | 3  |
| X-Ray                | 3  |
| Dental Specialists   | 20 |
| Dentists             | 4  |
| Speech Pathologists  | 2  |
| Audiologist          | 1  |
| Audiometrist         | 1  |
| Nutritionists        | 5  |
| Nutrition Assistants | 8  |

The Department of Public Health and Social Services offers a variety of health care services. Unfortunately these services are limited by the Department's organizational and financial problems which complicate the delivery of medical care as well as public assistance. This Plan is primarily concerned with the fragmentation of health care services.

The medical clinics are located in the northern, central, and southern areas. While this provides a semblance of accessibility, the level of care available at the northern and southern clinics is fairly basic. The more specialized services and the majority of medical support services are available only at the central facility. As a result, DPHSS officials are concerned that patients may choose to by-pass their regional clinic and to go directly to the central facility. A comprehensive investigation of services, utilization, and costs must be initiated in an effort to measure the efficiency and effectiveness of the public health facilities.

### **(3) Private Health Care Facilities and Services**

Private sector facilities consist of 17 private clinics and physicians offices that offer a full range of medical services in an ambulatory setting.

#### **(a) Health Maintenance Organizations (HMOs)**

There are currently two federally approved HMOs. One, the Guam Memorial Health Plan and Associates (GMHPA), provides its services through various clinics, group practices, and private physician's offices. The other health maintenance organization, FHP, Inc., has an ambulatory medical center of its own. The total enrollment for these two HMOs was approximately 41,000 as of July 1985.

#### **(b) Medical Clinics and Physician's Offices**

The Seventh Day Adventist Clinic, the Family Medical Clinic, and the International Trade Center (ITC) Clinic provide a full range of medical specialties and ancillary services. The remainder of the private medical facilities are either solo or group practices. Services offered include family practice, obstetric/gynecological care, pediatrics, internal medicine, otalaryngology, urology, dermatology, orthopedics, general surgery, and others.

#### **Conclusion and Recommendations**

Hospital authorities, health professionals, and government officials all agree that having GMH reaccruited is the first of several priorities. The hospital has begun to address the structural deficiencies, and has plans for additional improvements in its facilities and provision of services. In addition GMH officials expect to continue its progress in improving the hospital's financial status which enables not only the expansion of health care services, but also the maintenance of such services.

Efforts to maximize the effectiveness of the regional public health facilities must also be initiated. If, as public health officials suggest, the use of regional health centers is to foster the accessibility of primary care to DPHSS clients who would otherwise have to deal with excessive waiting periods at the central facility, then clients from the northern and southern areas must be discouraged from by-passing their regional centers.

Likewise, it may prove worthwhile to investigate the utilization of services at private sector health facilities. Given the increasing costs of medical services, the island's population may benefit from a government policy that encourages group practices in clinic settings. By consolidating the sites for the delivery of health care, providers can hope to share and thereby reduce personal operating costs; consumers can expect to receive medical care without the runaround between providers at a lesser cost.

#### **C. Health Promotion and Protection**

The central mission of health promotion and protection programs is to encourage each individual to take responsibility for one's own health. As recorded history has shown, the responsibility for one's health was originally placed with the individual. However, as knowledge of the human body and disease mechanisms increased, and as medical practices became more scientific, society became increasingly dependent upon medical intervention and public health measures.

The control of infectious and communicable diseases was left to environmental protection and immunization programs. Advances in polio prevention, antibiotics and drug therapies, as well as breakthroughs in diagnostic and surgical procedures led to more intervention by medical specialists. By 1960, the inpatient facility replaced the home as the setting for medical care, and "health" became equated with "health care" by the policymakers and the public alike.



Except for a flurry of interest in physical fitness that was inspired by President Kennedy, the general public no longer associated individual behavior with health status. Yet changes in lifestyle that accompanied the rise in affluence experienced during the sixties and early seventies have strongly influenced the health habits and health status of Americans. Advertising and marketing campaigns that fostered immediate gratification through alcohol consumption, cigarette smoking, and "fast food" dining were launched without regard to the consequences for health.

The results of these developments are evident in the nation's health statistics published by the Department of Health and Human Services (Promoting Health Preventing Diseases: Objectives for the Nation). Despite the vast increase in health care expenditures and greatly improved access to care for most Americans, the nation's health status with respect to chronic illness, disability, and premature death shows little--if any--improvement. The principal causes of death for people past their middle years are still heart disease, cancer and stroke, followed by accidents.

Deaths from these diseases, however, represent only the tip of the iceberg. For every middle-aged person dying of cirrhosis, there are hundreds of alcoholics or near-alcoholics. For every death caused by heart attack or stroke, hundreds of persons are at risk with uncontrolled atherosclerosis and hypertension. The medical care strategies employed to deal with the above listed conditions consume millions of dollars. In a sense, this is wasted money, since most of the chronic and disabling diseases, as well as many accidents, could have been prevented.

Hence, new perspectives on health and well-being which emphasize health promotion and protection are replacing the traditional emphasis on the treatment of illness. This change has been prompted by the newly acquired knowledge that environment and lifestyles are important determinants of health. It has again become apparent that each individual must bear responsibility for his or her well-being.

Below is a description of recent health education efforts on Guam. In addition, the island's environmental protection services, as well as the highway safety and occupational safety programs are discussed.

#### **(1) Health Education**

The traditional role of health education has been challenged and found to be wanting. In the past, health education was an addendum to the medical care system, primarily aimed at informing the public of the availability and value of the various services, how to recognize symptoms and seek help, or providing individual instruction in the compliance of treatment regimens. Today it has become obvious that major health and social problems such as heart disease, alcoholism and drug addiction, as well as accidents must be resolved through educational strategies leading to individual lifestyle modification and community action, rather than attempting to cure afflicted individuals on a case-by-case basis.

To this effect, the national Consumer Health Task Force has agreed on a single definition for consumer health education which subsumes a set of six activities that:

inform people about health, illness, disability, and ways in which they can improve and protect their own health, including more efficient use of the delivery system;

motivate people to change to more healthful practices;

teach them the necessary skills to adopt and maintain healthful practices and lifestyles;

foster teaching and communication skills in all those engaged in educating consumers about health;

advocate changes in the environment that will facilitate healthful conditions and healthful behavior; and

add to knowledge through research and evaluation concerning the most effective ways of achieving these objectives.

In summary, consumer health education is meant to be a process that informs, motivates, and helps people to adopt and maintain healthy practices and lifestyles. Ideally, it should be a lifelong process that starts in early childhood. It should be provided in school, at the place of work, in every primary health care setting and on a community-wide basis. Such health education should include information on general health maintenance and illness prevention, as well as disease-specific education for anyone with an identified chronic illness or a propensity to such illness. Moreover, health education should also advocate the environmental changes needed to facilitate its program goals, and conducts professional training and research towards the same ends.

On Guam, health education is provided through several mechanisms. This section examines school health education; patient education for persons using a particular health service; community health education for the general public; and education and information provided by Guam's voluntary groups.

#### (a) School Health Education

Children, from the moment of birth, are passive recipients of medical care. However, the child must be allowed to gradually become an active participant and eventually, an aggressive seeker of good health. The schools, as a major social structure, provide an educational setting to foster these goals. No other community setting even approaches the magnitude of the school education enterprise ranging from Kindergarten (k) through grade 12, with its "captive" audience for school health education and the resources available for reaching that audience.

Guam's Department of Education has integrated comprehensive health education into their teaching curriculum for all children, from kindergarten through grade 12. DOE feels that health education should provide students with information and assist them in examining how their attitudes and behavior may harm health. It also supplies students with opportunities to learn how to change these behaviors or to adopt new ones as a means of promoting a healthier life.



The school health curriculum seeks to provide students with a personal learning and growing experience. It outlines concepts and student-oriented performance objectives in a sequential manner for each grade level. These concepts and objectives have been designed to acquaint students with health information and practices that are both personally relevant and interesting. The curriculum for K-through 5 stresses the following subjects:

- Family Life and Sex Education;
- Consumer Health;
- Environmental Health;
- Career Education;
- Mental Health;
- Personal Health and Body Systems;
- Nutrition;
- Disease Control; and
- Substance Abuse.

The curriculum for the middle and high school grades is organized into:

|                         |                        |
|-------------------------|------------------------|
| General Health Concepts | Human Sexuality        |
| Emotional Health        | Consumer Health        |
| Safety & First Aid      | Environmental Health   |
| Disease Control         | Career Education       |
| Substance Abuse         | Traditional Health and |
| Nutrition               | Healing Practices.     |

A component on suicide, which is to be added to this curriculum, is currently being developed in cooperation with staff from the Department of Public Health and Social Services.

At present, the health classes for middle and high school students are only taught at the 6th and 10th grade levels. The remaining middle and high school grades take required science courses instead, which have been expanded to include a section on health. Any efforts to have a full-year health course taught to all middle and high school students must have the approval of the Territorial Board of Education and the DOE administration. The approval must not only include the added curriculum, but the allocation of funding, manpower, and classroom resources as well.

#### (b) Patient Education

A health consumer becomes a patient when she or he recognizes a health problem or a potential problem and turns to a physician, clinic, hospital, or some other component of the health care delivery system for assistance. Patient education refers to the learning process which is generated when a person receives preventive, diagnostic, therapeutic, or rehabilitative treatments or services.

Any contact with a health professional is a learning experience in itself, but this process does not necessarily lead to the improvement of the patient's health. A large proportion of patient education is



done on an informal one-to-one basis by physicians in their own offices, as well as by nurses, therapists, and other health professionals. These providers are usually under severe time constraints and cannot provide either in-depth coverage of the instructional material or follow-up. The quality and content vary widely.

The results of a recent national study of patient compliance with the prescribed therapeutic regimen, presented in The Handbook of Health Education, indicate that a large gap exists between the doctor's prescription and what the patient actually does. The study also suggests that patients may not have received instruction about their disease or that the explanation, when given, was too technical.

Generally, on Guam as in the mainland, a large proportion of health information is given to the patient by physicians in their own offices, by nurses and by therapists. The information is usually provided under limited conditions and therefore neither thorough nor comprehensive. An alternative method of providing patient education is through a formal setting such as organized classes. The primary providers of organized patient education are FHP, a health maintenance organization, the Seventh Day Adventist Clinic (SDA), the Guam Memorial Hospital Authority (GMH), and the Department of Public Health and Social Services (DPHSS).

The FHP Clinic offers individual health care counseling as well as group and individual instructions in the control of diabetes and hypertension; the clinic also holds regular classes for prenatal care, prepared childbirth, and weight control. All the classes are free of charge to FHP members and are available to non-members for a nominal fee. All classes are held at the FHP clinic in Tamuning.

At the SDA Clinic, individual nutritional and lifestyle counseling services are provided to clinic members as requested. Regular prenatal and prepared childbirth classes are scheduled. In addition, aerobics classes to enhance physical fitness and stop-smoking classes have been added to the clinic's health education curriculum.

Patient education at Guam Memorial Hospital is geared toward compliance and maintenance of treatment regimen, and self-care after discharge from the hospital. Instructions for post-partum and post-surgical care, as well as for acute gastroenteritis, diabetes, and cardiac care are tailored to individual needs.

The Department of Public Health and Social Services provides health care education according to the individual patient's needs. Instructions are provided on home nursing care; tuberculosis, leprosy, and sexually transmitted disease control; immunization; nutrition; family planning; prenatal care; infant care; and dental care. Patient education services are available at the regional public health clinics, or are brought to the home of patients by public health personnel.

#### (c) Community Health Education

The main objective of community health education is to foster individual and community awareness about health risk factors and harmful

lifestyles. A second objective is to change lifestyles and to encourage the adoption of behavior patterns that will favorably impact on health status. The programs are geared towards prevention and often promote the concept of self-help.

Community health education is comprised of many aspects: needs assessment studies, community organizations, problem-solving, training, health screening, educational planning, and the dissemination of health information. Such health education programs are geared to specific target population groups, usually those at risk, and are reinforced with media presentations.

Guam's major provider of community health education is the Department of Public Health and Social Services. Various divisions offer information and education, and particular emphasis is placed on family planning, sexually transmitted diseases, immunization, dental health, nutrition, maternal and child health, risk reduction, and sanitation.

The Maternal and Child Health program (MCH) within the Department provides health education services in family planning, breastfeeding, prenatal care, infant care, and nutrition. The program recently augmented its scope to include a teen-parenting pilot project and prepared childbirth classes. The teen-parenting pilot project is an outreach program set up in the schools for pregnant teenagers to assist them in their academic course work and furnish them with services relating to health information and counseling, as well as prenatal care referrals. The local agencies that support this program, in part, are the Department of Education and the University of Guam's Cooperative Extension Service. As for the prepared childbirth classes, each session is intended to provide pregnant women with information and instructions about pregnancy and childbirth.

The DPHSS Health Education Section offers an outreach risk reduction program aimed at the middle and high school population, and the working adults. The program teaches self-evaluation for six lifestyle risk factors:

- Nutrition/Weight Control;
- Smoking;
- Alcohol and Drug Abuse;
- Stress;
- Physical Fitness/Exercise; and
- Accident Prevention and Safety.

In addition, the Health Education Section provides technical assistance to other programs in the Department, schools, and community groups upon request or indication of need. It has also initiated a Health Education Network (HEN) that consists of public and private entities, and representatives from civic groups that are concerned with community health education. The mission of HEN is to serve as a professional support group that enables its members to interact with each other and share resources.

The Cooperative Extension Service (CES) of the University of Guam's College of Agriculture and Life Science (CALS) provides health education on weight reduction, nutrition, food safety, poison safety, food sanitation, and stress management. A telephone referral and information service was created by CES recently. Three-minute "Tele-Tips" on nutrition, childbearing, and other health-related subjects, as well as information on the availability of health services have been produced. CES officials also plan and produce occasional television presentations on community health issues that are aired on KGTF, the local public TV station.

The Office of Highway Safety (OHS), in an attempt to reduce road fatalities, provides community education on traffic-related risk factors. It sponsors the Motor Vehicle Occupant Protection program which encourages people to use seat-belts and child restraints while driving, and discourages the transportation of people in the bed of pick-up truck. It has also helped in initiating the Student Against Drunk Driving (SADD) campaign within the public high schools. Various educational materials, such as pamphlets, slides, and movies are available to any interested group in the community. OHS works in close conjunction with DPHSS and the Guam Police Department.

Several other government agencies offer health education services. The Department of Administration informs all new employees of safety hazards at the work place through a mandatory workshop combined with a media presentation; the Department of Public Safety offers classroom presentations to raise the awareness of traffic accidents among school children; and the Department of Mental Health and Substance Abuse (DMHSA) presents a 3-day workshop, "Facts About Drugs and Alcohol Abuse," on drug and alcohol abuse at the request of Government of Guam departments and agencies, as well as public and private organizations.

Guam's two health maintenance organizations (HMOs), FHP and Guam Memorial Health Plan (GMHP) are active participants in community health education efforts. They have sponsored and participated in activities which promote good health through physical fitness, anti-smoking campaigns, and health screening events.

#### (d) Community Health Education by Voluntary Groups

Voluntary civic groups are community resources with an increasing beneficial impact on health awareness and health education. The American Red Cross provides instructions on methods to prevent accidents, promote individual well-being, save human lives, and prevent or reduce human suffering. The Red Cross offers courses in First Aid and Cardio-Pulmonary Resuscitation (CPR). Nursing and health classes provide instructions in prepared childbirth, good grooming, and custodial care for the elderly and the handicapped. Additional classes include water safety (swimming) and boating safety. Courses vary in degree of difficulty so that they are applicable for everyone from homemakers, businessmen, and school children, to specific groups, such as families of cardiac patients, ambulance attendants, and rescue workers. Classes are scheduled on demand.



The Guam Heart Association disseminates information on the correlation between certain behavioral factors and certain health status problems. Posters and pamphlets illustrating the adverse effects that smoking, nutritional habits, stress, and the lack of exercise have on health are available to interested parties. In addition, the Association offers four levels of instructions on CPR techniques: Heart Saver, Basic Cardiac Life Support (BCLS), BCLS Instructor Classes, and Advanced Cardiac Life Support for health providers. These classes are available to the public and to health providers. The Association is also involved in blood pressure screening programs as a member of the Guam High Blood Pressure Council. (Other members of the High Blood Pressure Council are the American Red Cross, the Kiwanis Club, the Rotary Club, and DPHSS.)

The American Cancer Society (Guam Chapter), provides concrete assistance through their service and rehabilitation program, as well as public education to Guam's population. Literature, films, and speakers are provided free-of-charge for both adult and youth audiences. The focus of these activities is reducing cancer risks and encouraging early detection. A unique computerized "Cancer Quiz" has been a highly successful program to assess an individual's risk of developing certain types of cancer. In addition, the local chapter coordinates the annual "Great American Smoke-Out" which is intended to increase community awareness about cancer as well as the yearly Carole Kai Bed Race that is a major fund-raising event for the local community. The American Cancer Society also sponsors life-saving media messages on cancer risks and early detection.

Other civic groups offer community education and services through their respective programs. The Guam Diabetes Association provides counseling and nutrition information to newly diagnosed diabetics and support to patients and their families through monthly meetings. The Guam Ostomy Association supports ostomy patients and teaches them self-care so that they might continue to lead a normal and productive life. The Lytico and Bodig Association provides needed medical equipment and supplies to patients, and informs and educates the patients and their families about the progress of the disease and the care for the patients. In addition, the Guam Epilepsy Foundation offers support for epileptics and provides information as to drug and treatment regimens.

These voluntary groups participate either jointly or as a single unit in Health Fairs and in the Guam World Health Day activities. They also collaborate their efforts for the Great American Smokeout held each year in November. Accordingly, the educational efforts of the above voluntary groups have made an invaluable contribution to Guam's health awareness and illness prevention efforts, particularly since they often enhance and complement health education activities of Guam's public and private health care system.

#### **Conclusion and Recommendations**

It is clear that a major reorientation effort towards promoting health and preventing disease is needed on Guam, and that health education is the vehicle

by which such reorientation will most likely be accomplished. Unfortunately, Guam's health education efforts and resources are fragmented and sporadic, and need to be coordinated in order to achieve the desired impact. Health education is provided by diverse organizations, that have similar purposes and target groups, but lack mutual goals and coordination. Furthermore, health education efforts have not received a sufficiently high priority for funding allocation. Both the coordination of health education activities and the funding for such activities must be well established if health education is expected to succeed.

**GOAL 1: PLACE HEALTH PROMOTION AND THE PREVENTION OF DISEASE AMONG THE TOP PRIORITIES OF GUAM'S HEALTH CARE SYSTEM.**

Target Population: All Guam inhabitants.

**OBJECTIVE 1.1.:** Increase the efforts of the Department of Public Health and Social Services to Coordinate health education in the community and target populations-at-risk.

**OBJECTIVE 1.2.:** Encourage public and private health providers and organizations to develop comprehensive programs which promote wellness.

**OBJECTIVE 1.3.:** Encourage Department of Education to identify alternatives to implementing health education in the School Health Curriculum throughout grades K-12.

**OBJECTIVE 1.4.:** Allocate sufficient financial resources to the DPHSS Health Education Section to take the lead in community health education efforts.

**(2) Environmental Protection Services**

The focus of environmental health planning is the improvement of those factors in human surroundings which may have adverse effect on one's physical development, health, and survival. Minimizing environmental threats, such as water, air, and noise pollution, as well as hazards of unsafe residential environs, may be a more effective approach to attaining certain health status goals than treatment of diseases caused or exacerbated by the environment.

Guam's high incidence of certain diseases, such as shigellosis and salmonellosis may be significantly lowered through the provision of proper sewage disposal and safe water supplies. (See Chapter III, Health Status) Maintaining a high level of environmental quality is of particular concern on an island with only 212 square miles of land, surrounded by ocean. Guam's land, water, and air must serve as repositories for wastes generated by activities of its residents. Prominent local concerns that are addressed in this section include: water supply and protection; waste management; air quality management; as well as pesticide control and vector control.



#### (a) Water Supply and Protection

Island residents have long recognized the importance of a safe, adequate source of water to the sustenance of life and to the development and growth of the island. While pre-war water supplies from surface sources and a few wells were adequate for subsistence and the small military population, Guam's rapid growth, particularly since 1962, placed increasing demands on water resources.

Today, Guam's water supply system is a composite of several ground and surface sources, treatment facilities, and a network of distribution pipelines operated and maintained by the Public Utilities Agency of Guam (PUAG), the Navy, and the Air Force.

Guam residents are fortunate to have an abundant supply of high quality water. Groundwater resources beneath Northern Guam, which supply approximately 40 percent of the island's potable water, are generally free of pollutants and require no treatment other than chlorination. The Northern Guam Lens Study, which was undertaken to determine the amount of water and most effective methods of groundwater extraction, estimated the sustainable yield at 59 million gallons per day (mgd). An additional 42 mgd can be pumped from the northern aquifer without drawing saltwater into the supply. However, residents must be made aware that this water is a finite resource and must be conserved for future generations.

Although the island has an ample supply of groundwater, severe water shortages are experienced in southern villages during Guam's dry season due to dwindling southern sources and the inadequate transmission and storage of transported northern supplies. The Guam Environmental Protection Agency's (GEPA) Southern Guam Water Development Program efforts are directed toward exploring additional sources of water for this part of the island.

##### (i) Water Pollution Control

The need for protection of our water supply cannot be over-emphasized. Once an underground water supply becomes contaminated, it is virtually impossible to purify. Diseases would be widespread as our water distribution system would serve as routes through which harmful bacteria, viruses, and pollutants reach the island's population.

Although Guam's groundwater is of high quality, there are several ways that unregulated development on or near aquifers can unfavorably affect the resource. Covering recharge areas with relatively impervious surfaces and sealing them from percolation decreases recharge of the supply. Overpumping of groundwater can result in saline pollution of freshwater. Certain land use practices such as the location of septic tanks or cesspools on or below the water table, land disposal of wastes, and agricultural activities involving concentrated fertilizer, pesticides, or animal wastes, all increase the risk of bacteria and other harmful substances entering the aquifer.



The greatest potential threat to the quality of Guam's groundwater supplies are the millions of gallons of improperly treated sewage from over 8,500 people residing directly over the lens. Commercial swine and poultry operations constitute the largest source of livestock waste in the northern area, which can increase the concentration of nitrogen in the groundwater. Although not a problem at this time, the use of toxic, highly residual pesticides represents a potential hazard because of the thin soil cover and porous characteristics of the northern limestone. With proper controls, however, the island's critical water source can be protected.

In efforts to protect this critical resource, the Guam Environmental Protection Agency has established various standards, rules and regulations through its Monitoring, Wastewater Treatment, and Safe Drinking Water Programs. Diligent enforcement of these regulations must continue. These efforts must be augmented by aggressive enforcement of zoning and subdivision laws by the Department of Public Works and the Department of Land Management.

#### (ii) Water Quality Monitoring

The key to safe drinking water involves sound standard operating procedures, frequent monitoring, and the prompt use of standard disinfection procedures. All potable water from wells and various points in the distribution system, is monitored by the suppliers (PUAG, the Navy, and the Air Force) with GEPA providing a check on sampling and analytical methods. When bacterial contamination of a line occurs, GEPA advises the public to boil their water and PUAG disinfects lines with chlorine. Drinking water contamination has been detected in Umatac and Merizo, on occasion, possibly due to improperly working chlorinators and inadequate holding tanks. Within 24 hours, PUAG can disinfect the waterlines, and the villagers can resume use of the lines.

Because contaminated reefs and beaches can be sources of numerous diseases, GEPA periodically tests the quality of coastal waters. Samples are collected from a network of 29 marine off-shore stations, rivers, drainage basins, and recreational areas. Certain coastal areas show a high level of pollution: Umatac, Asan, and Pago river mouths. Coastal waters with high levels of fecal coliform bacteria throughout the year include: Agat Beach, Dungca's Beach, Santos Memorial Park, War Memorial Park, and the Agana Storm Drain areas. Studies over the past several years indicate that bacterial pollution of surface waters is caused primarily by land use practices along rivers and storm drains. Farming and animal husbandry are more often responsible for pollution than are human wastes. Contamination of beaches near river mouths and drain outlets generally increase during the rainy season and decrease during the dry season.

## (b) Waste Management

### (i) Wastewater

Responsibility for management of the island's wastewater is shared by the Guam Environmental Protection Agency and the Public Utility Agency of Guam. GEPA is charged with planning for wastewater facilities, administration of sewer construction grants, and the enforcement of permits regulating point and non-point sources of water pollution. Responsibility for the operation and maintenance of Guam's wastewater treatment plants rests with PUAG.

While many positive steps have been taken toward the elimination of raw sewage discharges through the planning, design and construction of major wastewater facilities, funding continues to be a major obstacle in wastewater management. Additional pumps and collector lines are still required for optimal operation of the system. The Northern District Plant remains underutilized as sewage from the island's most heavily populated residential and tourist areas continues to be pumped into the Agana Wastewater Treatment Plant. The sewage is generally quite septic because of the extra distance and time required to reach the central area of the island. Since construction grants for improving the wastewater treatment system are not as readily available as in the past, officials are concerned with finding alternative resources.

In the interest of protecting Guam's groundwater supplies, major emphasis must be placed on encouraging residents to utilize existing sewer systems. An estimated 20 percent of the population continue to utilize septic tanks, and less than half with access to public sewers are connected. Generally, villages with recently constructed sewage systems reflect low hook-up rates. More connections are anticipated as the 5-year grace period for hook-up ends. Cost, however, may be the primary reason for low hook-up rates. Residents must pay an average of \$2,000 for sewer connections and low-interest loans previously offered through the PUAG Loan Program are no longer available due to lack of funding. Hence, finding resources to enable a reactivation of the program would assist in protecting the quality of island groundwater resources.

### (ii) Solid Waste

Guam's growing population and its increasing demands for newer transportation, a wider variety of foods and consumer products, as well as better housing have resulted in the generation of 50,000 tons of solid waste per year. It is estimated that each person on Guam produces 2.5 pounds of trash per day, or nearly half a ton of trash per year.

The management of this waste is a major environmental concern with profound public health implications. Solid wastes serve

as breeding grounds for rats, roaches, and other vectors. Improper disposal and storage of certain types of waste can contribute to the degradation of the quality of surface and groundwater resources. Odors and other forms of air pollution stem from garbage, trash, and other discarded materials.

While Guam's unique location, far from most industrial development and world population centers, helps in preserving the quality of island water and air resources, it presents difficulties for the Department of Public Works (DPW) and the Guam Environmental Protection Agency in their management of solid waste. The Ordot Landfill, the only civilian solid waste disposal site, is expected to be filled to capacity within 2 years. High infrastructure costs for proper expansion of the landfill are prohibitive. To help reduce the bulk of solid wastes and expand the life of the existing landfill, plans for an energy recovery incinerator are underway. GEPA officials estimate that this alternative would reduce the volume of waste by up to 90 percent and generate at least 50 percent of the island's electricity needs. With the eventual filling of the Ordot dump, an additional landfill will be required. Approximately 20 acres in Asan have been identified for landfill purposes. The availability of funds for both alternatives, however, remain obstacles toward implementation.

Although some improvement has been made in cleaning up unsanitary dumping sites throughout the island, illegal dumping remains a major environmental concern. The situation is aggravated by DPW's reduction of garbage collection from twice a week to weekly pick-ups. Various approaches to the problem have included provision of solid waste transfer stations, the adoption of more stringent fines for littering, and enactment of laws requiring the use of recyclable aluminum cans for beverages. More aggressive enforcement of Guam's litter laws and increased education for the public on health hazards of improperly disposed waste must be pursued.

#### (ii) Toxic Waste

In 1984 approximately 148 tons of hazardous wastes were produced on Guam. Because Guam does not have a hazardous waste disposal site, all toxic wastes are temporarily stored on-island until shipped to an approved site on the mainland. The anticipated construction of a central hazardous waste transfer facility will help to ensure the safe, short-term storage, and removal of these wastes. Given Guam's limited land area and its sensitive environment, GEPA officials do not foresee the opening of a toxic waste disposal site on-island.

#### (iii) Nuclear Waste

While not currently a problem, nuclear dumping has the potential for serious environmental and public health concerns. Several years ago, the Japanese government announced its plans to dispose

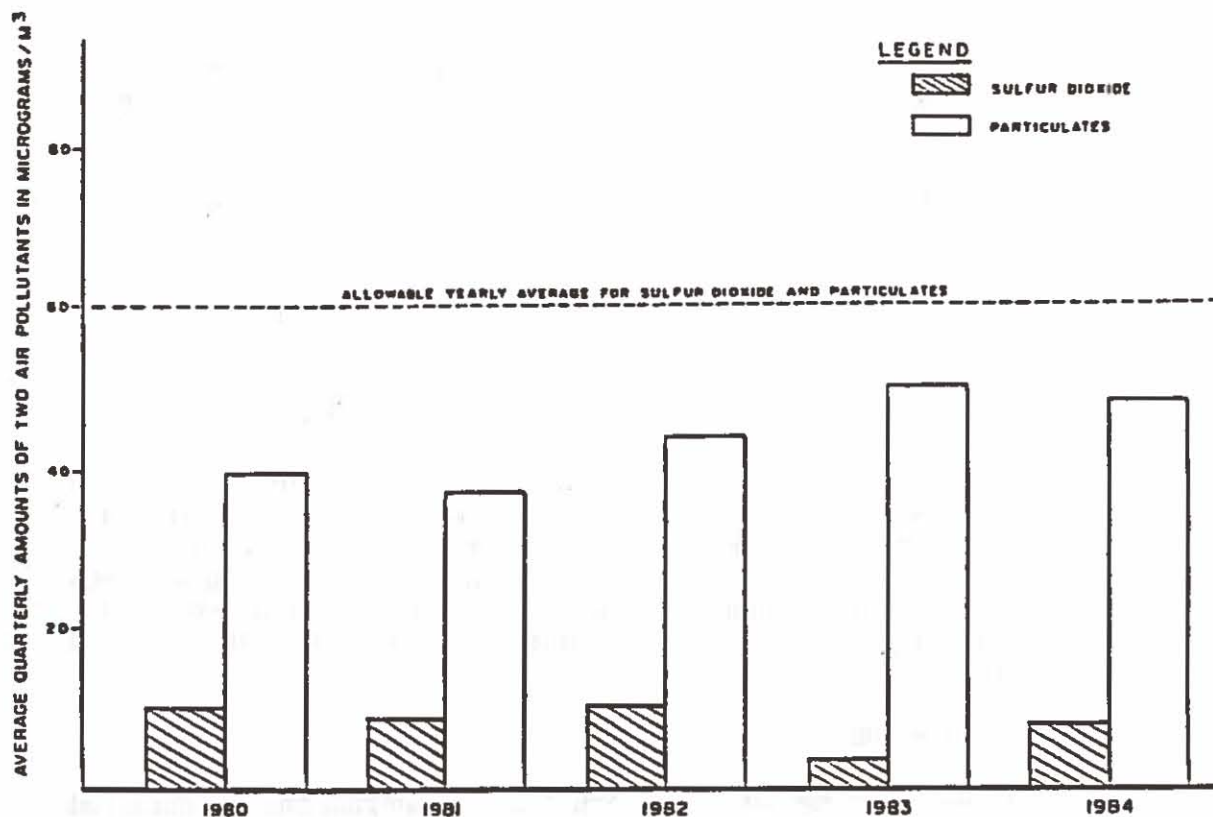


of 460,000 drums of low level nuclear waste into the Pacific Ocean, north of the Mariana Islands. Efforts to halt the proposed dumping spread throughout the Pacific region and have culminated in a temporary moratorium on all nuclear dumping worldwide. Pacific island representatives, including those from Guam, are in the process of drafting a treaty to prohibit the storage and dumping of radioactive wastes and possibly, the testing of nuclear devices in the region.

(c) Air Pollution Control

Air pollution is defined as the presence of contaminants in the atmosphere in such quantity and duration to be injurious to health or to unreasonably interfere with the enjoyment of life or property. Specific pollutants and episodes of atmospheric emissions have been proven to be contributing factors in respiratory ailments such as emphysema, chronic bronchitis, and lung cancer. Eye irritations have been caused by various particles, and certain pollutants, such as carbon monoxide, can interfere with oxygen reaching vital organs, such as the brain and heart.

FIGURE 15  
AIR QUALITY TRENDS  
GUAM: 1980 - 1984



Source: 1984 Annual Report, Guam Environmental Protection Agency.

Responsibility for air quality management rests with the Guam Environmental Protection Agency. The Air Pollution Control Standards and Regulations enforced by the agency require a permit for existing or proposed stationary sources of air pollution. Open Burning Permits are issued by both GEPA and the Fire Department. Inspections are conducted to ensure smoke emissions of less than 20 percent opacity from motor vehicles. Sampling stations are regularly monitored to provide baseline information and long-term air quality data.

Guam's air quality is superior to that of most U.S. cities. The lack of heavy industry and intensive urban development coupled with the almost constant tradewinds have helped to keep Guam's air quality high. Although dust, smoke from open burning, and emissions from power plants and motor vehicles have from time to time threatened the quality of Guam's air, these sources have been managed to minimize impact. Guam's air quality has remained better than national standards during the previous years. (See Figure 15.) With continued monitoring and enforcement of regulations, the island's air quality should remain high.

#### (d) Pesticide Control

The Guam Environmental Protection Agency's Pesticide Control Program is charged with safeguarding the community from environmental risks and health hazards caused by pesticide overuse or misuse which might lead to disease, injury, or loss of life and property. One major concern of the program is the control of dangerous residual pesticides which could contaminate Guam's drinking water supply and arable land.

In recent years, the need and concern for safe pesticide use has become more pressing because of the island's growing population. With a rising demand by homeowners, agriculture, and industry, the pattern of pesticide usage on Guam has increased tremendously. Many of the pesticides available today are toxic to both man and the environment; several of them are persistent and residual in nature and, consequently, do not break down into non-toxic waste materials.

The Pesticide Control Program provides a multitude of services to the community in joint cooperation with federal and local agencies. For example, GEPA is working with the College of Agriculture to conduct a Comprehensive Certification Training Course for pesticide applicators. Additionally, the agency has on-going coordination with the Division of Customs and Quarantine regarding procedures for the importation of pesticides and devices from foreign countries. The Agency has implemented reporting procedures on pesticide usage by conducting pesticide dealers licensing workshops. The inventory and disposal of surplus pesticides continues to be a top priority. Any accident or illness caused by pesticides are being reported by the Guam Memorial Hospital Authority, public and private clinics, as well as the Naval Hospital and other military clinics on Guam to GEPA.

The Pesticide Control Program has also maintained an active enforcement program of pesticide inspection, complaint investigation, and surveillance. Thus, GEPA is responsible for administering and

enforcing Public Law 14-22, the Guam Pesticides Act, and subsequent regulations. In addition, GEPA has entered into a cooperative agreement with the federal EPA for the purpose of regulating pesticides under the federal provisions (FIFRA).

(e) Vector Control

Vector control on Guam is the responsibility of the Bureau of Environmental Health in the Department of Public Health and Social Services. The vector control program includes:

Inspections, surveillance and investigations of mosquitoes, rodents, and other vector harborers.

Biological or chemical elimination of disease carrying vectors and other insects.

Special rodent control programs in private as well as public sectors of the community.

Evaluation and inspection of all ports of entry in accordance with international health regulations.

Issuance of deratting certificates to commercial ships in accordance with international health regulations.

Vector control also attempts to manage a common nuisance encountered by all island residents: a proliferation of stray dogs. In addition to the inconvenience of overturned garbage cans and scattered garbage, the island residents are at risk of getting bitten by these stray dogs. Furthermore, stray dogs are a motor vehicle safety hazard as evidenced by roadways frequently littered with the carcasses of stray dogs hit accidentally by cars or motorbikes. During fiscal year 1983-1984, there were 4,366 stray or unwanted dogs impounded; 4,014 of those were destroyed. An additional 1,288 dog carcasses were collected from the island's roadways.

**Conclusion and Recommendations**

Maintaining a high level of environmental quality is important to the health of island residents. While Guam's unique geographic location, far from most industrial and world population centers, helps in preserving the quality of its air, it presents difficulty in the management of solid waste. Major environmental concerns also include the protection of the high quality of groundwater through proper management.

**GOAL 1: ENSURE THAT THE QUANTITY AND QUALITY OF GUAM'S WATER SUPPLY ARE MAINTAINED AT LEVELS THAT WILL NOT JEOPARDIZE THE HEALTH AND WELL-BEING OF THE ISLAND RESIDENTS.**

Target Population: All island residents.



**OBJECTIVE 1.1.:** Pursue aquifer yield and ground water management strategies set forth in the Guam Environmental Protection Agency's Northern Guam Lens Study.

**OBJECTIVE 1.2.:** Encourage the Guam Environmental Protection Agency and the Public Utilities Agency of Guam (PUAG) to coordinate efforts toward the survey and development of productive water sources for southern Guam.

**OBJECTIVE 1.3.:** Continue diligent monitoring and enforcement of Guam's water protection rules and regulations set by the Guam Environmental Protection Agency.

**GOAL 2:** **ENSURE ACCEPTABLE AND EFFECTIVE CONTROL AND MANAGEMENT OF SOLID WASTE COLLECTION AND DISPOSAL ON GUAM IN A MANNER THAT WILL PROTECT THE PUBLIC'S HEALTH, SAFETY, AND WELL-BEING.**

**OBJECTIVE 2.1.:** Provide sanitary as well as economically and environmentally sound solid waste storage, collection, processing and disposal facilities and services.

Recommended Action 2.1.1.: Encourage the Guam Environmental Protection Agency and the Department of Public Works to continue monitoring Ordot dump operations to ensure maximum utilization of the landfill.

Recommended Action 2.1.2.: Urge the Department of Public Works to increase the frequency of garbage collection.

Recommended Action 2.1.3.: Encourage the Guam Environmental Protection Agency to continue its efforts toward timely implementation of plans for an energy-recovery incinerator.

Recommended Action 2.1.4.: Urge the Guam Environmental Protection Agency to aggressively enforce litter regulations and solid waste disposal.

### **(3) Highway Safety**

Before World War II, Guam had few private motor vehicles. The common mode of transportation was a wagon or cart pulled by carabao, oxen, or bulls. This changed rapidly after World War II.

The rise of population, particularly the influx of U.S. military personnel, resulted in a rapidly increasing number of car/owners. In 1964, approximately 20,000 motor vehicles were registered on Guam; in 1984, 20 years later, 80,000 cars were registered to a population of 118,344 people. Yet Guam's highway system has not changed appreciatively from

the days when the Navy put down the first paved highways. For Guam's population of people and the number of vehicles, 141 miles of primary roads and 336 miles of local roadways are available. Of these roads, 254 linear miles are paved.

Apart from the school buses, Guam has at present no public transportation system, which necessitates car ownership by just about every employed person in order to go to work. This accounts for the traffic congestion on the island roads, particularly in the early morning and evening hours during the weekdays, and on weekends in the business-districts of Agana and Tamuning. It also accounts for the comparatively high number of motor vehicle accidents occurring each year on the island. During the last 5 years, 106 persons were killed on Guam's roads, at an average annual rate of 21 persons or 0.24 per 1,000 population.

This average yearly rate translates to 4.44 deaths per 100 miles of roadway. Compared to the 1981 U.S. motor vehicle deaths of 1.28 per 100 miles of roadway Guam's rate is 3.5 times, or 247 percent higher than the U.S. rate.

A further problem contributing to road accidents and fatalities is the extreme slickness of the roads when they are wet. This is due to the crushed coral used as aggregate in the pavement, which polishes to a smooth surface over time.

The Highway Division of Guam's Department of Public Works has experimented over the last 2 years with different kinds of skid-proof surfacing on sharp curves and steep grades to eliminate traffic accidents in rainy weather. So far, these experimental patches of road have met with enthusiasm by Guam's drivers and additional island-wide surfacing is being contemplated.

A major highway improvement project is planned for the island. A \$30 million general bond issue has been proposed to eliminate the major risk conditions on Guam's highways. The planned improvements include the widening and paving of inadequately designed two-lane roads and the reconstruction of dangerous intersections. Bike paths and sidewalks are being planned in the Tumon Beach area and the business district to facilitate tourist traffic and prevent pedestrian accidents.

#### **(4) Occupational Health and Safety**

Ensuring safety and health protection at places of employment is primarily a responsibility of the federal government. In most cases, however, this responsibility is administered through a state agency. On Guam, the local Department of Labor, has been delegated the authority to enforce the standards of the U.S. Occupational Safety and Health Act in the recognition, prevention, and control of occupational health hazards and illnesses, as well as to promote the physical and mental well-being of employees.

The OSHA Division, through the Bureau of Labor Statistics, collects data on occupational injury and illness. The Division is also charged with the administration's enforcement and voluntary programs, and provides on-site consultation on occupational safety and hazards at the work place.

(a) Occupational Injury and Illness

The Bureau of Labor Statistics of the Guam Department of Labor conducts an annual survey of occupational injuries and illnesses in conjunction with the U.S. Department of Labor's Bureau of Labor Statistics. Information obtained from the survey is based on records that employers must maintain under the Occupational Safety and Health Act of 1970 (Public Law 91-596).

The annual survey includes all employers, including the local government, with one or more employees in the following categories:

Construction  
Manufacturing  
Transportation and Public Utilities  
Wholesale and Retail Trade  
Finance, Insurance, and Real Estate  
Services  
Local Government

**TABLE 68**  
**Occupational Injury and Illness**  
**Incidence Rates Per 100 Employees By Industry**  
**Guam and U.S.: 1980 - 1983\***

| Industry                  | U.S. | Guam |      |
|---------------------------|------|------|------|
|                           | 1980 | 1980 | 1983 |
| Private Sector            | 8.7  | 3.3  | 2.7  |
| Construction              | 15.7 | 7.5  | 7.6  |
| Manufacturing             | 12.2 | 4.6  | 3.2  |
| Transportation & Public   |      |      |      |
| Utilities                 | 9.4  | 3.4  | 2.0  |
| Wholesale & Retail Trade  | 7.4  | 2.1  | 1.9  |
| Finance, Insurance, &     |      |      |      |
| Real Estate               | 2.0  | 0.1  | 0.5  |
| Services                  | 5.2  | 2.9  | 2.7  |
| Public Sector - State and |      |      |      |
| Local Government          | N.A. | 1.8  | 1.8  |

\*U.S. figures for 1983 are not available; Guam figures for 1983 are taken from Draft report of Guam's Department of Labor.

Source: Statistical Abstract of the United States: 1984;  
Occupational Injuries and Illnesses Survey, Guam, 1980;  
Draft Occupational Injury and Illness Survey, Guam, 1983.

Table 68 summarizes the incidence rates of occupational injuries and illnesses recorded on Guam and in the United States. The statistics show that in each industry for which there is comparable data, the



rate of occupational injury and illness on Guam is much lower than the rate experienced in the mainland. Local OSHA officials suggest that a successful enforcement program and employer cooperation are major factors in the low incidence of occupational injuries and illnesses on Guam.

**(b) OSHA Enforcement Program**

During fiscal year 1984, OSHA officials made 154 enforcement inspections. At that time 115 citations were issued to establishments not complying with safety and health standards, and penalty payments were collected. Officials also conducted 45 survey visitations of facilities housing temporary alien workers. Another 33 related visits were made as prerequisites to new and extended petitions prior to importing or extending alien workers.

**(c) OSHA On-Site Consultation**

In addition to its enforcement activities, the Guam Department of Labor offers on-site consultation to employers to help them to provide a hazard-free working environment. These consultations are designed to encourage employers to voluntarily comply with occupational safety and health standards. Under no threat of penalty to the proprietor, OSHA consultants are permitted to inspect and identify all immediate and potential hazards to employers.

In fiscal year 1984, 262 on-site consultation visits were made. OSHA officials spent an average of 6 hours per consultation. Overall, 572 hazards were discovered, and subsequently joint efforts between the employers and the OSHA consultants placed 1,970 employees in safer working conditions.

**Conclusion and Recommendations**

The overall interest in prevention and in environmental health demands a sharp focus on the workplace. The workplace is where people spend a large part of their lives and where some of the more serious health hazards are concentrated. Passage of the federal Occupational Health and Safety Act (OSHA) in 1970 has helped to direct attention to this area in recent years. Locally, Guam's OSHA Enforcement Program and OSHA Onsite Consultation Program have done much to eliminate hazards and to provide safer working conditions for the island's employees.

**GOAL 1:**           **ENABLE THE WORKING POPULATION ON THE ISLAND OF GUAM TO OPERATE IN WORKING ENVIRONMENTS THAT ARE HAZARD-FREE AND POSE MINIMUM RISKS TO THEIR HEALTH AND SAFETY.**

Target Population: All employed Guam residents.

**OBJECTIVE 1.1.:** Reduce the incidence of occupational injury and illness caused by unsafe and unhealthy working conditions to a lower than present level.

**OBJECTIVE 1.2.:** Inform and educate all workers of hazards in the workplace that may be injurious to their health.

#### **D. Prevention and Detection Services**

Prevention and detection services are intended to promote the optimum physical and mental well-being of the individual and the community. They prevent the development of disease and illness, or identify disease and illness at the pre-symptomatic or early stage when timely intervention is possible. This section addresses immunization, communicable disease control, and community screening programs.

##### **(1) Immunization**

Immunization is one of the primary preventive health measures. It involves protection against disease through the injection of a vaccine into the body. Active immunization of infants and children has provided the most effective means of preventing the infectious childhood diseases of diphtheria, pertussis, tetanus, polio, measles, mumps, and rubella. While these major childhood diseases can in some cases cause permanent disability or death, all can be prevented through immunization.

The Communicable Disease Control Unit of the Department of Public Health and Social Services is charged with the responsibility of monitoring immunization activities. The Unit also provides immunization services to children who do not have a primary physician, as well as to the population in the face of an epidemic, or possible pandemic, as might be the case with influenza.

The CDC immunization program has been very successful in controlling the childhood diseases. The immunization levels of children entering day care, headstart, kindergarten, and first grade are 98 percent, three percentage points above the national goal for the year 1990.

Guam has not experienced any cases of diphtheria, pertussis, or polio in the last 10 years, and only five cases of tetanus have been reported. Mumps, measles, and german measles were well controlled in the same period. However, in 1984 a sharp increase in mumps, from 2 to 13 cases, and an epidemic rise in measles from 3 to 104 cases occurred.

The collected incidence data indicates that many of the measles victims were older school children and young adults. It was established that the measles case was "imported" by a student at one of the high schools and that the rapid spread of the disease was attributed to the following:

- (a) Some of the immigrant children came from foreign countries where measles vaccination is not mandatory.
- (b) In the early days when the measles vaccine was made available, U.S. children were not required to be inoculated.



(c) Some vaccines used before 1968 may not have been as effective as the newer ones. Furthermore, children were originally immunized before 12 months of age and therefore may have been less protected than those children presently being immunized at 15 months.

(d) Since no vaccine is 100 percent effective, 5 to 10 percent of vaccinated children may develop measles in spite of being inoculated.

Vigorous monitoring by the CDC Unit and the Department of Education has led to the identification of those children (many of them immigrants) with incomplete immunization records, and the subsequent vaccination of these children prior to the beginning of each new school year. During the last year, the Communicable Disease Control Unit monitored 29,800 immunizations. This was done in close cooperation with the DPHSS Maternal and Child Health clinics, private pediatricians and family practitioners, military base clinics, the Department of Education, the Guam Community College, and the University of Guam in order to maintain or even improve the present high level of immunity against childhood diseases.

In addition to the series of childhood vaccines, influenza immunization is provided for a nominal fee at the Department of Public Health and Social Services. The immunizations are generally offered to the high-risk population (the very young, the elderly and frail, and those with existing medical conditions) whenever a new strain of flu virus is expected. However, anyone might receive such a vaccination upon request.

#### **Conclusion and Recommendations**

Due to the efforts of the CDC Unit, Guam's children have a higher level of immunization upon entering school than is found in the continental U.S.A. However, vigilance must be maintained in guarding against "imported" childhood diseases, particularly german measles, measles, and mumps, from countries where such immunization is not mandatory or effectively enforced.

**GOAL 1:               REDUCE CHILDHOOD IMMUNIZABLE DISEASES TO LESS THAN 15/100,000 BY DECEMBER 1986.**

Target Population: All school-age children on Guam, and young adults.

**OBJECTIVE 1.1.:** Maintain at least the present high level (95%+) of immunization for all entrants to nursery, schools, Headstart programs, kindergarten, and first grade.

#### **(2) Communicable Disease Control**

The DPHSS Communicable Disease Control Unit provides detection, diagnosis, and treatment services for the communicable diseases of tuberculosis, Hansen's disease (leprosy), hepatitis, cholera, dengue fever, and the sexually transmitted diseases (STDs). The Unit is also charged with surveillance and outbreak control of these diseases.



Each of the Unit's program is well-established and fairly comprehensive. Unfortunately the number of patients seeking care at the CDC Unit exceeds available funding resources. Funding for necessary off-site laboratory and x-ray testing as well as for maintenance of vehicles used in field inspections is limited, and ultimately diminishes the efficiency of the Unit. While the discussion below does not include financial resources, the constraints must be considered in any event.

(a) Tuberculosis

The incidence and prevalence of tuberculosis on Guam has been steadily and significantly declining. Yet in 1984, Guam's rates were still twice those of Hawaii and more than four times higher than those in the U.S.

The high TB rates on Guam are due in part to a large immigrant and alien labor population that is not required to be screened for communicable diseases upon entering Guam. In FY1983-1984 alone, the local Immigration Clinic saw 347 persons, 17 of whom were in the Class A Waiver Category (known active TB at the time of immigration), and 115 of whom were Class B Waiver cases (known inactive TB). In addition to those identified in the Immigration Clinic, 851 patient contacts were recorded in the TB Clinic; 68 new active cases and 9 reactivated cases were reported.

The lack of a mandate for health screening in conjunction with immigration procedures makes the treatment and surveillance of TB cases on Guam complex, and often taxes the ingenuity of the CDC Unit. The Unit's activities must focus on screening and treatment as well as surveillance and control.

(i) Screening, Diagnosis, and Treatment

Tuberculosis patients are identified through routine screening for TB; through physical exams for employment or school entrance; and through the Immigration Clinic when an immigrant or alien worker suspected of or known to have TB enters the island. Patients are referred to the TB Clinic for definite diagnosis. Tests include the tuberculin skin test, a chest x-ray, sputum smear and culture exams, as well as a thorough medical examination.

The physician's subsequent diagnosis is classified as either active pulmonary tuberculosis (PTB), active extra-pulmonary tuberculosis (XTB), inactive pulmonary tuberculosis (IPT), or positive reactors and converters (i.e., patients with a positive PPD but no sign of active disease). Treatment varies with the diagnosis, but those with an active form of TB are generally put on a year-long, 2-drug therapy that includes Isoniazid (INH) and Rifampin (RMP). Patients who exhibit an inactive form of the disease are placed on similar treatment regimens only if there is no history of previous treatment or a history of incomplete treatment.

Occasionally a client will not, or cannot for whatever reason, comply with the treatment regimen. For these cases the CDC Unit has initiated "directly observed therapy." The patient is

brought to the TB clinic for medication, or a nurse visits the patient at home to administer the medication. Whether at home or at the TB clinic, the patient is observed for any adverse drug reaction(s).

Contacts with TB patients may also be required to undergo a regimented treatment program. High-risk contacts, or those who are in close contact with active TB cases, receive INH for 3 months and are reevaluated in the third and sixth month following the initial visit. Those with negative PPD reactions at the time of reevaluation are discharged, while positive PPD reactors continue treatment for the next 12 months. Low-risk or occasional contacts require no medical follow-ups.

Patients on medication, however, are subject to monthly evaluations as part of the CDC's follow-up program. The follow-ups are intended to foster compliance with the drug regimen, and are continued until the patient's disease has been rendered inactive. Those who fail to keep their scheduled monthly appointments receive home visits from the communicable disease investigators, who again try to stress the importance of patient compliance with the prescribed treatment.

## (ii) Tuberculosis Surveillance and Control

Medical follow-up is only part of the system of treating and containing tuberculosis. Surveillance and control have equally important roles in limiting the spread of the disease.

The Central Tuberculosis Registry and Roster is maintained by the Tuberculosis Registry Clerk. The Clerk updates the Registry daily as patient charts from the previous day are reviewed. It is mandatory that the Registry contain the names of all active tuberculosis cases as well as their current treatment status. The Central Patient Roster, on the other hand, identifies: inactive pulmonary tuberculosis cases, contacts with active cases, suspect cases, as well as positive reactors who have had no contact with an active case.

As active cases are identified, either by morbidity report, physician referral, or case finding, they undergo an extensive interview process to elicit the names of contacts and the contacts' degree of exposure. The interviews are conducted by the staff nurses or the TB Coordinator during doctor/nursing clinics.

The names of contacts, which are recorded on a TB master file form, are categorized epidemiologically into high-risk and low-risk groups. The high-risk or close contacts to an active case must undergo field investigation to inform them of their exposure and the importance of reporting immediately to the Department of Public Health and Social Services. The low-risk or occasional contacts do not require any follow-up, but children under the age of 5 with positive PPD skin tests are followed epidemiologically

to locate the index case. All the investigations are conducted by DPHSS staff nurses, TB control officers, and communicable disease investigators.

The CDC Unit employs a TB Program Coordinator who oversees the activities of four CDC investigators which are utilized, two at a time, to conduct field investigations. Additionally, the community health nurses assigned to the Tuberculosis Clinic collaborate with the Program Coordinator in managing the problematic active cases and the patients under directly observed therapy. Nurses also provide patient and family counseling about the disease and its treatment, and make referrals for additional services such as nutrition counseling or family planning.

(b) Hansen's Disease (Leprosy)

Hansen's disease, also known as leprosy, is a chronic infectious disease caused by mycobacterium leprae, which primarily affects the skin and peripheral nerves, and occasionally affects the nasal mucosa of the upper respiratory tract. The disease takes on a variety of forms that range from lepromatous leprosy to tuberculoid leprosy. The latter is the least communicable, and the former is the most severe; in between are borderline-tuberculoid, borderline undifferentiated, and borderline-lepromatous leprosy.

Hansen's disease occurs in almost all tropical and warm temperate regions. On Guam, the incidence and prevalence of leprosy has not changed significantly over the last 10 years. An average of 2 new cases was reported each year from 1973 to the present. The average annual prevalence during this same period was 32 cases, some dating back to 1964. A total of 28 leprosy patients and their contacts were treated and monitored in 1984.

(i) Detection, Diagnosis, and Treatment

Hansen's disease often goes undiagnosed for long periods of time, or remains undiagnosed altogether, mainly because many physicians are unaware of its existence and because the disease mimics a wide variety of dermatologic, neurologic, and rheumatologic disorders. However, all patients with skin or peripheral nerve lesions who have resided in endemic areas or have been in close contact with a person diagnosed with the disease warrant close examination.

Three symptoms are common indicators of leprosy: thickening of one or more of the predilection or cutaneous sensory nerves; anesthetic skin lesions; and acid-fast bacilli (AFB) in skin smears. Skin or nasal symptoms that persist despite routine treatment, footdrop unassociated with trauma, or an unusual presentation of arthritis and redness of skin nodules are three additional warning signs of Hansen's disease. Diagnosis of leprosy is confirmed by clinical examination and the histo-pathological results from biopsy materials.



Treatment for patients afflicted with Hansen's disease usually includes Dapsone (DDS) mono-therapy. Newly diagnosed multi-bacillary cases are treated with Rifampin in combination with DDS; the Rifampin is continued until the patient is considered inactive while the DDS continues for varying lengths of time. Depending on the type of leprosy, the DDS treatment can last anywhere from 3 years to a lifetime:

|                              |                            |
|------------------------------|----------------------------|
| Undifferentiated tuberculoid | ----- 3 years              |
| Borderline-tuberculoid       | ----- 5 years              |
| Borderline-leprosy           | ----- 7 years              |
| Borderline-lepromatose       | -----15 years              |
| Lepromatose                  | -----20 years or for life. |

With the exception of the small number of patients being treated by private physicians or the military clinics, confirmed leprosy cases receive treatment free-of-charge from the Communicable Disease Control Unit of the Department of Public Health and Social Services. The patients are followed up on a monthly or quarterly basis, depending on their type of leprosy. Those not under the care of DPHSS are monitored closely and regularly by the CDC Unit in collaboration with the patients' personal physicians to assure compliance with the treatment regimen and clinic appointments. Appropriate measures are taken with patients found to be non-compliant. Household contacts of multi-bacillary cases are examined annually for at least 5 years, while contacts of pauci-bacillary cases receive an initial examination only.

### (iii) Recording and Reporting

The Communicable Disease Control Unit maintains a registry of Guam's Hansen's disease cases. The registry contains all patient and treatment information, and is incorporated into the National Hansen's Disease Registry System. The Territorial Epidemiologist and the Communicable Disease Control Unit collaborate on reporting to avoid any discrepancy in reported number of cases being treated by the Department of Public Health and Social Services and the number of cases reported to the Territorial Epidemiologist by community or military physicians.

### (c) Hepatitis

As reported in Chapter III - Health Status, both hepatitis A and B have drastically increased on island. During fiscal year 1983-1984, 39 hepatitis cases were investigated by the CDC Unit and 273 follow-ups with contacts were made.

A study conducted by the Communicable Disease Control Unit of the DPHSS during the summer and fall of 1984 suggests that a significant number of hepatitis cases remains unreported. Analysis of a cross-section of the Department's clients showed that more than half (51.1 percent out of 327 randomly selected persons) had a history of hepatitis B infection and that 5.5 percent were chronic carriers of the disease.

The vast majority of hepatitis patients, type A as well as B, experience mild to moderate illness; fatalities are rare. With recovery the patient gains full immunity. However, approximately 15 percent of hepatitis B victims develop into lifetime carriers, and increase the risk of developing cirrhosis and cancer of the liver.

Definitive diagnosis of hepatitis A, B, or the non-A and non-B type, is made by testing blood samples, oropharyngeal secretions, seminal fluid, urine, or stool specimens. If a patient is diagnosed with hepatitis, the protocol for treatment and surveillance is dependent on whether one has hepatitis A or B.

Those identified with hepatitis A are treated immediately with a single dose of immunoglobulin; those with hepatitis B are given an injection of hepatitis B hyperimmune globulin. In both instances, those at risk of contracting the disease, whether they be family members or co-workers of the diagnosed patient, are given a prophylactic injection of immunoglobulin. Patients and contacts are also educated about the signs and symptoms of the disease as well as about personal and sanitary measures that need to be followed to avoid further spread of the disease.

Pregnant women who are diagnosed with type B hepatitis before or at the time of delivery, or who are chronic carriers of the disease, have a very high risk for bearing a child who will be a carrier. Babies born to such women are given an injection of HB hyperimmune globulin and a Heptavax B vaccine at birth or as soon as they are stabilized, but no more than 12 hours later. The vaccination is repeated at 1 month and 6 months of age; and at 9 months the infant is tested for antibody protection. Since March 1985, five babies have been treated at GMH through the maternal and child health program. The Naval Hospital reported eight babies since January 1985, but no data has been reported by private providers.

#### (d) Cholera and Dengue Fever

Both cholera and dengue fever are endemic to the neighboring islands and the Philippines. While there have been no reported cases in the last several years on Guam, the island is at risk for cholera and dengue fever due to the frequent travel of persons between Guam and the other islands.

The CDC Unit has implemented preventive measures in this regard. Prevention against dengue fever outbreaks is accomplished through ongoing vector control programs which include targeting and clean-up of mosquito breeding sites, aerial spraying, and ground fogging.

Outbreaks of cholera, on the other hand, are generally water borne, although contaminated food, such as vegetables and shell fish, have also been responsible for the spread of the disease. As a result, the CDC Unit stresses careful personal hygiene and an adequate water and sewer system as the best protection against cholera.



Should either cholera or dengue fever break out on Guam, the Communicable Disease Control Unit has a well-defined protocol for diagnosis, treatment, surveillance, control, reporting, and recording of these diseases.

(e) Sexually Transmitted Diseases (STDs)

The incidence of sexually transmitted diseases is increasing on Guam and elsewhere as previously described in Chapter III. In 1984 the Communicable Disease Control Unit of the Department of Public Health and Social Services diagnosed and treated 674 cases of gonorrhea and 22 cases of penicillin resistant gonorrhea (also known as PPNG). There were 40 reported cases of syphilis in the late latent stage, and an additional 91 persons were diagnosed with various other sexually transmitted diseases.

In addition to its diagnosis and treatment services, the CDC Unit is charged with the control and surveillance of STDs. The Unit is particularly concerned with gonorrhea and syphilis since the number of such cases has increased substantially and pose the most serious problems on island. While part of the Unit's efforts to control the spread of STDs rests with treatment and follow-ups, the CDC Unit's involvement in public awareness and education programs has also proven effective.

(i) Diagnosis and Treatment

Persons coming to the STD Clinic, whether as walk-ins, referrals, previously identified contacts, or follow-up patients, are diagnosed (or found free of disease) through blood tests for syphilis and/or cultures of specimens. Once diagnosed, treatment commences immediately.

The treatment regimen for those infected with gonorrhea includes probenicid and procaine penicillin G. Penicillinase producing neisseria gonorrhea (PPNG), for which penicillin treatment is ineffective, requires spectinomycin. Syphilis treatment, on the other hand, includes benzathine penicillin G, or tetracycline for those who are allergic to penicillin. Dosage and length of treatment varies with the stage of the disease. In all cases, patients are encouraged to make follow-up appointments to monitor the progress of the disease and cure the disease if possible.

Treatment for STDs also includes counseling by trained CDC investigators. All patients are made aware of the importance of identifying all sexual contacts to facilitate prompt treatment for contacts and to curtail the spread of the disease.

(ii) Surveillance

By law, all cases of communicable disease must be reported to the CDC Unit of the DPHSS. Gonorrhea and syphilis are such reportable diseases. A good reporting mechanism has been developed between the CDC Unit and the military personnel.



However, there seems to be a serious underreporting of cases by private physicians who like to protect the confidentiality of their patient-doctor relationship. This prevents the CDC Unit from the necessary follow-up of contacts, and limits the accuracy of STD rates, particularly gonorrhea, on the island.

### **Conclusion and Recommendations**

The Communicable Disease Control Unit of the DPHSS provides a wide array of services as part of the detection, diagnosis, treatment, surveillance, follow-up, and outbreak control measures for infectious and communicable diseases. Each of the services augments the Unit's overall effort to limit the incidence and prevent the epidemic spread of disease.

**GOAL 1:** BY SEPTEMBER 1986, CONTROL AND REDUCE THE INCIDENCE OF:

- (1) ACTIVE TUBERCULOSIS TO LESS THAN 30 CASES/100,000.
- (2) ACTIVE LEPROSY TO LESS THAN 5 CASES/100,000.
- (3) SEXUALLY TRANSMITTED DISEASES (STDs) TO LESS THAN 500/100,000.
- (4) HEPATITIS A AND B TO LESS THAN 500 CASES/100,000.
- (5) OTHER INFECTIOUS DISEASES, SUCH AS SHIGELLA, BELOW THE CURRENT LEVEL.

Target Population: All island residents, particularly ages 15-30 at risk for STDs.

**OBJECTIVE 1.1.:** Increase awareness of infectious and communicable diseases, particularly the STDs, through increased public education via mass medium and through the school curriculum.

### **(3) Community Screening Programs**

It has become more and more evident that sound medical practice must focus on prevention first rather than to rely on treatment when a disease is diagnosed. Health screening and health education have become the crux of prevention measures. Both screening and health education must have a positive impact on mortality, morbidity, and disability. The benefit of detecting and treating the precursors of a disease prior to the onset of symptoms are greater than having a clinical diagnosis made after the patient becomes symptomatic. The discussion below focuses on the various community screening programs available on Guam; a description of health education activities is presented in Section C, Health Promotion and Protection, of this chapter.

Screening is defined as the detection of a disease or disease-related condition before the appearance of clinical signs and symptoms. It often involves a specific medical test, a physical examination, or a combination of the two. Screening services should encompass all diseases or conditions for which there are cures, or for which existing medical technology can retard the disease process.

High blood pressure, diabetes, tuberculosis, sexually transmitted diseases, glaucoma, hearing and speech defects, and several of the cancers are conditions which can be detected in their early stages by screening. The screening services can be provided in private or public clinics, and, in some cases, are limited to certain age groups such as school children.

While screening programs are advocated for each community there are several criteria which need to be evaluated before establishing such programs.

The condition being screened should be an important health problem for the individual and the community.

There should be a suitable test or examination for detecting the disease at the early symptomatic or latent stage, and this test should be acceptable to the population.

There should be an acceptable form of treatment for patients with the recognizable disease.

The facilities required for diagnosis and treatment of patients identified by the screening program should be available on island or, by referral, off-island.

Diagnosis and treatment of patients identified by the screening program should be provided regardless of the patient's ability to pay.

The cost of case finding (which also includes the cost of diagnosis and treatment) needs to be economically balanced in relation to the available resources for health care for Guam's population.

In addition to addressing the above criteria, each screening program should also include the elements of outreach, counseling about the identified disease, referral for diagnosis and treatment, as well as follow-up activities. Without providing these complementary services, screening programs lose much of their potential usefulness in disease prevention. Furthermore, each screening program should also have a built-in evaluation component which will indicate, over time, whether or not the program is having the expected and optimal effects on Guam's health status.

Several screening procedures are performed by Guam's health care delivery system. Some of them have become so integrated in the medical services continuum that they now have become part of a routine. Other screening efforts are carried out in a sporadic fashion, while others still are reserved for certain segments of the population.

**(a) Infant Screening Services**

All newborn babies are routinely screened 1 minute and 5 minutes after birth with the Apgar Score, which assesses the baby's heart rate, respiratory effort, muscle tone, reflex irritability, and color. If any abnormalities are discovered, further screening or testing will be performed as indicated.

The screening programs aimed at detecting metabolic diseases in infants, which are mandatory in most states on the mainland, are not performed at Guam Memorial Hospital, since they have not proven cost-effective for the very limited number of babies identified with such diseases on Guam over the years.

**(b) Vision, Hearing, and Speech Screening**

The Department of Education (DOE) provides hearing and vision tests to various groups of school children. The DOE nurses conduct vision testing for children in Headstart, kindergarten, grades 1, 3, 5, 7, 9, and 11, including those in Special Education. The hearing tests are provided for the same groups of children by public health personnel in cooperation with the DOE nursing staff. Screening among children in the other grade levels is performed on a referral basis through the Child Find program.

The speech tests for school children are conducted by the DPHSS Hearing and Speech Clinic personnel in conjunction with the Maternal and Child Health program. The speech tests are provided automatically for pre-schoolers and on a referral basis for all other children.

Those children identified with suspected vision, hearing, or speech problems are referred to the Hearing and Speech Clinic, their personal physician, or a specialist (e.g., optometrist, otolaryngologist) for further diagnostic testing and necessary treatment.

**(c) Tuberculosis Screening**

Guam's Department of Public Health and Social Services sees prevention as a prime factor in reducing the high incidence and prevalence of tuberculosis on the island. At this time it is recommended and/or mandatory that the following special populations undergo screening for TB, either through a skin test, or chest x-ray:

- (i) All pregnant women at their first pre-natal examination.
- (ii) Infants at age one (all infants and children entering a nursery or child-care center must have skin test).
- (iii) Children entering kindergarten, or the Guam school system for the first time.
- (iv) All persons entering the University of Guam.
- (v) All persons upon initial employment by the Government of Guam.



(vi) All food-handlers in public and private eating places.

(vii) All alien laborers.

Persons who screen positive for tuberculosis are referred to the Tuberculosis Clinic of the DPHSS Communicable Disease Unit.

(d) Cervical Cancer Screening

Screening for cervical cancer has become very effective with the availability of the "Pap Smear." Identifying abnormal cancer cells before the onset of a cancerous growth is the most valuable lifesaving aspect of cancer control.

The "Pap Smear" is a routine part of physical examinations for females. Also, all pregnant women are given this test during their first doctor's visit and examination, regardless if the woman sees a physician at a public or private clinic.

(e) Other Screening for Pregnant Women

During the first pregnancy check-up, women are screened routinely for sexually transmitted diseases. During the course of the pregnancy, those females with a family history of diabetes will be tested for higher than normal blood sugar. Additionally, pregnant women receiving their care from the DPHSS Maternal and Child Health program, are screened for hepatitis B.

(f) Screening for Glaucoma

The last mass-screening for glaucoma was performed in 1982 when an ophthalmologist (eye specialist) from the Naval Hospital volunteered his services and the services of Navy corpsmen, as well as Navy eye testing equipment, to test Guam's senior population for glaucoma, cataracts, and other eye diseases. This was a joint venture between the Naval Hospital, Guam Memorial Hospital Authority (who provided examination and waiting rooms), and the Division of Senior Citizens (who arranged for the scheduling and transportation of the seniors). Over 2,000 persons were screened that day, and more than 200 were referred for further tests and/or treatment to eye doctors in the community.

(g) High Blood Pressure Screening

There were several public mass screenings for high blood pressure during the last 5 years, as already described in Chapter IV, Section C. At one time, the Department of Public Health and Social Services provided job-site screening through a Health Education Risk Reduction grant. With the discontinuation of the grant such screening activities were subsequently funded through a preventive block grant. However, a lack of manpower resulted in the curtailment of job-site screening. Instead mass screenings were conducted at Health Fairs and Shopping Centers sporadically and were not targeted specifically towards the

population at risk. Furthermore, counseling and follow-up for those identified with hypertension was not possible in many cases.

**(h) Screening for Diabetes**

In Chapter IV, Section E the screening efforts for diabetes are discussed in detail. Mass blood sugar screenings are advocated in order to identify diabetics in the earliest possible stages and to provide appropriate treatment.

**(i) Screening for AIDS**

The CDC Unit of DPHSS has very recently been awarded a federal grant to set up an alternative test site for AIDS screening. The test site, to be established at the central DPHSS facility in Mangilao, will screen for Human T-cell lymphocytic Type III antibodies. This is not a diagnostic test for AIDS, but will indicate whether a person has been exposed to the virus. The virus has been strongly suspected to cause AIDS.

Screening will be done on demand or by referral for anyone who suspects that he or she has the disease, or has been in close contact with someone known to have the disease. Clients will be charged for the screening tests according to their ability to pay, but no one is denied screening for lack of financial resources.

All clients to be tested will receive a pre-test counseling session on the test procedure, its limitations, and the interpretation of results. Clients with positive results confirmed by the Center for Disease Control Laboratory in Atlanta, Georgia, will receive post-test counseling followed by referral to a physician for a complete AIDS workup, and if indicated, to an off-island facility for treatment. All test results will be held confidential, with the counselor informing the client of the results in person.

**Conclusion and Recommendations**

The community screening programs are offered through several different providers and generally for specific target populations. While the Department of Education and the Department of Public Health and Social Services have made great strides in reaching the school-age population, screening efforts aimed at the adult population have not been as successful.

Part of the problem stems from the lack of job-site screening. The formerly active Health Education Risk Reduction program had been quite effective in reaching large factions of the adult population. More importantly, worksite programs enabled ongoing efforts in health education and allowed for regularly scheduled medical contacts.

With the end of the job-site programs, most health screening for adults is done in private clinics as part of routine physical exams. The exams themselves are generally offered through insurance plans that, first of all, are not equally accessible to the island's population and secondly, do not require the insured to get an annual physical. The uninsured and the medically indigent are oftentimes eligible for services at DPHSS but may be unaware of their eligibility and the services that are available.



The overriding concern, however, is the lack of community awareness in the benefits of health screening. In order for health screening, and prevention measures in general, to be effective, the population must be educated as to the availability, accessibility, and necessity of routine screening. Health education and health screening then must be done in conjunction with each other.

**GOAL 1: PROVIDE SCREENING AND PATIENT EDUCATION ACTIVITIES FOR HYPERTENSION, DIABETES, AND CANCER AS DETAILED IN CHAPTER IV - HEALTH STATUS PRIORITIES.**

**E. Diagnosis and Treatment Services**

Diagnosis and treatment generally refer to the evaluation of individual health status, as well as the identification and alleviation of disease and ill health. These services currently consume the largest proportion of health care dollars nationwide and, as a result, have come under close scrutiny. Health officials are working to measure the impact that diagnostic and treatment services have on health status, and are monitoring the efficiency and effectiveness of service utilization.

This section of the Plan addresses various primary and acute care services and programs offered in the civilian health care industry. (Chronic care is discussed in Section G.) In addition, this section examines the manpower needs for Guam's diagnosis and treatment services, and discusses alternatives to the traditional health care providers.

**(1) Maternal and Child Health Services**

The maternal and child health programs on Guam offer a continuum of care that includes obstetric services, pediatrics, and family planning. Each program and each service is aimed at improving the population's health status by ensuring that all women and all children have access to quality care.

**(a) Obstetric Services**

Obstetric Services refer to the diagnosis and treatment of any abnormalities throughout one's pregnancy, as well as to those services that promote and maintain the optimum mental and physical well-being of the individual woman and her child from the onset of labor until the end of the perinatal period. In light of the high birth rate on Guam, these services are particularly important. Between the years 1979 and 1983 the birth rate for women of childbearing ages has decreased overall from 94 in 1979 to 92.2 in 1980, 88.6 in 1981; 86.7 in 1982; and 91.7 in 1983. The average during the 5-year period was 90.6, which is much higher than the U.S. birth rate of 68.4 births per 1,000 women of childbearing ages reported in 1980.

As it becomes more apparent that favorable pregnancy outcomes are strongly associated with socio-economic, psychological, and



environmental factors, the traditionally defined scope of obstetric services has broadened. More comprehensive care such as counseling in nutrition, and lessons in childbirth are now incorporated with the regimen of medical services. Below is a description and analysis of obstetric services available on Guam.

#### (i) Prenatal Care

The central mission of good prenatal care is identifying mothers at risk and providing them with continuing care appropriate to their particular needs. Ensuring the availability and accessibility of good prenatal care, and encouraging the proper utilization of such care significantly reduces the chance of infant mortality and morbidity.

The U.S. Department of Health and Human Services has identified several essential health services which pregnant women need during the prenatal period. The medical services include the diagnosis of pregnancy, the identification and special care for high risk pregnancies, nutritional assessments, as well as the screening, diagnosis, and follow-ups needed for fetal genetic defects. The "non-medical" services, on the other hand, refer to counseling, health education, and appropriate referrals for adoption and fertility regulation services.

On Guam, prenatal medical care is available in nine private clinics and physicians's offices as well as in three public health clinics. While a majority of the private clinics are concentrated in the northern villages, there are public and private facilities within the central and southern districts as well. Services are provided by licensed obstetricians, family practitioners, and nurse practitioners.

Services in the private clinics are generally available Monday through Friday, between the hours of 9 a.m. and 6 p.m. Certain private facilities do, however, offer extended hours of service that begin as early as 7:30 a.m., continue through 9 p.m., and are available on Saturdays. The extended hours provide ample opportunity for obtaining prenatal care to those women wishing to receive such care.

The Department of Public Health and Social Services provides prenatal care during its Women's Health Clinics and Youth Clinics. These clinics are scheduled at various times during the week, between 8 a.m. and 5 p.m. The services provided are made available to those women who need prenatal care but cannot afford to pay for either the care or the health insurance that covers such care.

In addition to the medical services offered during pregnancy, prenatal counseling, social services, nutrition, assessments, health education, family planning, and adoption services are also available. Many private clinics and all the public health

clinics include counseling, health education, and fertility regulation services in their prenatal care. Those who do not offer these additional services do make the appropriate referrals. Adoption services are generally obtained through referrals to the Child Support Enforcement Services (a division of DPHSS).

As mentioned earlier, the proper utilization of prenatal services reduces the risk of infant mortality and morbidity. In addition, adequate prenatal care may minimize the incidence of low birthweight infants. The infant mortality rate on Guam has been lower than that of the U.S. and continues to drop. Yet the large proportion of neonatal deaths suggests that there may be problems with the proper management of pregnancies. One of the leading causes of infant mortality has been "conditions originating in the perinatal period" (e.g., fetal malnutrition, birth trauma, isoimmunization). These conditions are related to maternal health during the gestation period and constitute 35 percent of all neonatal deaths.

On Guam, the proportion of mothers who have received prenatal care has steadily increased from 97.5 percent in 1979 to 98.7 percent in 1983. Between 1979 and 1983, only 1.6 percent of mothers failed to receive prenatal care as compared to 1 percent of mothers in the U.S. who, during 1980, had no prenatal care. However, the number of pregnant women that seek prenatal care during the first trimester of pregnancy is somewhat troubling. U.S. figures for 1980 indicate that 77.9 percent of U.S. mothers had their initial prenatal visit within the first 3 months of pregnancy. Guam's statistics, on the other hand, show that between 1979 and 1983 only 61.5 percent of the island's pregnant women had prenatal care in the first trimester, and that Chamorro and Micronesian women have consistently fallen below the U.S. utilization rate as well as the rate for all ethnicities on Guam. (Please see Figure 16.)

During the 5-year report period only 56.1 percent of Chamorro mothers and 42.5 percent of Micronesian mothers received prenatal care before the end of the first trimester. This may account for the high percentage of low birthweight infants among these ethnic groups.

The overall incidence of low birthweight infants has improved steadily in the past, from 8.31 percent in 1979 to 7.63 percent in 1983, but remains higher than the U.S. rate of 6.84 percent. The percentage of low-weight babies is higher still among Chamorros and Micronesians. (Please see Figure 17, and Tables 34 and 35 in Chapter III.)

It is clear from Figure 17 that Caucasian mothers on Guam have the lowest percentage of low-weight infants, and that Chamorros and Micronesians have the largest proportion of low birthweight babies. The trends in the incidence of low birthweight infants correspond with the proportion of pregnant women who received prenatal care in the first trimester of

FIGURE 16

PROPORTION OF MOTHERS BEGINNING PRENATAL CARE  
DURING FIRST TRIMESTER OF PREGNANCY BY ETHNICITY

GUAM: 1979 - 1983

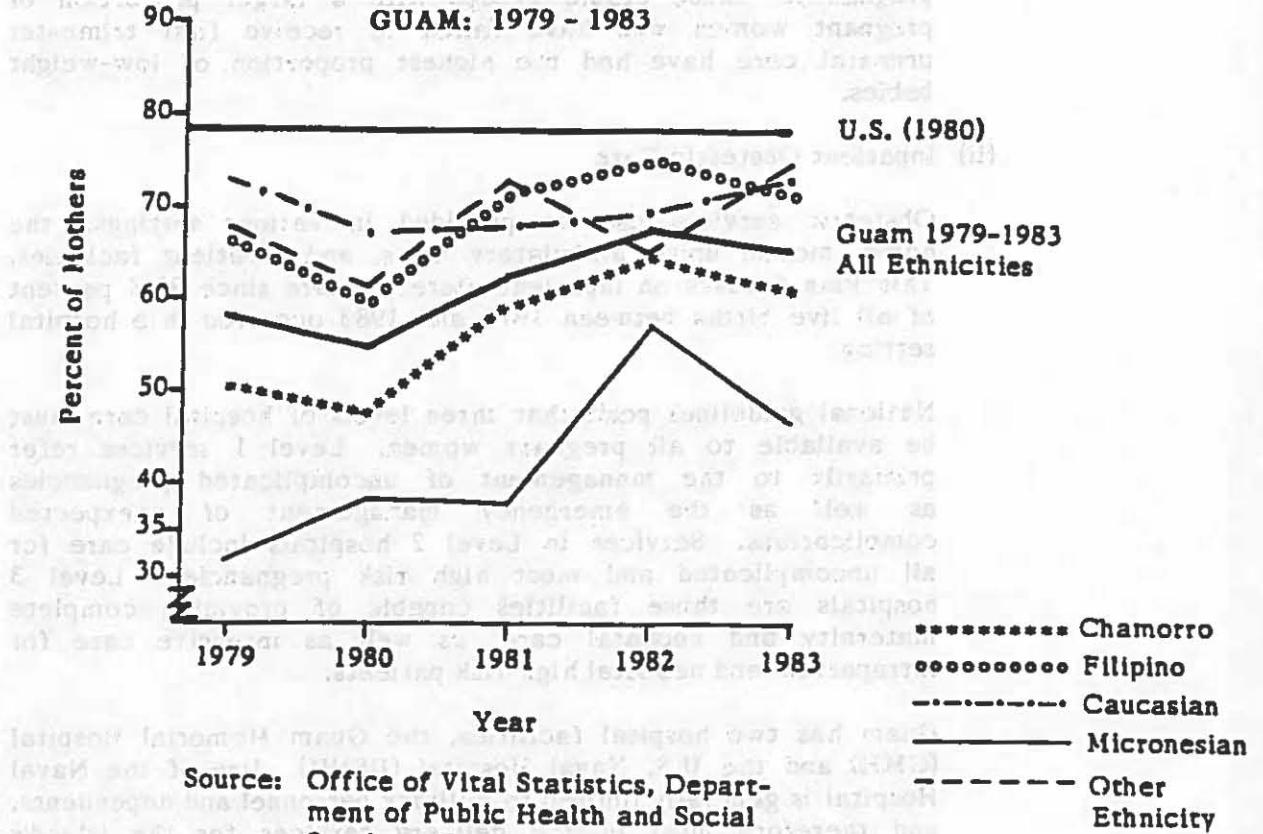
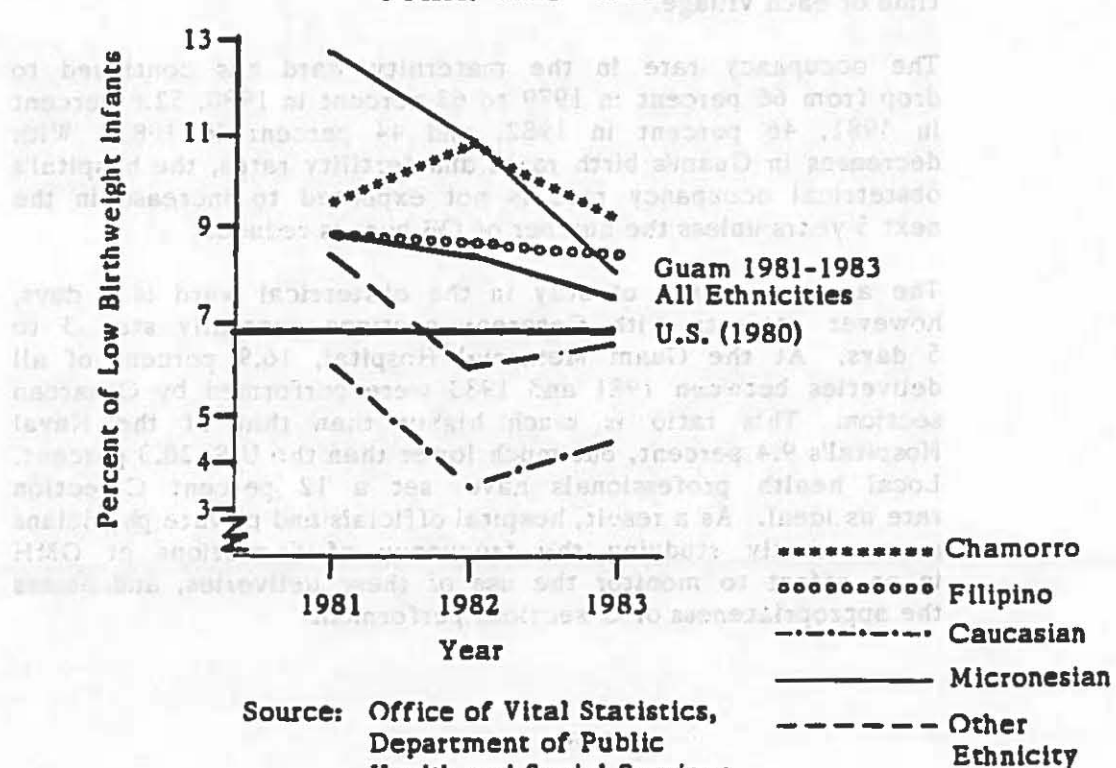


FIGURE 17

PROPORTION OF LOW BIRTHWEIGHT INFANTS BY ETHNICITY

GUAM: 1981 - 1983





pregnancy. Those ethnic groups with a larger proportion of pregnant women who have failed to receive first trimester prenatal care have had the highest proportion of low-weight babies.

## (ii) Inpatient Obstetric Care

Obstetric services can be provided in various settings: the home, mobile units, ambulatory units, and inpatient facilities. This Plan focuses on inpatient obstetric care since 99.8 percent of all live births between 1979 and 1983 occurred in a hospital setting.

National guidelines posit that three levels of hospital care must be available to all pregnant women. Level 1 services refer primarily to the management of uncomplicated pregnancies as well as the emergency management of unexpected complications. Services in Level 2 hospitals include care for all uncomplicated and most high risk pregnancies. Level 3 hospitals are those facilities capable of providing complete maternity and neonatal care, as well as intensive care for intrapartum and neonatal high-risk patients.

Guam has two hospital facilities, the Guam Memorial Hospital (GMH) and the U.S. Naval Hospital (USNH). Use of the Naval Hospital is generally limited to military personnel and dependents, and therefore most of the delivery services for the island's civilian population are provided at GMH.

Guam Memorial Hospital is a Level 2 facility that provides services for uncomplicated cases, as well as certain specialized obstetrical and neonatal services. These services are readily available, and the facility is located within 60 minutes traveling time of each village.

The occupancy rate in the maternity ward has continued to drop from 66 percent in 1979 to 63 percent in 1980, 52.6 percent in 1981, 46 percent in 1982, and 44 percent in 1983. With decreases in Guam's birth rates and fertility rates, the hospital's obstetrical occupancy rate is not expected to increase in the next 5 years unless the number of OB beds is reduced.

The average length of stay in the obstetrical ward is 2 days, however patients with Cesarean sections generally stay 3 to 5 days. At the Guam Memorial Hospital, 16.9 percent of all deliveries between 1981 and 1983 were performed by Cesarean section. This ratio is much higher than that of the Naval Hospital's 9.4 percent, but much lower than the U.S. 20.3 percent. Local health professionals have set a 12 percent C-section rate as ideal. As a result, hospital officials and private physicians are currently studying the frequency of C-sections at GMH in an effort to monitor the use of these deliveries, and assess the appropriateness of C-sections performed.

### **(iii) Post-Partum Care**

Post-partum care is given to the mother and newborn at GMH immediately following birth; and all mothers are encouraged to see a physician again 6 weeks after delivery. The care received after delivery is intended to maintain proper maternal health and includes fertility regulation services. At GMH there is a parenting class offered by a hospital consultant for every new mother and father. The class is aimed at preparing the parents for proper infant care at home.

Unfortunately there is no education at GMH for the increasing number of mothers wishing to breastfeed their children. The Women and Infant Care (WIC) program as well as many maternal and child health care service providers encourage breastfeeding among their patients as an effective means of improving the nutritional health of infants. The nutritional content of breast milk is uniquely suited to the infant. In addition, recognition of the anti-infective properties of human milk and the importance of mother-infant bonding have given greater impetus to the importance of breast milk for the infant.

Instructions on breastfeeding are usually included in childbirth classes, but since these classes are optional for pregnant women, those who do not attend childbirth classes but wish to breastfeed may not have the benefit of such instructions. As the primary site of delivery services, the hospital is a more apt setting in which to reach a greater number of women, and can incorporate instructions on breastfeeding into the routine of its delivery and maternity ward personnel. In combination with the efforts of the recently established Maternal and Child Health Resource Center, such educational activities at GMH may, in the long run, minimize painful experiences and subsequently increase the prevalence of breastfeeding.

### **(b) Pediatric Services**

The medical care offered to Guam's children range from nursery services in the hospital, to well baby and child care in the island's clinics, and acute care in the hospital's pediatric ward.

#### **(i) Nursery Services**

Guam Memorial Hospital provides standard nursery care to normal infants as well as intensive care for high risk infants. The hospital has 22 bassinets in the nursery and 4 bassinets in the Neonatal Intensive Care Unit (NICU). In the past several years, the occupancy rate in the nursery unit has dropped from 73 percent, between 1978 and 1980, to 65 percent between 1981 and 1983. The NICU occupancy rate has remained fairly stable, at 18 to 19 percent, for the same period of time.

#### **(ii) Well-Baby and Child Care**

Well-baby care refers to the series of 8-10 visits between infants



and pediatricians that occur during the infants' first 18 months of life. The services include periodic health assessments, nutritional assessments, immunizations, as well as diagnosis and treatment for acutely ill or injured infants. In addition, parents and guardians are counseled as to proper health care for young children.

Similar medical care is provided for older children, but generally on an annual basis unless serious illness or injury arises. These services in addition to well-baby care are available in eight private clinics and three public health clinics. All primary pediatric care is administered by licensed pediatricians, family practitioners, and nurse practitioners. Referrals are made for those children in need of special medical or dental care. (See Chapter V, E.(2).)

### (iii) Other Services for Children

Special care is provided to the island's handicapped children through the Services for Handicapped Children Program. SHC offers diagnostic evaluation and appropriate medical or surgical treatment, hospitalization, and continuing care to those children with crippling (or potentially crippling) conditions who are from families who meet financial eligibility requirements. As of 1980, the SHC program had served 527 children, and was expecting to see an additional 250 in each of the succeeding years.

There are also specialized services offered at the DPHSS's Hearing and Speech Center for children below the age of 18. Screening efforts are available for certain age groups in the public schools. Referrals are made to the Department of Public Health and Social Services for diagnostic services, and on to eyes-ears-nose- and throat specialists (EENTs) for treatment. The Bureau of Family Health Services, DPHSS, reports that between 85 and 90 percent of the children seen at the Department are referred to physicians; 5 percent for further testing, 5-7 percent for monitoring, and the remainder for treatment.

In addition, the Department of Public Health and Social Services administers a Home Training program for children 0-3 years of age who have problems with development. The program accepts referrals, from any source, for diagnostic evaluations at the DPHSS clinic in Mangilao. Those children and families requiring special care are visited in their homes by health educators who assist in fostering child development. Due to a shortage in manpower, however, the Department currently has a waiting list for home training.

### (iv) Inpatient Services

In addition to the health care provided to newborns and infants in the hospital nursery, inpatient services are readily available for all children. As is the case with infant care, there are



pediatricians and family practitioners to offer care ranging from periodic health assessments to acute care for serious illness or injury.

Inpatient care for serious illnesses and injury to children are provided at GMH. The hospital has 25 beds available in its Pediatrics Ward and a family practitioner is on call to care for the young patients in the event no private doctor is available. Table 69 shows the rates of occupancy in the GMH pediatric unit for the period 1979 through 1983. The rates are, on the whole, lower than the 65 percent occupancy rate recommended by the National Health Planning Guidelines.

**TABLE 69**  
**Guam Memorial Hospital**  
**Occupancy Rates in the Pediatric Unit**  
**Guam: 1979 - 1983**

| Year    | # of<br>Beds | Rate of<br>Occupancy |
|---------|--------------|----------------------|
| 1979    | 25           | 56.1%                |
| 1980    | 25           | 66.8%                |
| 1981    | 25           | 52.3%                |
| 1982    | 25           | 56.3%                |
| 1983    | 25           | 65.8%                |
| Average | 25           | 59.5%                |

Source: Medical Records Department, Guam Memorial Hospital Authority.

While 25 beds are currently available, 23 beds would be adequate based on the utilization trends in the past. A reduction in the number of beds would increase future occupancy rates in the pediatric ward, and would enable GMHA to convert one room into a recreation room for the children in compliance with JCAH recommendations.

#### (c) Family Planning

Family planning programs are premised on the belief that unwanted, unintended pregnancies adversely affect infant and maternal health, as well as the emotional and social well-being of the individuals and family units involved. The national family planning program is designed to ensure the availability of services, to educate patients about reproduction and birth control, and to initiate or upgrade contraceptive use.

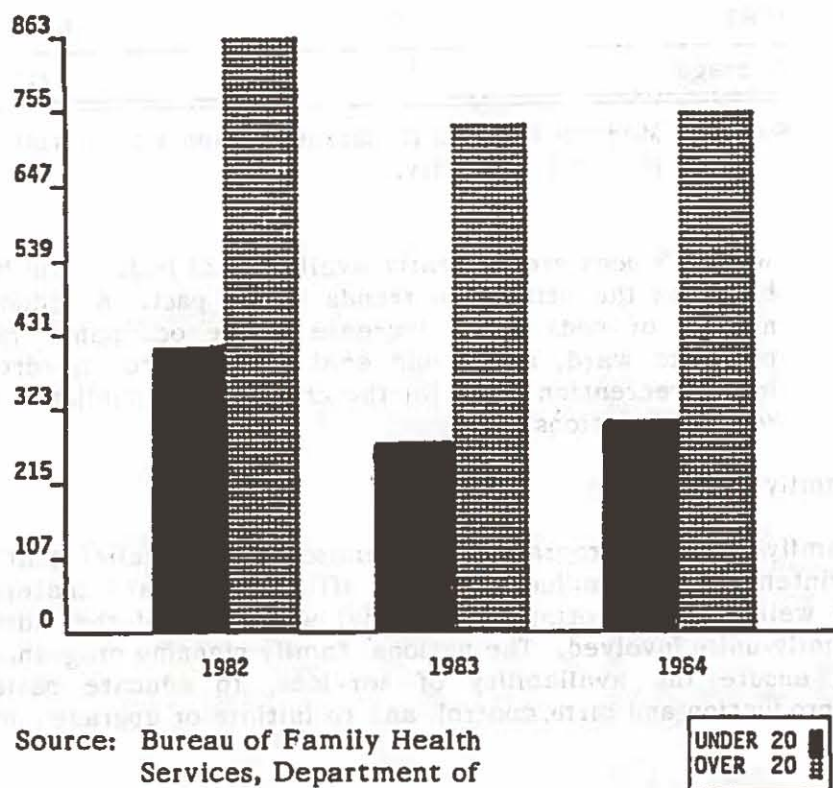
On Guam, private and public health clinics that offer obstetric and

gynecological care include family planning services. In addition to fertility regulation, family planning involves health screening measures, such as pap smears, pelvic examinations, blood pressure tests, and patient education.

Utilization data for family planning services is available for the Department of Public Health and Social Services program. Data from private providers are not available at this time. Clients are seen at the Family Health Care Clinics, the Women's Health Clinics, and the Youth Clinics that are held at specifically scheduled times, Monday through Friday between 8 a.m. and 5 p.m. The clinics are located in northern, central, as well as southern Guam, and provide care to those uninsured women with low incomes, who cannot afford private physician care; to those with marginal incomes, who may not be able to afford private physician care; and to teenagers, who often do not have access to private physicians for contraceptive care.

The number of women seen at public health clinics for family planning has increased over the past few years. Figure 18 details the patterns of use by specific age groups. (Data is available for 3 years only.)

**FIGURE 18**  
**WOMEN IN FAMILY PLANNING PROJECT BY AGE**  
**GUAM: 1982 - 1984**



The utilization of family planning among teenage women is of particular concern to public health officials. Between 1979 and 1983, live births to teenage mothers accounted for 13.5 percent of all live births on Guam. This proportion compares fairly well to the 15.6 percent of births to teenage women recorded in the U.S. during 1980. However, birth rates for specific teenage groups are not as favorable. In 1980, the U.S. birth rates for teens 10-14 and 15-19 years of age were 1.1 and 53.0 per 1,000 adolescent girls. On Guam, the birth rates for the same age groups averaged out to 1.1 and 76.5 per 1,000 teenage women between 1979 and 1983. The year-to-year rates show slight fluctuations and relatively no improvement. (Please see Table 70.)

**TABLE 70**  
**Birth Rates for Teenage Women**  
**Per 1,000 Women Between the Ages of 10 and 19**  
**Guam: 1979 - 1983**

| Year               | Population     |                | Live Births    |                | Birth Rate by Age Group |                |                   |
|--------------------|----------------|----------------|----------------|----------------|-------------------------|----------------|-------------------|
|                    | 10-14<br>Years | 15-19<br>Years | 10-14<br>Years | 15-19<br>Years | 10-14<br>Years          | 15-19<br>Years | All Teen<br>Years |
| 1979               | 5,445          | 4,899          | 5              | 386            | 0.9                     | 78.8           | 37.8              |
| 1980               | 5,503          | 5,144          | 5              | 379            | 0.9                     | 73.7           | 36.1              |
| 1981               | 5,562          | 5,401          | 5              | 426            | 0.9                     | 78.9           | 39.3              |
| 1982               | 5,622          | 5,437          | 11             | 403            | 2.0                     | 74.1           | 37.4              |
| 1983               | 5,699          | 5,482          | 5              | 423            | 0.9                     | 77.2           | 38.4              |
| Average Birth Rate |                |                |                |                | 1.1                     | 76.5           | 37.8              |

Source: Office of Vital Statistics, Department of Public Health and Social Services, Guam;  
Guam Health Planning and Development Agency.

The Bureau of Family Health Services has targeted the teenage population for specific family planning programs. Through the joint efforts such as the Youth Clinic and Teen Parenting Program, health and education officials alike are striving to make family planning available, accessible, and most importantly acceptable to the island's adolescents.

#### Conclusion and Recommendations

The scope of maternal and child health services on Guam comes very close to the standards established by DHHS. Both medical and non-medical services are readily available and accessible.

Yet the utilization of such services on Guam continues to fall below mainland standards. While the overall percentage of mothers who receive prenatal



care in the first trimester of pregnancy is lower than that of U.S. mothers, Chamorro and Micronesian mothers show the poorest utilization patterns of all. This in turn corresponds with the higher incidence of low birthweight babies among Chamorro and Micronesian women.

In addition the teenage births continue to account for a significant proportion of the island's total births. At present there is insufficient data on the access and availability of family planning to teenage women, as well as for the utilization of appropriate obstetric services. Accordingly, data collection and analysis on adolescent pregnancies has become a priority in the maternal and child health programs.

**GOAL 1: REDUCE THE RISK OF INFANT MORTALITY AND MORBIDITY.**

**OBJECTIVE 1.1.:** Increase the proportion of pregnant women who seek prenatal care during the first trimester of pregnancy.

**OBJECTIVE 1.2.:** Reduce the disparities between ethnic groups in the utilization of prenatal services.

**GOAL 2: ENSURE THE AVAILABILITY AND ACCESSIBILITY OF COMPREHENSIVE MATERNAL AND CHILD HEALTH SERVICES TO TEENAGE WOMEN.**

**OBJECTIVE 2.1.:** Reduce the number of unplanned, unwanted teenage pregnancies.

**OBJECTIVE 2.2.:** Improve the utilization of prenatal services among adolescent pregnant women.

**(2) Dental Health Services**

Dental caries and periodontal disease are the two most common oral diseases of children, and affect 95 percent of all Americans. By the age of 10, the average American child has two decayed, missing, or filled (DMF) teeth and three DMF surfaces. By the age of 14, the average child has four DMF teeth and seven DMF surfaces, and by the age of 17, an average of six DMF teeth and eleven DMF surfaces. Dental disease has three characteristics that are considered in health planning: 1) dental disease is universal; 2) it can be easily prevented; and 3) treatment of dental disease is often an elective health service.

Guam's dental services are provided through both private dental clinics and the Department of Public Health and Social Services. Most private clinics are located in the Agana, Tamuning, and Harmon areas; public health centers are located in Mangilao and Inarajan. Residents in the southern villages who are not eligible for free public dental care must travel more than 30 minutes to the Agana-Tamuning area for service.

Dental care in the private sector ranges from complete examinations and diagnosis, to routine cleaning and fillings, and on through the more specialized root canal treatments, oral surgery, and orthodontics. Services in the private clinics are available weekdays and on Saturdays, between 7:30 a.m. and 8 p.m.

The dental section at the Department of Public Health and Social Services, on the other hand, provides a limited scope of dental services, which includes examination, x-rays, diagnosis, cleaning, sealing of teeth, fluoride treatment, treatment planning, and the performance of certain treatment required. Orthodontic treatment, complicated oral surgery, and root canal therapy of multirooted teeth are not performed, but appropriate referrals are made. This dental care, like other public health services, is generally available Mondays through Fridays during regular working hours.

While private clinics provide dental care to insured and self-paying patients, the Department of Public Health and Social Services is mandated to service the institutionalized population and all children below the age of 17. Overall, 99.4 percent of the Public Health patients seen from September 1984 to April, 1985 were 16 years old or younger. This includes 16,562 children who represent only 33.5 percent of all those aged 16 years or younger. The remaining 66.5 percent are either covered by a dental insurance plan, see a private dentist, receive care from a military dentist, or go without care.

Adequate use of dental services by children is of particular concern to health officials. Five dental surveys of Guam's children taken in the 25-year period from 1959 to 1984 present a discouraging picture of their dental health. In 1959, there was a 90 to 93 percent prevalence of dental caries among schoolchildren, with an average of 5.2 carious teeth per child. In 1964, the prevalence of dental caries rose to approximately 98 percent, and the average number of carious teeth to 8.3 per child. The 1972, 1975, and 1984 dental surveys utilized a standard measure of dental health, the DMF Surface (DMF-S) ratio. In 1972, the average DMF ratio for those surveyed was 9.87 surfaces per child. Between 1972 and 1984, it was reduced to 8.14 surfaces per child surveyed. Though the surveys have shown a slow downward trend in the number of DMF surfaces, Guam children still have higher DMF ratios than U.S. children at every age.

The Department of Public Health has consequently attempted to reduce the prevalence of dental caries in Guam's children not only through treatment, but through promotion and prevention programs. Public health officials have been working closely with the Public Utilities Agency of Guam (PUAG) to have the island's water supply fluoridated. It is estimated that by August of 1985, the northern area of Guam will be completely fluoridated; the completion date for fluoridating the remainder of the island's water supply has been set at November, 1985.



**TABLE 71**  
**Dental Caries in Children by Age**  
**U.S. and Guam**

| Age<br>(Yrs.) | Average Number of<br>DMF Teeth |              | Average Number of<br>DMF Surfaces |              |
|---------------|--------------------------------|--------------|-----------------------------------|--------------|
|               | U.S.<br>1979-80                | Guam<br>1984 | U.S.<br>1979-80                   | Guam<br>1984 |
| 5             | 0.07                           | 0.20         | 0.11                              | 0.60         |
| 6             | 0.16                           | 0.59         | 0.20                              | 0.99         |
| 7             | 0.44                           | 1.16         | 0.58                              | 1.73         |
| 8             | 0.90                           | 1.86         | 1.25                              | 2.69         |
| 9             | 1.26                           | 2.68         | 1.90                              | 4.22         |
| 10            | 1.69                           | 2.87         | 2.60                              | 4.39         |
| 11            | 1.96                           | 3.22         | 3.00                              | 5.20         |
| 12            | 2.64                           | 4.46         | 4.18                              | 6.89         |
| 13            | 3.38                           | 5.57         | 5.41                              | 9.03         |
| 14            | 4.04                           | 6.61         | 6.53                              | 10.75        |
| 15            | 4.94                           | 6.79         | 8.07                              | 11.44        |
| 16            | 5.54                           | 8.02         | 9.58                              | 14.52        |
| 17            | 6.35                           | 8.63         | 11.04                             | 15.86        |
| Average       | 2.91                           | 4.73         | 4.77                              | 8.14         |

Source: Statistical Abstract of the United States, 1984;  
Dental Program, Department of Public Health and Social  
Services, Guam.

Where there is no fluoridated water available, alternative sources of fluoride include mouthrinses, dietary fluoride supplements, topical application of fluoride by dentists, and the use of toothpastes containing fluoride. A fluoride mouthrinse program, is currently being provided by DPHSS for schoolchildren in both public and private schools. During school year 1984-1985, there were 22,000 students and 33 schools involved in the program, representing 85 percent of the estimated 25,823 children aged 5 to 14 years, and 73 percent of all public and private elementary and middle schools. Guam's participation rate in the mouthrinse program is 15 percentage points higher than the U.S. rate of 70 percent.

In addition, the Public Health Dental Program employs a full-time oral health educator who is available for classroom presentations, and is creating videotapes about dental care to be viewed by Guam's television audience. The classroom presentations and the tapes cover the subjects of fluoride mouthrinsing, sealants, government-sponsored transportation between schools and DPHSS, nursing bottle syndrome, special services for the handicapped, as well as the benefits of fluorides and general oral health.



Public and private health officials alike suggest that the new emphasis on prevention and promotion programs will eventually reduce the DMF rates among children. Unfortunately, the adult population will continue to need diagnostic and treatment services, but are likely underutilize these services because of the cost and acceptability of care. The cost of dental care to self-paying patients is prohibitive; and of all those who are covered by dental insurance, it is estimated that only 20 percent actually use the services on a regular, non-emergency basis.

Utilization of services by the elderly is also low. In 1981, only 35 percent of the elderly saw a dentist. Of all older adults, 45 percent have not seen a dentist in 5 or more years, and of those with no natural teeth, 72 percent have not seen a dentist in over 5 years. The main reason is cost: 94 percent of the cost of dental care for the elderly is paid for by the individual. Most of the elderly are not on an insurance plan because dental insurance was not offered when they retired. Medicare offers virtually no insurance coverage for dental benefits.

### **Conclusion and Recommendations**

Nearly all of the available public dental services have been used by the island's children below the age of 17. Most of the services were originally restorative in nature, however the emphasis has recently been transferred to prevention and promotion programs. Nonetheless, the public health dental program has continued to focus on the school age population, almost to the exclusion of all other eligible clients.

With the recent development of dental insurance plans that cover dental care for children, the policy of free care for all children should be reevaluated. The public dental program could be better used to provide direct care to the medically indigent and senior citizens, as well as to continue its prevention and promotion efforts.

#### **GOAL 1: PROMOTE THE OPTIMUM DENTAL HEALTH OF THE ISLAND'S POPULATION.**

**OBJECTIVE 1.1.:** Make a fluoridated water supply available throughout the island by 1986.

**OBJECTIVE 1.2.:** Provide preventive care to all children below the age of 17.

#### **GOAL 2: INCREASE THE ACCESSIBILITY OF DENTAL CARE TO THE ISLAND'S POPULATION.**

**OBJECTIVE 2.1.:** Limit the preventive care and restorative treatment offered by the public health dental program to the medically indigent population, including the indigent senior population.

### **(3) Emergency Medical Services**

Emergency medical services (EMS) have been defined by federal statute to include "those services required for alleviation of severe pain, or immediate diagnosis and treatment of unforeseen medical conditions, which, if not immediately diagnosed and treated would lead to disability or death." Services are to be delivered through a well-coordinated system that incorporates 15 specific components. These include: manpower; training; communications; transportation; facilities; critical care units; public safety agencies; consumer participation; accessibility to care; transfer of patients; standard medical record keeping; public information and education; evaluation; disaster linkage; and mutual aid agreements. The discussion below addresses the island's EMS System in terms of the system's capabilities and limitations for providing emergency medical care.

#### **(a) Program Administration**

The Office of Emergency Medical Services (OEMS) is the organizational unit within the Department of Public Health and Social Services that is responsible for EMS planning and development. Based on the rules and regulations governing emergency medical services on Guam, the OEMS licenses and certifies ambulances and attendants as well.

In the past, the Office of Emergency Medical Services has placed an emphasis on rendering technical assistance to the public safety and hospital personnel that directly provide emergency medical services on Guam. This has included the development of a curriculum for training Emergency Medical Technician-Ambulance (EMT-As) and the upgrade of the emergency communication system.

The OEMS has continued its efforts towards improving the capabilities of the island's emergency medical communication, and is currently working on an implementation plan for that purpose. In addition, the Office is conducting an assessment of the overall system as part of the EMS System Plan's update. The EMS Plan will look particularly at manpower, training, transportation, facilities, as well as communication, and will be a product of the program administrators and service providers alike.

#### **(b) EMS Operations**

Guam's EMS System has been designed to provide three classes of care.

Incident Care covers the range of operations from receiving an initial call for assistance to the dispatch and completion of the first aid triage, or determination of appropriate and necessary treatment.

Transport Care involves the management and coordination of resources to assure that appropriate medical response and transport decisions are made to provide either basic or advanced life support. Such "field care" is generally provided by Fire Department ambulance personnel.

Definitive Care includes those activities in the hospital setting which range from first aid to referrals for appropriate specialized medical services. These referrals may involve local treatment at either the Guam Memorial Hospital or the U.S. Naval Hospital; they may also involve a request to transport patients off-island for treatment that is unavailable on Guam.

Incident care and transport care are provided by the local Fire Department. Since 1985 each training cycle for the Department's recruits has included basic emergency medical training. Each new firefighter is a certified EMT-A.

Definitive care, on the other hand, is given by licensed physicians, nurse practitioners, and nurses in the emergency rooms at GMH or Naval Hospital. Those patients who are brought to Naval Hospital, but who would otherwise be ineligible for medical care at a military facility, are stabilized and released or stabilized and transported to the Guam Memorial Hospital for further treatment.

### (c) System Analysis

The emergency medical system on Guam is a relatively young one, having been established in 1977. Since its inception, the program has made considerable strides in the administration and provision of emergency medical services. Among the most important achievements is the recent appointment of a full-time administrator for the Office of Emergency Medical Services. In addition, the Guam Fire Department has been established as an agency independent of the local police department. Both of these new circumstances allow for more direct, more concerted efforts to improve upon the EMS system.

#### (i) Manpower and Training

The majority of emergencies fall under two distinct phases, each of which requires specific types of personnel. The "pre-hospital phase" begins with the initial call for aid and ends with the patient's admission to a hospital emergency room. The manpower needed includes dispatchers, public safety first responders, and ambulance attendants.

The majority of pre-hospital emergency care providers on Guam are public safety personnel; they are often the first on the scene of a medical emergency. Staffing and training personnel has been and continues to be a priority with the Office of Emergency Medical Services and the fire department.

The Division of EMS in the Fire Department reported that as of June 1985 the total number of trained ambulance personnel was 55. These EMT-As are firefighters who have received basic EMT instructions as part of their preliminary training. The Fire Department then is not only responsible for providing fire protection services, but for emergency medical services as well. The firefighters/EMT-As are shuffled between roles and responsibilities without the opportunity to specialize in one area or the other.



In order to sustain the Department's capacity to provide fire protection and to strengthen its capabilities in emergency medical care, the fire-fighting personnel must become distinct from a crew of EMT-As. According to both the OEMS and the Guam Fire Department, such a change in staffing will enable specialization in the much needed emergency medical services. However, firefighters should continue to be trained in basic life support and to augment the services of specially trained EMTs during disasters involving mass casualties. (The OEMS is currently working with the Guam Community College and the Guam Memorial Hospital Authority in developing an intermediate-level curriculum and a hands-on training program.)

The "emergency department phase" consists of evaluation and care given upon admission to the emergency room. Treatment rendered during this phase is provided by licensed physicians and nursing personnel.

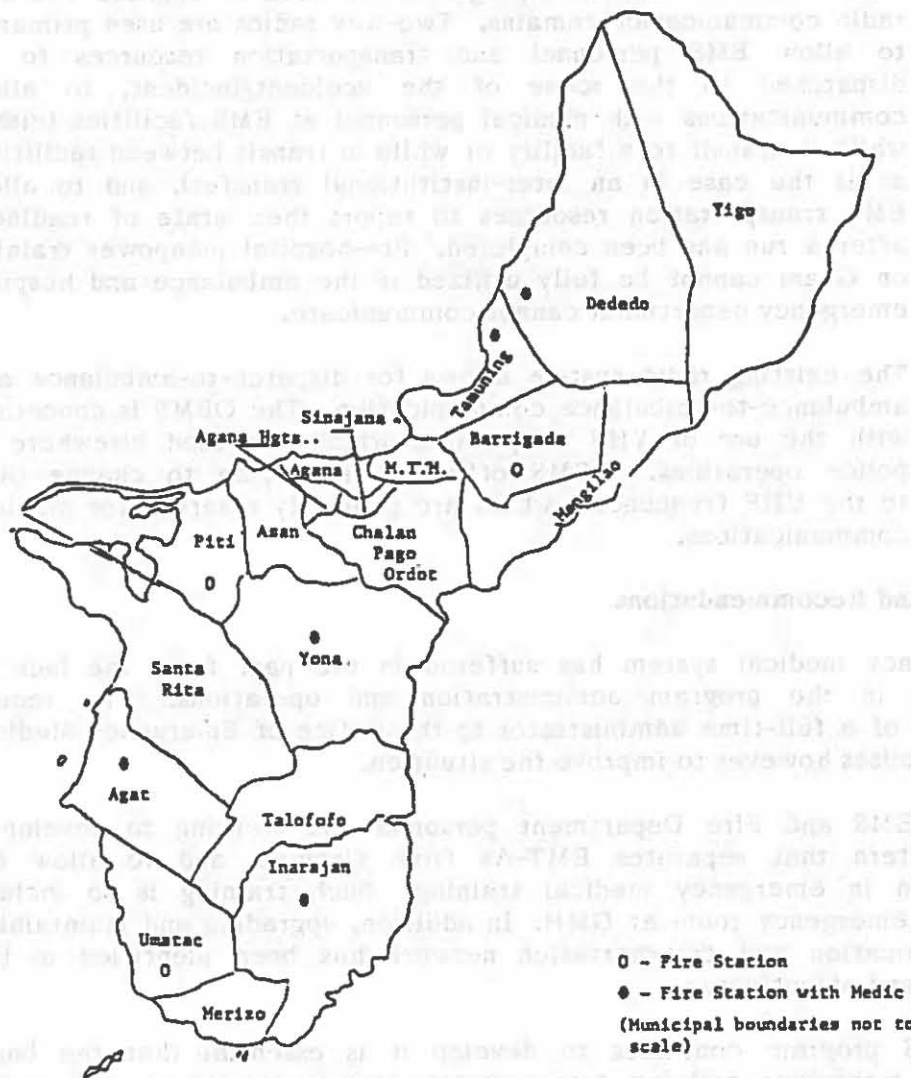
Guam Memorial Hospital Authority staffs its emergency department with a physician 24 hours a day. There are, however, private clinics that provide emergency treatment services, but only on a limited basis. Neither the hospital nor the private clinics has an emergency medicine specialist.

## (ii) Transportation and Facilities

Most patients with emergency medical conditions need to be transported from the scene of the accident to a hospital or other type of medical care facility. The only types of ground emergency vehicles available are ambulances. Currently five are operated by the Fire Department's EMS Division, all of which must meet federal specifications. The military (Navy and Air Force), also operates ambulances which assist the civilian community as necessary. In addition, military helicopters are sometimes used for emergency air transportation when accidents occur in areas that are not readily accessible by ground transportation. Air vehicles, however, are fundamental to inter-island transport and are more often than not necessary for the evacuation of critical care patients.

The Guam Fire Department has 9 substations throughout the island, but only five house ambulances. (Please See Figure 19.) While the ambulances are fairly well situated in terms of the population distribution, any one ambulance run leaves a sizeable area vulnerable to a second call for emergency care. For this reason, the Barrigada station has been designated as a back-up ambulance station; it provides emergency medical services when the remaining ambulances are operating at full capacity. Plans to place ambulances in the Umatac substation and the yet-to-be erected station in Yigo are dependent upon the availability of funds.

**FIGURE 19**  
**Location of Fire Stations and Ambulances**  
**Guam: 1985**



Source: Office of Emergency Medical Services, Department of Public Health and Social Services, Guam.

### (iii) Communication

The ability to communicate is the vital link that ties together the patient, the manpower, the transportation, and the hospital. The development of a communications network has several objectives. Among the most important ones are: easy public access to the EMS system; effective control and coordination between and among EMS resources; and effective patient management and medical supervision during the pre-hospital and, to a somewhat lesser extent, the hospital stage (especially during inter-institutional transfer).

Guam's telephone system is an integral part of the EMS system. With improvements in the capabilities of the island's telephone exchanges came the opportunity to implement the widely accepted emergency phone number 911. While this ability to use 911 on Guam certainly indicates progress, the need to upgrade two-way radio communication remains. Two-way radios are used primarily to allow EMS personnel and transportation resources to be dispatched to the scene of the accident/incident, to allow communications with medical personnel at EMS facilities (either while in transit to a facility or while in transit between facilities, as is the case in an inter-institutional transfer), and to allow EMS transportation resources to report their state of readiness after a run has been completed. Pre-hospital manpower training on Guam cannot be fully utilized if the ambulance and hospital emergency department cannot communicate.

The existing radio system allows for dispatch-to-ambulance and ambulance-to-ambulance communication. The OEMS is concerned with the use of VHF frequencies which are used elsewhere in police operations. OEMS officials are trying to change over to the UHF frequencies which are generally reserved for medical communications.

### **Conclusion and Recommendations**

The emergency medical system has suffered in the past from the lack of coordination in the program administration and operations. The recent appointment of a full-time administrator to the Office of Emergency Medical Services promises however to improve the situation.

Both the OEMS and Fire Department personnel are working to develop a staffing pattern that separates EMT-As from firemen, and to allow for specialization in emergency medical training. Such training is to include work in the emergency room at GMH. In addition, upgrading and maintaining the communication and transportation network has been identified in the OEMS goals and objectives.

As the EMS program continues to develop it is essential that the basic components, manpower, training, transportation, communication, and facilities be firmly established. This requires above all a well-coordinated effort among EMS administrators, providers, and educators.

### **GOAL 1: IMPROVE THE DELIVERY OF EMERGENCY MEDICAL SERVICES ON GUAM.**

**OBJECTIVE 1.1.:** Establish a network of coordination among program administrators, service providers, and training professionals.

**OBJECTIVE 1.2.:** Encourage the specialization of emergency medical manpower, distinct from the specially trained public safety and fire protection personnel.



#### **(4) Medical and Surgical Services**

This category includes the diagnosis and treatment of disease or ill-health conditions through medical procedures or operative techniques. The level of sophistication in the delivery of these services comprises the whole range of primary, secondary, and tertiary care. For purposes of this Health Plan, medical and surgical services exclude obstetric, pediatric, diagnostic radiology, and clinical laboratory services since they are discussed under separate sections.

The simpler and more common diagnostic and treatment procedures for general medical conditions or minor surgery are usually delivered in an ambulatory setting. Those services requiring a greater degree of care are usually delivered in the short-stay, inpatient setting. This section briefly discusses the medical services available on an outpatient basis, and focuses on surgical services offered in both the ambulatory and inpatient settings. All services discussed below exclude those provided by the military.

##### **(a) Medical Services**

Outpatient medical care services are provided at numerous clinics around the island, 17 of which are in the private sector and 4 of which are government-operated. The services include periodic health assessments as well as the diagnosis and treatment of minor illness and injury, and are offered by licensed physician-specialists and nurse practitioners.

Private clinic hours vary, but medical services are available weekdays and Saturdays as early as 7:30 a.m. and as late as 9 p.m. Services are available to both self-paying and insured patients; referrals from the Department of Public Health and Social Services are accepted as well.

The medical care provided at DPHSS clinics is primarily offered through the Women's Health Clinics, the Youth Clinics, and the Family Health Clinics. Each of these is part of the Maternal and Child Health Care Program. Accordingly, each clinic is intended to serve women, children, and young adults who cannot afford private health care or insurance. The adult male population that would be otherwise eligible for government health care is referred to clinics in the private sector; diagnosis and treatment services received are subsequently paid for by the DPHSS Medically Indigent Program.

Outpatient medical care is also available at the Guam Memorial Hospital. However, the services are generally limited to emergencies, inhalation therapy, physical therapy, and hemodialysis.

##### **(b) Inpatient Surgical Services**

The Guam Memorial Hospital offers a wide range of inpatient surgical services to the island's population. The hospital maintains approximately 77 beds in its medical, surgical, and special care units which comprise a little over half of the total acute care beds.

Table 72 displays the occupancy rates and the average lengths of stay for the period between 1980 and 1984. The average length of stay in this case is based on the proportion of total patient days to total admissions.

**TABLE 72**  
**Occupancy Rates and Average Lengths of Stay**  
**in the Medical and Surgical Units at**  
**Guam Memorial Hospital\***  
**Guam: 1980 - 1984**

|         | Number<br>Of Beds** | Occupancy<br>Rate | Average<br>Length of Stay |
|---------|---------------------|-------------------|---------------------------|
| 1980    | 83                  | 80.4%             | 8.3 days                  |
| 1981    | 79                  | 65.9%             | 6.7 days                  |
| 1982    | 79                  | 69.9%             | 6.9 days                  |
| 1983    | 75                  | 81.7%             | 6.3 days                  |
| 1984    | 75                  | 86.3%             | 6.2 days                  |
| Average |                     | 76.8%             | 6.8 days                  |

\*Includes beds in special care units, ICU and CCU.

\*\*Refers to number of beds at the beginning of each year.

Source: Medical Records Department, Guam Memorial Hospital Authority.

The average length of stay has declined overall, with a 5-year average of 6.8 days. This average however, more reflective of the medical and surgical bed stays than the length of stay in the special care units. The ICU and CCU patients have, on the average, spent 3 days in the hospital's special care units.

#### (c) Ambulatory Surgical Services

In addition to the surgical procedures that require inpatient stays, there has been a growing proportion of surgeries performed on an outpatient basis. Those outpatient surgeries requiring general anesthesia are performed either in the hospital or in one of the surgi-centers. Some of the simpler procedures (e.g., skin grafting, biopsies, setting fractures, dilatation and curettage) can and often are performed in a physician's office.

##### (i) Services in the Physician's Office

Several physicians perform simple surgical procedures in their own offices. While the aggregate number of actual procedures performed in physicians' offices is not known, one clinic estimates

that nearly 500 simple procedures were conducted within a year's time without the benefits of a surgical suite.

Some argue that the costs associated with these office procedures are much less than those incurred by operations conducted in the hospital or surgi-centers, and that the risks involved in the two types of surgeries are relatively the same. At this time, however, there are no established guidelines as to which surgical procedures may be safely conducted within a physician's office, nor whether or not emergency back-up facilities are and should be required. Likewise, reimbursement policies and patient-doctor perceptions on these office procedures are unclear.

Nevertheless, the number of surgeries conducted within a physician's office will affect the demand for outpatient surgeries done in the hospital as well as in the surgi-centers. Just as hospitals and ambulatory surgery centers are required to meet certain standards, so too must doctors who perform operations within their own offices. The costs saved in office procedures cannot substitute for the need to ensure quality.

## (ii) Services in the Hospital and Surgi-Centers

Approximately 20 percent of the surgery done at the Guam Memorial Hospital is "come-and-go surgery." Two ambulatory surgical centers provide such services as well. Figure 20 shows the proportion of ambulatory surgery performed on Guam between 1980 and 1984. While the total number of surgeries has increased only slightly from 3,773 in 1980 to 3,801 in 1984, the amount of outpatient procedures has risen more dramatically, from 719 to 1,210 during the same 5-year period.

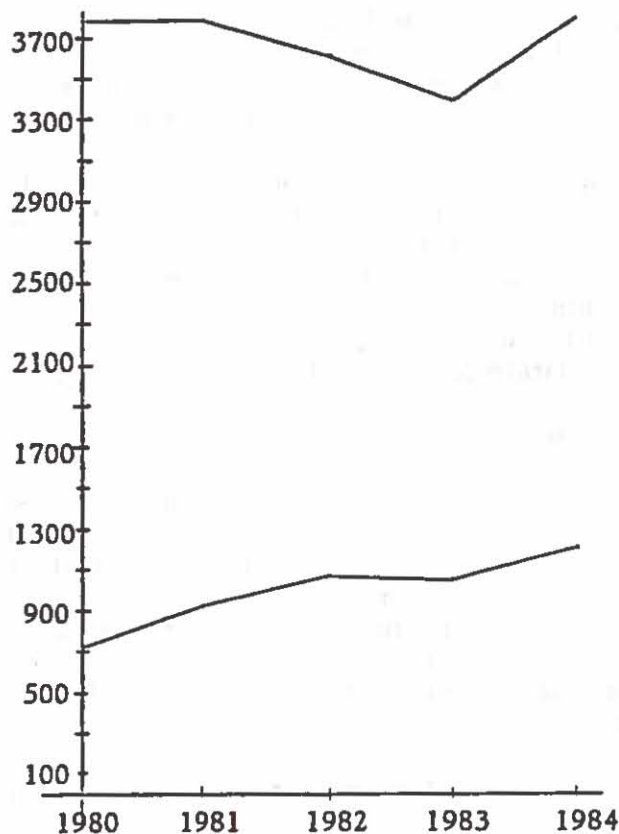
The number of outpatient surgeries performed on Guam is expected to increase along with the overall number of surgeries. In 1980, outpatient surgeries accounted for 19 percent of all surgeries; by 1984 the ratio had risen to 32 percent. It is estimated that by 1990, approximately 40 percent of all surgery will be performed on an outpatient basis. Health and government officials alike are concerned as to whether or not the current capacity for ambulatory surgery will suffice for the anticipated increase.

Based on the 5-year surgical rate of 40.49 surgeries per 1,000 population and the projected population for the year 1990, a projection for surgeries can be made.

$$\begin{aligned}
 \text{Projected Number of} &= \text{Total Surgical} \times \frac{\text{Projected Population}}{\text{Total Surgeries, 1990}} && \text{Rate} && (1990) \\
 &= 40.49 \times \frac{106,858}{1,000} \\
 &= 4,327 \text{ Surgeries}
 \end{aligned}$$



**FIGURE 20**  
**Frequency of Surgeries Performed,**  
**All Surgeries and Outpatient Surgeries**  
**Guam: 1980 - 1984**



Source: Medical Records Department, Guam Memorial  
Hospital Authority;  
Guam Health Planning and Development Agency.

Of the 4,327 surgeries anticipated for 1990, 40 percent or 1,731 of these surgeries can be expected to be performed on an outpatient basis. The Guam Memorial Hospital and the two freestanding surgi-centers have, in comparison, conducted only 1,210 ambulatory surgeries in 1984. Although the number of outpatient surgeries performed at the existing facilities is well below the expected demand for services, neither the hospital nor the freestanding centers are operating at the standard full-time 40 hours per week. The hospital currently has four surgical suites, none of which is dedicated to outpatient surgery. Instead, the hospital can only schedule outpatient surgery as the need for inpatient surgeries and emergencies will allow. Based on current utilization trends, it is estimated that, approximately 93 percent of the hospital's surgical time will be slated for inpatient and emergency surgery in 1990--leaving only 7 percent for outpatient procedures.

The ambulatory surgical centers, on the other hand, schedule procedures according to facility capabilities and doctor-patient preferences. The FHP Surgi-Center uses the hours between 8 a.m. and 1 p.m. for its surgical procedures. The remainder of the regular working day is reserved for recovery from general anaesthesia. The Dededo Medical Center schedules surgeries at the convenience of the patients and the surgeons. The operations are most frequently scheduled for early mornings and early evenings, but generally do not fill a 40-hour week.

The need for additional freestanding surgical suites on Guam will largely depend upon the number of hours of operation in the existing facilities, and whether or not procedures performed in physicians' offices will be regulated and subsequently conducted in surgical suites. If the hospital and the surgi-centers increase their hours of operation to accomodate a rising demand for ambulatory surgeries, then additional surgical facilities may be unnecessary. A decrease or retention of current working hours may, on the other hand, necessitate the development of additional ambulatory surgical rooms. If such a development occurs, then a critical review of reimbursement policies of third-party payors and the management practices of surgical facilities may be warranted.

### **Conclusion and Recommendations**

In recent years, ambulatory surgery has received much attention among health care providers. The island currently has two freestanding surgi-centers in addition to GMH, which does some of its surgery on an outpatient basis as well. Nonetheless, other health care providers are considering the possibilities of establishing additional surgi-centers. It is essential that the Guam Health Planning and Development Agency continue to monitor the trends in outpatient surgeries, since these trends will ultimately affect the need for more ambulatory surgical facilities.

### **(5) Diagnostic Radiology Services**

Diagnostic radiology services are aimed at detecting physical disease and other ill-health conditions through the use of radiant energy. All diagnostic radiology techniques are intended to provide essential information regarding the structure of internal body systems and are applied to a broad range of conditions. As is elsewhere, Guam's diagnostic radiology services fall into five categories.

General Radiology refers to the basic x-ray examination of the body. The images produced from the conventional x-ray devices are limited to the dense structures of the body, particularly the bones.

Contrast Radiology refers to the consumption or injection of radio-opaque substances in conjunction with either plain film or fluoroscopic x-rays. By inserting or injecting the appropriate fluid mixtures, the functional characteristics of certain organs and the distribution of blood in these organs can be explored. Among these are intestinal structures, the kidney and liver, the uterus, as well as the skeletal structures.

Diagnostic Ultrasound is a non-invasive method of imaging the body's internal structures by using high frequency sound waves instead of radiation (x-rays). Currently, the major application of ultrasound technology is concentrated upon studies of abdominal structures since the soft tissues are easily penetrated by sound. Ultrasounds can also produce transverse images of the brain and eyes, but thus far the use of ultrasounds for such purposes has been limited.

Computerized Tomography Scanners (CT Scanners) emit a thin sheet-like beam of x-rays that penetrate the body and are detected by ionization chambers. The detectors feed the data into a computer which constructs a 2-dimensional image of the plane's cross-section. Each cross-sectional image is collected, stored by a computer, and then reconstructed into a number of "slices" to provide a complete picture. Problems with overlapping shadows have been virtually eliminated.

Nuclear Medicine involves the use of radioisotopes and gamma cameras. Injected intravenously, certain isotopes accumulate selectively in specific organs as an indicator of function. Gamma cameras, or isotope sensors, can produce images that illustrate a body pathway, indicate the rate of an organ's function, measure the size of a body compartment, or depict focal areas of disease within an organ.

The availability of diagnostic radiology on Guam is contingent upon manpower and resources. The discussion below focuses on the capabilities and limitations of diagnostic radiology locally given the current availability of qualified manpower and equipment.

#### (a) Service Capabilities

The Guam Memorial Hospital is the primary provider of diagnostic radiology on the island. There are however four private clinics who do basic x-rays, as well as one HMO that performs conventional x-ray examinations and certain contrast studies. The HMO contracts the services of a navy radiologist, but none of the private clinics has such a specialist on staff.

The hospital employs the only radiologist that practices in the civilian health care industry; the services available at GMH are varied. Plain film as well as fluoroscopic imaging are used quite regularly. Special studies like myelograms, arthrograms, and arteriograms are also performed. In addition, diagnostic ultrasound is used not only in obstetric cases, but in studies of the female pelvis, the liver, gall bladder, aorta, thyroid, and kidneys as well.

As is the case with ultrasound, the hospital is the sole provider of CT scans. According to GMH's radiologist, mostly head scans are performed because of the limited capabilities in the existing equipment. Often the hospital's radiologist must run alternative tests, like an ultrasound or nuclear study, if a CT image is poor. If necessary, those who are unable to receive services or to obtain conclusive results locally are referred off-island to have appropriate tests done. Such referrals, however, are generally limited to patients requiring neurosurgery,



cardiac surgery, or cobalt therapy, and generally account for 5 percent of the patients seen in the hospital's radiology department.

Guam Memorial Hospital uses nuclear medicine during special examinations of the liver, lungs, bone, thyroid, and kidneys. The existing equipment, while sufficient for the time being, is expected to be replaced shortly. The new gamma camera will have nearly ten times as many detectors as the older one, and will subsequently produce images of a much higher quality than is currently possible.

#### (b) Service Limitations

Although there is an array of radiology services available on Guam, the quality of such services is limited by the amount of qualified personnel on Guam, and the capabilities of the existing equipment. As mentioned earlier, there is only one licensed radiologist that services the civilian population on a regular basis. This specialist and his technical staff perform diagnostic radiology not only for hospital patients, but also for those who are referred to the hospital by private physicians. In addition, the hospital's radiologist avails himself, upon a physician's request, to review any x-rays done outside the hospital.

Unfortunately, there are non-specialists who not only conduct x-ray examinations, but who also make diagnoses from such tests. These diagnostic services must be rendered by properly trained personnel who must be licensed accordingly. Regulations to establish the parameters within which diagnostic radiology can be performed must be developed and subsequently enforced. The regulations must include provisions for manpower and equipment alike.

The equipment that is currently used at Guam Memorial Hospital is old and outdated, but is used regularly for lack of an alternative. The CT scanner, for example takes 2 minutes for each image to be produced as opposed to the 10 seconds (or less) required in modern scanners. The images that are produced often have streaks and poor contrast resolution, which subsequently make conclusive results rare. Patients then are frequently referred off-island for services that should be offered locally.

The hospital's ultrasound device is in good working condition, but is several years old. Its primary purpose is to be used in obstetric studies and female pelvic exams. The hospital's radiologist, however, has no alternative but to use the equipment for diagnostic ultrasound on other abdominal structures and the aorta as well. The images from these latter types of studies fare poorly against imaging produced in state of the art equipment.

Clearly, the limitations of diagnostic radiology on Guam are grounded in the insufficient number of radiologists and the poor quality equipment. The possibility of improving the services offered locally rests with these same two factors: manpower and resources.

### **(c) Prospects for Future Improvement**

Guam Memorial Hospital has continuously worked towards upgrading its equipment inventory. A new gamma camera, for example, is to be installed within the year. In addition, particular time and energy has been invested in the search for a new CT scanner for the hospital. Both of these acquisitions would indicate progress, and yet there are several factors which must be considered. Hospital authorities aptly point out that the purchase and maintenance costs, the access to maintenance services, the level of contrast resolution, the manpower training required, and the recommendations of those who have used the equipment are among such considerations.

Likewise, GMH has been striving to increase its manpower capabilities. Most recently the hospital has recruited a second radiologist. This additional manpower and the improved capabilities of the hospital's equipment will greatly contribute to an overall improvement in diagnostic and treatment services on Guam.

As the hospital moves towards obtaining full JCAH accreditation, and as the health care industry as a whole looks towards the efficient allocation of resources, employing this comprehensive approach in upgrading the health system becomes essential.

### **Conclusion and Recommendations**

The capabilities and limitations of diagnostic radiology on Guam have been in direct correlation to the poor quality of the equipment and the shortage of manpower. Guam Memorial Hospital, the primary provider of diagnostic radiology services, recognize the deficiencies, and has begun to upgrade the hospital's radiology department. The hospital is expected to have an additional full-time radiologist on its staff, and to purchase a high quality gamma camera and CT scanner by the end of 1985. Both the manpower and equipment are sure to increase the amount of services that can be provided, and to improve the quality of these services accordingly.

### **(6) Medical Support Services**

There are several health care services which do not involve direct medical care, but which facilitate the provision of personal health care services. These medical support services enhance the provision of direct services at any point along the health care continuum. They include pharmacy services, laboratory tests, vision care, blood banking, facility maintenance and housekeeping, as well as administrative and medical records services. The discussion below addresses three of the many support services. (Diagnostic radiology and therapy are often included among the list of support services. Each is treated separately in this Plan. Please see Sections E.(5) and H. in this chapter.)

#### **(a) Laboratory Services**

Clinical laboratories perform various tests which aid the physician in the diagnosis and treatment of patients, and the screening of disease

as well. The tests are performed in either an inpatient or outpatient setting, and are available at both public and private health care facilities.

Most of the customary laboratory services are available in all the laboratories on the island. These services include clinical chemistry, hematology, cytology, urinalysis, immunology, blood typing (ABO and Rh), and other miscellaneous tests. Blood banking is done primarily at Guam Memorial Hospital, although the FHP Clinic and the Department of Public Health and Social Services do so on a smaller scale. Microbiology is performed primarily in the hospital or DPHSS clinics, although routine studies such as throat, blood, urine, and stool cultures are done in the private laboratories. Anatomic pathology is available solely at GMH. Specimens and cultures for unusual and seldom performed tests are sent to reference labs in Hawaii and California. However, the DPHSS laboratory serves as a reference lab for the Territory's epidemiologic investigations.

Lab services are concentrated in the Tamuning area, with DPHSS as the only exception. The private laboratories, Physician Diagnostic Laboratory (PDL) and Biopathology Medical Laboratory, as well as the public health facilities accept the privately insured, the self-paying patients, and those on public assistance. The health maintenance organization, FHP, services its enrollees primarily but does accept referrals.

The clinical laboratories are staffed by lab technologists and technicians. Neither the personnel nor the facilities are regulated or licensed by law on Guam. However, the laboratory personnel is generally certified by the American Society of Clinical Pathologists (ASCP) or other professional organizations. The lab facilities at the hospital are evaluated by the Joint Commission on Accreditation of Hospitals (JCAH), or by representatives from the Health Care Financing Administration (HCFA) in the event that accreditation is pending. Private laboratories who participate in Medicare are evaluated and certified on a regular basis by HCFA's Division of Health Standards and Quality.

In addition, the island's laboratories participate in quarterly or monthly proficiency testing. Each respective lab subscribes to an independent laboratory which then sends samples to the local lab facilities for testing. The results are returned to the proficiency testing organization and examined for precision and accuracy in test results. In return, the island's clinical labs are graded and evaluated for performance.

#### (b) Pharmacy Services

Pharmacy services on Guam are available in various settings: the local drug stores, the hospital and clinics, and in freestanding pharmacies. Regardless of the setting, the pharmacies are staffed by licensed pharmacists and pharmacy aides. In all there are 28 pharmacists and 24 aides practicing on the island.



Pharmacists are highly-trained professionals whose role traditionally has been one of health care support. In recent years, pharmacies in the U.S. have become increasingly oriented toward patient care services and this trend has led to the expansion of the pharmacist's involvement in the health care system. Pharmacists have skills and knowledge which they should be encouraged to share with patients and other members of the health care team. The pharmacist is trained to consult with the physician on the effects of given drugs on various diseases, as well as the possible side effects or reactions which may occur with certain drug therapies. Such training can be used effectively with patients as well.

The pharmacist's role on Guam has been limited to the preparation and distribution of medicinal and therapeutic products. The pharmacist is often reluctant to practice patient-oriented services, and the patient is unlikely to expect such care. However, as the role of the pharmacist in the U.S. continues to develop, the expectations in pharmacy services on Guam will change accordingly.

The island's pharmacy services can be expanded to include additional patient-pharmacist consultations at the time of dispensing drugs, monitoring of patient compliance with their drug regimen, and increased communication between the physician and pharmacist. The medical profession as a whole has moved towards diligent patient education and participation in individual health care treatment. It is essential that the pharmacist is included in such efforts.

#### (c) Vision Care

Proper eye care involves screening, diagnosis, and treatment for ocular disease and systemic disease that affect the visual system; it also includes the measurement and enhancement of the visual system's functional capabilities and efficiency as well. Guam's civilian community is currently serviced by 2 full-time ophthalmologists (and 1 part-time navy ophthalmologist), 13 optometrists, 6 opticians, and 7 optical aides. Most of the services are available weekdays and Saturdays, and all services are located in the Agana-Tamuning area.

As elsewhere, cataracts rank as the leading cause of blindness on Guam. Yet while primary glaucoma is the second leading cause of blindness in the United States, diabetic retinopathy ranks second on Guam due to the higher incidence of diabetes mellitus experienced on the island. Other leading causes of blindness include ocular injury and congenital abnormalities (ranked third), as well as macular degeneration (ranked fifth).

Ophthalmologic treatment includes all generally recognized medical, surgical, optical, and orthoptic means. The treatment providers, or ophthalmologists, are physicians who have specialized training in ocular disease in addition to the usual skills in defining refractive errors and ocular muscle imbalance.

Optometrists, on the other hand, specialize in the evaluation of the functional ability of the visual system, and in the diagnosis and treatment of refractive error with corrective lenses. Often the optometrist is the initial contact for the consumer seeking eye care, and therefore it is the optometrist who most often provides the preliminary diagnosis of ocular disease or ocular manifestations of systemic disease.

In addition to the ophthalmologists and optometrists on Guam, there are several opticians who are usually trained in vocational school programs to grind lenses and fit them into frames. Dispensing opticians, similarly trained, sell and adjust frames to the wearer. Opticians frequently work independently or for ophthalmologists and optical dispensing firms, but not generally for optometrists who dispense their own lenses and frames. Thus far, only ophthalmologists and optometrists are licensed on Guam; there are no licensure requirements for opticians.

### **Conclusion and Recommendations**

The customary medical support services on Guam are both available and accessible to those in need of such services. The personnel that provides medical support is generally well-trained, however, it is difficult to monitor and maintain the quality of care without appropriate licensure and certification requirements. As is the case with all the licensure programs, comprehensive rules and regulations for program administration must be developed and implemented. (For further discussion, please see Chapter VI.)

#### **GOAL 1: ENSURE THE AVAILABILITY AND ACCESSIBILITY OF QUALITY MEDICAL SUPPORT SERVICES ON GUAM.**

**OBJECTIVE 1.1.:** Establish appropriate licensure standards and regulations for providers of medical support services. Include provisions for continuing education in each licensure program.

### **(7) Other Health Professionals**

The delivery of health care services has traditionally been associated with physicians and nurses. In recent years, the health care industry has seen the rise of two new health professions: nurse practitioners (NPs) and physician assistants (PAs). These new health professions developed as a result of physician shortages, and enabled the limited medical manpower to provide an extensive range of services. As public and government officials began to acknowledge the existence of neglected areas in health care, the roles of NPs and PAs became instrumental in addressing problems of availability, accessibility, and costs of primary care. In addition, the new health professionals have demonstrated competence in providing chronic care, in prevention, patient education, and health maintenance. More and more, NPs and PAs raise the possibility of medical practice that is increasingly independent of physicians.



The discussion below identifies the roles of nurse practitioners and physician assistants on Guam. As health professionals and government officials explore the possibilities for the cost-effective delivery of quality care to the island's population, a closer look at these new health professionals is essential.

- (a) Nurse practitioners on Guam are, as elsewhere, registered nurses who have elected to obtain additional training in a specialty area. The training usually involves between 9 and 18 months of classroom instruction and clinical work. (The University of Guam recently held a 15-month program from which 6 NPs were graduated.) Each is certified upon the successful completion of the training and a nationally administered examination.

There are currently 8 nurse practitioners on the island, each of whom practices in one of several specialties: women's health, school health, family practice, and pediatrics. (Adult medicine, gerontology, and psychiatric mental health are three other fields available, but unfilled, for NP specialties.) The nurse practitioners work in both private and public health facilities under the supervision--direct or indirect--of a physician. The services performed generally include the diagnosis and management of common acute illness and chronic disease. Emphasis is placed on health maintenance, health education, and counseling.

At present, there is a Nurse Practice Act which addresses the advanced nursing professions, nurse anesthetists as well as nurse practitioners. The administrative rules and regulations for implementing the licensure, certification, and evaluation program have yet to be adopted. However, the drafted rules are expected to be finalized and adopted by late 1985. These rules will, among other things, define the scope of services allowed by NPs, and will enable the health industry as a whole to monitor the capabilities and limitations of this additional health care manpower. Through appropriate measures, manpower planning to ensure the quality of care in a cost effective manner can be accomplished.

- (b) "Physician assistants are trained to be interdependent practitioners under physician supervision." The training generally involves a 2- to 3-year graduate program that is offered in either a medical school or an allied professional school. The first year is primarily didactic, while the remainder of the program requires its participants to rotate through the various medical practices. Upon graduation, each PA sits for a 2-day examination. (Each certified PA is then required to fulfill continuing education requirements, as well as to sit for exams every 6 years.)

Unlike the Nurse Practice Act, there is no licensure law for PAs on Guam. Nonetheless, there is currently one physician "assistant" practicing in Guam's civilian community (who graduated with a Physician Associates degree). As a rule, the PA takes a patient's history and, unless in doubt, makes the appropriate diagnosis and treatment. In the event that a patient requires specialized care an appropriate referral to a physician is made.



## **Conclusion and Recommendations**

As the roles and responsibilities of nurse practitioners and physician assistants continue to evolve, the public and private health sectors must continue to monitor the effectiveness, safety, and efficiency of using new health professionals. Legislation that addresses these concerns needs to be enacted. The legislation must be comprehensive, it must reflect the roles of NPs and PAs on Guam, and it must be strictly enforced.

### **GOAL 1: PROVIDE FOR THE PRACTICE OF PHYSICIAN ASSISTANTS AND NURSE PRACTITIONERS IN LOCAL LEGISLATION.**

**OBJECTIVE 1.1.:** Encourage the utilization of services by physician assistants and nurse practitioners in an effort to increase the efficiency of clinical practices.

## **F. Mental Health Services**

A community's mental health services system should encompass a continuum from the most restrictive (inpatient) setting to independent living, with therapy and support systems available to those in need. The necessary manpower includes psychiatrists, psychologists, nurses, and social workers.

On Guam, there are several privately practicing psychologists, two of whom hold doctoral degrees in clinical psychology. In addition, professionals trained in the various fields of psychology or social work also provide therapy and counseling to Guam's civilian population. The military population's mental health needs are met through the Naval hospital's medical care system. On occasion, the Navy contracts with the psychologists in the civilian community for therapy through the CHAMPUS reimbursement program.

For most of Guam's population, the Department of Mental Health and Substance Abuse (DMHSA) is the sole public agency available and authorized to provide in- and outpatient mental health services. The Department was created in October 1983 through a merger of the former Mental Health and Substance Abuse Agency and the Community Mental Health Center. The central mission of DMHSA is to provide comprehensive inpatient and community-based outpatient mental health care, as well as alcohol and drug programs and services for the people of Guam. In addition, the Department is mandated to strive towards the improvement, enhancement, and the promotion of the physical and mental well-being of the people of Guam who experience the life-disrupting effects of mental illness, alcoholism, and drug abuse, as well as to those who are at risk of suffering those effects and who need such assistance. Thirdly, DMHSA is to provide such assistance in an efficient and effective manner in order to minimize community disruption and strengthen the quality of personal, family, and community life. The Department's philosophy stresses that all provided services must enhance the client's psychological, social, and economic situation as well as improve his physical well-being in order to make him a optimally functioning member of our community.

DMHSA is a Government of Guam line agency, administered by a Director and Deputy Director with the assistance of an appointed Advisory Council. DMHSA provides a multitude of services and programs through their various administrative and service divisions, each of which is discussed below.

### **(1) Facility**

The Department of Mental Health and Substance Abuse is located in the old Guam Memorial Hospital in Tamuning. It occupies the F-Wing and F-Wing Annex, where the inpatient ward is located. In general, the facility is dilapidated, and there are continuous problems with the air conditioning as well as the electrical and water heating systems.

### **(2) Clinical Services**

#### **(a) Inpatient Psychiatric Care**

The inpatient unit provides medical and psychiatric care to individuals suffering from acute psychiatric disorders and distress that require hospitalization. Since DMHSA is Guam's only public mental health facility, the 17 beds of the unit are available for a patient mix of acute and chronic mentally ill, voluntary and involuntary admissions, alcohol and drug-related cases, the mentally retarded, court-ordered criminally insane individuals, and court-ordered cases for psychiatric evaluation and treatment. Programs at the inpatient unit include milieu therapy, group, individual and family psycho-therapies, chemotherapy, participation in occupational and recreational activities, and coordination with the Aftercare/Advocare Branch for follow-up upon discharge in case social services referrals are indicated.

#### **(b) Emergency/Crisis Intervention**

DMHSA is mandated to provide 24-hour emergency care, including weekends and holidays. Clinical staff (psychiatrist, psychologist) are available on the premises or are on call at all times for the Department and the Guam Memorial Hospital Emergency Room. Services consist of immediate screening, evaluation, and intervention or treatment for patients who either call or walk in to the Department, or who are referred from GMH or other entities.

#### **(c) Outpatient Clinic Care**

The clinic provides diagnostic and treatment services to individuals, families and groups, for both children and adults, who have problems in coping with life, or who have other mental disturbances that may or may not be connected with the abuse of addictive substances. During the last year an increasing number of children and adolescents were referred to the outpatient clinic by schools and community agencies for crisis intervention and the investigation of adolescent suicide attempts.

Direct clinical services include:

- (i) Assessment on an emergency or appointment basis.
- (ii) Complete social casework and psychological evaluation as indicated.
- (iii) Rendering of psycho-therapeutic modalities including, but not limited to: crisis intervention, individual psychotherapy, co-joint marital counseling, drug and alcohol counseling, group psychotherapy with various patient populations, play therapy with children, and family therapy.

Indirect clinical services consist of technical assistance provided to other agencies such as clinical consultations, referrals, and participation in clinical case conferences.

**(d) Partial Hospitalization Day Care**

This program provides services to the chronic mentally ill patients who are discharged from inpatient hospitalization but still require close supervision and therapeutic interaction, either individually or within a group. Individual therapy focuses on reality therapy and helps the patient handle critical situations and incidents in their daily lives. Group therapies include horticultural, occupational and recreational activities, character building, skills learning, improvement of role behavior, and other activities to enhance the person's ability to function in the family unit and the community.

A number of successful programs have helped the clients of the partial hospitalization program towards recovery. Some are engaged in ground keeping and janitorial activities, for which they are paid. Others participate in the Horticultural Program, which is aimed at making Guam's "green revolution" a reality by having the clients take part in a successful experience in gardening. Each client is assigned a fruitbearing tree or vegetable plant to nurture and watch as it grows. (The plants have been donated by the Guam Department of Agriculture.)

The Natural High Company, a non-profit venture that is in the final planning stages, hopes to incorporate arts and hand crafts, as well as vending, in the skill-teaching functions of the partial hospitalization program. Pinatas, kites, and other items will be made by the clients and sold in the store. Additionally, a planned shopping center, manned by the clients of the program, will sell used clothing, books, magazines, and sundries to clients and visitors. This will allow for reality orientation therapy, equipping the clients with additional skills necessary for integration with the community.

Swim Therapy is provided 2 days a week at the swimming pool of the Naval Communication Station. Instructors certified by the American Red Cross teach water safety and swimming, and supervise all activities in the water. This program has been met with great enthusiasm by the clients.



Home visits and social services referrals are made available to all clients of the partial hospitalization program.

### **(3) Community Support Services**

These services include programs which provide various preventive, educational, and support services focused upon mental health problems and drug and alcohol abuse. Programs geared toward facilitating the reintegration process of the chronic mentally ill adults into the community through necessary support services, and establishing linkages with resources vital to their eventual independent living are also provided. The major programs are as follows.

#### **(a) Support Services**

This service component of the Aftercare/Advocare Branch is a major one which involves meeting the client's basic human needs and his or her mental health care needs, as well as recognizing natural support systems within the community and providing support services to families, friends, and others who come in frequent contact with mentally disabled persons.

#### **(b) Rehabilitative Services**

These rehabilitative services are intended to motivate and encourage clients to assume increasing responsibility for their lives. Vocational rehabilitation is included, and supportive living arrangements where clients can work toward gradual independent living, are provided.

#### **(c) Advocacy Services**

The intent of this program is to facilitate the clients' effective use of available resources. Efforts include educating and assisting the clients in making informed choices about opportunities and services, assuring timely access to needed assistance, and coordinating all services to meet clients' goals.

#### **(d) Community Outreach/Case-Finding**

This activity involves expediting the referral process by providing field assessments. The outreach efforts include mental status evaluation, consultation and education, and crisis intervention in the community.

#### **(e) Information and Education**

This program is designed to facilitate the dissemination of information regarding mental health-related problems among the community. Program personnel provides education about the causes and effects of mental illness, including drug and alcohol abuse.

#### **(f) Intervention Services**

This program addresses those high-risk segments of the community not yet experiencing mental illness or drug and alcohol problems, as

well as those beginning to confront stress situations, such as school-age children, young and/or single parents, abused persons, and low income families. Life skills training for these groups is particularly emphasized.

**(g) Prevention Services**

The aim of this program is to create alternative support structures in the community, using "natural providers," and to provide alternatives to self-defeating practices in coordination with the human resources development activities of the Research and Development Division.

**(h) Special Projects**

Various civic organizations have worked with DMHSA in raising public awareness and providing community assistance through special events. These special projects have included Holiday Hotline, which addresses the problem of drinking and driving, and the dissemination of alcohol and drug abuse information to schools and the general public through displays, oral presentations, and printed materials.

**(4) Research and Development**

The primary goal of Research and Development is the ongoing assessment of Guam's mental health and substance abuse care delivery system. The division is charged with identifying system needs and evaluating service capabilities as part of the development of a 3-year Mental Health and Alcohol and Drug Abuse Plan. Major programs are listed below.

**(a) Alcohol, Drug, and Mental Health (ADM) Planning**

The aim of this program is to ensure that the development of Guam's alcohol, drug abuse, and mental health care delivery system is consistent with the needs of the local community. The establishment and maintenance of a management information system (MIS), as well as the documentation of ADM problems, existing services which address these problems, gaps in service delivery, and recommended solutions for problems are the major program objectives. The MIS will be a tool that allows management to make more informed decisions about the delivery of services and human resource recruitment, retention, deployment, and utilization.

**(b) Human Resource Development (HRD)**

The HRD program is directed toward improving the availability, distribution, competence, and appropriate use of personnel who provide mental health services. Program efforts are concerned with both the Department's and the island's mental health workforce (professionals and para-professionals), either in private practice or organized mental health service settings. The program promotes linkages between the Department and other related service agencies, as well as institutions that educate, train, or otherwise prepare mental health personnel for the delivery of mental health services, and the natural or traditional providers throughout the community (i.e., family members, village commissioners, parish priests, suruhanos/suruhanas, and village elders).



### **(c) Quality Assurance and Evaluation**

Since evaluation is a vital and necessary component in the provision of quality health care, the major intent of this program is to plan, develop, and implement a department-wide quality assurance program. Developing departmental policies and procedures, administering quality assurance in-service programs, establishing standards to meet Joint Commission on Accreditation of Hospitals (JCAH) requirements, and evaluating the efficacy of current ADM programs and services are among the major objectives of the program.

### **(5) Staffing of the Department of Mental Health and Substance Abuse**

At this time, DMHSA is considerably understaffed. The most pressing need is for a full-time, board-certified psychiatrist, since both of the part-time psychiatrists who had, up until recently, provided care to the Department's patients have left the island. A National Health Service Corps psychiatrist has been assigned to DMHSA since Guam had been designated a Psychiatric Health Manpower Shortage Area. Guam meets the unusually high needs criteria by having a youth dependency ratio greater than 60 percent and having more than 20 percent of the population below poverty level, which puts the island into a Degree of Shortage Group 2. (R > 40,000). Satisfying this criteria qualifies Guam for the allocation of an additional NHSC psychiatrist.

The Department of Mental Health is also in need of a second clinical psychologist. Currently there is only one such position filled. Four out of 15 nursing positions are vacant; three nurse specialists and one staff nurse are being recruited. Only five out of seven psychiatric social worker positions are filled. However, the Department has a full complement (16) of psychiatric technicians. In addition, there is a full-time physician (general practitioner) to take care of the medical needs of the inpatient clients.

### **(6) Utilization/Case Loads**

During the 12-month period from March 1984 to February 1985, the various divisions and branches of DMHSA had case loads as listed in Table 73.

### **Conclusion and Recommendations**

The Department of Mental Health and Substance Abuse operates Guam's only public facility for inpatient and outpatient mental health care. DMHSA is beset by several problems. The dilapidated condition of the facility, the continuous shortage of psychiatrists and clinical psychologists, and the lack of segregation between acute psychiatric and chronic mentally ill patients, the mentally retarded, the alcohol and drug-related cases, and the court-admitted criminally insane individuals are the most pressing problems at this time.

Goals, objectives, and recommendations for DMHSA will be discussed and stated in the 3-year Mental Health and Alcohol and Drug Abuse Plan to be prepared later this year as a cooperative project between DMHSA and GHPDA.



TABLE 73

**Service Utilization at the Department of  
Mental Health and Substance Abuse  
Guam: March 1984 - February 1985**

| Services                             | Average Monthly<br>Census of Cases | Highest # of<br>Cases/Month |
|--------------------------------------|------------------------------------|-----------------------------|
| <b>Inpatient Unit</b>                | 12.2                               | 20                          |
| <b>Partial Hospitalization:</b>      |                                    |                             |
| Primary Cases                        | 35.9                               | 49                          |
| Secondary Cases*                     | 7.9                                | 13                          |
| <b>Outpatient Services:</b>          |                                    |                             |
| Adult                                | 28.7                               | 47                          |
| Adolescent                           | 13.2                               | 24                          |
| Children                             | 5.7                                | 15                          |
| <b>Emergency/Crisis Intervention</b> | 8.9                                | 16                          |
| <b>Drug &amp; Alcohol Treatment:</b> |                                    |                             |
| Methadone & Methodone Maintenance    | 9.7                                | 15                          |
| Drug Free Counseling                 | 2.0                                | 3                           |
| Alcohol Abuse                        | 3.4                                | 7                           |

\*Inpatients attending Partial Hospitalization Day Care Program in the period July 1984 - February 1985.

Source: Department of Mental Health and Substance Abuse, Guam, 1985.

### G. Chronic Care Medical Services

Chronic illness and long-term physical impairments are major health problems in the United States, as well as on Guam. This is a result of lower mortality from infectious and parasitic diseases, acute illness, and injuries; improvements in medical technology and care which prolong life for those with chronic problems; and increased social stress.

Chronic diseases can cause death in any age group; however, they are much more frequently the cause of disability and death for those aged 45 and older. Elderly persons often suffer from multiple chronic conditions; circulatory system diseases, diabetes and arthritis are particular problems of the older population.

Unlike acute illness, chronic illness is often gradual in its onset and of a lifetime duration. In some cases, chronic conditions stabilize over time. In others, the individual's condition deteriorates, sometimes with periods of stabilization or even improvement between periods of decline. Receipt of chronic care services for a particular condition does not preclude the need for preventive, acute, or rehabilitative care. A chronic condition may increase an individual's susceptibility to other illnesses and may, therefore, increase the need for and use of other components in the health care system.

Chronic care services are designed to maintain a chronically ill or disabled individual at an optimum level of functioning. Medical care and maintenance services (as described in Section I of this chapter) are necessary to control the effects of the disease or disability, prevent deterioration due to chronic conditions, and enhance an individual's ability to function as independently as possible. Chronic care medical services are provided for Guam's population by all the medical providers. In addition there are several specific programs for persons suffering from hypertension, diabetes, arthritis, end stage renal disease (ESRD), as well as lytico and bodig (ALS and PD).

### **(1) Care for Hypertension, Diabetes, and Arthritis**

The Chronic Disease Prevention and Control program (CDPC) of the Department of Public Health and Social Services provides free ambulatory chronic disease care to persons aged 18-54 with social and economic need and limited access to health services (e.g., those persons with low incomes, inadequate, or no health insurance, and those who are not eligible for Medicaid). The services focus on controlling chronic diseases, particularly hypertension, diabetes, arthritis, and gout, through treatment, education, counseling, referrals, and follow-ups for those patients meeting the criteria for services.

Seniors aged 55 and older receive the same services under the "Salud Y Manamko" program. The purpose of both the Salud Y Manamko and CDPC program is to delay the adverse effects of chronic disease. Regular check-ups are scheduled for all patients and free medication is provided for their conditions.

Only the above specified chronic diseases are treated in the DPHSS clinic. If complications arise or hospitalization is required, the patient will be referred to a physician in the community or to the Guam Memorial Hospital under the Medically Indigent Program. During 1984 there were 378 patients enrolled at the clinic; 241 received care through the Salud Y Manamko program and 137 were registered in the Chronic Disease Prevention and Control program.

The programs are funded in part by the federal Prevention Block Grant, and partly by local appropriations. Federal funds are to cover laboratory costs and pharmaceutical supplies, and local funds are to pay the salaries of the clinic physician and the administrative staff of the programs.

### **Conclusion and Recommendations**

At present, only those indigent persons with the greatest social and economic need and limited access to health care are provided with formal and organized care for the treatment of the chronic diseases, hypertension, diabetes, arthritis, and gout. Although many persons in the community are receiving similar care from private physicians, there are many persons who do not know about the importance of regular medical care for these chronic diseases, others who cannot afford them and are not aware of the free Chronic Disease Prevention and Control program, and others still who do not take their disease seriously enough to comply with the prescribed treatment regimen. Increased public awareness through health promotion and education efforts is seen as the most

important activity to lower the incidence of hypertension and diabetes, and to prevent the complications of these disease if they remain untreated.

**GOALS: AS STATED IN CHAPTER IV - HEALTH STATUS PRIORITIES, SECTIONS C AND E.**

**(2) End Stage Renal Disease (ESRD) and Chronic Renal Dialysis Services**

End stage renal disease (ESRD) refers to the state of advanced renal impairment which is irreversible and can lead to death if untreated. Once diagnosed, ESRD patients generally undergo renal dialysis for the remainder of their lives.

Renal dialysis is a process used to remove harmful waste products from the blood of persons whose kidney function is impaired or has stopped. The renal dialysis process performs the kidney's purification function. The most common form of dialysis treatment is hemodialysis which entails circulating the patient's blood through an artificial kidney machine to remove impurities caused by the body's metabolic processes. Peritoneal dialysis is another method of purifying the blood. This process introduces a chemical solution into the abdominal cavity of the patient to remove waste products from the peritoneal membranes and flush them out of the body.

Dialysis treatments can be received at home, in the hospital, or at a center. Many patients, when properly instructed, can receive their dialysis at home. This requires the necessary equipment, a trained partner, and the availability of purified water and a back-up electrical system. Home dialysis is preferred by many patients because of the increased freedom and flexibility. It has also proven to be more cost-effective. Home dialysis is most successful when initiated at the onset of treatment, as persons who have settled into the routine of dialysis at a center become dependent on the center and its staff, and are therefore reluctant to switch to home dialysis.

Dialysis at a facility or center can either be self-administered or staff-assisted. Self-care patients have been trained to dialyze themselves with minimal assistance under appropriate professional supervision. Staff-assisted patients are those who are unable to perform any of the dialysis tasks for themselves. Staff-assisted dialysis is more expensive than self-care because it requires a greater amount of staff time and supervision.

An ESRD patient usually requires three treatments per week in order to make dialysis effective and to prolong the life of the patient. Treatments normally last from 5 to 6 hours, and in some instances even longer. An ESRD patient must receive dialysis treatments for the rest of his or her life unless he or she has a successful kidney transplant. Dependency on the kidney machine becomes a fact of life and must be accepted as such.

A number of non-medical problems face the dialysis patients. There are of an economic, social, and emotional nature brought on by the changes



in employment status and interpersonal relationship with family members and friends. Furthermore, there is the immense stress of coping with a life-threatening disease.

The ESRD facility must therefore be more than just a treatment center for the disease; it must also consider the emotional, financial, vocational, and rehabilitative needs of the patients. Patient care plans at the hemodialysis facility must reflect the psycho-social and functional needs of the patient. The extent to which these needs are addressed by a facility are major determinants of the acceptability of the care and the patient's active participation in treatment.

(a) ESRD Service Provisions on Guam

(i) Hemodialysis

Guam Memorial Hospital is the only facility providing hemodialysis for ESRD patients. The hemodialysis unit is located in the F-Wing of the old Guam Memorial Hospital. At present 8 HCFA-approved dialysis stations are available 6 days a week in double-shifts of 16 hours per day.

Hemodialysis care is provided by an internist/nephrologist, who supervises a staff of 9 nurses and 6 hemodialysis technicians. All personnel have received specialized training in dialysis. There is an initial training and orientation program for new staff members, and continuing specialized in-service training for all staff members in the unit.

(ii) Utilization of the Hemodialysis Unit

The unit reported in June 1985 that it provided 82 treatments per week to 33 patients, utilizing the 8 stations in a double-shift of 16 hours per day. Of the 33 patients, 24 were staff-assisted and 9 performed self-care dialysis.

The June 1985 patient load shows an increase over the previous years. This is due to a marked rise in the incidence of cases entering the dialysis program for the first time; there were 15 new cases in 1984. More particular data are presented in Table 74. It can be seen that the number of patients entering the program is greater than the number of patients lost by attrition. (Attrition is usually a result of patient deaths, geographical relocation, and successful kidney transplants.)

(iii) Service Capacity of Hemodialysis Unit

For renal dialysis to be effective, 3 treatments per week for each patient are required. However, due to scheduling difficulties, adverse medical conditions of the patient, or unavailability of a dialysis station, a patient sometimes receive only two treatments per week.

TABLE 74

**Patient Flow in Hemodialysis Unit at Guam Memorial Hospital  
Guam: 1980 - 1984**

| Year | Number of Patients<br>in Unit at<br>Beginning of Year | YEARLY ADDITIONS |                               |                              | YEARLY LOSSES |                         |                               | Number of<br>Patients at<br>End of the Year |
|------|-------------------------------------------------------|------------------|-------------------------------|------------------------------|---------------|-------------------------|-------------------------------|---------------------------------------------|
|      |                                                       | New<br>Patients  | Transfers From<br>Other Units | Returned After<br>Transplant | Deaths        | Received<br>Transplants | Transferred to<br>Other Units |                                             |
| 1980 | 25                                                    | 11               | 4                             | 0                            | 5             | 0                       | 3                             | 32                                          |
| 1981 | 32                                                    | 7                | 1                             | 0                            | 10            | 1                       | 3                             | 26                                          |
| 1982 | 26                                                    | 13               | 2                             | 0                            | 7             | 1                       | 4                             | 29                                          |
| 1983 | 29                                                    | 13               | 2                             | 1                            | 11            | 0                       | 5                             | 29                                          |
| 1984 | 29                                                    | 15               | 0                             | 0                            | 12            | 0                       | 0                             | 32                                          |

Source: Hemodialysis Unit, Guam Memorial Hospital, 1985.

TABLE 75

**Projected Number of Dialysis Patients, Guam Memorial Hospital  
Guam: 1985 - 1990**

| Year | Estimated<br>Population | # of<br>Carry-Over<br>Patients<br>C | Projected # of<br>New Patients<br>R | Projected # of<br>New Patients Based<br>On 10% Mortality<br>.90R | # of Carry-Over<br>Patients Based<br>on 8% Mortality<br>.92C | # of Patients<br>Undergoing<br>Transplant<br>.6(.06R) | Total Number of<br>Chronic Dialysis<br>Stations Needed |
|------|-------------------------|-------------------------------------|-------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------|
| 1985 | 96,011                  | 32.0                                | 11.52                               | 10.37                                                            | 29.44                                                        | 0.41                                                  | 11.59 = 12                                             |
| 1986 | 98,089                  | 39.4                                | 11.77                               | 10.59                                                            | 36.25                                                        | 0.42                                                  | 13.65 = 14                                             |
| 1987 | 100,212                 | 46.42                               | 12.03                               | 10.82                                                            | 42.71                                                        | 0.43                                                  | 15.62 = 16                                             |
| 1988 | 102,381                 | 53.10                               | 12.29                               | 11.06                                                            | 48.85                                                        | 0.44                                                  | 17.49 = 17                                             |
| 1989 | 104,597                 | 59.47                               | 12.55                               | 11.30                                                            | 54.71                                                        | 0.45                                                  | 19.28 = 19                                             |
| 1990 | 106,858                 | 65.56                               | 12.82                               | 11.54                                                            | 60.32                                                        | 0.46                                                  | 21                                                     |

Source: Hemodialysis Unit, Guam Memorial Hospital, 1985.

At present the GMH hemodialysis unit is providing 82 treatments per week for its patients. Each of the 33 patients currently enrolled in the program receives an average of 2.5 treatments per week. With a total of 8 HCFA-approved stations in operation, this amounts to roughly 10.3 treatments per station, as compared to 6.6 treatments per station in 1982, and 7.3 treatments per station in 1983.

On two shifts per day (16 hours), 6 days per week, each dialysis station can be utilized by four patients at 100 percent capacity, assuming that patients are dialysed three times a week. If that were presently the case, only 32 out of the 33 current patients could be accommodated. Furthermore, if the DHSS standard for a 85 percent optimal use rate for hemodialysis (allowing for emergency dialysis, scheduling and back-up problems) was maintained, then the Guam unit would need at this time 9 functional stations to provide 3 treatments per week to all the 33 patients. A compromise has been reached instead by providing hemodialysis only twice a week to some patients.

(iv) Projected Further Needs

Nationally, the incidence rate of ESRD patients undergoing hemodialysis is 6/100,000 population. In 1984, Guam had an incidence rate of 15/100,000, up from 13/100,000 in 1982 and 1983. Clearly, with the rising incidence rate being greater than the attrition rate, Guam's present dialysis services will not be able to meet the future need of the island's ESRD patients.

In order to come up with a close estimate of need, several factors have to be considered:

- ...The annual incidence rate which is rising, averages to 12/100,000 over the last 5 years.
- ...Ten percent of all new patients entering the program will die during the year.
- ...The overall average mortality rate of persons receiving chronic maintenance dialysis is 8 percent annually.
- ...Six percent of Guam patients (as compared to the national figures of 20 percent) will receive kidney transplants.
- ...Of those receiving a transplant, approximately 40 percent experience graft failure and will have to return to dialysis.
- ...Chronic dialysis services should operate at 85 percent utilization.



**TABLE 76**  
**Forecast of Additional Hemodialysis Stations Needed**  
**Guam: 1985 - 1990**

| Year | Projected # of<br>In-Center Patients<br>C | Treatments<br>Required<br>Per Week | Treatments<br>Available<br>Per Week | Treatments<br>Needed<br>Per Week | Additional<br>Stations<br>Needed |
|------|-------------------------------------------|------------------------------------|-------------------------------------|----------------------------------|----------------------------------|
| 1985 | 32                                        | 96                                 | 82                                  | 14                               | 1                                |
| 1986 | 39.4                                      | 118.2                              | 82                                  | 36.2                             | 2.6 = 3                          |
| 1987 | 46.4                                      | 139.2                              | 82                                  | 57.2                             | 4.1 = 4                          |
| 1988 | 53.10                                     | 159.3                              | 82                                  | 77.3                             | 5.5 = 6                          |
| 1989 | 59.4                                      | 178.2                              | 82                                  | 96.2                             | 6.8 = 7                          |
| 1990 | 65.5                                      | 196.5                              | 82                                  | 114.5                            | 8.1 = 8                          |

Source: Hemodialysis Unit, Guam Memorial Hospital, 1985.

NOTE: **Treatments required** = # of patients x 3 treatments per week.

**Treatments available** per week = (number of stations x actual number of operating shifts per week) x expected utilization rate = 8 stations x 12 shifts/week x .85 = 82 treatments.

**Additional stations** needed is based on the assumptions of an 85% utilization rate and optimal utilization of 12 shifts (or 12 dialyses) per station per week. Stations needed = (Treatments needed ÷ optimal # of shifts per week) x actual utilization rate.  
 Example:  $18 \div 12 = 1.5 \times .85 = 1.3$ .

A formula for determining the need for chronic hemodialysis stations can, therefore, be written as follows:

$$\frac{.92C + .90R - .60 (.06 \times R)}{4 \text{ (pts. per station)} \times .85 \text{ (utilization rate)}}$$

Where:

32 = C = number of carry-over patients from the previous year.  
12/100,000 = R = annual incidence or expected number of new patients based on the estimated population.

(Note: The numerator of the formula gives you the next year's number of carry-over patients.)

Using this formula and a carry-over number of 32 from 1984, the information as shown in Table 76 is produced, forecasting need as described. If the incidence of ESRD patients increases at the same steady rate as in previous years, then by the year 1990, eight additional hemodialysis stations are needed to provide three treatments per week for all patients.

#### (b) Kidney Transplantation

A kidney transplant is the preferred alternative to hemodialysis. Transplantation is a surgical procedure that involves the removal of a kidney from a donor, preferably a patient's relative, or a cadaver, and the substitution of the donor kidney for an individual's nonfunctioning one. The major impediment to a successful transplantation is the transplant patient's rejection of the new kidney. When this occurs, the patient has to return to hemodialysis or wait to receive another donor kidney.

The chances for long-term kidney survival are 70 to 90 percent when the donor kidney comes from a sibling or parent and is well-matched. Chances for kidney survival when organs are taken from cadavers drop to 40 to 60 percent, since there is a higher risk of rejection. The ages of both the donor and the receiver of the kidney are determining factors in a successful transplantation. Additionally, such operations tend to be more successful when performed during the first year of dialysis.

A successful kidney transplant offers several advantages over life-long hemodialysis, mainly an improved quality of life due to greater energy and vitality, a less restricted diet, and freedom from the twice-weekly dialysis treatment. Kidney transplantation, if successful, is also the less costly method of treatment for ESRD patients. The one-time cost for surgery, approximately \$30,000, is about the same as the cost for 1 year of staff-assisted hemodialysis. Maintenance care, and immuno-suppressive drug therapy after surgery costs about \$5,000 per year, which is considerably lower than the costs of dialysis for the same period.

Guam's ESRD patients have access to kidney transplants. They are usually referred to the regional transplant center, St. Francis Hospital in Honolulu, Hawaii, which specializes in this type of surgery. In addition, a nephrologist who is also a kidney surgeon, comes from St. Francis to Guam regularly for the purpose of evaluating ESRD patients for possible kidney transplants. While on Guam, he also provides in-service education to the ESRD care providers, ESRD patients, and their families.

Since 1978, there were only 6 kidney transplants performed on Guam patients, a number well below the national average of 15 to 20 percent of ESRD patients receiving donor kidneys. This is due to the unavailability of living kidney donors on island, and the great distance from the nearest transplant center, St. Francis in Honolulu. All patients without a living relative donor have to register their need for a cadaver kidney with St. Francis. When a kidney becomes available, the 72-hour limit for transplantation makes it difficult, if not impossible, for a patient from Guam to make arrangements and fly to Honolulu in time to have the donor kidney implanted.

#### (c) Financial Consideration of ESRD Care

Federal policy stipulates that every person diagnosed with ESRD is to receive appropriate care regardless of his or her ability to pay. Public Law 92-603, Section 2991 was enacted in 1973, and mandates that quality medical care must be accessible to all ESRD patients, and must be provided in an efficient and cost-effective manner.

The Medicare program was charged with the responsibility of providing coverage to eligible ESRD patients under both parts A and B, subject to the standard deductibles and coinsurance conditions. Part A covers hemodialysis services in all settings (inpatient, outpatient, free-standing and home), as well as the hospital and surgical costs involved in a kidney transplant. Part B pays for services provided to patients hospitalized for routine maintenance dialysis, as well as for outpatient dialysis services provided in any dialysis facility. Part B also reimburses for the rental or purchase of equipment and necessary supplies for both transplant and dialysis patients.

Concerns about the considerable and rapidly increasing costs of ESRD services and their financial effect on the Social Security fund prompted further legislation (Public Law 95-292) in 1978. The intent of this legislation was to promote home dialysis and encourage kidney transplantation. However, Guam did not benefit greatly from this legislation as home dialysis on Guam is fairly risky and kidney transplantation is problematic due to the island's long distance from the kidney center.

On Guam, ESRD patients under Medicare pay 80 percent of the charges for dialysis. This does not include physician charges for services rendered during the dialysis sessions. Most of the Guam ESRD patients (about 70 percent) are covered under Medicare; the others are covered by Medicaid and private insurers. For those ineligible for any of these programs, the Medically Indigent Program pays for the required dialysis services and physician costs.



Since persons afflicted with ESRD have considerable out-of-pocket expenses at a time when their income is reduced, the Guam Government enacted Public Law 15-132 in 1980, which appropriated \$100,000 to the Guam Memorial Hospital Authority to provide financial assistance to ESRD patients. This amount was raised to \$250,000 in December 1982 through P.L. 16-125. The assistance rendered to ESRD patients consists of cash allowances to purchase equipment, supplies, medicine, and high protein food, as well as to pay for transportation to the hemodialysis unit. The monies were given in perpetuity and the hospital has to report to the legislature when 90 percent of the amount has been encumbered, so that a new sum can be appropriated. By making this supplemental aid available to the ESRD patients, cost is no longer an access barrier to receiving hemodialysis treatments.

**(d) ESRD Network Coordinating Council - Network 1.**

The above mentioned Public Law 95-292 also mandated the establishment of federally funded ESRD Networks and Network Coordinating Councils. Guam is part of the ESRD Network 1, which also has Hawaii, American Samoa, the Commonwealth of the Northern Mariana Islands, and the Federated States of Micronesia as members. Saint Francis Hospital in Honolulu is the designated transplant center for Network 1.

The Network Coordinating Council consists of service providers and consumers of the member islands. Regular meetings and workshops are scheduled to carry out the mandated functions of the Council, such as the formulation of a comprehensive ESRD plan, the monitoring of patient care, the coordination of training activities for ESRD care personnel, the establishment of a data collection system, and the scheduling of kidney transplants at St. Francis Hospital. The main goal of the ESRD Network Coordinating Council is to ensure that all ESRD patients are provided expert and quality care in the setting and modality which is most appropriate for each patient's individual needs.

**Conclusion and Recommendations**

Chronic or end stage renal disease is devastating to the patient and his family. The disease is costly and drastically infringes on a person's emotional and socio-economic well-being.

Federal legislation has done much to assure sound medical care, either through dialysis or kidney transplants, for ESRD sufferers. Guam's special legislation provides financial assistance to needy ESRD patients for the purchase of equipment, supplies, medicine, and high protein food or to pay for transportation. With this, all access barriers to appropriate ESRD care have been removed.

Currently the Guam hemodialysis unit is under-equipped. At least one additional station is needed to provide three treatments per week to each of the 32 clients presently enrolled in the program.

Kidney transplants are underutilized by Guam's ESRD patients. This is believed to be due to an unavailability of donor kidneys and the great distance between Guam and the Regional Transplant Center in Hawaii, at the St. Francis Hospital.

The feasibility of performing kidney transplants on Guam, and "harvesting" and preserving donor kidneys locally is currently under investigation by the island's health care providers.

**GOAL 1:** PROMOTE THE AVAILABILITY AND ACCESSIBILITY OF PREVENTION, EARLY DETECTION, AND ACUTE CARE SERVICES TO HELP PREVENT OR LESSEN THE SEVERITY OF DISEASES AND CONDITIONS WHICH CONTRIBUTE TO ESRD, THEREBY REDUCING THE NEED FOR RENAL DIALYSIS SERVICES AND KIDNEY TRANSPLANTS.

Target Population: All island inhabitants, particularly those suffering from hypertension and diabetes.

**OBJECTIVE 1.1.:** Increase provider and consumer awareness of health information regarding services related to the prevention and minimization of ESRD. (See Goals and Objectives under Chapter IV, Sections C and E).

**GOAL 2:** CONTINUE TO PROMOTE THE AVAILABILITY AND ACCESSIBILITY OF RENAL DIALYSIS AND TO IMPROVE THE CONTINUITY, QUALITY, ACCEPTABILITY, AND COST SENSITIVITY OF SERVICES DELIVERED.

Target Population: ESRD sufferers.

**OBJECTIVE 2.1.:** Support the efforts of the Guam Memorial Hospital Authority to move the hemodialysis unit to the new GMH building.

**OBJECTIVE 2.2.:** Increase the number of dialysis stations so patients can be assured of receiving 3 treatments per week, with the hemodialysis unit operations at 85 percent capacity.

**OBJECTIVE 2.3.:** Support continued federal and local funding for ESRD programs to ensure that these services are available and accessible to those who need them.

**GOAL 3:** PROMOTE AND IMPROVE THE AVAILABILITY AND ACCESSIBILITY OF TRANSPLANTATION SERVICES FOR GUAM'S ESRD PATIENTS TO REDUCE THEIR LONG-TERM DEPENDENCE ON CHRONIC DIALYSIS SERVICES.

Target Population: ESRD patients.

**OBJECTIVE 3.1.:** Continue to investigate the feasibility of performing kidney transplants on Guam.

**OBJECTIVE 3.2.:** Explore the possibility of making Guam a center for "harvesting" and preserving donor kidneys in order to increase transplant opportunities for Guam's ESRD patients.



### **(3) Chronic Care for Lytico (ALS) and Bodig (PD) Patients**

These diseases are described in detail in Chapter IV - Health Status Priorities.

At present, 31 persons suffering from lytico, and 68 persons afflicted with bodig receive their chronic medical care on a regular basis at the clinic established by the National Institute of Neurological and Communicative Disorders and Stroke (NINCDS) at the old Guam Memorial Hospital. Services consist of laboratory tests and physician visits to monitor the progression of the disease. CT scans, EEGs, and EMGs are administered as necessary. Bodig (PD) patients are also provided with free medication (i.e., Sinemet, L-Dopa compound) to control the symptoms of the disease.

The above care and services were, until recently, heavily subsidized by NINCDS. However, since the research objectives have been met, NINCDS officials has started to phase out their Guam involvement, and will totally withdraw from the island in 1986. Since care must be given on a continuous basis to the lytico and bodig patients, and since none of the major health insurers provide coverage for these diseases, the Medically Indigent Program has been charged with the responsibility of paying the expenses for all care related to these conditions.

**Note:** For Conclusions, Recommendations, Goals, and Objectives please read Chapter IV - Health Status Priorities, Section D.

### **H. Habilitation and Rehabilitation Services**

Habilitation and rehabilitation services are intended to assist the developmentally disabled individual in achieving or restoring his or her fullest physical, mental, social, vocational, and economic capabilities. This definition addresses a wide range of patients and services. The deaf, blind, mentally ill, mentally retarded, physically handicapped, and socially and culturally disadvantaged are all included in the rehabilitation target population. Services available include physical, occupational, speech, language, and recreational therapy, medical restoration, education, emotional and vocational counseling, as well as job training and placement. Not all of the patients require or receive the same services, but the same steps are included in every person's habilitation/rehabilitation process.

Step 1: Evaluation of the patient's condition and prognosis.

Step 2: Treatment and/or training.

Step 3: Referral or placement.

Step 4: Follow-up to guarantee continuation of any services needed.

Many states have combined all physical restoration services into Comprehensive Physical Rehabilitation Facilities. As yet there is no such facility on Guam. Instead, services are provided in various settings by a multitude of care givers.

#### **(1) Guam Memorial Hospital**

The rehabilitation services available at the Guam Memorial Hospital include medical restoration, as well as physical, occupational, and recreational therapy. In addition, the hospital regularly conducts patient status



evaluations for referrals to the Department of Vocational Rehabilitation (DVR), and can perform evaluations for placement testing as needed. Inpatient as well as outpatient services are offered Monday through Friday between 8 a.m. and 4:30 p.m.; all services are on a "first come first served basis."

**TABLE 77**  
**Utilization of Occupational and Physical**  
**Therapy Services at GMH**  
**Guam: 1984**

|                             | Occupational Therapy |            | Physical Therapy |            |
|-----------------------------|----------------------|------------|------------------|------------|
|                             | Inpatient            | Outpatient | Inpatient        | Outpatient |
| # of Procedures             | 514                  | 491        | 6,363            | 14,086     |
| # of Patients               | 476                  | 377        | 3,651            | 6,120      |
| # of Procedures/<br>Patient | 1.1                  | 1.3        | 1.7              | 2.3        |

Source: Guam Memorial Hospital Authority.

The habilitation and rehabilitation staff at the hospital consists of one physical therapist, three physical therapy technicians, one occupational therapy technician, one recreation supervisor, and two recreational therapy technicians. The hospital operates under a fee schedule; charges depend on the treatment ordered and the time spent. A standard charge for a 30 minute program of massage, for example, costs the consumer approximately \$17. There are no free services.

The hospital's service capabilities are limited by a lack of resources. There are several unfilled positions for physical, occupational, and speech therapists; and certain conditions, such as closed head injuries, cannot be treated because of a shortage of qualified staff and proper equipment. Moreover, no psychological counseling for the disabled is offered. As a result it is unlikely that Guam Memorial Hospital can function as the island's Comprehensive Physical Rehabilitation Facility at this time.

## **(2) Department of Public Health and Social Services**

The Department of Public Health and Social Services provides screening and diagnostic services to children under the age of 19 through its Hearing and Speech Center. Services are primarily diagnostic and include impedance screening; pure tone and impedance screening; audiological, hearing aid, and speech and language evaluations; speech and language screening; and consultant services.

During calendar year 1982, there were 1,841 patients seen; 1,004 seen in calendar year 1983; and 1,845 seen during calendar year 1984. At present, the Center is concentrating on pre-school children because of limited personnel. There is currently one of two audiologist positions filled, and one audiometrist employed.

As part of their screening services, the Hearing and Speech Center accepts referrals from other agencies and departments, such as the Department of Education. Audiological evaluation is a part of the DPHSS Home Training Program. The Center also provides referrals: if a child has been found to be hearing or speech impaired or learning disabled, the Center will refer the child to the Department of Education for evaluation and possible placement with the Special Education Program.

### **(3) Department of Education**

The Department of Education, through its Division of Special Education, offers habilitation and rehabilitation services to children from pre-school through the age of 21. These services range from identification and screening, through education and therapy, to job placement.

The identification program, Child Find, is primarily for locating handicapped children, who are either not served or underserved by the normal education process, and placing them into programs which meet their special needs. The Hearing/Speech Screening Program audiotically tests children in grades K, 1, 3, 5, 7, 9, 11, and those in resource rooms and the Juvenile Justice facility. During School Year 1983-84, 800 children failed the initial test and were referred to the Department of Public Health and Social Services for further testing and follow-up.

The education programs for the handicapped in the Division of Special Education are varied, each attempting to meet the needs of different kinds of students. The resource rooms that are utilized in most elementary and secondary schools can serve anything from a site for consulting and tutoring students who spend most of their days in a regular classroom, up to being self-contained classrooms themselves. Resource rooms are also the centers for counseling, as well as speech, physical, occupational, recreational, and emotionally handicapped therapy sessions delivered at public and private schools by the Division's 26 itinerant therapists. During SY83-84, 870 students were served by therapists and consultants. Vocational education programs for the handicapped include the off-set printing and agriculture/science programs.

Brodie Memorial School, for the more severely handicapped students, had 195 students enrolled in its programs during SY1983-84. These programs are varied and offer comprehensive training. The Respite Care Class, teaches students skills in feeding, dressing, and language utilization, while the Domestic Maintenance Class focuses on home maintenance activities such as household cleaning, laundry skills, clothing repair, and bed making. The Pre-Workshop Skills Program teaches assembling skills, and the Work Experience Programs include on-campus work experience, off-campus jobs, on-the-job training, and placement in permanent employment. During SY1983-84, 6 students were placed in off-campus jobs, 3 of whom were accepted for permanent employment.

The State School for the Deaf and Blind operates satellite programs at M.U. Lujan Elementary School, Agueda Johnston Middle School, Brodie Memorial School, and Guam Community College. During SY1983-84, 62 students were enrolled in special programs at these schools and an additional

23 with vision and hearing impairments received special itinerant teacher services in their regular school program.

An integral part of the Education Program, though indirectly related, is the transportation of handicapped students to their schools. In SY1983-84, 750 students per week were transported in the Division's eight vans, three station wagons, and two 24-passenger buses. Without this special service, many of the students would be unable to take advantage of the special programs.

Though the Division of Special Education offers the widest ranging continuing habilitation and rehabilitation services 5 days a week during the 9-month school year, it is not without its problems. Staffing shortages pose the greatest concern. In SY1983-84, 10 speech therapists had left the program. For 1984-85, there were 15 speech therapist positions filled, and only 2 unfilled, but there is no guarantee that these positions will stay filled. There is also a need for psychologists, vocational instructors, elementary and secondary special education teachers, as well as physical, occupational, language, and recreation therapists.

A second problem is that of transportation. Though the division has eight vans, three station wagons and two buses for its use, some of them are old and need to be replaced. A rotation schedule for replacement has been drawn up, but implementation hinges upon funding.

Addressing two additional needs, more vocational programs for secondary students and residential treatment centers for emotionally handicapped children, is also dependent upon funding. Thirty-three percent of the funds utilized by the Guam Division of Special Education are federal as compared to only ten percent in most U.S. school districts. With both the federal and local budgets being reduced, it is unlikely that the special education program will be much expanded during the next 5 years.

#### **(4) Department of Vocational Rehabilitation**

The Department of Vocational Rehabilitation (DVR) offers an array of services for the physically and mentally handicapped with the goal of preparing these individuals for gainful employment. These services include but are not limited to: diagnosis and evaluation (medical, vocational, and psycho-social); counseling; medical restoration (corrective surgery and therapeutic treatment); hospitalization; prosthetic and orthotic devices; eyeglasses and visual services; all aspects of vocational training (training and training materials, job placement, tools, initial stocks and supplies, and management services for small businesses); interpreter services, daily living skills instruction, and rehabilitation teacher services for the blind; transportation; advocacy and support services for the handicapped and their families; and any other goods and services necessary to render a handicapped individual employable. Other than counseling and placement, most of these services are purchased from private practitioners and facilities.

During fiscal year 1984, 58 full-time equivalent employees provided services to 724 individuals; 96 of these cases were closed as rehabilitated, for a 13 percent rehabilitation rate. This was accomplished on a budget of



\$1,042,039, comprised of 80 percent federal and 20 percent local monies. These percentages are comparable to those of the U.S. in 1980. However, the Guam rehabilitation rate was considerably lower, as the U.S. rate of rehabilitation was 62 percent in 1980.

In addition, DVR administers the Developmental Disabilities Program; and the Disability Determination Service Program; DVR also oversees the Guam Rehabilitation and Workshop Center, Inc. The Developmental Disabilities Program identifies gaps in the service network for developmentally disabled individuals who are ineligible for services by any agencies or organizations due to severe disabilities. The program is 90 percent federally funded, receiving \$135,000 in FY1984 and expecting \$160,000 in FY1985. The program served 50 clients in FY1984.

The Disability Determination Service Program is a 100 percent federally funded program based upon an ongoing contractual agreement between the Social Security Administration and the Rehabilitation Services Administration to adjudicate disability claims for the Social Security Administration. In FY1984, a total of 144 claims were processed; of these 50 percent were denied, 35 percent were allowed disability benefits, and the remaining 15 percent were either transferred to another state, discontinued, or were found ineligible to apply for disability benefits.

The Guam Rehabilitation and Workshop Center, Inc. provides vocational and work evaluation, personal and work-adjustment, and job placement to DVR clients and sheltered workers who are unable to enter the competitive labor market. In FY1984, the Center served 81 sheltered employees and 58 DVR clients.

All services to clients are free of charge, including the cost of orthotic and prosthetic devices and other special appliances. DVR pays the private practitioners and facilities who render services. Counseling and placement services are available at DVR from 8 a.m. to 5 p.m. weekdays; all other services are available at the discretion of those offering them.

#### **(5) Department of Labor - Guam Employment Service**

The Guam Employment Service (GES) of the Guam Department of Labor acts as a job market for all those seeking jobs, including the handicapped. It has no organized program for servicing the handicapped, but offers job counseling to prepare them for entering or re-entering employment. Counseling is offered 5 days a week, from 8 a.m. to 5 p.m.

As a pre-requisite for many federal grants, the Guam Employment Service is required to have at least one person equipped to handle the needs of handicapped applicants. They are also required to meet a parity placement level of 30 percent: that is, at least 30 percent of their job placements must be handicapped. The monthly parity level has been ranging from 12.5 to 50 percent. A top priority at present is the placement of disabled veterans.

For employment service purposes, the GES utilizes a long list of handicapping conditions which range from missing digits and limbs, blindness, and

respiratory impairments, to being a law offender, alcoholic or drug addict. Based on this list of barriers to employment, the handicapped specialist at GES estimated that Guam has a population of 3,000 to 5,000 handicapped persons of employment age, not including those with hypertension.

Two main barriers to effective utilization of the handicapped remain: fear and money. Potential employers are hesitant to hire handicapped workers because of their perceived limitations and misunderstanding of the prospective employee's handicaps. Some handicapped employees have low self-esteem, little self-confidence, and often refuse positions or fail to show up for interviews. These are areas in which counseling may help. Budget constraints limit the GES to only one person who can concentrate on job placement for the handicapped, and limits the available jobs. No expansion of the counseling program is expected in the near future.

#### **(6) Western Pacific Association of the Disabled (WPAD)**

The Western Pacific Association of the Disabled (WPAD) was founded on Guam in 1984 in an attempt to give the disabled a more active voice in their lifestyles. Anytime a person falls through the "helping net" of services to the disabled they come to WPAD. The services offered by WPAD range from arranging treatment to finding employment for the disabled. "Too often," says founder Patricia Botten, "the disabled, especially [those disabled] from birth, have been programmed to rely on their caretaker's advice rather than assimilating and directing their own lives." WPAD is attempting to establish jobs for the disabled, to the extent of beginning their own company. The Association has been instrumental in employing 27 persons in permanent full-time jobs since its inception.

Another WPAD activity involves parking rights for the disabled. The Association is working with the Jaycees and the Police Department to paint handicapped parking spaces and to issue parking tickets for those who park in those spaces illegally. WPAD hopes to issue "handicapped person" stickers so that the handicapped who do not drive can give them to their drivers. The Association is also actively involved in planning the Disabled Persons International World Conference, which is scheduled to take place on Guam in 1988. One of the main themes of the conference is prenatal care and the prevention of disabilities.

One of the problems that the Association has encountered is lack of money. WPAD supports all of its activities through public fundraising and donations. When at all possible, recipients of the Association's help pay it back, but this is not required, (nor is it always possible). Because of this, services beyond counseling and job placement are often on a case-by-case emergency basis.

#### **(7) FHP, Inc. - Guam Medical Center**

The FHP Guam Medical Center (FHP-GMC) offers physical therapy treatments on an outpatient basis, usually between the hours of 8 a.m. and 5 p.m. on weekdays. There is one physical therapist on staff; and during calendar year 1984, FHP-GMC supplied 2,294 physical therapy treatments.



FHP-GMC accepts physical therapy referrals from all doctors on island. If a patient has FHP insurance, the treatments are covered by the plan. Members of any other insurance plan must clear the payment process with their insurance company.

If a patient has no insurance, therapy is offered on a fee-for-service basis. A standard visit of from one-half to one hour costs the patient from \$15 to \$25. This visit may include whirlpool treatment, heat or ice packs, bandaging, wound care, elective muscle treatment, gait training to teach a prosthesis user to walk, exercise therapy, ultrasound, rehabilitation exercises, or any combination thereof. FHP-GMC does not supply or fit special appliances such as orthotic-prosthetic devices or hearing aids, but they do order appliances for patients from a Hawaii supplier, and will recommend a hearing aid supplier on-island. They will also train the recipient in the use of the device, and offer counseling to the recipient's family.

Having only one physical therapist on staff could result in slow delivery of services or the refusal to accept new patients because of limited manpower resources. However, the physical therapist at FHP does not see this as a problem at present, everyone who requires or requests treatment receives it. As treatment is supplied only on an outpatient basis, there is no tie-up of manpower on maintenance care activities, and all resources can be devoted solely to therapy.

### **Conclusion and Recommendations**

Habilitation and rehabilitation services available on Guam can and do serve all sections of the population. They can begin before a disabled child enters school, and can last all the way through his adult life. The services can help provide the disabled person equal education under the law, assist him in acquiring job skills and finding a job, and can help him to overcome the psychological and social barriers present in everyday life. Habilitation and rehabilitation providers offer medical care and counseling to those newly disabled, those disabled from birth, as well as to family members. The services are offered in both the private and public sectors, and while some are based on the person's ability to pay, no services are refused to those who need them and are unable to provide financial compensation.

The major shortcomings of all services presented here are financial in nature. The extent of services is constricted by budgetary restraints, and no expansion of any services is planned in the future. Maintaining the present level of services offered is all that can be reasonably expected for the next 5 years.

In addition to the funding problems, is the fragmented network of services. While the Departments of Education, Public Health, and Vocational Rehabilitation, as well as the Guam Memorial Hospital all share a referral system, the duplication of their efforts in screening for disabilities and the absence of a central location for the screening process, as well as rehabilitation, counseling, and training causes some disabled persons to fall through the cracks of the rehabilitation net. Some persons are forced to travel from place to place for the different steps of the evaluation and training cycle, and as many disabled do not drive, they must rely on a caretaker to transport them. This



in itself has a discouraging effect on the disabled person's sense of independence. A central facility for the medical, physical, emotional, and vocational habilitation and rehabilitation of the disabled may be a goal to strive for in the future.

A third problem encountered on the island is the lack of training facilities and programs in the rehabilitation field. The University of Guam has a Communications Disorders program offered through its College of Education to train speech-hearing clinicians, but there are no other programs available. Any training necessary must be done off-island. Because there is no pool of trained personnel locally, oftentimes positions remain vacant for years until off-island personnel can be recruited for jobs.

**GOAL 1: PROVIDE FULL RANGE OF CULTURALLY RELEVANT AND ACCESSIBLE SERVICES FOR PHYSICALLY AND DEVELOPMENTALLY DISABLED PERSONS THROUGH A COORDINATED SYSTEM OF PUBLIC AND PRIVATE PROVIDERS WHICH EMPHASIZES COMMUNITY-BASED DIAGNOSIS AND TREATMENT.**

Target Population: Disabled and handicapped persons on Guam.

**OBJECTIVE 1.1.:** Upgrade and expand physical therapy, occupational therapy, and speech therapy services.

**OBJECTIVE 1.2.:** Under the auspices of the University of Guam, establish a pool of qualified on-island personnel through in-service training programs conducted and taught by local and/or off-island professional rehabilitation specialist.

## **I. Long-Term Care**

Long-term care refers to a continuum of interrelated health and social services. This encompasses both institutional and non-institutional services and requires coordination of public policies, funding, and case management to provide appropriate options for services to individuals whose needs inevitably change over time. Long-term care is intended to provide the individual users with choices among a variety of services, used singly or in combination, that will minimize the disabilities of chronic disease or debility, support as independent a lifestyle as is practical, and prevent further complication of chronic health conditions.

Long-term care and services can be provided in a facility, in a community setting, or brought into the homes. Sometimes services move from one setting to another, or overlap. Medical chronic care and rehabilitation services have been discussed in previous sections of this chapter; institutional, community, and home services are detailed on the following page.

**(1) Long-Term Care on Guam**

| Service or Program                                               | Available | Provided By                           |
|------------------------------------------------------------------|-----------|---------------------------------------|
| <b>Institutional Setting:</b>                                    |           |                                       |
| Acute Care                                                       | Yes       | GMH                                   |
| Skilled Nursing Facility (SNF)                                   | Yes       | GMH                                   |
| Intermediate Care Facility (ICF)                                 | Yes       | GMH                                   |
| Supervised Residential Facility (SRF)                            | No        |                                       |
| <b>Institutional or Community Setting:</b>                       |           |                                       |
| Respite Care                                                     | No        |                                       |
| Hospice Care                                                     | No        |                                       |
| <b>Community Facilities/Programs:</b>                            |           |                                       |
| Congregate Housing                                               | Yes       | GHURA                                 |
| Residential Living                                               | Yes       | Guma Mami                             |
| Senior Centers                                                   | Yes       | SPIMA                                 |
| Congregate Meals                                                 | Yes       | G.E.                                  |
| Transportation Services                                          | Yes       | SPIMA                                 |
| Information and Referral                                         | Yes       | DSC/DPHSS                             |
| Case Management                                                  | Yes       | CSS                                   |
| Legal Services                                                   | Yes       | GLS                                   |
| Senior Employment                                                | Yes       | SCSEP/Dept.<br>of Labor               |
| Supplemental Assistance<br>(cash benefits, foodstamps, Medicaid) | Yes       | DPHSS                                 |
| Housing Assistance                                               | Yes       | GHURA                                 |
| Senior Day Care                                                  | No        |                                       |
| <b>In-Home Services:</b>                                         |           |                                       |
| Homemakers/Health Aides                                          | Yes       | CSS                                   |
| Homebound Meals                                                  | Yes       | G.E.                                  |
| Visiting Nurses                                                  | Yes       | DPHSS, FHP                            |
| Companion, Escort, and Friendly Visits                           | Yes       | Interfaith<br>Volunteer<br>Caregivers |
| Foster Care                                                      | No        |                                       |

The above tabulation gives an overview of services or programs available in a variety of settings to Guam's elderly or handicapped.

**(a) Institutional Care**

All institutional care is provided by the Guam Memorial Hospital Authority. Acute care is provided in the new hospital. The Skilled Nursing Facility and Intermediate Care Facility are located in the old hospital, on the 5th and 6th floors respectively. There are 35 beds reserved for SNF level care, and 36 beds for intermediate and custodial care.

To date Guam has not established an organized nursing home. The 5th and 6th floor assume this function on an informal basis, since it is the only place where the island's displaced old, frail, handicapped, or mentally incompetent people are cared for. There is usually a 100 percent occupancy rate and patients spill over from one floor to the other, and sometimes into the new hospital. This makes for inappropriate placement at the different care levels. Nevertheless, there is a long waiting list of people to enter the ICF, and in an emergency the hospital has always accommodated those who can no longer live alone and have no one to care for them.

**(b) Community Services**

These services generally favor the more able-bodied and ambulatory seniors on Guam. Most of the services are provided through the federal Older Americans Act, Titles III and IV, which are administered by the DPHSS Division of Senior Services (DSS). The Division provides all administrative functions for the services as well as the Information and Referral Program for Seniors. The other services are contracted to providers in the community.

The Guam Association of Retired Persons (GARP), for example, operates the 16 Senior Centers around the island. Its subsidiary, SPIMA (Servicio Para Manamko), provides transportation services for Guam's elderly and handicapped persons in mini-vans designed to accommodate wheelchairs. General Enterprises is contracted by DPHSS to prepare meals for those at the Senior Centers and for the homebound clients as well.

Housing assistance for needy seniors and disabled persons is provided by the Guam Housing and Urban Renewal Authority (GHURA) through its Section 8 program. GHURA developed Guma Trankilidad, a housing project specially designed and built for able bodied seniors, and has plans for similar housing developments.

Legal aid for the elderly and disabled are available through Guam Legal Services, and job training and placement for seniors are offered through the federally funded Senior Community Services Employment Program (SCSEP). Those needy elderly or disabled persons who are unable to work are assisted through the Food Stamp Program, cash payments under Old Age Assistance or Aid to the Permanently and Totally Disabled, and the Medicare of Medically Indigent Program.

In addition, case management is available for persons who can no longer take care of their own affairs and who need assistance in obtaining social or medical benefits. Catholic Social Services is contracted by the Division of Senior Citizens to provide case management to Guam's seniors, which includes referrals to appropriate agencies or programs, and follow-ups on such referrals.

**(c) In-Home Services**

Home health care is provided by nurses (RNs, LPNs, nurses' aides) from the DPHSS Bureau of Community Health and Nursing Services, who



visit bedridden patients at home and tend to their medical needs. The nursing services are augmented by home visits from the Catholic Social Services Homemakers/Health Aides who perform light housekeeping, meal preparation, and personal care services. Medicare, Medicaid, and private insurance companies reimburse for services rendered by the Bureau; and the Homemaker/Health Aide Services are funded under Title III of the Older Americans Act.

FHP, Inc. and Health Maintenance Life (HML), both HMOs, offer home nursing services as well. These services are available to FHP and HML subscribers in need of home health care.

The Interfaith Volunteer Caregivers program was recently established to provide friendly visits and escort services to the frail and disabled. This pilot program is funded by the Robert Wood-Johnson Foundation and relies on volunteers from various religious denominations in the community. The program intends to promote the social and emotional well-being of shut-in and isolated persons through regular visits, or to provide a few hours of respite for the regular care giver.

## **(2) Gaps in the Continuum of Long-Term Care Services**

The previous sections examine long-term care services provided to Guam's frail elderly and handicapped persons. Institutional long-term care at the intermediate and custodial level is inadequate in terms of setting as well as availability. In the next 5 years, the demand for such services will rise sharply, since the number of civilian persons 55 years and older is expected to increase from 9,677 to 12,223, and those aged 65 and older are expected to increase from 3,423 persons to 5,040 persons in 1990.

St. Dominic's Senior Care home is scheduled to open its doors to patients in mid-1986, and will be able to accommodate the expected number of frail and disabled persons in true need of institutional care, either at the intermediate or the supervised residential care level. However, institutionalization should take place only as a last resort. Every effort should be made to retain a person at home in his familiar surroundings as long as possible.

Yet changes in Guam's society have limited the possibility of keeping the elderly and disabled at home. The traditionally close-knit extended family unit has been replaced by nuclear ones. Most of the seniors with families on Guam have adult children who work full-time and cannot afford to forego employment and income in order to stay at home with the aging or disabled parent(s). The elderly without families have no choice but to live on their own. As a result the able-bodied elders are left to care for themselves at home; those who need constant care and supervision are placed on the waiting list for admittance to the Intermediate Care Facility at the hospital.

The choice between caring for oneself at home or being admitted to ICF need not be the only choice. Other communities, faced with similar problems, have ameliorated them by implementing services that are designed to help a family with the care of a frail or feeble relative while allowing family members to work, or to provide a family for a single, older person.

Senior or Adult Day Care, Foster Care, Respite Care, and Hospice Care have become successful alternatives to institutionalization. Additionally, in-home services have been increased and cash incentive have been offered to provide support to families willing to care for their elders at home. Each of these programs has been developed to prevent early and inappropriate institutionalization, as well as to provide a less costly alternative to institutional care.

**(a) Senior Day Care**

Senior day care centers have been in the mainland United States and the European countries for many years, and enjoy great success. These centers provide a level of care for senior citizens who are no longer capable of remaining in their home environment unattended, but do need 24-hour institutionalization. A day care center offers a person a therapeutically structured day while allowing him or her to remain within the community for as long as possible. Responsibility for the elderly in the evenings and on weekends remains with the family, thus perserving close family ties and preventing institutionalization.

Senior day care has been contemplated by Guam's care providers for many years. Several studies have shown that such care is needed, is appropriate, and would be acceptable to the island residents. The lack of a suitable facility and funding for the day care center operations have, however, prevented senior day care from becoming a reality.

**(b) Family Foster Care for Seniors**

Family foster care provides frail elderly and handicapped individuals an alternative to ICF or nursing home care by placing individuals in family settings. Usually, appropriate social and medical support services are provided as a component of the program.

Foster families are recruited from the community and are screened extensively for suitability. All families found acceptable must successfully complete the family care training. The training covers practical aspects of caring for a handicapped or elderly person at home, including personal hygiene, bladder training and incontinence care, skin care, exercise, special diets, nutrition, and medication. Comprehensive Family Care Manual is provided during training and can be used for further reference.

**(c) Cash Incentive Program**

This program would function similarly to the Foster Care Program, but the caregivers of the frail or disabled persons would be relatives who have elected to quit work or stay unemployed in order to take care of the relative at home. Training and supervision would be the same as in the Foster Care Program; and the families would receive cash support for the provision of full-time care at home.

**(d) Respite Care**

Respite care offers short-time relief from patient care, ranging from a few hours to several days, to families and caregivers. This relief



time is intended to avoid or delay institutionalization, by lending professional support to the caregivers and ameliorating the problems that result from the constant strain of caring for a sick or disabled person. Respite care can either be provided in the home by a person temporarily moving in, or in a facility which is organized to provide such services. On Guam, such services will be particularly helpful to those people who need to travel off-island for medical or family reasons, and who have no one to look after the patient during their absence.

#### (e) Hospice Care

The concept of hospice care for the terminally ill is relatively new, but has found great acceptance in a short time both in Europe and the United States. Hospice involves the skilled and compassionate care of the dying and their families. Hospice is a program rather than a facility. It can function as a home care program or as a department in a hospital. The program is designed to give a patient a choice as to his place of dying. If he or she wants to die at home, then the support services of a multi-disciplinary team of physician, nurses, social workers, and hospice volunteers will help the patient and family to do so. Should the care at home become too difficult, then the patient can be moved to the hospital, with the same multi-disciplinary team following him.

Guamanian families draw together and support each other when one of their members dies. Rituals have been established over the centuries that are comforting to the bereaved and ease their mourning. However, there are now many non-Guamanians residing on island, many of them without family support. For these persons, a hospice program becomes a necessity, as well as a less costly alternative to hospitalization. As Medicare now pays for hospice services, Guam's health care providers are exploring the feasibility of adding hospice care to the island's long-term care continuum.

### (3) Financial Considerations in Long-Term Care

Long-term care is costly care. High costs are incurred by a population with proportionally small incomes. A crisis in the financing of long-term care has developed in the United States due to an increase in the number of aged and an increase in longevity. People live longer, have more chronic diseases, and need more costly care.

#### (a) Funding Sources

In the mainland, institutional long-term care is primarily financed by Medicare, SSI (Supplemental Security Income) and Medicaid. Very few health insurance companies cover expenses for long-term care in institutions. On Guam, long-term care services are financed through various programs. A list of services and their funding sources are presented on the following page.

Long-term services provided in the home are reimbursable through Medicare and Medicaid, as well as by most HMOs and third-party insurers. In-home services, such as the Homeaker/Health Aide programs, are



financed by Title XX funds and Title III, Sections B and C of the Older Americans Act. Each of the homecare services has proven to be considerably more cost-effective than institutional care.

Senior day care is an optional service provided under Medicaid and reimbursed under SSI Title XIX if the senior day care center follows a medical model. For a social model of day care, Title XX monies are used. In addition, Title III-B monies for nutrition can be combined with the above funds.

Foster care for seniors is usually funded by the Titles XIX and XX monies with local supplements. Community-based long-term care activities are mostly provided through the Title III monies, augmented by local funds, or are financed through philanthropic grants. Hospice care is reimbursed under a special provision of Medicare, and some HMOs and third-party payers have added such care to their benefits package.

| Service or Program                                 | Financed by:                                                                          |
|----------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Institutional Setting:</b>                      |                                                                                       |
| Acute Care                                         | Insurers, Medicare, Medicaid, MIP                                                     |
| Skilled Nursing Facility (SNF)                     | Insurers, Medicare, Medicaid, MIP                                                     |
| Intermediate Care Facility (ICF)                   | Self-pay, Government of Guam<br>General Funds                                         |
| <b>Community Facilities/Programs:</b>              |                                                                                       |
| Congregate Housing                                 | GHURA                                                                                 |
| Residential Living                                 | Guma Mami, Inc., Government of<br>Guam General Fund and Terri-<br>torial Lottery Fund |
| Senior Center                                      | Federal Title III-B (OAA)                                                             |
| Congregate Meal                                    | Federal Title III-C (OAA)                                                             |
| Transportation                                     | Federal Title III-B (OAA)                                                             |
| Information and Referral                           | Federal Title III-B (OAA)                                                             |
| Case Management                                    | Federal Title III-B (OAA)                                                             |
| Legal Services                                     | Federal Title III-B (Government<br>of Guam)                                           |
| Senior Employment                                  | Federal Title V                                                                       |
| Supplementary Assistance                           | Federal and Government of Guam<br>General Funds                                       |
| <b>In-Home Services:</b>                           |                                                                                       |
| Homemakers/Health Aides<br>for Seniors             | Federal Title III-B (OAA)                                                             |
| Homemakers/Health Aides for<br>the Disabled        | Federal Funds                                                                         |
| Visiting Nurses - Home Care<br>Program             | Medicare, Medicaid, CHAMPUS,<br>Insurers, and Government of<br>Guam General Fund      |
| Companion, Friendly Visits,<br>and Escort Services | Robert Wood Johnson Foundation                                                        |

Due to a large influx of federal monies, Guam's community services for seniors are available to every person over the age of 55, except for the meal programs which require a minimum age of 60. A total of \$2,321,583 was available in 1985 for Guam's seniors, of which 75 percent was derived from Title III-B and Title III-C monies of the Older Americans Act.

Funds for the Companion/Friendly Visit/Escort Services provided by Interfaith Volunteer Care Givers are part of a 3-year grant from the Robert Wood Johnson Foundation. The grant monies are to be used for providing services to Guam's disabled, frail, and feeble persons, using volunteers from every religion denomination on island.

#### (b) Funding Problems

Lack of financial resources is not an access barrier to in-home services for any Guam senior; however, the current programs are understaffed and cannot meet the existing demand for home care nursing and in-home support services. The financing of institutional long-term care, on the other hand, presents a major problem for individuals, families, and the community at large. No federal support monies are available for any care below the SNF level. Medicaid under Title XIX and Supplemental Security Income funds are used in the U.S. mainland to provide supervised residential care and intermediate nursing care for the physically and mentally disabled and frail. Guam receives neither Medicaid nor SSI monies for these purposes.

The Guam Memorial Hospital has functioned as Guam's unofficial nursing home, providing services not only to those requiring intermediate nursing care, but also custodial care for persons who either had no one to care for them or whose families were unable or unwilling to retain and care for them at home. The extended care services were paid for by subsidies from the Government of Guam's General Fund. Approximately \$700,000 had been spent yearly for care at the ICF.

In 1984 the Guam Memorial Hospital Authority announced that it would no longer request any subsidies from the Government of Guam General Fund, and that the hospital could no longer provide "free" care to the medically indigent and those patients receiving care at the ICF on the 6th floor of the hospital. Instead, hospital officials referred to Guam's Public Law 15-139, the Senior Citizen's Act of 1978, and in particular Section 9988(e), which states that one of the primary functions of the then created Division of Senior Citizens (under DPHSS) is

"--- to plan, oversee, coordinate, or implement programs and activities for health care (of the elderly) including but not limited to the medical, health, and social services and special homes for the aged."

As a result, the Governor passed Executive Order 84-2 in February 1984 and assigned responsibility for the ICF patients to the Department of Public Health and Social Services. (This action concurs with the Long Range Institutional Plan of the Guam Memorial Hospital Authority



which calls for the transfer of responsibility for the ICF to the DPHSS-Division of Senior Citizens.) Since DPHSS has no staff or facility to provide direct institutional care to the ICF patients, the Guam Memorial Hospital Authority continues to provide appropriate care to the patients on the 6th floor to ensure their well-being. However, DPHSS is expected to pay for these services.

With this transfer, the hospital hopes to solve two major problems: the elimination of uncollectable hospital fees for the care of the frail and feeble, and equally important, to regain JCAH accreditation. As GMH plans to move its Skilled Nursing Facility to the new hospital campus, and the ICF has been transferred to DPHSS, major obstacles to reaccreditation will have been removed.

### **Conclusion and Recommendations**

Providing and financing long-term care have become major issues both nationally and on Guam. Greater longevity, change in family composition, increased rates of inflation, high costs of living, and the increasing number of working women have all contributed to the growing problems of long-term care.

Among these problems is the increased need for institutional care. For some persons, institutionalization is necessary. However, for the majority of disabled and frail elderly, long-term services need to be planned and provided in such a manner that the individuals will receive coordinated, comprehensive quality services. The services should include:

- Adequate, supervised, residential care for those who lack families but want to live in their communities.

- Special services for those who live at home but need help from outside; for example, transportation or shopping assistance, or help with meals and personal care.

- A range of alternatives between the hospital and the nursing home, including a system of home health care, senior day care, or foster care.

- Innovative and compassionate ways of caring for the terminally ill outside the traditional hospital or nursing home.

Guam has already established a wide array of long-term services. There are some gaps, however, in the continuum of care, which should provide services for all levels of need, from those of the minimally dependent to those needing total care. In-home services, such as home care nursing and homemaker/health aide services, must be increased in order to make a noticeable impact on the length of stay in hospitals and long-term or lifetime institutionalization. Those in need of institutional long-term care must be placed in appropriate facilities.

In 1986, GMHA hopes to have completed the renovation necessary to move all SNF patients to the new hospital. At the same time St. Dominic's Senior Care Home will be ready to accept patients and clients for intermediate or supervised residential care according to their needs.

With appropriate facilities established, steps towards financing long-term care must be taken. Major efforts must be made to secure an increase of



Guam's Medicaid allocation to allow for the payment of intermediate nursing care; and less costly alternatives to institutionalization, such as Senior Day Care, Foster Care, and Incentive Pay for Relatives, must be provided. In addition, financial responsibility for long-term care must be delineated by determining whether or not adult offsprings are liable for the cost of care for their parents.

Local and federal resources allocated for health care are no longer sufficient to meet the rising demands of a grown population. Only where able individuals assume greater responsibility for their well-being and the cost of health care, will a community be able to provide appropriate health care services to all its members in an equitable fashion.

**GOAL 1: PROVIDE LONG-TERM CARE FOR DISABLED AND FRAIL PERSONS IN A SETTING WHICH PROTECTS THE INDIVIDUAL AND PREVENTS THE DETERIORATION OF PHYSICAL, MENTAL, AND SOCIAL CONDITIONS WHILE ENABLING THE INDIVIDUAL TO MAINTAIN THE HIGHEST DEGREE OF INDEPENDENT LIVING AND COMMUNITY PARTICIPATION.**

Target Population: Guam's disabled persons and all of the senior population.

**OBJECTIVE 1.1.:** Promulgate Rules, Regulations, and Standards for the provision of

(1) Intermediate Care

(2) Supervised Residential (Nursing Home) Care

(3) Senior Day Care

(4) Foster Care for Seniors

**OBJECTIVE 1.2.:** Provide Skilled Nursing Facility and Intermediate Care Facility in facilities approved by the Joint Commission on Hospital Accreditation and the Health Care Financing Administration.

**OBJECTIVE 1.3.:** Investigate feasibility of Adult Day Care and Senior Foster Care as pilot projects for the purpose of data and information collection pertaining to the cost of such care.

**OBJECTIVE 1.4.:** Investigate Title III B and C, Title IV, Title XIX, Title XX, and local funding sources for Senior Day Care, Senior Foster Care, and Incentive Payments.

**OBJECTIVE 1.5.:** Increase in-homes services, such as home care nursing and homemakers/health aides to provide cost-effective alternatives to hospitalization and institutionalization.

**GOAL 2: HAVE THE DEPARTMENT OF PUBLIC HEALTH AND SOCIAL SERVICES DIVISION OF SENIOR CITIZENS ASSUME ITS MANDATED FUNCTION UNDER P.L. 15-139 (SENIOR CITIZEN'S ACT OF 1978) BY WHICH THE DIVISION IS CHARGED WITH THE PROVISION OF A CONTINUUM OF SENIOR CARE SERVICES.**

**OBJECTIVE 2.1.:** Convene a long-term care task force consisting of providers and consumers of long-term care services to address the above objectives.

**GOAL 3:           ASSURE FUNDING FOR LONG-TERM CARE THROUGH THE PARTICIPATION OF FEDERAL, LOCAL, AND PRIVATE FINANCIAL RESOURCES.**

**OBJECTIVE 3.1.:** Petition Congress to increase Medicaid funding to include payment for Intermediate and Supervised Residential (Nursing Home) Care.

**OBJECTIVE 3.2.:** Enact legislation for a special appropriation to finance long-term care for the island's disabled and elderly indigent population.

**OBJECTIVE 3.3.:** Enforce individual, family, and guardian responsibility for payment of long-term care out of existing financial resources, as stated in the Guam Civil Code, Section 206.

**GOAL 4:           LIMIT THE WAITING TIME FOR ADMITTANCE TO THE SKILLED NURSING FACILITY OR FOR INTERMEDIATE CARE TO 7 DAYS.**

Target Population: Persons in need of long-term care.

**OBJECTIVE 4.1.:** Maintain occupancy rates for Skilled Nursing Facility and the Intermediate Care Facility between 85 and 90 percent to accommodate patient flow between facilities and emergency admissions.

**OBJECTIVE 4.2.:** Increase the number of Intermediate Care Facility and Skilled Nursing Facility beds to meet the needs of the population.

**GOAL 5:           ENCOURAGE INDEPENDENT LIVING TO THE GREATEST EXTENT POSSIBLE FOR GUAM'S MENTALLY HANDICAPPED ADULTS.**

Target Population: Guam's mentally retarded and handicapped persons.

**OBJECTIVE 5.1.:** Provide home care training, training opportunities, local support services, and access to local resources, such as the various services of the Department of Public Health and Social Services and the Guam Housing and Urban Renewal Authority, to help mentally handicapped adults and their families maximize the skills leading to independent living.

## **J. Alternative Health Care Providers**

Due to Guam's location as well as its historic background and ethnic composition, health services are provided in various ways. On the whole the western model of medical care has prevailed, and in the last few years this model has been slowly expanding to incorporate the emerging health professions. Among these growing professions are the doctors of chiropractic whose services are now being used on Guam either as a supplement to medical care or as an alternative.

In addition, the older Chamorros and people from the Asian countries feel in many instances more comfortable with "native" or traditional health providers. These include the Chamorro suruhas, surahanos, and kakahnas, the Filipino hilots, and the more widely known acupuncturists from the east Asian countries.

### **(1) "Native" or Traditional Health Care Providers**

#### **(a) Suruhas and Surahanos**

These are native healers who use natural herbs in combination with massage to cure a variety of ailments. The name is believed to come from the Spanish word "cirujano," for the ship doctors who came to Guam with the Spanish galleons.

Suruhas and surahanos are considered to be "good" people who have received their powers from God. In addition, it is also believed that the powers are inherited, and that they usually stay in the family. However, if there is no family member who can continue with the healing, then a suitable apprentice is trained. A working knowledge of curative herbs, where and when they grow, how they are converted to medicine, as well as anatomy of the human body is taught over the course of several years. Being a suruhana or a suruhano relies heavily on former experience and successes with a particular treatment. Some suruhas and surahanos specialize in particular fields such as problems of pregnancy and childbearing, others will treat matters related to the skeletal or muscular system.

A combination of massage and appropriate herbs, mixed and usually brewed into a liquid or tea, is said to cure the following ailments:

- Shortness of breath/asthma
- Problems with sleeping
- Loss of appetite
- Pain of any kind
- Problems with the eyes or ears
- High blood pressure
- Control of fevers and chills
- Paralysis and shaking
- Mental illness
- Skin disorders, boils, and sores
- Stomach ailments, diarrhea
- Diabetes
- Female problems, infertility
- Problems of pregnancy, breach positions
- Impotence.



Many people swear by the suruhanas and suruhanos, claiming that they have been helped by the traditional healers after western medicine failed to do so. Success in the control of high blood pressure and diabetes through the regular intake of herbal infusions have been documented.

A suruhana or suruhano does not charge a fee. It is believed that by taking money for the healing, the power to heal would be lost. Therefore, compensation is usually in kind, and left to the individual. Fresh fish, produce from the garden or farm, or groceries are an accepted mode of payment. Suruhanas and suruhanos also refuse to advertise for business. Either one knows one of the healers, or is referred to one by an intermediary. No licensing requirements have been established for suruhanas or suruhanos.

**(b) Hilots**

Hilots are traditional Filipino healers, who function much the same way suruhanas and suruhanos do. Naturally, the hilots' services are used more frequently by those of Filipino descent than any other ethnic group.

**(c) Kakahnas**

This particular group of healers is no longer as prevalent now as it was in the years before the second World War. Kakahnas healed through supernatural powers and were also considered to be sorcerers who could be hired to put spells on people and make them ill. Folklore holds that kakahnas could invoke the souls of the dead, the "anite", and could communicate with the Taotaomonas, or "Old People," who are believed to be the spirits of the ancient Chamorros that have returned to the island to watch over the right and wrong doings of the island's inhabitants. Taotaomonas are supposed to guide the suruhanas/suruhanos or kakahnas to the proper medicinal plants in the jungle.

Kakahnas are feared and avoided by the island people when not needed. They have largely disappeared on Guam, but are still found and feared in the neighboring islands of the Northern Marianas.

**(2) Acupuncturists**

The healing method of acupuncture came to Guam from the East, mostly mainland China, Taiwan, and Korea. The practice refers to the stimulation of a certain point or points on or near the surface of the body by the insertion of needles. Acupuncture is intended to prevent or modify the perception of pain, or to normalize physiological functions. Acupuncture effects pain control, treats certain diseases or dysfunctions of the body, and generates a feeling of general well-being.

Acupuncture has been employed in China for several thousand years and is still practiced throughout China as the major form of medical treatment. It has found great acceptance in the Western World, particularly in Europe and United States. It is non-invasive, non-toxic, and does not produce harmful after-effects. At times acupuncture is enhanced by the application

of electrical currents, the use of oriental massage, such as acupressure, breathing techniques, exercise, nutritional advice, and the prescription of drugless substances and herbs as dietary supplement to promote better health.

Usually 3 to 5 treatments are needed to give a person relief from his pain or illness. Chronic illness requires more treatments than acute cases. Cost of acupuncture is currently \$25 for the first visit and \$18 for each subsequent visit. Herbal prescription or dietary supplements are not included in these prices.

At present there are eight persons licensed to perform acupuncture, three of whom are also practicing M.Ds. All of them have met the licensing requirements for practicing on Guam. These requirements include the completion of a course or tutorial program in acupuncture which is acceptable to the Licensing Board and 3 years of experience performing acupuncture. The Guam Licensing Board also requires that an applicant is licensed by a state or territory of the United States or the appropriate board of licensure of another country; that the applicant is a U.S. citizen or permanent resident of the United States; and that he or she is sufficiently proficient in the English language to carry on appropriate conversation with patients.

The fact that the major health insurance companies have included the costs for acupuncture treatments in their benefit packages is evidence that this method of health care is becoming more and more acceptable. In many states of the U.S., Medicare also reimburses for acupuncture.

On Guam, various insurers, as well as Workman's Compensation pay in part or in full for acupuncture treatments. Medicaid at this time is not able to pay for acupuncture due to lack of funds, and our major insurers, FHP, and GMHP, are currently not reimbursing for such care.

### **(3) Chiropractors**

Chiropractic is the science and art of examination, diagnosis, and treatment of the body by manipulations of the spine and other articulations of the body to cure illness and alleviate pain. Treatment can be in conjunction with the application of heat or cold, light, electricity, and mechanical and nutritional modalities. Treatment can improve and properly maintain collateral and reciprocal innervation, which in turn will stimulate the neuromuscular functions of the afferent, autonomic, cerebro-spinal, efferent, inhibitory, motor, parasympathetic, and efferent nervous systems. Chiropractic healing is based on the principle that a misaligned spine will put pressure on the various nervous systems thereby causing illness and disease. Consequently, treatments to align the spine properly will alleviate pain and cure illness and disease.

Chiropractic is performed by a Doctor of Chiropractic, who has trained and received a D.C. (Doctor of Chiropractic) degree from an institution accredited by the Council of Chiropractic Education (CCE). Currently there are three persons licensed to perform chiropractic on Guam; this does not include the license to take or interpret x-rays. An additional



two temporary licenses were issued to persons not yet residing on Guam, but hoping to practice here in the near future. Licensing requirements stipulate that an applicant must have graduated from an accredited school of chiropractic; must have satisfactorily completed one year of internship training; must be at least 21 years or older; must be a U.S. citizen or a permanent resident of the United States; and must be a person of good moral character.

At present, several private insurance companies, as well as workman's compensation, provide coverage for chiropractic treatment; Medicaid is unable to do so due to the unavailability of funds. According to the Guam Chiropractic Association, the majority of patients seeking chiropractic care are between 20 and 49 years of age, and nearly half are employed in the private sector.

### **Conclusion and Recommendations**

Guam is located on the crossroads between East and West. The island population is a conglomerate of ethnically and culturally different people with distinct characteristics. Some of these characteristics pertain to concepts of health and wellness.

It is an established fact that the degree of a person's belief in the effectiveness of a particular medical procedure or practice is closely related to the success of the treatment. One can therefore reason that a person should avail himself of those medical care services in which he has the most faith.

The most prevailing form of medical care provided to the island population follows the western model, originally brought to the island by the U.S. Navy government. The traditional or "native" healers, the suruhanas or suruhanos, were slowly replaced by the more scientific western medical care, but are still considered useful and sought after, especially by the older populations. The Filipino immigrants brought their own healers, the hilots, with them. Acupuncture began to flourish on Guam with an increased influx of Asian people to Guam. Chiropractic care has only been established on Guam in the last decade or so, but is becoming popular with Guam's population.

Many of the U.S. health insurance companies provide coverage for acupuncture and chiropractic treatments, as do Medicaid and Workman's Compensation in the majority of states. This coverage attests to a growing popularity and acceptance of these services in the spectrum of health care services on the mainland; similar trends are now developing on Guam.

### **GOAL 1: ALLOW EQUAL ACCESS TO ALTERNATIVE MEDICAL PROVIDERS BY REMOVING FINANCIAL BARRIERS TO CARE.**

Target Population: All Guam residents.

**OBJECTIVE 1.1.:** Encourage our major health insurers, FHP, GMHP, HML, and Staywell/Calvo to include acupuncture and chiropractic treatments in the benefit package.

**OBJECTIVE 1.2.:** Explore the feasibility of having Medicaid reimburse for acupuncture and chiropractic treatments as an optional service.



## K. Mechanisms for Financing Health Care

No Guam resident is denied access to medical care because of an inability to pay. This policy is specifically stated in Title XLVII of the Government Code of Guam (P.L. 7-101) Section 49008, which reads:

"... It is the policy of the Government of Guam that no person shall be denied complete medical care and services by reason of his partial or complete inability to pay therefore. All persons, however, shall be required to pay for such care and services in accordance with their means..."

At this point concrete and conclusive data for actual costs and reimbursement of health care have not been established. It is known, however, that a major portion of Guam's population is covered by various private health insurance plans, Medicaid or Medicare, and those without insurance receive locally funded medical assistance, either through the mandated "free" health services for special conditions or the Medically Indigent Program (MIP). The figures detailed below are approximate but still allow for a more or less accurate picture of health care financing for Guam's civilian population.

**TABLE 78**  
**Civilian Population by Health Care Payment Sources**  
**Guam: 1985**

| Method of Payment/<br>Insurance Coverage                                  | Approximate Percent<br>of Population |
|---------------------------------------------------------------------------|--------------------------------------|
| <b>Health Maintenance Organizations:</b>                                  |                                      |
| FHP, Inc.                                                                 | 26                                   |
| Guam Memorial Health Plan (GMHP)                                          | 17                                   |
| <b>Group or Other Indemnity Plans</b>                                     |                                      |
| Staywell/Calvo                                                            | 2                                    |
| Health Maintenance Life (HML)                                             | 5                                    |
| Calvo                                                                     | 7                                    |
| Others                                                                    | 4                                    |
| <b>Federally Supported Health Insurance:</b>                              |                                      |
| Medicaid                                                                  | 8                                    |
| Medicare                                                                  | 2                                    |
| Military/V.A. Medical Care                                                | 8                                    |
| <b>Self-Pay</b>                                                           | <b>5</b>                             |
| <b>Uninsured persons depending on MIP or<br/>"free" services coverage</b> | <b>16</b>                            |

Source: Reported by Insurers

The data from TABLE 78 is somewhat corroborated by the results of the GHPDA Health Status Survey, which are listed below.

**TABLE 79**  
**Proportion of Health Status Survey Respondents**  
**Covered by Health Insurance**  
**Guam: 1984**

| Insurance Coverage                           | Percent   |
|----------------------------------------------|-----------|
| <b>Health Maintenance Organizations:</b>     |           |
| FHP                                          | 24        |
| GMHP                                         | 17        |
| <b>Group or Other Indemnity Plan:</b>        |           |
| HML                                          | 5         |
| Other Insurers                               | 17        |
| <b>Federally Supported Health Insurance:</b> |           |
| Medicaid                                     | 5         |
| Medicare                                     | 1         |
| Medicare and Medicaid                        | 1         |
| Medicaid and Other                           | 1         |
| Military/V.A. Medical Care                   | 7         |
| <b>Uninsured/Self-Pay</b>                    | <b>22</b> |

Source: GHPDA-CDI Health Status Survey, 1984.

Both the tables clearly show that the HMOs are the major providers of health coverage, followed by several indemnity plans.

#### **(1) Health Maintenance Organizations**

This form of prepaid health care coverage has been readily accepted by Guam's inhabitants and is the most preferred way to safeguard the health of individuals and their families. Almost half of the population, 43 percent, is covered by either FHP or GMHP.

##### **(a) FHP, Inc.**

This federally qualified, California-based HMO is built upon the foundation of a medical group practice consisting of approximately 40 health professionals in various specialties who are practicing at the FHP Clinic in Tamuning. The clinic is essentially self-contained, since it operates its own dental clinic, X-ray department, clinical laboratories, pharmacy, physical and occupational therapy unit, as well as home care services. Persons covered under FHP also have the option of utilizing the Seventh Day Adventist Clinic which offers total patient care services similar to those provided at the FHP clinic. Approximately 25 health professionals representing the various medical specialties are employed at SDA, providing a wide spectrum of preventive, diagnostic, primary, and specialized services.

Government of Guam and federal government employees make up the bulk of FHP enrollees. Those covered under the plan pay only minimal co-payments for physician care and drug prescriptions. However the amount of the co-payment varies with the benefit package negotiated by different employer groups.

**(b) Guam Memorial Health Plan**

GMHP originated as a division of the Guam Memorial Hospital Authority and was sponsored by the Government of Guam to provide low-cost health care coverage to the citizens of Guam. GMHP has since severed its ties with the government and is now a private non-profit and federally approved health maintenance organization, who offers its services to government employees as well as any other interested individual in the community. The HMO is organized along the lines of an independent practice association (IPA) by which the services of the Guam Memorial Hospital, approximately 40 physicians providing primary and specialized care, 9 dental clinics, 16 pharmacies, 8 optometrists, and 3 clinical laboratories are contracted for the subscribers of GMHP.

GMHP is the major insurer of Government of Guam employees; 45 percent of these employees opting for health insurance have purchased such insurance from this health plan. Only minimal co-payments are required for physician visits and pharmaceuticals. GMHP covers 80 percent of the first \$5,000 and 100 percent of all charges incurred thereafter, up to a maximum of \$45,000. GMHP will be offered to federal employees for the first time this year.

While the two health maintenance organizations provide excellent insurance for preventive, primary, and specialized health care, the ceilings of \$25,000 (FHP) and \$45,000 (GMHP) for off-island medical care are not sufficient to pay for catastrophic illness which cannot be adequately treated on Guam.

**(2) Group and Other Indemnity Plans**

The second most popular mode of health insurance for Guamanians is the purchase of or participation in group health plans. Approximately 25 percent of Guam's population are covered under these insurance programs.

HML, Staywell, and about 20 other group plans available on Guam are purely indemnity insurance programs like the more familiar Aetna, Prudential, or Hawaii Medical Service Association. Because of the customary deductible and co-insurance features that are standard among such plans, the group plans have been subscribed to at a far lesser degree than either FHP or GMHP, which offer lower out-of-pocket expenses at the point of service at a somewhat higher premium cost. The lower market penetration of these group and other indemnity plans on Guam is in direct contrast to their predominance in other places, and stands as clear testimony to the local preference for the more organized health maintenance forms of programs. This probably, in the case of Guam, stems from the earlier days when virtually all medical care was provided in highly organized, governmental clinic settings as opposed to the more traditional solo physician office setting in the U.S. mainland.



### (3) Federally Supported Health Insurance

In addition to federal programs and grants-in-aid which support largely special health programs and services, Guam is also eligible for the Medicaid and Medicare programs. Services for Veterans or retired military personnel are provided by the U.S. Naval Hospital or through the CHAMPUS program.

#### (a) Medicaid

The Medicaid Assistance Program is a federal-state matching program under Title XIX of the Social Security Act to provide medical care for persons receiving welfare benefits and those who are medically indigent. For all the states of the union, the Federal share is determined by a statutory formula based on per capita income.

$$\text{State Share} = \frac{(\text{National per capita income})}{(\text{State income}) 2 \times 45\%}$$

$$\text{Federal Share} = 100\% \text{ minus the State share}$$

By design, the formula provides a higher percentage of federal matching funds to states with low per capita incomes (up to a statutory maximum of 83%); and a lower percentage of federal matching funds to states with high per capita incomes (down to a minimum of 50 percent). All states have an open-ended allotment ceiling, which means that the federal government will match (depending on what the required state match is) the state share with no funding ceiling identified as a limiting factor on the total expenditure of the program.

Funding for Guam's Medicaid program has been statutorily established at a 50:50 ratio with a fixed ceiling on the federal share. The ceiling on the federal share was originally set at \$900,000 but was increased to \$2 million in 1984. Due to financial constraints in the local government, Guam has been unable to match the federal share. In FY1984, local funding for Medicaid was \$1.4 million; in FY1985, the local share has been increased to \$1.8 million resulting in a \$3.6 million budget for the program.

The present funding base, in terms of the statutorily defined allotment ceiling and the matching ratio between federal and local shares, places Guam in a significantly disadvantaged position. If Guam's share would be based on the statutory formula, the Territory would surely be eligible for a higher federal match than 50 percent. If one would use Guam's per capita income of approximately \$4,000 and the U.S. per capita income in the formula, Guam would be eligible for the statutory maximum of the federal share.

The Government of Guam has taken several measures to ensure the program's integrity and the provision of health care to all needy persons. The scope of services covered has been kept to a minimum, and excludes ICF prosthetics, adult dental care, as well as eyeglasses for adults. Only last year, when Guam's ceiling was raised to \$2 million, was the Medicaid program able to provide necessary off-island care, audiological testing and evaluation, and medical supplies used by ostomy patients at home.

As a result of the limitations on services that are available under Medicaid, the Government of Guam has been compelled to a 100 percent locally funded program to address the needs of the medically indigent population. Guam's Medically Indigent Program is for those people who do not qualify for Medicaid because of the stringent eligibility requirements and yet cannot afford to pay for their medical bills.

**(b) Medicare**

Medicare was established in 1965 under Title XVIII of the Social Security Act. Its intent was to ease access to quality health care for the elderly population aged 65 and older. Medicare provides hospitalization and medical insurance for those who are eligible for Social Security or Railroad Retirement benefits.

Medicare embodies two insurance formats. Part A is the hospital insurance program and offers a variety of hospital and institutional services. Benefits are subject to specific deductible and coinsurance requirements.

Part B is a supplemental insurance to Part A. It is a voluntary program which provides for physician services and outpatient hospital services. Monthly premiums are paid in part by the federal government and the beneficiary.

On Guam there are only about 2,000 persons enrolled in the Medicare Program, since many of the island's seniors have not accrued the necessary Social Security benefits to make them eligible for this program.

**(4) Self-Payers and Uninsured Persons**

Approximately 22 percent of Guam's population or 21,000 persons, are not covered under any insurance program. It is assumed that about 5 percent of the population (5,000 persons) can and will pay for their own medical expenses. This leaves 16,000 persons in our community, vulnerable to illness or accidents, with no identifiable means of paying for medical care.

Some of these persons receive health care services from categorically funded special health programs such as the Maternal Child Health services provided by the Department of Public Health and Social Services. Others are cared for through the locally mandated "free" services for special diseases. Those not eligible for any of these programs will be cared for by the Medically Indigent Program (MIP). In addition there are those persons who have exceeded the maximum coverage of their health plan and need help with the additional medical bills.

The financing of health care for the uninsured, underinsured, and the indigent is a major issue which is currently under investigation by Guam's policymakers and health care providers. Health Care Financing is discussed and analyzed in greater detail in Chapter VI under Section C.

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## **VI. HEALTH CARE POLICY ISSUES**



## **VI. HEALTH CARE POLICY ISSUES**

The previous chapters examined Guam's demographics, health status, health status priorities, and health care delivery system. This chapter will take a closer look at some of the policies governing the provision of health care on Guam.

Policy can be defined as a definite course of action, selected from various alternatives in view of given conditions, to guide and determine present and future decisions. Health policies are formulated at a number of different levels on Guam, taking into account prevailing unique conditions, federal funding and regulations pertaining to the funding, local revenues, and general trends in the health care delivery system. Sound health care policy concentrates health resources and allocates them to islandwide health needs and priorities, assuring an equitable distribution of the available health care services to the people of Guam.

Guam's health care policies are analyzed by using the six general criteria of **Availability, Accessibility, Cost, Quality, Continuity, and Acceptability**. Analysis of this nature will provide the health care providers, as well as the legislators and decision makers within the Government of Guam, with recommendations for the revision of current policies and suggestions for shaping future policies.

### **A. Availability**

Availability is a measure of the island's supply and makeup of health services and manpower, both professional and ancillary, as well as the capacity of these resources for providing care. A detailed description of each service and its manpower requirements is provided in Chapter V. The services and manpower requirements are classed into four categories: Preventive, Acute/Specialized, Chronic, and Long-Term Care.

#### **(1) Preventive**

Preventive services encompass Health Promotion and Protection as well as Disease Prevention and Detection. The services include health and nutrition education, immunization, communicable disease control, and screening programs. All health education and promotion programs are available to Guam's population from both public and private providers, but there is a lack of coordination among the delivery entities, particularly with private providers such as the Heart and Cancer Associations. The Department of Public Health and Social Services Health Education section must play a much stronger role in bringing cohesive education to the people.

The prevention and detection services are among the best organized and widespread services available on Guam. The immunization levels of Guam's kindergarten and first grade school children are 3 percentage points higher than the 1990 U.S. national goal. The Communicable Disease Control Unit has an excellent system of reporting and disease treatment. Services are available and free to all. Only the screening programs for chronic

disease have shortcomings: they have not had a high priority in the past, but are expected to be concentrated on during the next 5 years.

Manpower shortages that affect service availability are primarily in the area of health education. This particular field has also failed to receive a high priority in the past. A solution would be to encourage undergraduate and graduate students to concentrate on health education and hire them to fill the presently empty positions.

## **(2) Acute/Specialized**

Diagnosis, treatment, and mental health services are part of the Acute/Specialized services available on Guam. They cover maternal and child health, dental health, emergency, medical, and surgical services, diagnostic radiology, as well as inpatient and maintenance mental health services and community programs. All services are presently available to the population.

Shortcomings in the Acute/Specialized area of services include the lack of a complete neonatal unit at the hospital; limited free dental care to the medically indigent and elderly; and the need for newer diagnostic radiology equipment at the hospital, which would expand the amount of services offered. Manpower needs include a neonatologist, a second radiologist, cardiological support personnel, an emergency medicine specialist, and, especially, a podiatrist to treat Guam's diabetic population. The training and staffing of ambulance personnel needs to be upgraded, with more specialized emergency training courses added, and the two-way communications between ambulance and personnel need to be improved.

Mental health services are available to those in need of them; however, there is, at present, a glaring gap in the service continuum caused by the lack of a psychiatrist and a clinical psychologist. A National Health Service Corps psychiatrist is expected on island soon, but a second psychiatrist is needed to adequately serve our population in need. Vacancies in the mental health administration and the Divisions of Community Support Services and Research and Development need to be addressed so that present and future mental health service needs can be accommodated.

## **(3) Chronic Care**

Chronic care services for those with hypertension, diabetes, and arthritis are available through private providers for those with insurance. For indigent persons with an established economic and social need, the Chronic Disease Prevention and Control program provides care; but lack of funding limits the scope of services and the number of people in the program. Medical care for those persons suffering from end stage renal disease (ESRD) and lytico and bodig (ALS/PD), is, at present, available to all those identified with the diseases. The ESRD section at the hospital has adequate trained manpower, and inservice training programs for upgrading skills. However, to provide all patients the most effective number of hemodialysis treatments, at least 1 more dialysis station is needed this year, and an additional 8 more by the end of the decade. ALS/PD services were being provided by the clinic run by the National Institute of Neurological and Communicable Disorders and Stroke (NINCDS), but these services are

being phased out and transferred to the Medically Indigent Program for payment, and to private practitioners for treatment. The transfer is considered a hardship by some, and there is no indication which pharmacies will stock the necessary medication. The transition period is not expected to be a smooth one, and could adversely affect services to ALS/PD patients.

#### **(4) Long-Term Care**

Habilitation, rehabilitation, and long-term care are available to all who require such care. At present, habilitation and rehabilitation services are adequate, but delivered in a fragmented manner. The services could be much improved and expanded with the addition of qualified trained manpower, especially speech, physical, and occupational therapists.

Long-term care is adequate in the area of community facilities and programs, but under-staffed at present in the area of in-home services. Institutional long-term care is inadequate at the intermediate and custodial levels. Upon its completion in 1986, St. Dominic's Senior Care Home will help accommodate those in need of institutional care, relieving the GMH Skilled Nursing Facility of the responsibility for providing care to patients inappropriately placed there.

#### **Conclusion and Recommendations**

When viewed in total, Guam's health care delivery system can adequately serve most primary care needs of the majority of the population, and will continue to do so into the future. However, those requiring specialized care must often be referred off-island for service. Guam's population base is, at present, not large enough to support such specialized services as specialized neonatal, cardiological, neurological, and radiological care, yet the expense of off-island referrals almost justifies the establishment of such services locally. With their inception, and the support of qualified staff, Guam could accept referrals from other Pacific island nations and defray the cost of such services, as well as cut down the numbers and cost of its own referrals.

For an isolated population such as Guam's, reliance upon services available locally is a necessity. The need for mental health services is growing, and the absence of a psychiatrist and the limited number of clinical psychologists negates the value of services being offered. To adequately serve the population, at least 2 psychiatrists and a clinical psychologist are needed.

As the population ages, with all the attendant physical impairments that aging brings, the need for long-term care facilities grows. The institutional facilities, with the addition of St. Dominic's Senior Care Home, will meet the needs of the present and the near future, but long-range planning is necessary to ensure that such facilities and services are available to all who need them in the distant future. Much greater emphasis must be placed on community and in-home services to prevent institutionalization until it becomes absolutely necessary.

#### **B. Accessibility**

The Government of Guam assured accessibility to all its constituents by including, in the Guam Code, a stipulation (P.L. 7-101, Section 49002) that



medical care and services are to be provided to all persons regardless of the inability to pay. Other access factors, which were not addressed in this Public Law, are discussed below.

Accessibility is defined as the measure of the degree to which a system inhibits or facilitates the ability of an individual or group to gain entry to and receive appropriate services. Considerations, besides the ability to pay, include temporal, geographical, and socio-demographic accessibility.

### **(1) Temporal Access**

Temporal access refers to the ability of patients to receive services at the time when either they need them or can make use of them. Because of transportation problems, and more importantly, the fact that work hours often coincide with the hours during which medical services are usually provided, many persons have difficulty in obtaining medical services.

In Guam's health care system, most private providers have office hours that begin before and extend after normal working hours to allow those who are employed access to services. Those services offered by the government, however, are limited to 40-hours per week operations. The hours of operation have a direct effect on waiting time, both between and before visits. Patients of private providers have few complaints about the length of time they have to wait between requesting an appointment and receiving services, or the time spent in a doctor's office waiting to be seen, as the major private health providers have extended their office hours into the evenings and weekends. Patients of public providers, on the other hand, have many complaints about how much of their time is "wasted" waiting to be seen, and of the length of time between making appointments for medical care and actually being seen at a clinic.

Manpower considerations also affect temporal access. At this point in time, Guam can only be considered a shortage area for psychiatric and podiatric manpower. While not overly abundant, the supply of medical and dental personnel is sufficient to meet our present needs. The distribution of this manpower, with the majority in the private sector, coincides with the ease or difficulty of scheduling visits that was mentioned earlier.

### **(2) Geographical Access**

The geography of a certain area can serve as the major impediment to obtaining health services. On Guam, this translates to the geographical placement of the health services. Most are in the north-central villages of Agana and Tamuning. As a result, the residents of the southernmost villages must travel an average of 45 to 60 minutes for health care. For this reason, the Southern Regional Community Health Center was opened in Inarajan. Unfortunately, due to limited operating hours and the accepted habit of travelling to the center of the island, the health center has been underutilized. As many of the island's other businesses are located in Agana and Tamuning, the trip to these villages for routine health care is not seen as a hardship for most southern residents, but as a chance to conduct other business as well as a health visit.

Geographical access to off-island specialist care does not seem to be a problem, as FHP, GMHP, Medicaid, and the MIP program have contracts for service with qualified specialists and hospitals in Hawaii and in the U.S. mainland.

### **(3) Socio-Demographic Access**

Health beliefs, cultural mores, attitudes, and languages can cause significant problems for the individual or group in obtaining or maintaining access to health care. Despite the advanced degree of westernization of Guam's culture, non-western medicine is preferred by some segments of our community for certain health problems. The bartering nature of payment for the services of the Chamorro suruhana or suruhano and the Filipino hilot makes it difficult to ascertain the extent to which traditional healing and western medicine co-exist on this island. The well established acceptance of acupuncture and the emergence of chiropractic services can be viewed as indicative of the extent to which alternative health care services are supported by the people of Guam.

Since most of the population speak English as either a first or second language, there exists only a limited language barrier. This affects elderly Chamorros and new immigrants the most. However, they can take advantage of the health care practitioners on island who speak Chamorro or the Filipino languages; and many health education materials are being translated from English into Chamorro or Tagalog to reach those who have difficulty with English. Every attempt is made on the part of the health care community to reach all segments of Guam's multi-cultural population with information or services.

### **(4) Financial Access**

Financial access is the ability of the population, or a segment thereof, to obtain available health services as determined by financial resources. Through HMO enrollment, mandated free care for certain diseases, and the Medically Indigent Program, many of the financial barriers to access of primary health care have been removed. Care for catastrophic illness lacks financial coverage, bringing considerable hardship to some individuals and their families. A more thorough discussion is presented in Section C, Cost.

### **Conclusion and Recommendations**

Many geographical, socio-demographic, and financial access barriers to routine health care services have been eliminated at this stage of Guam's health system development. Temporal access is seen as a problem by those who must utilize the public providers of care. For those who are employed by the government and utilize the public health clinics, this is not as much of a hardship as it seems, as they may use earned leave time for their doctor visits. However, for the low income who are not employed by the government and do not have leave time, this is a financial hardship that may prevent individuals from seeking medical care for themselves or their families. Major financial problems are encountered by those suffering from catastrophic disease.



## **C. Cost**

When discussing health care costs, one usually means the total expenses and economic consequences resulting from the provision of health care services and goods. Measures of cost include consumer costs, direct provider costs, total program costs, indirect costs, capital costs, and operation costs. An additional factor on Guam are the costs to the community, through the Government of Guam's general funds, for health care provision to the uninsured, under-insured, and indigent inhabitants of the island.

A measurement of cost is effected by looking at data--facts and figures which have been collected over time. Unfortunately, to this date Guam has not established a system to collect uniform cost data from public and private providers. We have "approximate" cost figures arrived at by totaling available federal and local funding and their disbursement records; by summing the premiums paid by employers and employees for health insurance coverage; by looking at reimbursement information from Medicare, Medicaid, and the major insurers on island; by the operation costs of the hospital, and by hospital charges. However, information is patchy and does not in any event include opportunity costs and societal costs.

While exact figures on total costs for the provision of health care are unavailable, Guam's health care providers, legislators, and decision makers have increasingly become aware of the many issues of providing health care and medical services to the rather large portion of the population not covered by insurance or considered medically indigent. They are equally aware that the current ceilings of the HMOs and third-party insurers, and the funding limitations of Medicaid, Medicare, and the Medically Indigent Programs do not allow for catastrophic illness coverage for the population. Furthermore, it is recognized that the overall escalation of medical costs, particularly those for chronic care and long-term care, must be contained so that a proper balance can be found in the resource allocation for health care across the generations.

These issues are the subjects for discussion under this section. Not included, however, are the costs of medical care provided by the U.S. Naval Hospital to the island's veterans, military retirees, and their dependants. (This includes services to 8 percent of the population.)

### **(1) Health Care Provisions for the Uninsured, Under-insured, and Indigent Population**

Health insurance, either through pre-payment or indemnity, has been called the backbone of the health care system as it assures access to needed health care. Employer-subsidized health insurance covers approximately 61 percent of Guam's population. This is a considerable increase since 1977, when only 45 percent of the population were estimated to be covered by health insurance.

Health insurance is often offered to employees as a fringe benefit by which the employer pays all or part of the insurance premiums. The Government of Guam pays an average of 48 percent of the premium for single employees, and approximately 20 percent towards the premium of employees with dependents.



(a) Uninsured Population

The decision to purchase health insurance is an individual one. Most people feel comfortable knowing that they are protected in case of accident and illness. Others perceive themselves as so healthy and invincible that they feel health insurance is a waste of their money. Yet others feel that they can pay for any illness with less monies than they would spend on the aggregated insurance premiums. Underlying this is the genuine belief that the Government of Guam will provide health care, if and when needed, regardless of the inability, or even deliberate intention not to pay for such care. Approximately 5 percent of the population fall into these categories.

A certain segment of the population cannot afford to purchase health insurance, even with the employer paying part of the premium. In the case of our local HMOs, insurance premiums for an employee and his family amount to approximately \$2,500, out of which the employee has to pay \$2,000 and this amount can often not be accommodated by the limited budget of a large family with a single bread winner. It is estimated that 16 percent of the population belong to this group.

Of course, this category of people who cannot buy insurance because of their low income will most likely be eligible for the Medicaid or Medically Indigent programs, or one of the categorical programs of the Department of Public Health and Social Services, such as the Maternal/Child Health program and the Services for Handicapped Children. Some of these categorical programs are supported partially or totally by federal grants, while others are entirely funded by local revenues, as part of the Government of Guam's mandated "free" health care services.

(b) "Free" Health Care Provision

During the past two decades the various legislatures have enacted laws mandating "free" health services to particular groups of the island population. This was done with the intent of ensuring access to medical care for those persons afflicted with a specific disease. Below is a summary of Public Laws and their mandates:

(i) Locally Mandated "Free" Services

Mental Health Services

Public Law 7-101, Section 49225, obligates the Government of Guam to pay for all expenses incurred for medical or hospital care of the mentally ill and for the transportation of mentally ill persons to hospitals off-island. This was subsequently amended through P.L. 14-29, Section 49003(b), which allowed Guam Memorial Hospital to charge fees for the services to the mentally ill. However, it did not repeal the provisions of Section 49225.

When the new Department of Mental Health and Substance Abuse was created, this Public Law was further amended through Section 85105, which charges DMHSA with the establishment

of a fee schedule based on the ability to pay.

#### Tuberculosis Patients

Public Law 7-101, Section 49010, provides for free medical care and hospitalization of tuberculosis patients. TB testing and all medications dispensed in the public health clinics are also free of charge. Public Laws 14-29 and 16-43 enforced this free care. Public Law 15-132, Section 6 authorized funds (\$1,500) for off-island travel of indigent patients for TB treatment. Public Law 15-145, Section 12, appropriated \$1,750 out of General Funds for the purchase of medication for indigent patients suffering from tuberculosis.

#### Lytico Patients

An amendment to Section 49010 of P.L. 7-101 in 1968 made provisions for free medical care and hospitalization for persons afflicted with lytico (Amyotrophic lateral sclerosis and Parkinsonism dementia). This became subsequently Public Law 9-220. The intent of providing free care to lytico patients was reinforced by Public Laws 14-29 and 16-43.

#### Insulin Injections for Diabetics

Public Law 14-29, which enacted a new Chapter 1 to Title XLVII of the Guam Code, Section 3, made provisions for the free insulin injections for diabetic patients. P.L. 16-43 reinforced the mandate. The original policy of 1970 on insulin injections for diabetic patients, excluded free care to those persons whose insulin injections are chargeable to health and medical insurance.

#### Dental Care

Public Law 9-93, Section 9121, mandates free dental care for Guam's school age children through age 16. At this time it was slated that dental services shall be limited to prophylaxis and emergency extraction. This was subsequently amended by Public Law 12-130 to include care for pre-school children, but no longer stated any limitations.

#### End Stage Renal Disease

Public Law 16-43, Section 24 and its amendment Public Law 16-47, Section 6, are for the provision of supplemental cash for the purchase of medication, high protein food, or payment for transportation for indigent persons suffering from ESRD. A new Section 49010.4 was added to the Guam Code to safeguard these provisions.

#### Orthodontic Care

Public Law 15-142, Section 3(12), appropriated \$3,000 to the Crippled Children's Services (now known as Services for Handicapped Children) to pay for orthodontic care.

(ii) Federally-Funded Free Programs

All of the above cited local "free" care provisions are in addition to federally mandated free services to Guam's population. One of them is the diagnosis and treatment for sexually transmitted diseases, free of charge regardless of the income or insurance coverage of the patient; diagnostic assessment for any child suspected of having a crippling disease is another one. (Treatment for a diagnosed condition will be provided, but payment for such treatment is determined by the parent's ability to pay.)

Maternal and Child Health services are provided to indigent individuals without insurance coverage, as are homecare nursing services for the bedridden and poor frail and handicapped. Chronic care for high blood pressure, diabetes, and arthritis for the indigent is also provided through a federal program.

The locally mandated and federally-funded free health services have been instrumental in providing medical care to persons who would otherwise not have access to such services. While these mandates attest to the good intentions of Guam's policymakers, they have brought about several problems.

One of the problems is the fact that the good intentions were never equally matched by sufficient funds to fulfill the mandated obligations for services. Another problem arises from the wording of some of the public laws: Free Services have been mandated because certain persons suffer from a specific disease, not because they were unable to pay for treatment. Additionally, the mandate reads and is interpreted to mean that free medical care and hospitalization are to be provided to persons who have been diagnosed with a specific disease without stating that free services were to be given only for treatment related to that disease. Because of these free provisions, the major health insurers on island do not provide coverage for these diseases in their benefit packages.

There is yet another problem which pertains to the administration of these funds. Until 1983, the hospital provided most of the outpatient care and all of the inpatient care to persons eligible for free health care services. The hospital also provided the needed medication and even such equipment as wheelchairs, walkers, etc. For this care the hospital received a subsidy from the Government of Guam's General Fund. However, since the GMH administration no longer requests or receives general funds directly, it seems unclear now just who is going to pay for the services. For instance, at present 21 persons suffering from lytico or bodig are being cared for at the SNF or ICF of the old GMH. The responsibility to care for lytico and bodig patients has been assigned to the Medically Indigent Program of DPHSS; however, no supplemental funding for the care of these patients has been allocated to this program.

(c) Health Care for the Under-Insured Population  
and Catastrophic Illness Coverage

A person is under-insured when his insurance payments do not cover



his or her medical expenses. This can then become a financial access barrier to adequate health care. There are two categories of under-insured people: those whose insurance is not adequate for needed primary and specialist care, and those who have enough primary care and specialist coverage, but lack sufficient funds to finance care for catastrophic illness. Medicare subscribers are in the first category and almost all of Guam's population are in the second.

(i) Medicare Coverage

Medicare is a health insurance program for which persons 65 or older and prematurely disabled persons who have contributed to the Social Security or Railroad Retirement Fund are eligible. Part A provides for medical care in hospitals and is considered an entitlement for those qualifying. Part B is a supplementary program, and can voluntarily be purchased by those entitled to Part A. It provides payment for a variety of physician and outpatient hospital services. The cost of premiums are co-shared by the beneficiary and the federal government.

There is no doubt that Medicare has had a tremendous impact on the health status of older persons since its inception 20 years ago. Even though deductibles, co-insurance, and illness-associated expenses cause considerable hardship for persons living on a limited retirement budget, basic medical care is assured through Medicare to approximately 2 percent of the population.

However, with the tremendously accelerating costs of health care, the amounts required for deductibles, co-insurance, medications, and health aids have risen much higher than any increase in pensions, interests on savings, or Social Security benefits. Serious and chronic illness often depletes the lifesavings of seniors. At this point, a person then becomes eligible for Medicaid, which covers the deductible and provides co-insurance after the Medicare benefits are used up.

Medicaid eligibility criteria disallows the owning of land, which is a particular problem on Guam, as land is usually a family possession handed down from one generation to another, and therefore not easily sold. Nor is this land, in the majority of cases, producing any revenues. Still, it precludes acceptance into the Medicaid program. As Guam's elders usually do not possess significant cash resources, a senior on Medicare must then turn to the Medically Indigent Program in order to continue with medical treatment.

(ii) Catastrophic Illness Coverage

Catastrophic illness coverage pertains to insurance which will pay for medical expenses incurred for the care of catastrophic illness. A catastrophic illness is a medical condition requiring treatment and care which cause expenditures in excess of a specified level or threshold. Such conditions can be caused by major accidents necessitating several operations and a long period

of rehabilitation; they can be precipitated by stroke or heart attack, and almost all types of cancer.

Some health care insurers provide a level of coverage sufficient for any kind of catastrophic illness. On Guam this is the exception rather than the rule. Since 43 percent of all insured persons purchase their insurance from either FHP, or GMHP, their ceiling on coverage is \$25,000 and \$45,000, respectively. Those 2 percent insured by Staywell have a threshold of \$100,000. At current health care costs, treatment for leukemia, for instance, is in excess of \$100,000, as is by-pass surgery (single, double, or triple) and recovery after a heart attack. In addition, there are travel and cost-of-living expenses for the patient and accompanying persons to Hawaii or the U.S. mainland. Few individual families have the financial means to pay for the medical expenses once the insurance benefits have been exhausted. Savings, monies set aside for education, and the sale of land must come before a person can apply for Medicaid or the Medically Indigent Program. Often a family must lose all assets and resources which might have been acquired over a life time, and be declared "indigent" before such help can be requested. Medicaid and MIP become in these instances the catastrophic illness insurers. Organized and formal catastrophic illness coverage is designed to forestall precisely such occurrences. It is not yet perceived as a necessity on Guam, because in the previous years the government has always provided for medical care, on- or off-island, and such expectations are still prevalent among many of the island residents.

One thing is certain: excessive medical care costs have to be paid for, either directly by the individual through pre-paid catastrophic illness coverage, or, as in the past, by the government. This translates into "by the community," as the Government of Guam will need to raise taxes for additional revenues to pay for such care. Either option will find dissidents. There are people who cannot conceive of themselves or their families getting a catastrophic illness, others who have no family, and who are therefore not willing to buy catastrophic illness insurance, pay higher insurance premiums, or pay higher taxes. However, should such illness happen to them or a family member, they fully expect the government to pay for the care out of community-collected general funds.

The issue of catastrophic illness coverage can only be settled when the common good of the community takes precedence over individual preference.

**(d) Coverage for the Uninsured and Medically Indigent**

Persons unable to provide for their own medical care may apply to DPHSS' two programs, Medicaid or the Medically Indigent Program. Both programs contract private providers to render the needed medical services to program enrollees.

(i) Medicaid Program

For those persons with financial access barriers to health care, Title XIX of the Social Security Act established the Medicaid Assistance Program. This is a federal/local matching program for which \$4 million is available to categorically and medically indigent persons who meet the rigorous eligibility requirements of the program. Basic medical care and some optional services, including off-island referrals for specialized treatments, are provided to the 8,000 persons (8 percent of the population) currently enrolled in the program. There are no thresholds to limit the amounts spend for care for each individual.

(ii) Medically Indigent Program

Public Law 17-83 pertains to the Medically Indigent Program and makes reference to Public Laws 17-25 and 17-37:7, which charge the Department of Public Health and Social Services with the administration of the program.

Interim guidelines state that an applicant to the program:

"... Is not eligible for Medicaid under Title XIX of the Social Securities Act;

Has neither medical insurance coverage nor the financial ability to pay for such coverage or for medical services as determined by the programs;

Has medical insurance coverage but such coverage is inadequate to cover the cost of medically required treatment and is otherwise qualified for the program as a result of inadequate income or resources. Any supplemental coverage are limited to Medically Indigent Program coverages and limitations.

The Medically Indigent Program is intended to be the last resort for the provision of medical services for those persons who cannot pay for medical services. Therefore, a person with medical insurance must refer claims to his or her insurance company first before the bills can be submitted to the Medically Indigent Program. Those services provided by federal or other territorial programs should be utilized first as the Medically Indigent Program is "the last dollar."

Public Law 17-83 also charges the Medically Indigent Program with the provision of free hospitalization and medical care to persons afflicted with tuberculosis or lytico (Amytrophic lateral sclerosis or Parkinson's dementia) and insulin injections for diabetic patients (Article 9, Chapter 2, 10GCA). In addition, as DPHSS has been assigned the responsibility for the patients in intermediate and custodial care, MIP is also expected to reimburse the hospital for these services.



MIP provides coverage for primary and specialist care and functions in some instances as catastrophic illness coverage. Eligibility standards are somewhat less stringent than those of Medicaid since it allows additional property to that in which the program applicant resides, and an additional vehicle to that being used as the "family car." Coverage is considered somewhat more flexible and generous than that which is provided by Medicaid, particularly as MIP covers the costs for off-island transportation where there is a demonstrated need, as well as mortuary expenses when the patient expires. There is no upper limit to the coverage provided by MIP.

As with the "free" services, MIP attests to the intent of Guam's legislators to assure medical care to each and every one of the island inhabitants, regardless of ability to pay. However, since approximately 16 percent or 15,000 persons of Guam's civilian population are not covered by any other insurance program and are not eligible for Medicaid, MIP needs much greater financial resources than currently appropriated by the legislature.

There is uncertainty as to how much exactly is needed. This is partly due to the relatively short duration of the program which has not allowed the establishment of reliable data regarding the number of persons who can be expected to apply to the program in any given year, or the medical care and services such people would require. It is known that there are approximately 100 persons diagnosed with either lytico or bodig, and that of those, 21 persons are hospitalized in the SNF or ICF at the old hospital. There are an additional 30 medically indigent persons at these facilities for which the hospital expects payment. Added to this must be the numbers who seek financial help with catastrophic illness expenses. Estimates of need range from \$4-6 million per year to fulfill the intent of the legislation. The \$2.3 million appropriated for FY1985-1986 and the \$1.9 million budgeted for FY1986-1987 are considered insufficient to provide the mandated services for the island's indigent population.

While funding is the major problem for MIP, it is not the only problem. Policymakers, and the Guam Health Coordinating Council in particular, are concerned that the community's awareness of the Medically Indigent Program is limited. Often one does not learn about the program until he or she is struck with an acute illness or injury. The required diagnostic and treatment services are much more costly than any preventive measure would have been. It is therefore essential that the MIP administrators and the Department of Public Health and Social Services as a whole invest in a public awareness program that is aimed at those who are likely to use public health services and enroll in MIP. The Department and MIP must first make the community aware of the medical assistance and services that are available. At the same time, DPHSS and the Medically Indigent Program administrators must advocate that those who may be eligible for such health services and medical assistance secure preventive care before the need for diagnosis and treatment arises.

## **(2) Cost Containment Measures**

Increases in medical care spending have surpassed that of the economy in general. In this respect, Guam is no different from any other community of similar size in the U.S. mainland. And for this reason, similar cost containment measures should be as effective here as elsewhere.

The Certificate of Need program, the control of hospital costs by restructuring Medicare and Medicaid reimbursement to hospitals, and the promotion of HMOs were considered major steps in the federal efforts to contain rising health care costs. While these steps are also pertinent to Guam, the first two have not had a major impact on the island's health economy.

However, fostering the development of HMOs was very successful: 43 percent of Guam's population are enrolled in the two existing programs. An indirect by-product of the HMOs was a reduction in the average length of stay at Guam Memorial Hospital, and therefore a reduction in hospital costs, which is presumably reflected in lower premiums for the enrollees. Secondly, through its utilization review procedures, medical costs (and the quality of care) are continuously monitored.

There are no problems with the rates GMH charges to its patients: they are below the national median. However, collection for hospital bills has plagued GMH since it was purchased by the government. As there are a substantial number of uncollectable bills, a certain amount of cost-shifting had to take place, and this necessitated a 12 percent increase in hospital charges in 1984. But even with this increase, Guam's hospital rates are still comparatively low and do not lend themselves to any cost-containment measures.

Such measures must be applied to programs and services related to local funding and local spending. The Government of Guam represents the largest contributor to payment of health and medical care expenses. Approximately 40 percent of total health care costs are from direct federal appropriations for the delivery of health and human services, matching funds (such as Medicaid), locally collected taxes, and foregone federal revenues which are residual on Guam in the form of taxes or income.

As stated previously, no data has been established for the total costs of health care, nor for total expenditures incurred by the provision of care. But it has been established that due to a decrease in federal funding and an increase in the population, the Government of Guam's health revenues are no longer sufficient to cover health care expenses for the needy population. Since the island can no longer rely on federal monies for all its needs, local initiatives have to be established to stretch the available monies to cover a larger number of people.

Several methods of cost-containment are examined. Some of them could be effective in a relatively short time, while others might take years to show their true effectiveness.

(a) Repeal of "Free" Disease Legislation

The mandated free services should be repealed. Persons should receive Government of Guam assistance because they are categorically or medically indigent, not because they are suffering from a certain disease. Negotiations with GMHP, FHP, and Staywell to include these diseases in their benefit package have to be brought to a positive conclusion.

In particular, the mandate to provide free dental care to all children through age 16 has to be repealed. Only preventive and prophylactic services should be provided, which need to include island-wide fluoridation. This makes sound financial sense in view of the relatively inexpensive dental insurance which can be (and has been) purchased from the major insurers. The monies saved could be used to provide dental care for the categorically and medically indigent children and adults, and in particular seniors, who at present receive no dental care at all.

(b) Consolidation of Medical Assistance Programs

All available federal and local health dollars including sums previously appropriated for the "free" diseases, need to be consolidated and administered by one single Medical Assistance Program. This would not only save on administrative overhead costs, but would considerably ease the burden of enrollment for the applicants. One single intake procedure could identify whether a person is eligible for Medicare, Medicaid, or other medical assistance, eliminating the existing duplication of intake procedures. It would also allow for easier contracting of physicians and services, faster billing and reimbursement processing, and tighter utilization review and quality control.

(c) Contracted versus In-House Medical Care

A thorough and careful cost-benefit analysis should be performed to determine whether it is less costly to purchase medical services from the private providers in the community than to provide these services directly by DPHSS at the Southern, Central, and Northern clinics and some selected village dispensaries. Such analysis should recognize the importance of the new health providers, such as nurse practitioners, physician assistants, and midwives in the provision of cost-effective primary care. The feasibility of tying Professional Technical Awards and Student Loans for nursing and medical school students to working for a stipulated amount of time in DPHSS should also be investigated.

(d) Alternatives to Institutional Care

Much greater emphasis must be given to the strengthening of existing and the development of new home and community-based services, such as homecare nursing, homemaker/health aides, senior day care, foster care, and respite care to prevent inappropriate costly institutionalization and lengthy stays in hospitals. Any single service or combination of home- and community-based services has proven less costly than hospitalization or institutionalization, more emotionally



satisfactory to the patient, and appropriate to island culture.

**(e) Promotion and Prevention**

Funds must be allocated to health promotion and disease prevention. Preventive health services should be made an integral part of all health care in an effort to contain the high costs associated with acute and chronic illness. Particular emphasis has to be placed on the prevention of medical complications due to obesity, high blood pressure, and diabetes, such as heart attack, stroke, ESRD, blindness, and amputation of limbs.

**(f) Fiscal Responsibility**

The costs of needed health care should be borne jointly by the individual (depending on his ability to pay), the community and the government. The feasibility of mandating employer/employee shared health insurance coverage for each employed person needs to be explored. Various models of catastrophic illness insurance coverage have to be investigated and preliminary contact with such insurers must commence at the earliest date possible.

**(g) Data Collection**

A most important component of any cost-containment scheme is the monitoring of health care costs. Therefore, all health care facilities and programs should be required to use a uniform reporting system to establish utilization and cost data. Such data can then be analyzed and used to project future needs.

**Conclusion and Recommendations**

It is the Government of Guam's policy to provide health care to all its inhabitants regardless of the inability to pay. The mandated "free" services and the Medically Indigent Program attest to this. This policy requires a large portion of Guam's financial resources, and to some degree, has diminished the initiative of individuals and families to provide for their health care.

A gradual decrease in the much relied upon federal programs and a growing population have strained Guam's health care budget. While the inability to pay should not determine the nature and quality of the health care services which an individual receives, dwindling resources make it necessary to examine the provided services and to seek cost-effective solutions which might overcome shortfalls in the health care budget.

Various cost-containment measures have been explored. Abolishment of the mandated free services, consolidation of all medical assistance programs, contrasting the costs for contracted medical services to those of medical care provided by DPHSS, and investigating alternatives to institutional care are organizational or administrative mechanisms which have the potential of reducing health care costs in a relatively short time. Increasing an individual's sense of responsibility towards his own health care will take longer, as this involves a change of attitudes.

An increasing awareness of the close correlation between an individual's habits and lifestyle (smoking, drinking, eating, exercise) and his good or bad health have fostered greater personal responsibility. High blood pressure, heart disease, diabetes, and certain types of cancer--the leading causes of death--are linked to personal habits and lifestyles. Clearly, an individual has a great measure of control over his or her health, and being attuned to one's body, malfunctions or illness are noticed at an early and curable stage. Financial investment in health education, promotion, and prevention will guide individuals towards more healthful living, and will, in the long run, be the most effective measure for containing the costs for acute and chronic care.

In addition, a large number of individuals have to be weaned away from the belief that Guam's health resources are boundless, and that the government can easily afford to pay for health care. This attitude is a carryover from the naval administration when free care was dispensed to everyone, and supported by the years of "free" care provided by GMH. However, a much more equitable distribution of the responsibility for health care costs between individuals, health insurers, the community, and the government must take place. This should manifest itself in an increased number of enrollees in the major health and dental insurance programs, and a joint effort to cover each island resident with catastrophic illness insurance coverage. Whether such insurance is provided through increased insurance premiums, separate payments, or increased taxes is as yet debatable, but the outcome is most important: financial security in the face of catastrophic illness. This can only come about when individuals perceive themselves as being responsible for their own health and the collective health of their community.

#### **D. Quality**

The quality of health care refers to the level or degree of excellence in the delivery of health services. It is measured in terms of established professional standards and in the consumer's judgement of value. Measures of quality can be conceptualized as ranging from statements of some ideal to statements of set minimal standards. These measures often reflect three dimensions of care: input, or the licensure and certification of manpower and facilities; process, or the appropriateness of procedures in a given situation; and outcome, either actual improvements in conditions or reductions in harmful effects.

Quality assurance or quality control programs are an integral part of health care. The programs are carried out in varying degrees, and for various reasons or motivations, by health care institutions, medical societies, government agencies, and prepaid health plans. Overall, the goal of quality control programs is to assure an adequate level of quality in the delivery of care while, at the same time, maintaining a degree of control over utilization and costs.

##### **(1) Quality Control by the Government**

Licensing and certification programs for both facilities and personnel are generally provided by government agencies, and are often considered as programs to assure quality. Unfortunately, there is no legislation on Guam that requires a health care facility to be licensed or certified as

such. Thus far, the parameters of the licensing and certification statutes have been limited to manpower; and these statutes have yet to be implemented comprehensively since neither administrative nor procedural rules and regulations have been developed.

The limited progress in the government's quality control activities stems in part from the much too rapid growth of the island's health care industry. For years, the federal government provided health services through military personnel that was not required to be licensed or regulated locally. When the Government of Guam assumed the primary responsibility for providing medical care, the lack of licensure and certification requirements was not unusual. Now, however, public and private health professionals agree that the development of health care in the private sector and the expansion of public health services necessitates that the government provide for sound quality control.

Legislation that identifies the need for quality assurance within health care institutions must be enacted. The implementation of detailed rules for monitoring quality control must follow. Similarly, an active licensure program for health manpower must be reinstated.

The legislation and the program guidelines should be created and maintained to achieve the highest degree of health care services for consumers. Areas of particular concern are listed below:

There should be a system for regular review of the quality in the process of medical care by internal and external agencies;

All health care providers should be technically competent and have the appropriate license and certification;

Health care services should only be provided when they are medically necessary, and should only be offered in those facilities which provide for quality control;

Health care services should improve health status; and

Quality should be assured in all medical support services and facilities.

## **(2) Internal Quality Assurance**

Although the local government does not require quality control programs within the health care industry, there are various incentives that lead medical facilities and prepaid health plans on Guam to provide for quality assurance through formal in-house procedures. The programs are often a combination of utilization review and quality control.

### **(a) Utilization Review**

The Guam Memorial Hospital Authority and the two federally approved HMOs each have their own utilization review (UR) procedures. Each of the UR activities is aimed at controlling costs and ensuring that the services provided, either within the hospital or under the respective health plan, are appropriate. Judgements for appropriateness generally



focus on the process, or the procedures involved in health care; and these judgements vary with the standards of each entity that employs utilization review.

The Guam Memorial Hospital Authority, for example, follows the standards set by the federally contracted Peer Review Organization (PRO) that monitors GMHA's operations with regard to Medicaid, Medicare, and Maternal and Child Health patients. The standards require that the hospital UR address the appropriateness of admission, lengths of stay, and services provided.

The HMOs are naturally concerned with similar aspects of the process involved with inpatient care, but the standards may vary from those of the hospital. In addition, each health maintenance organization monitors the utilization of the outpatient services, whether the services are provided in the HMO's own facility or in the office of one of its providers. Again, the cost of health care is the underlying cause for utilization review.

#### **(b) Quality Assurance**

The quality assurance programs that are operative in the island's health care institutions generally go beyond the scope of utilization review. Quality assurance addresses the facilities and the equipment used in the delivery of health services. As with utilization review, the standards and criteria vary with the facility, but the goal of improving and maintaining the quality of care remains.

The Guam Memorial Hospital Authority and the Department of Public Health and Social Services use national standards and criteria in their quality control programs. The hospital, for example, must maintain the standards set by the Joint Commission on the Accreditation of Hospitals in order to keep an accredited status. Both GMHA and the Department of Public Health and Social Services serve Medicaid, Medicare, and MCH patients and therefore must meet the guidelines set by these federal programs.

Likewise, quality assurance is achieved to a certain extent within the two federally approved HMOs since they are federally mandated to incorporate quality assurance into the delivery of health services. In addition, federally qualified HMOs must meet certain guidelines that have been established by the federal government and are monitored for compliance through appropriate reviews. The criteria for federal reviews of HMOs are established for services provided by HMOs in an ambulatory setting, in a clinical laboratory, and in a surgi-center as well. Moreover, the recruitment process and peer evaluation of the medical manpower are to be included in the quality control activities.

#### **Conclusion and Recommendations**

There is no question as to whether or not the quality of health care on Guam needs to be addressed. The questions involve, instead, who and how should the quality of care best be monitored and evaluated.

Thus far, the legislation that has been enacted to regulate quality through manpower licensure has been limited in its effect because of the lack of provisions for adequate administrative personnel. It is not likely that any new legislation for facility licensure and certification will include funding for the actual operations of the program or for the staffing of such a program. Moreover, the larger health care institutions like GMHA, DPHSS, and the HMOs are currently under federal guidelines and review for funding and certification purposes. The local government can, however, mandate that since these facilities serve the local population, and that since it is the government's role to protect the local population, the government has the right to access the federal review and certification records. The Government of Guam will avoid a duplication of regulating activities, but will remain informed as to the standards of the services provided. This may result in the most effective and efficient use of the local government's limited health care dollars.

#### **E. Acceptability**

Acceptability is an individual's or group's overall assessment of available health care in terms of such factors as quality, cost, outcome, convenience and provider attitudes. It is generally measured in terms of the degree to which health care consumers and providers are satisfied with the performance of the health care system.

Unlike other characteristics, acceptability focuses on perception of the health system rather than the system itself. As such, it is a subjective judgement, influenced by culture and attitudes. For example, social stigma associated with certain illnesses, such as mental disorders, continue to serve as barriers to those requiring vitally needed services. Certain individuals or groups that have traditionally turned to the services of the church and clergy for emotional help may be less likely to utilize existing programs and services of the Department of Mental Health and Substance Abuse. Other individuals may not seek available services because of the isolated location and delapidated condition of the Department's facilities.

Health officials indicate that public acceptance of certain health programs may be linked to awareness of the need for a particular service. For example, Micronesian and Chamorro women are consistently below the norm in seeking prenatal check-ups during the first trimester of pregnancy; these groups of women have the highest proportion of low birthweight infants. Maternal and Child Health Program officials feel that the low utilization of services by these groups of women is due to the lack of awareness for the need for prenatal check-ups.

The Health Care Status Study of the Population of Guam reflect responses from 400 randomly-sampled households on their level of satisfaction with quality, accessibility and cost of health care services. The survey showed a 90 percent level of satisfaction with the information received from professionals about health conditions and treatment. Eighty-nine percent of those surveyed were satisfied with the quality of health care; eleven percent were not.

With regard to out-of-pocket costs, 69 percent noted some degree of satisfaction and of the 31 percent who were unhappy about costs, nearly

one-third were very dissatisfied. One aspect of medical care that the group was most dissatisfied with was the length of time required from arrival at the doctor's office until care was received. Approximately 37 percent were not happy with the waiting time.

A high level of positive response was received on questions concerning days and times that medical care and related services were available. As compared to a previous survey conducted four years earlier, the findings reflect that the extension of doctor and clinic hours into time frames outside of the usual 8 to 5 Monday through Friday have been well-received by the public. The levels of satisfaction rose from 11 percent and 15 percent respectively for times and days, to the 90 percent range.

### **Conclusion and Recommendations**

The majority of Guam's population find medical health care services acceptable. Prejudice against certain services and ignorance about the benefits of others are often rooted in cultural perception. Public education can eliminate this.

Waiting time, either at a private or public medical care provider, seems to exceed expectation of almost 40 percent of a recently surveyed sub-group of the population and led to dissatisfaction. It could not be measured whether such dissatisfaction would actually make the delivered health care services unacceptable to the consumer, prohibiting him from seeking needed care or continuing with treatment. More data needs to be collected to pinpoint the reasons for prolonged waiting time before any recommendations can be made.

## **F. Continuity**

Continuity is effective structuring, coordination, and delivery of health services on a continuous basis in one or more settings. Continuity is measured by the ease in which the consumer can move between required elements of the health care system and the degree to which these services are integrated. This characteristic of health care may be viewed as having three dimensions: 1) continuum of care; 2) scope of services; and 3) coordination of services.

### **(1) Continuum of Care**

This dimension of continuity is the timely provision of health services from diagnosis to treatment to cure. Inherent to the problem of continuum of care is the multiplicity of local health care "systems" that do exist. Many programs and services overlap; some operate out of separate government agencies and private settings. Certain services are supported by federal funds and others by private monies.

The availability of a regular source of care is basic to continuum of services. A major problem facing the medically indigent who must depend on local government health programs is the lack of continuity of service with any single provider, such as GMHP enrollees might have with a primary care physician. The use of the GMH Emergency Room for obtaining routine primary care, although decreased in the past two years, contribute to increased health care costs with less continuity of care.



Services offered from the island's regional public health centers are generally fragmented and continuity of care is assured only to the extent that the same clinic and service is utilized. In the past, particular problems have arisen in instances when a pregnant woman comes to GMH to have her baby delivered by a physician who is not familiar with her case history. Occasionally, her medical records are not transferred to GMH from the DPHSS in time. This has led to confusion, if not complications. The process is then repeated in reverse order--the patient and child return to DPHSS without medical notes from the hospital. While problems with continuity of care have improved with DPHSS's contracting of physicians for prenatal and delivery services, these situations could reoccur if contracted services were unavailable in the future.

## **(2) Scope of Services**

While a vast array of health care is available to island residents, these services are often limited by the lack or shortage of qualified personnel, necessary equipment, adequate facilities, and financial resources. Detailed descriptions of these services are presented in Chapter V and are generally discussed in this chapter with regard to other health system characteristics.

Ideally, the scope of Guam's health services should address not only immediate, but total patient needs as well. These services should encompass sound preventive programs as well as acute, chronic, and long-term care. Health services providers should develop patient care plans to ensure the provision of a wide range of services. One area in which there appear to be shortcomings is in securing necessary services following discharge from inpatient facilities, such as GMH and the Department of Mental Health and Substance Abuse. Although certain programs such as home care services, meal delivery, and other social services are available to the public, these alone are inadequate in addressing the needs of each patient when no coordination exists between the discharging facility and community services.

Another area of concern lies with off-island referral. Because Guam's population base is presently too small to support such specialized services as radiological care, patients requiring these services must obtain them from off-island hospitals, usually in Hawaii or the U.S. mainland. Referral mechanisms and follow-up procedures for care are weak and in some respects, non-existent. The situation is often aggravated by infrequent airline flights serving Guam, flight time to the referral centers, and the expenses involved in securing specialty services. Off-island physicians who are unfamiliar with Guam's medical capabilities hesitate to release a patient for the trip back home for fear that the patient will not get proper aftercare.

## **(3) Coordination of Care**

Although certain programs reflect the most effective and efficient use of Guam's limited health care dollars, much improvement must still be made in bridging the gaps between services. Overall, the picture of health care on Guam is one of fragmentation, aggravated by the lack of coordination by both government and private providers. This is evident in the system of patient referrals and follow-up treatment for all levels of care, both on and off-island.

Health services should be interlinked with other social services in the community. Only through these efforts can holistic care of patients be realized. There are adequate habilitation and rehabilitation services scattered among several government agencies and private clinics, however, they need to be coordinated to maximize manpower and financial resources.

#### **Conclusion and Recommendations**

While both patient and provider have responsibility for assuring the maximum degree of continuity, the health system must be structured to ensure that services are delivered in the most efficient and effective manner. Problem areas that must be addressed are the provisions of: 1) regular source of care; 2) patient and medical information transfer; 3) delays or interruption in service; and 4) follow-up procedures.

## **VII. PLANNING FOR THE FUTURE**



## VII. PLANNING FOR THE FUTURE

State health plans are usually prepared for 5 years and therefore the planning information presented in the previous chapters covers a wide range of issues relevant to Guam's health care provision through 1990. As a health system is dynamic in that it continually grows and changes, revisions are made during the third year of the planning cycle to accomodate unforeseen situations, newer technologies, or unusual population changes as they may arise.

When planning for a 5-year period, it is only natural to look beyond this time span. This is perhaps even more important on Guam than it would be on the mainland, as great distances separate the island from other more specialized and sophisticated medical providers. Health planning on Guam, therefore, is carried on with a view to the future and eventual self-sufficiency in the provision of health care. Some of the advocated goals, objectives, and actions can be considered as steps towards achievements which will not be fully realized until 1995 or the year 2000.

Changes over time that can be expected in Guam's population and its composition, the health status and health system, data collection, and health care financing, are briefly discussed as follows.

### A. Population Changes

If Guam continues to experience the same population growth over the next decade and up to the year 2000, as seen in the previous 5 years, the existing medical facilities and medical manpower will no longer be sufficient to provide quality health care to the island population. Listed below are population figures in 5-year intervals for the years 1985-2000 and the percent of increase calculated from the 1985 base.

**TABLE 80**  
**Projected Increase In Civilian Population**  
**Guam: 1985 - 2000**

| Year | Total Population | Increase In Population From 1985 | Percent of Increase from 1985 Population |
|------|------------------|----------------------------------|------------------------------------------|
| 1985 | 96,011           | 10,847                           | 11.30                                    |
| 1990 | 106,858          | 20,960                           | 21.83                                    |
| 1995 | 116,971          | 31,130                           | 32.42                                    |
| 2000 | 127,141          |                                  |                                          |

Source: Guam Health Planning and Development Agency.

It can be seen that we will have an 11 percent increase of population over the next 5 years, double that number in 1995, and will have trippled that figure to 32 percent in 15 years. This means that the capacity of Guam's health care delivery system must increase by one-third by the year 2000, necessitating an expansion of facilities, services and programs, and, most importantly, an enlargement of our manpower resources.

The population is expected to increase proportionately in all age groups up to 55. Only in the category of 55 and older can larger numbers be anticipated. By the year 2000, the senior population is expected to increase by 52.73 percent of the 1985 senior population, as shown in the table below.

**TABLE 81**  
**Projected Increase of Civilian**  
**Senior Population 55 Years and Older**  
**Guam: 1985 - 2000**

| Year | Total Senior<br>Population 55+ | Increase In<br>Senior Population<br>From 1985 | Increase As Percent<br>of 1985 Seniors |
|------|--------------------------------|-----------------------------------------------|----------------------------------------|
| 1985 | 9,677                          | 2,546                                         | 28.08                                  |
| 1990 | 12,223                         | 3,897                                         | 40.27                                  |
| 1995 | 13,574                         | 5,102                                         | 52.73                                  |
| 2000 | 14,779                         |                                               |                                        |

Source: Guam Health Planning and Development Agency.

The implications for planning are obvious: with an increase of 28 percent in the next 5 years, of 40 percent over the next 10 years and of 53 percent by the year 2000, an extensive expansion of all services and programs in the long-term care continuum must be initiated early enough to guarantee appropriate placement for each person in need.

One might rightly conclude that increased efforts in health promotion and disease prevention will result in a dramatic reduction in chronic diseases and disabilities, and a similar decrease in the demand for institutional long-term care. But since the senior population for the years 1995-2000 are already middle-aged or older, many carry the seeds of hypertension/cardiovascular disease, cancer, diabetes, crippling arthritis, lytico or bodig, Alzheimer's disease, or emphysema--the conditions which require care over a long period time. Therefore, attention must be given to the need for long-term care at all levels. The next generation and those to follow should be the ones to reap the harvest of the earlier endeavors of changing lifestyles and the course of diseases through promotion, prevention, and detection programs and services.

## **B. Health Status**

### **(1) Reduction of Chronic Disease**

It is anticipated that vigorous health promotion, prevention, and screening efforts during the mid- and late eighties will show their desired result by 1995-2000. If the national experience holds also true for Guam, then these prevention efforts should result in a noticeable downward trend in the incidence, prevalence, and mortality rates of the diseases or causes for premature death.

Even though medical technologies and innovations have advanced tremendously over the past years, and no doubt will continue to do so at an even faster pace, it is still unrealistic to expect that cures will be found for Guam's leading causes of death in the next 10 to 15 years. However, lifestyle changes effected through health promotion and disease prevention and detection services will lead to greater individual knowledge about the diseases, resulting in either the prevention of disease or in much earlier diagnosis and treatment. This in turn will reduce the risk of life-threatening complications and premature death.

For instance, if persons would quit smoking--a major risk factor for cancer, chronic obstructive lung disease, and cardiovascular disease--many deaths and disabilities could be avoided. Control of obesity and stress, and an increase in physical exercise are known to prevent, or at least to beneficially impact on, diabetes and hypertension. Persons with controlled diabetes or hypertension can expect to lead a normal life; yet left untreated, hypertension leads to stroke, heart disease, heart attack, as well as end stage renal disease, and uncontrolled diabetes can result in blindness, amputation, stroke, and ESRD as well. The prevention or control of alcoholism will manifest itself in a lower alcohol-related accident rate, increased productivity in the community, and greater social cohesion.

There is a dual benefit to be reaped by making a serious investment in health promotion, disease prevention, and detection activities. Guam will have a healthier population and will also experience, over time, a cost reduction for acute and chronic care.

### **(2) Holistic Approach to Medicine**

The successful reduction of illness and disability through promotion and prevention in the mainland has yet another effect. It has proven that the way to better health does not depend solely upon improved technologies and more sophisticated treatment modalities for illness. Modern medicine has come to view the human body as a machine that can be disassembled and repaired or have its parts replaced. An entire economic structure and payment system not only supports this view, but perpetuates it.

Yet more and more evidence points to the fact that a person's illness cannot be separated from his body, mind, and spirit, and if any treatment or cure is to be effective, this must be taken into account. "Holistic" medicine is a concept that has been increasingly employed over the last several years. It simply means that more is needed than the prescription of a drug for



an ailment or the excision of an organ or tumor. Holistic medicine recognizes that the elements relating to health, healing, and recovery reside not only in the physique of an individual, but are rooted in values, perceptions, emotions, spirituality, and other matters that are beyond the scope of modern mechanistic medicine.

Until now, health planners considered health care provision and health economy from a technical and financial point of view. For future planning the "human" element must be incorporated, as the benefits of holistic medicine are now being realized and the costs of fostering self-awareness, self-actualization and wellness are considerably lower than those required for highly specialized medical treatments in which the patient has no faith, and therefore provide no benefit to him.

### **C. Health Care Delivery System**

Guam's health care delivery system is a conglomerate of public, private, and military facilities, programs, and services as detailed in Chapter V. Guam's public facilities, the Guam Memorial Hospital, the clinics under the Department of Public Health and Social Services, as well as the Guam Mental Health and Substance Abuse Inpatient and Outpatient Facility, require long-range planning. While day-to-day activities continue, much thought is given to the future of these facilities and their services.

#### **(1) Facility Planning**

##### **(a) Department of Mental Health and Substance Abuse**

Inpatient and outpatient mental health services are provided at the old Guam Memorial Hospital, in the F Wing and the F Wing Annex. The facility is dilapidated and continuous problems exist with the air conditioning and the electrical and water heating systems. The present facility does not allow for the segregation of acute psychiatric and chronic mentally ill patients, the mentally retarded, alcohol and drug-related cases, and court-admitted criminally insane individuals from each other. This hampers the provision of services and undermines the effectiveness of treatment.

The construction of a free-standing mental health facility is a long-range goal which has been assigned priority by Guam's health care providers. An estimated \$4 million is needed to build and furnish a new facility which will allow for appropriate placement of mental patients and improved services. A new mental health center will also be able to serve as a regional referral center for mental health care. Vigorous efforts are underway to secure federal funding for this endeavor, and private financial sources are also being investigated.

##### **(b) Guam Memorial Hospital**

Every effort is presently directed towards having GMH reaccredited by the Joint Commission on Accreditation of Hospitals (JCAH), as such accreditation is in fact the hallmark of the successful delivery of quality health care to the population. Major activities geared towards reaccreditation are the relocation of the Hemodialysis Unit, the Skilled

Nursing Facility, and the Morgue from the old hospital to the new one; the addition of dietary and laundry services to the new hospital; and most importantly, the correction of existing structural deficiencies identified in the new hospital facility.

A major capital outlay is required for this very necessary endeavor. However, once all construction, relocation, and corrections are completed, Guam will have a first rate acute care facility to be proud of. In addition, the Guam Memorial Hospital will be able to function as a medical referral center for the neighboring Pacific Island population of Micronesia, once certain specialized services can be added to Guam's health care delivery system. Besides many other considerations for adding speciality services, one particular factor has fostered the development of hospital plans in this direction: the increasing numbers of persons referred off-island for specialized medical care and the sky-rocketing costs involved in such referrals. (Please see subsection (2) below.)

#### **(c) Department of Public Health and Social Services**

The Department of Public Health and Social Services needs to establish a long-range plan for its facilities and services. While the new Northern Area Regional Health Center is expected to open its doors in November 1985, the Southern and Central clinics are over 10 years old and will require extensive renovations in the next 5 years. Any plans for renovations must be tied to the Department's plans for the delivery of services.

Over the last 5 years, budget constraints within the Department have resulted in problems with maintaining DPHSS clinic services; shortages in physician and nursing manpower have further hampered the Department's ability to effectively deliver its services. The Department then, must first determine whether it is more economical to purchase services from physicians in the private sector or to continue providing services directly to DPHSS clients. Once the determination is made, the plans for the renovation and equipment purchase requirements for the three regional health clinics can be developed accordingly.

#### **(2) Planning for Medical Referral Services**

Off-island medical referrals are generally made because Guam lacks the required specialist health manpower and equipment for needed diagnosis and treatment. The outlying islands of Micronesia are usually in still greater need of referral because their technical capabilities trail behind Guam's and their population bases are even less able to support specialized manpower.

A recent, rather informal, study has identified the classes of diseases or medical procedures for which referrals were most frequently made, as well as the approximate costs for these referrals from the years 1982 to 1984.



| Category of Procedure                   | Number of Referrals | Range of Costs | Avg. Cost Per Person, 1982-84 |
|-----------------------------------------|---------------------|----------------|-------------------------------|
| Heart Trouble/Cardio-logical Procedures | 138                 | \$ 200-52,855  | \$13,696                      |
| Neonatal Complications                  | 43                  | \$3,609-90,237 | \$30,239                      |
| Radiation Therapy                       | 22                  | \$3,300-27,985 | \$12,121                      |

Cardiac procedures were diversified, ranging from catheterization, angiograms, and angiographs to very intricate double and triple bypass operations. Neonatal treatment was most often required for complications of premature birth and congenital anomalies. Radiation treatment to various sites was administered to effect cure or palliation in cancer victims.

In the last 3 years Guam spent a minimum of \$2.5 million for off-island medical referrals. For all of the Pacific Basin region, this figure rises to approximately \$15 million. These amounts represent a sizeable share of available health finances on Guam and in the other islands. Concerns over this spending has given rise to closer investigation of referral practices and the exploration of possible cost-saving alternatives.

There is no doubt that the majority of medical referrals are justified in light of the existing medical technologies. It is also a fact that as remote as Guam is from other health care centers, the knowledge of available technologies has travelled to Guam far in advance of the capabilities to perform specialized health services. The media, for one, keeps island inhabitants abreast of medical innovations. Many of the islanders travel to the mainland and abroad and are exposed to advanced medical technologies; others hear about them from kin residing off-island. There are also the younger physicians trained in the mainland who are returning or coming to Guam and are used to the latest state-of-the art tests, procedures and equipment, and feel that their patients ought to have no less in their care. Additionally, the fear of medical malpractice litigation and the unavailability of malpractice insurance might in part be responsible for the increase in off-island referrals, since a physician prefers to be safe rather than sorry when uncertain about the diagnosis or treatment of a patient.

The best possible way to decrease off-island referrals and retain health dollars on Guam would be by enhancing the island's medical capabilities. The Guam Memorial Hospital is well underway to becoming a first rate acute care center. The planned relocation, renovations, and additions previously mentioned, the replacement of second-hand medical equipment such as the C.T. scanner, ultrasound, and mammography apparatus, as well as the purchase of new and sophisticated equipment (e.g., a gamma camera to diagnose and treat internal bleeding and heart problems and an Echocardiogram to assess heart murmurs), will, in the next 5 years, enable GMH to accomodate patients from Guam and the other islands in Micronesia for specialized diagnosis and treatment that are now only available in Hawaii or the U.S. mainland.



At this time it is important to look still further ahead and plan for medical services that can be performed on Guam 10 years from now or by the year 2000. Since cardiological procedures, neonatal care, and radiation treatment comprise the bulk of medical referrals, they warrant closer examination. It must be stated that conventional planning by which a certain population base is related to the need for a specific service is not truly applicable to Guam. For island inhabitants, all medical costs are combined with the additional high air fares for the patient and his accompanying caregiver or escort, as well as the living expenses for the escort and patient if treatment is on an outpatient basis. Furthermore, it must be considered that several million dollars leave the island's economy for services which do not greatly impact on Guam's health status and do nothing for the improvement of the health care system. Additionally, the emotional impact of separation caused by off-island referrals added to the trauma of coping with serious disease leads to stress which cannot be equated with dollar amounts, but which are nevertheless a very real component of medical referrals. In view of this, it makes sense to explore the possibility of retaining the patients and the health dollars on Guam and aim towards the provision of as many specialized services as is realistically feasible.

#### (a) Specialized Cardiac Care Services

Such services consist of diagnostic cardiac catheterization and cardiac surgery. Cardiac surgery might be as simple as the implantation of pacemakers, or be open or closed heart surgery. Open heart surgery has developed rapidly since the introduction of pulmonary bypass procedures, a technique by which the patient needs to be connected to a pump oxygenator which takes over the function of the heart and the lung during the operation while the heart is being repaired. Open heart surgery benefits patients with congenital and acquired heart defects. Coronary artery bypass grafts, either single, double, or triple, are the most common of the open heart procedures.

Cardiac catheterization is an invasive diagnostic procedure by which a thin hollow tube is introduced through the circulatory system into the chambers of the heart. This permits direct measurement of intracardiac pressure, valve function, structure, flow pattern and vascular anatomy. Catheterization is performed in order to make a decision about surgery; however, at least one-half of patients who undergo catheterization are found not to require surgery.

Closed heart surgery refers to operations that do not need a mechanical pump during surgery. The repair of aneurysms, pulmonary arteries, and systemic pulmonary shunts fall into this category.

Cardiac catheterization and open heart surgery require specialized staff, equipment, and organizational arrangements in a hospital setting. Many factors are involved in planning for such services. One is the population base for which such services will be performed, another is the incidence and prevalence of heart disease for that population. From this can be calculated the number of actual procedures which will be performed. National standards recommend that 200 procedures per year be performed in a specialized cardiac care center. It is

questionable whether that many procedures will ever be demanded by Guam and the other Micronesian islands. Only a careful cost-analysis of referrals for cardiac procedures over the years compared to the costs of providing these services on Guam will allow for realistic planning and decision making. Additionally, it must be established what minimum volume of procedures and aftercare has to be provided to assure the maintenance of professional skills for quality care.

A cardiac specialist team should include, at a minimum, the following:

|                                                              |                                                                                   |
|--------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Cardiologist(s)                                              | Perfusion Team - Certified technicians or nurses                                  |
| Cardiac Surgeon(s) assisted by a senior surgical resident    | Nurses - specially trained scrub nurse for cardiac surgery and circulating nurses |
| Anesthesiologist assisted by a resident or nurse anesthetist | Other staff - should be available for providing immediate lab work                |

Besides the pump oxygenator, the other necessary equipment, such as x-ray, oximeters, cardioverters, defibrillators, and pacemaker units are generally available in a hospital. The nursing team of the Cardiac Care Unit is trained and able to provide the required care during recovery.

(b) Level III Neonatal Speciality Nursery

At present, Guam Memorial Hospital (and the U.S. Naval Hospital) are well equipped to manage maternity patients not at risk, or patients at minimal risk. At the same time, because of the possibility of unexpected complication during pregnancy, it is necessary to have immediate access to a facility which provides care for infants with critical conditions.

Such a facility should be available to all pregnant women at considerable or high risk. A high risk pregnancy is one with a great likelihood of requiring intensive care for either the mother or the infant. Guam Memorial Hospital uses Kapiolani Women's and Children's Hospital in Hawaii as their high risk intensive care center. The U.S. Naval Hospital refers its high risk maternity patients to the hospital at Clark Air Force Base in the Philippines and to Tripler Army Hospital in Hawaii. In the last 3 years, 43 such referrals were made, most of them for premature and low birthweight babies.

In addition to the above referrals, six or seven of the on average 175 babies born each month on Guam are referred to the Newborn Intensive Care Unit (NICU) for speciality care; another 10 to 15 infants require attention in the intermediate care unit each month for less serious problems. Many of these problems are caused by Guam's higher than average rate of premature and low birthweight infants (those who weigh less than 2,500 grams at birth).

New technologies make it possible for such infants to survive, when formerly they would have died because of a lack of specialized care. Level III nurseries have experienced dramatic successes with the saving of more than 50 percent of those infants weighing 1,000 grams, and more than 90 percent of those weighing 2,000 grams. Such specialized care assures improved survival and optimum physical and neurological growth and development of the newborn, while avoiding such complications as neurological deficits leading to mental retardation, cerebral palsy, diverse behavioral problems, epilepsy and the more subtle, later occurring ophthalmologic and auditory deficiencies and learning disabilities.

GMH's newborn intensive care unit was originally intended as a Level III nursery, designed to provide care to the critically ill newborn of Guam's civilian and military population, and also to function as a regional center for the other islands in the Western Pacific. Lack of equipment, a sufficient number of nurses, and a neonatologist have prevented GMH from providing Level III nursery care.

A neonatologist is a medical specialist trained to provide intensive care during the first critical hours and days of a high risk infant, thereby improving recognition and therapy of neonatal problems. It might be questioned if there are a sufficient number of at-risk infants in any given year to warrant the hiring of a neonatologist and to justify the purchase of the additional equipment needed to upgrade GMH's NICU to a Level III unit. Again, costs for off-island referrals have to be compared to the cost of providing such services on Guam. Such a cost-benefit analysis must include the consideration of the impact of separation through off-island referrals on the parents and the newborn, as well as the long-range consequences this will have on the infant's emotional development. Furthermore, it must be taken into account that a neonatologist can also provide regular pediatric care, can teach obstetricians, pediatricians, nurses, and expectant parents about the risk factors of pregnancy and how to avoid or deal with them, and thereby considerably improve maternal and child health on island.

#### (c) Therapeutic Radiation Services

Radiation therapy involves the use of equipment to bombard specific sites of the body where malignant cells are located with intensive doses of radiation for short periods of time. Guam's health care system referred 23 patients off-island for radiation treatment at an average cost per patient of \$15,642. The number of off-island referrals is considered an underrepresentation of cancer patients in need of radiation treatment, since some persons opt not to go off-island for radiation and others cannot afford to go.

Estimates indicate that more than one-half of all patients with cancer receive radiation therapy at some time during the course of their disease. Radiation therapy may be used as the principal form of treatment or in conjunction with surgery and/or chemotherapy.

Radiation therapy is the preferred type of treatment for most cancers of the cervix and lymphomas, particularly Hodgkin's disease. It is the



most frequently used treatment for esophageal, lung, and bronchial cancer, as well as cancer of the larynx. The primary effect of properly applied radiation is the destruction of cancer cells for curative purposes (curative therapy) or for the alleviation of pain and suffering without curative intent (palliative therapy).

Several types of radiation are used for therapeutic purposes. Among these are:

External irradiation (therapy) from sources at a distance from the body;

Local irradiation from sources in direct contact with the tumor;

- surface irradiation using applicators loaded with radioactive material (for example, molds for the treatment of certain oral and skin tumors);
- intracavitary irradiation in which radioactive materials in removable applicators are inserted into body cavities, such as the uterus or sinus;
- interstitial irradiation where radioactive sources are inserted into tissue; includes insertion of removable seeds, nonremoval seeds of radioactive material, nylon sutures containing small radioactive particles, or radioactive wire; and

Internal or systemic irradiation by radioactive sources administered intravenously.

There are several ways in which the various types of radiation therapy can be administered. Most radiation therapy is carried out with beams of x-rays or gamma rays. The term x-ray applies to electromagnetic radiation produced by human made machines. Gamma rays emanate from naturally occurring or artificially produced radioactive elements, (for example, Radium and Cobalt 60).

Several types of machines are currently being used to apply these rays to bombard the area being treated. The megavoltage machines are the preferred equipment to administer radiation therapy.

Demand for radiation therapy services is generally a function of the incidence of cancer in the population, the proportion of cancer patients for whom radiation therapy is deemed appropriate, and the number of treatments to be given during the course of therapy. The incidence of cancer in a population is affected by population growth and aging, and by changes in the age-specific cancer incidence rates. Cancer incidence varies with age, with incidence rates among older persons as much as 200 times greater than the rates experienced among the younger age groups. Since Guam's older population is growing at a higher rate than the general population, an increase in the incidence of cancer can be expected over the next 5-15 years.

Since radiation therapy services are needed by a small proportion of the population, involve use of expensive, highly specialized equipment,

and require sophisticated treatment planning and supervision by physicians (radiation therapists/oncologists), and other health professionals with experience in the technique, a regional approach to the planning and development of radiation therapy facilities is needed. Such an approach will help to ensure the availability of a consistently high level of care and the timely incorporation of advances in cancer management into all treatment programs. For these reasons, the need for and availability of radiation therapy services for Guam and the surrounding island needs to be closely investigated.

The National Guidelines for Health Planning state that a megavoltage radiation therapy unit should serve a population of at least 150,000 persons and treat at least 300 cases annually, within 3 years after the initiation of service. A treatment is equivalent to one patient visit. The guidelines permit downward adjustment in the required number of cases where travel time and expenses to an alternate unit (such as the ones in Hawaii and the U.S. mainland) pose a serious hardship to patients due to geographic remoteness.

It cannot be stated often enough that careful thought and deliberation must be employed when investigating the feasibility of having Guam directly provide the specialized medical services for which people currently have to travel off-island to obtain. It has been established that we do not have the population bases normally required to support cardiac speciality services, a Level III neonatal speciality nursery, and therapeutic radiation services. The issue here is not so much the purchase of all the required equipment. Even though Guam's financial resources are expected to remain scarce through the next decade or more, monies invested in our health care system will be recouped by a reduction in off-island referrals. The real problem is finding and retaining the required specialty medical manpower.

There are several approaches that could be used to prepare for the above services within 10 years. One would be the channelling of new medical students into the required medical specialties through Professional Technical Award or Student Loan incentives. Another approach would be to purchase the necessary equipment and to upgrade the skill of medical technicians, technologists, and nurses, but to hire specialist services through contractual agreements from reputable medical centers specializing in the needed services. Specialists in cardiology/cardiac surgery and oncology/radiation therapy could make scheduled trips at regular intervals to the island to examine patients, set up treatment protocols as indicated, perform cardiac surgery or radiation therapy, and provide follow-up. Furthermore, the specialists or their contracting institutions could also be responsible for training all support personnel as well as on-island physicians to upgrade their skills, and accept the referral of unusually complicated cases in their respective speciality from Guam Memorial Hospital. Similar arrangements have already been made by some of the private providers for a nephrologist/surgeon and this arrangement has proven to be satisfactory.

A third option would be to provide only some of the services, e.g., diagnostic cardiac catheterization, but not the surgery. An argument against this option is that equipment has to be purchased and staff upgraded and hired, yet the need to refer patients off-island will remain.



A weighty factor in favor of providing specialist services on Guam regardless of the population base are the costs involved in off-island referrals. For instance, radiation therapy on the mainland requires that the patient drives to the facility, spends 12-15 minutes in treatment, and returns home or even to work. For someone from Guam or the other Pacific Islands, matters are much more complicated. There is a long and expensive flight for the patient and his escort (since island culture as well as medical practice dictate a sick person should not go off-island unattended); there are rent and living expenses for several weeks or months in Hawaii or the mainland to consider; there is sometimes the loss of wages, and quite often there is the culture shock of coming to a booming metropolis (Honolulu, Los Angeles) from a relatively isolated and sedate island, combined with the anxiety of leaving the family behind. If the real and social costs for patient off-island radiation treatments are added up and compared to customary radiation treatment costs, one will find no doubt that Guam does not need to treat the number of patients or provide the number of treatments set forth in the national guidelines in order to meet the threshold of financial feasibility for such services.

Guam, of course, cannot solely bear the financial brunt of such a venture. After a feasibility study which compares the upgrading of Guam's medical system to the expenses of referring persons from the different island entities to Hawaii, to the U.S. mainland or the Philippines for needed specialized medical care, a method of financing has to be worked out, and negotiations have to begin. Such negotiations must include the U.S. Naval Hospital, who now refers a number of patients to either the Clark Air Force Base Hospital in the Philippines, or the Tripler Army Medical Center in Hawaii for services they could possibly receive at Guam Memorial Hospital under CHAMPUS reimbursement. The feasibility of special federal funding for this venture needs to be investigated. Formal inter-governmental agreements between Guam and the other participating islands in Micronesia for the referral of patients and payment for their care have to be reached and legalized, as Guam's resources cannot and should not be the sole basis for the creation and maintenance of a regional medical referral center.

#### **D. Health Data Collection**

Guam's health service system has grown tremendously over the past two decades. From the initial U.S. Navy-administered hospital and public health programs, the delivery system has expanded into a sophisticated network of governmental and private providers delivering health care to the island residents in a variety of ways. This growth of the health care system has beneficially impacted on the health status of the island population. It has also altered disease patterns, which have moved away from diseases caused by environmental conditions to those associated with more stressful living, faulty diets, and excessive smoking and drinking. However, this improved health status and the determinants of this status have yet to be explored in depth.

Such an assessment requires the continuous compilation of health status indicators and an evaluation of the availability of health resources and health services; it has to monitor the utilization and acceptance of these services by the island residents, and also examine health care expenditures. The analysis and evaluation of Guam's health status determinants, in conjunction with a



review of our growing health care system, will enable policymakers and health care providers to more clearly establish the direction Guam's health care system should follow in the future. This is especially important in an era where health care resources are becoming scarce and allocation of these resources must be prioritized.

A particular gap in Guam's health information inventory are data pertaining to hospital stays and physician visits in relation to health conditions and health expenditures. In addition, Guam has yet to establish a medical price index, or a health facilities capital assets inventory.

It can be anticipated that in a very short time all the major public and private health care providers will utilize a computerized system to track service utilization and expenses. The Guam Health Planning and Development Agency is in the process of establishing an automated Health Information System. If all health care providers and agencies collaborate with GHPDA by providing ongoing information, then the Agency will be able to compile and analyze health information of various kinds and forms. This information will allow continuous assessment of the efficiency, effectiveness, and equity of Guam's health care provision, it will clarify trends, patterns, and relationships of health problems, and identify gaps in services as well.

The major benefit derived from a well-organized health information system is the availability of valid and reliable data which enable planning and policymaking that is based on reality rather than suppositions, and which provide baselines from which evaluation and measurements of progress and improvement in Guam's health system can be made. Such information is particularly valuable when important decisions pertaining to the allocation of health resources have to be made, or cost-containment measures initiated.

## **E. Health Care Financing**

### **(1) Health Resources**

Guam's financial resources for health care are limited; no changes are foreseen for the near future. Federal funding, which comprises a large share of Guam's health budget, has been reduced over the last few years, and this trend is expected to continue under the present administration in Washington. Guam's own health finances are derived from taxes and revenues, and are not anticipated to increase unless the island experiences another economic boom.

As negotiations are underway to change Guam's status from that of a Territory to a relationship with the U.S. that is more appropriate to present circumstances, the pattern of federal assistance might also be renegotiated. Perhaps then Guam's fixed ceiling of Medicaid can be removed and Supplemental Security benefits paid to the needy. It is also hoped that the federal government will, in the near future, change its policy on long-term care and allow Medicare to reimburse for intermediate and nursing home care.

It is doubtful that there will ever be a surplus of health finances. Guam's decision makers and health care providers must continue their efforts to

provide the best possible medical care to every island resident, regardless of the inability to pay. A consolidation of all medical assistance programs is considered a cost-saving measure which at the same time will improve a needy patient's access to quality care. Establishing employer-shared health insurance for each person in the labor force and catastrophic illness insurance for all of Guam's population within the next 10 years is expected to reduce the government's large share of financing health care, while providing greater financial security to the island inhabitants.

## **(2) Consideration of Ethics and Values**

A discussion of health care financing for the future must include the ethical considerations now inherent in health planning, particularly as it pertains to lifesaving technology and expensive long-term care for the elderly. The prevailing U.S. (and Guam) policy of denying no one access to life-sustaining technology, regardless of age, is now being questioned by policymakers. In Britain, for instance, a person over age 60 is no longer able to receive hemodialysis, as the costs of the treatment and the expected return for such costs can no longer be balanced. This is just an example, but it illustrates that serious considerations are given to resource allocation in order to curb health expenditures in the mainland and abroad.

The number older Americans are increasing more rapidly than any other age group; additionally, these older persons can look forward to living longer than any of the previous generations. The seniors, with their many chronic conditions, have become the main consumers of health services and health dollars. This leads to questions of "generational justice." Solutions to this dilemma are sought, since many now advocate that the monies spent on the aged ought to be reallocated to better health care and education for the young, since the youth's future lies ahead and the country can expect many years of productivity from them. Others argue that these monies ought to be invested in capital improvement projects, such as dams, roadways, and water systems, which will contribute to the good of society and will benefit future generations.

The arguments have come down to a question of ethics and values. The issue of special obligation to the elderly because of their past collective contribution to society is widely debated in view of dwindling resources available for health care across the generations. Additionally, the concept of "useless" or "hopeless" life, terms which are increasingly being used to spark debate on the expenditure of social and health resources for the old and frail, seems now a criterion for measuring individual worth. Such measurements are based solely on the individual's ability to contribute to the common good of the community through certain types of social activities, and not on previous contributions.

These debates are countered by the arguments that a community ought to take care of all its members, regardless of their abilities and contributions. As the theologian Karl Barth has aptly observed:

"No community, whether family, village, or state, is really strong if it will not carry its weak and even its very weakest members. They belong to it no less than the strong, and the quiet work of their maintenance and care, which might seem useless from a superficial view, is perhaps more effective than common labor or cultural or historical conflict in knitting it closely and securely together."

The sentiments of this statement are particularly pertinent to the population of Guam, as there is a centuries-old tradition of providing care to all in need within the extended family and the community. However, this tradition has been weakened by demographic changes, modernization, and western aculturation, and on Guam, like everywhere else, the question of resource allocation needs to be addressed eventually, since our finite health resources limit the kind and quality of health care given to the island residents.



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