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April 27, 1979

Dr. Sheridan Weinstein, M.P.H.
Regional Health Administrator
U.S. Public Health Service
Department of Health, Education,
and Welfare
50 United Nations Plaza
San Francisco, California 94102

Dear Dr. Weinstein:

We are herewith presenting Guam's Preliminary Health Plan. This draft plan marks the culmination of some very hard work by the Guam Health Planning and Development Agency, the Bureau of Planning's Social Section staff and other individuals who provided data, their technical expertise, insight, and recommendations.

As you know, this will be the first health planning document prepared since the Comprehensive Health Plan prepared by the old Comprehensive Health Planning Agency.

We hope that in the coming years we will be able to further develop the document so that it will become a useful decision-making tool for citizens and policy-makers alike.

Please note that Chapter V, the Health Delivery System is still pretty much unrefined and that there are sections yet still undeveloped. The undeveloped portions are noted in the attachment.

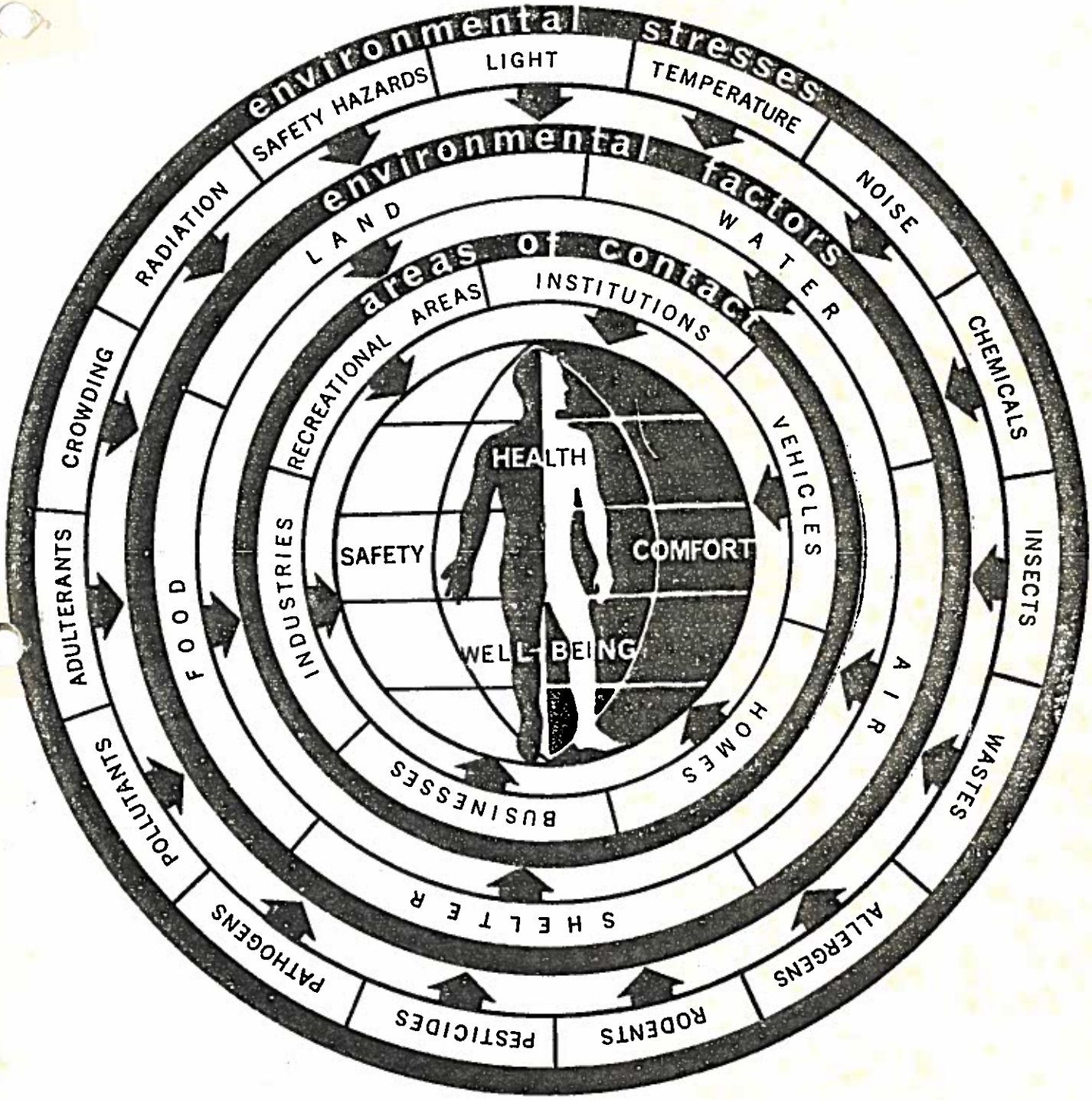
We hope that you accept this document as evidence that we, as an agency and the Council, do accept the tremendous responsibility placed upon our agency. We commit ourselves to the tasks ahead, and hope that you will continue your personal support to the improvement of the health care of the people of our Territory.

Sincerely,

CERILA MATIAS RAPADAS
Administrator

Enclosure

Figure V. Man and his total environment for health purposes*



*Reproduced by permission of Larry J. Gorndon, Director, Environmental Services, Division of New Mexico Health and Social Services Department, Santa Fe.

HEALTH INFORMATION SYSTEM

The "Health Information System" will be regarded as a joint inter-agency effort between PH&SS, MHSAA, GMH, and GHPDA to develop and establish a "Health Information System" which would serve the needs of all governmental health institutions, departments and related agencies, including private health providers.

The system will be developed to provide these agencies with access to health and related information which they could use for the following purposes:

a) Planning process
b) Decision making/policy, program and budget decisions
c) Program evaluation

The types of data which the HIS System will collect will include:

a) Health Status Data/Indicators
b) Health Systems Information
c) Socio-Economic Information
d) Environmental Factors
e) Financial Data
f) Legislation/Legislative Proposals

Data to be collected under the system will include but not necessarily be limited to:

a) PH&SS

1. Vital Statistics
2. Nursing Section
   2.1 nursing activity
   2.2 general PH&SS activities/utilization

b) GMH

c) MHSAA

d) Bureau of Planning

1. Demographic Data
2. Socio-Economic Statistics
3. Programming Services

ACKNOWLEDGMENT

THE GUAM HEALTH PLANNING AND DEVELOPMENT AGENCY WISHES TO ACKNOWLEDGE THE MANY FINE CONTRIBUTIONS AND EFFORTS WHICH HAVE GONE INTO THE DEVELOPMENT OF THIS GUAM HEALTH PLAN.

WE WISH TO ESPECIALLY INDICATE OUR SINCERE APPRECIATION TO THE:

- BUREAU OF PLANNING SOCIAL SECTION STAFF AMONG THEM: MIKE CRUZ, SECTION HEAD, BENNY MESA, BILL CONCEPCION, MICKY CRAIG, MAGGIE LEON GUERRERO, EVANGELINE BLAS, BING BENHART, AND THE DRAFTING, PROGRAMMING STAFF AND OTHERS.

- BUREAU OF BUDGET AND MANAGEMENT RESEARCH ESPECIALLY MR. MICHAEL DUENAS

THE ASSISTANCE RENDERED OUR AGENCY BY THE ABOVE AGENCIES MADE POSSIBLE OUR MEETING AN ALMOST IMPOSSIBLE DEADLINE: AND IS AN EXEMPLARY EXAMPLE OF INTER-AGENCY COOPERATION.

WE ALSO WISH TO ACKNOWLEDGE THE SUPPORT OF THE PLAN DEVELOPMENT COMMITTEE OF THE GUAM HEALTH COORDINATING COUNCIL AND THE INDIVIDUAL CITIZENS WHO APPEARED TO TESTIFY AND OFFERED TO ASSIST IN THE FUTURE PLAN UPDATES.

LASTLY. A SPECIAL SALUTE TO THE ADMINISTRATOR WHO MAINTAINED THE MOMENTUM AND COMMITMENT TO SEE THE PROJECT DONE.

TO ALL OF HTE INDIVIDUALS WHO ASSISTED, "THANK YOU" ONCE AGAIN!

GUAM HEALTH PLAN

TABLE OF CONTENTS

		Page No.
I.	INTRODUCTION	1-18
	A. Legals Basis and Authority for Planning	2
	B. Agency Mission and Goals	7
	C. Agency Structure and Organization	9
	D. Health Planning Process and Responsibilities of GHPDA and GHCC	10
	E. Guam Health Planning and Development Agency Planning Priorities	12
	F. Health Planning: Its Environment	15
II.	HEALTH PLANNING AND DEVELOPMENT OVERVIEW	19-25
	A. GHP Methodology, Development and Approval Process	19
	B. Guam Health Plan Scope and Content	20
	C. GHP Purpose, Uses and Limitations	22
III.	DESCRIPTION OF THE PLANNING AREA	26-83
	A. Introduction	26
	1. Population Based Planning	26
	2. Demographic Context for Planning	26
	3. Sources of Data	27
	4. Organization of this Section	27
	B. Situation	27
	1. Orientation	27
	2. Vulnerability	27

Page No.

C. Physiography ---------- 29

1. Geologic Formations and Water Resources --------- 29

2. Topographic Influence on Development ---------- 29

D. Climate ---------- 34

1. Temperature and Rainfall ---------- 34

2. Air Circulation ---------- 34

E. Environmental Setting ---------- 34

1. Water Supply ---------- 36

2. Water Contamination ---------- 36

3. Water Facilities ---------- 38

4. Solid Waste ---------- 39

5. Air Quality ---------- 41

F. Population ---------- 41

1. Population Data Base ---------- 41

2. Historical Perspective ---------- 43

3. Civilian Population ---------- 44

4. Transient Population ---------- 44

5. Population Distribution ---------- 46

G. Profile of the Civilian Population ---------- 46

1. Size, Age and Sex ---------- 46

2. Ethnicity ---------- 54

3. Marital Status ---------- 54

4. Educational Status ---------- 54

H. Population Projection (1980-1990) ---------- 54

I. Employment ---------- 57

Page No.

J. Income ---------- 66

K. Health Insurance Coverage ---------- 66

L. Social Change ---------- 66

M. Transportation ---------- 71

1. Air Transportation ---------- 71

2. Water Transportation ---------- 72

3. Ground Transportation ---------- 73

N. Communications ---------- 76

O. Federal/Territorial Relationship ---------- 77

P. Governmental Organization and Health-Related Expenditures ---------- 78

Q. Unique Characteristics of the Territory ---------- 78

1. Advantages ---------- 78

2, Disadvantages ---------- 81

R. Implications for Health Planning ---------- 81

S. Summary: Planning Assumptions and Constraints ----- 82

IV. HEALTH STATUS PROFILE ---------- 84-140

A. Introduction ---------- 84

1. Planning with Health Status Indicators ---------- 85

2. Mortality Indicators ---------- 87

3. Morbidity Indicators ---------- 88

4. Organization of the Section ---------- 88

B. Overall Vital Events ---------- 89

1. Natality ---------- 89

2. Life Expectancy ---------- ---------- 91

3. Mortality ---------- --- 92

4. Leading Causes of Death ---------- 93

Page No.

C. Critical Elements of Health Status ---------- 94

1. Infant Mortality ---------- 94

2. Accidents ---------- 96

3. Chronic Diseases ---------- 99

4. Infectious Diseases ---------- 109

5. Dental Health ---------- 119

D. Lifestyle Indicators ---------- 119

1. Suicide and Homicide ---------- 119

2. Drug Abuse ---------- 120

3. Alcohol Abuse ---------- 122

4. Adolescent Pregnancies ---------- 122

5. Crime ---------- 124

6. Marriage and Divorce ---------- 125

E. Determining Health Status Priorities ---------- 127

F. Major Health Status Goals and Objectives ---------- 128

G. Health Status Recommended Actions ----------

V. HEALTH DELIVERY SYSTEM ---------- 141-303

A. Introduction ---------- 141

B. Desired Health Services System ---------- 142

C. Existing Health System ---------- 149

1. Community Health Promotion and Protection Services ---------- 157

a. Health Education Services ---------- 157

b. Environmental Quality Management ---------- 160

b.1. Water Pollution ---------- 161

Page No.

b.2. Wastewater Pollution ---------- 161

b.3. Safe Drinking Water ---------- 162

b.4. Air Pollution Control ---------- 163

b.5. Solid Waste Disposal ---------- 164

b.6. Pesticide Control ---------- 165

b.7. Vector Control ---------- 166

b.8. Highway Safety ---------- 166

c. Occupational Health and Safety ---------- 172

d. Drug and Radiation Safety ---------- 176

d.1. Radiation Safety ---------- 176

e. Food Protection Services ---------- 178
e.1. Nutritional Quality and Sanitation --------- 180

2. Prevention and Detection Services ---------- 181

a. Individual Health Protection Services ---------- 181

a.1. Immunization ---------- 182

a.2. Well-Child Services ---------- 182

a.3. Dental Prophylaxis ---------- 182

a.4. Family Planning ---------- 182

a.5. Detection Services ---------- 182

3. Diagnostic and Treatment Services ---------- 192

a. General Medical Services ---------- 193

a.1. Primary Care Services ---------- 193

a.2. Inpatient Medical-Surgical ---------- 202

a.3. Ambulatory Surgery Services ---------- 205

a.4. Inpatient Perinatal Services ---------- 209

a.5. Inpatient Long-Term Care ---------- 212

a.6. Emergency Medical Services ---------- 217

Page No.

b. Special Medical Services ---------- 220

b.1. Chronic Dialysis Services ---------- 220

b.2. Burn Care Services ---------- 226

c. Substance Abuse Services ---------- 228

d. Mental Health Services ---------- 233

e. Dental Services ---------- 237

f. Diagnostic Radiology Services ---------- 244

f.1. Radiation Therapy Services ---------- 244

4. Habilitation and Rehabilitation Services ---------- 247

5. Maintenance Services ----------

6. Personal Health Care Support Services ---------- 266

a. Direct Patient Care Support Services ---------- 266

a.1. Pharmacy Services ---------- 266

a.2. Blood Bank Services ---------- 271

a.3. Medical Records ---------- 272

a.4. Clinical Laboratory Services ---------- 273

7. Health System Enabling Services ---------- 275

a. Health Planning ----------

a.1. Data assembly and analysis ----------

b. Resources Development ----------

b.1. Manpower ----------

b.2. Facilities ----------

b.3. Equipment ----------

Page No.

c. Financing ----------

c.1. Certificate of Need ----------

c.2. Public and Direct Public Expenditure for Services ----------

c.3. Construction Grants ----------

d. Regulation ----------

d.1. Certificate of Need ---------- 275

d.2. Manpower Licensure ----------

d.3. Facility Licensure ----------

d.4. Insurance Regulation ----------

.5. Accreditation ----------

D. Health Care System Problems ---------- 279

E. Linkage Between Health Status Problems and Health System Deficiencies ---------- 286

F. Health Systems Goals and Objectives ---------- 291

G. Health Care System Recommendations ----------

VI. GLOSSARY ---------- 304-316

VII. FOOTNOTES ---------- 317-325

VIII. BIBLIOGRAPHY ---------- 326-331

IX. APPENDIX ---------- 332-334

A. Planning Area Profile ---------- 332

B. Health Status ---------- 333

C. Health System ---------- 334

I. INTRODUCTION

GUAM HEALTH PLAN

I. INTRODUCTION

This section describes the foundation for a comprehensive State Health Plan for the Territory of Guam. It includes, in general, the Guam Health Planning and Development Agency's (GHPDA) legal basis and authority for performance of health planning and development of the Guam Health Plan (GHP) and the Annual Implementation Plan (AIP). It provides discussion on the Guam Health Planning and Development Agency's (hereinafter referred to as the "Agency) mission, goals and responsibility for comprehensive health planning. It further examines the relationship between the Agency, the Guam Health Coordinating Council (GHCC), and the Plan Development Committee (PDC), with regard to their respective roles.

A. LEGAL BASIS AND AUTHORITY FOR PLANNING

1. Federal Legislation:

After many years of policy development and program funding, the United States Congress, in December of 1974, enacted P.L. 93-641, the National Health Planning and Resources Development Act (hereinafter referred to as the "Act").

The purpose of this Act was "to facilitate the development of recommendations for a national health planning policy, to augment areawide and state planning for health services, manpower, and facilities, and to authorize financial assistance for the development of resources to further that policy". (P.L. 93-641, Sec. 2.(b))

This Act is to eliminate duplication and fragmentation of planning activities of various health planning agencies mandated under the Comprehensive Health Planning, Hill-Burton and Regional Medical Programs by consolidating their resources, health planning activities, and intentin one governmental structure, to be known as the State/Territorial Health Planning and Development Agency.

The Act further attempts to integrate national, state and local goals to promote improved and more efficient health and medical care by assuring all citizens equal access to quality care at a reasonable cost. This legislation establishes a direction for national health policy to be determined and implemented through the coordination of government, private enterprise, and local consumers and providers of health and medical care.

To implement the above expectations of improved health/medical care, Sections 1512 and 1521 of the Act provide for the designation of a Health Service Area and the establishment of both a Health Systems Agency (HSA) and a State/Territorial Health Planning and Development Agency (SHPDA). The purpose of these agencies is to improve the health of area residents; increase the accessibility, acceptability, continuity and quality of health and medical care services; restrain increases in the cost of providing health and medical care services, and prevent duplication of health and medical care resources.

To accomplish these purposes, each HSA is expected to develop and use a Health Systems Plan (HSP) and an Annual Implementation Plan (AIP). Rules and regulations governing the designation and funding of health systems agencies recognize the importance of the development of the plan and require the HSA to produce a preliminary HSP and AIP in order to achieve full designation. The HSA must, therefore, place the highest priority on the development of these two plan documents.

However, because of Guam's unique situation, in terms of

population and geographical size, Section 1536 of the Act provides for its exemption from the requirements for the designation of a Health Service Area and the establishment of an HSA. Rather, it provides for the establishment of a State/Territorial Agency that assumes both the SHPDA's and HSA's health planning responsibilities mandated under Sections 1513 and 1523 of the Act.

Section 1536 of the Act provides that:

"(a) Any State which --

1. has no county or municipal public health institution or department, and

2. has, prior to the date of enactment of this title, maintained a health planning system which substantially complies with the purposes of this title, and the Virgin Islands, Guam, the Trust Territories in the Pacific Islands, and American Samoa shall each be considered in accordance with subsection (b) to be a State for purposes of this title.

(b) In the case of an entity which under subsection (a) is to be considered a State for purposes of this title --

1. no health service area shall be established within it,

2. no health system agency shall be designated for it,

3. the State Agency designated for it under Section 1521, may, in addition to the functions prescribed by Section 1523, perform the functions prescribed by Section 1513, and shall be eligible to receive grants authorized by Sections 1516 and 1640, and

4. the Chief Executive Office shall appoint the Statewide Health Coordinating Council prescribed by Section 1524 in accordance with the regulation of the Secretary."

Section 123.110 (a)(2), found under 42CFR Subchapter K, Part 123, provides that: "In the case of State Agency (1536 Agency) designated pursuant to a Full Designation Agreement, the State Agency shall perform the additional functions of an HSA, as though the State were a health service area and the State Agency a health system agency for such area."

Section 5.1 of the Draft Guidelines for the Development of the State Health Plan (May 20, 1977) prepared by the Bureau of Health Planning and Resources Development provides that:

"The plan development process described in these re-

gulations should be modified in any State or Territory which qualifies under Section 1536 of P.L. 93-641. Although there would be no HSP's to aggregate, the SHPDA must perform the functions of an HSA as well as the functions of the SHPDA. Then the SHPDA would be responsible for coordinating its activities with other planning organizations, agencies or State or Territorial government, and the private sector. The SHPDA should develop a preliminary State Health Plan including analyses of the population's needs and State health policies, and prepare goals, objectives, recommended actions and resource requirements for health status and health systems priorities."

Therefore, in Guam (also in Hawaii; Rhode Island; other jursidictions of the Pacific Basin; Washington, D.C.; and the Virgin Islands), the Act is being implemented differently from in the more highly populated states.

The island territory has a system of government which includes a single Department of Public Health and Social Services (DPH&SS), operating both on a "State" and "local" level. The central health department facility, which is located in Mangilao, also has one areawide health center located in Inarajan, and a network of some nineteen village (district) health centers. The DPH&SS, which handles all public health functions for the Territory, is also responsible for administering Social Services programs such as public assistance, food stamps, Medicaid, support enforcement, and others. The health programs operated by the DPH&SS include maternal child health, health education and nutrition, environmental health, consumer health protection, zoonosis control, laboratory services, public health nursing, communicable disease study, crippled children services, chronic disease service, speech and hearing care, dental health care, vital statistics record-keeping, pharmacy service, and records management. Because Guam has only one layer of local government (no city or county governments), an exemption was granted by the Secretary of Health, Education and Welfare. This means that in Guam the GHPDA, with the Guam Health Coordinating Council (GHCC), has both SHPDA and HSA functions.

Pursuant to Federal guidelines, the health plan is to be based on an analysis of the health and medical care needs of the population to be served rather than on the existing facilities and other related resources. This population-based approach represents a major departure from traditional health planning methods. In the past, program requirements have been expressed or planned in terms of available resources, not in terms of needs. At least one observer has noted that there are several problems associated with this type of traditional planning:

"Planning in terms of resources perpetuates resource patterns and eliminates constructive change. Functions

and needs are assumed, and planning responds primarily to technological demands. Planning becomes an exercise in process refinement rather than a concerted action to achieve some goal based on determined needs.

The second problem of resource based planning is that it is very slow to respond to health problems.

"Finally, it is the size of a person's income, rather than his or her personal health needs, that largely determines the demand for personal health services. This current pattern of providing and planning for services in accordance with the ability to pay for them, rather than in accordance with the need for them, may need to be altered if health care services are to be provided appropriately and efficiently."[1]

As a result of population-based planning, the SHP provides a basis for promoting a healthful environment, reviewing proposed health systems changes, reducing deficiencies and inefficiencies within the area, and fostering desired achievements which meet community needs. The SHP sets forth long-range (five-year) goals and objectives which are the foundation for developing the short-range (one-year) priority objectives of the AIP.

The AIP is an action-oriented document which complements the SHP. It expresses the changes which the community wishes to see in the health/medical care systems which will promote the long-range health status and health systems changes addressed in the SHP. The AIP identifies specific short-range priority objectives upon which the community and the GHPDA wish to act during the ensuing year.

2. Local Planning Mandate:

Pursuant to P.L. 93-641, the National Health Planning and Resources Development Act of 1974, Governor Ricardo J. Bordallo, on January 23, 1976, promulgated Executive Order 76-5, designating the Department of Public Health and Social Services as the interim State Health Planning and Development Agency for the Territory of Guam. Its prescribed duty was to consolidate all health planning activities, resources and intent mandated under the Comprehensive Health Planning, Hill-Burton and Regional Medical Programs under a single agency to be known as the Guam Health Planning and Development Agency (GHPDA).

In addition, Executive Order 76-5 mandated the establishment of the Guam Health Coordinating Council (GHCC). This Council has review and approval authority over State Plans, Statewide Health Project Applications, and advises the State Agency generally in the performance of its various functions.

On August 12, 1976, the Secretary of the Department of Health,

Education and Welfare, upon the recommendation of the Governor of Guam, granted Conditional Designation for a 12-month period to the DPH&SS as the GHPDA to administer the State Administrative Program and to carry out the planning functions and activities mandated bySections 1513 and 1523 of the Act as provided by Sections 1536 the Act. The GHPDA received its second conditional designation (for a 12 month period) on July 1, 1977.

On September 30, 1977, Governor Ricardo J. Bordallo signed Executive Order 77-20 mandating the creation of the Health Planning and Development Agency, and repealing Executive Order 76-5. In effect, Executive Order 77-20 transferred the Office of Health Planning and Resources Development out of the DPH&SS and established the Office as a separate Agency within the Executive Branch. The new Agency shall continue to carry out the planning functions and activities of the Act.

On October 16, 1978, P.L. 14-150 was enacted locally to formally establish the Guam Health Planning and Development Agency. This law, in addition to giving the Agency full powers and authority to carry out its planning responsibilities also provided for regulatory functions. The new Agency received authority and power to operate a Certificate of Need program.

3. Ethical Basis:

Quality and Equity of Opportunity

In P.L. 93-641, the following shortcomings are listed by Congress as detrimental to the achievement of equal access to quality health care:

> "The massive infusion of Federal funds into the existing health care system has failed to produce an adequate supply or distribution of health resources, and consequently has not made possible equal access for everyone to such resources." (Section 2(a)(2))
>
> "The many and increasing responses to these problems by the public sector (Federal, State, and local) and the private sector have not resulted in a comprehensive, rational approach to the present lack of uniformly effective methods of delivering health care, and maldistribution of health care facilities and manpower." [Section 2(a)(3)]
>
> "Health policy has not adequately addressed the legitimate needs and concerns of the provider, who should play an active role in developing health policy at all levels." [Section 2(a)(5)]
>
> "Large segments of the public are lacking in basic

knowledge regarding proper personal health care and methods for effective use of available health services." [Section (a)(6)]

With this in mind, health planning must proceed in a logical manner to define what health problems exist within a population and what resources are available or should be available to address existing problems. This process should maximize public involvement, taking into consideration perspectives such as technical capacity, consumer preference and community priorities. This emphasis on broader participation increases the complexity of the planning environment. A better understanding of the goals justifying the Agency's existence will aid in understanding the responsibility towards the development of a Guam Health Plan.

B. AGENCY MISSION AND GOALS

This subsection provides mission, or purpose statements and goals justifying the Agency's existence and reflecting the basic intent of the Act. The mission statements are general purpose statements justifying the Agency's existence, while the Agency's goal statements specify the broad tasks which the Agency must accomplish in order to fulfill the mission. However, the goal statements, because they represent long-range accomplishments toward which resources will be directed, are probably expressions of the perfect and ideal situation, and their full attainment may never be realized. Nevertheless, these goal statements provide general direction for planning and become the basis for evaluating progress and establishing objectives.

It is the mission of the GHPDA to promote for every resident of the Territory the availability and equal access to the highest possible quality health service at a reasonable cost, through the provision of a mandatory planning process and health system development program involving a representative cross section of the Territory's population and geographical area.

This mission reflects the ten National Health Priorities established by Congress in P.L. 93-641:

1. The provision of primary care services for medically underserved population, especially those which are located in rural or economically dpressed areas.

2. The devleopment of multi-institutional systems for coordination or consolidation of institutional health services (including obstetric, pediatric, emergency medical, intensive and coronary care, and therapy services).

3. The development of medical group practices (especially those whose services are appropriately coordinated or integrated with institutional health services), health

maintenance organizations, and other organized systems for the provision of health care.

4. The training and increased utilization of physician assistants, especially nurse clinicians.

5. The development of multi-institutional arrangements for the sharing of support services necessary to all health service institutions.

6. The promotion of activities to achieve needed improvements in the quality of health services, including needs identified by the review activities of Professional Standards Review Organizations under Part B of Title XI of the Social Security Act.

7. Development by health service institutions of the capacity to provide various levels of care (including intensive care, acute general care, and extended care) on a geographically integrated basis.

8. Promotion of activities for the prevention of disease, including studies of nutritional and environmental factors affecting health and the provision of preventive health care services;

9. Adoption of uniform cost accounting, simplified reimbursement, and utilization reporting systems and improved management procedures for health service institutions;

10. Development of effective methods of educating the general public concerning proper personal (including preventive) health care and methods for effective use of available health services.

The GHPDA plays a role in the planning and development of health services and resources which are provided by various public, private and voluntary agencies, organizations, and individuals in the Territory of Guam. In order to fulfill these missions, the GHPDA and the GHCC have adopted goals which state the reason for their existence as well as the direction of change in which both attempt to move. The goals are as follows:

1. to promote the health and social conditions that contribute toward the achievement of the highest level of health for the residents of the Territory;

2. to develop within the planning process Territorial planning policies, goal, criteria and standards leading to the publication of a Comprehensive State/Territorial Health Plan (SHP), an Annual Implementation Plan (AIP), and a State/Territorial Facilities Plan (SMFP) for im-

proving the system for providing health programs, health facilities and health manpower which meet the identified needs of the Territory's residents;

3. to promote and support efforts toward increasing the availability (including overcoming geographic, architectural, and transportation barriers), acceptability, continuity and quality of the services provided to the Territory's residents; restraining increases in the cost of providing health services and preventing unnecessary duplication of health services and resources;

4. to review, approve, and comment on all applications submitted by individuals, institutions, organizations and agencies within the Territory requesting federal health funds, and to review on a periodic basis all institutional health services offered in the Territory for appropriateness;

5. to support collection, assembly and analysis of data on population and health status characteristics of the Territory's residents; on the availability, development and utilization of the Territory's health care delivery system; on the health resources available, and on environmental factors affecting the health conditions of the Territory's population;

6. to provide technical assistance to individuals, institutions, agencies, or public and private organizations in developing and implementing their health plans and/or programs, striving for coordination among all health planning bodies in the development of alternatives and in the elimination of the duplication of planning activity;

7. to provide an information program regarding planning progress for the general public, as well as for agencies on the Federal and Territorial levels and to make recommendations on ways to meet the Territory's health needs with the most efficient utilization of existing resources;; and

8. to perform such other activities required in meeting the above goals and mandated functions (compatible with national health policies) affecting the Territory's health status and health care delivery system.

C. AGENCY STRUCTURE AND ORGANIZATION

Initially, Executive Order 76-5 on January 23, 1976, designated the Department of Public Health and Social Services as the interim Health Planning and Development Agency and established the Guam Health Coordinating Council. In turn,, the DPH&SS established the Office of Health Planning and Resources Development as a separate section within the Department to carry out the required responsibilities of the Act. This office was replaced by the GHPDA under Executive Order 77-20, which

established GHPDA as a separate agency within the Executive Branch.

The GHPDA also replaces the Comprehensive Health Planning Office, formerly under the DPH&SS. Additionally, the Agency assumed the responsibilities of the Hill-Burton Program, which had been a part of the DPH&SS. Finally, the Agency assumed the function of the Regional Medical Program which had been administered from the State of Hawaii's Regional Medical Program.

The GHPDA has a full-time professional staff carrying out the Agency functions for plan development, community liaison, and proposal review.

In addition to the Agency Administrator, who generally oversees and provides guidance to all the staff, five full-time professional staff are assigned to carry out the plan development, data management and review and community relations responsibilities of the Agency. Two secretarial and clerical staff provide essential supportive services. (Appendix ___)

D. HEALTH PLANNING PROCESS AND RESPONSIBILITIES OF THE GHPDA, THE GHCC, AND THEIR INTERRELATIONSHIPS:

1. The Participants in the Health Planning Process:

The planning process provides for participation at the Federal, State/Territory, and local levels. It allows for the standardized collection of health planning data on a state and local level. It also strengthens the communication and interaction between the planning bodies, the provider institutions, and the consumers of health services. The Federal government sets up the regulation guidelines, calculates and allots federal funds to the Territory for grants, loans, loan guarantees, and subsidies, and provides technical assistance to the GHPDA. The federal level also provides conditional review of and comment on the GHP, if requested by GHPDA. The Secretary of Health, Education and Welfare certifies the Guam Health Plan and approves the Guam Medical Facilities Plan (GMFP).

2. The GHPDA Role:

The GHPDA is charged with the responsibility for deve loping several specific planning products mandated by P.L. 93-641. These include the preparation, and annual review and update of a Preliminary Guam Health Plan (PGHP) which is considered to be the Health System Plan (HSP) in States and Territories falling under the provisions of Section 1536 of the Act; the Annual Implementation Plan (AIP); and a Guam Medical Facilities Plan (GMFP). In addition, the GHPDA is charged with the

responsibility for the preparation of specific plans and/or projects for achieving high priority objectives contained in the AIP.

The GHPDA undertakes essential activities necessary to develop these plans. Examples of these activities include the determination of what the plans are to include, how they are to be developed, the development and conduct of a work program to prepare the plans, and revision of the plans as required by the GHCC.

In summary, the role of GHPDA during the plan development process is as follows:

a) Adopt a policy for conducting health planning activities of the Territory.

b) Provide the technical and staff support required by GHCC for carrying out its plan review and coordination responsibilities.

c) Prepare the preliminary GHP from the material submitted by various public agencies and consumers.

d) Revise, as recommended by GHCC, and update annually the GHP.

e) Prepare the draft of the interim GHP service components for review.

f) Prepare selected GHP subchapters for use and review by various agencies and consumers.

g) Assume responsibility for coordinating the preparation of the GHP service component that should be planned on a territorial basis.

Finally, GHPDA planning functions include a periodic review and determination of the appropriateness of institutional health services, and an annual determination of the need for medical facilities projects in the Territory.

3. The GHCC Role:

The GHCC has the responsibility for the preparation, review and revision (at least annually) of the GHP, based on the Preliminary Guam Health Plan prepared by the GHPDA. In addition, the GHCC is required to review annually the AIP, prepared by the GHPDA. Furthermore, the GHCC is required to review and approve or disapprove the GMFP prepared by the GHPDA, on the basis of whether or not such plan is consistent with the GHP. It also advises the GHPDA on its administration of the GMFP.

The primary responsibilities of the Agency and GHCC are to provide effective health planning for the Territory; to promote the development of health services, manpower, and facilities which meet identified needs; to reduce documented inefficiencies, and to implement the Agency's health plans.

In summary, the role of GHCC during the plan development process is as follows:

a) Adopt a plan of action which addresses consumer and provider concerns, analyses, findings, and recommendations.

b) Review the findings, analyses, and recommendations of the consumers and providers and consolidate them into the preliminary GHP (or the first draft of the GHP).

c) Approve the initial draft of the GHP and send this out to interested parties for their review and comment.

d) Consider the comments received and develop a second draft which will be taken to public meetings conducted by GHCC.

e) Consider the comments received from these open meetings and prepare the final draft of the GHP, which will then be published as the State Health Plan and forwarded to the Department of Health, Education and Welfare.

E. GUAM HEALTH PLANNING AND DEVELOPMENT AGENCY PLANNING POLICIES

1. GHPDA General Planning Policies:

- GHPDA will develop and annually update a health systems plan and an Annual Implementation Plan.
- GHPDA will, as practicable, provide technical and/or limited financial assistance to organizations seeking to implement the plans.
- GHPDA will gather and analyze health status and health systems data.
- GHPDA will review and approve or disapprove applications for Federal funds for health programs within the Territory.
- GHPDA will review capital expenditures proposed by health care facilities within the Territory.

- GHPDA will make findings on the need for new institutional health services proposed for the Territory.

- GHPDA will review the appropriateness of existing institutional health services offered in the Territory.

- GHPDA will annually recommend projects for modernizing, constructing and converting health facilities in the Territory.

2. GHPDA Health Status Policy:

- GHPDA will promote and encourage the highest attainable health status for all individuals in the Territory.

- GHPDA will promote and encourage health research, health education and prevention in an effort to decrease the rates of morbidity and mortality associated with the ten leading causes of death in the Territory.

- GHPDA will promote and encourage the early prevention and detection of disease through the promotion of:

  studies of nutritional and environmental factors affecting health,

  health education on preventive health care and methods for effective use of available health services, and

  activities to achieve needed improvements in needs identified by the review activities of Professional Standards Review Organizations (PSROs).

- GHPDA will promote and encourage a reduction in the fetal, neonatal and infant mortality rates within the Territory.

- GHPDA will promote and encourage a reduction in the duration of illnesses in all health settings.

- GHPDA will promote and encourage a reduction in the number of accidental deaths to area residents.

- GHPDA will promote and encourage a reduction in the number of occupationally related deaths and the number of disability days associated with occupational injuries.

3. GHPDA Health Services Policy:

- GHPDA will plan for the following health system services within the Territory:

Community health promotion and detection
Prevention and Detection
Diagnosis and Treatment
Habilitation and Rehabilitation
Maintenance
Personal Health Care Cost
Health System Enabling Services

- GHPDA will plan for health services across the following settings within the Territory:

  Home
  Mobile
  Ambulatory
  Short-Stay Inpatient
  Long-Stay Inpatient
  Free-Standing Support

- Health services must be available in a sufficient but not excessive quantity to meet the needs of the population in the Territory.

- Health services must be accessible to all of the population in the Territory.

- Health services delivered should represent the least costly alternative to satisfying the demonstrated need, and the resulting cost should be reasonable in terms of the economic market within the Territory.

- Health services should have sufficient manpower, equipment and funding resources available before they are established within the Territory.

- Health services provided in the Territory must be of a qualitative nature as judged by professionally accepted standards of excellence.

- Health services must be delivered through a process which is socially and culturally acceptable to the residents in the Territory.

- Health services must be delivered within a system which provides continuity of care.

- Health services must be delivered within a system which assures effective managerial and administrative interaction of the system's components.

4. Territorial Planning Assumptions:

The unique characteristics which are described in Section IV form the basis for certain assumptions which influence the formulation of goals and objectives of the PGHP, the

GHP, and the types of recommendations which have been selected as the best means of achieving these goals and objectives. These assumptions include the following:

a) The small size of the population and its limited resources preclude a full-range of medical expertise to provide the specialized education for all professional and technical health personnel. A degree of reliance shall continue to be placed on off-island recruitment of certain categories of health personnel. Also, it will continue to be economically unfeasible to provide certain highly specialized health services, facilities and/or equipment in the Territory (travel costs will be considered to be a part of the cost of providing these off-island services).

b) The influence of Health Maintenance Organizations (HMO's) and third party insurances (in addition to special interest groups such as the Medical Society, hospital associations, voluntary agencies, etc.) will become a factor in the delivery of health care within the Territory.

c) With two existing hospital sites, and a number of public health and private outpatient clinics, the (1) sharing and/or coordination of facilities and services, (2) utilization of facilities by levels of care, (3) appropriate staffing by levels of care, (4) level of occupancy, (5) admissions review, and (6) utilization review in relation to cost and length of stay, shall continue to be major areas of concern for health facilities and services planning.

F. HEALTH PLANNING: ITS ENVIRONMENT

The legislative base for health planning in this country has broadened gradually since 1947, as well as the organizational system for planning activities. To date, a common feature of health planning has been a focus primarily on medical care resources: diagnosis and treatment programs, and physical facilities. A second feature has been a planning approach which has emphasized voluntary plans and minimal regulation. Health planning in the past was reasonably compatible with its environment, characterized by needed growth in the medical care industry, relatively available resources within both the public and private sector, and little interest in government intervention, except as a financial stimulus for potentially risky investments.

Today, the environment is characterized by a seemingly boundless growth in medical care, increasingly limited resources,

and growing government involvement as both an underwriter and provider of services. Within this environment, planning to guarantee equal access to needed services at a reasonable cost assumes priority, requiring a more complex process.

Current legislation (P.L. 93-641) attempts to define a planning system to achieve several purposes: "...(1) to advance the health status of communities and their several definable population subsets; (2) to increase and equalize the availability, accessibility, acceptability, and quality of health care for all population subsets; (3) to maximize the health impacts of federally supported health services; (4) to constrain escalations in the cost of health care services; (5) to minimize the duplication of health care services and facilities within service areas, as well as the suboptimal use of health manpower and other resources; and (6)to stimulate changes in national, state, and local policies, statutes, organizational arrangements, resource allocations, and health system operations so as to facilitate the accomplishment of the other purposes."[2]

Health planning today has been placed in a considerably different environment. Planning activities to accomplish the above purposes, especially the last one, force the public to become more familiar with the problems of the health/medical care delivery system. Issues such as inequality of care, cost effectiveness, and the real impact of medical care on health status will become apparent. Questions will necessarily be raised regarding provider versus consumer, public versus private, and local versus State or Federal control. These health planning debates, especially those concerning allocation of resources, raise challenges to the social and economic order of the United States: freedom of individual choice and a free market system. The high degree of conflict in the area of health planning is not surprising, given the importance attached to health as a human right and to the increasing amount of money devoted to supporting the medical care system. In this environment, health planning must proceed in a logical manner to define what health problems exist and what resources either are available or should be available to address existing problems.

In addition to increasing the number and kinds of participants in the planning process, current health legislation has greatly expanded the definition of "health". Although the planning process itself has not been changed, definitions of "health" and of "health care" have changed significantly in the past decade. The planning environment oriented toward physician-hospital-patient concerns has turned to a more "comprehensive" approach.

A current concept of "health" extends far beyond the mere absence of disease or disability. It is a concept which reflects many different social beliefs about the wholeness or well-being of an individual, including physical, mental and

social factors. High level wellness in all these factors is the ideal.

What is high level wellness? High level wellness approaches health in the fullest sense and goes beyond the old concept of absense of illness. Wellness looks at health from three levels:

1. Physical - health is freedom from pain and limiting illness;

2. Emotional - freedom from anxiety and excess passion-a state of serenity and calmness and a zest for living;

3. Mental - health is freedom from aimlessness and selfishness, a state of compassion and a sense of purpose in life.

The general definition of health is that it is a positive state of living up to the best possible potentials -- a long way from the neutral expectations that often define health as being "not sick".

There are five dimensions to the concept of "wellness". These are

1. SELF RESPONSIBILITY - unless you are accountable for your own actions, energy for the other four dimensions will be lacking. Acceptance of responsibility for your own well-being and a willingness to pursue a health-promoting lifestyle are the foundation to a wellness philosophy.

2. NUTRITIONAL AWARENESS - The food we eat, where it comes from, and how we think of it are part of wellness.

3. STRESS MANAGEMENT - In the high pressure environments of modern life, we need concepts, techniques, and principles for avoiding stress-induced illnesses and diseases. A wellness philosophy recognizes this as part of full physical, emotional, and mental well-being.

4. PHYSICAL FITNESS - The benefits of exercise and the hazards of inactivity are so evident that this dimension is a must to a wellness lifestyle. The emphasis is on those activities which promote cardiovascular fitness, are enjoyable, and become a welcome and regular part of your everyday schedule.

5. ENVIRONMENTAL SENSITIVITY - Most people know about the physical and social components of the environment. A wellness philosophy also concentrates on ways to shape thepersonal environment. This area is less than the other dimensions and it takes more effort to develop. Wellness in this area involves following principles and suggestions for shaping the "spaces" over which you have

control.[3]

(Of course, variations of these factors are practically endless.) The personal judgment of how an individual feels and perceives his or her own health, is also a significant element in defining and measuring health status. For health planning to be relevant, then, any measurements of health status must consider all the social determinants of health. As shown in Figure 1, the major areas of input are: environment (social, cultural, political, educational, economical, and physical); behavior (habit patterns); heredity (genetic constitution); and health care services (primarily illness care services).

When this concept of health is used to describe a given population, the complexity of improving health through the planning process becomes evident. The factors of which must be considered multiply rapidly, as do the participants' beliefs about appropriate alternatives.

Health has come to mean far more than the absence of disease, and health care has grown to encompass a variety of services designed to improve health status. Unfortunately, health planners have not kept pace with the new definitions. Traditional medical care emphasizes diagnosis and treatment services (especially acute, episodic treatment) as well as short-stay institutional settings (hospitals), and relies heavily on technology as a major indicator of quality care. Health planning has been done in relation to this traditional view, concentrating mainly on the provision of services. As a result, the most commonly referred to system for delivering health care in the United States is the "traditional medical model".

Currently, there is no organized system in the United States delivering health care. Health care services created to respond to the new definition of health needs include, for example, community health promotion and protection services, prevention and detection services, as well as diagnostic and treatment services. In addition, the possible settings for the delivery of health care vary from the home to long-stay facilities. Ideally, health planning should link health care services to all other social systems, as shown in Figure 1. While current legislation does not specifically call for this, it does provide a basis from which planning can consider ways to improve health status, other than those of the traditional medical care model.

II. HEALTH PLANNING AND DEVELOPMENT OVERVIEW

II. GUAM HEALTH PLANNING AND DEVELOPMENT OVERVIEW

A. GHP METHODOLOGY, DEVELOPMENT AND APPROVAL PROCESS

The Guam Health Coordinating Council, in developing its first Guam Health Plan, actively sought citizen participation. A Plan Development Committee was established to coordinate all development activities. This committee then convened task forces dealing with the seven health services categories identified in HEW's A Taxonomy of the Health System Appropriate for Plan Development. Additionally, the Plan Development Committee instructed GHPDA staff to initiate several public meetings (March 31, 1977; October 1, 1977; and January 4, 1979) in order to solicit community ideas pertaining to health needs and issues. The products of these public meetings were a major consideration in the development of the GHP. Finally, professional, community and civic groups, as well as practicing health providers were invited to serve on one or more of the established Plan Development Task Forces.

In preparation for embarking on the final GHP, a Development Plan was completed during the month of October, 1977. It was only after completion of this phase that further development of the GHP commenced. During October, 1977, analysis of health status and health system goals and objectives, as well as development of recommendations and priorities was pursued. A draft document of the GHP was then presented to the GHCC in October, 1977.

In draft form, the GHP Then underwent public review, providing an opportunity for amendment of the plan. After this took place, the GHP was formally adopted in November, 1977.

As in any plan development activity, the GHPDA was directed to continue assessing health care needs and, continue its planning functions by preparing draft documents for inclusion in the 1979 GHP.

During 1978 and part of 1979, several planning studies and analyses were carried out and reported by the staff of GHPDA. Additionally, several public agencies (Bureau of Planning, Department of Public Health and Social Services, University of Guam, Environmental Protection Agency, Guam Memorial Hospital) as well as some private consulting firms (Touche Ross and Company, for example) contributed to the studies.

Additional task force meetings were held during 1978 and early 1979, to assure that input from both consumers and providers continued throughout the process. Through these, the GHCC has kept in line with the national health priorities promulgated as part of P.L. 93-641.

To summarize, the Guam Health Coordinating Council, through its Plan Development Committee and its established task forces, has the res-

ponsibility for the development of the GHP, the AIP, and the GMFP through an open planning process involving many members of the Territory's community. Therefore, the plan development process can be summarized as follows:

1. The GHPDA is responsible for developing the Preliminary Guam Health Plan (PGHP) in accordance with HEW and GHCC requirements.

2. The GHPDA will seek technical assistance from HEW or the Western Center for Health Planning during the development of the PGHP as necessary.

3. The GHPDA will seek comments from the GHCC, via the Plan Development Committee, during the PGHP development process Revisions will be made as appropriate so that the PGHP, when completed, will essentially be the draft GHP and may only require minor revisions to become the approved GHP of that body.

4. The GHPDA will annually review the GHP during the tenth month of each project period and will revise the GHP as necessary to reflect the changing needs of the Territory.

5. The GHPDA will include in its findings the appropriateness of existing institutional services in the PGHP.

6. The GMFP may be included as a component of the GHP at the discretion of the GHPDA.

B. GHP: SCOPE AND CONTENT

The Guidelines Concerning the Development of Health Systems Plans and Annual Implementation Plans, distributed on December 23, 1976, by the Department of Health, Education and Welfare, states:

> "Based on an analysis of its population and the health systems in its area, the HSP should identify the long-range changes that are required in the environment and in the amount, type, organization or distribution of health services being offered in the area."

In producing the plan, GHPDA was guided by P.L. 93-641, Section 1513(b) that requires: "The Agency shall assemble and analyze data concerning:

> the status (and its determinants) of the health of the residents of its health service area;
>
> the status of the health care delivery system in the area and the use of that system by the residents of the area;
>
> the effect the area's health care delivery system has on

the health of the residents of the area;

the number, type and location of the area's health resources, including health services, manpower, facilities;

the patterns of utilization of the area's health resources; and

the environment and occupational exposure factors affecting immediate and long-term health conditions.

Furthermore, the Guidelines state:

> "The HSP should address the health systems of the community from three primary perspectives. These include the health services delivered to the population, the settings of service delivery, and characteristics for analysis of the system."

The use of this approach focuses attention on the entire spectrum of health services and settings. This means components of the system may be analyzed so that interrelationships of the various types of services, may be identified. It also aids in the determination of appropriate alternative levels of health care.

These health services, settings and characteristics are outlined as follows: (They are also defined in Appendix ____)

a. Health Services

1. Community Promotion and Protection Services
2. Prevention and Detection Services
3. Diagnostic and Treatment Services
4. Habilitation and Rehabilitation Services
5. Maintenance Services
6. Support Services
7. Health Systems Enabling Services

b. Health Settings for Each Health Service

1. Home Setting
2. Mobile Setting
3. Ambulatory Setting
4. Short-stay (acute inpatient) Setting
5. Long-stay (long-term inpatient) Settingand
6. Free-standing Support Setting

c. Characteristics of the Health System

1. Availability
2. Accessibility
3. Acceptability

4. Continuity
5. Cost
6. Quality

Finally, the Guidelines provide for certain special considerations:

a. "In consideration of these characteristics, cost should receive special emphasis due to the alarmingly high rate of inflation in the medical care sector and the growing proportion of our nation's resources going into this sector without clearly commensurate return."

b. "Because there is a direct relationship between cost and each of the other characteristics, the trade-offs between these factors should be explicitly considered in the plan."

c. "To the extent feasible, the HSP should take into account the services estimated to be received and needed by all the residents of the area recognizing that some of these services may be obtained outside the area."

d. ".... in the first year, the HSA should include among its immediate priorities some extensive attention to diagnostic and treatment services across all settings."

In other words, because of the tremendous pressure of rising health care costs, health planning agencies are encouraged to include among their immediate priorities attention to diagnostic and treatment services during their first year of operation.

The development of the GHP covering the full range of services and settings, based upon all the characteristics, will be a developmental process taking years to complete. With each annual update, the GHP will become more specific and detailed.

Finally, as provided in the Guidelines, long range goals, objectives, recommended actions and estimates of resource requirements of the GHP cover a five year period.

C. GHP: PURPOSE, USES AND LIMITATIONS

It should be noted that the Federal Government has set forth a long list of requirements for the plan which insure that the Territory continue receiving federal health funds. However, it must be emphasized that approval or disapproval of the Guam Health Plan does not fall within the purview of responsibility of HEW. The approval or disapproval responsibility belongs solely to the GHCC, whose primary concern in approving the GHP is whether or not the plan document adequately meets the needs of the Territory. In short, the GHP is not to be viewed as a compliance plan developed primarily for the purpose of meeting

Federal requirements necessary for continued receipt of federal funds. This clearly, is not the purpose of the GHP development. (Nevertheless, Agency effectiveness will be measured by the continual development of planning goals, as well as the Agency's responsibilities for facility review, Federal health funds review, and institutional review.)

HEW's guidelines in The Development of Health Systems Plans and Annual Implementation Plans (December 23, 1976) and the Draft Guidelines for the Development of the State Health Plan (May 12, 1977) state that the HSP and SHP should be an "articulation of desired achievements for improvement in the health status of area residents and in the health system serving that population".

Traditionally, health plans developed by health planning agencies were based primarily on facilities and resources. Historically, these planning efforts had little or no impact on health status, cost constraint, public policy, consumer education, and health manpower planning. It is clear that this plan document must demonstrate greater sensitivity to, and action directed towards these factors.

In this light, the general purpose for the development of the Guam Health Plan is outlined as follows:

a. to utilize data on health status and the health care delivery system in ways that permit evaluation of progress towards achievement;

b. to review health services by a systems approach methodology (which means that when you consider and analyze one portion or element of the system, you must necessarily consider and analyze its interrelation with and impact on other portions of the system);

c. to assess and consider the effects of the environment and personal behavior on health;

d. to develop goals and objectives that will be the basis for all subsequent decisions of the GHPDA;

e. to influence Territorial policy through the Guam Health Plan;

f. to take into consideration the actions of other Territorial planning agencies, and others whose planning efforts and actions affect the Territory's health and health care delivery system,

g. to provide a basis for the GHPDA to promote a healthful environment, to review proposed health systems changes, reduce documented deficiencies and inefficiencies within the Territory, and promote desired achievements which

meet identified Territorial needs.

Five interest groups have been identified for whom the Guam Health Plan has significance. They are

a. the GHPDA
b. Federal and local public executive/legislative bodies
c. public, private and non-profit health care providers
d. other planning and resource development agencies
e. residents of the Territory.

The relationship of each of these entities to the Plan is stated below.

A. GHPDA uses the GHP to carry out the following functions and responsibilities:

1. the establishment of the Annual Implementation Plan;

2. the development of specific plans and projects to achieve health systems objectives;

3. the provision of technical assistance to individuals and entities for the development of projects and programs which the Agency determines as necessary to achieve the desired health systems;

4. the award of grants and contracts from the Area Health Services Development Fund...;

5. the review of uses of certain Federal funds within the health service area;

6. the review of the need for proposed new institutional health services;

7. the review of the appropriateness of all institutional health services offered in the health service area.

B. For Federal and Local Public/Legislative Bodies:

1. to serve as a basis for legislation, rules and regulations, and policies as they relate to health; and

2. to serve as a guide for making decisions about granting money to identified Territorial health needs.

C. For Public, Private, Non-Profit Health Care Providers:

1. to serve as a guide in the allocation and utilization of resources; and

2. to serve as stimulus for the development of program activities addressing health needs.

D. For Other Planning Agencies:

to guide, foster and enhance coordination of health-related planning activities among other agencies and the GHPDA.

E. For Residents of the Territory:

1. to stimulate and promote citizen participation in health planning;

2. to stimulate and promote awareness of health care resources, services, and facilities; and

3. to promote and enhance an understanding of the Territory's health problems, needs and issues.

III. DESCRIPTION OF THE PLANNING AREA

III. DESCRIPTION OF THE PLANNING AREA

A. Introduction

1. Population-Based Health Planning

The ultimate purpose of health planning is the improvement of the health status and well-being of the population. As such, all health planning is ultimately related to people. While, historically, planning efforts have concentrated on health facilities and resources as the beginning point for planning decisions, current efforts recognize that the desires of the population should form the basis of determining what health services should be planned and developed. One of the basic purposes of population based health planning is to enable a more effective health care delivery system to respond to the different needs and conditions of groups within planning area.

2. Demographic Context for Health Planning

Demography is the study of human population, the factors which make it change, and the results of those changes. It focuses, primarily, on three variables - fertility, mortality (death) and migration - and other various characteristics that are used to describe and understand populations, such as age, sex, ethnic background, place of residence and the like. Also included is a study of the relationships of all these variables to other social and economic indicators. These kinds of data are not only important to the immediate decisions planning agencies must make but also provide a means for predicting what will happen in the future as a result of shifts in the composition of the population. The development of an appropriate health care system and adequate health resources to meet the future needs of the Territory is, in part, dependent upon reliable information about the the Territorial population's size, composition and economic status.

This section briefly describes the characteristics of the Territory's environment and population that are essential to a complete understanding of health-related problems encountered by residents of the Territory.

The demographic and socio-economic forces indexed here have often been slow to have an impact on the health status of the population. For example, economic and social disadvantage is often associated with health problems for those who are at, or near, the poverty level. However, no cause and effect relationship is implied here. What is important is that the socio-economic characteristics of the Territory's residents may complicate certain problems of health status.

3. Sources of Data

Most of the data in this section are from the 1970 census of the population, the Bureau of Planning documents, and Department of Labor data. These data are considered to be the most recent, and most accurate available. Major additions to this analysis will be made when the 1980 census data are published. Most of the tables and figures supporting statements made in this section can be found in the Appendix section.

4.

B. Situation

1. Orientation

Located at latitude 13 degrees, 28 minutes north and longitude 144 degrees, 45 minutes west, Guam is the largest and southernmost island of the Marianas Chain, an archipelago in the southwest Pacific. The island is 28 miles long and 4 to 8 miles wide and has a total land area of 212 square miles.

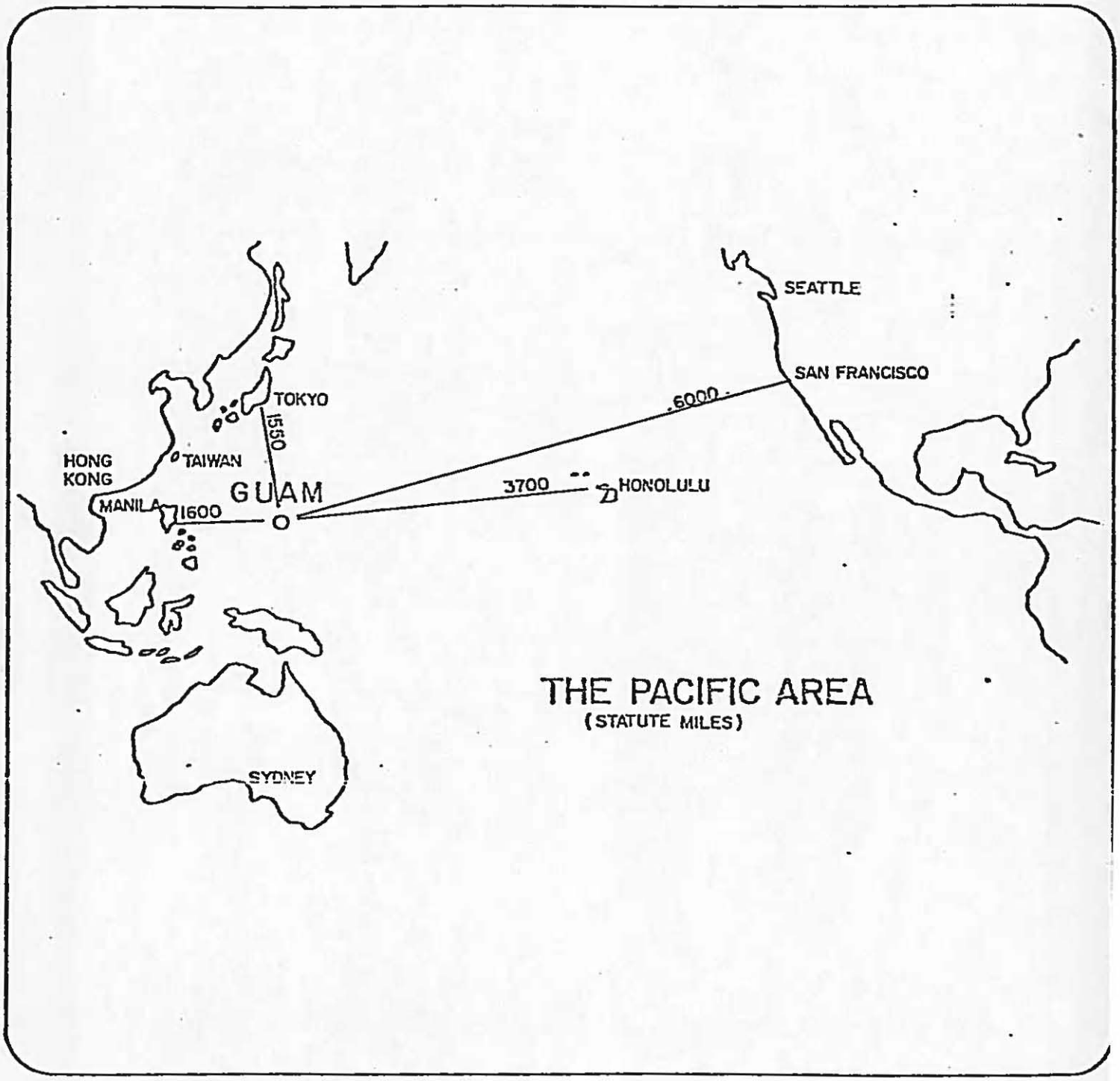
Guam is situated in the western Pacific 1600 miles from both the Philippines and Japan, 3700 miles from Hawaii, and 6000 miles from California (Figure III.1). As a U.S. possession, Guam's strategic location has influenced its development as a major U.S. military base, with an estimated (though fluctuating) military population of 22,000. This military presence influences not only the economic and employment structure of the island but also its vulnerability to catastrophic (nuclear) disaster and the organization and distribution of health care resources available to island residents.

2. Vulnerability

Guam's location in the Pacific makes it particularly vulnerable to natural disasters. It is located within the breeding grounds for Western Pacific typhoons. Approximately 15 to 25 typhoons are born each year

FIGURE III.1

LOCATION OF GUAM IN
THE PACIFIC AREA



SOURCE: BUREAU OF PLANNING

(Table III.1). During the aftermath of Supertyphoon Pamela in 1976, most of the island was without water for one to three weeks, the majority of the island was without electrical power for nearly a month and the telephone system has yet to be restored to pre-typhoon conditions. Guam is also located in one of the world's most active earthquake zones, known as the Pacific Ring of Fire. Because of Guam's location and geological structure, earthquake damage has been known to occur, and it is expected that earthquakes of strong magnitude may well occur in the future (Table III.2). Fault zones tend to be distributed over most of Guam (Figure III.2).

C. Physiography

1. Geologic Formations and Water Resources

Guam has two distinct geological formations that split the island in half, as well as a fringing coral reef that surrounds the island. The northern half, except for several volcanic outcrops, is basically a limestone plateau, characterized by a relatively flat or rolling landscape bounded by sheer cliffs that either fall directly to the sea or on to narrow beaches. Although lush vegetation abounds throughout the island, the northern plateau generally supports a variety of mixed, broadleaved evergreens. Also located within the northern plateau is an underground water lens system that supplies 90 percent of the island's potable (drinkable) water which is replenished by rainfall soaking into the porous baserock of the northern plateau.

In contrast, the southern half of the island is primarily volcanic, mountainous, and interlaced with rivers and streams. Predominantly hilly, most of the terrain is characterized by slopes of or exceeding a 15 percent gradient (Figure III.3). The mountainous regions bordering the western coast are characterized by high peaks or a ridge rising above 1,000 feet that is steep on the seaward side and gently slopes inward toward the interior basin. Due to the volcanic nature of the baserock, relatively small amounts of rainfall percolate into the underlying rock strata and instead collect in rivers and streams that flow either to the ocean or to a manmade reservoir (Fena Lake) which supplies 10 percent of the island's potable water. Sharp divisions between savannah grasslands that have adapted to the soils of the upper slopes and ravine forests which border the streams provide aesthetic contrasts in the southern half of the island.

2. Topographic Influence on Development

The island's topography has had an influence upon the extensive and rapid development which has occurred in the

TABLE III.1

TYPHOONS SIGNIFICANTLY AFFECTING GUAM (1800-1976)*

APRIL	1807	NOVEMBER	1900
MAY	1847	OCTOBER	1911
AUGUST	1848	NOVEMBER	1913
SEPTEMBER	1855	JULY	1918
APRIL	1859	MARCH	1923
NOVEMBER	1860	NOVEMBER	1940
NOVEMBER	1861	AUGUST	1941
FEBRUARY	1864	SEPTEMBER	1946
JUNE	1868	NOVEMBER	1949
NOVEMBER	1870	NOVEMBER	1957
AUGUST	1872	NOVEMBER	1962
DECEMBER	1876	APRIL	1963
OCTOBER	1891	MAY	1976
MAY	1900		

* LIMITED TO CASES IN WHICH THE 'EYE' OR CENTER OF THE TYPHOON PASSED DIRECTLY OVER OR JUST SOUTH OF GUAM (+60 NM) AND WITH WIND SPEEDS OF OVER 64 KNOTS (74+MPH).

SOURCE: COMPREHENSIVE DEVELOPMENT PLAN: GUAM BUREAU OF PLANNING 1978

EARTHQUAKES IN THE MARIANAS/GUAM REGION, 1902-1975
(6.0 AND ABOVE IN MAGNITUDE)

YEAR	MONTH	MAGNITUDE	YEAR	MONTH	MAGNITUDE
1902	SEPTEMBER	8.10	1940	AUGUST	6.00
1905	JULY	7.25	1940	DECEMBER	7.30
1909	DECEMBER	7.40	1941	JULY	6.25
1912	OCTOBER	7.00	1941	AUGUST	6.75
1914	NOVEMBER	8.10	1942	JUNE	7.00
1919	JUNE	6.00	1942	JUNE	7.10
1921	FEBRUARY	6.25	1943	MARCH	6.75
1924	JANUARY	6.25	1943	APRIL	7.00
1925	JULY	6.25	1944	AUGUST	6.90
1925	JULY	6.00	1944	DECEMBER	6.75
1927	JULY	6.00	1945	JULY	7.10
1928	FEBRUARY	6.00	1947	JUNE	7.20
1928	DECEMBER	6.00	1947	JUNE	7.00
1929	JANUARY	6.25	1948	DECEMBER	6.75
1929	MARCH	6.75	1949	JULY	7.10
1929	MAY	6.25	1949	JULY	6.75
1929	NOVEMBER	7.20	1950	MAY	7.00
1929	DECEMBER	6.25	1950	JULY	6.80
1930	JANUARY	6.25	1950	AUGUST	6.63
1930	OCTOBER	7.10	1950	AUGUST	6.50
1931	JANUARY	7.20	1953	FEBRUARY	6.75
1931	SEPTEMBER	7.10	1953	JULY	7.00
1931	OCTOBER	6.50	1954	NOVEMBER	6.63
1931	NOVEMBER	6.25	1956	FEBRUARY	7.00
1932	JANUARY	6.00	1956	DECEMBER	6.50
1932	FEBRUARY	6.00	1957	MAY	7.00
1932	MARCH	6.23	1957	JUNE	6.75
1932	MARCH	6.75	1957	JUNE	6.00
1932	JUNE	6.00	1959	JANUARY	6.75
1932	NOVEMBER	6.00	1959	MARCH	6.00
1932	NOVEMBER	6.50	1959	APRIL	6.50
1933	MAY	6.25	1959	DECEMBER	6.13
1933	JULY	6.00	1960	SEPTEMBER	6.38
1933	NOVEMBER	6.00	1961	APRIL	6.50
1934	FEBRUARY	6.50	1961	JULY	6.50
1934	OCTOBER	6.50	1961	AUGUST	6.38
1934	DECEMBER	6.00	1962	MARCH	7.00
1935	JULY	6.00	1962	MAY	6.50
1935	SEPTEMBER	7.00	1964	JULY	6.00
1935	OCTOBER	7.10	1965	JANUARY	6.10
1935	DECEMBER	6.50	1966	FEBRUARY	6.20
1936	MARCH	6.00	1966	MAY	6.00
1936	APRIL	6.75	1966	JUNE	6.03
1936	OCTOBER	6.75	1970	MARCH	6.20
1936	NOVEMBER	6.25	1970	SEPTEMBER	6.30
1937	MAY	6.25	1970	SEPTEMBER	6.00
1937	AUGUST	6.50	1971	OCTOBER	6.00
1937	SEPTEMBER	6.25	1971	OCTOBER	6.00
1939	NOVEMBER	6.25	1974	MAY	6.40
1940	JANUARY	7.30	1975	NOVEMBER	6.10

SOURCE: COMPREHENSIVE DEVELOPMENT PLAN: GUAM
BUREAU OF PLANNING 1978

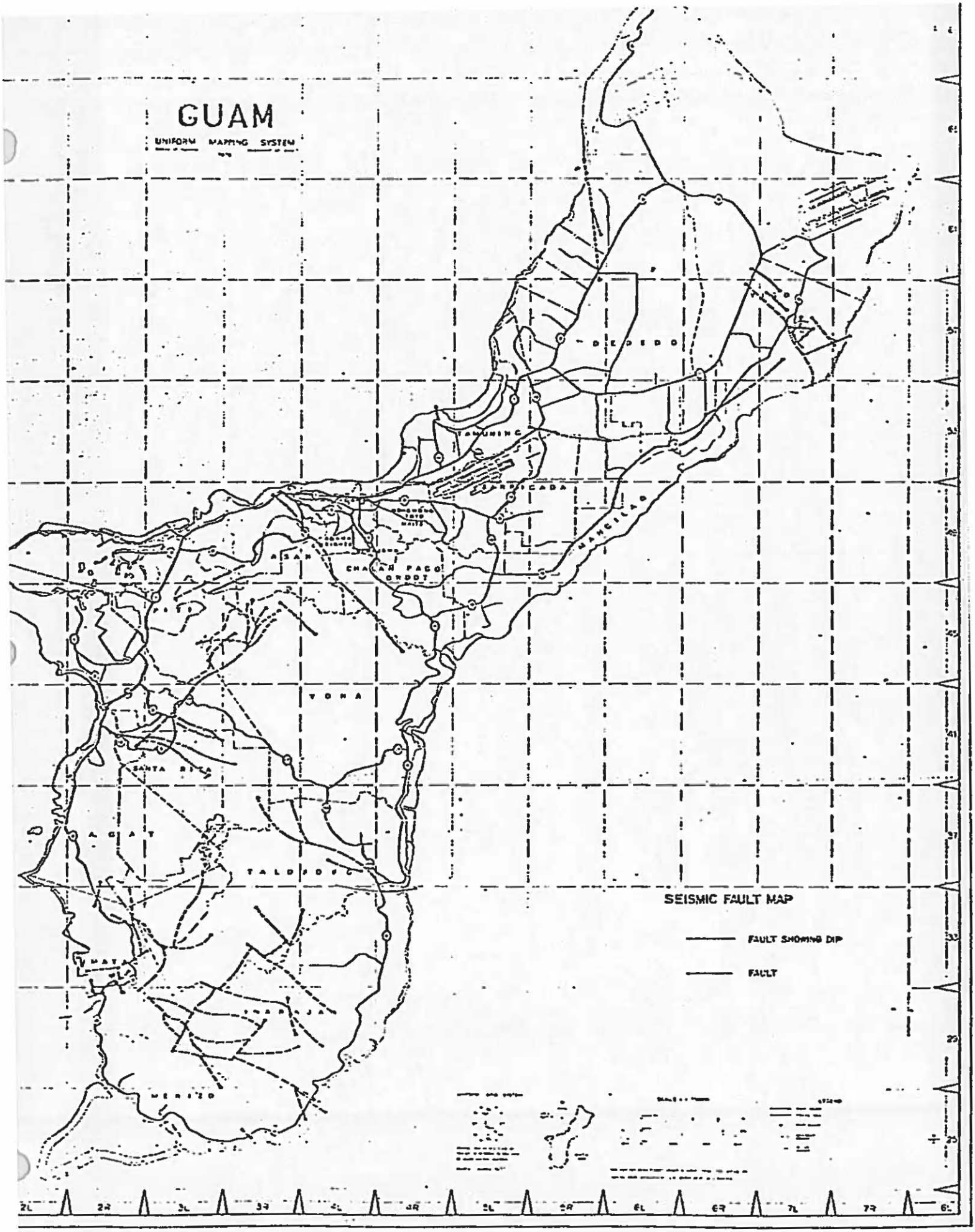

GUAM
UNIFORM MAPPING SYSTEM
TOLEDO
TAMUNING
BARRIGADA
MANGILAO
ASAN
CHALAN PAGO ORDOT
AGAT
SANTA RITA
TALOFOFO
MERIZO
SEISMIC FAULT MAP
FAULT SHOWING DIP
FAULT

FIGURE III-2

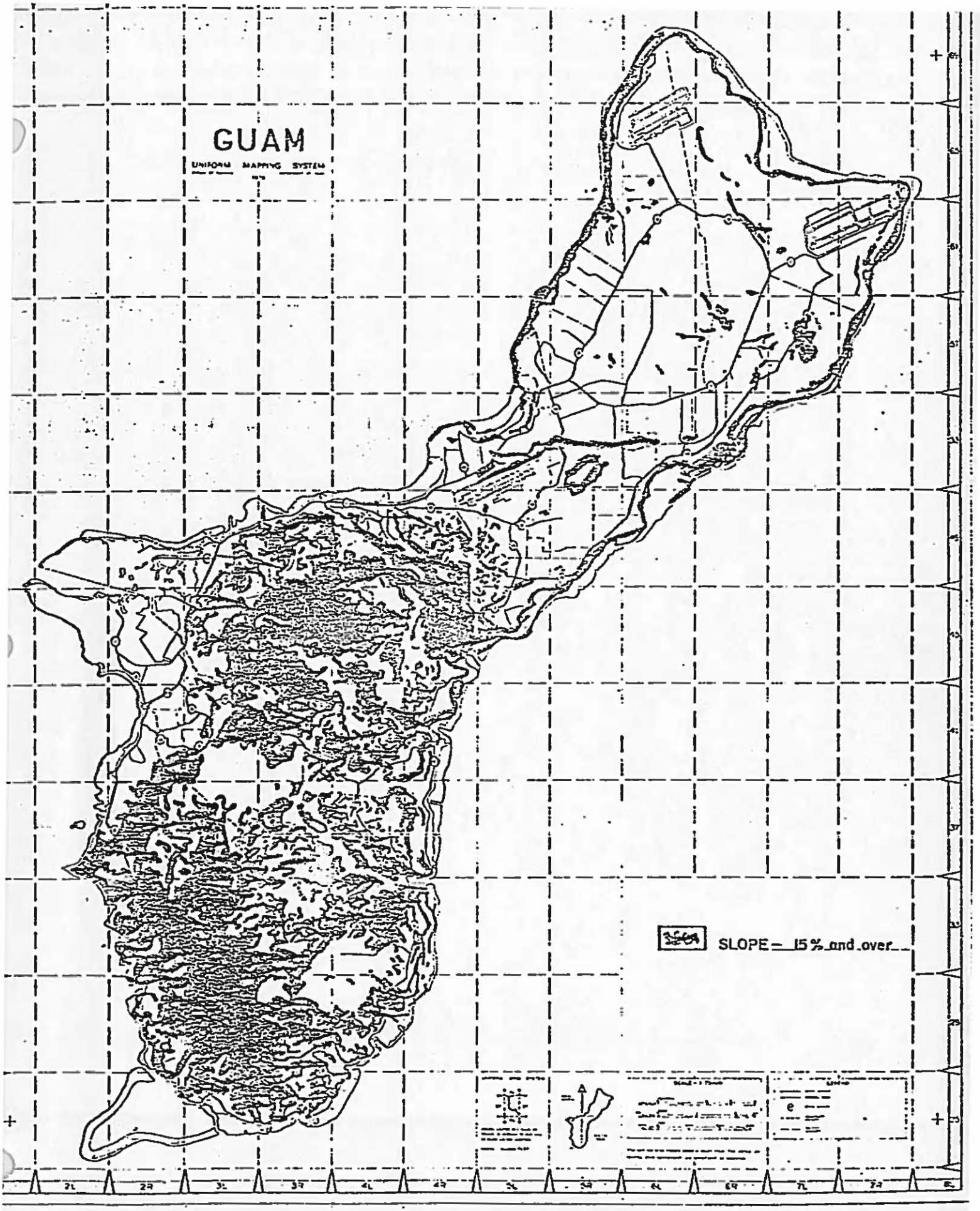


Figure III 3

northern half of the island. Although the southern half comprises 50 percent of the total land area, only about 20 percent of Guam's civilian households are located in the south (Figure III.4). Roads and other infrastructure are more expensive to build in the south, because it is hilly and because of the soil composition. Freshwater resources are also scarce in the south. On the other hand, the more intense development of the northern half of the island at present may jeopardize the capacity of the water lens system unless existing and proposed land use controls are properly implemented.

D. Climate

1. Temperature and Rainfall

The climate on Guam can best be described as hot and humid. Because the island is located 13 degrees north of the Equator, the average daily temperature ranges from 80 to 85 degrees Fahrenheit, with the humidity ranging between 65 to 80 percent during the day and higher at night. Temperatures seldom rise above 90 degrees or drop below 70 degrees. The average annual rainfall ranges from 85 to 100 inches, 70 percent of which falls from July through November. This is also the period when Guam is most likely to experience typhoons or tropical storm conditions. Furthermore, flooding due to heavy rains or typhoonassociated rains and ocean waves is a common occurrence during this time. In some areas, roads become impassable and citizens have to move from their homes because of flooding problems during the rainy season.

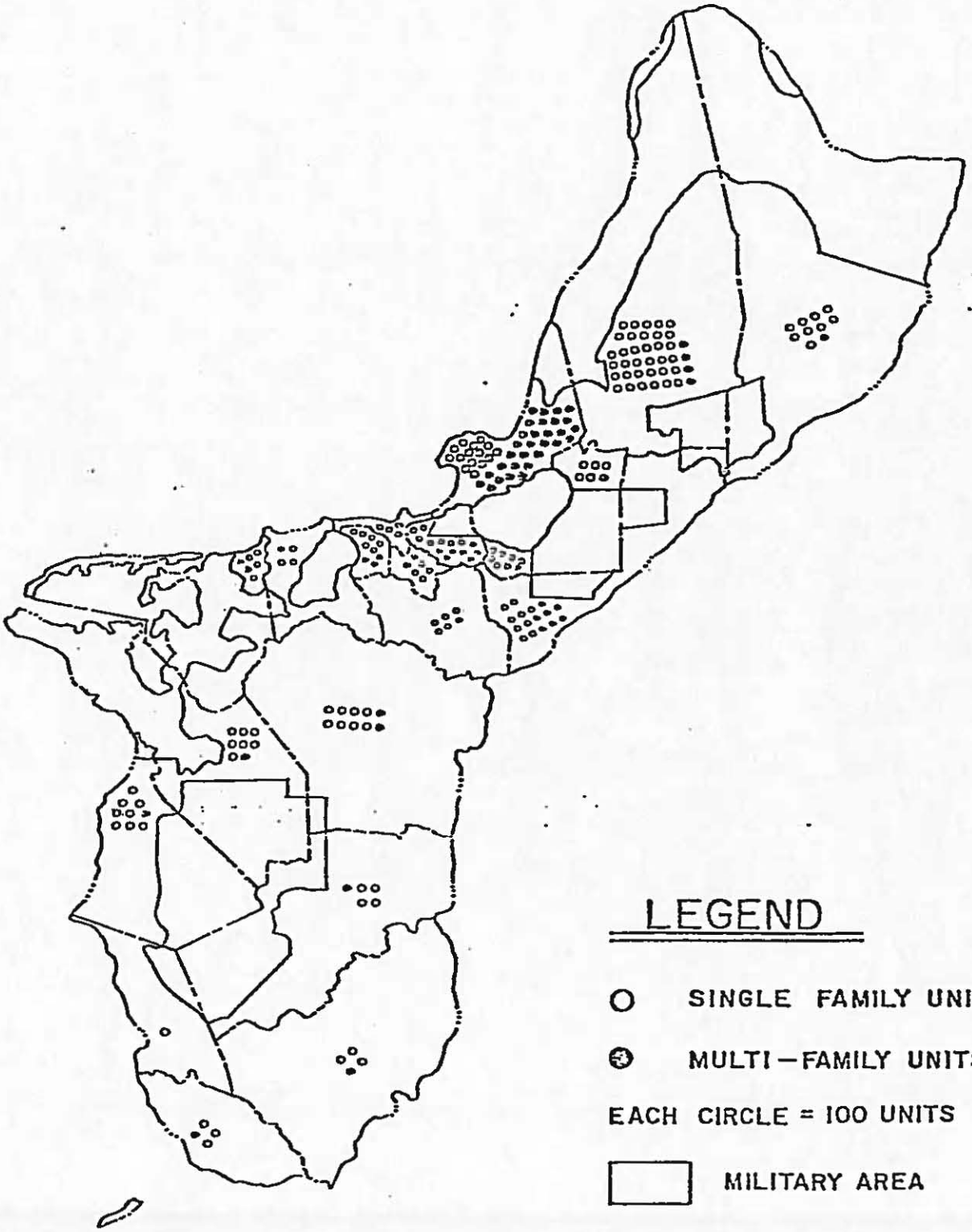
2. Air Circulation

Easterly tradewinds are dominant throughout the year and blow 90 percent of the time from January through May. Calms are rare during this time but frequent during June through October. Tradewind speeds generally range between 12 and 40 miles per hour, though typhoons passing over or near the island may bring winds greater than 100 miles per hour. In general, Guam has relatively good air circulation. Occasionally, low lying pockets of warm, stagnant air are formed in the evening, but persistent periods of stagnation have never been experienced.

E. Environmental Setting

There are many environmental factors which affect the people of Guam. Some of the factors will be discussed here and others will be included in the future revisions of this Plan. Those which will be discussed in this section are Guam's water supply and resources potential, the present and future potential for its contamination, water facilities available, the state and nature of the solid waste disposal system, and the present

DISTRIBUTION OF HOUSING UNITS ON GUAM
(PRIVATE LAND AREAS)



SOURCE: RESIDENTIAL DEVELOPMENT POLICY REPORT
BUREAU OF PLANNING, 1976.

sources of air pollution. As Guam continues to experience rapid economic and population growth, the environmental quality of the island's natural resources (land, water and air) and the health and well-being of its people can be expected to be poorly affected unless measures are taken to effectively control environmental elements which affect our health. The major areas of concern affecting water are as follows:

1. Water Supply

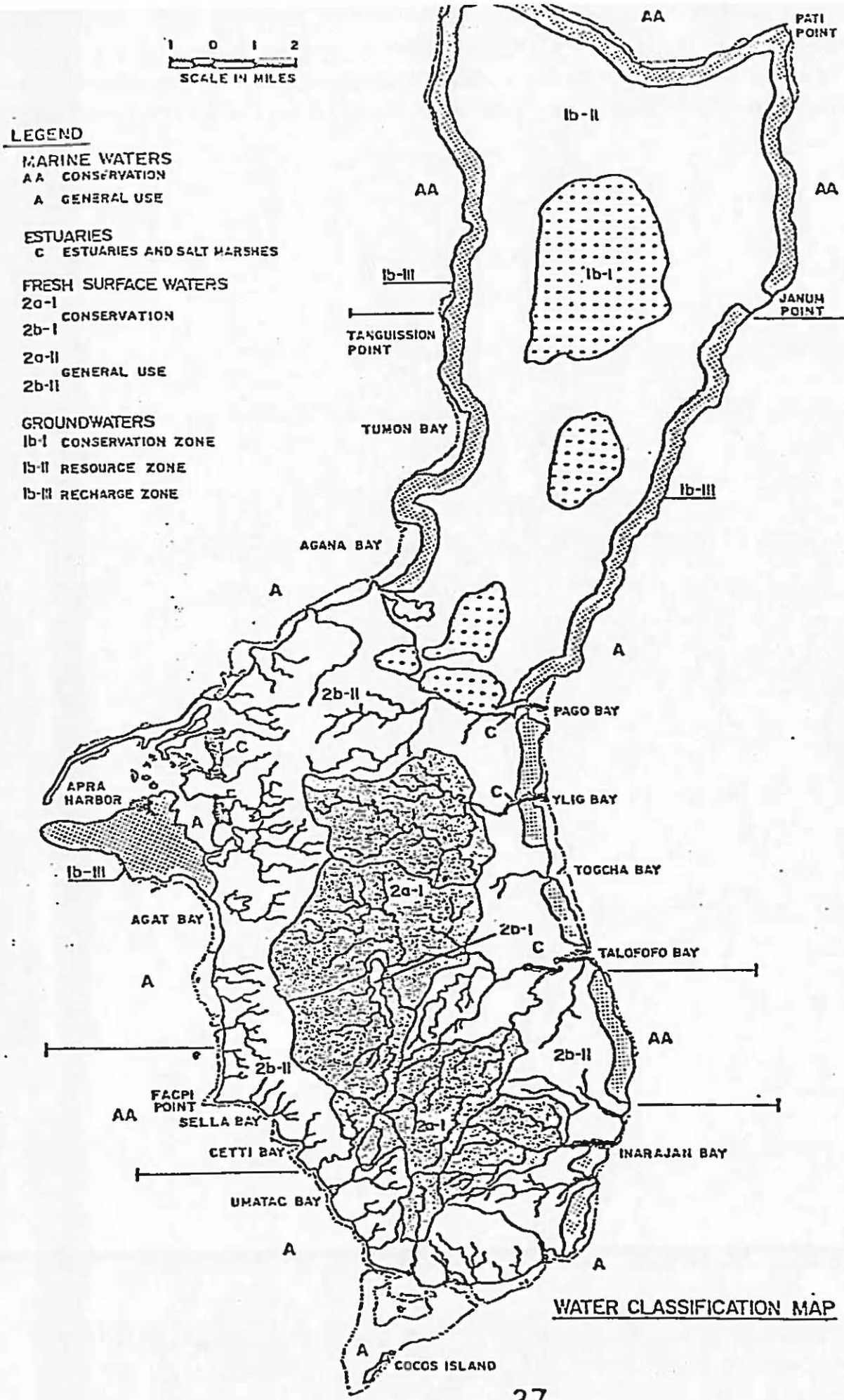
   Guam's primary source of potable water is the groundwater supply beneath Northern Guam. This supply, when fully developed and managed, can provide an estimated 50 mgd (million gallons per day). If more than this amount is pumped from the water lens, salt water will be drawn into the water supply. Over 90 percent of the water for public consumption comes from the northern groundwater lens. The remainder is supplied by spring or river (surface water) resources found in the southern areas. The primary source in the South is the Fena Reservoir (Figure III.5). It is expected that the 50 mgd maximum yield from the northern lens (under the most optimal circumstances) will be reached by the year 2,000. Thus, the water supply will greatly limit the island's population and development growth potential. The current total island consumption ranges between 26 mgd to 29 mgd. The above consumption level includes 11.5 mgd of water consumed by the military population.

2. Water Contamination

   It is important that the water we drink be free of major water pollutants such as domestic sewage and other oxygen-demanding wastes, infectious agents and other microorganisms, pesticides, detergents, industrial wastes, sediments from land erosion, radioactive substances, and excessive heat discharges from industrial and power plants.

   It is increasingly apparent that Guam's water supply and coastal resources are greatly threatened by pollution. Four sources of contamination can easily endanger the island's water quality: human waste as a result of inadequate sewage disposal practices, waste related to agricultural activities (use of pesticides), industrial wastes, and over-pumpage of wells. Presently, the northern lens shows negligible contamination, while southern water sources show contamination 25 percent of the time.

   Most developments are located in the northern and central portions of the island, and along the areas of the southern coastline because of the relatively level terrain. The major source of contamination is the three million gallons



WATER CLASSIFICATION MAP

per day of improperly treated sewage from approximately 7,500 residents living directly over the northern water lens. Even if sewer connections are properly made, run-off from paved areas can still seep into the lens causing contamination.

In the southern area, the contamination problem is caused largely by the lack of any sewage system. There are plans underway, however, to construct a treatment plant, and interceptor and collector lines for the Umatac, Merizo, Inarajan areas. Water conservation and management plans are also being formulated. The quality of Guam's drinking water is closely monitored by the Guam Environmental Protection Agency. The Agency in 1977 established a Safe Drinking Water Program, and is administering Guam's Water Resources Conservation Act.

Tests are conducted periodically of coastal waters, and drinking and groundwater supplies to assure that they are safe and/or properly treated. Certain areas show a high frequency of pollution: Pago River outfalls, and the Umatac, Asan, and Pago River mouths. Drinking water contamination is found largely in Merizo, Ipan, Talofofo, Inarajan/Malojloj and Barrigada/Mangilao areas. The coastal waters with high levels of fecal coliform bacteria throughout the year are Agat-Gaan Point, the New Agana Storm Drain, Santos Memorial Park, Sleepy Lagoon, and the War Memorial Park areas. In general, the open lagoons which adjoin land areas that lack rivers and which enjoy low usage are in excellent condition. Pollution in these areas is localized and of short duration. Marine waters receiving riverflow from undeveloped river basins are also in relatively good condition. Few samples, if any, show above moderately polluted levels.

Marine waters fronting residential or industrial-commercial areas such as East Agana Bay or Tumon Bay are the locations for storm water discharges. The pollution found in these waters is intermittent and peaks during rainy periods.

The water in rivers that capture residential or agricultural land wastes has the poorest pollution record. There is a high degree of pollution found in the waters around Pago River because of the sewage treatment plant in the Yona Urban Renewal Project which discharges into the river.

3. Water Facilities

The number of wells has markedly increased since the first one was constructed by the Navy at Wettengel School, Barrigada

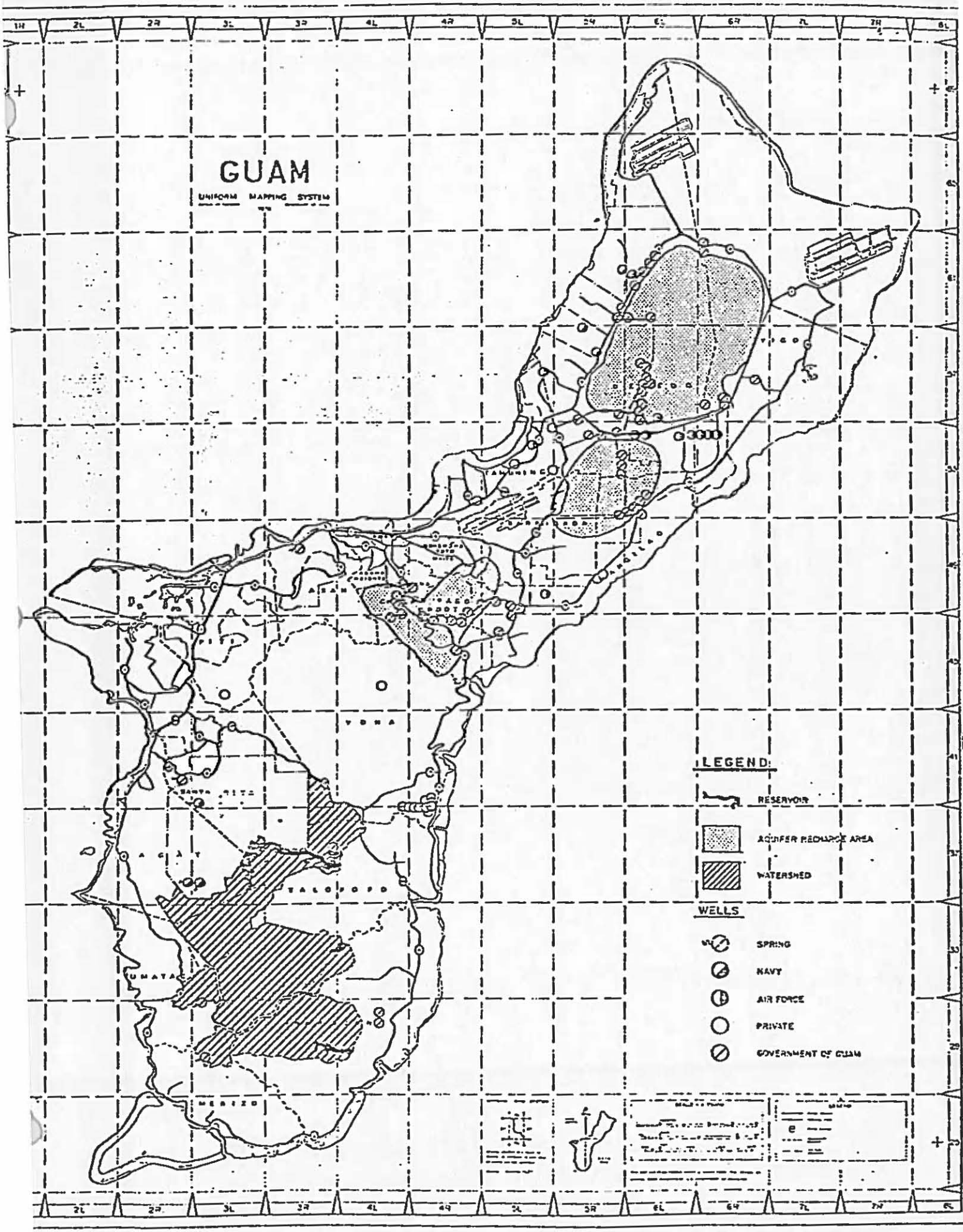
in 1937. The Government of Guam has 62 wells operating in the northern limestone plateau. The U.S. Air Force maintains 8 wells and the Navy has 4 wells, while private companies own some half dozen wells. In the limestone areas of the south, the Government relies on wells at Malojloj and Talofofo. The Navy obtains most of its water supply from the Fena Reservoir (Figure III.6). Water shortages have occured in the south when the springs dry up during the dry season. Occasionally, water has to be brought in by tank trucks. Large amounts of water are lost annually as a result of leakage in the public water system. In some areas, the water pressure is low as a result of new homes and/or housing tracts being built. Water consumption has increased from 1,457 million gallons in 1966 to 4,983 million gallons in 1976, or about 3.5 times. Since 1976, the Government of Guam has had to purchase some 850,000 million gallons of water at prices ranging from $.45 per 1000 gallons at the Navy to $.81 per 1000 gallons of water at the Air Force in order to supply civilian water needs.

4. Solid Waste

Solid waste is any refuse generated in homes, service establishments, government installations, etc., and consists of a wide variety of cans, bottles, jars, packaging materials, metal and plastic caps, junk cars, trash and garbage. Solid waste serves as a breeding ground for disease-bearing organisms such as rats, flies and cockroaches; it causes unsightly conditions and unpleasant odors and is a contributing factor to air as well as water pollution.

The disposal of solid waste did not become a problem until recent years with the rapid growth of business, industry, and population, both in the stable population and transient population. It is estimated that Guam generates over 400,000 pounds of solid waste per day and that such waste is increasing at the rate of 8 percent per year. Bulky metallic waste is also high. It is estimated that there are some 4,700 vehicles discarded and some 1,000 tons of other metallic material thrown away annually.

The Government of Guam currently operates only one landfill operation located at Ordot. The military operates three: one at Naval Station, one at Naval Air Station, and one at Andersen Air Force Base. Though these disposal sites exist, there is still a large amount of illegal dumping throughout the island. (Some 38 illegal dumps were identified by GEPA in 1973.) Additionally, there is widespread littering on the beaches and roadways. It is predicted that if the current rate of solid waste disposal is maintained, the present landfill operations in Ordot will be filled in four year. Good landfill sites are limited, because so much of Guam's land area is porous limestone, which is not suitable for landfills. Solid waste disposal is, therefore, a major concern for the future.


GUAM
UNIFORM MAPPING SYSTEM
LEGEND:
RESERVOIR
AQUIFER RECHARGE AREA
WATERSHED
WELLS
SPRING
NAVY
AIR FORCE
PRIVATE
GOVERNMENT OF GUAM

5. Air Quality

Air pollution is "the presence in the outdoor atmosphere of one or more air contaminants in such quantities and duration as is or tends to be injurious to human health or welfare, plant or animal life, or property, or would unreasonably interfere with the enjoyment of life or property".[5]

Guam still enjoys cleaner air than most cities in the U.S. The average concentration for sulfer dioxide and nitrogen dioxide is 8 and 6 micrograms per cubic meter, respectively. Dust is one of the major air pollutants, mainly because of construction activities, but also due to the unpaved or partially paved condition of many roads. The average annual concentration of particulates is roughly 110 micrograms per cubic meter. This level exceeds the island's current ambient air quality standard for particulates by some 50 percent. The other sources of pollutants on Guam are motor vehicles, power plant emissions, the rock processing industries, and construction projects.

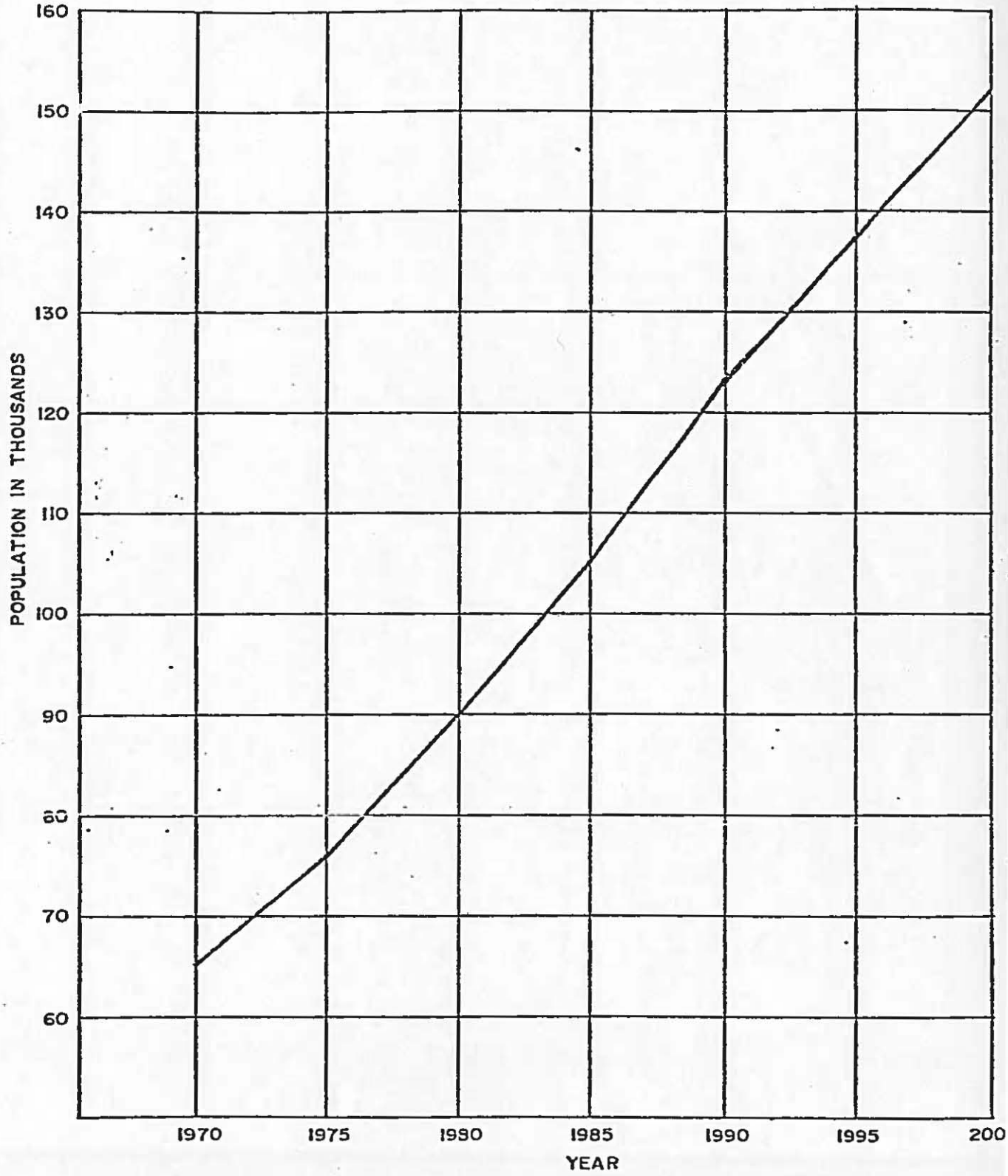
Emmissions from motor vehicles and power plants are the chief sources of air pollution on Guam. In Fiscal Year 1977, there was a total of 57,779 licensed motor vehicles.[6] Between 1965 and 1975, the number of registered vehicles tripled. Since there is no mass transit system, it is expected that the number of vehicles will continue to increase. Several attempts in the past to establish a mass transit system have failed. In fact, to alleviate the heavy traffic in the Agana area, the Guam Energy Office is attempting to encourage some 9,000 Government of Guam employees to share a ride to work. Power plant emissions are another major source of air pollution on Guam. Although the rate of emission is not as rapid as that of vehicles, the effects of this increase can significantly reduce air quality. Fugitive dust is also in excess of the standards imposed by the Federal government, which the GEPA is seeking to enforce.

F. Population

1. Population Data Base

Although several population projections have been developed over the last five years, the Quinton-BudLong (Series A) population estimates (Figure III.7), developed in 1973 and verified by the Guam Bureau of Planning in 1977, shall be used in this plan as the basis for population trends and projections. For certain years, however, notably 1975, the more accurate population data derived from a survey conducted by the Guam Bureau of Labor

GUAM ESTIMATED AND PROJECTED POPULATION
1970–2000



NOTE: 1990–2000 EXTENSION OF QUINTON-BUDLONG USING POPULATION PROJECTION METHOD.

SOURCE: QUINTON-BUDLONG POPULATION ESTIMATES, 1970–1990.

Statistics will be utilized for age, sex, and village population breakdowns. (For 1975, the Quinton-BudLong (Series A) estimate is 4.6 percent, or 3,711 persons lower than the BLS estimate.

It should be noted that more accurate and consistent population data are needed in order to improve health planning capabilities. The absence of an adequate data base, federal immigration policies independent of local considerations, fluctuations in military personnel and their dependents, the seasonality of tourist traffic, and unstable economic conditions, including alien labor force levels, all contribute to the variations to be found in current population estimates and projections for Guam. It is hoped that the 1980 Census will provide an opportunity for Guam to accumulate more timely and consistent data necessary for reliable projections.

2. Historical Perspective

Since 1521, Guam's population diminished or increased depending on the social, economic, or political controls imposed by authorities that have governed the island. The Chamorros, original inhabitants of Guam, lost control over their island soon after the arrival of the Spaniards. Wars, exile to other islands, the introduction of new diseases, and a disruption of the socio-economic and cultural fabric of the island community all played a significant role in the decline of the Chamorro population. From a population estimated at 80,000 in 1521 there followed a 90 percent decline by the 17th century. By 1898, when the United States annexed Guam as part of the spoils of the Spanish-American War, the population of the island numbered only a few thousand.

When the Americans came to Guam in the early 1900's, they found the health status of the population to be generally poor. This was a consequence of poor sanitation conditions and the lack of basic health services. In 1918, over 70 percent of the population was found to have intestinal parasites from drinking, cooking, and bathing in water from wells that were heavily polluted and from poor personal hygiene. Dysentery and tuberculosis were the chief causes of death among adults. Infant mortality was high as a result of the unsanitary methods of child delivery by local midwives.

The Naval Government sought to upgrade the health status of the local population through improvements in sanitation, particularly in the water supply, and the provision of basic health services. Although the Naval Government established a central hospital and a network of health stations in the villages, the local population was reluctant at first to seek medical treatment because of cultural

beliefs and fear.

American annexation and resultant improvements in sanitary conditions led to a steady increase in the population which was disrupted only temporarily by the Japanese occupation and the events of World War II. Following World War II, the total population (civilian and military) increased dramatically from 22,290 in 1940 to 52,498 in 1950. The dramatic upsurge in the population was the result of the establishment of Guam as a major U.S. military outpost in this part of the world. Prior to 1962, entry to Guam was subject to strict U.S. military clearance. Little in-migration to the island occurred, except for workers brought in by the military from the Philippines and the U.S. Mainland.

The lifting of the military clearance requirements in 1962 by President Kennedy subsequently opened the island for visitors, investors and immigrants. Between 1960 and 1970, the total population increased at an annual rate of 2.4 percent. During the same period, the civilian population increased at an annual rate of 4 percent, which, by demographic standards, is a high annual growth rate. More than 50 percent of the civilian population increase between 1960 and 1970 was the direct result of net in-migration. Guam's immigrants were primarily from the Philippines.

3. Civilian Population, 1970-1975

Between April, 1970, and September, 1975, the civilian population increased from 64,510 to 76,089 for an annual growth rate of 3.4 percent (Table III.3). If this rate of growth is maintained, the civilian population will double by the year 1995. Between 1970 and 1974, 10,377 immigrants were admitted to establish permanent residency on Guam. As in the period 1960 to 1970, more than 50 percent of the population increase that occurred between 1970 and 1975 was due to net in-migration. The median age of the civilian population increased from 16.1 to 18.9 years, reflecting a young population. The upward movement of the median age of the population was due to a declining birth rate, out-migration of local families, and in-migration of an intermediate age population.

4. Transient Population, 1970-1977

The growth of tourism and the military as Guam's largest industries make it necessary to consider the transient population in health planning since visitors can become ill or injured during their stay on the island.

Guam's yearly tourist population has been steadily increasing from 73,723 to 240,267 between 1970 and 1977 (Figure

TABLE III.3

POPULATION
1970 — 1985

YEAR	POPULATION *	CHANGE - %
1970	64,510	
1971	66,838	3.6
1972	69,166	3.5
1973	71,494	3.4
1974	73,822	3.2
1975	76,089	3.1
1976	78,868	3.6
1977	81,647	3.5
1978	84,426	3.4
1979	87,205	3.3
1980	89,938	3.1
1981	93,102	3.5
1982	96,266	3.4
1983	99,430	3.3
1984	102,594	3.2
1985	105,706	3.0

AVERAGE ANNUAL GROWTH RATE 1970 – 1975 = 3.4 %

* CIVILIAN POPULATION ONLY

SOURCE: QUINTON – BUDLONG SERIES "A" POPULATION ESTIMATES

III.8). The majority of Guam's visitors are tourists from Japan. The seasonal fluctuation of tourist arrivals increases the difficulty in determining the actual daily visitor population. However, during the peak tourist season (March through August), there is an average daily tourist population of 3,000 and approximately 1,000 tourists per day during the off-season months.

In the interest of national defense, the military has been reluctant to provide information regarding its population. For planning purposes, the Government of Guam has assumed that the military population is kept constant at 22,000 active and dependent personnel.

5. Population Distribution

As noted previously, the topography of the island has influenced the distribution of the population. Roughly 80 percent of the civilian households are located in the northern and central districts of Guam. In 1969, population was loosely arranged around communities in the south and more densely situated in central and northern communities (Figure III.9). Between 1970 and 1975, a major redistribution of population took place, with northern municipalities accounting for much of the population growth during this period (Figures III.10 and III.11). In particular, the municipal districts of Dededo, Tamuning, Mangilao, and Yona significantly increased their share of island population. This spatial shift in population parallels new subdivision developments, which are concentrated in northern Guam (Figure III.12).

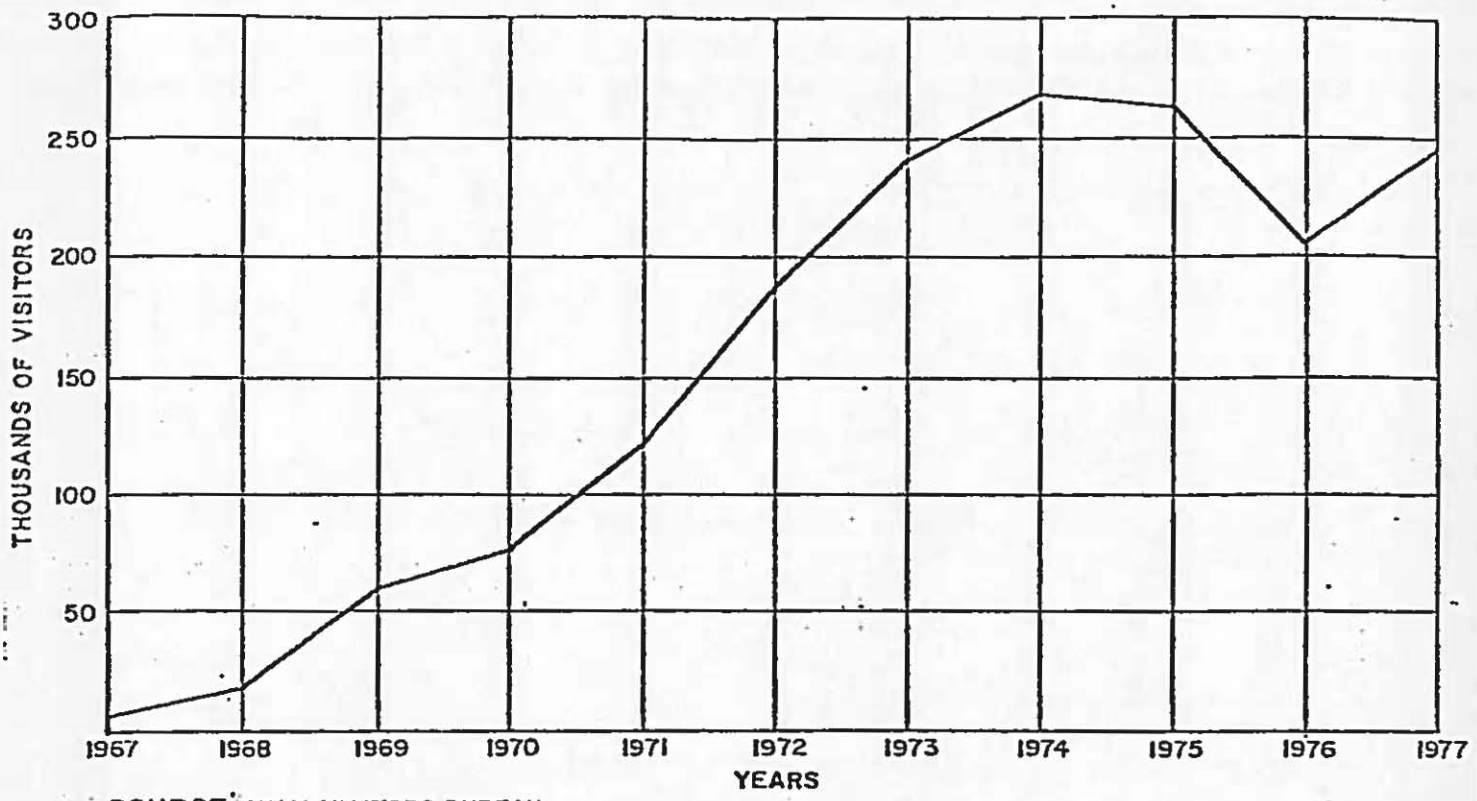
G. Profile of the Civilian Population

1. Size, Age and Sex

The civilian population, estimated by the Bureau of Labor Statistics to be 79,800 in 1975, is, by demographic standards, a young population. The median age was 18.9 years 19.6 years for females and 18.1 years for males. Forty-one percent (32,800) of the population was under fifteen years of age. The child dependency ratio of 79 children (0-14 years old) per 100 persons (age 15+) is relatively high in comparison to many developed countries. People sixty-five years and over comprised three percent (2,400) of the population (Table III.4, Figure III.13).

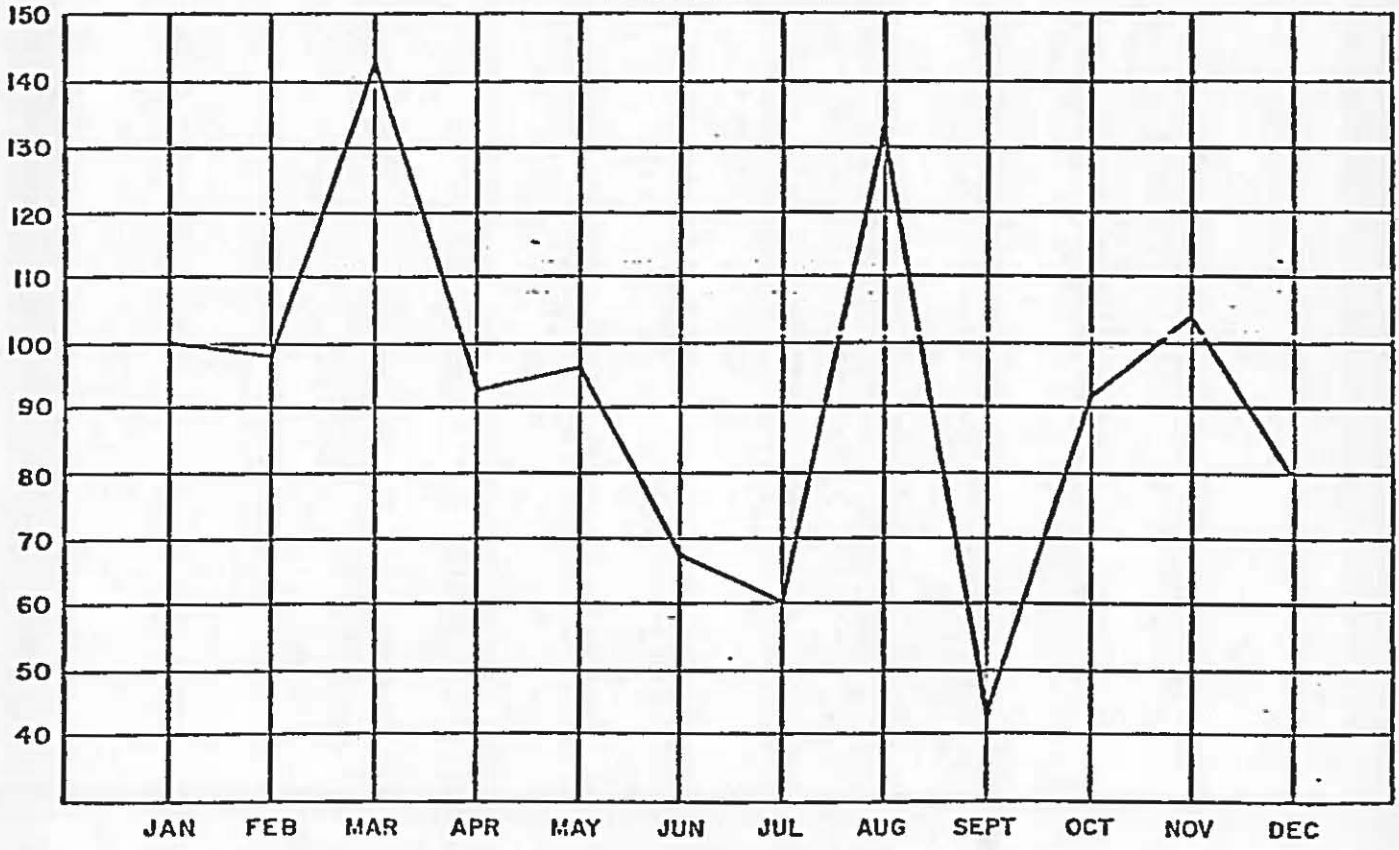
Overall, the sex ratio of the population was one to one: 39,900 males per 39,900 females. However, this ratio did not hold constant throughout all age groups. Under the age of 5 years, there were 81 males per 100 females. Between the ages of 5 to 19 years, 45 to 54 years and 60 to 64 years, there were more males than females. Between the ages of 20 to 24 years, 30 to 44 years and 65 years

VISITOR ARRIVALS TO GUAM
1967–1977



SOURCE: GUAM VISITORS BUREAU

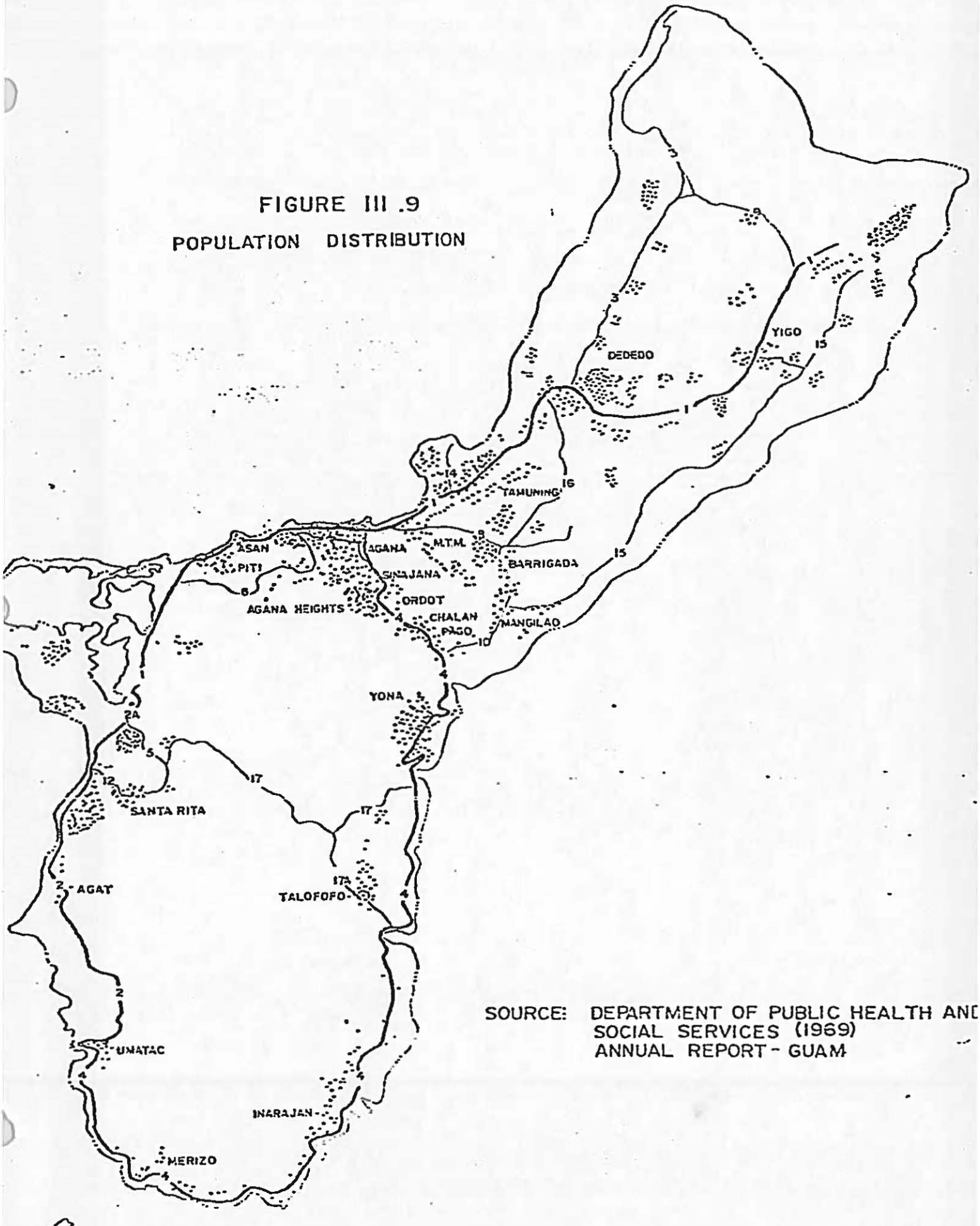
SEASONAL INDEX OF TOURIST ARRIVAL TO GUAM
(JANUARY=100)



SOURCE: GUAM'S VISITOR INDUSTRY, AN ECONOMIC ASSESSMENT
BUREAU OF PLANNING, GOVERNMENT OF GUAM, 1977.

FIGURE III .9

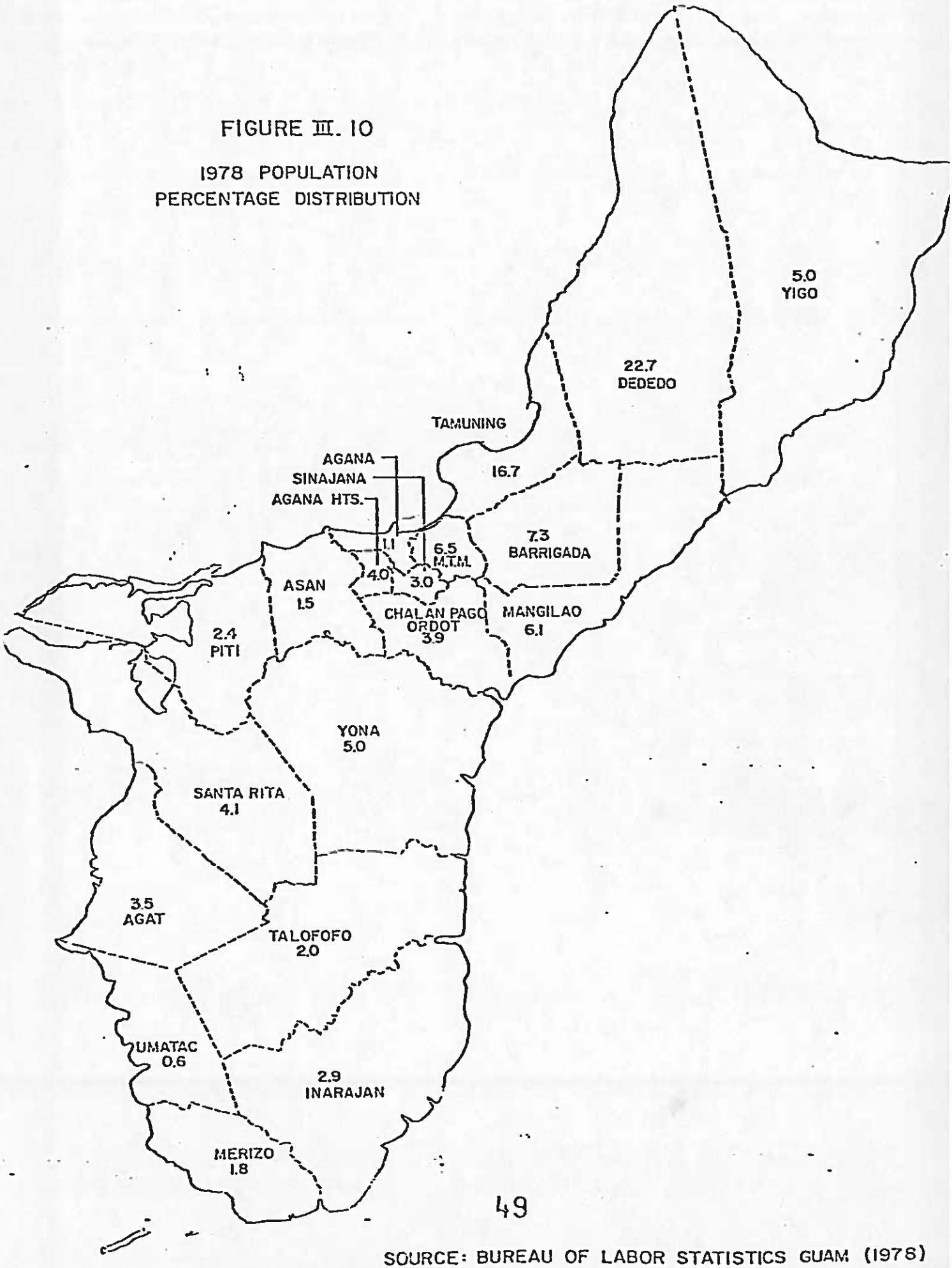
POPULATION DISTRIBUTION



SOURCE: DEPARTMENT OF PUBLIC HEALTH AND SOCIAL SERVICES (1969) ANNUAL REPORT - GUAM

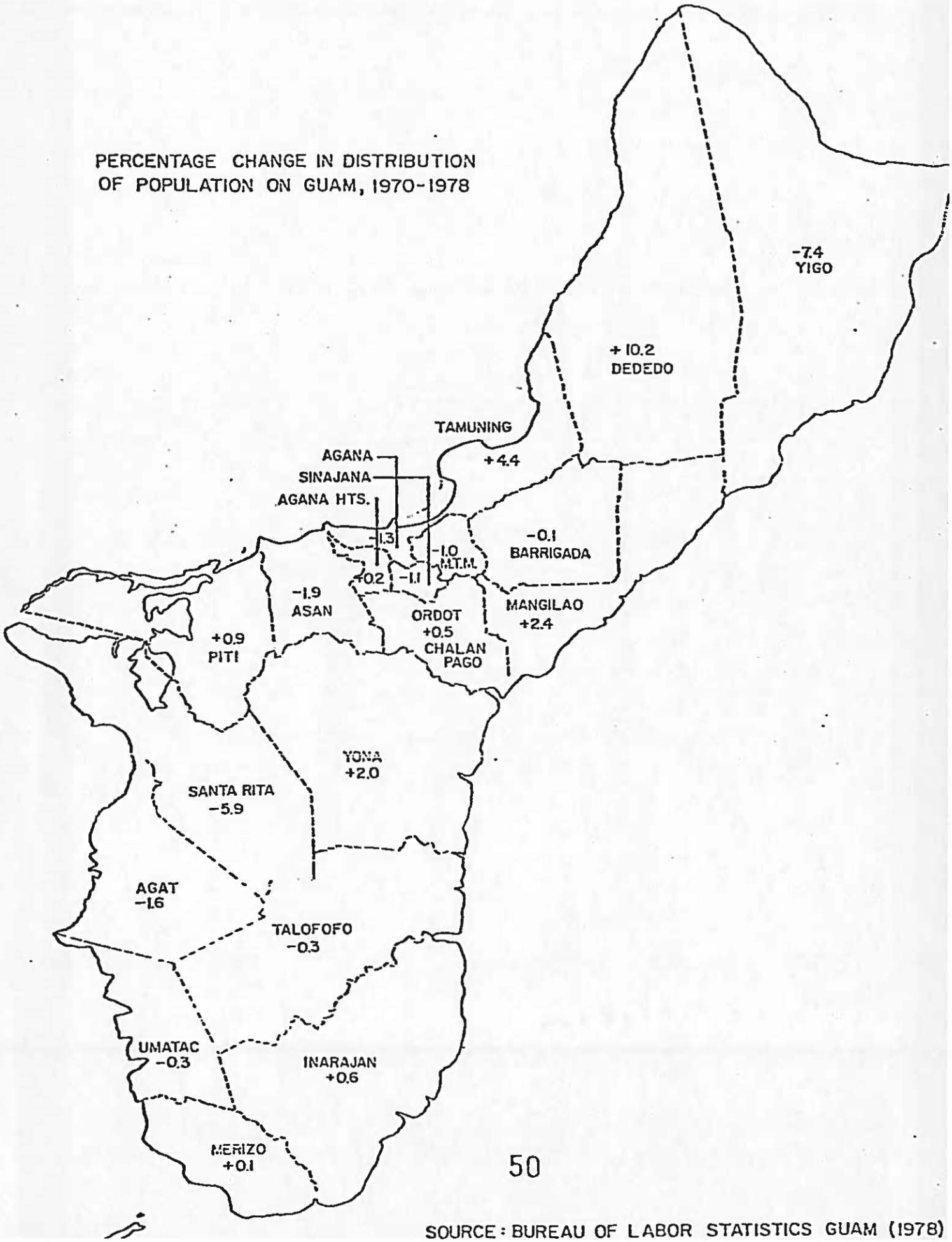
FIGURE III. 10

1978 POPULATION
PERCENTAGE DISTRIBUTION

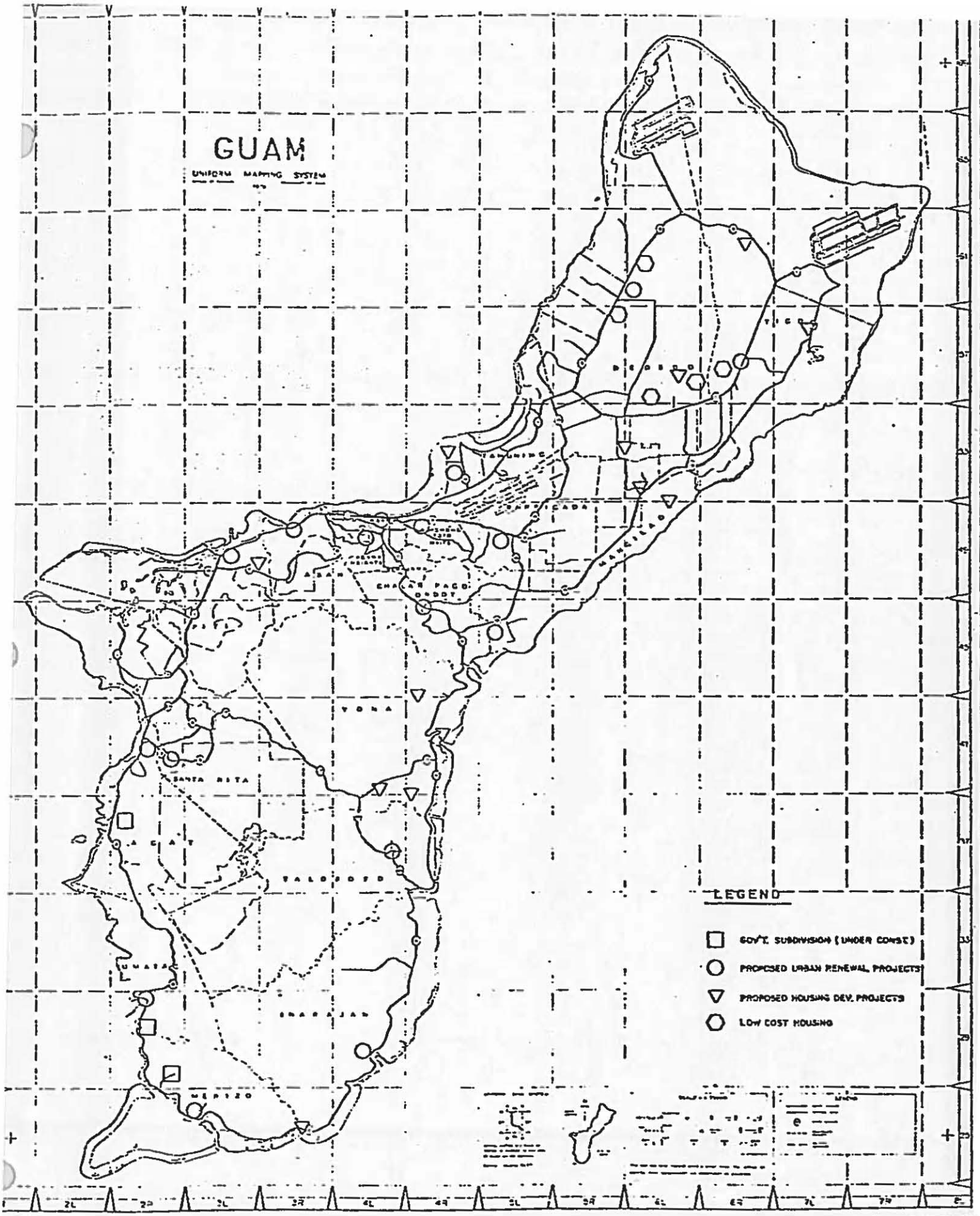


SOURCE: BUREAU OF LABOR STATISTICS GUAM (1978)

Figure III 11



SOURCE: BUREAU OF LABOR STATISTICS GUAM (1978)


GUAM
UNIFORM MAPPING SYSTEM
LEGEND
GOV'T. SUBDIVISION (UNDER CONST.)
PROPOSED URBAN RENEWAL PROJECTS
PROPOSED HOUSING DEV. PROJECTS
LOW COST HOUSING

AGE-SEX CHARACTERISTICS
CIVILIAN POPULATION ESTIMATES *
(AS OF SEPTEMBER 1975)

AGE GROUP	MALE NUMBER	PERCENT	FEMALE NUMBER	PERCENT	TOTAL
NDER 5	4,800	46.6	5,500	53.4	10,300
-9	5,600	52.8	5,000	47.2	10,600
)-14	6,400	53.8	5,500	46.2	11,900
5-19	4,700	52.8	4,200	47.2	8,900
0-24	3,200	47.1	3,600	52.9	6,800
5-29	3,000	50.0	3,000	50.0	6,000
0-34	1,700	43.6	2,200	56.4	3,900
5-39	1,900	47.5	2,100	52.5	4,000
0-44	1,900	46.3	2,200	53.7	4,100
5-49	2,200	53.7	1,900	46.3	4,100
0-54	1,600	53.3	1,400	46.7	3,000
5-59	1,100	50.0	1,100	50.0	2,000
0-64	900	56.2	700	43.8	1,600
5 & OVER	900	38.0	1,500	62.0	2,400
OTAL	39,900	50	39,900	50	79,800
NDER 15	16,800		16,000		32,800
% TOTAL	42.1		40.1		41.1
5 & OVER	900		1,500		2,400
% TOTAL	2.2		3.7		3
EDIAN GE	18.1		19.6		18.9

: EXCLUDING NON-IMMIGRANT ALIENS AND MILITARY DEPENDENTS STAYING ON MILITARY BASES.
OURCE: BUREAU OF LABOR STATISTICS , GOVGUAM DEPT. OF LABOR

TABLE IV. 2

MORTALITY RATES: GUAM-U.S. 1970-77

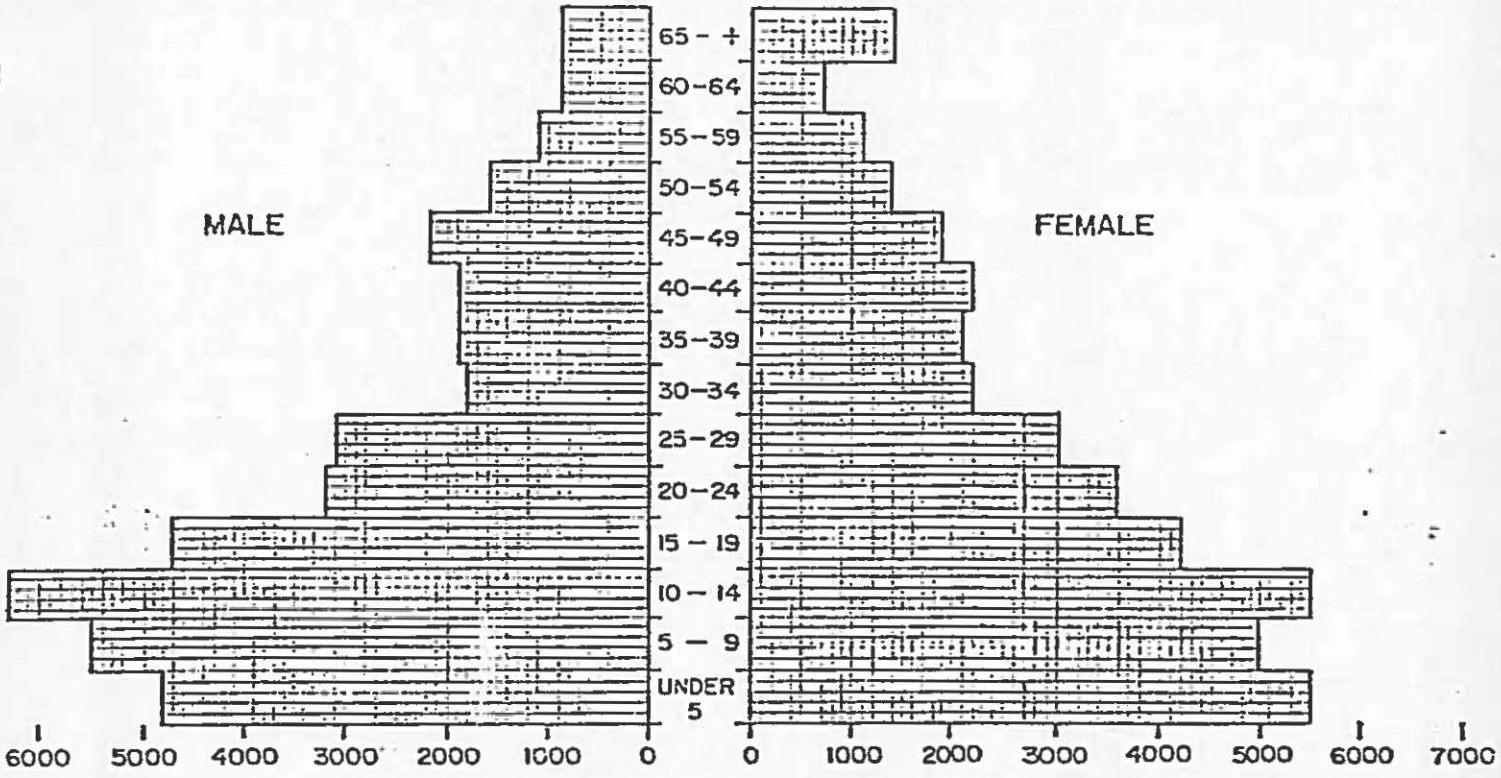
GUAM				U.S.			
ARS	CRUDE DEATH RATES	MALE	FEMALE	YEARS	TOTAL	MALE	FEMALE
970	5.5	6.9	3.9	1970	9.5	10.9	8.1
971	5.4	6.8	3.9	1971	9.3	10.7	8.0
972	5.9	6.6	5.2	1972	9.4	10.8	8.1
973	6.1	7.0	5.0	1973	9.4	10.7	8.1
974	6.1	6.8	5.2	1974	9.2	10.4	8.0
975	5.8	7.2	4.2	1975	8.9	10.1	7.7
976	5.3	6.7	3.8				
77	4.7	5.6	3.6	AVERAGES	9.3	10.6	8.0
RAGES	5.6	6.6	4.3				

URCE: STATISTICAL REPORTS 1970-77, OFFICE OF VITAL STATISTICS; DPHSS

SOURCE: STATISTICAL ABSTRACT OF THE U.S.; 1977; U.S. DEPT. OF COMMERCE

CIVILIAN POPULATION PYRAMID

AGE GROUPS



Source: BUREAU OF LABOR STATISTICS, GUAM DEPARTMENT OF LABOR SEPTEMBER 1975

and older, there were fewer males per 100 females. The sex ratio evens out in the 25 to 29 years and 55 to 59 years age group.

2. Ethnicity

The three major ethnic groups in the population are Chamorros (native Guamanians), Filipinos, and Caucasians. Chamorros, who scholars believe are Malayo-Indonesian descendants, comprise 55 percent (44,300) of the population with a median age of 18.1 years, followed by Filipinos at 19.3 percent (15,400) with a median age of 25.8 years, and Caucasians at 9 percent (7,200) with a median age of 26.1 years. The remainder of the population (12,900) is composed of mixtures of Chamorros, Filipinos, Caucasians and other ethnic groups (Figure III.14). The median age difference between Chamorros and the other major ethnic groups is indicative that the latter two are primarily immigrants to the island (Table III.5).

3. Marital Status

In _____ 64 percent (28,910) of the population 16 years and above were married, and 8percent (3,660) were either widowed, divorced or separated. The remaining 28 percent (12,560) were never married. The average household size was about 4.7 persons. The southern villages of Umatac, Merizo, Inarajan, and Talofofo tend to have larger household sizes. The general marriage rate was 20 per thousand and the general marriage rate for the marriageable population was 76 per thousand.

4. Educational Status

Thirteen percent (5,830) of the population 16 years and above have completed at least four years of college. Eleven percent (4,890) have completed high school. Sixteen percent (7,240) have completed certain levels of elementary schooling and eight percent (3,550) have completed either the seventh or eighth grades.

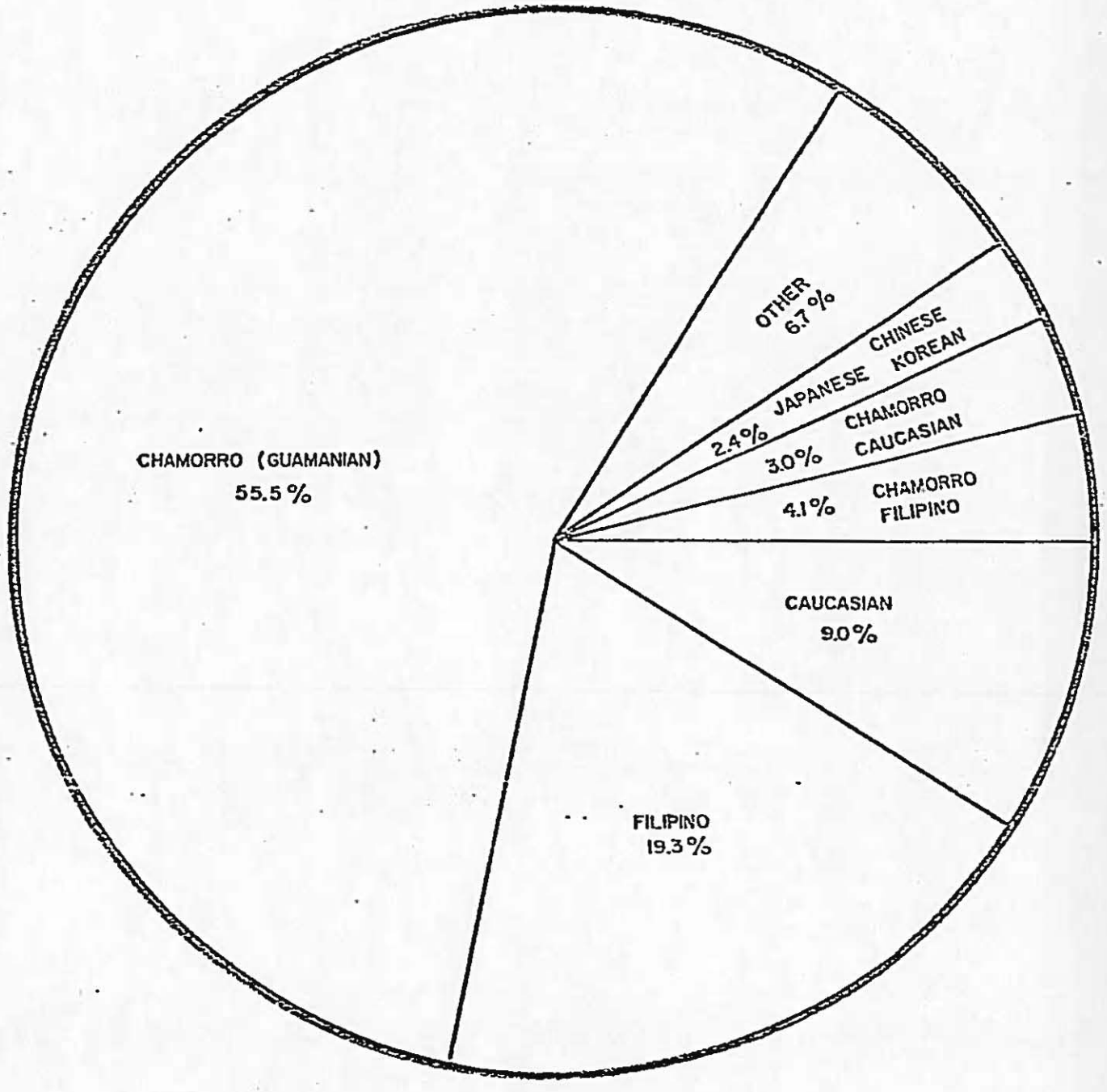
During the 1976-1977 school year, there were 30,991 students enrolled in the island's school system (public and private). 57 percent (17,804) were in elementary level, 23 percent (7,175) in junior high schools, and 20 percent (6,012) in high school. The public school system enrolled 82 percent (27,272) of the total school enrollment in 1976-1977.

H. Population Projection, 1980-1990

The Quinton BudLong Series A population estimates developed for the Governor of Guam and projected yearly from 1970 to 1990 serve as the basis for estimating shifts in the age and

FIGURE III.14

ETHNIC COMPOSITION OF CIVILIAN POPULATION OF GUAM



SOURCE: 1975 BUREAU OF LABOR STATISTICS, GOVERNMENT OF GUAM.

TABLE III. 5

ETHNIC PROFILE OF THE CIVILIAN POPULATION (AS OF SEPTEMBER 1975)

ETHNIC COMPOSITION			AGE DISTRIBUTION OF THREE MAJOR ETHNIC GROUPS			
ETHNICITY	NUMBER	PERCENT OF POPULATION	AGE	ETHNICITY		
				CHAMORRO	FILIPINO	CAUCASIAN
GROUPS	79,800	100.0	ALL AGES	44,300	15,400	7,200
MORRO (GUAM)	44,300	55.	0 - 15	19,700	5,500	2,000
PINO	15,400	19.3	16 - 19	4,300	900	400
CASIAN	7,200	9.0	20 - 24	3,900	1,000	1,000
MORRO-FILIPINO	3,300	4.1	25 - 34	4,700	2,600	1,400
MORRO-CAUCASIAN	2,400	3.01	35 - 44	4,400	1,900	1,100
MORRO-OTHER	1,400	1.8	45 - 54	3,500	2,200	700
ER MIXTURE	2,000	1.8	55 +	3,800	1,300	600
RONESIAN	1,100	1.4	MEDIAN AGE	18.1	25.8	26.1
ANESE	900	1.1				
NESE/KOREAN	1,000	1.3				
ER	800	1.0				

RCE: BUREAU OF LABOR STATISTICS, GOVGUAM 1975

sex distribution of the population for the foreseeable future. This population series has been selected less for the validity of its assumptions than for its comparability to known population levels computed by the U.S. Bureau of Census and Guam's Bureau of Labor Statistics. The population projections for the period 1980-1990 represent a conservative estimate of population increase, based on anticipated immigration levels, economic conditions, and demographic trends.

I. Employment

The number of employees on payrolls as of September, 1977, was 32,600, with 55 percent employed by the private sector, 20 percent by the federal government, and 25 percent by the local government (Table III.8). As of December, 1977, the total unemployment rate was 6.9 percent, with an average duration of 11.5 weeks (Table III.9).

The high percentage of employment in the private sector depicts the continuing growth and development of Guam, especially in the trade and construction industries. However, of the total employees on payrolls in the private sector, over 47 percent are aliens. In construction alone, non-immigrant H 2 workers constitute 74.3 percent of the employees (Table III.10). The low wage scale in the construction industry is a major reason why it has not been able to attract local manpower (Table III.11). However, the U.S. Department of Labor is trying to alleviate this situation by scheduling a series of wage increases in six-month phases which began in September, 1977 and lasting over a two-year period. The wage increase will be comparable with prevailing U.S. Navy Wage Board rates by September 1979. Some of these increases will reach as high as 100 percent more than the existing wage depending upon the employee's current salary and the type of job. (At present, the minimum wage on Guam is $2.90 per hour.)

Of the civilian labor force, teenagers (16 to 18 years) have the highest unemployment rate. Moreover, in the next five years (1978-1983), the Department of Education is projecting that about 6,308 students will be graduating from the public senior high schools, for an average of 1,261 graduates per year (Table III.12). The number of private school graduates, as shown by past data is approximately 13 percent of the total annual graduates from public schools. Unless a majority of these graduates are planning to further their education, the local labor market will not be able to absorb such an increase. The options for these graduates are either to join the ranks of the unemployed, enter the military, or leave the island to seek employment elsewhere.

Female participation in the labor force, especially in the 25 to 34 age group, has escalated from 38.5 percent in 1970 to 61.9 percent in 1977. The need to supplement the family's income due to the high cost of living, in part, has increased

TABLE III.6

PROJECTED POPULATION BY AGE GROUP AND PERCENTAGE DISRIBIUTION ON GUAM, 1975-1990

AGE GROUP	TOTAL CIVILIAN POPULATION				PERCENTAGE OF POPULATION			
	1975	1980	1985	1990	1975	1980	1985	1990
0-4	10,277	17,358	19,787	22,113	12.90	19.30	18.70	18.00
5-9	10,617	14,110	16,751	19,094	13.30	15.70	15.80	15.50
10-14	11,894	8,554	14,067	16,700	14.90	9.50	13.30	13.60
15-19	8,940	8,836	8,435	13,870	11.20	9.80	8.00	11.30
20-24	6,785	7,559	8,712	8,316	8.50	8.40	8.20	6.80
25 29	5,987	5,883	7,454	8,590	7.50	6.50	7.10	7.0(
30 34	3,911	7,345	5,730	7,260	4.90	8.20	5.40	5.9(
35 39	3,991	4,455	7,154	5,581	5.00	5.00	6.80	4.5(
40-44	4,071	4,285	4,340	6,968	5.10	4.80	4.10	5.7(
45-49	4,071	3,554	3,925	3,976	5.10	4.00	3.70	3.2(
50-54	3,033	2,905	3,256	3,595	3.80	3.20	3.10	2.9(
55-59	2,235	2,096	2,661	2,982	2.80	2.30	2.50	2.4(
60-64	1,596	1,085	1,459	1,852	2.00	1.20	1.40	1.5(
65-+	2,396	1,913	1,975	2,260	3.00	2.1	1.90	1.8(
TOTAL	79,824	89,938	105,706	123,157	100.00	100.00	100.00	100.0(

SOURCE: 1975, BUREAU OF LABOR STATISTICS, GOVERNMENT OF GUAM.
1980-99, QUINTON-BUDLONG.

TABLE III.7

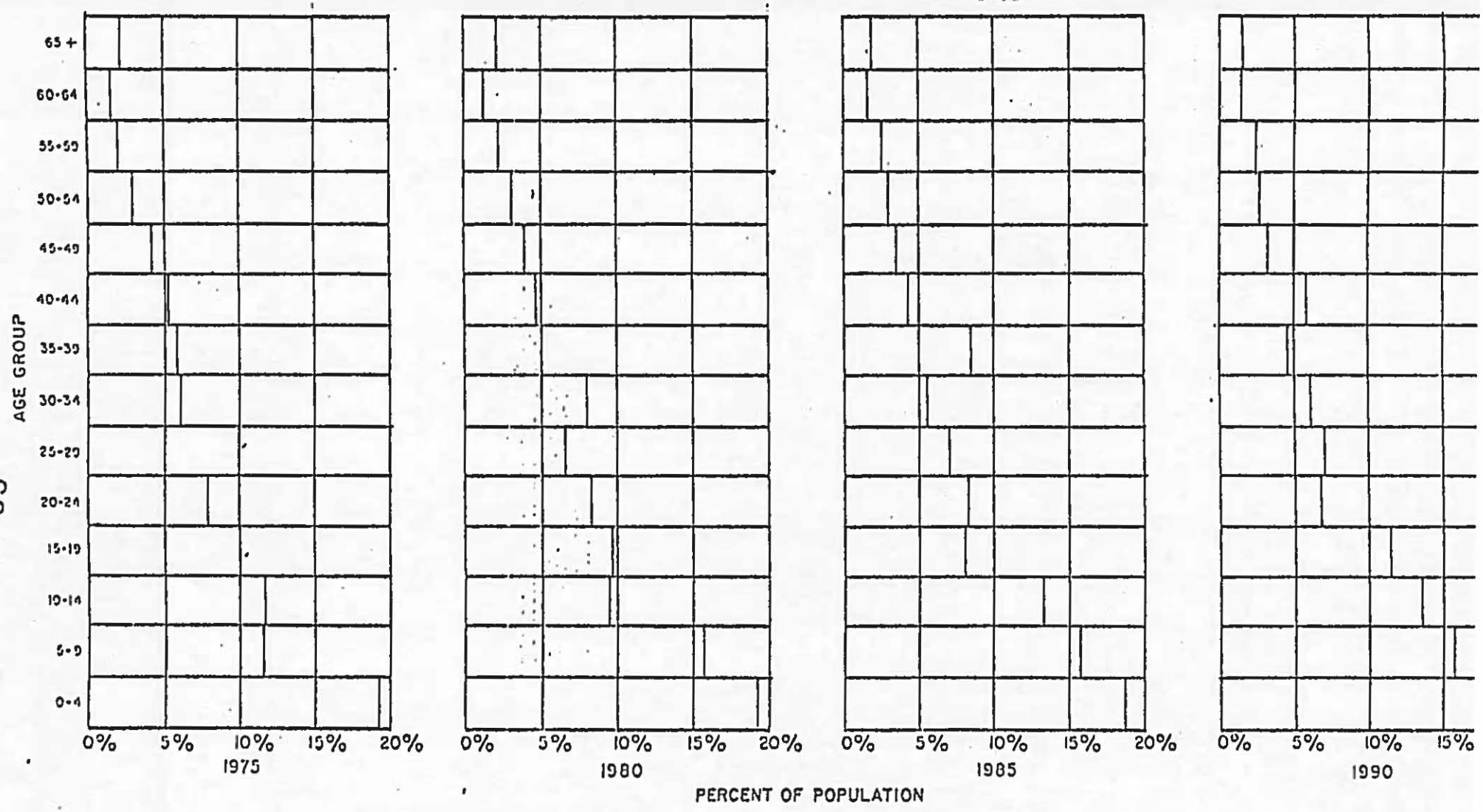
PROJECTED POPULATION BY SEX AND AGE GROUP
15-44 ON GUAM, 1975-90

AGE GROUP	1975			1980			1985			1990		
	MALE	FEMALE	SEX RATIO	MALE	FEMALE	SEX RATIO	MALE	FEMALE	SEX RATIO	MALE	FEMALE	SEX RATIO
15–19	4,381	4,559	49:51	4,548	4,288	51:49	4,323	4,112	51:49	7,101	6,769	51:4
20–24	3,325	3,460	49:51	3,887	3,672	51:49	4,484	4,228	51:49	4,262	4,054	51:4
25–29	2,934	3,053	49:51	2,985	2,898	50:50	3,833	3,621	51:49	4,421	4,169	51:4
30–34	1,916	1,995	48:51	4,108	3,237	56:44	2,907	2,823	50:50	3,733	3,527	51:4
35–39	1,956	2,035	49:51	2,398	2,057	54:46	4,001	3,153	56:44	2,831	2,750	51:4
40–44	1,995	2,076	49:51	2,376	1,909	55:45	2,336	2,004	54:46	3,897	3,071	56:4
TOTAL	16,507	17,178	49:51	20,302	18,051	53:47	21,884	19,941	52:48	26,245	24,340	52:4

NOTE: SEX RATIO PER 100 IN AGE GROUP.

SOURCE: 1975, BUREAU OF LABOR STATISTICS, GOVERNMENT OF GUAM.
1980-99, QUINTON-BUDLONG.

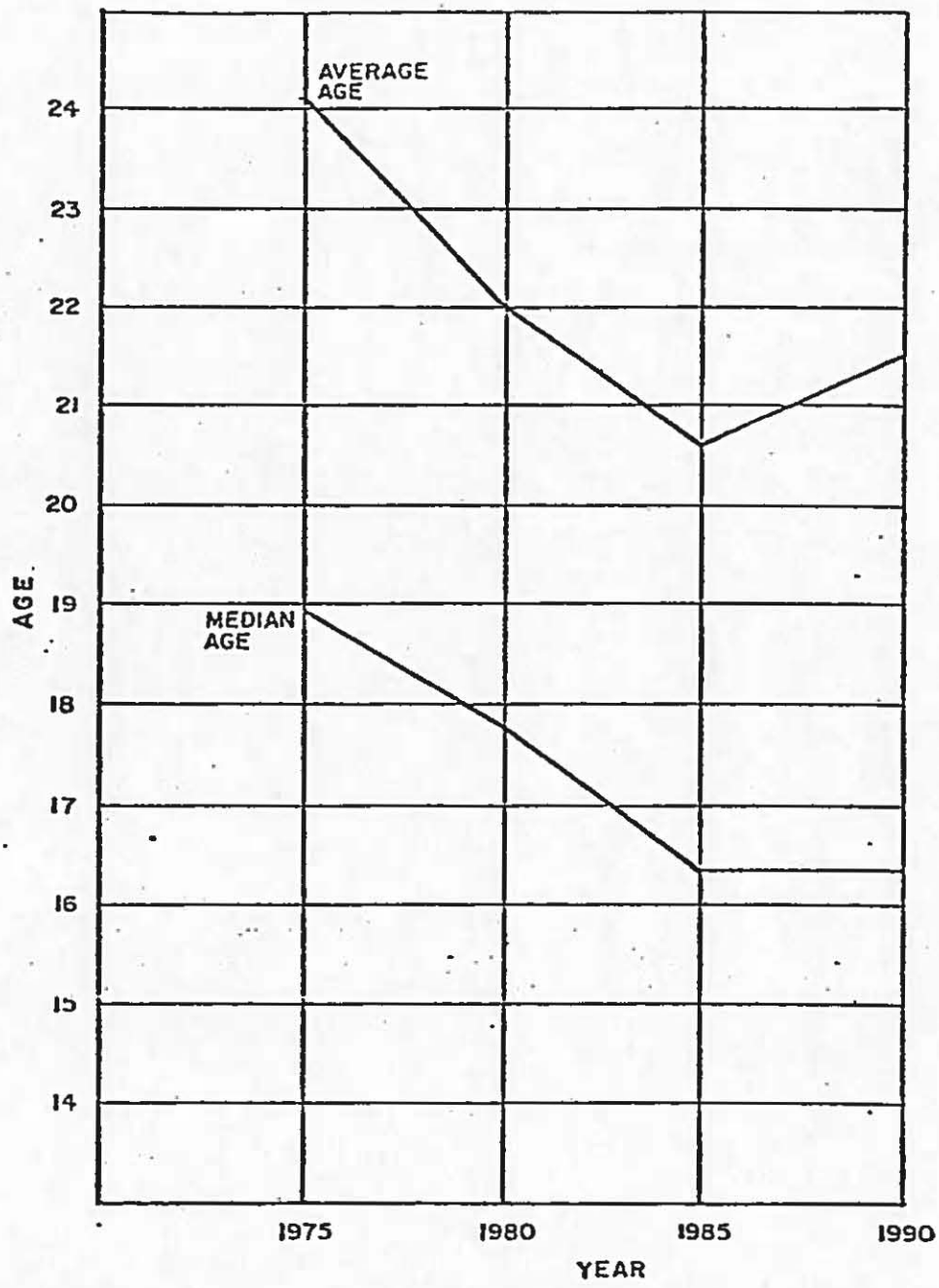
PERCENT DISTRIBUTION OF PROJECTED POPULATION ON GUAM BY AGE GROUP



SOURCES: 1975, BUREAU OF LABOR STATISTICS, GOVERNMENT OF GUAM.
1980-1990, QUINTON-BUDLONG.

FIGURE III.16

PROJECTIONS FOR MEDIAN AND AVERAGE AGE OF POULATIONS ON GUAM, 1975-1990



SOURCE: 1975, BUREAU OF LABOR STATISTICS, GOVERNMENT OF GUAM.
1980-1990, QUINTON-BUDLONG.

TABLE III.8

EMPLOYEES ON PAYROLLS ON GUAM, BY INDUSTRY 1971 — 1977

INDUSTRY DIVISION	NUMBER (IN THOUSANDS) 71 SEPT.	72 SEPT.	73 SEPT.	74 SEPT.	75 SEPT.	76 SEPT.	77 SEPT.
TOTAL	26.8	30.4	38.0	37.0	33.8	29.5	32.6
TOTAL PRIVATE	14.3	17.0	22.6	21.1	18.4	15.6	18.0
FEDERAL	5.9	6.1	7.4	7.2	6.2	6.4	6.5
TERRITORIAL	6.6	7.3	8.0	8.7	9.2	7.5	8.1

SOURCE: BUREAU OF LABOR STATISTICS, DEPARTMENT OF LABOR, GOVERNMENT OF GUAM

TABLE III.9

HIGHLIGHTS OF THE EMPLOYMENT AND UNEMPLOYMENT SITUATION ON GUAM - 9/75 to 12/77

	SEPT. 1975	SEPT. 1976	DEC. 1977
CIVILIAN LABOR FORCE	28,090	26,910	28,420
TOTAL EMPLOYMENT	25,390	24,600	26,460
TOTAL UNEMPLOYMENT	2,700	2,320	1,960
UNEMPLOYMENT RATES (% OF LABOR FORCE)	9.6	8.6	6.9
AVERAGE DURATION OF UNEMPLOYMENT (WEEKS)	6.7	7.1	11.5

OTE: SUM OF INDIVIDUAL ITEMS MAY NOT EQUAL TOTALS DUE TO ROUNDING. DATA ON UNEMPLOYMENT AND LABOR FORCE DOES NOT INCLUDE NON-IMMIGRANT ALIENS.

OURCE: BUREAU OF LABOR STATISTICS, DEPARTMENT OF LABOR, GOVERNMENT OF GUAM

EMPLOYEES ON PAYROLLS ON GUAM BY INDUSTRY AND CITIZENSHIP STATUS: MARCH 1977

INDUSTRY[1]	NUMBER				PERCENT DISTRIBUTION[2]			
	Total	U.S. Citizen	ALIEN Immigrant	ALIEN non-Immig't	Total	U.S. Citizen	ALIEN Immigrant	ALIEN non-Immig't
ALL INDUSTRIES	30,815	21,851	5,027	3,938	100.0%	70.9%	16.3%	12.8%
PRIVATE SECTOR	16,901	8,926	4,076	3,899	100.0	52.8	24.1	23.1
AGRICULTURE AND FISHERIES	147	38	15	94	100.0	25.9	10.2	63.9
CONSTRUCTION	4,019	563	470	2,986	100.0	14.0	11.7	74.3
MANUFACTURING	977	591	313	73	100.0	60.5	32.0	7.5
TRANSPORTATION & PUBLIC UTILITIES	1,476	1,147	198	131	100.0	77.7	13.4	8.9
TRADE	5,411	3,296	1,893	222	100.0	60.9	35.0	4.1
FINANCE, INSURANCE, REAL ESTATE	1,268	947	273	48	100.0	74.7	21.5	3.8
SERVICES	3,603	2,344	914	345	100.0	65.1	28.6	39.3
PUBLIC SECTOR	13,915	12,925	951	39	100.0	92.9	6.8	0.3
FEDERAL GOVERNMENT	6,318	5,646	656	16	100.0	89.4	10.4	0.3
LOCAL GOVERNMENT	7,597	7,279	295	23	100.0	95.8	3.9	0.3

NDARD INDUSTRIAL CLASSIFICATION MANUAL. 1967 EDITION.
CAUSE OF ROUNDING. SUMS OF INDIVIDUAL ITEMS MAY NOT EQUAL TOTALS.
E: SUMS OF INDIVIDUAL ITEMS MAY NOT ADD TO TOTALS BECAUSE NOT ALL INDUSTRIES ARE SHWON SEPARATELY.
RCE: BUREAU OF LABOR STATISTICS, DEPARTMENT OF LABOR, GOVERNMENT OF GUAM.

TABLE III. 11

COMPARATIVE LISTING OF WAGES IN GOVGUAM VS PRIVATE SECTOR *

TITLE	PRIVATE SECTOR	GOVGUAM	DIFFERENCE
)UNTANT	$3.96	$4.82	$0.86
) MECHANIC	2.76	4.04	1.28
INISTRATIVE SECRETARY	3.30	5.64	2.34
RK	2.30	3.58	1.28
PENTER	3.04	3.93	0.89
PENTER FOREMAN	3.33	4.68	1.35
STRUCTION WORKER	2.30	3.10	0.80
TROLLER	6.00	6.87	0.87
TODIAN	2.30	3.32	1.02
TAL ASSISTANT	2.65	3.93	1.28
EL MECHANIC (HELPER)		3.68	
STRICIAN	3.22	4.05	0.83
STRICIAN FOREMAN	3.52	4.82	1.30
INEERING AIDE	3.64	4.15	0.51
M WORKER	2.30	3.84	1.54
VY EQUIPMENT OPERATOR	3.24	3.87	0.63
SEKEEPER	2.50	3.17	0.67
HINIST	3.36	4.05	0.69
NTENANCE MAN	2.50	4.39	1.89
TER	2.94	4.27	1.33
FITTER	3.20	4.05	0.85
MBER	3.20	4.05	0.85
VEY AIDE	2.58	3.58	1.00
RETARY	2.30	3.66	1.36
DER	3.16	4.05	0.89

/AGES GIVEN IN EARNINGS PER HOUR.

RCE: PRIVATE SECTOR: GUAM INVENTORY OF JOB OPENINGS, DECEMBER 1976.
GOVERNMENT OF GUAM: GOVERNMENT OF GUAM CLASS LIST AND PAY RANGE SCHEDULE, JANUARY 21, 1975.

TABLE III. 12

ENROLLMENT PROJECTIONS BY GRADE LEVELS

	SENIOR HIGH SCHOOLS									
	ACTUAL		PROJECTED							
	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-
	2,085	2,220	2,085	2,007	1,924	2,007	1,917	1,890	1,993	1,96(
	1,761	1,715	1,776	1,668	1,605	1,539	1,605	1,534	1,512	1,59-
	1,285	1,307	1,320	1,367	1,284	1,236	1,185	1,236	1,181	1,164
	5,131	5,242	5,181	5,042	4,813	4,782	4,707	4,660	4,686	4,718

: STATISTICAL SERVICES UNIT, DIVISION OF CURRICULUM & INSTRUCTION, DEPARTMENT OF EDUCATION, 1976

the labor force participation rate among women.

J. Income

Personal and family income on Guam are substantially less than the U.S. average. In 1976, the mean family income totalled $14,411 on Guam compared with $16,870 in the U.S., 15 percent less than in the U.S. Over 11 percent of the families on Guam have an income of under $3,000 (Table III.13). Based on the poverty index for the U.S., developed by the U.S. Office of Economic Opportunity, about 25 percent of Guam's families with seven members or less were below the poverty level (Table III.14). Meanwhile, the price of consumer goods and services has increased on Guam by 7.1 percent, 1.4 percent and 5.3 percent in 1975, 1976, and 1977, respectively (Table III.15). Guam's inflation rate, in part, is externally generated, because most commodities are imported. Presently, the purchasing power of the consumer dollar is $0.66 (1st quarter, FY-73 = $1.00) according to Guam's Consumer Price Index.

K. Health Insurance Coverage

In 1977, approximately 45 percent of Guam's population was covered by employer subsidized, prepaid health insurance and it is estimated that by 1990 only 48 percent of the population will be covered. Those that are covered are primarily Government of Guam employees, federal employees, and a few of the larger commercial corporation employees. For the most part, few of the employees in the private sector are covered.

It is roughly estimated that 60 percent of the businesses in the private sector offer some type of health insurance plan to their employees. The type of health plan varies with the business as does the amount the employer and employee contribute; in some cases the employer pays none, half, or all, with the employee paying the difference to cover his family. The cost of the health plan also varies with the total number of employees to be covered; the fewer the employees, the higher the cost of the insurance. Individuals with low incomes are the least likely to participate in health insurance plans, because a larger percent of their disposable income will go to paying the premium. Currently, of the three programs which have negotiated for health care coverage of Government of Guam employees, the lowest premium available for a Class II employee (one or more dependents) is $775.44 a year. Of this total, the Government of Guam contributes $138.48 and the employee pays $636.96 yearly (Table III.16). These premiums have been established as a group package to lower the costs. For an individual to acquire health insurance with one or more dependents outside of the group package, it would cost over $183.00 monthly or $2,200 yearly.

L. Lifestyle and Social Change

TABLE III.15

FAMILIES ON GUAM BY MONEY INCOME LEVEL
1976

INCOME LEVEL	NUMBER OF FAMILIES 1/	PER CENT
UNDER $3,000	1,700	11.3
$3,000-$4,999	1,000	6.8
$5,000-$6,999	1,000	6.6
$7,000-$10,999	3,300	21.6
$11,000-$14,999	2,100	13.8
$15,000-$19,999	2,600	17.0
$20,000-$29,999	2,200	14.5
$30,000 AND OVER	1,300	8.4
TOTAL	15,400	100.0
MEDIAN FAMILY INCOME 2	$11,961	($14,958-U.S.)
MEAN FAMILY INCOME 2	$14,411	($16,870-U.S.)

1/ EXCLUDES NON-RESIDENT ALIEN FAMILIES, AND FAMILIES LIVING ON MILITARY BASES.

2 UNWEIGHTED AVERAGE.

SOURCE: BUREAU OF LABOR STATISTICS, DEPARTMENT OF LABOR, GOVERNMENT OF GUAM. STATISTICAL ABSTRACT OF THE U.S., 1977, U.S. DEPARTMENT OF COMMERCE, BUREAU OF THE CENSUS.

TABLE III.14

NUMBER AND PERCENT OF FAMILIES
BELOW POVERTY LEVEL BY FAMILY SIZE
1975

FAMILY SIZE	ALL FAMILIES[1]	FAMILIES BELOW POVERTY LEVEL	
		NUMBER	PERCENT OF ALL FAMILIES
TOTAL	16,560	4,140	25.0
2	2,510	570	22.7
3	2,640	500	189
4	3,100	600	19.4
5	2,290	660	28.8
6	1,900	530	27.9
7	1,320	350	26.5
8	1,170	360	30.8
9	530	170	32.1
10+	1,000	400	36.4

[1] EXCLUDES NON-RESIDENT ALIEN FAMILIES AND FAMILIES LIVING ON MILITARY BASES.

SOURCE: NEWS, GUAM DEPARTMENT OF LABOR, AUGUST 30.1975

TABLE III.15

GUAM CONSUMER PRICE INDEX
SEPTEMBER 1972 = 100)

	1974	1975	1976	1977
ALL ITEMS	130.0	139.2	141.1	148.6
FOOD	141.3	152.2	157.3	163.8
HOUSING	126.9	132.4	131.7	141.3
APPAREL & UPKEEP	107.4	133.2	141.1	152.0
TRANSPORTATION	131.2	139.6	140.6	148.7
HEALTH & REC.	121.0	127.7	128.3	132.2

SOURCE: COST OF LIVING OFFICE, ECONOMIC RESEARCH CENTER, DEPARTMENT OF COMMERCE, GOVERNMENT OF GUAM

Guam is an island with a rich, cultural heritage. Many of the traditional values, beliefs and practices which were carried over from the ancient Chamorros and the Spanish impact continue to play an important role in the lifestyle of the island's residents, despite strong influences from other cultures now represented on Guam. Since the American annexation of Guam, rapid economic and technological changes have been sweeping the island, and, as a consequence, many of the traditional attitudes and values have combined or clashed with modern U.S. values.

The blending of traditional Guamanian and modern American values often results in value conflicts which may contribute to the increase and prevalence of stress and mental illness. Personal insecurity, especially among the younger generation, and cultural value conflicts are causing family cohesiveness to deteriorate. Value conflicts are encouraged through institutions which teach the importance of individualism, self-determination and competitiveness as prerequisites for "getting ahead" in life; while other more traditional in stitutions place more importance on family ties and mutual cooperation.

Prior to American annexation, very few Guamanians participated in a wage-based economy, but instead relied upon subsistence farming for their livelihood. Residents primarily depended on locally grown fruits and vegetables, meat and fish for their food. This subsistence pattern changed drastically after World War II when rapid technological and economic changes altered island lifestyles and more residents began to participate in a wage-based economy. Rather than depending upon locally produced foods, residents grew increasingly dependent upon imported, processed foods, many of which contained sugar. This change in diet has had a significant impact on the nutritional status and the prevalence of nutrition-related diseases among island residents.

Due to the influence of the Spanish missionaries, the island residents are predominately Catholic, and, although many of the younger residents are not as devout as their parents, the Catholic church continues to influence the island's lifestyle. The combination of the Catholic church's stand on birth control and the importance of the family have significant implications for the effectiveness of family planning programs.

One of the most noticeable changes in the island's lifestyle is its housing patterns. This change affects the physiological and psychological health of the island's residents. Influenced partly by American values, residential subdivisions and apartments are replacing the traditional housing patterns in which extended families lived with or near each other in housing clusters. Although the majority continues to live in single family dwellings, the number of apartment dwellers is growing. In 1976, there were 21,026 residential dwellings on

Guam, of which 6,620 were multi-family units. The change in housing patterns has been brought about by a combination of physical, economic and social factors, the major ones being the cost of building a home, the cost of purchasing land, subdivision regulations, inadequate infrastructure, and value changes. Increasingly, young adults and newly married couples are moving into apartments and residential subdivisions for the same reasons as those on the mainland. As a direct result of this change, the cohesiveness of the family is deteriorating. This deterioration has been created because extended family members can no longer promote and transmit values by constant intergenerational contact.

Another major change is the architectural style of homes. Although some families continue to live in homes constructed of wood and metal, the majority lives in typhoon-proof concrete homes. In 1971 and 1976 assessments of the housing stock, it was found that the number of dwellings considered to be in good condition rose from 4,361 (33 percent) to 11,515 (55 percent) and that the number of dwellings in fair condition also rose from 2,131 (16 percent) to 5,292 (25 percent), while the number of dwellings in a dilapidated condition decreased from 6,710 (51 percent) to 4,216 (20 percent). (However, it should be noted that this assessment is based primarily upon the home's susceptibility to typhoon damage and less upon the actual condition of the structure.) This change in housing has had favorable impacts upon the island's health status because less residents fear losing their homes, household goods and their lives during typhoons. In effect, post-disaster trauma regarding personal losses and their replacement has been reduced substantially.

M. Transportation

Guam's transportation links to the world are aircrafts and ships. Unlike the continental U.S., Guam's off-island transportation is affected by the Jones Act which prohibits foreign ships or planes from travelling between two U.S. ports. It should be noted that American Samoa and the Virgin Islands are exempt from many of the provisions of this act. Exceptions can be made on a case by case basis. For example, foreign airline companies with routes to the U.S. can apply on a yearly basis for permission to refuel on Guam. If granted, the plane can land only to refuel, and passengers may not disembark or depart on these flights.

1. Air Transportation

The island is dependent upon airline carriers for transporting individuals, although some cargo is also flown in. (The cargo plane which comes in weekly usually carries only perishable goods.) Guam is serviced by two foreign airline carriers, Air Nauru and Japan Airlines, which bring tourists to the island daily; and two domestic

carriers, Pan American Airways, which has a daily flight to and from Hawaii, and Continental Air Micronesia, which has a flight to and from Hawaii three times a week. The island also has several smaller domestic airline companies which service the Northern Marianas and Micronesia. Guam is a refueling stop for several foreign airline companies which have flights to and from the mainland. The Jones Act prevents passengers from disembarking or departing on these flights.

Recently, the Civil Aeronautics Board (CAB) granted air flights to another domestic airline company, North Western to service Guam and the Pacificand granted Continental permission to increase its flights to and from Hawaii. The CAB also granted rate reductions to all domestic international carriers servicing Guam. The full implications of the CAB rulings are not known at this time.

Guam's dependence upon international flights, foreign and domestic, makes the island vulnerable to the economic and political powers of airline companies and their related unions and to manmade disasters. First, as technology advances, planes may no longer have to stop on Guam to refuel. If this should happen, it would be difficult for people to enter or leave, and Guam could lose its status as a trade center in the Pacific. Secondly, there is the threat of a massive air crash. Due to the location of the Guam International Airport, an air crash would not only affect the plane's occupants but also individuals living or working in areas surrounding the airport. Lastly, a domestic airline strike could restrict travel to and from Hawaii and the mainland. Depending upon the scale of the strike, all air travel could come to a halt. However, if this should occur, the military will transport civilians in need of emergency off-island medical treatment.

2. Water Transportation:

Guam has a well protected, deepwater harbor which facilitates shipping. Due to the prohibitive cost of air freight, most of the island's commodities are imported by ship, including 90 percent of the island's food supplies. In 1977, 744 ships came to Guam, of which 134 originated in the U.S. Guam is serviced by two major domestic shipping lines, the United States Lines which carries almost two-thirds of the cargo with a ship coming in at least once a week, and Matson Navigation Company which also has a weekly ship. In comparison to domestic shipping lines, there are far more foreign lines, which are too numerous to list. However, the Daiwa Line, originating from Japan, is one of the primary foreign shipping lines servicing Guam. In 1977, 423 ships originating from foreign ports came to Guam. There are also numerous, smaller inter-island cargo vessles and fishing boats

which enter Guam's port. In 1977, 187 inter-island fishing and cargo boats entered Apra Harbor.

Apra Harbor has a wharf for Navy ammuniton ships. The ammunition handling activities at the harbor can endanger thousands of lives and the economy of Guam should an explosion occur. Located within the two mile radius danger zone are the Commercial Port facilities, Cabras Island Industrial Park (accommodating Mobil/Esso facilities, Guam Oil Refinery fuel pier, Kaiser Cement Company, and a feed mill), the Navy Ship Repair Facility, Navy family housing, fuel piers, a power barge, and other civilian and Navy facilities. Since waivers have been granted to handle ships with explosive cargo up to nine million pounds net explosive weight instead of the unwaivered capacity of 100,000 pounds, an explosion of this magnitude within the area will substantially and adversely affect the island.

Site selection problems, deletion of 43 million dollars earmarked for the construction of the wharf from the 1980 Defense Budget, and the agreement signed in 1966 by Governor Manuel Guerrero exempting the federal government for any damage caused by an explosion at the wharf have resulted in relocation delays. However, it is critical that the Navy relocate its ammunition wharf to ensure the safety of those within the area and to allow for expansion of civilian facilities.

Although most of the ships coming to Guam carry commodities, passenger ships also come into Guam's port. The passenger ships, which originated either in Japan or Australia, brought 6,100 tourists to Guam in 1977. However, this is small in comparison to the 234,367 individuals were brought in by air.

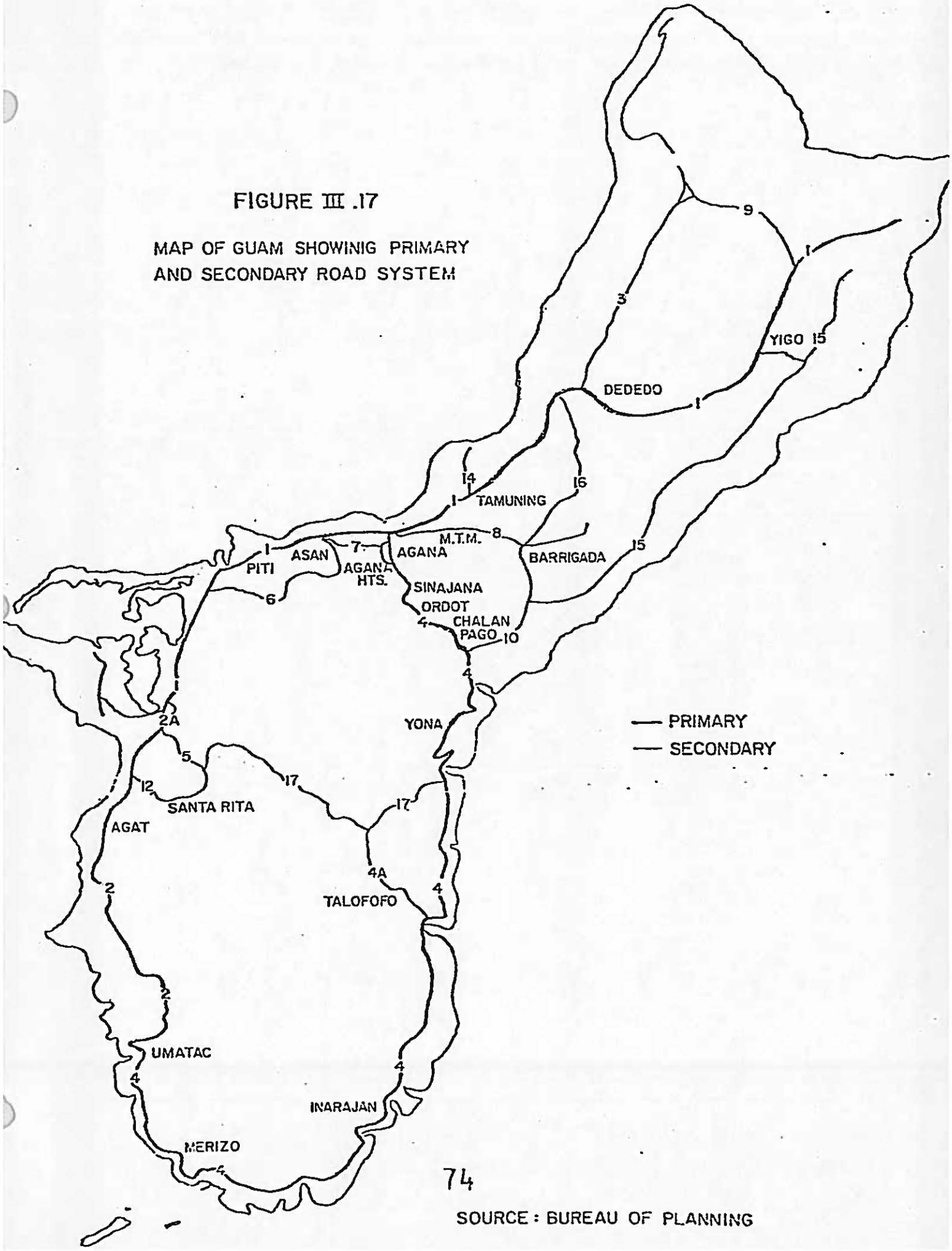
For the most part, shipping has very little effect upon the island's health status unless there is a domestic shipping or dock strike. Most of Guam's imported food is shipped from the United States due to federal food and drug regulations. As a provision against a shipping strike, most food distributors maintain food supplies for at least thirty days. In the case of prolonged strikes, food can be flown in by domestic airlines. The major impacts would be less variety and a higher cost for food due to the cost of air freight.

3. Ground Transportation:

Guam has 256 miles of road, most of which are primary and secondary highways originally constructed by the military shortly after World War II (Figure III.17). The traffic handling capacity of the road system is often inadequate; in many cases, there are few or no alternative routes

FIGURE III .17

MAP OF GUAM SHOWINIG PRIMARY AND SECONDARY ROAD SYSTEM



SOURCE : BUREAU OF PLANNING

between one village and another.

There are five classifications of roads on Guam, which are these:

(a) Trunk Highways: There are 38 miles of road which connect the major centers of population and major traffic generators and carry large volumes of traffic for relatively long distances. Volumes are greater than 20,000 vehicles per day.

(b) Major Highways: There are 18 miles of road which connect major population centers and traffic generators to small population centers, and carry moderately high volumes of traffic over relatively long distances. Volumes usually reach or are greater than 10,000 vehicles per day.

(c) Minor Highways: There are 56 miles of road which connect smaller communities and lesser traffic generators to higher volume highways. Unlike the higher classification highways, minor highways also provide access to adjacent land. Volumes are generally less than 10,000 vehicles per day.

(d) Collector Roads: There are 24 miles of road which funnel traffic to the higher order highways from surrounding land uses such as residential areas, industrial areas and institutional areas. Volumes are generally equal to or greater than 3,000 vehicles per day.

(e) Local Roads: There are 103 miles of paved roads and 17 miles of unpaved roads. Primarily, they provide access to abutting residential land, both in urban and rural areas. Volume is generally less than 3,000 vehicles per day.

Although roads are being widened and resurfaced, much of the road system is currently in poor physical condition. Many of the roads exhibit frequent surface and foundation failures or have inadequate drainage and shoulders. There are also very few guard rails in those areas needing them. In rainy weather the roads are very slippery due to the coral content in the materials used. There are no pedestrian walks or paths and no separate bike lanes. Compared to Hawaii, which has 134 registered vehicles per mile of road, Guam has 260 vehicles per mile of road. As a result of these and other factors, Guam has a high rate of motor vehicle-related accidents. In 1976 alone, Guam had a total of 4,222 reported accidents, of which 54 involved pedestrians, 670 resulted in injuries, and 20 resulted in fatalities.

Locally, Guam's major form of transportation is the personal automobile. Although there are a few privately-owned taxi cabs, there is no mass transit or handibus system to meet the needs of those who do not have a license or car or of those who are disabled, aged or poor. In the summer of 1975, a mass transportation experimental system was operated on a limited, trial basis, but failed due to lack of ridership. This failure may have been due to the brevity of the trial period (three months) and the fact that most residents on Guam, as elsewhere, enjoy the convenience and sense of independence provided by the personal automobile.

Limited transportation services are available to the aged and the disabled. Servicio Para I Manamko, a private, non-profit organization, provides transportation to senior citizens who need to go grocery shopping or are in need of non-emergency medical treatment. However, since the agency does not have a tommy lift, the transportation needs of those in wheelchairs are not met. The Department of Vocational Rehabilitation provides medically related transportation to its clients only under extenuating circumstances; once again, those in wheelchairs are excluded.

N. Communications

Guam's telephone system is inadequate. Existing cables in most areas of Guam are severely congested, which limits the number of telephones that can be installed. Presently, there are 11,815 telephone subscribers, which is less than 50 percent of the projected 25,000 which would subscribe. Furthermore, due to the congestion, the efficiency with which one party can reach another is often severely impeded. The problems of the telephone system can be attributed to several factors, the primary one being its almost complete destruction by Typhoon Pamela in 1976. Since that time, reconstruction of the system has been underway. The Guam Telephone Authority is currently installing underground cables as well as a cross-island microwave system. It is expected that by mid-1979, the new system will be comparable to those on the mainland and will be able to handle all requests for phones. Until that time, the present phone system could have an impact upon a resident's accessibility to emergency help. The call for help could be delayed because the individual can not obtain an open line, does not have a phone or has an inoperative phone.

The island's forms of communication are not limited solely to local telephones. Radio Corporation of America's Global Communications, Inc. (RCA) provides overseas telephone and radio dispatch services; American Telephone and Telegraph (ATT), through its Trans-Pacific cable provides telex and data communication circuits; and Western Union International provides telegram service.

In the event of a disaster, an emergency communication system has been developed and is operational. This system includes the procedures by which information is disseminated from the Office of Civil Defense, the military and local government officials to the general public through radio and television. A separate telephone system is to be utilized by officials, and an auxiliary switchboard telephone system will provide support in case of a general power failure or damage to the main telephone exchanges. This system will be used as the primary mode of communication prior to the disaster and during restoration. A two-way radio system has also been developed and is the primary mode of communication during and immediately following the disaster.

O. The Federal-Territorial Relationship And Its Impact On Health Care

Guam is an unincorporated territory of the United States. This means that

1. There is no federal commitment toward Guam becoming a state of the Union.
2. Only certain sections of the U.S. Constitution and certain federal laws apply to Guam.
3. Although control over internal affairs is vested in the executive, legislative, and judicial branches of the Government of Guam, as provided by the Organic Act of 1950, external matters including international relations are controlled by the U.S. Congress.
4. Since the local government derives its powers from the U.S. Congress, any or all powers can be taken away.

Despite the disadvantages, Guam's relationship with the U.S. has produced many benefits for island residents. With respect to health care, federal assistance in purchasing the Medical Center of the Marianas will further improve our capability to provide effective hospital-based health services. The island's participation in nutrition, mental health, and other federal health related programs provides much needed assistance, given our limited resources and expanding needs. The existence of military health care facilities, services and manpower increases local capabilities, particularly in times of emergency.

On the other hand, the nature of Guam's political status has had certain adverse impacts on the health care delivery system. Although many improvements have been achieved through federal initiative, some potential improvements are hindered by the island's inability to utilize specialized services offered by foreign nations and organizations in proximity to Guam. Moreover, federal control over international relations hampers the local government in pursuing a regional approach toward the delivery and utilization of health care, in coordination with other Western Pacific islands, particularly those in the Commonwealth of the Northern Marianas. Finally, the lack of opportunities for participation in federal policy-making concerning immigration affecting Guam has contributed to the rapid growth of the population to be served by the health care

system.

Future political status discussions will affect the delivery of health care. Although in a recent referendum, Guam voters indicated their desire for closer ties with the U.S., the impacts of this status are difficult to assess, since a precise definition of "closer ties" has not been developed. The proposed Guam constitution, if passed, will have a definite impact on health care, since it guarantees adequate health care for all residents regardless of cost.

P. Governmental Organization and Health Related Expenditures

The overall structure of the Government of Guam, which is patterned after most state governments in the U.S., consists of the legislative, executive, and judicial branches. The majority of health related services and programs are provided by the Department of Public Health and Social Services and the Guam Memorial Hopital which fall under the executive branch of the Government of Guam (Figure III.18).

The principal revenue sources of the Government of Guam are taxes and federal grants. The Government of Guam currently maintains a number of funds, the most important of which is the General Fund, which provides for the ordinary operations of government. Except for specifically allocated types of taxes, most taxes, such as income, gross receipts, and real property, are placed into the General Fund. Legislative approval is required for any disbursements from this fund. In Fiscal Year 1977, General Fund revenues totaled $117,459,000, 12 percent of which were expended on programs within the Department of Public Health and Social Services. This figure, though, is not representative of total expenditures for health here on the island. For Fiscal Year 1977, approximately $19.3 million, in federal funds were expended on health related programs and projects (Table III.17). Combining federal fund and General Fund expenditures, at least $34.3 million were spent for health care in Fiscal Year 1977; this is a minimum figure, since local expenditures for Guam Memorial Hospital and other health related agencies and the local government's contribution to prepaid health plans are not included.

Q. Unique Characteristics of the Territory

Reference should be made to the unique characteristics of the Territory which affect its health care delivery system. These can be summarized as follows:

1. Advantages:

- The small size of the island is an advantage, since it assures that approximately 93 percent of the population of the Territory reside within 30 to 45 minutes of a site providing a full range of primary care service.;

ORGANIZATIONAL CHART
FISCAL YEAR 1979

Figure III.18

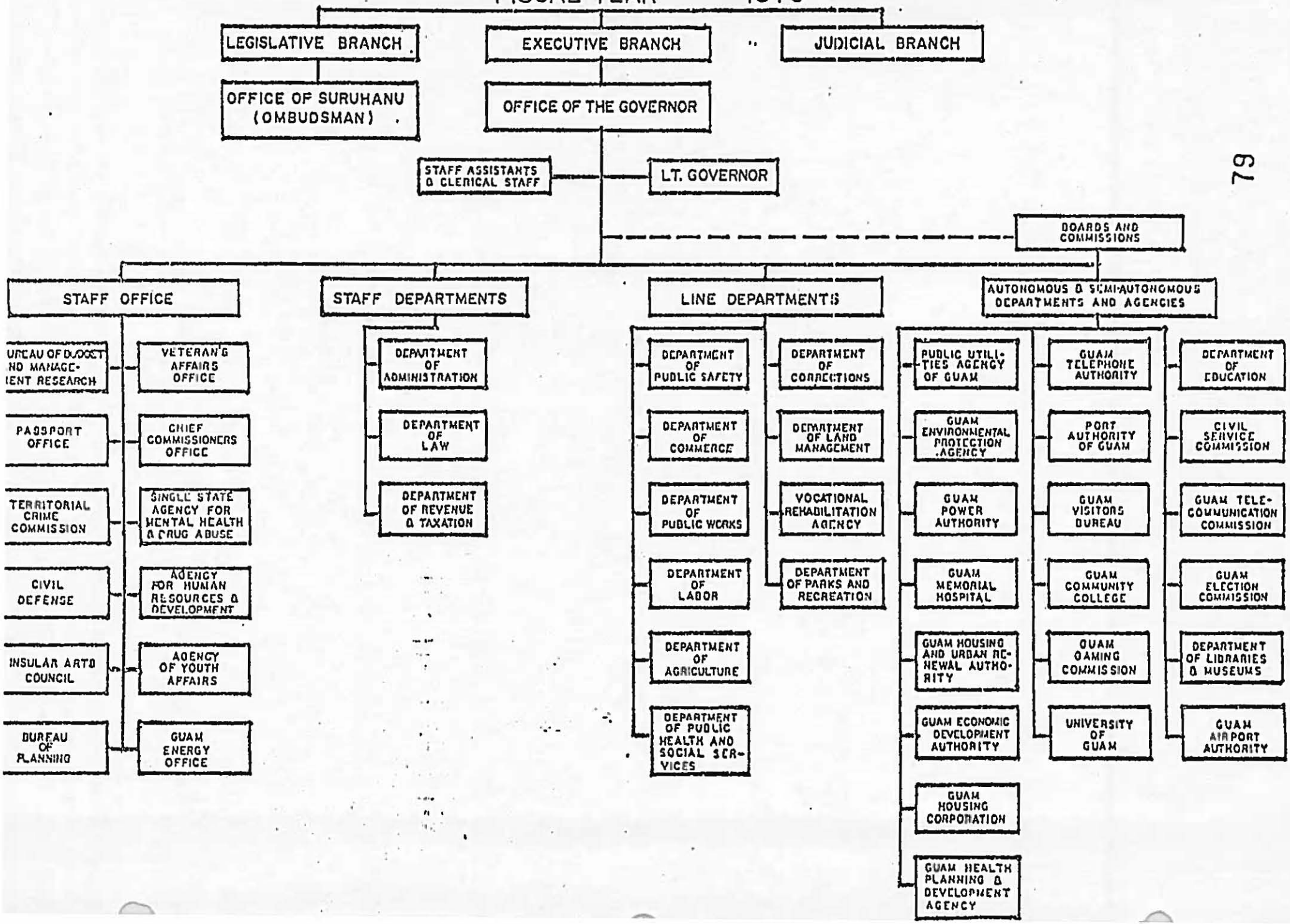


TABLE III.17

GEOGRAPHIC DISTRIBUTION OF FEDERAL FUNDS IN TERRITORIES AND OTHER AREAS ADMINISTERED BY THE U.S.

	FY 1977 FEDERAL FUNDS (DOLLAR AMOUNTS IN THOUSAND
DEPARTMENT OF AGRICULTURE	
FOOD STAMP BONUS COUPONS, FNS	$ 9,795
NATIONAL SCHOOL LUNCH PROGRAM-CASH, FNS	1,152
SCHOOL BREAKFAST PROGRAM, FNS	268
DEPARTMENT OF HEALTH, EDUCATION AND WELFARE	
COMMUNITY MENTAL HEALTH CENTERS-STAFF & CONSTRUCTION, ADMHA	184
COMPREHENSIVE PUBLIC HEALTH SERVICES FORMULA GRANTS, HSA	299
CRIPPLED CHILDRENS SERVICES, HSA	251
DEVELOPMENTAL DISABILITIES - BASIC SUPPLEMENT, OS	70
DEVELOPMENTAL DISABILITIES - SPECIAL PROJECT, OS	40
DISEASE CONTROL-PROJECT GRANTS, CDC	45
DRUG ABUSE PREVENTION FORMULA GRANTS, ADMHA	32
FAMILY PLANNING PROJECTS, HSA	85
HEALTH PLANNING-HEALTH SYSTEMS AGENCIES, HRA	143
HEALTH PROFESSIONS-START-UP ASSISTANCE, HRA	18
MATERNAL AND CHILD HEALTH SERVICES, HSA	396
MEDICAL ASSISTANCE PROGRAMS, SRS	577
MENTAL HEALTH-CHILDREN'S SERVICES, ADMA	135
NURSE TRAINING IMPROVEMENT-SPECIAL PROJECT, HRA	77
PROGRAM FOR AGING-NUTRITION PROGRAM, OS	508
STATE HEALTH PLANNING AND DEVELOPMENT AGENCIES, HRA	113
ENVIRONMENTAL PROTECTION AGENCY	
ABATEMENT AND CONTROL, EPA	362
AIR POLLUTION CONTROL PROGRAM GRANTS, AWM	60
CONSTRUCTION GRANTS FOR WASTEWATER TREATMENT WORKS, WHM	4,690
PUBLIC WATER SYSTEM SUPERVISION-STATE PROGRAM GRANT, WHM	7
SOLID WASTE DISPOSAL PLANNING GRANTS, AWM	20
TOTAL	$ 19,327

SOURCE: GEOGRAPHIC DISTRIBUTION OF FEDERAL FUNDS, FY '77 BY THE U.S. COMMUNITY SERVICES ADMINISTRATION.

- Under the Organic Act of Guam and the proposed constitution, the provision of health care to the Territory's residents is ultimately the responsibility of the Government of Guam. Health care, therefore, shall be provided to every resident regardless of his/her ability, or inability, to pay for these services.

- The small size of the Territory's population enables projects, surveys, screenings and studies to be carried out which would benefit high risk groups in a relatively short period of time at moderate cost.

2. Disadvantages:

- The Territory's health care system is made up of both public and private providers. Under this system, decision-making is not centralized, and coordination of activities and resources toward common goals and objectives has not been achieved or, as yet, attempted. A major deficiency is the absence of a centralized source of comprehensive health information which would be of benefit to health care providers, health planners, and program administrators.

- Preventive and curative services do not fall under a single administration. This situation makes it very difficult resolve health problems uniformly.

- The small size of the present population on Guam makes the provision of many specialized services economically unfeasible.

- The isolation of the island from sources of ongoing medical education is one of the greatest disadvantages; and

- Isolation also poses problems for procurement of supplies and equipment.

- Shipping delays and high cost have an adverse affect on inventory.

R. Implications for Health Planning

During the past several years, several trends in the demographic and socio-economic character of the Territory of Guam have been identified which may affect the population's health status and the Territory's health care delivery system. Of primary concern is the continuing youthfulness of the population despite the entry of more people into the older age groups.

Although the Territory's birth rate will continue to decrease

for the next few years, the large female population moving into and remaining within the fecund ages between 14 and 44 years of age will eventually trigger an increase in the Territory's birth rate within a few years. The anticipated increase in the Territory's younger population (especially those aged 15 to 24) coupled with a concurrent increase in the number of persons over the age of 55, will affect health status and health care significantly. Studies, conducted by the National Center for Health Statistics have shown that incidence of disease, duration of illness, and frequency of health service utilization are markedly higher for these two groups than for other age groups in the population.

The territory's anticipated increase in the younger population will require that significant emphasis be placed on provision of obstetrical services to meet the expected high fecundity ratio and of services to treat childhood/pediatric diseases and problems. In addition, the anticipated increase in the Territory's older population will require that more emphasis be placed on the provision of facilities and services to treat chronic illnesses associated with the aging process.

The levels of income and education will continue to increase within the Territory, as previously illustrated. With rising affluence and increased knowledge, the population's aspirations for health care have increased and can be expected to lead to greater utilization of health care services, and health education programs, and greater demands for increased quality and efficiency within the Territory's health care delivery system.

S. Summary: Planning Assumptions and Constraints

In the next five years, as Guam's population continues to grow, there will be a consequent need for improvements in the health care delivery system. Theoretically, the type, scope and location of health services should be determined by the projected size, structure, distribution and characteristics of the population. Although data regarding these variables are limited, the following major health planning assumptions can be made, based upon the trends previously discussed:

1. Barring changes in political status or immigration policy, the civilian population will grow at a rate of two to three percent per year.

2. Although more women will enter the child bearing ages, the average family size will be about 4.5 persons per family.

3. The bulk of the population will reside in the central and northern areas of Guam.

However, other non-demographic factors affect the nature and scope of the health care system.

1. Although the political relationship between the U.S. and Guam will be refined, radical changes in this relationship will not occur; hence, federal assistance in providing health care will continue to be required.

2. In general, local lifestyles will continue to reflect American patterns, hence, Guam's health system will continue to be patterned after that of the U.S.

3. For a major segment of the population, any increases in household income will be offset by cost of living increases, which will hinder the utilization of health care services and require that the local government maintain a significant role in the provision of these services.

4. The island and its residents will continue to experience the effects of natural disasters, but losses of life and property will be reduced.

IV. HEALTH STATUS PROFILE

IV. HEALTH STATUS

A. Introduction

U.S. Public Law 93-641 encourages health planning agencies to assess the health status of the residents within a health service area and set specific goals and objectives to improve upon that measured status. A number of limitations exist concerning the fulfillment of that requirement other than the difficulty of measuring a concept such as health. One of these is the lack of morbidity data, which is why the indicators used in our assessment are primarily death statistics. Although limited by data, this section includes whatever morbidity data are available and lifestyle indicators which will hopefully give a better understanding of the "health status" of residents.

The following general conclusions about the population of Guam seems appropriate based on available data:

a. Though Guam's infant mortality rate has declined to 14 infant deaths per 1,000 live births, this rate falls short of the national goal of 12 infant deaths per 1,000 population.

b. Guam's average motor vehicle accident of 0.44 per 1,000 population during 1972 to 1976 is double the U.S. rate of 20 per 1,000 population.

c. Forty-four percent of all deaths on Guam were due to 6 key chronic diseases: cardiovascular, cancer, cerebrovascular, ALS/PD, cirrhosis of the liver and diabetes mellitus for an average mortality ratio of 2.46 deaths per 1,000 population.

d. Eighty-seven percent of deaths due to cerebrovascular and 85 percent of deaths due to malignant neoplasms occurred among people age 45+. The age group with the highest cause-specific death rate for cirrhosis of the liver is also highest among the age 45+ with 69 percent of all yearly deaths.

e. During 1971 to 1977, pneumonia averaged seventh among the leading causes of death on Guam. The island's rate was 0.28 deaths per 1,000, versus a U.S. average of 0.26 per 1,000 population. Sixty-six percent of the deaths occurred among those aged 45+, and 19 percent were among infants less than one year old. Of the cases recorded during 1972 to 1975, 84 percent of them were among native Guamanians.

1. Planning with Health Status Indicators

The end purpose sought by health planning is the improvement of the health status of the population and assurance that the population maintains an acceptable or high level of wellness. The Guam Health Plan has adopted the World Health Organization (WHO) definition of health. The WHO defines health as

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

Because this definition is general and somewhat all inclusive, it is very difficult to measure "health", and/or define "health status". These terms are not easily quantifiable or measurable. The idea of "wellness" depends largely on a person's perception of his physical and mental well-being.

Perhaps the most critical aspect of health planning is the need to develop techniques to evaluate what is happening now, to identify trends that have led to the present situation, and to determine what problems the future might hold unless there are deliberate interventions. Health assessment provides a score card and a monitoring system. In addition, it establishes the basis for determining health system planning strategies.

Traditionally, health has been measured in a negative way. That is, the presence of a disease or illness and the occurrence of death were used to determine the poor health status of the population. However, if this is the method of measurement, then, conversely, those who are not sick or dead are therefore well or healthy. ..which is obviously not true, due to the relative nature of the phenomenon to be measured.

A measure of the population's health also is a possible measure of the success of the health care delivery system in meeting identified health needs. The parameters of health, therefore, have important implications for policy, planning, and priority-setting purposes.

If the ultimate purpose of health planning is the improvement of the health status of the population and the maintenance of a high level of wellness, then the health status should influence to the greatest extent possible the direction of the health system, so that the system's components (i.e., facilities, manpower, services, equipment, etc.) will establish and maintain an effective, efficient and interrelated system. However, the difficulty in implementing this concept is the inability to determine the nature and degree of the impact of the health system

on improvement in the health status of the population. In other words, when improvements are made in the existing health care delivery system, there should be an improvement in the population's health status. In fact, this relationship is very hard to measure. Nevertheless, GHPDA is required by P.L. 93-641 to "assemble and analyze data concerning the effect the area's health care delivery system has on the health of the residents of the area".

The description of a healthful environment and collection of information about the health status of the Territory's residents has been emphasized throughout the Act and subsequent regulations and guidelines. In addition, as stated in the previous section, the purpose of the GHP was described as the "Agency's articulation of desired achievements for improvement in the health status of area residents".

As mentioned in the previous section, the GHPDA was faced with the very difficult task of defining measures of the population's health status in its development of the GHP Health Status component. Generally speaking, health status measurements are referred to as "health status indicators", quantitative measures intended to describe the level of health of the population. Usually, they consist of one or more numerical variables which are, presumably, related to the concept of health, since there is no meaningful and direct measure of health.

No single health status indicator has been chosen to assess, or determine the overall level of health in the Territory. However, several health status indicators have been proposed, with the qualification that most of them require more extensive data collection on a regular and continuing basis.

Several indicators of mortality and morbidity are examined over time and are compared to national (and other area) data when available. The leading causes of death, death to infants, and other selected causes of death were initial variables chosen to describe the health status of the Territory. The limited amount of morbidity data available was utilized to the fullest possible extent in order to identify disabling health conditions of a more acute or widespread nature. Unfortunately, it must be noted that, at this time, morbidity data are less accurate than mortality data. It is hoped that a uniform and acceptable data collection and retrieval system will be devised, implemented and used in the very near future, in order to obtain more accurate and comprehensive data on which to base future revisions of this document.

It must be cautioned that there are several specific limitations in the data used to describe the Territory's

health status. These data limitations include the following:

1. Timely and specific data reporting within the local health system have never been possible. This results in difficulties in dealing with illness and death in a meaningful way over a period of time.

2. Inaccurate data due to underreporting of communicable diseases have been a continuing problem in the Territory.

3. Mortality statistics do not give a good indication of the amount of morbidity or disability in the living population.

2. Mortality Indicators

Traditionally, mortality data have been considered the most basic indicator of the health (or the lack thereof) of a population. Using mortality rates as an indicator of health, however, means we are defining health as non-death. However, survivorship, although it serves as an indicator of health status, is not equivalent to health. For example, two populations may have identical death rates but varying frequencies and degrees of illness. They can, therefore, not be said to have the same level of health.

Mortality data limitations include the following:

1. Not all mortality rates are readily available for the population classified by age, sex, ethnicity and geographical area.

2. Because many deaths occur without medical attendance prior to death, reporting of the cause of death is less satisfactory than reporting of the fact of death.

3. Data on fetal and infant mortality are not always adequate due to differing definitions of events.

Territorial mortality data contained herein are derived from Statistical Reports published by the Office of Vital Statistics, Department of Public Health and Social Services. Comparative data are derived from these sources:

1. Health: United States 1975, published by the U.S. Department of Health, Education and Welfare, Public Health Service, Health Resources Administration; and

2. Monthly Vital Statistics Report, "Provisional Statistics: Annual Summary for the United States, 1975", Department of Health, Education and Welfare, Public Health Service, Health Resources Administration, National Center for Health Statistics.

3. Morbidity Indicators

Morbidity data have been obtained from two (overlapping) sources: hospitalization data from Guam Memorial Hospital and communicable disease reports compiled by the Department of Public Health and Social Services. For any given disease or condition examined herein, only one source was selected to index morbidity frequencies and rates in order to avoid possible double counting. In a few cases, data on hospital or disability days were available to gauge the relative severity of a morbid condition. This morbidity data, it must be cautioned, are at best indicative of health or disease conditions existing in various segments of the population on Guam. Due to chronic underreporting, it can be safely assumed that the morbidity rates calculated herein are lower estimates than the true incidence of conditions. Local morbidity data, where possible, are compared to U.S. morbidity data obtained in standard sources.

4. Organization of the Section

The following discussion of health status aims at presenting as comprehensive a view of recent and current health and disease conditions on Guam as can be supported by available data. The following section (Section IV. B) reviews vital events in general, including natality, life expectancy, and mortality. This is concluded with a summary look at the ten leading causes of death on Guam from 1971 to 1977. It is the intent of this section to identify the broad trends in health status from which more specific patterns can be drawn out through detailed examination. In Section IV.C, critical health problems are described and analyzed. In all, 21 specific health conditions are identified and organized into five groups: (1) infant mortality, (2) accidents, (3) chronic diseases, (4) infectious (communicable) diseases, and (5) dental diseases. In addition, a subsequent section (Section IV.D) identifies several health-related social problems in terms of lifestyle indicators: suicide and homicide, substance abuse, adolescent pregnancy, crime, and marriage and divorce.

The cornerstone of this planning document is an understanding of the variety of health status problems that must be addressed by any actions taken to alter the system of health care delivery. Thus, the last element in this section (Section IV.E) is the key one: an identification and prioritization of the health status problems that must be addressed (provided as summary statements) along with specific goals and objectives which establish the degree to which each problem should be corrected within a given time period (four to five years).

These goals and objectives can be viewed in three ways: first, as indicators of the relative severity of current health problems and the extent of correction needed for each one; second, as yardsticks by which to measure future changes and improvements (or declines) in the health status of Guam's population; and third, as the basis for identifying elements within the health system which are likely to most directly affect and improve the various dimensions of health status. This last function is the most important. Health status goals and objectives must be available to guide the selection of health system goals and objectives. System changes are all too easily itemized to resolve institutional problems instead of to resolve the needs and problems of the population which are expressed by the health status indicators.

B. Overall Vital Events

1. Natality

Natality is the term used to describe the event of birth. Originally, the concern for recording births emerged from the legal need to establish a person's identity, documenting nationality or citizenship, and for political and bureaucratic reporting purposes. Natality data are now used for a number of planning purposes such as estimating the need for birth and child-related services.

1.1. Guam Compared to the U.S.: 1970-1977

Birth indicators such as the crude birth rate, general fertility rate, and total fertility rate are declining at both the national level and in Guam. The crude birth rate is a general indicator of the event of birth, because the entire population is not at risk of (capable of) child-bearing. Guam's crude birth rate which experienced a slight increase between 1970 and 1972, has been steadily declining since 1972. On the other hand, the U.S. crude birth rate has been maintaining its downward trend (see

Figure IV.1). Although both Guam and the U.S. have been experiencing declining births, Guam's crude birth rates were much higher than the U.S. For instance, Guam's crude birth rate in 1975 was 4.15 per thousand as compared to the U.S. rate of 14.8 per thousand population.

The general fertility rate is a more refined indicator of birth since it takes only females in the child-bearing ages (15-44 years) into consideration. Guam's general fertility rate dropped from 222.3 per thousand in 1972 to 180.6 per thousand in 1977, or an average yearly decline of 8.2 per thousand. On the other hand, the U.S. general fertility rate dropped from 87.9 per thousand in 1970 to 66.7 per thousand in 1975, or an average decline of 4.2 per thousand. Although Guam's general fertility rate has been declining at a higher average than the U.S., Guam's general fertility rate was much higher than the U.S. (see Figure IV.2).

The total fertility rate is the estimated total number of live births 1,000 women would have if they all lived through their entire reproductive period and were subject to a given set of age-specific fertility rates. Guam's total fertility rate dropped from 6,010 per thousand in 1971 to 4,977 per thousand in 1977, or an average yearly decline of 172 per thousand. This means that in 1971, women were expected to have on the average 6 children by the time they reached 44 years. This has changed to 4.9 children in 1977. On the other hand, the U.S. total fertility rate dropped from 2,480 per thousand in 1970 to 1,799 per thousand in 1975. Although both Guam and the U.S. fertility rates have been declining, Guam women are expected to have, on the average, more children per 1000 females in the child-bearing ages (see Figure IV.3). This suggests that Guam women and infants are more at risk of experiencing complications and problems associated with pregnancy and childbirth.

1.2. Guam Natality: 1970-1977

The general fertility rate, which has been declining since 1972, was primarily influenced by the decline in the number of first and second-order births (see Figure IV.4). This could mean that either women and/or families have decided against having children, or the number of women in the child-bearing ages has decreased. The first interpretation is the more likely explanation for the decline in births. Financial costs of maintaining large families in an urban setting, increasing participation of women in the labor force, fragmentation of the extended family system, loosening of cultural values concerning the role of women, decreasing influence of the church on matters pertaining to birth control, and increasing costs of maternal and child care have all contributed to declining

births.

The most fertile period during the childbearing years is between the ages of 20 to 24 (see Figure IV.5). The median age at which women have their first to third children have remained fairly constant from 1973 to 1977 (see Figure IV.6). For instance, the median age of mothers for first-order birth has only increased from 22.4 years in 1973 to 23 years in 1977. However, the medican age of mothers for fourth and higher-order births has fluctuated substantially between 1973 to 1977. The risk of problems and complications of pregnancy and childbirth increases with age and prior births.

Between 1970 and 1977, there were less than four percent of the total live births with no prenatal visits. However, since 1973, there was an upward trend in the percentage of births with no prenatal visits (see Figure IV.7). Most prenatal visits occurred during the first trimester (1-3 months) of pregnancy.

Between 1970 and 1977, there was a steady decrease, except for 1975 in the ratio of low birth weight infants per 100 live births (see Figure IV.8). The average yearly percentage distribution of low birth weight infants by age of mother generally follows the age-specific birth rate schedule which peaks in the 20 to 24 age group (see Figure IV.9).

The illegitimacy ratio has been increasing from 1970 to 1977, except for decreases in 1974 and 1975 (see Figure IV.10). Illegitimate live births were highest among women 15 to 19 years and decreased with the increasing age of the mother (see Figure IV.11). On the average, more than two-thirds of the illegitimate births were from women under 24 years. On the average, almost fifty percent of mothers with illegitimate children have some form of high school education (see Figure IV.12) while the number of illegitimate births decreases with increasing education. In short, pregnancy during the high school years has been the major contributor to illegitimate births.

2. Life Expectancy

Averaging life table data for the U.S. as a whole for the period 1971 to 1975, life expectancy for the U.S. and for Guam populations can be roughly compared. (In effect, 1972 is used as the index year since the values change gradually and uniformly for the period.) For males and females, and for the age groups selected (0-1, 1-5, 5-10 years), Guam's values for average number of years of life remaining at the beginning of the respective age interval is consistently less than for those of the U.S. as a whole (Table IV.1). For life expectancy

at birth for the total population, Guam's age of 69.2 is 1.9 years less than the U.S. age of 71.1. The proportion of the total population reaching age 65 for Guam is 68 percent, while the U.S. proportion is 4.5 percent higher at 72.5 percent. The female population of Guam, while still living longer than males on average, is the group with a larger discrepancy in years of life remaining when compared to the U.S. as a whole.

3. Mortality

Between 1971 and 1977, there was an average of 420 deaths per year on Guam for an average mortality rate of 5.6 per 1,000 population. In comparison, the average mortality rate for the U.S. was 9.3 per 1,000 population between 1970 and 1975 (Table IV.2). Both the U.S. and Guam mortality rates are on the decline. However, death rates differ due to a number of factors, the overriding one being the age differential. In making comparisons between different time periods or different populations, it is important to take age differences into account. For example, even if the number of age-specific deaths are the same, an area with a high proportion of very old people, for whom death rates are high, will have a higher crude death rate than an area such as Guam, with a high proportion of young people, for whom death rates are low. In general, comparisons should be based on the age-adjusted death rates.

On the other hand, planning for health facilities requires knowledge of the actual number of deaths, or the death rate for the population living at a specific time or in a specific area. Therefore, age-adjusted rates are not appropriate for this purpose.

On Guam, for the period between 1971 and 1977, on the average, more males (64 percent) died than females (36 percent), for an average mortality rate of 3.6 per 1,000 males and 2.0 per 1,000 females. The male mortality rate for Guam appears to be 70 percent lower than the U.S. average for males (10.6 per 1,000) and the rate for females is 4 times lower than the average U.S. rate for females (8 per 1,000).

In comparing the age-specific mortality rates for Guam and the U.S. between 1970 and 1975, the patterns are similar, approximately a "U" shaped curve. However, although the age-specific mortality rates of Guam and the U.S. are nearly equal in the under 1-44 ages, the Guam rate between the 45-85+ ages greatly exceeds the U.S. rate for the same ages between 1970 and 1975.

In short, the possiblity of dying is greater for males than for females and for those persons ages 45+ than for other age groups (see Table IV.3). Hereinafter, a more detailed discussion of mortality rates is presented in the following sections

concerning the ten leading causes of death on Guam for the period of 1971 to 1977, or any part thereof.

4. Leading Causes of Death

Mortality data by cause of death has long been recognized as an essential informational component for health status assessment. The Government of Guam has collected data on the ten leading causes of death at least since 1959, although for earlier years, the disease classification used is in some respect different from and non-comparable to that of later years.

The time period for which this comparative study of cause of death, as well as the subsequent investigation of specific diseases and conditions, is examined is the seven year period from 1971 to 1977. This period was selected to reflect long-term trends, if any were to be identified, and to provide an adequate range of data from which to derive average rates where desired. Data of 1977 were the most recent data obtainable. The cut-off chosen was 1971, because 1970 and earlier data were judged to be of questionable accuracy and comparability.

The cause of death categorization follows the revised International Classification of Diseases (ICDA). For the seven year period from 1971 to 1977, the causes of death, the number of deaths per cause, the rate of deaths by cause per 1,000 population, and the relative ranking per year, have been tabulated (Table IV.4). These figures have subsequently been aggregated and averaged to provide a summary view of the relative ranking (i.e., severity) of various causes of death on Guam over the seven year period (Table IV.5).

The five leading causes of death over this time period were: (1) heart disease, (2) cancer, (3) motor vehicle accidents, (4) diseases of early infancy, and (5) non-motor vehicle accidents. They accounted for just over 50 percent of the average total number of deaths from 1971 to 1977. Heart disease alone accounted for 18 percent of deaths during this period.

There was very little variance in the rankings of the above ten causes throughout the period. However, diabetes, congenital anomolies, homicide, and suicide did fluctuate from year to year for the tenth leading cause.

These average rates and ranking can be compared to leading causes of death identified for the years 1975 and 1960 (Table IV.6).

In the first quarter of this century, major infectious diseases accounted for the majority of deaths on Guam. By 1960, chronic diseases such as heart disease, central nervous system diseases and cancer were contributing causes of 32 percent of all deaths. Of major importance is the fact that despite major

medical advances in controlling infectious causes of death, the overall mortality rate has not declined substantially. In 1925, the overall rate was 5.83 deaths per 1,000 population (Table IV.7), while in 1960 and for the 1971 to 1977 average, the rates were 5.24 and 5.68, respectively (in 1976, the rate was 5.9, while in 1977, it dropped to 4.6).

C. Critical Elements of Health Status

1. Infant Mortality

People are subject to a high risk of death during the first year of life. The infant mortality rate[7] has been widely used as an indicator of the health conditions of a community. Studies have found that infant mortality is affected by environmental and socio-economic conditions such as poverty, malnutrition, poor housing, and quality of medical care services (particularly, prenatal and postnatal care).[8]

Many infant deaths on Guam have been attributed to congenital anomalies and diseases of early infancy.[9] Congenital anomalies are abnormalities of any portion or organ of an infant's body that develop during pregnancy. They may be minor deformities which do not affect the health of the infant, or they may be major defects of internal organs that lead to death. It may be a single abnormality or it may be associated with other congenital anomalies or multiple defects that involve several organ systems. Congenital anomalies can be caused by a number of different factors: chromosomal, genic, infectious, chemical, or physical agents. For instance, overexposure of pregnant women to x-rays or radium is likely to cause injuries to the developing embryo. Rubella infection during the early months of pregnancy is associated with the infant developing congenital heart disease, and certain drugs and chemicals, such as the notorious thalidomide, can cause severe congenital defects.[10]

1.1. Guam Compared to the U.S. 1970-1975

The U.S. infant mortality rate has been steadily declining each year since 1962 to 1975.[11] Guam infant mortality rates have also shown a downward trend from 1973 to 1977. For 1970 to 1975, Guam's infant mortality rates were higher than the U.S. However, Guam's rates were lower than the rates for the U.S. non-white population. For instance, the infant mortality rate for the U.S. total in 1975 was 16.1 per 1000 live births in comparison to Guam's 21 per 1000 live births. The U.S. rate, for all others except white during same year was 24.2 per 1000, 3.2 per 1000 higher than Guam's rate. Guam's infant mortality rate in 1975 was third to the highest in

the nation. The District of Columbia ranked first with an infant mortality rate of 29 per 1000, followed by Mississippi with a rate of 22.3 per 1000 live births (Figure IV.13).

1.2. Infant Mortality: 1970-1977

Guam's infant mortality rates have shown a downward trend since 1973 (Figure IV.14). The Guam infant mortality rate of 14 per 1000 live births in 1977 is 2 per 1000 higher than the national health goal of 12 per 1000 or less live births.

On the average, there were 63 infant deaths yearly from 1970 to 1977. Fifty-eight percent of the average yearly infant deaths were males and 42 percent were females. Municipalities with infant mortality rates above 20 per 1,000 live births, however, include Inarajan, Umatac, Santa Rita, Agat, Dededo, Agana Heights, Mangilao, Sinajana, and Yona.

Due to the high risk of dying in the first few weeks of life and the difference in the causes accounting for infant deaths at the earlier and later stages of infancy, the infant mortality rate may be broken up into neonatal and postneonatal rates.[12] Sources of very early infant deaths tend to be congenital anomalies, injuries at birth, prematurity, and other causes which are not easily prevented by modern medical and health measures. On the other hand, causes of later infant deaths such as infectious diseases and nutritional problems are more easily corrected by modern heaalth approaches.[13]

1.3 Nenonatal Mortality

Most of Guam's infant deaths occur during the first 28 days of birth. On the average, 75 percent of the yearly infant deaths occur during this period. However, the neonatal mortality rates, which increased between 1972 to 1974, have been decreasing since 1975. The infant mortality rates for Guam are strongly associated with the increase or decrease in neonatal mortality.

1.4 Post-Neonatal Mortality

The post-neonatal mortality rates have been fluctuating between 1971 to 1977 (Table IV.8). On the average, 25 percent of the yearly infant deaths occur during this period.

1.5 Ethnic Differences

Fifty percent of the average yearly infant deaths were

Guamanians, 12 percent were Filipinos, 17 percent were Caucasian, and 12 percent comprised other groups. The distribution of infant deaths parallels the ethnic composition of the population.

1.6 Summary

The declining infant mortality rate is an indication that there are improvements in conditions that are conducive to good infant health. Although few studies have been conducted on Guam to determine the exact association of environmental, social, and physical factors to infant mortality, some observations have been made, among which are the following:

A. Prior to 1970, the general non-military stable population of Guam was characterized by comparatively large families and confronted with relatively low income and high living costs. Dietary habits were often unsatisfactory because of cultural patterns and the scarcity and/or high cost of meat, fish, fresh produce, and dairy products. These factors plus the lack of understanding and appreciation by many mothers of their own health needs as well as those of the children, lead to frequent pregnancies and a number of conditions detrimental to good maternal and child health.

B. Maternal morbidity is associated with premature births, hence, neonatal deaths. Maternal morbidity often causes the occurrence of various birth defects.

C. It is estimated that over half of the local mothers giving birth each year on Guam receive prenatal and post-partum care from public health facilities.

D. There appears to be a marked improvement in the decline of infant mortality rates as a result of the Maternal and Child Health Program.14

2. Accidents

2.1. Motor Vehicle Accidents

From the period of 1971 through 1977, motor vehicle accidents averaged third among the 10 leading causes of death on Guam, and except for the year 1974, it has been in the top 5 leading causes of death on island. Accidents are defined as traffic accidents or as non-traffic accidents, according to whether the accident occurs on a public highway or elsewhere.

2.1.1. Mortality

Overall, the average mortality rate for motor vehicle accidents between 1971 and 1977 was less than 0.5 per 1000 population.

The average mortality rate for motor vehicle accidents almost doubles the average for the U.S., except for 1974. U.S. rates show a decline in mortality rates for the years from 1972 to 1975; whereas Guam's rates have no definite pattern. The rates for 1976 and 1977 were .330 and .465 per 1000 population, respectively.

According to information in a recent highway safety plan, accidents, fatalities and injuries on Guam are rising at rates proportional to that of the motor vehicle population. In Guam, most accidents occur during daylight hours but most fatalities occur at night. The pedestrian death rate is 30 percent higher than in the U.S., with most pedestrian fatalities occurring at night and among males.

2.1.2. Age and Sex Characteristics

For the periods of 1971 to 1977, there was an average of 34 motor vehicle deaths per year (Figure IV.15). The yearly averages for males and females in the same period were 28 and 6 deaths per year, respectively, or one male death per 1,000 male population and less than one female death per 1000 female population. Males in the 15 to 24 age group on up to 75 or over averaged one death per 1000 population of males in their respective age groups, with females averaging less than one. Per 100 total deaths by age groups, the 15 to 24 age group ranked highest with an average mortality ratio of 33 males and 26 females, followed by the 5 to 14 and 25 to 44 age groups, averaging 26 and 19 per 100 deaths for males and 25 and 14 per 100 deaths for females in their respective age groups (Table IV.10).

2.2. Non-Motor Vehicle Accidents

On the average, for the years 1971 through 1977, non-motor vehicle accidental deaths ranked fifth among the ten leading causes of death on the island. Except for motor vehicle accidents all other types of accidents are dealt with in this section (i.e., water, air and space transportation, poisoning, falls, fire and flames, drowning, suffocation, mechanical suffocation, hit by object, firearm missles, electric current, machinery, nature, environment, etc.)

2.2.1. Mortality from Non-Motor Vehicle Accidents

There was an average of 29 accidental deaths per year from 1971 to 1977. The highest number of deaths (38) occurred in 1974 and the lowest number of deaths (21)

occurred in 1977. When expressed in rates per 1000 population, Guam averaged .4 accidental deaths per 1000 population during this period. Although apparently low, the Guam rates exceed U.S. rates (Tables IV.11,12,13).

Guam's average for the four years exceeds the U.S. average. In comparison to U.S. rates, which appear to be declining from 1973 to 1975, Guam's rates seem unpredictable for those four years. However, when Guam rates for 1976 and 1977 are included, .320 and .260 per 1000 population respectively, there appears to be a progressive downward trend from 1974 to 1977.

2.2.2. Age and Sex Characteristics

From 1971 to 1977, an average of almost four times as many males as females died. Higher male deaths occurred in all age groups, although the difference between male and female deaths varied. Most of the male deaths occured in the 15 to 44 age groups while female deaths had a slightly higher average per year in the 0 to 4 and 25 to 44 age groups.

Males had a slightly higher mortality rate than females per 1000 population. There was a yearly average of .6 male deaths compared to .2 female deaths per 1000 population. Although it varied slightly, more males than females per 1000 population died in all of the age groups. Within the age groups, the 75 and over age group experienced the highest average rate of deaths per 1000 population.

When deaths from all other diseases are considered, an average of 7 persons died from accidents per 100 total deaths from 1971 to 1977. Per 100 total male and female deaths from all diseases, almost 9 males and 4 females died from accidents between 1971 to 1977. Lastly, within the age groups, over 32 persons per 100 total deaths in the 5 to 14 age group died from accidents while the 25 to 44 and 15 to 24 age groups both ranked second, with 27 deaths per 100 total deaths within these age groups. (Table IV.14).

2.3. Occupational Accidents

The incidence of cases of occupational injury in Guam, expressed as a rate per 100 employees covering all private sector industries has declined from 6.8 in 1974 to 6.0 in 1975 and 4.7 in 1976. During the same period, the incidence rate of injury in the contract construction industry fell from 13.1 cases to 12.2 cases per 100 employees. In 1976, a rate of 21.4 cases per 100 employees was recorded for residential construction. Two of the total of 5 fatalities in that year were registered in the

construction sector. The occupational injury incidence rate in the private sector on Guam is less than the United States rate for these years (15.3 and 15.9). In general, therefore, occupational injury is not a priority health problem for Guam, although attention should be addressed to conditions and safety precautions that may influence occupational injuries associated with residential construction.

3. Chronic Disease

3.1. Heart Diseases

The term "heart disease" is used to describe a variety of heart problems. It includes active rheumatic fever, chronic rheumatic heart disease, hypertensive, and ischemic heart disease.[15] Ischemic and hypertensive are the two heart problems of major health concern to the island.

Ischemic heart disease is the term used to describe a condition whereby the supply of blood to the heart becomes insufficient due to hardening of the coronary arteries or atherosclerosis.[16] It is yet to be truly determined what causes the occurrence of atherosclerosis. However, it is found to be definitely associated with high blood pressure, high serum cholesterol levels, a family history of the problem, being male and smoking cigarettes. Additional factors that have been found include obesity, circulatory blood fats other than cholesterol, and certain personality traits. The heart muscle requires a constant supply of oxygen and nutrients carried by the blood via the coronary arteries. The loss of sufficient blood supply for a period of more than a few minutes results in heart attack. Lesser degrees of coronary artery obstruction cause insufficient blood supply only when the demands or the heart incrases, such as during physical exertion or emotional stress.

Hypertensive is the term used to describe a condition of high blood pressure. Generally, a blood reading of 140/90 has been used to indicate conditions of high blood pressure, although this will vary with age, sex, race, and evidence of already existing complications from hypertensive heart problems.[17] Prolonged high blood pressure may cause the heart to deteriorate prematurely, causing cerebral strokes, heart failure or kidney failure.

3.1.1. A Comparison of Guam and the U.S.

Disease of the heart is the leading cause of death in Guam as well as in the nation. Initially, Guam's death rates from heart disease appear to be lower than the national rates (Table IV.15) and most states, because

Guam has a relatively young population, while those at risk of dying from heart disease tend to be older people. If the age distribution of Guam's population were similar to the national and the states' population, then Guam rates would be higher. For instance, the U.S. crude death rate in 1975 was 8.9 per 1000 population, and Guam's rate was 5.8 per 1000. However, the age-adjusted crude death rate for Guam, using the U.S. population as a standard, was 12.7 per 1000 or 3.8 per 1000 more than the U.S. crude death rate.

Guam's death rates from heart disease for the years 1972 to 1975 were lower than the national rates. The nation's rates were 3.6, 3.5, and 3.4 per 1000 population, respectively for the years 1972, 1973, 1974 and 1975.[18] Guam's rates were 1.0, 0.9, 1.1, and 1.2 per 1000 respectively for the same years. Overall, the national death rates from heart disease appear to be 3 times higher per 1000 population than the local rates. Guam had the second to the lowest death rate from heart disease among the states in 1975, the lowest was Alaska with a rate of .74 per 1000 population.

In 1975, the national death rates from heart disease were 3.85 per 1000 male population and 2.89 per 1000 female population.[19] Guam's death rates for the same year were .88 per 1000 males and .38 per 1000 females (Table IV.16). Both the national and local rates for the male populations were expectedly higher than females. Moreover, the sex differences in rates were approximately the same at both the national and local levels.

Guam's death rates from heart disease were consistently higher than the national rates if compared by age group. The 1975 national death rates from heart disease for those 25 to 44 years old were .42 per 1000 for the male population and .13 per 1000 for females. Comparatively, Guam's rates for the same year and age group were .1 per 1000 for the male population and .2 per 1000 for females. In the 45 to 64 age group, the national rates were 5.66 per 1000 for the male population and 1.87 per 1000 for females as compared to Guam's rates of 7 per 1000 for males and 2.7 per 1000 for females. Although direct comparison cannot be made for those below 25 years and above 64 years due to the absence of comparable U.S. data by age, indications are that Guam rates were consistently higher than the U.S. in these age groups. (Table IV.17).

3.1.2. Guam Mortality: 1971-1977

There is a demonstrable decrease in observed death rates from heart disease from 1971-1977 (Figure IV.16). The highest recorded death rate, 1.26 per 1000 population occurred in 1975. This rate has declined in a two year period to .87 per 1000 population in 1977, or a .2 average

decrease for both male and female 1000 population. As expected, the rates for the male population were consistently higher than females. On the average, the yearly rate for the male population was .27 per 1000 higher than females. Most of the deaths from heart disease were attributed to ischemic heart disease. This form of heart disease accounted for almost 80 percent of the total heart disease deaths between 1972 to 1976. It is reasonable to anticipate that ischemic heart disease will continue to be the major cause of heart disease mortality.

3.1.3. Age Differences

In terms of dying from heart disease, those below 45 years of age were generally at low risk. On the average, the yearly death rate from heart disease for persons under 45 years was less than .50 per 1000 population. In terms of frequency these age groups account for about 13 percent of the average yearly deaths from heart disease between 1971 to 1977. The major cause of death for those below 45 years is rheumatic fever, which medical authorities have been fairly successful in preventing and treating.

Persons 45 years and over are definitely at greater risk of dying from heart disease. Eighty-seven percent of the average yearly deaths from heart disease were in this age group. On the average, the yearly death ratio from heart disease per every 100 total deaths in this age group was 69 per 100. Although the death rates from heart disease for the male population were consistently higher than females, the average yearly death ratio from heart disease per 100 total deaths was higher for women than men. The average yearly death ratio for women was 79 per 100 as compared to 62 per 100 for men. These statistics show that both men and women are somewhat equally at risk of dying from heart disease.

3.1.4. Morbidity: 1973-1976

Guam has limited morbidity data. The following discussions were based on Guam Memorial hospitalization data. The heart disease hospitalization rate increased from 10 per 1000 in 1973 to 13 per 1000 in 1976. During the four year period, the female population experienced the most significant increase in rates, from 10 per 1000 in 1973 to 15 per 1000 in 1976. The rates for the male population increased from 10 per 1000 to 12 per 1000 during the same years. The average yearly rate was 11.5 per 1000 population.

There were 3,555 cases hospitalized for heart disease between 1973 to 1976, or an average of 889 yearly. Fifty-one percent of the hospitalizations were females and 49 percent were males. People were most frequently hospitalized for ischemic heart disease. It accounted

for 40 percent of the total number of hospitalization during the four year period, followed by hypertensive heart disease with 28 percent. Combined, they accounted for more than two-thirds of the total number of hospitalizations between 1973 to 1976.

3.1.5. Age Differences

The risk of being afflicted by heart disease increases with age. Those below 45 years were generally at low risk as compared to those 45 years and above. The average yearly hospitalization rates were 48 per 1000 for those between the ages of 45 to 64, 173 per 1000 for 65 to 74 years, and 346 per 1000 for those 75 years and over.

3.1.6. Ethnic Differences

The percentage distribution of heart disease hospitalizations by ethnicity approximates the ethnic composition of the population. Annually, an average of 75 percent of the hospitalized disease cases were Guamanian, 12 percent were Filipinos, and 9 percent were Caucasian. (Table IV.18).

3.1.7. Hypertension Morbidity: 1975

With only 1 sample year available to examine morbidity (indexed by hospitalization) associated with hypertension, only information suggestive of the incidence of such a condition can be presented. For the year 1975, 228 people were hospitalized for hypertension, for a rate of 3.0 per 1000 population. Females outnumbered male 1.7 to 1. Native Guamanians were over-represented (74%) compared to their population share (55%). A total of 1801 disability days were recorded, yielding an average of 7.9 disability days per person.

3.2. Neoplasms

A neoplasm is a mass of new or abnormal growth (tumor), the structure of which resembles the tissue or organ of the body in which it is situated.[20] There are two forms of neoplasms, malignant and benign. Although both forms can enlarge, a malignant neoplasm is often fatal, whereas a benign neoplasm rarely kills unless it compresses a vital organ or causes a hemorrhage. Cancer is the disease marked by the presence of malignant neoplasms. There is one exception, leukemia, which does not form tumors but is classified as a form of malignant neoplasm and cancer.

Generally, most neoplasms originate in one location of the body. If not detected early, the cells grow and multiply out of control and are eventually spread to

other parts of the body. Usually, an individual is more likely to die when the neoplasm enters a vital organ rather than when the malignant neoplasm is localized to the original site. No single distinguishing biochemical characteristic has been found for all neoplasms, but neoplasms which are carried to other parts of the body retain the same characteristics as when they were localized.

3.2.1. Mortality

Malignant neoplasms (cancer) are the second leading cause of death in the United States and Guam. During the seven year period of 1971 to 1977, Guam had an average of .51 deaths per 1000 population (Table IV.19). However, due to the age differences in the populations of the U.S. and Guam, one cannot directly compare the rate of those individuals who died on Guam to those on the mainland unless the two populations are standardized. However, it is possible to compare the two trends. During the period of 1971 to 1976, the U.S. trend showed a rise in the rate of individuals who were dying while the trend for Guam during the same period of time appeared to be going downward. (Figure IV.17).

Both in the U.S. and on Guam, malignant neoplasms of the digestive organs and respiratory system were the primary causes of death (Table IV.20). Within the U.S., malignant neoplasms of the digestive organs had the highest rate of death. Although the trend of deaths due to malignant neoplasms of the digestive organs was fairly stable, the rate of deaths due to malignant neoplasms of the respiratory system (the second leading cause of neoplasm death) was on a sharp increase. On the other hand, the primary cause of death on Guam was malignant neoplasms of the respiratory system. In both cases, the rates of death for the respiratory system and digestive organs were increasing. An average of 0.11 individuals per 1000 population died from neoplasms of the digestive organ and an average of 0.15 individuals per 1000 population died from neoplasm of the respiratory system.

On Guam, most of the deaths due to malignant neoplasms occurred in the 45 and over age group (Tables IV.21, IV.22). This is not surprising since cancer is generally considered a disease of the old.[23] Generally, there was a slightly higher rate of males (0.56 per 1000) than females (0.44 pre 1000) who died. This is also consistent with national trends.[24] However, even though a larger proportion of the male population was dying than the female population, females were slightly more likely than males to die from malignant neoplasms when all other causes of death were taken into consideration. Per 100 total female deaths, 9.7 were due to neoplasms, whereas per 100 total male deaths 8.6 were attributed to neoplasms. This is also

consistent with national trends.[25] Furthermore, when all other causes of death were taken into consideration, both males and females were more likely to die from malignant neoplasms than from any other cause in the 45 to 64 age group. Although there is no clear trend for males, the rate of female death appears to be decreasing in the 45 to 64 age group and increasing in the 65 to 74 age group.

3.2.2. Neoplasm Morbidity

Data for the period 1972 to 1975 indicate than an average of 356 persons were hospitalized for neoplasms, for a rate of 4.9 persons per 1000 population (Table IV.23). Fifty-eight percent of these cases were native Guam anians, 21 percent Filipino, and 15 percent Caucasian. Sixty-five percent were female, with over-representation particularly evident in the age group 21 to 50. The yearly average number of disability days was 2,980 for an average of 8.6 disability days per person hospitalized.

3.3. Cerebrovascular Disease

Cerebrovascular disease can best be described as damage to the brain resulting from abnormalities in the flow of blood to the brain. The primary type of cerebrovascular disease is cerebrovascular accident which is more commonly known as "stroke". Cerebrovascular accident usually occurs as the result of a blockage of blood to the brain. This blockage is caused either from a thrombosis, an embolism or a hemorrhage.[26]

A thrombosis is a clot which develops during a process by which a fatlike material, cholesterol, is deposited in the lining of the blood vessel, causing the inside diameter to narrow (arteriosclerosis). An embolism usually occurs suddenly with no forewarning and is caused by a piece of clot that has broken away from a thrombosis in another part of the body and has travelled to the brain. A hemmorrhage is the least common cause of stroke. Brain damage can result either directly from the release of blood into the brain tissue or indirectly from the reduction of blood in the artery beyond the point of rupture. The most common cause is a leakage of blood from arterial walls (arterial aneurysm). An abnormally high arterial blood pressure brought about by a state of emotional tension (hypertension) plays an instrumental part in the development of an arterial aneurysm.[27]

Nationally, stroke or cerebrovascular disease is the third leading cause of death, however, it is the sixth leading cause of death on Guam. During the seven year period from 1971 to 1977, there was an average of 0.37 deaths per 1000 population on Guam. Nationally, the rate of death resulting from stroke was 0.99 per 1000 population

(Table IV.24).[28] In addition, per 100 total deaths, Guam had an average ratio of 6 deaths per year as a result of cerebrovascular disease, whereas the national average was 20 per year.

On Guam, neither sex is more susceptable to dying from stroke. Per 1,000 total population, there was an average of 0.33 male deaths compared to 0.4 female deaths. Nationally, females had a slightly higher rate of death than males. Per 1,000 population, there was an average of 1 female death compared to 0.8 male deaths.[29] Furthermore, when all other causes of death were taken into consideration, females on Guam had almost twice as many cerebrovascular disease related deaths as males. There was an average ratio of 9 female deaths compared to 5 male deaths per 100 total deaths by sex (Table IV.25).

Most of the deaths occurred in the 45 and over age group on Guam. Although the 45 to 64 age group had the highest frequency of deaths, the population's risk of dying from a stroke was much lower for those between the ages of 45 to 64 than for those over the age of 65 (Table IV.26).

3.4. Amyotrophic Lateral Sclerosis and Parkinsonism-Dementia

Amyotrophic lateral sclerosis (ALS) can best be described as a disease of the spinal cord. The spinal cord is the nervous tissue where a great number of nerve cells and fibers are present. The disease causes the spinal cord to be destroyed slowly and progressively over a period of years. In the beginning, most individuals develop weakness or wasting of hand and legs and difficulty in walking. After a period when the muscles of speech and swallowing, including the tongue, are affected, speech beomes slurred and eating progressively difficult. Eventually the weakness and wasting are so severe that the patient becomes "skin and bones" with completely useless arms and legs. Although the body wastes away, the individual's feelings are not impaired at all. Mental capacities are well prescribed until death, which usually occurs in about four years. However, 60 out of 100 individuals on Guam survive more than four years and about 10 percent have survived more than 15 years.[30]

Parkinsonism-dementia (PD) is a disease in which the individual shows signs of mental deterioration combined with a progressive muscular stiffness or rigidity of the body, shaking of the hands and a slowing down of daily activities. Individuals with PD often lose their memory and their mobility. Terminally, they become bedridden and totally incapacitated.[31] These forms of disease of the central nervous system usually affect people in their 40's and at the peak of their careers.[32]

3.4.1. Mortality

Amyotrophic lateral schlerosis and Parkinsonism-dementia, combined, are the eighth leading cause of death on Guam. In the United States, it is estimated that there are 0.01 deaths from ALS/PD for every 100 deaths.[33] On Guam, from 1971 to 1977, there was an average of 4.4 deaths from ALS/PD for every 100 total deaths (Table IV.27).

Although United States rates are unavailable for comparison for the years 1971-1977, there was an average of 0.25 deaths per 1000 population in Guam. Since 1950, there has been a decline in the incidence and mortality rates, especially of ALS.[34]

More males are affected than females. On Guam, from 1971 to 1977, there was an average of .28 males compared to .02 females who died from ALS/PD per 1000 population (Tables IV.28 and IV.29).

3.5. Cirrhosis of the Liver

Cirrhosis (scarring) is the term reserved for liver disease that has progressed to an advanced stage. In the early state of cirrhosis, the liver is enlarged, loaded with fat, and smooth. In its progressive stage, the disease leaves a typical nodular, shrunken organ, which is largely scar tissue with an irregular pattern of regenerating liver lobules. A high number of cases are frequently free of severe symptoms until the terminal stage. The scarring of the liver is dangerous, because it leads to changes in the blood circulation, and the resulting detours in the blood supply can have many life threatening consequences.[35]

The major cause of cirrhosis in the U.S. is alcohol; however, it may be caused by other conditions, including infectious hepatitis, drug or toxic-induced diseases, and other less well understood causes. The gastrointestinal system is the first of the body's organ systems to come into contact with food, drink, and drugs taken by mouth. The most vulnerable organ is the liver, which serves the function of eliminating toxic materials from the body.[36]

3.5.1. A Comparison of Guam and the U.S.: 1970-1975

Guam's total death rates from cirrhosis of the liver were consistently higher than the U.S. rates, except for 1974, during the six year period from 1970-1975 (Figure IV.18). The average yearly rate for Guam was .18 per 1000 population in comparison to .15 per 1000 for the U.S.[37] However, the U.S. rates for females were consistently higher than Guam's (Table IV.30).

In 1975,[38] the U.S. male death rates from cirrhosis of the liver were lower in all age groups except in the 25 to 44 age category. In the 15 to 24 age group, Guam's rate was 3.5 times higher than the U.S. In the 45 to 64 age group, Guam's rate was 3.2 times higher than the U.S. In the 65 and over age group, Guam's rate was 5.5 times higher than the U.S. On the other hand, the U.S. female rates were higher in all age groups (Figure IV.19).

3.5.2. Guam Cirrhosis Mortality: 1970-1977

There is no definite trend of increase or decrease in the island death rates from cirrhosis of the liver in the eight years from 1970 to 1977. Since most deaths from cirrhosis were males, the fluctuation in annual rates has been strongly associated with the fluctuation of male death rates. The average yearly rate for males was 4 times higher than females.

3.5.3. Age Differences

Almost all of the cirrhosis deaths from 1971 to 1977, except one, in the 15 to 24 age group in 1974, were to persons 25 years and above (Tables IV.31 and IV.32). The age group with the highest deaths from cirrhosis was 45 to 64 years. On the average, 69 percent of the yearly cirrhosis deaths were in this age group. The average yearly death rates for all age groups were 0.17 per 1000 for males and 0.05 per 1000 for females age 25 to 44, 1.66 per 1000 for males and 0.44 per 1000 for females age 45 to 64, 1.44 per 1000 for males and 0.73 per 1000 for females age 65 to 74, and 0.70 per 1000 for males age 75 and over.

3.5.4. End-Stage Renal Disease

The major function of the kidney is to filter waste products from the blood. When a kidney is damaged through accident or such diseases as diabetes nephritis or hypertension, partial or complete kidney failure leads to accumulation of toxic waste products in the body. The more serious cases, however, result in the permanent, irreversible condition of end-stage renal disease with eventual death if the process remains untreated. This disease is more completely defined as that stage of kidney impairment which cannot be favorably influenced by conservative management alone (such as diet modification and medication) and requires dialysis or transplantation to maintain life and health of the patient. In 1978, there were 28 patients receiving maintenance dialysis for a rate of 0.34 per 1000 population. In Hawaii, the rate was 0.25 per 1000 population and in the United States 0.20 per 1000 population. The Guam rate is then 36 percent higher than the U.S. rate.

3.6. Diabetes

Diabetes mellitus is a disorder in which the body is unable to manufacture insulin, which enables the body cells to absorb and metabolize (burn) sugar glucose. Insulin is secreted by the beta cells, which are found in the pancreas. Without insulin, an individual eventually goes into a coma and dies. Very few individuals die solely from diabetes but from complications brought about by the disorder. The severity of an individual's diabetes correlates (although not absolutely) with the person's age at the onset of the disease. Generally, the younger the individual, the more severe the disease[40] There are an estimated 2 million individuals with diabetes and another one to two million more with undiagnosed diabetes in the U.S.[41]

There are two forms of diabetes mellitus: juvenile and maturity-onset. Juvenile diabetes develops only in children and usually there is an absolute deficiency of insulin. Due to this deficiency, half of those with juvenile diabetes are expected to die from kidney failure, while 20 to 30 percent are expected to become blind.[42] Maturity-onset diabetes may develop at any age but generally the disease is diagnosed in people between the ages of 40 to 60. Those with maturity-onset tend to suffer to a lesser degree from complications affecting the eyes or kidney but tend to suffer from premature arteriosclerosis which increases the probability of death due to heart attack and doubles the probability of a stroke. Generally, those with maturity-onset diabetes have insulin deficiencies which are less than those with juvenile diabetes. Depending upon the severity, maturity-onset diabetics are usually placed on restrictive diets to correct the sugar level in the body whereas those with juvenile diabetes must receive supplemental insulin daily.[43]

3.6.1. Mortality

During the period of 1971 to 1976, there was an average rate of 0.16 deaths per 1000 population on Guam compared to an average rate of 0.18 deaths per 1000 population within the United States (Table IV.33). The national rate of deaths due to diabetes appears to be decreasing; however, there is no detectable trend on Guam.

When all causes of death were taken into account, Guam had a lower average ratio of deaths due to diabetes than the U.S. per 100 total deaths; Guam had an average of 0.26 deaths attributed to diabetes whereas the U.S. had 3.7 deaths.[44]

Both nationally and on Guam, females were slightly more inclined than males to die from diabetes (Tables IV.34 and IV.35). On Guam, there was an average of 0.12 male compared to 0.19 female deaths per 1000 population.

Generally on Guam, the 45 to 64 age group had the greatest frequency of death followed by the 65 to 74 age group (Table IV.36).

Even though the U.S. had a slightly higher rate of death than Guam, when age and sex differences were taken into consideration, Guam had a significantly higher rate of death in the 45 and over age group. During the period of 1971 to 1977, Guam had an average rate of 0.96 per 1000 female population in the 45 to 64 age group. This rate was almost four times greater than the national average of 0.2 per 1000.

3.6.2. Morbidity

During the period of 1973 to 1976, there was an average rate of 5.02 cases per 1000 population hospitalized for diabetes mellitus (Table IV.37). Those that were hospitalized tended to be Guamanian females between the ages of 45 and 64. Almost twice as many females (1,206 or 6.75 per 1000) than males (64 of 3.15 per 1000) were hospitalized. This is not surprising since females are more susceptible to diabetes than males. Generally, those individuals hospitalized tend to be between the ages of 45 to 74. However, those individuals between the ages of 45 to 64 experienced almost twice as many hospitalizations than those between the ages of 65 to 74. From 1973 to 1976, there was an average of 191 hospitalizations per year in the 45 to 64 age group compared to an average of 80 hospitalizations per year in the 65 to 74 age group.

The average length of stay in a hospital on Guam for diabetes was 11.8 days (Table IV.38). The national average length of stay was 10.9 days.[45]

4. Infectious Diseases

Infectious disease morbidity prevalence or incidence data may be one of the more useful measures of health status but it also has limitations. Data for different areas may not be strictly comparable because of differences in the accessibility or utilization of health services. For instance, economic or convenience considerations such as transportation problems, may discourage the seeking of physician care except in cases which appear to be life-threatening. In some areas, traditional medicine practitioners may be consulted for all but the most serious problems, and such cases will in all likelihood not be included in the morbidity reporting system.

Variability in the ability of physicians to make a specific diagnosis will also affect the reliability of morbidity data as a measure of health status. Especially in areas where medical laboratory services are marginal, diseases which require laboratory confirmation (such as Salmonella or Shigella infections) may be underreported while other disease designations may come to serve as "catch-alls".

A special problem on Guam is the absence, in many cases, of street addresses. Until recently, many homes did not have house numbers or home mail delivery and listed their address as an Agana Post Office box number. This problem makes compiling data for study and surveys difficult, in those cases when the occurrence of the disease is higher in one area than in another.

Finally, even when diagnosed, disease cases may fail to become a statistic. Reporting of infectious disease cases in private physician offices may approach zero because of the inconvenience involved and lack of readily apparent tangible benefit to patient or physician. Reporting by larger instituions may be better if the cooperation of administrative leaders can be secured, since specific individuals can be assigned the responsibilities for collecting and reporting morbidity data (for example, the Infection Control Nurse, Nursing Coordinator or Medical Records Clerk).

Below, data on the following infectious diseases are examined: pneumonia, bronchitis, venereal disease, repatitis, mumps and measles, tuberculosis, salmonellosis and shigellosis, and parasitism.

4.1. Pneumonia

Pneumonia is an inflammation of the lungs resulting from any of a variety of causes. Pneumonia can be caused by many infectious agents, including bacteria, viruses, yeast and other fungi. It can also be caused by inhaled chemical agents, by radiation, and by allergic reactions to foreign particles in the lungs. Pneumonia sometimes occurs in various diseases that are probably caused by disturbances in the body's immune mechanisms.[47]

4.1.1. Mortality Rates

During the period of 1971 through 1977, pneumonia has averaged 8th among the ten leading causes of death on Guam. For the same period, there was an average of 21 deaths yearly from pneumonia or an average rate of 0.28 per 1000 population.(Table IV.39).

Although insignificant, Guam's average mortality rate for the four years presented in the table above is higher than the U.S. rate per 1000 population. U.S. rates show a consistent rate of decline, whereas Guam's rates seem

sporadic especially when 1976 and 1977 rates are included .291 and .208 per 1000 population respectively.

4.1.2. Age and Sex Characteristics --

Of the average 21 deaths yearly from 1970 to 1977, 52% were males and 48% females. (Table IV.40)

Sixty-six percent of the average yearly deaths from pneumonia were 45 years and over, 19% were infants less than a year old, and the remaining 15% were dispersed between the ages of 1 to 44 years old (Table IV.41)

Between 1971-1977, the pneumonia death rate for males has been fluctuating between .2 to .4 or an average yearly rate of .3 per 1000 male population. Female rates basically follows the same pattern. For the same period, females in the 75 and over age group had the highest average death rate of 17 per 1000 female population, followed by males in the same age group with an average of 11 per 1000 male population (Table IV.42)

On the average, there were 5 pneumonia deaths yearly per 100 total deaths between 1971 and 1977. For the period, there was an average of 5 male and 6 female deaths yearly per 100 total male and female deaths. Within the age groups between 1971 to 1977 per 100 deaths in the ages, the 75 and over age group had more deaths per 100 from pneumonia than any other age group (Table IV.43).

For the period 1972 to 1975, there was an average of 215 cases of pneumonia infection recorded, for a morbidity incidence rate of 2.97 per 1000 population. Of these cases, 84 percent were reported for native Guamanians (Table IV.44). An average yearly total of 3,246 disability days or 14.8 disability days per person were reported for pneumonia cases.

4.2. Bronchitis

The limited mordity data available to assess the number of people affected by bronchitis or asthma suggests an average incidence rate (for 1972 to 1975) of 1.56 cases of bronchitis per 1000 total (civilian and military) population. The condition affects Guamanians much more than other ethnic groups (83 percent of all cases of bronchitis). Of all bronchitis cases, 60 percent were recorded for those aged 1-10 (Table IV.45).

4.3. Venereal Disease

Venereal disease consists of cases[48] of both syphilis and gonorrhea (gonoroccocal infections). Few if any cases of syphilis were reported for the years 1974 to 1978. For

the same period, however, total cases of gonorrhea have averaged (conservatively) 256 (Table IV.46). This number includes both cases contracted on Guam and off-island (the latter averaging at least 92 cases, or 36 percent of all cases). Excluding off-island cases, the average incidence rate for gonorrhea for the period 1974 to 1978 for combined civilian-military population is (conservatively) 1.61 per 1000 population.

For 1977 to 1978, 54 percent of on-island cases were among civilians, and 46 percent were among military personnel. For this same two year period, the average incidence among military personnel was 3.82 cases per 1000, while among civilians, the incidence rate was only 1.11 cases per 1000 population.

4.4. Hepatitis A and B

4.4.1. Hepatitis

Hepatitis A (infectious hepatitis) is an acute or chronic communicable and infectious disease caused by a viral agent. It is most frequently spread by the fecal-oral method of transmission, presumably by means of contaminated food or water in many cases. Outbreaks of the disease are common where sanitation may be minimal and overcrowding occurs. Children and young adults are most frequently affected, presumably because older individuals may have developed some immunity. Symptoms may be inapparent or mild in children and severe in older persons. Humans (and other primates) are the only reservoir of infection.

A. National Data

The Trust Territory islands, Alaska and Guam rank one to three respectively in the national incidence of Hepatitis A. Although these areas represent disparate climatic conditions, they share problems with regard to cultural conflicts resulting from rapid modernization, inadequate and crowded housing, and inadequate drinking water and sewage disposal problems.

B. Guam Data

The very distinct clumping of villages with a high incidence of Hepatitis A in the southern part of Guam emphasizes the need for priority attention to this area to improve sanitation facilities and services.

4.4.2. Hepatitis B

Hepatitis B (serum hepatitis) is an acute or chronic infectious viral disease of relatively low communicability. In Europe and America, it is most frequently spread by the use of inadequately sterilized needles associated with medical procedures or drug use and with blood transfusions. It is suspected that this disease may be transmitted by mosquito bites in Africa and, an unusually high prevalence among certain Asiatic and Pacific populations suggests that it may be spread by other means in these areas also.

A. National Data

Alaska and Guam rank one and two respectively in Hepatitis B incidence (data are not available from the Trust Territory, and it is possible that some cases reported there as Hepatitis A are actually Hepatitis B) (Table IV.47).

B. Guam Data

Hepatitis B infection is one of the few diseases in which the incidence among military and military dependent personnel exceeds that of any civilian area (Table IV.48). This is due at least in part to active case finding efforts, excellent laboratory support and an efficient reporting system. It also probably reflects the seriousness of the illicit drug problem within the military community.

Of additional interest is the fact that all of the cases recorded from Mangilao, the civilian area of Guam with the highest incidence of Hepatitis B infection, were among residents of the Department of Corrections facility in that village.

C. Combined Data

Infectious cases of Hepatitis A and B (and unspecified types) averaged 194 cases for the period 1973 to 1977, for the military and civilian populations combined (Table IV.49). For the civilian population, the average number of cases was 90, compared to 103 cases among military personnel. The average civilian incidence rate was 1.18 cases per 1000 population; while it was 4.7 per 1000 for military. Cases of Hepatitis A were 2.5 times more frequent than cases of Hepatitis B and unspecified types, on average. Hepatitis cases on Guam for this period have primarily affected individuals in the 15 to 30 age group. In 1979, an outbreak of Hepatitis (A and B) quadrupled the number of cases (496) over the previous year

(101); cases of Hepatitis A occurred 1.7 times as often as Hepatitis B and unspecified. In this outbreak, cases were distributed among individuals aged 4 to 40, but were particularly frequent among children aged 5 to 9 (22 percent of all cases). The southern Guam villages of Agat, Inarajan, Merizo, Talofofo and Umatac were all especially over-represented in number of cases.

4.5. Measles and Mumps

Measles and Mumps are both acute, highly communicable infectious diseases caused by viral agents. Both are spread most commonly by direct contact with infected persons. Effective vaccines are available for both of these diseases, so incidence rates will reflect the effectiveness of immunization programs.

A. National Data

Guam ranks fourteenth with respect to the incidence of reported measles cases and sixth with respect to the incidence of reported mumps cases among 56 reporting states, territories and administrative areas of the United States (Table IV.50). Except for the measles rate in Puerto Rico, which ranks eighth, all of the outlying U.S. areas (including Alaska, Hawaii, Puerto Rico, Trust Territory of the Pacific Islands and the Virgin Islands) have lower reported measles and mumps incidence rates than does Guam. Although this apparent difference may be due, at least in part, to underreporting of cases in these areas, taken at face value the data suggests that there is considerable room for improvement in the provision and/or utilization of preventive health services on Guam.

B. Guam Data

Measles and mumps incidence data for Guam show a scattered distribution (Table IV.51). Of particular interest is the fact that the military areas rank among the highest five (top 25 percent) of island areas for both diseases. This suggests that the immunization of military dependent children is lagging behind that of the civilian community. Alternative explanations could include differences in the accuracy and completeness of reporting or differences in the utilization of pre-school childcare centers which could lead to increased risk of spreading these diseases among military dependents.

C. Additional Data on Mumps

The average number of reported cases of mumps for 1973 to 1977 was 74 for civilians, 20 for military, or 103 overall (Table IV.52). The corresponding incidence rates per 1000 population are 0.97, 1.32, and 1.05. However, these figures are inflated by the severe outbreak of mumps in 1974 which generated 388 cases in all, 75 percent of them among civilians, for an overall incidence rate of 4.05 cases per 1000 population. Suppressing this year yields an average incidence rate, for the period, of 0.27 per 1000 civilian population, 0.51 per 1000 military, or 0.32 per 1000 combined population. In the 1974 outbreak, the villages significantly overrepresented in terms of cases of mumps were Inarajan, Merizo, Umatac, and Agat. For the period 1972 to 1976, the U.S. average incidence rate was 0.28 per 1000 population.

D. Additional Data on Measles

For the period 1973 to 1976, an average of 22 civilian cases of measles were reported, for an average civilian incidence rate of 0.23 per 1000 population, 1.6 times greater than the U.S. rate of 0.14 per 1000 for the same period (Table IV.53). Eight of Guam's villages were above this U.S. rate, and 3 villages (Asan, Piti, and Agana) as well as military areas as a whole were above the Guam average rate. (In particular, Agana had a civilian incidence rate of 1.31 per 1000.) An outbreak of rubella in 1973 (46 civilian cases, for an incidence rate of 0.60 per 1000) exceeds the overall incidence. For the period 1974 to 1977, the average civilian rate is only 0.15 per 1000, while the military rate is double this figure at 0.31 per 1000.

4.6. Tuberculosis

Tuberculosis is a chronic, progressive, infectious and communicable bacterial disease. In its early stages, infection may be completely symptomless, but the untreated disease may progress in time to cause severe disability or death. Infected patients who live without symptoms for many years may develop serious symptoms as they grow older or experience some form of stress, perhaps a concurrent illness. The disease is spread by repeated direct contact with an infected person.

A. National Data

Again, with respect to this disease, Guam ranks among the U.S. areas with the highest incidence, exceeded in this case only by Hawaii and the District of Columbia and followed closely by the Trust Territory and Alaska (Table IV.54). The parallel of socio-economic problems in these areas and the problem of high disease incidence rates is

striking.

B. Guam Data

The difference in incidence rates between military and civilian communities is the most striking for this disease of any of those studied (3.6/100,000) rate for the military as opposed to 65.7/100,000 rate for civilian areas), and probably represents both the lessened chance of exposure to this disease in the abbreviated "stateside" type family unit typical of military families as well as the effectiveness of preventive measures such as annual physicals for active duty personnel.

The demographic pattern of the disease within the civilian community does not appear to be correlated with sanitation or economic factors but may be related to some other determinant such as average age of residents (Table IV.54).

C. Summary

For the period 1972 to 1976, Guam ranks among the U.S. areas with the highest incidence rate: 0.43 per 1000 population, or nearly 3 times the U.S. rate of 0.15 per 1000. In 1976, 61 percent of tuberculosis cases (46 cases) were male. For 1972 to 1976, the overall incidence rate is comprised of a rate of 0.66/1000 for civilians, and 0.04/1000 for the military. The five villages with incidence rates above 0.75/1000 population were Asan, Agana, Agat, Sinajana and Merizo.

4.7. Salmonellosis and Shigellosis

Both of these diseases are acute infectious communicable diseases caused by bacterial agents. They are both spread almost exclusively by the fecal-oral route, i.e., the ingestion of contaminated food and drink or, particularly in the case of infants, direct ingestion of fecal material.

Salmonella infections are the result primarily of eating contaminated animal-origin foods (inadequately cooked pork, chicken or eggs, etc.), since animals are the principal reservoir for this disease. Humans are the reservoir of Shigella infections, so cases are contracted by direct contact with an infected patient (typically mother and child or roommates in institutions, etc.) or contamination of food by infected food handlers.

Immunity to these diseases is apparently short-lived, and effective immunizations are not available. Salmonellosis occurs most frequently in the very young but shigellosis typically is most common in adults; the reason for this age difference is not known. The incidence of these diseases is a

reflection of general sanitary conditions in a community and, with respect to salmonellosis in particular, may reflect cultural habits in food preparation and selection.

A. National Data

For the five year period covered by this study, Guam ranks second nationally in the incidence of salmonellosis, behind only Hawaii (in 1977 the Guam incidence surpassed Hawaii). The incidence of reported shigallosis cases on Guam is slightly less than the national average while the Trust Territory has the highest shigellosis incidence rate of any of the areas included in the study (Table IV.55).

B. Guam Data

Diarrhea and gastroenteritis have been recognized as important health problems on Guam since the island's Spanish period, but it is only recently that salmonellosis has been identified as an important constituent of the problem. This development may be due in part to the increased proficiency of local medical laboratories and increased utilization of laboratory services by island physicians. In Hawaii, the salmonella problem has been linked to the consumption of raw pork and ethnic dishes containing hog intestines. This would not seem to be the source of Guam's problem as pork is generally cooked thoroughly, fresh pork offal is not available in local markets, and the salmonella infection rate is high among statesiders and military dependents as well as among Guamanians and Filipinos.

With respect to both salmonellosis and shigellosis, a distinct clustering of high incidence rates among the southern villages of Guam is noticeable. This may be due to poor sanitary conditions in the area as a result of both relatively lower family incomes and inadequate municipal services, particularly the provision of pure drinking water and adequate sewage and garbage disposal.

C. Additional Salmonellosis Data

Between 1973 and 1977, an average of 36 civilian cases of Salmonellosis were reported, for an incidence rate of 0.47 per 1000 population. The incidence rate among the military population is almost half of this figure. Incidence rates above 0.90 per 1000, however, are reported on average (1972 to 1976) for the villages of Umatac, Inarajan, Agana, Talofofo and Asan. In 1975, 38 percent of all cases were in southern villages, with approximate rates of 5.3 per 1000 in Inarajan and 3.8 per 1000 in Talofofo. In 1977, 17 percent of all cases were in the south; 61 percent of all cases were male; and more strikingly,

63 percent of all cases were reported for those under age 4. The overall incidence rate for Guam in the period 1972 to 1976 was 0.24 per 1000 population, compared to 0.11 per 1000 for the U.S. as a whole (Tables IV.56 and IV.57).

4.8. Diseases due to Parasites

Intestinal parasitism was a major problem at the turn of the century. In a Governor's report for 1921 to 1923, figures showed that of an average of 2,128 stools examined, 65 percent tested positive for parasites, particularly ascaris, trichmis, and hookworm.

A stool survey in 1918 revealed a prevalence of hookworm infestation ranging from 66 percent for residents of rural ranches to 92 percent in a southern village, the island average being 72 percent. There did not appear to be significant age or sex distribution differences. A subsequent survey in 1923 indicated that the prevalence of roundworm infestations was 95.2 percent; of whipworms, 71.2 percent and of hookworms, 25.9 percent. Only 0.9 percent of the stools examined contained no parasite ova. At this time, the prevalence of hookworm infestation was slightly higher in adults than in children; the reverse was true in the case of roundworm infestations. Deaths, particularly of young children, were occasionally attributed to parasitism; hookworm disease and ascariasis accounted for two each in 1925, and ascariasis alone accounted for five deaths as late as 1930. Although of doubtful long-term value, this problem led the Naval health authorities to institute routine annual or semi-annual deworming campaigns for all school children.

By 1947, the prevalence of intestinal parasitism had been reduced to an estimated 40 percent. This improvement can probably be attributed to generally improved sanitary conditions and elevated personal hygiene standards rather than treatment of individual cases. Of 2,696 stools examined in 1961 to 1962, 39 percent were tested positive. In the mid-1960's, a limited survey of 879 stools showed 17 percent to be positive. Finally, in 1973, a small-scale survey of four villages (Umatac, Merizo, Yigo, and Dededo), or a total of 337 individuals, was conducted. Overall, 20 percent tested positive for ascaris, 23 percent for trichuris, and 8 percent for protozoa. Umatac and Merizo villages had the highest positive test rates, with 33 percent, 25 percent and 13 percent for the respective parasite categories in Umatac; 21 percent, 28 percent, and 10 percent for Merizo; and the lowest rates in Dededo with 6 percent, 15 percent and 5 percent, respectively. The age group most at risk, as indicated by this study, is the 1 to 9 year old. This problem may be directly correlated with poor sewage disposal facilities,

especially in Umatac and Merizo.

5. Dental Health

The occurence of dental disease among children of the Territory of Guam is comparable in prevalence to most developing areas of the Pacific where dietary patterns have been disrupted due to social and economic change. Specifically, these changes are related to the diet, income, motivation, and the availability and accessibility of dental services. Dental caries constitute the major portion of the total dental problem in Guam. A 1964 dental survey identified among elementary and preschool children a 98 to 99 percent prevalence of dental caries, and an average of 8.3 carious teeth per child. In 1975, a Decayed Missy and Filled (DMF) survey was conducted. The mean DMF was determined to be 7.62 for males and 8.89 for females. A similar study conducted in 1972 reported that as age increased, so also did the mean DMF. The data indicated that the mean DMF for girls was approximately 1.5 surfaces more per examinee than for boys. The mean DMF of non-caucasians was almost double the mean DMF of caucasians. This discrepancy can be explained, in large part, by the differences in dietary patterns of the two people. With the dental care needs as extensive as they are in Guam, and a shortage of practicing dentists, the situation is critical.

D. LIFESTYLE INDICATORS

This presentation is intended to highlight several measurable factors that have large potential or actual negative effects on social well-being, with which health status is linked. They are grouped together as a set of indicators which represent results of disrupted lifestyle: suicide and homicide, drug and alcohol abuse, teenage pregnancy, criminal activity, and the relationship between marriage and divorce. These lifestyle indicators do not add up to a comprehensive picture of lifestyle, nor do they suggest the full set of consequences of disrupted lifestyle. They are used and discussed in the context of this health planning document to indicate the harmful effects to health status that may indirectly result from one or more social and behavioral conditions. In addition, they indicate the breadth of concern which health planning should encompass in dealing with health problems that all too often lay imbedded in the strained social and behavioral fabric of a changing culture that is undergoing rapid westernization.

1. Suicide and Homicide

1.1. Suicide

The seven year average annual rate of suicide deaths for Guam between 1971 and 1977 was determined to be 0.10 per 1000 population, compared to 0.126 per 1000 population for the United States in 1975. The incidence of deaths due to suicide has been increasing in recent years in the

A majority of divorces are native Guamanians. The emergence from a subsistence type economy into a wage-earning one has allowed for more choices in the lifestyle of modern Guamanians, while at the same time introducing strains in family members' traditional roles and values. Household formation is less of an economically necessary unit today than in the past. More leisure time available at present enables Guamanians to explore individual preferences and pursuits. Presently, more women are entering the labor force; in the past, the woman's sole occupation was assumed to be caring for household members, including children and elders. Cultural changes and expanding aspirations on the part of women and conflicting expectations between marriage partners, coupled with the increasingly high cost of living on Guam which "pushes" women into the labor force and out of the home may be the principal agents contributing to the breakdown of many Guamanian marriages (Figure IV.24).

E. DETERMINING HEALTH STATUS PRIORITIES

The basis for the rank order of the following seven health status goals and their respective objectives specifications lies in a two-stage procedure for prioritizing health status problems. The first stage consisted of a formal, inter-agency meeting convened in January, 1979, and consisting of representatives from all the major branches, divisions and public agencies directly or indirectly related to health care provision or health maintenance. Through a modified Delphi Technique, an initial and quite expansive list of health problems was obtained and subsequently narrowed down, over several rounds and after much debate, to a more limited set of health problems identified for Guam's population, with relative priority based on group consensus as to relative severity of each problem, indexed according to the votes received per problem.

With this list of consensus and first-stage prioritization of health problems, the second stage of the procedure involved compiling data and documentation in support of each problem identified. Thus, the initial ranking of health problems on Guam served as a basis for data collection efforts beyond those that had been carried out previously and on a more routine basis; such data, in turn, eanabled a re-ordering and further clarification of health problems in terms of three criteria employed to more critically compare and rank identified problems· (1) productive years of life or activity lost; (2) calculated levels of mortality and mrobidity, and subjective levels of risk of death or disability associated with different health conditions; and (3) prevalence, severity and average duration of specified conditions. No formal, computational ranking procedure was developed to rigorously establish the exact (composite) score for each health problem. Rather, these criteria were used as guides to unambiguously rank health status problem areas (which are translated in to health status goals) in the following order: infant mortality and morbidity; accidents (motor vehicle and non-motor vehicle); chronic diseases; acute, infectious diseases; dental decay and caries· suicide; and substance abuse. Each of these problem areas, and the specific health status problems covered by them, are briefly discussed in turn, followed by the corresponding health status goals and objectives established as the essential basis for comprehensive health planning on Guam.

F. MAJOR HEALTH STATUS GOALS AND OBJECTIVES

This portion of the Plan identifies the critical health status problems, as based on available data, that should be addressed by the health care community in coming years. The goal and objective statements, in particular, provide a specific and measurable focus on which to base health system recommendations for actions to be detailed in the following section. Health status goals and objectives are the foundation for proper, comprehensive health planning with respect to a given area's population. It is with this rationale in mind that the following seven goal statements and their accompanying forty targeted and measurable objectives are presented here.

GOAL I. Infant Mortality And Morbidity Problem Statements

1. Infant Mortality

Although Guam's infant mortality rate has steadily declined since 1974, to a rate in 1977 of 14 infant deaths per 1000 live births, this rate is still short by 2 per 1000 of the national goal of 12 infant deaths per 1000 live births. On Guam, 75 percent of these deaths are in the first 28 days of life. Additionally, half of the municipalities have unacceptable infant mortality rates greater than 20 per 1000, including Inarajan, Umatac, Santa Rita, Agat, Dededo, Agana Heights, Mangilao, Sinajana, and Yona.

2. Fetal Deaths

In the period 1971 to 1975, an average of 42.3 fetal deaths were recorded. While the average fetal death ratio was 14.1, minimum levels of 12.2, 11.1, and 10.1 were recorded for 1971, 1972 and 1973. In 1977, 27 percent of all fetal deaths were due to anoxia, while another 17 percent were due to prematurity and still-born causes. Sixty three percent of fetal deaths occur in pregnancies of 27 weeks or less gestation.

3. Congenital Anomaly

In 1977, the death rate due to congenital anomalies was 0.12 per 1000 population; an average of 0.14/1000, however, was in evidence for the period 1971 to 1977, making congenital anomaly the eleventh ranking cause of death on Guam. Of all infant deaths in 1977 (44), 18.2 percent were due to congenital anomalies. (In 1973, the death rate per 1000 population aged 1 to 4 for the U.S. was 0.096.)

4. Diseases of Early Infancy and Childhood

Deaths due to diseases of early infancy ranked fifth on Guam in the period 1971 to 1977, for an average rate of 0.42 deaths per 1000 population or 7 percent of all deaths. However, in 1977, the average death rate was 0.23 per 1000 population. Diseases of early infancy have ranked as the third and fourth

leading cause of death in Guam for 1974 to 1976, taking 95, (9 percent and 6 percent) of all deaths in those years.

Contributing Problem: Low average birth weight has been linked to a number of infant diseases and complications. Low average birth weights have been recorded particularly among native Guamanians (Chamorros) and has been linked to nutritional deficit and lack of proper prenatal care.

For the years 1965 to 1967, the median birth weight of live-born Guamanian infants was 6 pounds, 15 ounces; compared to 7 pounds 4 ounces for U.S. newborn infants.

5. Otitis Media

In a 1966 screening sample of school-aged children, 17 percent were found to have hearing impairments, and 50 percent of those were due to otitis media. Since 1973, hundreds of children have been diagnosed as suffering from hearing loss by the Hearing and Speech Center. A study in 1970 indicated that hearing loss is four times as frequent among Guamanian school children as for U.S. school children. The problem appears to be particular acute among children of large families (5 or more siblings).

6. Salmonellosis

Of all Salmonella infections recorded in 1977 (a total of 89), 48 percent occurred among infants aged one year or less.

Goals and Objectives

GOAL I Reduce infant mortality and morbidity, with particular attention to reduction in village differentials, neonatal complications, and certain diseases of early infancy with a high incidence among Guam's population.

OBJECTIVE I.1 OVERALL INFANT MORTALITY

Reduce the overall infant mortality rate to at least the national goal of 12 per 1000 live births by 1983.

SUB-OBJECTIVE I.1a NEONATAL MORTALITY

Accomplish objective I.1 by concentrating on reducing the neonatal mortality rate by cutting the rate by a third, from 9/1000 to 6/1000 by 1983.

SUB-OBJECTIVE I.1b VILLAGE DIFFERENTIALS

Reduce the excessive infant mortality rates recorded in half of Guam's villages so that no village has a rate higher than 20/1000 live births by 1983; and concentrate in particular on four key villages with the highest rates: Inarajan, Umatac, Agat, and Agana Heights.

OBJECTIVE I.2 FETAL DEATHS

Reduce the number of fetal deaths (not counting interrupted pregnancies) by 1983 to achieve a fetal death ratio of 12.0 (a 15 percent reduction from the average for 1971 to 1976).

SUB-OBJECTIVE I.2 PREMATURITY AND GESTATION PERIOD

Accomplish objective I.2 by halving the number of fetal deaths due to prematurity and by improving the average gestation period, thereby reducing fetal complications and anoxia.

OBJECTIVE I.3 CONGENITAL ANOMALY

Reduce the overall death rate due to congenital anomalies to 0.10 per 1000 population, principally by reducing deaths among newborn infants due to congenital anomalies, by 1983.

OBJECTIVE I.4 EARLY INFANT DISEASES

Reduce the overall mortality rate for early infancy diseases as well as the incidence, in particular, of Otitis Media and Salmonellosis.

SUB-OBJECTIVE I.4a EARLY INFANT DISEASE DEATHS

Reduce the rate of deaths due to all diseases of early infancy by 50 percent by 1983, for a target of 0.12 per 1000 population.

SUB-OBJECTIVE I.4a (CONTRIBUTING OBJECTIVE)

Achieve an increase in the average birth weight of infants born to island women, particularly Chamorros by 1983.

(Improve the health and life expectancy of infants at birth as indexed by an increase of % in the birth weight of infants, particularly for native Guamanian mothers.)

SUB-OBJECTIVE I.4b OTITIS MEDIA

Reduce the level of hearing impairment among infants and school-age children by at least 50 percent by 1983.

SUB-OBJECTIVE I.4c SALMONELLOSIS

Reduce the incidence of Salmonella infections among childred aged one year to less than 20 percent of all Salmonella cases by 1983.

GOAL II. ACCIDENTS PROBLEM STATEMENTS

1. ALL ACCIDENTS

For all accidents, the U.S. average mortality rate for 1970 to 1975 was 0.47 per 1000. For Guam in the period 1972 to 1976, this rate was 0.85/1000 population, almost double the U S. average.

2. MOTOR VEHICLE

For the period 1970 to 1975, the average mortality rate for motor vehicle accidents in the U.S. was 0.20/1000 population; whereas, for Guam the average for 1972 to 1976 was double this at 0.44/1000. For the period 1971 to 1977, motor vehicle

accidents as a leading cause of death in Guam have averaged third in rank. The U.S. rate has generally been declining over this period, while Guam's rate has not. Eighty-two percent of Guam motor vehicle deaths occur among males; males in the 15 to 24 age group are especially vulnerable.

3. OTHER ACCIDENTS

An average of 29 deaths per year were recorded for the period 1971 to 1977, for an average mortality rate of .39 per 1000 population. Four times as many males as females died during this period in this category. For the years 1972 to 1975, the Guam mortality rate exceeds the U.S. rate and does not appear to be declining like the U.S. rate. Drowning was the leading cause of death in this category (30 percent of deaths), followed by accidental falls (15 percent).

4. OCCUPATIONAL INJURY

The incidence of cases of occupational injury in Guam, expressed as a rate per 100 employees, covering all private sector industries, has declined from 6.8 in 1974, to 6.0 in 1975, and 4.7 in 1976. During the same period, the incidence rate of injury in the contract construction industry fell from 13.1 cases to 12.2 cases per 100 employees. In 1976, a rate of 21.4 cases per 100 employees was recorded for residential construction. Two of the total of 5 fatalities in this year were registered in the construction sector. The occupational injury incidence rate in the private sector on Guam is less than the United States rate for both 1976 (9.2) and 1975 (9.1), and the rate for contract construction on Guam is less than the United States rate for these years (15.3 and 15.9). In general, therefore, occupational injury is not a priority health problem for Guam, although attention should be addressed to conditions and safety precautions that may influence occupational injuries associated with residential construction.

GOAL AND OBJECTIVES

GOAL II Reduce the deaths and injury associated with accidents of all kinds, in particular motor vehicle accidents and accidents affecting the young adult age group (15-24).

OBJECTIVE II.1 MORTALITY DUE TO ALL ACCIDENTS

Reduce the overall mortality rate due to accidents of all kinds by 60% to at most 0.50 deaths per 1000 population by 1983.

OBJECTIVE II.2 MOTOR VEHICLE ACCIDENT MORTALITY

Reduce the unacceptably high mortality rate due to motor vehicle accidents by at least 50% from 0.44/1000 population to 0.22/1000 population by 1983.

SUB-OBJECTIVE II.2 YOUNG MALES AT RISK

Reduce for motor vehicle mortality rate in particular among all males and females aged 15-24 by 50% by 1983.

OBJECTIVE II.3 DEATHS DUE TO OTHER ACCIDENTS

Reduce the mortality rate due to accidents other than motor vehicle accidents by 30% from 0.39/1000 population to at least 0.27 per 1000 population by 1983.

SUB-OBJECTIVE II.3 DROWNING, FALLS, AND SUFFOCATION

Reduce deaths due to non-motor vehicle accidents primarily by reducing the number of deaths due to drownings, falls (chiefly among the elderly), and suffocation (chiefly among children).

OBJECTIVE II.4 OCCUPATIONAL INJURY

Continue to improve the working environment and occupational safety in order to further reduce the number of occupational injuries, particularly in the contract construction industry, to achieve an injury incidence rate per 100 employees of not more than 10 cases by 1983.

GOAL III. CHRONIC DISEASE PROBLEM STATEMENT:

1. CHRONIC DISEASE

In 1977, 44 percent of all deaths were due to six key chronic diseases: 1) cardiovascular, 2) cancer, 3) cerebrovascular, 4) central nervous system disorders (ALSPD), 5) cirrhosis of the liver, and 6) diabetes mellitus. For the period 1971 to 1977, the average mortality ratio due to these chronic diseases was 2.46 deaths per 1000 population; 43 percent of all deaths were due to these diseases. This rate can be expected to rise as the population of Guam continues to age and thus, becomes more susceptible to chronic diseases of all kinds.

2. CONTRIBUTING PROBLEM

Public health clinicians and officials have long recognized obesity as a major contributing factor to deaths and disease of a chronic nature. Between 1967 and 1968, 112 females and 20 males were hospitalized with a primary or associated diagnosis of obesity.

3. CANCER (MALIGNANT NEOPLASMS)

In 1977, cancer was the third leading cause of death on Guam. It was second leading cause for the U.S. and for Guam for the period 1971 to 1977. Whereas the U.S. trend showed a rise in the mortality rate, the Guam trend suggests a decline. Both in the U.S. and on Guam, the respiratory system and digestive organs were the primary sites for malignant neoplasms, accounting for 50 percent of the mortalities rate for cancer. On Guam, 85 percent of the deaths due to malignant neoplasms occurred in the 45+ age group.

4. CEREBROVASCULAR DISEASE

In 1977, cerebrovascular disease (including stroke) ranked as the fourth leading cause of death on Guam, with a mortality rate of 0.32 per 1000 population. The average rate of 0.36 per 1000 for the period 1972 to 1976 on Guam is lower than the U.S. average rate for the same period of 0.40. However, there is no decline evident over the period in Guam as there is for the U.S. Of deaths due to cerebrovascular disease, 87 percent occurred among people aged 45+. (Fifty percent of such deaths were among those aged 65+.)

5. DISEASES OF THE CENTRAL NERVOUS SYSTEM - ALS-PD

During the period 1971 to 1977, an average of 18.4 deaths due to diseases of the central nervous system were recorded. This represents a mortality rate of 0.25 per 1000 population. The primary causes of death within this category are two diseases peculiar to Guam: Amyotrophic Lateral Sclerosis or ALS (accounting for 53 percent of central nervous system deaths from 1971 to 1977), and Parkinson's Dementia or PD (accounting for 47 percent of deaths). Since 1950, there has been a decline in the incidence and mortality of both diseases, especially ALS. However, for the period 1971 to 1977, the U.S. recorded an average .01 deaths from ALS/PD for every 100 deaths, while Guam recorded 4.4 deaths from ALS/PD per 100 deaths, a mortality ratio 440 percent greater. ALS/PD therefore remains a critical health problem on Guam, particularly among the native Chamorro population and, to a more limited extent, among Filipinos on Guam.

6. CIRRHOSIS OF THE LIVER

For the period 1971 to 1977, cirrhosis of the liver was the ninth leading cause of death with an average mortality rate of 0.19 deaths per 1000 population. For the period 1970 to 1975, the average mortality rate on Guam due to cirrhosis of the liver was 0.16 deaths per 1000 population, compared to 0.15 per 1000 population for the U.S. as a whole. There is no trend of decrease in the death rate due to cirrhosis of the liver in the period 1971 to 1977. The age group with the highest cause-specific death rate was persons aged 45 to 64 with 69 percent of yearly cirrhosis deaths. Males were 3.5 1/2 times more at risk than females overall. Cirrhosis of the liver is closely associated with heavy drinking and alcoholism.

7. DIABETES

During the period 1971 to 1977, diabetes ranked as the tenth leading cause of death on average, with an average mortality rate of 0.15 deaths per 1000 population. There is no consistent trend in the yearly mortality rate during this period. For the period 1971 to 1975, the U.S. average rate was 0.18 per 1000 while Guam's average rate was 0.15 per 1000 population.

The 45 to 64 age group had the greatest frequency of cause-specific death (54 percent of all diabetes deaths recorded between 1972 and 1976). For the period 1973 to 1976, there was an average of 5 cases per 1000 population hospitalized for diabetes mellitus, with demonstrated greater susceptibility among Guamanian females, especially among those aged 65+. For 1971 to 1977, in the 45 to 64 age group, Guam had an average diabetes mortality rate among females of .96/1000, four times the national average rate of 0.2 per 1000.

GOAL III Reduce the contribution of chronic diseases to the rate of deaths recorded on Guam per 1000 population, with particular attention to the leading causes of death (cardiovascular, cancerous, and cerebrovascular diseases), and the high incidence and mortality among certain age-segments of the population from specialized chronic diseases (ALS/PD, cirrhosis of the liver, and diabetes).

OBJECTIVE III.1 HEART DISEASE

By 1983, reduce the mortality rate due to heart disease by at least 20 percent to 0.8 deaths per 1000 population, and reduce the morbidity rate (hospitalization rate) by 15 percent.

OBJECTIVE III.1a ISCHEMIC HEART DISEASE

Reduce the high mortality rate among cerebrovascular diseases from deaths due to ischemic heart disease by at least a 25 percent reduction in in reported deaths due to ischemia, especially among native Guamanians (Chamorros) and those aged 45+.

OBJECTIVE III.1b HYPERTENSION

Reduce the incidence of hypertension and hypertensive heart conditions by at least 10 percent by 1983.

OBJECTIVE III.1c OBESITY

Reduce the complications, chronic disease incidence, and mortality linked to obesity by achieving a reduction in average weight per person, especially among native Guamanian women.

OBJECTIVE III.2 CANCER

Attempt to achieve a reduction of at least 10 percent in the number of deaths on Guam due to cancer by 1983.

OBJECTIVE III.3 CEREBROVASCULAR DISEASE

Attempt to achieve at least 10 percent reduction in deaths due to cerebrovascular conditions by 1983, especially among those aged 45 and above.

OBJECTIVE III.4 ALS-PD

Attempt to reduce the mortality rate due to ALS/PD by 10 percent by 1983, with particular attention to the Chamorro population.

OBJECTIVE III.5 CIRRHOSIS OF THE LIVER

Reduce the mortality rate due to cirrhosis of the liver to less than 0.14 deaths per 1000 population by 1983, with particular attention to the 45 to 64 age group and males.

OBJECTIVE III.6 DIABETES

Reduce the mortality rate due to diabetes to less than 0.15 for any and all groups, with particular attention to reducing the high rate recorded for females aged 45 to 64 by 50 percent by 1983.

GOAL IV. INFECTIOUS DISEASES PROBLEM STATEMENTS:

1. PNEUMONIA

During the period 1971 to 1977, pneumonia averaged seventh among the leading causes of death on Guam. It was responsible for an average of 21 deaths yearly or 0.28 deaths per 1000 population. Guam's average mortality rate for the seven year period is slightly higher than the corresponding U.S. average of 0.26 per 1000 population. Both in the U.S. and on Guam, the general trend is a gradual decline in mortality rates associated with pneumonia. Of the average yearly deaths from pneumonia, 66 percent occurred among those aged 45 and over; 19 percent were among infants less than one year old. For the period 1972 to 1975, an average incidence (morbidity) rate of 2.97 cases per 1000 population were registered, 84 percent of them among native Guamanians.

2. VENEREAL DISEASE

For the period 1974 to 1978, yearly cases of gonorrhea have averaged 256 (conservative figure). Excluding off-island cases, the average incidence rate of gonorrhea among civilians is 1.11 cases per 1000 population, while among military personnel it is 3.82 cases per 1000.

3. HEPATITIS

Infectious cases of Hepatitis A and B, and unspecified types averaged 194 cases for the period 1973 to 1977 for military and civilian population combined. The average civilian incidence rate was 1.18 cases per 1000 population, while it was 4.7 per 1000 for the military. Cases of Hepatitis A were 2.5 times as frequent as Hepatitis B and unspecified types, on average. Cases primarily affect the 15 to 30 age group. During severe outbreaks, southern villages appear to be particularly susceptible to the disease.

4. MUMPS

The average number of reported cases of mumps for 1975 to 1977 was 74 for civilians and 29 for the military; the corresponding incidence rates were 0.97 per 1000 (civilian) and 1.05 per

1000 (military). A severe outbreak of mumps in 1974, however, generated 388 cases in all, 75 percent of them among civilians, for an incidence rate of 4.05 cases per 1000 population. (Suppression of this year's data yields average incidence rates of 0.27 per 1000 civilian, and 0.51 per 1000 military). In the 1974 outbreak, southern Guam villages were again significantly overrepresented in terms of cases. For the period 1972 to 1976, the U.S. average incidence rate for cases of mumps was 0.28 per 1000 population.

5. MEASLES (RUBEOLA)

Between 1973 and 1976, 22 civilian cases of measles yearly were reported for an average incidence rate of 0.23 per 1000 population, which was 1.6 times greater than the U.S. average rate of 0.14 per 1000. Three Guam villages (Asan, Piti, and Agana) were above the Guam average incidence rate. Suppressing the 1973 outbreak of rubeola, which was double the average number of cases for the study period, incidence rates for civilian population are 0.15 per 1000, and for military population 0.31 per 1000.

6. PULMONARY TUBERCULOSIS

For the period 1972 to 1976, Guam ranks among the U.S. areas with the highest incidence rate: 0.43 per 1000 population, nearly three times the U.S. rate of 0.15 per 1000 population. The average civilian rate is 0.66 per 1000, while the average military rate is 0.04 per 1000. Five villages had average rates higher than 0.75 per 1000: Asan, Agana, Agat, Sinajana, and Merizo.

7. SALMONELLOSIS

Between 1973 and 1977, an average of 36 civilian cases of salmonellosis were reported, for an average incidence rate of 0.47 per 1000 population. The incidence rate among military personnel was almost half this figure. Incidence rates above 0.90 per 1000, however, were recorded for the villages of Umatac, Inarajan, Talofofo, Asan, and Agana. In 1977, 61 percent of all cases were male, and 63 percent of all cases were among those under age 4. For 1972 to 1976, the Guam incidence rate was 0.24 per 1000 compared to the U.S. rate of 0.11 per 1000.

8. SHIGELLOSIS

The average reported incidence rate for shigellosis from 1973 to 1977, is about .25 that of salmonellosis, or 0.12 per 1000 population; but villages in southern Guam (Inarajan, Talofofo, and Merizo) have rates higher than 0.36 per 1000. Civilian and military rates are equivalent over the period. For 1972 to 1976, Guam's incidence rate of 0.08 was near the U.S. rate of 0.09 per 1000 population.

9. PARASITIC DISEASES

It is apparent that prevalence rates among school-aged children on Guam of parasites, particularly intestinal parasites, exceed 30 percent in some villages, notably in the south. A survey in 1974 indicated that Umatac and Merizo villages had positive test rates for ascaris and trichuris exceeding 20 percent. The age group most at risk appears to be children aged 1 to 9. The full extent of parasite infection is not known at this time.

10. BRONCHITIS

The limited morbidity data available to assess the number of people affected by bronchitis suggests an average incidence rate from 1972 to 1975 of 1.56 cases per 1000 in the combined civilian and military population. The disease affects native Guamanians much more than other ethnic groups (83 percent of all cases). Of all cases recorded, 60 percent were for those aged 1 to 10.

GOAL IV. Reduce the mortality rate due to infectious diseases or communicable diseases on Guam, especially mortality due to pneumonia, and reduce the morbidity rate and disability associated with particular infectious diseases with high case rates on Guam.

OBJECTIVE IV.1 PNEUMONIA MORTALITY

By 1983, reduce the average mortality rate for pneumonia from the current 0.28 deaths per 1000 population to no greater than 0.25 per 1000 population, with particular attention to cases among newborn infants.

SUB-OBJECTIVE IV.1a PNEUMONIA MORBIDITY

By 1983, reduce the morbidity rates associated with pneumonia by at least 10 percent from 2.97 cases per 1000 to 2.65 or fewer cases per 1000 population, with particular attention to morbidity among native Guamanians.

OBJECTIVE IV.2 BRONCHITIS MORBIDITY

Assuming current incidence rates of 1.56 cases per 1000 combined military and civilian population, reduce the incidence of this condition by at least 15 percent by 1983 to 1.33 or fewer cases per 1000 population, with special emphasis placed on reducing morbidity among children aged 1 to 10 and among native Guamanians, as two primary target groups.

OBJECTIVE IV.3 VENEREAL DISEASE MORBIDITY

Reduce the combined civilian-military case rate for gonorrhea by at least 40 percent,, from 1.61 cases per 1000 to 0.97 or fewer cases per 1000 by 1983, with particular attention paid to military personnel as a high-incidence target group.

OBJECTIVE IV.4 HEPATITIS MORBIDITY

Reduce the incidence of cases of infectious Hepatitis A, B and unspecified types by 50 percent by 1983, including a reduction

in the rate for civilians to 0.60 per 1000 and for military to 2.3 per 1000 for Hepatitis A, with particular attention paid to military personnel and to children ages 5 to 9 as target groups, and to southern Guam villages as a primary target area.

OBJECTIVE IV.5 MUMPS AND MEASLES (RUBEOLA) MORBIDITY

Reduce the civilian incidence rate of mumps to at least 0.25 cases per 1000 population by 1983, with special emphasis placed on southern Guam villages, and reduce the measles (rubeola) incidence rate by 50 percent from 0.23 per 1000 combined military-civilian population to 0.12 per 1000 by 1983, with military personnel as the primary target groups.

OBJECTIVE IV.6 TUBERCULOSIS MORBIDITY

Reduce the incidence rate of pulmonary tuberculosis cases by at least 50 percent by 1983, from 0.43 per 1000 population to 0.22 per 1000 combined population, with efforts targeted to the villages of Agana, Asan, and southern Guam.

OBJECTIVE IV.7 SALMONELLOSIS AND SHIGELLOSIS MORBIDITY

By 1983, reduce the incidence rate of salmonellosis among civilians in half, from 0.47 per 1000 to 0.25 per 1000, with efforts focused on children under the age of 5 as a target group, and southern Guam and Agana-Asan as target areas. And reduce the incidence rate of shigellosis by at least 10 percent by 1983, with particular attention to the above target areas.

OBJECTIVE IV.8 MORBIDITY DUE TO PARASITES

Assuming a current prevalence rate overall of roughly 15 percent of the school aged population disabled by parasitic infections, reduce the rate to 8 percent or less by 1983, with particular attention to children aged 1 to 9 and to southern Guam villages.

GOAL V. DENTAL HEALTH PROBLEM STATEMENT

Dental caries constitutes the major portion of the problem of dental ill-health on Guam, with an estimated 90 percent of all elementary and pre-school age children having carious teeth. The average number of carious teeth per child is approximately 8. Decayed, missing and filled teeth (DMF) counts obtained by survey suggest a mean of 7.6 DMF teeth for males and 8.9 for females. Mean DMF counts are double for non-caucasians compared to caucasians.

GOAL V. Reduce the high rates of incidence and prevalence of dental problems, especially dental caries, among Guam's population.

OBJECTIVE V.1 DENTAL CARIES PREVALENCE

Reduce the prevalence of dental caries by 1983 from the estimate of 90 percent of all school children by at least half, with particular attention to the non-caucasian population and to females.

OBJECTIVE V.2 DMF RATE

Reduce the mean number of decayed, missing and filled teeth by at least 10 percent for both males and females, to no more than 6.8 DMF teeth per male and 8 DMF teeth per female by 1983, with particular emphasis on schoolage children and their dental health.

GOAL VI. SUICIDE PROBLEM STATEMENT

The seven year average annual rate of deaths due to suicide between 1971 and 1977 was 0.10 per 1000 population; in 1975, the U.S. rate was 0.13 per 1000 population. While the suicide rate has increased in recent years for the U.S. as a whole, there is no demonstrable trend in Guam's suicide rate. The average annual suicide rate for males for the seven year period was 0.85 per 1000 and only 0.15 per 1000 females. It should be noted, however, that for the last three years (1975 to 1977), an average rate of 0.21 suicides per 1000 population was recorded. Most suicides occur in the 15 to 25 age group.

GOAL VI. Reduce the rate of suicides on Guam, with particular attention to problems faced by adolescents and young adults.

OBJECTIVE VI.1 SUICIDE RATE

By 1983, reduce the rate of suicides, espesially among young adults, by at least 25 percent, to no more than 0.075 per 1000 population, and concurrently alleviate mental and emotional problems that underlie suicide.

GOAL VII. SUBSTANCE ABUSE PROBLEM STATEMENT

1. DRUG ABUSE (HEROIN)

Using the Heroin Problem Index (HPI), Guam ranks sixth out of 24 U.S. areas in terms of treatment for drug abuse, first in terms of emergency room drug-related cases per 1000 population (3.26 per 1000 in 1976), and third in terms of death rate associated with drug abuse, for an overall HPI ranking of first (most critical) area out of the 24 studied. Using the Indicator Dilution Method, the prevalence rate for heroin use on Guam in 1976 was estimated at 11.8 per 1000 population. During Fiscal Year 1978, 128 admissions and 197 discharges were recorded by the Methadone Clinic. Of the clinic's clients, 98 percent are heroin addicts (compared to 51 percent nationally). Predominantly male, more than two-thirds of the clients are between the ages of 21 and 30. Forty-one percent of the Clinic's clients began using heroin between the ages of 18 and 21.

2. ALCOHOL ABUSE

Direct counts of alcoholic cases are not available, but the severity of the problem of alcoholism and alcohol abuse can be assessed roughly by certain cirrhosis deaths and by alcohol-

related traffic fatalities. Between 1968 and 1972, Laennec's cirrhosis (directly linked to extended alcohol abuse) was found responsible for 10.2 percent of all cirrhosis deaths on Guam in the age group 45 to 54. Of all caucaisan deaths in the age interval 45 to 54, 25.7 percent were due to alcohol-induced cirrhosis. In addition, Department of Public Safety data show that 15.3 percent of all traffic deaths for 1976 to 1978 were the direct result of drunken driving.

GOAL VII Reduce the incidence of drug and alcohol related deaths, as well as the incidence and prevalence of drug and alcohol abuse and addiction on Guam.

OBJECTIVE VII.1 DRUG ABUSE

By 1983, reduce the drug-related death rate as well as drug-related hospital admissions and heroin use prevalence rates by 50 percent, with particular attention paid to addicts and potential abusers including males aged 18 to 30.

OBJECTIVE VII.2 ALCOHOL ABUSE

By 1983, reduce the rate of mortality due to alcohol abuse, including cirrhosis of the liver and alcohol related traffic fatalities by at least 25 percent, and reduce the prevalence of alcohol abuse (morbidity) by at least 15 percent.

IV. HEALTH STATUS PROFILE

G. HEALTH STATUS RECOMMENDED ACTIONS

THIS SECTION WILL BE DEVELOPED IN THE FY 1980 REVISION OF THE GUAM HEALTH PLAN.

V. HEALTH DELIVERY SYSTEM

V. HEALTH DELIVERY SYSTEM

A. INTRODUCTION

A health system is the interaction of all the services, functions, and resources available to population for the purpose of maintaining or improving health. This broad definition of health is "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." An individual's health is affected by many factors which can be structured into the following categories

1. Biological factors associated with the human body contribute to the individual's level of wellness. The human physiology of maturation, reproduction and aging affect one's health and need for health care services. Biological factors are those beyond the individual's ability to control: chronic disease, genetic disorders, and congenital problems are examples of health problems arising from the human biology.

2. Lifestyle factors involve individual preferences and decisions to pursue behavior which adversely affect one's health Examples of self-imposed health risk include cigarette smoking, excessive alcohol consumption, and other forms of drug abuse and addiction.

3. Environmental factors are the physical and social elements over which an individual has little or no control. Examples of these factors include occupational hazards, environmental pollution, food and drug contamination and community sanitation practices. To a great extent, the control of communicable diseases can be traced to improvements to the physical and social environment.[78] Better solid waste and sewage disposal methods, water purification, sanitary food processing practices, and vector control interrupt the chain of transmission of such communicable diseases as typhoid, botulism, yellow fever and malaria.

4. Health services consist of the various combinations of manpower, facilities, and other community resources employed in the prevention, detection, and treatment of health problems and the habilitation or rehabilitation of individuals with physical or mental impairments. Health services differ from the other health factors discussed earlier in that health care services are intended to eliminate health problems arising from lifestyle, human biology or environmental factors.

Planning Scope

The first edition of the Guam Health Systems Plan(HSP) will focus on health services as a distinct system. This approach to the health system is consistent with the various planning guidelines promulgated by the Department of Health, Education, and Welfare in response to the requirements of the National Health Planning and Resources Development Act.[79] The interrelationship between health services and the biological, environmental and lifestyle factors of the health system will be discussed in the health services component of the HSP.

A health services system consists of a network of providers, facilities, and support services and the linkages between these elements are the clientele. A non-system is said to exist when the linkages are weakened to where little or no communication occurs within the network.

B. DESIRED HEALTH SERVICES SYSTEM

An ideal health services system is responsive to the needs of its target population. There are certain desirable characteristics which all health services system have. These are as follows:

1. cost
2. availability
3. accessibility
4. acceptability
5. continuity
6. quality

Cost, availability, and accessibility are closely interrelated. The Congressional findings stated in the National Health Planning and Resources Development Act illustrate this interrelationship:

FINDINGS AND PURPOSE

"Sec. 2. (a) The Congress makes the following findings:
The achievement of equal access to quality health care at a reasonable cost is a priority of the Federal Government. The massive infusion of Federal funds into the existing health care system has contributed to inflationary increase in the cost of health care and failed to produce an adequate supply or distribution of health resources and consequently has not made possible equal access for everyone to such resources
Increases in the cost of health care, particularly of hospital stays, have been uncontrollable and inflationary, and there are presently inadequate incentives for the use of appropriate alternative levels of health care, and for the substitiution of ambulatory and intermediate care for inpatient hospital care."

Easy accessibility to health services, and the adequate availability of a mix of health services are contradictory to the goal of cost containment. An ideal health services system should present a balanced supply of the various health services at appropriate levels in an efficient and economic manner within the resource capacity of both the individual and the community. To this end, the Twelfth Guam Legislature in 1974 enacted the Consumer Health Protection Act (P.L. 12-156) which calls for compulsory prepaid health coverage for all employees, on the assumption that the best method of controlling cost and assuring accessibility and quality health care is through a prepaid health plan. Implementation of this Act awaits the development of a set of rates and benefits by the Health Commission established by the Act to regulate prepaid health plans. The continuity of a health services system is a measure of the effectiveness of the linkages between the various elements of the health services system to each other and to the patient. A Health services system should be intergrated so that the patient is treated as a whole individual rather than an assemblage of symptoms and disorders.

Taxonomy of a Health Services System

In order to evaluate the health services system in terms of cost, availability, accessibility, continuity, acceptability, and quality, an analytical scheme has been developed which classifies the health services system into health services and settings as follows:[81]

A. Health Services

1. Community Health Promotion and Protection
2. Prevention and Detection
3. Diagnostic and Treatment
4. Habilitation and Rehabilitation
5. Maintenance
6. Personal Health Care Support
7. Health System Enabling

B. Health Services Settings

1. Community
2. Home
3. Mobile
4. Ambulatory
5. Short-stay
6. Long-stay
7. Free-standing support

Levels of Services

Health services can be catergorized into several levels based upon the complexity and intensity of the services. Four levels have been identified as follows:

1. Pre-medical level services: Community and individual level programs and actions directed at preventing the onset of illnesses which arise from the environmental and lifestyle factors. Examples include air and water pollution control programs, the licensure of food handlers, community highway safety programs, and weight watchers programs.

2. Primary level services: Health services adequate for most daily personal health needs such as routine physical, dental or prental examinations, immunization or the treatment of minor illnesses such as the flu, measles, or colds.

3. Secondary level services: Health services requiring specialized care and/or inpatient care for patients referred by a primary care physician because of such factors as pre or post natal complications, a cancer diagnosis, or rehabilitation therapy services.

4. Tertiary level services: Health services requiring specialized care for health problems which occur infrequently in the population and which requires a higher degree of technological sophistication than secondary level services.

Health Specialization

The systematic development of the capital intensive and highly specilized secondary and tertiary levels of health services consumers an inordinate amount of health resources. For example, the resource and support service needs of specialized health services account for approximately 45 percent of hospital cost increases in 1975.[82] The Federal government's emphasis on cost containment of hospital-based services has resulted in the development of quantitative planning guidelines for these services (Table V.1)[83]

TABLE V.1

NATIONAL GUIDELINES FOR HEALTH PLANNING

Service/Resource	Standard
1. General Hospitals Bed Supply	There should be less than four non-federal short-stay hospital beds for each 1,000 persons in a health service area.
2. General Hospitals - Occupancy Rate	There should be an average occupancy rate for medically necessary hospital care of at least 80 percent for all non-federal, short stay hospital beds.
3. Obstetrical Services	a) Obstetrical services should be planned on a regional basis with linkages among all obstetrical services and with neonatal services. b) Hospitals providing care for complicated obstetrical problems should have at least 1,500 birth annually. c) there should be an average annual occupancy rate of at least 75 percent in each obstetrical unit with more than 1,500 births per year.
4. Neonatal Special Care Units	a) Neonatal services should be planned on a regional basis with linkages to obstetrical services. b) The total number of neonatal intensive and intermediate care beds should not exceed 4 per 100 live births per year. c) A single neonatal special care unit should contain a minimum of 15 beds.

Service/Resource	Standard
5. Pediatric Inpatient Services Number of beds	There should be a minimum of 20 beds in a pediatric unit in urbanized areas
6. Pediatric Inpatient Services Occupancy	Pediatric Units should maintain average annual occupancy rates related to the number of pediatric beds in the facility as follows: # Pediatric Beds — Occupancy Rate 20-39 — 65% 40-79 — 70% 80+ — 75%
7. Open Heart Surgery	a) There should be a minimum of 200 open heart procedures performed annually within three years after initiation, in any institution in which open heart surgery is performed on adults. b) Thereshould be a minimum of 100 pediatric hear operations annually, within three years after initiation in which pediatric heart surgery is performed, of which at least 75 should be open heart surgery. c) There should be no additional open heart units initiated unless each existing unit in the health service area is operating and is expected to continue to operate at a minimum of 50 open heart cases in pediatric services.
8. Cardiac Catheterization Unit Services	a) There should be a minimum of 300 cardiac catheterization of which at least 200 should be intracardiac or coronary artery catheterizations, performed annually in any adult cardiac catheterization unit within three years after initiation. b) There should be a minimum of 150 pediatric catheterizations performed annually in any unit performing pediatric cardiac catheterizations within three years after initiation.

Service/Resource	Standard
	c) There should be no new cardiac catheterization unit opened in any facility not performing open heart surgery. d) There should be no additional adult cardiac catheterization unit opened unless the number of studies per year in each existing unit in the health service area is greater than 500 and no additional pediatric unit opened unless the number of studies per year in each existing unit is greater than 250.
9. Radiation Therapy	a) A megavoltage radiation therapy unit should serve a population of at least 150,000 persons and treat at least 300 cancer cases annually, within three years after initation. b) There should be no additional megavoltage units opened unless each existing megavoltage unit in the health service area is performing at least 6,000 treatments per year.
10. Computer Tomographic Scanners	a) A computed Tomographic Scanner should operate at a minimum of 2,500 medically necessary patient procedures per year for the second year of its operation and thereafter. b) There should be no additional scanners approved unless each existing scanner in the health service area is performing at a greater rate than 2,500 medically necessary patient procedures per year. c) There should be no additional scanner approved unless the operators of the proposed equipment will set in place data collection and utilization review system.

Service/Resource	Standard
11. End-Stage Renal Disease (ESRD)	The Health Systems Plan established by HSAs should be consistent with standards and procedures contained in the Federal regulations governing conditions for coverage of suppliers of end-stage renal disease services (20 CFR Part 405, Subpart U.)

C. Existing Health System

Guam's "medical care delivery system" today is greatly similar to many typical health delivery of any system encountered within the United States. Generally speaking, Guam has a multi-varied system with all of the same elements as could be found in any similar community. Private individual physicians and dentists, multi-specialty medical groups, government health programs, private pharmacies and optometrists, a military system of hospital and feeder outpatient facilities, profit and non-profit agencies, a government hospital, volunteer groups, and both private and government medical care financing programs all exist in Guam. In addition, Guam currently has two health maintenance organizations (HMOs) the FHP/HML and the GMHP organizations.

It is a system or one might refer to it as a non-system which provides medical care to the people of Guam in the same manner as, say, the people in Des Moines, Iowa, probably receive theirs. The benefits derived are similar and problem areas are those that can also be found anywhere else.

Guam's system of medical care is not a particularly unique one. It does, however, exhibit some characteristics which differentiate it from other communities. Foremost among these would be the fact that Guam is an isolated area surrounded by hundreds, even thousands of miles of ocean. It must rely on its own resources, however limited they might be.

It also is a relatively new system. Although this might be equated by some with a low experienced level, it also means that Guam can learn and profit from mistakes already made in other geographical locations. Additionally, it means that the system in Guam is not an entrenched one and, therefore, is probably more open to new ideas and innovations as they might be applied in providing for the growing medical needs of the people here.

Guam basically has two independent and separate medical care systems the military and civilian medical care system. It serves two separate population groups almost equal in size with each group generally seeking services in its own sector of medical care services. There are about persons here on Guam eligible to receive some services within the military system, and anywhere from persons who receive the majority of their medical care within the civilian system. We do not have any information regarding the number of military personnel and dependents who receive health care services from the civilian subsystem. We also do not know how many patients are serviced by the military system who are also using civilian services. Hence, while each system has a distinguishable consumer-provider element, we do not know exactly where they interface with one another.

Within the civilian system, there are two separate components operating in which somewhat usually functions together more or less on a complementary basis; and in generally defined areas of responsibility.

Generally speaking, the Government of Guam provides health services needed on a community-wide basis. Specifically, it operates the only civilian inpatient facility in Guam, the Guam Memorial Hospital. It is a 148-bed general, acute care, short-stay hospital providing, in addition to the normal services associated with such a facility, the followong: both inpatient and outpatient mental health services, medical outpatient services, and extended care in such areas as tuberculosis treatment and geriatrics.

Through the Department of Public Health and Social Services, the government provides for general preventative medical and dental care, health education, and large scale diagnosis and treatment programs as well as in communicable diseases, maternal and child health, chronic diseases, and dental problems of children. The Department conducts its programs through a network of two area-wide and twelve village health centers located around the island

Emergency ambulance service throughout the island is provided by the Department of Public Safety through the Fire Division (Figure

Finally, the University of Guam and the Department of Education operate a school nurse program, and provide medical care manpower training; and the Department of Vocational Rehabilitation provides various rehabilitative programs respectively.

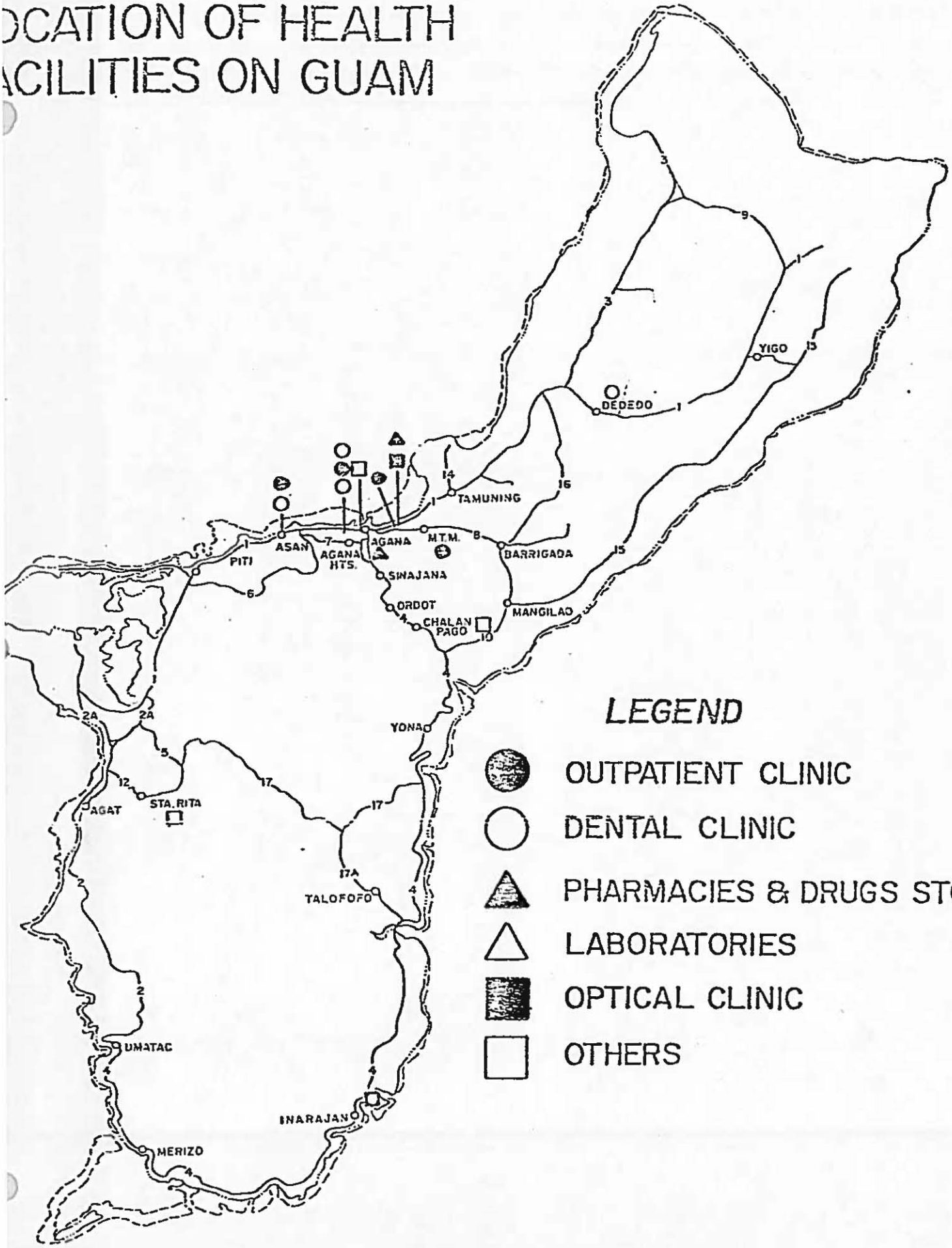
On the other hand, the private sector caters more to the individual needs of the community providing, on a one-to-one basis, outpatient medical and dental care, optometric services and pharmaceuticals. Presently offering outpatient services in Guam are nine multi-special medical/dental group practices, two specialty medical group practice, and seven individual (solo practice) physicians and dentists. In addition, auxiliary services are provided by the sixteen pharmacies and eight optical retailers operating within the community. Guam also has two health maintenance organizations, FHP/HML and GMHP offering comprehensive health serivces on a pre-paid basis. These two entities provide services to a total of 48,000 enrollees or an estimated 45% of the total estimated population.

If one were to examine the health care delivery system in terms of sponsorship and financial motives of the above organizations and individuals, with the exception of the two religious sponsored, non-profit multi-specialty groups, almost all of the rest are privately owned and operated for profit.

The two components of the civilian system can also be easily distinguished by comparing the physical distribution of facilities and services of the two throughout Guam. From Figure 1, it is most obvious that the private sector, for the most part, confines itself to the Agana, Tamuning, Harmon "medical care" corridor. The Government of Guam, however, operates its programs on an island-wide basis.

One more factor should be mentioned that tends to characterize the government and private sector system is the area of how medical care is financed.

OCATION OF HEALTH ACILITIES ON GUAM



The government's services are to a large degree, (except for certain areas) "free" or highly subsidized allowing for extremely low rates to be charged. With the exception of Guam Memorial Hospital which partially operates on a "fee for service" basis, all of the Government of Guam's medical care services are provided on a budgetary basis and financed through general revenue taxes, local and/or Federal. Charges within the private area are generally based entirely on the "fee for service" concept, except for those health providers which provide private medical care services on a prepaid service basis. The two prepaid health plans are: the Family Health Plan, a private, California based entity which provides two options for health services, one under the Family Health Plan and the other, the HML Plan. The other, Guam Memorial Health Plan is a government-initiated HMO program under the sponsorship of Guam Memorial Hospital.

From the consumer/patient point of view, there is a large number of financing programs that one may qualify for to seek the services which he needs. As an employee of the Federal Government, Government of Guam, or of a private firm, he may be covered by a private indemnity health insurance or health maintenance program. Low income individuals or families may qualify for participation in the Medicaid program for abatement of fees for services at Guam Memorial Hospital. If a person is above 65 years of age, he may be eligible for some or all of the Medicare medical care benefits. Of course, there is Workman's Compensation for on-the-job injuries; school children receive free care for accidents that occur during school hours and free dental services; there are also several government programs that provide free care for certain categories of illness such as tuberculosis, ALS and Parkinsons disease, and diabetes. The government, additionally, provides free medical services through the Department of Public Health and Social Services and anyone seeking care who cannot qualify for one of the above programs and who cannot afford to pay for needed medical services could receive hospital treatment with his cost subsidized by the local government.

Briefly, the military system is a comparatively unified one consisting of the U.S. Naval Hospital, a general, acute care, short-stay facility providing also outpatient services; various medical and dental outpatient facilities; and emergency abulances and air/sea rescue units located throughout the island (. The military hospital system also provides services to Trust Territory and Marianas Commonwealth patients.

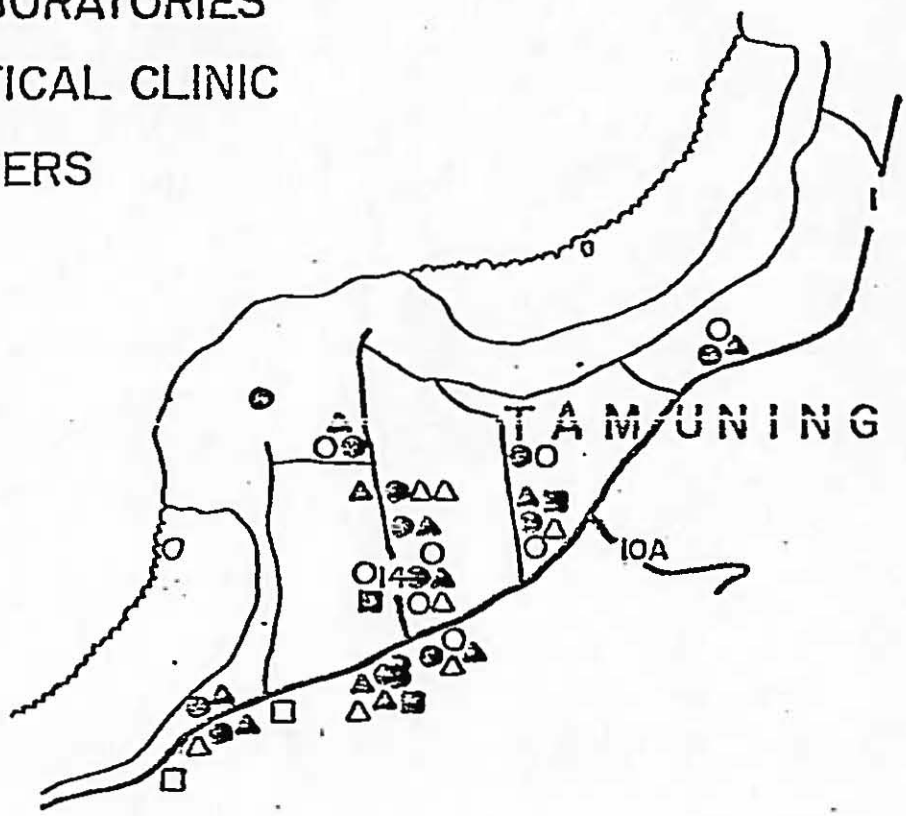
Unlike its civilian counterpart, the military does not operate community-wide programs per se. It does, however, incorporate many of these types of programs into its general system of medical care, thereby alleviating the need for operating separate programs. The military system also is able to draw on the resources of a worldwide system in terms of manpower, etc.

Except for certain categories of eligible civilians, there are no charges for services within the military system. The services provided are financed through Federal general revenue taxes.

LOCATION OF HEALTH FACILITIES ON GUAM

LEGEND

- OUTPATIENT CLINIC
- DENTAL CLINIC
- PHARMACIES & DRUGS STORE
- LABORATORIES
- OPTICAL CLINIC
- OTHERS



For those who must seek services outside of the military system, the military provides a medical insurance program; Civilian Health and Medical Program of Uniformed Services (CHAMPUS), which reimburses the civilian provider for services utilized by military eligible personnel. Although it is usually widely known that veterans with service connected disabilities can receive treatment in military facilities where no Veteran's Administration facilities are available, it is also a fact that indigent and even medically indigent veterans without service connected disabilities may obtain services without charge.

This, then, generally is the medical care delivery system in Guam. In this brief overview, only the most skeletal view can be hoped to be achieved. The system in reality is not a clearly defined set of elements, all coordinated and functioning smoothly. It is one which is highly complex and very diffuclt to understand. It is one that puts before the consumer/patient a vast array of organizations, services and personnel. It is one that can be bewildering and frustrating to the consumer attempting to seek medical care services that he so vitally needs.

Another manner in which the health delivery system might be viewed is to look at it from the level in which health care services are provided.

These three health services levels are as follows:

1. Primary Care Services: These are health services provided at the village/district level generally through a network of 12 village Public Health Centers and two areawide health centers; and through private ambulatory care facilities.

2. Secondary Care Services: These are services provided at what might be called the "commercial level" for highly organized services which may be found primarily within the hospital setting and within specialized private ambulatory care facilities.

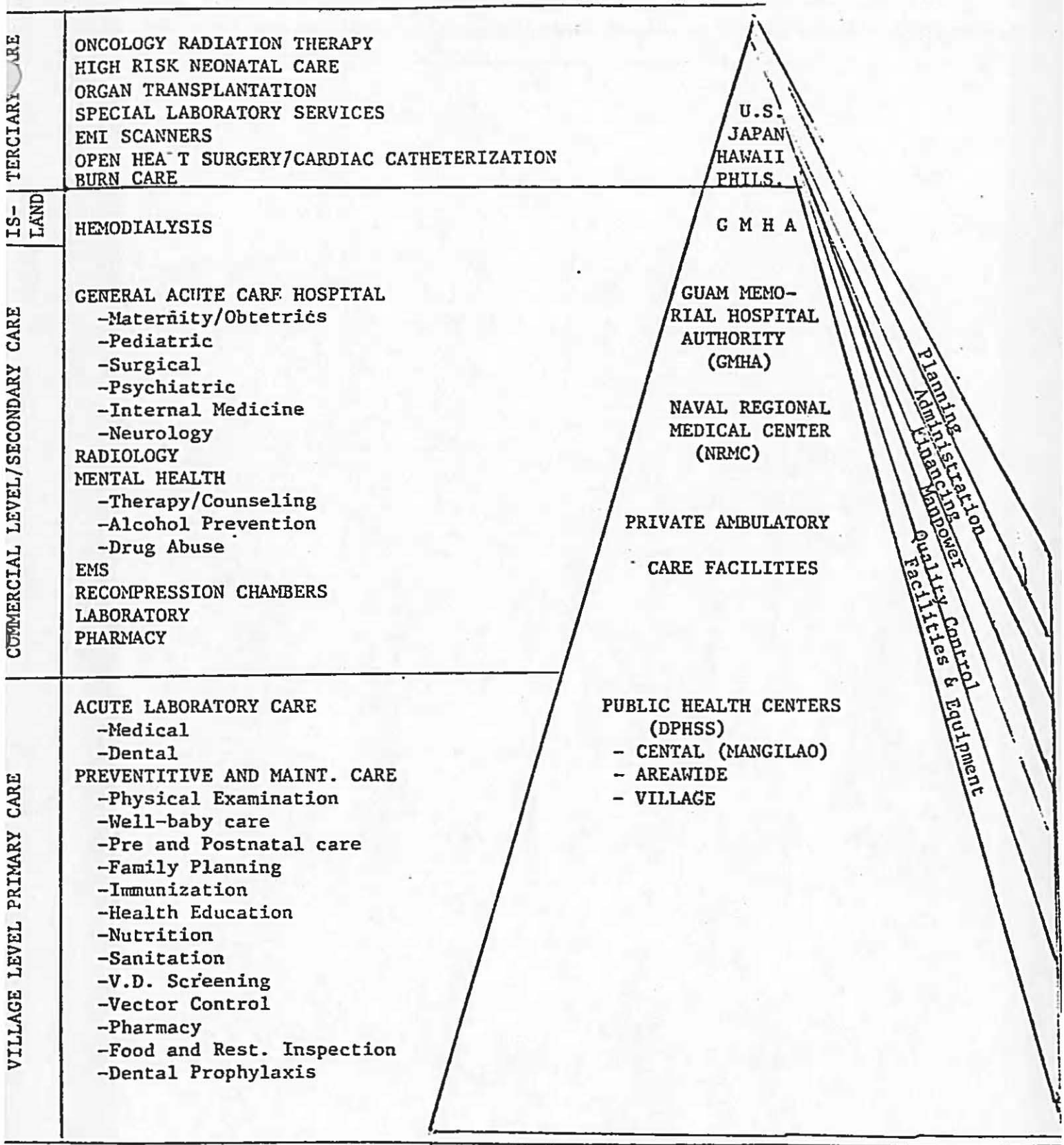
3. Tertiary Care Services: These are services which are highly specialized or expensive and which require skilled staff and special equipment in order to provide them. While some of these services are available on-island, these services are to a large degree obtained off-island in U.S. mainland, Hawaii, Japan, and Philippines.

Another way of examining the health care delivery system is by examining the services provided in the community. Services were described as per the Taxonomy's seven major health services which included the following:

1. Community Health Promotion and Protection Services

2. Prevention and Detection Services

HEALTH CARE SERVICES
BY LEVELS OF CARE



3. Diagnostic and Treatment Services

4. Habilitation and Rehabilitation Services

5. Maintenance Services

6. Personal Health Care Support Services

7. Health System Enabling Services.

These services are described in the following sections of the plan.

1. COMMUNITY HEALTH PROMOTION AND PROTECTION SERVICES

a. HEALTH EDUCATION SERVICES

DEFINITION

Health education is education for healthful living of the individual, family, and community; its purpose is to avorably change health behavior knowledge, attitudes, and practice.

BACKGROUND AND TRENDS.-

Health education encompasses allresources and services directed towards informing, educating, and motivating individuals to adopt life-styles and practices which will promote optimum health, avoid health risks, and appropriately use available health care services. Health education may be divided into three components: motivation towards positive health behavior, transfer of health knowledge, and the acquisition of health resources and services information, based on informed judgements regarding appropriate use of various levels of care.

Health education can be aimed at a variety of target populations and may occur on a one-to-one, provider-to-consumer basis or may be directed at a particular group such as school-age children or persons at risk for a given disease. The audience of a health edccation program may also be the general population through mass media programs. Whatever its source or target,health education is a major prevention strategy that is related to each of the antecedents and disease conditions described previously.
The current emphasis on health education has come about as a result of the growing realization of the relationship between life styles and diseases in the United States.

Many of the antecedents associated with the nation's four leading causes of mortality and morbidity (heart disease, cancer, stroke, and accidents) relate to behavioral patterns. Smoking, overeating, lack of exercise, excessive drinking, and working in high stress occupations significantly increase the individual's risk of becoming ill or injured. Only changes in behavior, many of which are addictive, will alleviate these risks. What is currently known about addictive behaviors was submitted at the National Heart and Lung Conference in 1975 as follows:

> "(1) no simple therapeutic strategy stands out as more efficacious than the others in treating addictive behavior;
> (2) each of a number of well-known therapeutic approaches (interventions for quitting) works for some individuals;
> (3) the majority of persons are capable of utilizing such intervention strategies for discontinuing injurous health behavior for brief periods (e.g.,for one day);
> (4) a small percentage of individuals can carry an initial quitting resolve further, i.e., to the point of

actually quitting for more than a day at a time;

(5) however, most of these 'succeeders' will eventually backslide or relapse (recidivism); and

(6) the bulk of this backsliding seems to take place in a relatively brief but critical period of time following successful quitting [84]

Although somewhat negative in nature, these findings do point out the importance of reinforcement during the period when backsliding is most likely to occur.

The size of the problem of addictive behavior can be demonstrated by examining available information on smoking and drinking habits. National trends indicate that the percent of teenagers who are regular smokers is on the rise.[85] Of particular note is the increase in smoking in girls 17 to 18 years of age which has shown an increase from 18.6% of the population in 1968 to 25.9% in 1974.

In terms of alcohol consumption, national data indicate that approximately 40 percent of adult males and 16 percent of females are moderate to heavy drinkers.[86] In addition to the problems associated with modifying addictive behavior, health education has encountered obstacles relating to the lack of conclusive evidence on effective motivational and educational techniques and the optimal timing for intervention. Other problems include a shortage of trained health educators, funding shortages and a lack of measures to evaluate the effectiveness of programs.

Despite these problems, health education programs are being implemented, and early reports indicate that this strategy can have an impact on changing behavior

AVAILABILITY AND ACCESSIBILITY

Although the Department of Public Health and Social Services, Guam Memorial Hospital and various other public and private organizations have been identified as providing a variety of very specific health education services, a detailed description of their availability and accessibility of their programs have not been completed. It is anticipated that this information will be completed during the updating of this initial HSP in 1979. Department of Public Health and Social Services activities for Health Education acitivities for 1977-1978 are the following:

HEALTH EDUCATIC:	1977	1978
TV Programs	39	37
Press Releases	59	62
AV Loans	336	291
AV Viewing Audience	50,353	23,354
Literature Issued	11,493	9,081

HEALTH EDUCATION	1977	1978
Person/Group Education	1,666	1,698
Bulletin Board Display	3	5
Office/Info. Requests	738	791
TV/Radio Spot Announcement	55	82
Radio Programs	11	26
Billboard	2	1

Cost - No data available

Acceptability - No data available

b. ENVIRONMENTAL QUALITY MANAGEMENT

DEFINITION

Environmental quality results from the measures taken to protect the community from environmental hazards causing or contributing to disease, illness, injury or death. Environmental hazards include air, water, and noise pollution, as well as hazards related specifically to unsafe residential and community environs. Prominent concerns fo environmental quality management include:

A. Water Pollution Control

B. Individual Waste Water Program

C. Safe Drinking Water

D. Air Pollution Control

E. Solid Waste Disposal

F. Pesticide Control

G. Vector Control

H. Highway Safety[87]

BACKGROUND AND TRENDS

The health and well-being of the individual are influenced by all factors of the physical environment: the quality of food, air, and water; climate and topography of the land; and general living habits. It is becoming more evident that environmental resources are being misused, depleted, and polluted.

The causes of environmental disruption include population growth, land speculation, inadequate financial and tax bases, and the lack of coordination among regulatory agencies which are responsible for environmental protection. Policies and programs are often designed to treat the individual symptoms of environmental disruption rather than the system itself.

The pattern of increasing consumption of limited material resources is linked not only to the nature of economic growth, but to a steadily growing population. Many areas are growing at a rapid pace with little planning aimed at environmental impact.

Health planning is not concerned with specific programs of environmental protection, but with how the elements of the environment operate as a total picture. Of primary concern is the advocation of an environment which contributes to the population's well being and presents the fewest possible hazards to health. Environmental quality focuses on health at a point which precedes needs or problems.

RESOURCE ASSESSMENT

AVAILABILITY AND ACCESSIBILITY

b.1. Water Pollution Control

The Guam Environmental Protection Agency (GEPA) is responsible for the control and abatement of water pollution in Guam. GEPA is responsible for carrying out Chapter III of the Government Code of Guam, Title LXI: Water Pollution Control Act, and Federal Water Pollution Control Act.

The implementation of Guam's Water Quality Management Plant and the Wastewater Facilities Plan should reduce and perhaps eliminate most water pollution problems. Parts of the Wasterwater Facilities Plan are now being implemented, particularly in the southern part of the island. The Water Quality Management Plan will begin to be implemented in July of 1979.

b.2. Individual Wastewater Program

The Individual Wastewater Program is concerned with treatment and disposal of wastewater generated and disposed at either on-site disposal systems such as septic tanks or through public sewer systems. The program is available to the whole civilian population and federal (military) facilities where applicable.

The program operates under the statutory authority of Public Law 3-109, as amended, relative to toilet facilities and sewage disposal. Under the law, all buildings are required to obtain a permit from GEPA to construct and operate wastewater disposal facilities before the building can receive an occupancy permit from the Department of Public Works. All complaints concerning failing wastewater disposal facilities are investigated and the ncecessary enforcement actions are taken to obtain compliance.

The Individual Wastewater Program involves review and issuance or denial of all application documents for installation and operation of individual wastewater disposal facilities to insure protection of human health and the environment. The program continues to improve services rendered and research for new, practical and efficient methods for treatment and disposal of wastewater on an individual basis.

Water Pollution, as far as individual wastewater is concerned, consists of potential pollution of groundwater (mostly located at the northern half of the island, which is basically limestone), from on-site septic tank disposal system, and agricultural and animal waste. In the southern half of the island, the problem is mainly failing or overflowing on-site disposal systems due to the poor percolation rate of the clay soil which is dominant in the area and the low-water tables in flood plains.

Approximately 70 to 80 percent of the residents, businesses, and institutional establishments which have access to the public sewer systems are connected to the system. Continued efforts are being made to encourage the remaining 20 to 30 percent to connect to the public sewer where it is available. Supplemental to these efforts are funding resources such as Public Utility Agency of Guam (PUAG), Loan and Grant Program, the Farmers Home Administration (FHA) and Small Business Administration (SBA) loan programs intended for proper treatment and disposal of wastewater in order to combat water pollution.

b.3. Safe Drinking Water Program

The Agency has the responsibility for implementing and enforcing a variety of laws which provide water supply management and water monitoring quality assurance for the entire population of Guam, including military personnel.

The Water Resources Conservation Act, P.L. 9-31, and its associated regulations concerning well drilling attempt to prevent pollution of our drinking water through the issuance of well drilling licenses, well drilling permits and well operating permits.

The Safe Drinking Water Act, P.L. 14-90, and its three associated sets of regulations (two of which are still in draft stage) assure that water quality is monitored, set standards of contamination for water, and require that the public be notified should violation of a standard occur. The act also requires review of all plans for water system inprovements or revisions.

The Operators Mandatory Certification Act, P.L. 14-31, requires the training and certification of all operators operating water and wastewater treatment plants, to ensure that properly qualified individuals are in charge of the plants and distribution/collection systems.

In addition, the northern half of Guam has been designated as a "Principal Source Aquifer," as stated in the April 26, 1978, Federal Register. This designation requires that all projects which involve use of federal funds in this area must be reviewed specifically for their actual and potential effects on the groundwater lens in the area before they can be constructed. The majority of the funding for the above is federal funding,

as GEPA is 75 percent federally funded. Special grants, however, are available from time to time, with 100 percent federal money.

Guam's drinking water is primarily groundwater which is obtained from an underground lens located in most of Guam north of Route 4. This water is, at present, of generally high quality, and the only treatment required is chlorination for removal of bacteria.

Surface water is also used, although less widely, and plants at Fena Reservoir, Merizo, Ylig and La Sa Fua River treat for bacteria as well as trubidity.

All potable water sources are monitored for quality by either PUAG, the Navy or the Air Force, with GEPA providing quality assurance through control samples.

The water lens, or aquifer, located in the northern limestone is one of our greatest concerns, because although it supplies the majority of our potable water, we know very little about it. Its extent and maximum production are still unknown. However, we dontknow that it can be damanged perhaps irretriveably-by pollution and that potential for pollution is great. For this reason, any project which might impact on the aquifer such as stormwater ponding basins or disposal wells, landfills, use of fertilizer or pesticide, chemical storage etc., is carefully reviewed before being permitted above the aquifer.

The main upcoming project is a federally funded $700,000 U.S. Department of Interior grant which will fund 10 to 12 borings and/or monitoring wells. Data from these borings will be place into a computer program to develop a lens model which will help us to determine such things as the extent of the lens, maximum sustained yield, flow rate and direction, etc. The islandwide Water Facilities Planning effort which includes, among other things, a financial and institiutional analysis and a priority list for water projects and sanitary surveys, is approximately 50 percent complete and will extend well into 1979.

Certification of all Water and Wastewater Treatment Plant Operators must be accomplished by May 31, 1979. However, training and certification are ongoing projects, as are the other facets of the drinking water program.

b.4. Air Pollution Control

Air Pollution control activities are carried out by the Guam Environmental Protection Agency under the statutory authority of Public Law 10-74, Chapter V, Title LXI - Government Code, and regulations of the Guam Air Pollution Control Standards and Regulations.

The Air Program has been involved in the processing of permit applications from stationary sources, inspection of stationary sources, and complaint investigation. Vehicle inspection is limited to vehicles which were issued Notices of Violation. In addition to the above, there is a plan to monitor the safety inspection station (s) and the . increasing volume of traffic on a continuous basis to identify potential problems.

b.5. Solid Waste Disposal

In general, GEPA is responsible for issuing permits for solid waste disposal, collection and transport facilities, in the enforcement of the Litter Control Act and for preparation of a Solid Waste Management Plan for the Territory of Guam. In line with these reponsibilities, regulations have been and will be developed for Solid Waste Disposal, Collection Storage and Hazardous Waste Management. Legal authority for these responsibilities is found in:

P.L. - 14-37 (Solid Waste Management and Litter Control Act)

P.L. - 14-38 (Provides for Construction of Solid Waste Transfer Stations)

Federal Resource Conservation and Recovery Act of 1976 (RCRA)

Regulations which have been approved relative to Solid Waste Management are 1) Solid Waste Disposal Regulations; 2) Litter Control Regulations. A set of regu .cions relative to solid waste collection and storage has been drafted and is pending a public hearing and action by the GEPA Board of Directors.

In June, 1977, the Solid Waste Management and Litter Control Act become effective. This Act defined the responsibilities of government agencies relative to solid waste collection and disposal (Department of Public Works) and storage (PH&SS), and furthermore, established permanent responsibility for long-range solid waste management planning with GEPA.

In conjunction with P.L. 14-37, GEPA is also required by federal mandate (RCRA) to prepare a State Solid Waste Management Plan and implement a Hazardous Waste Management Program.

Solid waste management planning efforts by GEPA have covered the entire island, including the civilian as well as the military population. Enforcement of federal laws also extend to the island.

At present, permits must be issued by GEPA for any solid waste related activity. Illegal dumping and littering have become major concerns of the agency. Implementing an effective enforcement system, whereby all disposal facilities will be permitted, is just one way of combatting the problem. In 1978, two solid waste transfer stations were designed and constructed in the South (Malojloj) and the North (Dededo) to provide people who are located greater than 23 miles roundtrip from an authorized landfill, with a site to legally dispose of their excess wastes. Enforcement of the Litter Control Act is another way of curbing the problem.

In order for GEPA to implement an effective enforcement program, the agency will be conducting an open dump inventory next year whereby all solid waste disposal sites, especially unauthorized dumping areas, will be inventoried, classified and scheduled for closing or upgrading to an authorized disposal site.

The agency has submitted capital improvement project requests for funds to 1) upgrade the Ordot landfill, the only authorized civilian disposal site, to meet the criteria for a sanitary landfill; 2) construct a waste processing facility at the Ordot landfill to extend its life; and 3) construct a Material and Energy Recovery Facility in 1995.

b.6. Pesticide Control

The Guam Environmental Protection Agency Pesticide Control Program is concerned with protecting the community from environmental risks and health hazards contributing to disease, injury, loss of property, etc., resulting from pesticides abuse. One of the major concerns of the program is the removalof dangerous types of residual pesticides that could eventually contaminate Guam's underground water source. To help maintain a safe and clean environment, it is necessary that air, land and water be free of pollution from any misuse of pesticides.

In recent years, the need and concern for safe pesticide use has become more demanding because of the island's growing population. Many of the pesticides available today are very toxic to both man and the environment. There are several pesticides that are persistent and residual in nature and, consequently, do not break down easily into non-toxic materials. There is also the danger that pesticides may concentrate through biological magnification. With the increasing demand for agriculture and industry, the pattern of pesticide usage on Guam has increased tremendously.

The Pesticides Control Program provides a multitude of services to the community in joint coordination with federal and other 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. Also, the agency has maintained active coordination with the government hospital and public clinics, including the military, in implementing reporting procedures on pesticide poisoning cases. The agency has also provided services to commercial establishments dealing with the sale and distribution of pesticides by conducting pesticide dealers licensing workshops. The inventory and disposal of surplus pesticides continues to be a top priority.

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).

b.7. Vector Control Program

Vector control in Guam is the responsibility of the Bureau of Environmental Health in the Department of Public Health and Social Services. The functions performed for vector control include:

1. inspections, surveillance and investigations of mosquitoes, rodents and other vector harborages;

2. biological or chemical elimination of disease carrying vectors and other insects;

3. special rodent control programs on private as well as private sectors of the community;

4. evaluations and inspctions of all ports of entry in accordance with International Health Regualtions;

5. issuance of deratting certificate to commerical ships in accordance with International Health Regulations.

b.8. Highway Safety

To understand the evolution of highway traffic safety in Guam, it is necessary to take into account a number of factors which are quite different for Guam than for the rest of the United States. Some of these factors are found in its history, government, economy, geography and climate. They are also found in the catastrophies, natural and man-made, which have afflicted the island from time to time. Finally, there has been a vehicle population explosion, the magnitude of which no other jurisdiction in the United States has had to deal with.

As a self-governing unit, Guam is among the youngest in the world. The Organic Act of 21, July, 1950, transferred the political authority over Guam from the U.S. Navy, where it had resided since the Spanish-American War of 1898.

Prior to the transfer, the entire infrastructure of the island had been the responsibility of the U.S. Navy. Since the transfer of authority to the Governor and Legislature, Guam has had to acquire the administrative and technical skills required to operate the complex infrastructure of a modern economy.

Another factor of importance is that the Navy did not allow any outsider to visit or become a resident on the island without a full security clearance. This ended in 1961 and with it a significant constraint on the development of the island. With the relaxation of the military security clearance in 1961, coupled with the advent of the large jet airplane, Guam began to change. The civilian population increase 61 percent from 1960 to 1979. Guam also has had a significant rise in affluence with personal income increasing from 43 million in 1962 to 142 million in 1970.

With the rise in population and affluence, there has been a corresponding rise in the vehicle population. During the period from 1964 to 1974, the number of vehicles increased from approximately 20 thousand to 55 thousand. The average growth rate during this period was 11 percent per year. By contrast, during the same 10 years, the growth rate on the mainland U.S. was 3.9 percent per year. In fact, the maximum rate of growth on the mainland occurred during 1945 to 1959 when it was 10 percent a year. Thus, the Guam highway system has been forced to cope with a demand growth of unprecedented magnitude.

It is important to note that the island has no public transportation. The highway system which has had to absorb this growth rate has not increased significantly in mileage since the days of the Navy. The total miles in 1972 was 249. Most of these highways are two lanes in width. The most heavily travelled highway consists mostly of three lanes, with some segments that are four and six.

Another factor to be taken into account is the extreme slipperiness of the roads on Guam when it is wet. The exact cause of this slipperiness is not known, but is believed to be polishing of the crushed coral used as the aggregate in the pavement. There is some speculation that algae also adds to the problem.

Guam has been subjected to much more than its share of catastrophes. There was World War II, at the end of which 80 percent of the dwelling units had been destroyed. Typhoon Karen came in November, 1962, and destroyed 90 percent of the island's buildings and vegetation.

Guam has, therefore, had to cope with a set of problems no other part of the United States has had to face. In twenty-five years it has had to rebuild almost completely from ruins twice, and learn how to organize and manage a government and economy. At the same time, Guam has had to accommodate to a vehicle population growing at an alarming rate.

The magnitude of the highway safety problem in Guam is indicated by the fact that the per mile fatality rate is 63 percent higher than for the United State as a whole, and the per mile injury rate is 85 percent higher. There are three types of accidents which predominate: pedestrian, head-on collision and run-off-the-road.

Compared to the United States as a whole, the proportion of fatal accidents which fall into these three categories is 66 percent higher for pedestrians, 470 percent higher for head-ons, and 19 percent higher for run-off-the-road accidents. Guam intends to carry on a vigorous highway safety program to make drastic reductions in these figures on a prioity basis.

AVAILABILITY

The Office of Highway Safety within the Department of Public Works coordinates all on-island highway safety planning and implementation acitivities. Prime responsibilities for safety activities are dispersed among several authorities, including the Department Public Works, the Department of Public Safety, the Department of Education, the Department of Health, and the Department of Land Management. However, the Office of Highway Safety is now the prime coordinating agency.

The Office of Highway Safety is responsible for developing a Comprehensive Plan and Annual Work Program for Highway Safety to conform with federal regulations. The Comprehensive Plan for Highway Safety in Guam, developed by the Office in 1976, will greatly enhance Guam's ability to deal with its highway safety problems. As a result of carrying out this plan, Guam will have more effective traffic laws, a more safety-conscious public and benefit of vitally needed technical expertise. Above all, Guam will be able to make the best use possible of its resources for highway safety. Consequently, the traffic laws will be better enforced and the funds for highway safety more efficiently used.

One of the priority objectives will be a modern traffic records system which will permit storage of and ready access to data on drivers, vehicles, resources and accidents. Such a system will provide a means for more efficient selective enforcement, high risk driver and accident location identification and the evaluation of the effectiveness of corrective actions.

A second priority objective is the alcohol problem, which is as serious here as in the rest of the United States. To begin to cope with this problem the Guam Legislature will be asked to pass the necessary laws, namely, implied consent and chemical testing. Once these laws are in effect, much more effective alcohol enforcement than at present will be possible.

The Emergency Medical System on Guam needs upgrading. The plan recognizes as a priority objective the requirements to establish an Emergency Medical Services Council and to prepare a comprehensive plan for a modern system. Guam needs technical expertise in many areas relating to highway safety. The acqusition of expertise to operate the traffic records system and to plan and conduct appropriate analyses is also recognized.

COST

WATER POLLUTION CONTROL PROGRAM

Funding of the construction of sewer lines and wastewater treatment facilities identified in the Construction Grant Project Priority List is provided by the EPA through the Construction Grant Program with 25 percent matching funds from local appropriations. Federal monies are earmarked for allocations on identified projects in their priority ranking through the construction grant project list prepared by GEPA and PUAG and approved by the GEPA Board of Directors and the USEPA.

The major problems in resolving water pollution problems are securing the money necessary to prevent water pollution and acceptance by the public of the need to control pollution.

Construction grant funds are allocated in the amount of $3,081,500 for Fiscal Year, 1979, and $3,720,000 each for Fiscal Years 1980 through 1981.

The Water Pollution Control Program operated on a total budget of approximately $365,000 for Fiscal Year 1978.

The emphasis within the Community Wastewater Program will continue to be within the construction grant program in terms of moving sewer projects to construction as per Guam's Sewer Construction Prioity List. A major effort will be made to revise Guam's Water Quality Standards and to receive delegation of the federal NPDES Program.

B. INDIVIDUAL WASTE WATER PROGRAM

The cost to the consumer varies depending on the type of disposal system used. For on-site disposal facilities such as septic tank, the cost of material and construction is around $1,500 to $2,000. The cost for connection to public sewers may run about $15.00 per linear foot of sewer connection plus a sewer application fee of $10.00 and a $5.00 service charge per month.

Major concentrated areas in the villages of Dededo, Tamuning, Mongmon-Toto-Maite, Agana,Agana Heights, Asan, Piti, Agat, Santa Rita, Yona and Sinajana are completely sewered. Portions of Chalan Pago-Ordot, Mangilao and Barrigada are also sewered. The sewer system for Umatac/merizo is being construted.

C. SAFE DRINKING WATER

The cost of pollution control is not easily measured, because many agencies are involved. EPA's budget in connection with safe drinking water is approximately $110,000 per year. However, PUAG's expenditures for sampling chlorination, treatment operation, etc. should be added to get a clearer picture of safe drinking water cost. The data for the chlorination treatment operations are not currently available; these costs will be ascertained during the 1979 HSP update.

. AIR POLLUTION CONTROL PROGRAM

The operational budget for the Air Program is about $75,000.

No information is available to quantify damage such as corrosion problems to transmission towers, damage to plants around stationary sources, and loss of income from the USO due to closure resulting from air pollution episodes.

For air pollution alone, it was estimated by the American Lung Association study, that it costs $10 billion per year nationwide. No studies have been made on Guam to determine pollution costs.

E. SOLID WASTE DISPOSAL PROGRAM

GEPA has submitted capital improvement project requests for funds to 1) upgrade the Ordot landfill to meet the criteria for a sanitary landfill; 2) construct a waste processing facility at the Ordot landfill to extend its life; and 3) construct a Material and Energy Recover Facility in 1995.

No current cost information is available at this time. Cost information will be obtained during the updating of the HSP in 1979.

F. PESTICIDE CONTROL PROGRAM

No cost information is available. Cost information will be obtained during the updating of the HSP in 1979.

G. VECTOR CONTROL PROGRAM

No cost information is available. Cost information will be obtained during the updating of the HSP in 1979.

H. HIGHWAY SAFETY

HIGHWAY TRAFFIC SAFETY EXPENDITURES FISCAL YEARS 1971 THROUGH 1973 ON GUAM[88]

Safety Program Code	Standard	Total
300	Planning and Administration	0
301	Motor Vehicle Inspection	160,000
302	Motor Vehicle Registration	293,000
303	Motorcycle Safety	6,000
304	Driver Education	159,000
305	Driver Licensing	135,000
306	Codes and Laws	10,000
307	Traffic Courts	371,000
308	Alcohol in Relation to Highway Safety	31,000

609	Identification and Surveillance of Accident Locations	0
310	Traffic Records	30,000
311	Emergency Medical Services	231,000
612	Highway Design, Construction and Maintenance	2,565,000
613	Traffic Engineering Services	0
614/314	Pedestrian Safety	0
315	Police Traffic Services	455,000*

* Fiscal Year 1971 expenditure estimated.

I. ACCEPTABILITY

Health care services in the area of environmental quality should be provided in ways that are acceptable to consumers and which insure the dignity, values, and rights of all parties concerned.

It appears that at this time the environmental quality services are acceptable to the citizens of Guam.

c. OCCUPATIONAL HEALTH SAFETY

DEFINITION

Occupational health safety is supported by those actions taken to assure the recognition, prevention and control of occupational health hazards and illnesses and to promote the physical and mental well-being of employed persons. Occupational health and safety concerns are typically different for each of the following occupational categories:

a) construction
b) agriculture
c) transportation and utilities
d) manufacturing, service, and others.

BACKGROUND AND TRENDS

The results of the 1975 Survey of Occupational Injuries and Illnesses were prepared by the Bureau of Labor Statistics of the Guam Department of Labor. This is the second release of statistical data where direct comparison of safety and health experience for the total private employment sector is presented for Calendar Years 1974 and 1975. The survey researched injury and illness data in agriculture, construction, manufacturing, transportation, wholesale-retail trade, finance, insurance, real estate and services.

The following are some survey highlights:

1. The survey, response to which is mandatory, involved 1,082 employers in the private sector. Self-employed individuals, the federal government and military were excluded from the survey.

2. The average annual employment was calculated at 18,452 in Calendar Year 1975 compared to 21,357 for 1974, a decrease of 13.6 percent.

3. The total manhours worked in 1975 were calculated at 33,270,850 compared to 30,124,459 for Calendar 1974, a decrease of 15.0 percent.

4. A total of 980 work-related injury and illness cases occurred in the private sector in 1975 compared to k,340 cases for 1974, a decrease of 26.9 percent.

5. The incidence rate (number of injuries and illnessess per 100 full-time workers) for all industries combined decrease to 5.9 percent in 1975 from 6.8 percent in 1974.

6. One work-related fatality was reported in manufacturing for 1974 compared to six in 1975 which occurred in construction, wholesale-retail trade, and service industries.

7. A total of 6,998 workdays were lost dur to work-related injuries and illnesses during 1975 compared to 8,090 workdays in 1974. The incidence rate of lost workdays per 100 full-time workers increased from 41.4 percent in 1974 to 42.1 percent in 1975.

8. Nonfatal cases without lost workdays were calculated at 429 cases in 1975 compared to 664 cases in 1974. A total of 544 lost workday cases were counted for 1975 whereas 675 cases were counted for 1974. The average lost workdays per lost workday case in 1975 was calculated at 13 days.

The Occupational Safety and Health Survey is a federal state program which collects and analyzes job-related safety and health statistics for the Territory of Guam.

Copies of 1976 OSH data will be available to the public during the first quarter of Calendar Year 1978.

Copies of the OSHS report on an industry-wide basis for Calendar Year 1975 are available to island employers and other interested persons from the Department of Labor, Bureau of Labor Statistics in the Duenas Building, Maite. 89

AVAILABILITY AND ACCESSIBILITY

The Occupational Health and Safety Administrations's (OSHA's) inspections of Government of Guam's departments and agencies have also been conducted during Fiscal Year 1977. To date, seven governmental agencies complied with inspection requests. OSHA will continue its efforts in this area until all local agencies are accounted for.

The following is a summary of compliance inspection activities for the Territory during Fiscal Year 1977:

a)	Labor camp (voluntary) housing	283
b)	Voluntary compliance private sector	4
c)	Voluntary compliance Government sector	7
d)	Federal 7(c)(1) joint enforcement	101

It is worthwhile at this point to examine the above indicated 7(c)(1) Agreement. The purpose of this agreement is to obtain local assistance in supplementing the compliance efforts of the Occupational Safety and Health Administration to improve the safety and health of employees, to train local personnel in the practices and procedures of OSHA programs, to assist the territory in its efforts to coordinate with OSHA in its supplementary programs and avoid unnecessary overlap in such activities, and to serve all mutual interests of OSHA and the territory in these fields.

This division continued to enforce federal/state efforts to insure that employers provided safe and healthful working conditions for their employers in accordance with established standards.

OSHA accomplishments continued to center on inspection (voluntary) for employers in the private sector and compliance to Federal Enforcement Standards.

OSHA intent to have employers correct safety violations resulted in accumulated citations during the fiscal year amounting to $26,995. A breakdown of these dollar penalties and number of violations follows:

FEDERAL COMPLIANCE

October 1976 - September 1977

Serious	$17,085
Repeat	4,180
Other	430
Failure to abate	5,300
TOTAL	$26,995

VIOLATIONS

Serious	79
Repeat	15
Other	407
Failure to abate	2
TOTAL	503

Fiscal Year 1976 registered a total of 283 violations cited compared to 503 cases for Fiscal Year 1977, an increase of 220 cases or 78 percent.

COST

Occupational Health Safety services are provided to the public at a cost which is difficult to evaluate. Although the system of occupational health safety may be costly, such services have the potential of ultimately reducing the need for more costly medical treatment services.

ACCEPTIBILITY

OSHA Compliance Division was unable to complete requirements for its State 18(b) Plan. The purpose of this plan is for the Territory of Guam to assume

responsibility for development and enforcement of Occupational Safety and Health Standards for which a federal standard has been promulgated and also to assume responsibility for development and enforcement of any Occupational Safety and Health issue with respect to which no federal standard is in effect under Section 6 of Public Law 91-596. Thus, without the additional professional staff with legal and technical expertise to rewrite a local Safety and Health program, the plan was not approved by the federal government. Another important factor is existing legislation, which is inadequate in meeting standards required by federal Law OSHA Compliance will continue to seek solutions to these problems in the future so that an 18(b) Plan will be approved and implemented.

d.1. Radiation Safety

DEFINITION

Radiation safety encompasses actions taken to protect the community from unnecessary exposure to ionizing and non-ionizing radiation from controllable industrial and nuclear sources and to minimize exposure of patients and medical personnel to clinical radiation. The major areas of concern in radiation safety include:

a) industrial radiation
b) medical radiation
c) radioactive wastes.

BACKGROUND AND TRENDS

There is no information available on Guam regarding radiation safety. This area will be developed as part of the 1979 up-dating of the HSP.

D.2 BIOMEDICAL AND CONSUMER PRODUCT SAFETY

DEFINITION

Biomedical and consumer product safety are support by those measures taken to ensure that drugs, cosmetics, therapuetic devices and all types of consumer products are safe and appropriate for their intended use and are clearly labeled as to the potential harm resulting from abuse or misuse. The major subcategories of biomedical and consumer product safety include drugs and medical devicew and hazardous substances and products.

BACKGROUND AND TRENDS

Currently the Bureau of Environmental Health of the Department of Public Health and Social Services has the responsibility for biomedical and consumer product safety. The staff performs such services as these:

a) routine inspections in pharmacies and clinics,
b) supervision of the distribution of recalled or unwanted drugs of abuse, and
c) proper accountancy.

The Bureau performed the following activities during Fiscal Year 1977-78:

1. Major activities conducted during this period:

Inspections	940
Regulatory Visits	557
Surveillance	339
Accountability Investigation	12

Registration

New	34
Renewal	113
TOTAL	147

Termination

Pharmacy and Practioners	8

2. Pre-registration investigation for DEA registration conducted by this Bureau are as follows:

New Practitioner and Pharmacy	22
Renewal (practitioners)	18
TOTAL	40

3. The number of physicians, dentists, pharmacies, veterinarians and wholesalers licensed locally to dispense controlled substances are as follows:

Physicians	98
Veterinarians	2
Dentists	17
Pharmacies	20
Wholesalers	2
TOTAL	139

AVAILABILITY AND ACCESSIBILITY

Services to ensure biomedical and consumer product safety as currently performed by the Bureau of Environmental Health, are currently being utilized and are available services for the health protection of the citizens of Guam.

COST

No current information is available. During the up-dating of the HSP in 1979, cost associated with biomedical and consumer product safety will be analyzed.

ACCEPTABILITY

It appears at this time that Biomedical consumer product safety services are acceptable to the citizens of Guam.

e. FOOD PROTECTION SERVICES

DEFINITION

Food protection involves those measures taken to assure wholesome and clean food during production, processing, packaging, distribution, storage, preparation and service to assure that marketed foods comply with established nutritional quality and packaging identification guidelines. The major components of food protection are

a) sanitation,
b) safety, and
c) nutritional quality.

BACKGROUND AND TRENDS

A majority of food establishments (restaurants, processing plants, health food stores, bakeries, etc.) are inspected on an annual basis in Guam. Inspections turn up a number of violations, the most common of which deal with cleanliness, food protection and storage facilities. Sanitarians perform routine inspections of food establishments and general nuisance complaints and there is a grading system for health sanitation for eating establishment. Regular programs for health education of food handlers are conducted.

AVAILABILITY AND ACCESSIBILITY

Inspections of the following food protection sources are carried out by the Department of Public Health and Social Services, Bureau of Environmental Health under P.L. 3-109:

Bars
Restaurants (snackbar and snackmobile included)
Retail Stores
Supermarkets
Wholesalers
Food Storage Warehouses
Food Manufacturers
Hospitals and clinics
Penal Institution

Inspections of food dispensing also occurs during carnivals, fairs or any fund-raising activities.

COST

No current cost information is available for food protection services. Cost information will be obtained as part of the HSP updating for 1979.

ACCEPTABILITY

Food protection services should be provided in ways that are acceptable to consumers and which insure that the dignity, values, and rights of all parties concerned will be respected and enhanced. At this time food protection services are acceptable to the citizens of Guam.

e. FOOD PROTECTION

e.1. NUTRITIONAL QUALITY AND SANITATION

Those measures taken to assure wholesome and clean food free from unsafe bacteria and chemical contamination, natural or added harmful substances, and decomposition during production, processing, packaging, distribution, storage, preparation and service; and to assure that marketed foods comply with established nutritional quality and packaging identification guidelines. In addition, dietcounseling, which includes nutritional care plan, menu planning, evaluation, home visits, and consultation are also provided to ensure that quality of nutrition is maintained for the health of the Island's population. The major components of food protection are:

- Sanitation
- Nutritional Quality

1. ACCESSIBILITY:

Both programs are operated by the Department of Public Health and Social Services. The services are rendered during regular days and regular hours, except in periodic instances during weekends. Inspections are routine, however, nutritional quality relies on referrals from both public and private clinics. In 1978, the sanitation program conducted a total of 8,183 inspections, of which 1,789 appropriate actions were taken. As for Nutritional Quality program, services were provided to 1,811 patients which includes patients counseled, home visits, new patients and returning patients.

2. AVAILABILITY:

Although these programs are within the Department of Public Health and Social Services, their operations are separated. The sanitation section consists of Region I (Mangilao) and Region II (Agat) with a total staff of four (4) environmental health specialists. The nutritional quality section has one (1) staff nutritionist operating mainly at DPHSS in Mangilao, however, additional counseling and consultation are conducted twice a month at Tamuning, Santa Rita and Inarajan.

3. COSTS:

There is no fee for services rendered. Cost per unit of service, however, is $40.65 for both programs combined. The yearly budgets for both programs are not available.

2. PREVENTION AND DETECTION SERVICES

DEFINITION

Detection services are those secondary prevention strategies involving the testing of a target population to detect early clinical signs of disease. Detecting or screening programs assume that early detection will lead to prompt treatment of a disorder, thus reducing morbidity and/or mortality. 90 It has become apparent in the past few years that disease prevention and detection offer the greatest promise of achieving any significant extension of life expectancy. Thus, prevention and detection services are those services that are delivered to individuals in order to promote optimum physical and mental health. This includes the actual prevention of the development of disease or the identification of disease at the pre-symptomatic stage to permit early identification. 01 In a broader context, prevention also encompasses other factors such as health education, adequate housing and a safe environment. 92

It is important to understand that services directed at promoting the health of the community should have some impact on the individual protection services sought and vice-versa. However, the basic focus of this chapter will be on the individual protection services such as immunization and well-person maintenance, and on detection services such as multiphasic or condition-specific screening.

Immunization is a primary preventive technique which has been very effective in controlling many communicable diseases. This technique has, in fact, become an important part of well-person maintenance. The process involves innoculating an individual in order to stimulate an acquired resistance to a particular disease. The primary immunization is usually not permanent; booster doses are necessary for the maintenance of immunity in some diseases. Immunization was the major factor in conquering such diseases as smallpox and diphtheria.

Screening is another major preventive strategy. A target population is tested in the hopes of detecting early clinical signs of disease. The sensitivity and specificity of the screening tests are important, since the tests should detect as much disease as possible and avoid labeling. Formal screening programs were initially directed at the early detection of specific diseases such as hypertension, sickle cell anemia, or cervical cancer. But in recent years, the concept has been expanded to include screening for a high risk population and multiphasic screening. 93 Multiphasic screening refers to many tests being given at the same time with the idea of detecting various conditions that can be treated. 94

a. Individual Health Protection Services

This category includes individual education, routine examination and use of drugs, and substances or devices used in order to render an individual protected disease and promote his optimum health. Illustrative service categories include

a) immunization
b) well-child services
c) dental prophylaxis
d) family planning.

a.1 Immunization Services

This is process involving inoculationg individuals for a particular communicable disease in order to stimulate an acquired resistance to possible subsequent infections of that disease. The immunization technique attempts to

1) provide protection to individuals against contracting certain diseases,
2) reduce the number of susceptible persons to certain diseases, and/or
3) interrupt the transmission of disease.

a.2 Well Child Services

This is regular program of prevention and early detection services provided to infants and preschool children.

a.3 Dental Prophylaxis Services

These are services provided to eliminate or decrease the incidence of dental caries and peridontal disease. Specific services include fluoridation (application of topical fluoride and fluoridation of water supplies or dietary fluoride supplements) and plague control.

a.4 Family Planning Services

This is primary preventive strategy which may include a varying number of the following services:

1) Contraceptive counseling and the provision of contraceptives
2) Abortion counseling, referral and/or abortion services
3) Prenatal and perinatal health education for women of childbearing age
4) Venereal disease screening, treatment, and case finding
5) Genetic screening and genetic counseling
6) Nutritional counseling
7) Parenthood education

a.5 Detection Services

This provides the routine evaluation and screening of individuals without recognized symptoms for the purpose of identifying the individuals at risk who have certain diseases or conditions. Illustrative service categories include

a) Condition-specific screening
b) Multiphasic screening
c) Contact/collateral follow-up

Screening programs are often aimed at health conditions which cannot be prevented from occurring: degenerative diseases and other conditions with causes not fully understood or controlled. They may also attempt to identify factors which cause disease, such as alcohol and drug abuse. Screening services have often been surrounded by controversy due to research which demonstrates that programs differ considerably in terms of costs and effects. Another major concern is that detection without adequate follow-up and treatment cannot be effective and may pose serious ethical questions.

Detection services may be either categorical, i.e., aimed at diagnosing a single condition, or muliphasic in that a range of tests are used to identify a number of health abnormalities in the same patient.

Examples of categoric screening programs include hypertension, cervical cancer, breast cancer, prostate and rectal cancer, PHU, sickle cell trait and disease, visual defects, hearing disorders, and diabetes.

An important problem in Guam and the nation is the immunization level. In spite of recent success in the control and prevention of measles, poliomyelitis, and rubella, twenty million of the fifty-two million children fourteen years or over in the U. S. have not been fully immunized against the seven most common childhood diseases.

In a month long survey conducted by the Guam Community Development Institute, the information obtained showed that 1½ to 2 year-olds, a third of the children 2 to 3 years, and about 20 percent of the 3 to 5 year-olds, did not have complete shot records. The findings showed that even many school-aged children, who are required by law to have up-to-date immunization before entering the first grade, did not have complete shot records. The statistics did show, however,, the local children are immunized in larger numbers than stateside counterparts. The federal government has recently launched a major national campaign to immunize the nation's children against preventable childhood diseases, and individual states are responding to this problem, also.

The nature of preventive services has changed with the nature of health problems and the scientific technology used in attacking these problems. The major health problem in the United States had historically been the communicable diseases. But by the middle of the Twentieth Century, chronic diseases, were receiving more attention. Prevention for chronic diseases consists of identifying high risk factors for certain conditions and minimizing these risk factors in the population. This leaves much of the responsibility for preventing the condition in the hands of each individual patient.

The physician may specify the way to control the known risk factors, but the ultimate responsibility for carrying out the specifications rests with the individual. Therefore, individual lifestyles are intimately related to the problems of prevention.

In 1973, there were about 75,000 deaths from heart disease, 115,000 deaths from cirrhosis of the liver, 45,000 deaths from suicide and homicide, and 7,000 deaths from hypertension. 95 In addition, more than 14,000 people are killed each year in the United States in work accidents. Also, occupation-related diseases have been estimated to cause more than 100,000 deaths each year. The costs associated with work accidents alone amount to 15 billion dollars. 96

Other health problems are posed by dental diseases. It has been estimated that one out of every five Americans will need dentures by age 45. The nation's dental bill each year is well over four billion dollars. 97 Most of these deaths and conditions are premature and can be prevented.

Because of these problems and other factors, the federal government has become aware that the solution to the nation's health problems "demands a comprehensive approach that not only requires the continued efforts of the medical community but also looks to the individual to accept primary responsibility for maintaining his health and to our industrial society to moderate those practices which are potentially hazardous to man". 98 Thus, with this statement, the Department of Health, Education, and Welfare's "Forward Plan on Health" has identified prevention as one of its major themes. The Public Health Service Division of HEW plans to increase the funding for immunization projects and venereal disease programs at the state and local levels, and other ambitious measures are being planned in t-he areas of health education, nutrition, child health, and environmental health at the Department of Health, Education and Welfare. Also, the enactment of the National Consumer Health Information and Promotion Act of 1976 (P.L. 94-317) provides for a separate organizati on within the Office of the Assistant Secretary for Health to coordinate all Department of Health, Education and Welfare activities that relate to preventive health services.

Examples of earlier federal attempts in the area of prevention and early detection include the Regional Medical Programs and the Early and Periodic Screening, Diagnosis and Treatment Program for children covered by Medicaid. This 1967 amendment to Title 19 of the Social Security Act mandated reaching high-risk children in needy families.

While there is no limit to what new technologies may provide for the treatment of disease, there are definite limits to the resources that are available for health care. The yearly cost of medical care in the United States is now over 118 billion dollars. 99 This is one reason why prevention has become increasingly important. The costs of preventing illness are substantially less than the costs of caring for the ill, and an investment in prevention can save many lives.

For example, one committee in Congress published data that demonstrated that 30.000 premature deaths would be averted if an investment of 50 million dollars were made in the early detection of cervical cancer. 100

With the recent national emphasis and focus upon preventive services, it is now up to the states, communities, and finally each individual to decide if this preventive emphasis is to be effective. Fortunately, there is increasing evidence that the leaders involved in delivering prevention and detection services are approaching prevention with more emphasis on specific chronic illnesses and major risk factors such as hypertension, smoking, alcoholism and obesity. 101

In addition, scientific research is seeking more effective means of disease prevention. A number of large studies such as the Hypertension Detection and Follow-up Program and the Community Cancer Control Program are currently in progress. Other efforts are being made to have the major health insurance carriers and other programs (such as Medicare) provide coverage for a major portion of preventive services. If these efforts do succeed, then prevention programs could reduce the burden on the medical system simply by allowing this system to more effectively manage the unpreventable diseases or conditions.

An important recent legislative effort was made with the passage of the National Consumer Health Information and Health Promotion Act of 1976 (Public Law 94-317), which sets up grants for specific health promotion and prevention programs, sets up application requirements for disease control programs, and also prohibits the use of lead-based paint in the construction of facilities and in the manufacture of certain toys and utensils. This act amended some sections of the Public Health Services Act which also has criteria for other services that relate to prevention or detection of disease. Medicare and Medicaid also have regulations that prescribe standards for various preventive services if they are to qualify for reimbursement under these programs.

Individual screening programs are directed at various populations. Target population may be defined by risk or by other characteristics. School populations (as in the CHDP program), employees of a single organization, HMO enrollees, Medicaid beneficiaries, and the aged have been selected as recipients of various screening programs.

Task Force VII of the National Conference on Preventive Medicine has developed a series of criteria that can be used in the evaluation of proposed screening programs. These criteria are as follows:

1) The condition being sought should be an important health problem for the individual and the community.
2) There should be an acceptable form of treatment for patients with recognizable disease.
3) The natural history of the condition, including its development from latent to declared disease, should be adequately understood.
4) There should be a recognizable latent or early symptomatic stage.
5) There should be a suitable screening test or examination for detecting the disease at the latent or early symptomatic state, and this test should be acceptable to the population.
6) The facilities required for diagnosis and treatment of patients revealed by the screening program should be available.
7) There should be an agreed policy on whom to treat as patients.

8) Treatment at the presymptomatic, borderline stage of a disease should favorably influence its course and prognosis.
9) The cost of case-finding (which would include the cost of diagnosis and treatment) needs to be economically balanced in relation to possible expenditures on medical care as a whole.
10) Case-finding should be a continuing process, not a "once and for all" project.

AVAILABILITY AND ACCESSIBILITY

Individual Health Protection Services

A. Immunization

The Department of Public Health and Social Services provides free immunization at village clinics in Tamuning, Mangilao, Sinajana, Santa Rita and Inarajan.

It was reported by the Guam Community Development Institute in 1978, that mothers interviewed complained that the Department's five clinics are sparsely located throughout the island or that if they went to the Mangilao Center facility, they were directed to village clinics or to the health insurance providers.

In addition to the Public Health clinics, the Headstart Program and private medical practitioners as well as HMO's provide immunization services to their client.

DEPARTMENT OF PUBLIC HEALTH AND SOCIAL SERVICES
ANNUAL REPORT - MATERNAL AND CHILD HEALTH
JULY 1, 1977 TO JUNE 30, 1978

Immunization

DPT	1,875
Polio	2,035
Measles	507
Rubella	499
Mumps	924
Smallpox	16
DT	225
PPD	2,305
Cholera	5
Measles/Rubella	32
Measles/Rubella/Mumps	18

Age

Under 1	490
1-4 years	1,844
5-9 years	464
10-14 years	133
15-19 years	60
20 and over	175

B. Well-Child Services

Well-child services are provided throughout Guam by the following organizations:

1. Public Health and Social Services
2. Headstart Program
3. Health Maintenance Organizations (FHP, GMHP & HML)
4. Family Planning in individual and group practices, clinics, etc.

The only information available as to the utilization of the well-child services on Guam is from the Department of Public Health and Social Services Annual Report, Maternal Child Health, July 1, 1977 to June 30, 1978.

Child Health Clinics

Seen by Doctor	3,597
Seen by Nurse only	4,615
Seen by Aide	7
Total	8,219
Nutrition Contacts	254

C. Dental Prophylaxis

The Department of Public Health and Social Services provides dental prophylaxis to children under 17 years such as topical fluoride and fluoride mouthwash test programs.

Some local private dental practitioners on Guam treat their patients with topical or oral medications of fluoride as part of their prophylaxis services. Currently, the water supply of Guam is not fluoridated for protection against dental caries, although some individuals may be using expensive fluoridated bottle water.

Family Planning

The Department of Public Health and Social Services provides family planning services including examination clinics, dispensing of birth control supplies, outreach activities, and educational programs. The clinics are located in Tamuning, Mangilao, Sinajana, Santa Rita, and Inarajan.

DEPARTMENT OF PUBLIC HEALTH AND SOCIAL SERVICES
ANNUAL REPORT - FAMILY PLANNING SERVICES
JULY 1, 1977 to JUNE 30, 1978

Services through Clinics	Number of Patients
Initial Visit	500
Revisit (1st visit this year)	204
Revisit (not 1st visit this year)	347
Readmission	21
TOTAL	1,072

Family Planning Method Used	Number of Patients
Pills	725
IUD	149
Foam	81
Condom	130
Rhythm	9
Diaphram	3
IUD/Foam	1
Condom/Foam	26
Pill/Condom/Foam	11
Pill/Condom	4
Pill/Foam	2
Sterilization	36
TOTAL	1,177

Outreach Workers Activities

New Admission	5
1st Visit Fiscal Year	127
Return Visit	156
Home Visit	116
Office Visit	237

Family Planning Lectures and Audio-Visual Viewing

1. Lectures	95
Attendees	1,234
2. Materials (pamphlets)	610
3. Film Viewing	38
Attendees	484

In addition to the Public Health clinics, private medical practitioners and HMO's provide family planning services to their clients.

An important problem in Guam as well as in the nation is the fact that while certain prevention and detection services are available, these services are not being utilized. This is vividly demonstrated in the area of family planning. It is obvious that more emphasis must be placed upon educating the public about the importance of prevention and detection services. This again illustrates how closely health promotion and protection services are related to the individual prevention and detection services. In future planning cycles, GHPDA will study the interrelationship of these services more closely and facilitate the planning and coordination of preventive services that is part of the mandate given by P.L. 93-641.

COST

Individual Health Protection Services

The cost versus the benefits of prevention and detection services is an important issue. For example, some screening programs are extremely controversial in terms of costs and benefits. Adequate follow-up and treatment is necessary if the detection of disease is to be considered worthwhile. Thus, the benefits of many prevention and detection measures will not be fully realized until certain chronic disease causes are completely understood and the diseases are able to be controlled. In spite of these difficulties, certain of the prevention and detection services have been thoroughly examined and found to be cost

beneficial. The phenylketonuria screening programs and immunization programs against r ubella and measles are examples. There is a tremendous difference in the costs of care for a person who contracts one of these diseases versus the cost of the immunization.

Another important issue that relates to cost is the fact that third party reimbursement for many preventive services is either scarce or non-existent. If preventive services are to become an important segment of the medical care system, this must be changed.

Immunization Services

The control of many communicable diseases through immunization has and will continue to have tremendous cost implications. The cost-benefit of an innoculation which prevents a disease as compared to the cost of treatment and lost productivity associated with contracting the disease is apparent.

Well-Child Services

As noted previously, well-child services encompass a broad range of activities, from screening services to parent education. The development of such programs has come about based on the assumption that early detection and adequate referral and follow-up can result in a reduction in the severity of a condition (hence reductions in morbidity and/or mortality) and/or that primary prevention can occur through parent and child education. Such programs are assumed to be cost effective and are probably the least debated (in terms of cost effectiveness because of the target population for such services.

Dental Prophylaxis

It has been demonstrated that preventive dental techniques are beneficial in preventing dental disease and are also beneficial when viewed from a purely fiscal perspective. Two studies of the effects of water fluoridation in Pennsylvania showed a cost-benefit ratio of 1 to 15.2 to 1 to 15.4. That is, the benefit (as measured by dollars saved in restorative dental works) to the population from fluoridation was over 15 times the cost of initiating fluoridation and maintaining it at proper levels. 102 A study conducted in Oregon also demonstrated the cost benefit of weekly fluoride rinse programs in schools. This program resulted in an estimated cost-benefit ratio of 1 to 1.52 up to 1 to 1.71. 103

Family Planning Services

The economic benefits of family planning services are best measured by the medical and social costs associated with an unwanted pregnancy. As was pointed out in previous sections, lack of family planning can result in illegitimacy, premarital pregnancy, perpetuation of poverty and post-partum psychosis. Teenage pregnancies have extreme cost implications because of maternal complications such as toxemia, anemia, prolonged and/or premature labor during pregnancy and delivery, urinary tract infection, and caesarean section, which are more common among pregnant women under 20 years. Although the costs associated with these problems have not been directly measures, one state, California, has estimated that if only 10 percent of adolescent pregnancies were prevented, the net savings to the state would be $2.3 million the first year.

ACCEPTABILITY

Adolescent pregnancies have become a growing health concern due to the high risk of death, injury, and illness to both the mother and infant. Despite the numerous birth complications that a pregnant teenager faces, on Guam most teenage mothers do not seek prenatal care until late in their pregnancy, if at all. When compared to all age groups in 1976 and 1977, the under 15 and the 15 to 19 age groups had a significantly lower average percent of first prenatal visits occurring in the first trimester and had a significantly higher percentage occurring in the second and third trimester. The under 15 age group had the highest percentage of no prenateal visits; however, the 15 to 19 age group had a percentage of no prenatal visits when compared to all age groups.

While the live birth rate for teenagers has been decreasing on Guam since 1972, it continues to be a serious health problem. It can be argued that due to the family's cohesiveness on Guam, many of the dangers associated with teenage pregnancies have been minimized. However, the family's cohesiveness is decreasing, which could increase the dangers of pregnanacy to both the mother and infant.

Despite strong cultural and religious preferences against certain clinical practices or techniques used in family planning, i.e., abortion, birth control pills, douches, etc., as well as inadequate outreach activities, individuals who utilize either the private or public family planning services find them acceptable.

AVAILABILITY

Detection Services

Because of the wide variety of screening services, it is difficult to make a complete, detailed assessment of all such services that are available. Test such as papanicalaou smear and even urine analysis could be included in the screening category. As with the immunization activities, it is hoped that the Guam Health Planning and Development Agency can more accurately assess the complete inventory of services in future planning cycles.

The Guam Department of Public Health and Social Services is a major provider of screening services and has a number of programs designed for the early detection of disease.

Again, because of their wide variety, it is difficult to include all of the possible preventive services. Prevention and detection services could include such things as mammography, genetic counseling, physical examinations, clinical laboratory tests, diagnostic radiology and thermography, electrocardiograms, blood pressure readings and family planning. If these types of services and tests are included, then Guam Memorial Hospital does certainly provide some type of detective services. Current detection services are included in certain subchapters in the Diagnostic and Treatment Services of the Health Systems Plan.

Private medical resources, i. e., physician offices, clinics and HMO's provide screening services to the population. The rate of utilization of private services of screening services, however, is unknown for Guam and should be analyzed in future planning cycles.

ACCESSIBILITY

Individuals residing in small, isolated communities, that possibly have no transportation, have difficulty in accessing screening services because of time and distance to some providers. The shortage of health care professionals in these areas often results in a complete emphasis on treatment services rather than on the preventive interventions because of lack of time.

COST

See cost implications in Individual Health Protection Services section.

3. DIAGNOSIS AND TREATMENT SERVICES

Definition

Diagnosis and treatment services are those which evaluate the health status of individuals and identify and alleviate disease and ill-health or the symptoms thereof.

Background and Trends

Diagnosis and treatment related services encompass the vast majority of health resources in Guam and the United States as a whole. Services which are included under the heading of diagnosis and treatment are general medical services, special medical services, surgical services, perinatal services, diagnostic imaging services, radiation therapy services, clinical laboratory services, emergency medical services, dental health services, and mental health services. All of these services are addressed in the following plan sections.

Because of the scope of the diagnosis and treatment service category, a complete evaluation of all component services in terms of the various settings of service delivery and each characteristic for analysis (availability, accessibility, ect.) is a process that will take years to complet. Therefore, the analysis of services in this category for the first HSP is focused on those services (and settings) which are of great importance to the health and well-being of the population of Guam(i.e., primary care). Subsequent editions of the plan will both broaden the scope and refine the analysis conducted in this planning year.

As noted above, diagnosis and treatment services have been emphasized in the American health care system. Other major components of the total system, including preventive, rehabilitative, and maintenance services have lagged in development in comparison, Within the overall category of diagnosis and treatment, however, there has also been disproportionate growth of some services.

Acute hospital and specialty care has been the biggest growth area in the United States health care system because of the better coverage of this care by health insurance, the funds pouring into research and hospital construction, the advances in medical technology, doctors' great interest in this level of care. 104 In comparison, the supply of primary health care services has actually declined over the last few decades.

Because of the cost implications of hospital and specialty services and growing evidence that many parts of the nation have excess hospital beds and services, recent legislation at both the federal and state levels has attempted to curtail the unnecessary growth of such services. The following plan sections have been developed in part in response to this growing concern and attempt to define the services required by the population while restraining unnecessary growth in hospital and specialty services.

a. GENERAL MEDICAL SERVICES

a.1. Primary Care Services

Definition

Primary care services are those which meet the routine health needs of persons who are generally mobile and do not require emergency treatment or hospitalization. Primary care can be characterized as 1) the care received by most of the people most of the itme; 2) the entry point into the health system and point of continuing care, and 3) non-intensive.

Background and Trends

As implied in the above definition, primary care serves as the mainstay of the health care system, both in terms of number of people served and in terms of its role as a gateway to other more intensive levels of care. Primary care is provided in a variety of settings, including a private physician's office, a freestanding clinic, a hospital outpatient department or hospital emergency room and an industrial health facility or a school or college health unit. It is provided by general/family practice physicians, interns, pediatricians, obstetricians/gynecologists and mid-level practitioners (nurse practitioners, physician assistants). Regardless of the setting of service delivery or the type of provider, primary care can be viewed as having four basic functions:

1) to prevent the occurrence of illness;
2) to reduce the impact of illness or to provide curative services once an illness has occurred;
3) to screen out and detect those patients with health conditions which require more specialized and intensive care;
4) to reduce the need for and dependence on acute hospital services.

In view of these functions, it is apparent that primary care services have a tremendous impact on the health status of the population and on other levels of care. Because of the role of the primary care provider in the delivery of preventive care, a shortage of this type of provider will adversely affect the population's access to and utilization of preventive services. This may result in illness and/or premature death that could be prevented. At the other end of the health care spectrum, a shortage of primary care services can result in ill health conditions going undetected and untreated until the patient requires hospitalization. When this situation occurs, the cost of treatment rises dramatically. These examples are designed to demonstrate the key role of adequate primary care in an effective health care system and to illustrate the relationship between primary care and other health services.

Broad trends relating to the delivery of primary care involve a decrease in the proportion of physicians trained in primary care specialties, the use of mid-level practitioners in the provision of care, and a change in the settings of service delivery. Data from the nation as a whole indicate a dramatic decline in the ratio of primary care physicians to population over the last few decades.

The data reflect the growing trend of American medicine to specialize. Numerous studies that have attempted to define the appropriate mix of specialists have indicated there is a growing shortage of physicains trained to provide primary care. 105 To correct this problem, the American Medical Association and other groups have recommended that at least 50% of all residency training programs be in primary care. National and territorial (proposed) legislation has also been developed which attempts to provide incentives for increased training of primary care physicians. Although these efforts may increase the number of physicians trained in primary care, they may have little impact on the supply of physicians in isolated areas, such as Guam.

Traditionally, isolated communities have had difficulties in securing and retaining physicians. This reluctance to practice in those areas is related to the physician's isolation from his peers and specialty backup that would be available in an urban area. In order to stimulate the location of physicians in rural areas, governmental programs such as the National Health Service Corps have been developed.

As a direct result of the shortage of primary care physicians, a new group of health workers has developed to take over from physicians some of the more routine aspects of medical care. Mid-level practitioners - both physicians assistants (PA's) or nurse practitioners (NP's) - are trained to provide patient care services under the supervision or in consultation with a licensed physician. The PA's duties can include the following functions:

- receiving patients, obtaining case histories, performing an appropriate physical examination, and presenting meaningful resulting data to the physician;
- performing or assisting in laboratory procedures and related studies in the practice setting;
- giving injections and immunizations;
- suturing and caring for wounds;
- providing patient counseling services and referring patients to other health care resources;
- responding to emergency situations which might arise in the physician's absence within the assistant's range of skills and experience;
- assisting the employing physician in all settings such as the office,hospitals, extended care facilities, nursing homes, and the patient's home. 106

The main functional difference between the NP and the PA is that the NP practices under his or her license as a nurse and consults with the physician who retains final medical responsibility for the patient. The NP performs both medical and nursing tasks.

The terms of the effectiveness of physician extenders, the literature indicates that the productivity of physicians can be substantially increased. Several studies indicate that PA's have increased the productivity of a physician's practice (in terms of number of patient visits) from 12 percent during the first year of training to 37 to 40 percent in subsequent years. The usefulness of PA's in rural and medically underserved areas [107,108] has been documented in studies from the rural southeast which indicate that a large percentage of patient problems in a general practice are appropriate for physician extender activity.109

Studies of the productivity of NP's demonstrate similar results to those cited above for PA's. A review of the literature relating to the use of NP's in a pediatric practice indicate a physician's time can be reduced by 50 percent by the use of 1.5 pediatric NP's.110 Another study of NP's in primary care practice indicated that they were able to function alone successfully in 67 percent of all patient visits.111

The use of mid-level practitioners has generally gained favorable acceptance by the public, physicians, and health professionals. A study conducted for the Board of Medical Examiners, State of California, found that 80 percent of the general public smapled would react favorably toward being cared for by a mid-level practitioner. The study also found that approximately two-thirds of the physicians surveyed were favorable toward this type of health professional, although only one-third of the physicians expressed interest in employing mid-level practitioners at this time.112

Some of the problems associated with the use of mid-level practitioners (mainly from the physician point of view) include malpractice insurance, reimbursement by third party payers, the delegation of patient care responsibilities and the kind of legal corporate structure within which a mid-level practitioner can act. Despite these problems, many of which can be remedied either through legislative action or a modification of current regulations, the supply of mid-level practitioners can be expected to increase in the future. The impact of mid-level practitioners on the availability of primary care services on Guam is dependent on the willingness of physicians to utilize this level of health professional and the ability of the island to attract the mid-level practitioner to an isolated setting.

A recent and alarming trend in the nation in the delivery of primary care services has been the increased use of hospital emergency facilities by patients whose condition does not require this type of care. It can be assumed that this large increase probably was not because more persons needed emergency care, but rather, because more patients looked to emergency departments to meet their primary health care needs which could not be met elsewhere. Some of the patients utilizing emergency rooms for primary doctors who were not available when needed or who instructed the patient to meet them in the emergency room.

The increasing use of emergency rooms by non-emergent patients has implications for the rapid care of emergency patients, continuity of care for the patient requiring only primary care and the cost of services. The non-emergency patients in undating emergency rooms may make it difficult to provide prompt treatment to true emergencies, while the patient seeking primary care may be required to wait an extended period for services. There is also usually little follow-up provided patients treated in emergency rooms. Since the cost of primary care provided in a hospital emergency department may be two to five times as costly as the same care provided in a physician's office, the inappropriate use of these facilities has dramatic implications for health care costs.

Because the increasing use of emergency facilities by non-emergent patients can be tied directly to a shortage of primary care providers, a reversal of this trend will require an increase in the availability of primary care services. Without such an increase, the use of emergency services by primary care patients can be expected to continue to increase.

specialty
There is a physician shortage here in Guam. Although, as previously mentioned, that need is not presently felt to any large extent. Most persons are able to see a doctor when they are in need, and to date there has not been any large expression of dissatisfaction on the part of the consumer/patient.

Experience has shown however, that in any area of economic growth and development along with increased consumer affluence comes a demand for more and increased quality of medical services. There is no reason to believe that Guam will be any different. How soon will that day arrive and how severe will the crisis be? Much of course depends on the type of system that will be in use.

Health Maintenance Organizations (HMO's) are a recent development in health care with a potential for cost containment. The HMO represents a type of health care organization which a growing number of people are regarding as a viable alternative to traditional services financed by "fee-for-service". The fundamental elements for these plans are these:

1) Prepayment Financing: Rather than fee-for-service, the HMO member pays for care with a fixed, normally monthly, prepayment. The HMO thereby can plan its costs on a predictable annual budget and has direct incentives to control costs.

2) Voluntarily Enrolled Member Population. The HMO provides services to a defined population of members who have voluntarily chosen to enroll.

3) Organized Delivery System. The HMO is an organized system which directly provides, or contracts to provide, for the delivery of a comprehensive range of health care services. The plan members receive benefits through the HMO's providers.

An HMO may choose to be federally certified as a qualified HMO by meeting the requirements and implementing regulations of the HMO Act of 1973 (P.L. 93-222, as amended by P.L. 94-460). There are three organizational models which a qualified HMO may elect to use to provide professional health care:

1) Group Practice Qualified HMO: a qualified HMO which contracts with a medical group, partnership or corporation composed of physicians licensed to practice medicine or osteopathy, as well as other health professionals (for example, dentists, pharmacists) necessary for the provision of health services. Usually, in this arrangement, all physicians are located in one facility and compensated on a salaried or capitation basis.

2) Staff Qualified HMO: a qualified HMO which delivers services through its own physicians who are paid employees (staff) on the HMO, and who usually are located in one or more clinic facilities.

3) Individual Practice Association (IPA) Qualified HMO: a qualified HMO that contracts with a partnership, association or corporation which has substantial responsibilities for entering into contractual arrangements with health professionals for the delivery of health services. Unlike group-practice-type HMO's, the IPA provides services in a variety of locations, e.g., allowing physicians to

work directly from their own offices, thereby allowing the HMO enrollees (members) to continue to receive services in their customary manner. Physicians usually are paid by the HMO on some type of fee-for-service arrangement.

The background of HMOs includes both federal and state initiatives. The last several years have witnessed the passage of significant legislation affecting the financing and delivery of health care. After 1965, with the passage of Medicaid and Medicare, there has been a stream of legislation and directives from the federal government designed to influence the health care industry, including the promotion of HMOs. Some of the more important legislation and directives which addressed HMOs were as follows:

February, 1971 - President's health message to Congress advocating federal assistance to HMOs.

May, 1971 - "White Paper" outlining the administration's health strategy with a key section relating to promoting the development of HMOs.

October, 1972 - Public Law 92-603 (H.R.1) stipulating that Medicare beneficiaries may receive their medical services through an HMO.

December, 1973 - Public Law 93-222 (HMO Act of 1973) modifying the system of health care delivery by providing financial and other incentives to support feasibility studies, planning, development, and initial operation of HMO's as a demonstration program. It also provided for special criteria to be applied to HMO actions subject ot certificate of need review.

January, 1975 - Public Law 93-641 (National Health Planning and Resources Development Act of 1974) including the development of health maintenance organizations as one of the nation's health priorities.

October, 1976 - Public Law 94-460 (HMO Amendments) modifying the HMO Act of 1973 to relax certain requirements (including community rating, open enrollment, dental benefit) and to make the HMO more viable as well as competitive with indemnity insurance plans. (Primary implementation provided in June, 1977, DHEW Interim Regulations.)

A most interesting primary health care system that is indigenous to Guam is the services given by the "Suruhano" or the traditional folk doctor of Guam. The "suruhano" is a cultural adaptation that has persisted through time as a consequence of the continued demand for the practice. A measure of successful adaptation is the good health of the people in a culture that is interacting with a specific environment. The main function of the "suruhano" is to promote good health within the community in which he practices. The maintenance of good health involves using a body of knowledge and beliefs in the prevention and cure of body ailments which, in turn enhance the survival potential of a

population. Thus, the "suruhano" is seen as a single cultural adaptation to the Guam ecosystem, which facilitates adaptation on a large scale: for without good health, other forms of cultural activity are naturally affected.

Originally, the belief that curers could improve the state of health of an individual by using their power, knowledge, and material objects arrived on Guam with the first migrations from island in Southeast Asia, and either actual curers or the concepts of curing were brought on initial migrations. Each individual village probably had one 'suruhano" just as the existing villages of present day Guam each have one or at most two "suruhanos".

The "suruhanos" are men, but there are also some women curers termed "suruhanas" who still practice the traditional methods of curing patients. Generally, the two sexes are competitive. The lack of interaction between the "suruhano" and the "suruhana' is much greater than the competition between two "suruhanos' or between two "suruhanas". A factor that probably adds to the difference between the "suruhano" and the "suruhana' is that the practice is usually learned by a member of the same sex as the person passing on the knowledge. This has resulted in some minor consistent differences between the practices of both sexes, but the basic underlying patterns of traditional medicine are prevalent in both groups.

Both the "suruhano" and the "suruhana" have so completely adapted to the Guam environment that it is difficult to trace their practices to parallel activities of the curers of ancient Southeast Asia beyond the fact that they both have powers that are most effective when used in conjunction with material objects such as plant medicines.113

Availability

Primary care services are delivered in a variety of settings on Guam, including the ambulatory setting (physician's office and free-standing private and public clinics) and the acute hospital setting (GMH outpatient department and emergency room).

Ambulatory Setting - Physician Office

The predominant mode of delivery of primary care services on Guam is through the Group fee-for-service or Group Prepaid (47.3 percent and 27 percent, respectively).

There are currently 21 GPs, 8 internists, and 11 OB-Gyns practicing some type of primary care. The population per provider ratio for general practice, OB-Gyn, internal medicine and pediatrics on Guam are: GP-1141:1; OB-Gyn-7,675:1; Ped-12,061:1; Int-10,553:1. All are over the current ratios in the United States.

The adequacy of current physician supply and projections of future need can be developed based on expected primary care visits by the population and estimates of physician productivity. Although data on the specific number of visits area residents utilize are not available, natural data can be used to estimate local experience. Information from the National Center for Health Statistics indicates that on the average, people utilized approximately 3.0 primary care visits in 1973.114 Trend data indicate an increase of approximately 2.5 percent in visits per year between 1964 and 1973.115 Information gathered from the National Health Interview Survey also indicates that the aged use approximately 15 percent more visits than did the general population.

The trend data above may be slightly over estimated for Guam because of its younger population, but is may, in fact, be a conservative figure of future use because of overall trends in health care toward emphasis on preventive and primary care services.

Physician productivity, or the number of visits a single physician can provide in a year, varies with physician specialty. Data from the American Medical Association indicates the following annual productivity for physicians practicing in non-metropolitan areas:116

Specialty	Annual Productivity (visits)
Family/General Practice	7,100
Internal Medicine	4,400
OB/Gyn	5,600
Pediatrics	6,100

As these data indicate, the capacity of an area to provide primary care services depends on the mix of physicians in the area. The United States as a whole exhibits the following mix of primary care services: Family/General Practice, 70 percent; Internal Medicine, 9 percent; Obstetrics/Gynecology, 9 percent; Pediatrics, 12 percent.117 If we assume this is a "reasonable" mix of specialties, this information can be used to determine both and average productivity rate for primary care physicians, and the population's expected demand for primary care services by specialty.

Given the physician mix data presented above and the estimated annual productivity by specialty, it can be estimated that primary care physicians will, on the average, provide a capacity of approximately 6,400 visits per year. Based on an average of 3.5 primary care visits per person per year, a primary care physician in Guam could serve a population of approximately 1,825 people.

Several studies have indicated that nid-level practitioners can be effective providers of primary care. The extent to which mid-level practitioners can extend a physician's productivity, however, cannot be precisely measured at this time.

Ambulatory Setting - Freestanding Clinics

Freestanding primary care clinics are abundant on Guam. As of 1977, there are 21 private outpatient or free-standing clinics dispensed throughout the island, as well as 3 Department of Public Health and Social Services clinics.

Currently, there is little information available which could give one an accurate picture of the utilization of these services on Guam. Productivity and utilization analysis will be initiated in future planning cycles.

Hospital - Outpatient and Emergency Department at GMH

GMH, being the only hospital on Guam, provides primary health care services through the outpatient and emergency rooms. There were 30,897 outpatient visits at GMH for Fiscal Year 1977-1978.

Outpatient visits are generally on an appointment basis when the clinic is open for general business, while emergency services are available 24 hours a day. All patients are seen and treated regardless of the type of complaints or problems. Patients with FHP-GMH or SDA health insurance are evaluated by the doctor on duty. If such injury is not life threatening, they are then transferred to other clinics.

Accessibility

The concept of access to services can be examined from at least four perspectives: geographical, temporal, psychological, and financial. Although all of these factors except grographical access are difficult to directly measure, surrogate measures are available and will be discussed here.

Geographical Access

Generally speaking, primary care services on Guam appear to be accessible. A case, however, might be made for the accessibility of certain services that are offered only in certain primary care settings. Individuals may have to travel over 30 minutes to a specific clinic that offers a specific service. There is no current information at this time to adequately address the question. It is anticipated that this question will be analyzed in the future planning cycles.

Temporal Access

Temporal access refers to the ability of patients to receive services at the time they need them. Traditionally, primary care services are provided on a 9:00 a.m. to 5:00 p.m. basis. These hours of service limit access to care when evening illness occurs and when an individual's employment prohibits seeking care during these hours. A direct assessment of the availability of after-hour services on Guam has not been conducted. However, a surrogate measure of access constraints resulting from limited after-hour services may be the use of emergency facilities.

The use of an emergency facility for primary care can become extremely attractive because of the convenience of being able to use the service at any time during the day. Over a period of time, the use of the emergency room for primary care, which may initially start as a temporary measure, may become more continuous and permanent.

Psychological Access

Psychological access refers to an individual's cultural, personal, or other beliefs that may effectively limit his access to primary care services. This factor is impossible to directly measure at this time. It should again be noted that primary care visits to emergency rooms are only a surrogate measure of the difficulty patients face in achieving access to an appropriate source of primary care. The proportion of visits to emergency rooms that are for primary care must also be viewed cautiously since they represent the subjective judgment of the hospitals providing services. In order to adequately address this area, an analysis will have to be completed during a future planning cycle.

Financial Access

Financial access can be defined as the patient's ability to pay for services and the willingness of a provider to accept the patient's mode of payment.

Cost

A discussion of the cost implications of primary health care must be restricted due to data limitations. However, based on national data, estimates of total expenditures for primary care can be developed and distinctions between the cost associated with alternative settings can be drawn.

Nationally, approximately 18.6 percent of total health care expenditures are for physician services and an estimated 80 percent of all physician visits are to primary care physicians.118

Acceptability

It appears, from limited information, that primary care services of both the private and pbulic sector are acceptable to the citizens of Guam. A more detailed analysis will be needed in future planning cycles to better as certain the true acceptability of primary health care services.

a.2. Inpatient Medical-Surgical Services

DEFINITION

A medical service means those preventive, diagnostic, and therapeutic measures performed by or at the request of the members of the organized medical staff of a general hospital. A surgical service means the performance of surgical procedures with the appropriate staff, space, equipment, and supplies. This element will focus on the medical-surgical inpatient bed requirements of the population.

BACKGROUND AND TRENDS

Guam Memorial Hospital (GMH), the only acute care hospital on Guam, is a fully accredited general hospital consisting of 223 acute and chronic beds and 26 bassinets (4 of which are in the newly created Neonatal Intensive Care Unit) and is a member of the Association of Western Hospitals and the Hawaii Hospital Association.

The primary objective of GMH is to improve the health care for the people of Guam.

On January 15, 1978, GMH acute care was transferred to the Medical Center of the Marianas (MCM) facilities. Public Law 14-91, among other things, created a new Board of Trustees for the hospital consisting of 13 members chosen from 13 local organizations.

The use of medical-surgical services on Guam during the period from December, 1977, through November, 1978, was with 25 beds. Medical East had 7,616 patient days with an occupancy rate of 83 percent and an average length of stay of 107 days. Medical-Surgical West had, with 49 beds in use, 13,973 patients days with an occupancy rate of _____ and an average length of stay of 6.6 days. The beds per 1,000 population at GMH are 4.7, which is slightly higher than the recommendation of the National Guidelines for Health Planning (4.0 beds/1,000 population). (See Guam Memorial Hospital Statistical Report, December, 1977, through November, 1978, for utilization information.)

Many factors impinge on the utilization of acute inpatient services, including availability of alternative services (ambulatory, surgery, home health care) primary care services, age of population, financing systems and governmental cost containment programs. Efforts toward cost control by government and utilization review by PSRO's are two relatively new factors that will tend to hold down the use of acute inpatient services.

Population growth in Guam alone might bring the area below the 4.0 beds per 1,000 population national standard. However, this may be countered in the future by the basically young population of Guam, now at an average of 18.9 years, getting older and utilizing more medical surgical services at GMH. The overall average occupancy rate is 80.5 percent for the area, which exceeds the national standard fo 80 percent average occupancy rate.

AVAILABILITY

From reviewing the utilization statistics of GMH (See Table entited "Guam Memorial Hospital Yearly Statistical Report, December, 1977 to November, 1978"), it is evident that the population of Guam does have medical-surgical facilities available.

The following formula was used to project the estimated bed need for 1983:

$$\frac{\text{1978 Patient Days (M/S) x Est. 1983 Population (those 15 and over)}}{\text{365 days x 80 percent Occup. Std.}}$$

The appropriate number of beds that should be available on Guam for 1983 relies on the following assumptions:

1. Current utilization is appropriate; that is, excessive utilization is not occurring, nor is under-utilization.
2. The demand for medical-surgical services by the population will remain constant through 1983. The population estimates for 1983 have been made with no or zero migration.

Such an approach is demand rather than need oriented, in that it relies on the appropriate volume of services that should be available rather than the expected incidence of conditions in the population requiring this level of service. Guam's bed need for 1983 is estimated to be 219.6 beds, 3.4 less than the current number of beds in service.

ACCESSIBILITY

The location of GMH provides access to medical-surgical services for over 90 percent of the population with a miximum of one hour ground travel time.

COSTS

Data from the "Guam Memorial Hospital Authority Budget and Rate Increases, FY 1979", indicate that the "rate per unit" of "adult nursing care" (medical-surgical) is $70.00 with a gross revenue of $1,761,130 and a net revenue of $1,471,776. It shows a net income (deficit) of ($695,828) without a rate increase of 22 percent.

The approved rate increase of 20.5 percent per unit by the Guam Memorial Hospital Authority of July 13, 1978, shows adult nursing care, (medical/surgical) for projected 1979, at $82.00 with an anticipated gross revenue of $2,963,038.

Because the data are only projections and fiscal reporting for 1978 is in its first year at GMH, we have restrained from any interpretation of data. An in-depth cost analysis will be done in the next planning cycle.

Areas of investigation in future planning cycles should look at the following accounting areas:

the average ratio net revenue to total cost for medical-surgical services,

cost of medical-surgical services,
revenue of medical-surgical services,
average ratio of revenue to cost.

ACCEPTABILITY

It appears as though the medical-surgical service at GMH is acceptable to the residents of Guam. Other than the high cost of care, there is information available to indicate a disatisfaction with the delivery of medical-surgical services at GMH.

a.3. Ambulatory Surgery Services

DEFINITION

Ambulatory surgery services are the provision of surgical services requiring anesthesia or a period of postoperative observation, or both, to patients whose admission for an overnight stay in an inpatient facility is not anticipated as being medically necessary.[119]

BACKGROUND AND TRENDS

Although current interest in ambulatory surgery is high, it is a service that has been practiced since the turn of the century. It was not until the 1960's, however, that ambulatory surgery became more acceptable to physicians as a result of the development of new anesthetics and anesthetic techniques. Furthermore, as the practice of surgery evolved, surgeons wanted many of their patients to move around sooner. Since many hospitals were then experiencing a high demand for inpatient beds, ambulatory surgery was welcomed as a mechanism for freeing up these badly needed beds for patients who were seriously ill. Ambulatory surgery was also viewed as providing potential convenience for both physicians and patients and, thus, the concept gained further acceptance. Finally, the potential for cost savings or containment, since patients were not hospitalized for two or three days, also caused increased interest in ambulatory surgery.

Federal initiative has also been instrumental in generating interest in ambulatory surgery. Public Law 92-603 provides for the establishment of Professional Standards Review Organizations (PSRO's). When the PSRO's are functional, they will be required to certify that Medicare and Medicaid patients are being cared for in the least complex and least costly manner appropriate to the medical problem. The likelihood of a National Health Insurance Program has also drawn attention to ambulatory surgery. It is anticipated that such an insurance program may increase the demand for all health services. If so, ambulatory surgery is viewed as helping to reduce the demand for hospital beds.

Ambulatory surgery is currently performed in a variety of settings:

1) Freestanding surgical facilities having no organizational ties to a hospital.

2) Private Clinics.

PATIENT CONSIDERATIONS

1) Some patients find ambulatory surgery more acceptable than inpatient surgery because of the ability to recover in the home setting. Often these patients resume their normal activities sooner and, therefore, the whole event may be less traumatic and disruptive.

2) Ambulatory surgery is a new concept which many patients are unfamiliar with and, therefore, they may be apprehensive about the procedure. Patients may be reluctant to having surgery on an ambulatory basis because of their psychological state, inadequate home environment for recovery, limited insurance coverage and a variety of other reasons.

PHYSICIAN AND SURGEON CONSIDERATIONS

1) Ambulatory surgery generally provides for the most efficient use of physicians' and surgeons' time, as compared with inpatient surgery.

2) Physicians and surgeons often are attracted to ambulatory surgery units or facilities because the professional staff usually are trained and skilled to meet the special needs of the physicians, the surgeons, and the ambulatory patient.

3) Some physicians and surgeons are apprehensive about participating in the provision of ambulatory surgery services for a variety of reasons including:

   a) fear of malpractice implications if the patient is not admitted to a hospital for surgical procedures;
   b) fear of complications and lack of professional management after discharge to his or her home; and
   c) impression that the staff in the ambulatory surgery unit or facility is insufficiently skilled.

IMPLICATIONS FOR QUALITY

Ambulatory surgery patients may receive less medication, both pre and postoperatively, than patients undergoing similar surgical procedures as impatients within a hospital setting. Some professionals argue that less medication is better for patients; others maintain that if a patient receives less medication, he or she may feel more discomfort after discharge. The actual relationship of the meeication issue to quality is unresolved at this time.

The safety of patients is assured when ambulatory surgery is performed in properly developed and controlled settings.

IMPACT ON THE UTILIZATION OF HEALTH RESOURCES

Ambulatory surgery services allow the waiting time for elective surgery to be greatly reduced when there is a backlog of elective surgeries. A backlog may be a function of a limited hospital bed supply or a surgeon shortage.

Ambulatory surgery services free hospital beds and staff for the more seriously ill patient (assuming a current high utilization of hospital beds). The important overall issue is the provision of the appropriate level of quality care for each patient's needs. If ambulatory surgery services cause an excess of unused beds, the proper solution should be to find alternative uses for these existing beds or to close the units.

Some facilities have positive attitudes toward ambulatory surgery but cannot implement such programs because their facilities and staff cannot be extended to meet the program requirements. All hospitals may not be able to offer ambulatory surgery services for one or more of the following reasons:

1) Space is lacking for patients dressing facilities and bathrooms.

2) Holding space for waiting preoperative patients is not available, and staff are not available to provide the required preoperative services.

3) The operating room schedule is tight and cannot control delays or meergency-urgent scheduling requirements; therefore, it becomes impossible to guarantee ambulatory patients a specific surgical time.

4) Recovery room facilities are inadequate to provide a non-threatening environment for patients.

5) The hospital may be unable to have the statement of charges ready when the patient is discharged. Ambulatory surgery patients, once discharged, cannot be allowed to wait in the hospital. Many will have some degree of pain after arriving home, and surgeons wish to make sure that any such discomfort occurs only after hte patient is in a safe environment.

6) The hospital staff (including physicians and nurses) may be resistant to the development of ambulatory surgery.

7) The area has too few patients who can be classified as probable ambulatory surgery candidates, thus prohibiting the development of a financially feasible service with adequate quality controls. If the demand for ambulatory surgery is too low, the unit or facility will not be able to hire or assign adequate staff for the appropriate management and operation of the service.

COST CONSIDERATIONS

Through the provision of ambulatory surgery services, the expense of two or three days of hospitalization can be averted. Although the ambulatory patient is generally considered to be spared the expense of daily room charge, the question of community-wide cost savings has not been fully evaluated.

Ambulatory surgery may cause an increase in the charges or costs for inpatient surgery as a result of a change in the case-mix of the hospital toward the more cases. Some hospitals have historically charged lesser sirgery cases above the actual cost in order to subsidize more complex surgery. If ambulatory surgery pulls patients from the inpatient surgery, prices to patients with complex problems would have to be increased, and fewer patients would have to pay a greater share of the hospital's overhead costs. A major argument for independent ambulatory surgery units has been that they avoid overhead costs which are necessary only for medically complex cases.

Some third party payers do not fully reimburse for a surgical procedure which is done on an ambulatory basis. Generally, third party payers will pay the physician charge for ambulatory surgery, but the facility charge may not be reimbursed. The same payer will reimburse the complete charge for inpatient surgery; thus creating an incentive to hospitalize patients.

Ambulatory surgery relieves the demand for and pressure on inpatient facilities. Ambulatory surgery services should reduce the demand for inpatient beds, since ambulatory patients will not need to use these facilities. Hospitals whose occupancy rates are below 80 percent may be resistant to the development of the ambulatory surgery capability in their area because such services are seen as a threat to the hospital's room revenues which are bolstered by keeping the patient at least overnight.

Generally, the goal of planning, to provide the appropriate level of care for each patient's needs, would indicate that keeping beds occupied by patients who do not require hospitalization is an inappropriate use of resources. However, in the case of a small rural hospital which serves as the sole provider in an area, a

reduction in occupancy rate brought about by ambulatory surgery might force the facility to close, leaving the area completely without needed health services.

As this brief summary of issues indicates, questions regarding the provision of ambulatory surgery services are widely debated. However, it is apparent that the volume of ambulatory surgery has increased greatly in the last few years. Many individuals feel that this trend will continue. If this prediction is accurate, it may have a significant impact on the health delivery system in the following ways:

1) Potential decreased need for new hospital bed construction;

2) Potential encouragement of the consolidation of hospital programs and/or facilities due to decreased inpatient utilization of services;

3) Establishment of a new case for physician practice and education;

4) Decreased proportion of domicilary patients in hospitals and greater opportunity for the hospital to function as the center for care of the critically ill;

5) Encouragement of new mechanisms for ambulatory delivery of what was once considered strictly hospital-based medical care;

6) Incentives for the provision of health care services in more accessible and potentially less costly settings.

SERVICE AREA

The service area for planning ambulatory surgery services shall be the individual service area for health facility beds. In accord with State Department of Health criteria relating to the planning and review of freestanding ambulatory surgery clinics, the entire health service area shall be used as the planning area for ambulatory surgery.

a.4. Inpatient Perinatal Services

DEFINITION

A perinatal unit means a maternity and newborn service of the hospital for provision of care during pregnancy, labor, delivery, postpsrtum and neonatal periods with appropriate staff, space, equipment and supplies.

The perinatal period, for which perinatal services are intended, begins with conception adn continues to focus on the woman through the first week after delivery and on the newborn through the first of perinatal services, the pregnant woman, the fetus, the newborn and the family members. The definition of perinatal refers to the period which extends from 20 weeks after a woman conceives to 7 days after she delivers. For the newborn infant, the term perinatal includes the fetus from 20 weeks after conception and extends through the first 27 days after birth.

Perinatal services include the following group of functions which are intended to provide needed care to each of the potential consumers:

Prenatal care
Intrapartum care (labor and delivery)
Postpartum care
High-risk obstetric care
Neonatal care (for normal newborns)
Neonatal intensive care

In planning for the delivery of perinatal services within each of these elements, a logical beginning is to determine the need for varying levels of care and the resource commitments required to provide each level. Levels of care refer to the concept of a three-tiered system of health services organization based on teh degree of intensity and specialization of care required by the patient. A level of care is not necessarily identified only by the setting in which the service is delivered. The more complex diagnostic and treatment services are often provided in ambulatory as well as hospital settings. Perinatal services, therefore, extend through all three levels of this system. Intrapartum care, postpartum care, newborn care and referred-patient care are secondary level services and account for the majority of perinatal services. Most high-risk obstetric care and neonatal intensive care are tertiary care services.

High-risk obstetric care involves those medical and health care services provided to the pregnant woman for whom the prospects of optimal outcome are reduced for mother and/or child. A few of the factors which may contribute to a higher risk of delivering a distressed or stillborn infant or to a higher risk of injury or stress to the woman are these: maternal age under 20 or over 35, previous history of perinatal complications, maternal hypertension or diabetes, premature labor.

Screening of all new obstetric patients for potential high-risk factors is an initial step and is a primary level of care. Identification of a high-risk pregnancy may result in referral to a secondary or tertiary level of care when special care is indicated. Approximately

two-thirds of high-risk newborns can be anticipated by evaluation during prenatal and intrapartum care.

Medical and nursing services provided to the newborn infant from birth through the first 27 days of life are referred to as neonatal care and include at least 6 functional areas: 1) resuscitation, 2) admission/observation, 3) normal newborn infant care, 4) continuing care, 5) intermediate care. The intensive care area or intensive care newborn nursery is designed for management of severely ill infants who require constant nursing and continuous cardiopulmonary and other support.

The survival, or ultimate functional integrity, of infants admitted to the intensive care area requires highly specialized personnel and facilities. The number of newborns requiring this level of care will be small compared to those requiring other levels of care. Newborns may be admitted to this area from any of the other functional areas, from other hospitals or from home.

BACKGROUND AND TRENDS

During the past 10 years, new and improved clinical technology has vastly changed the field of perinatal medicine. These improvements have been directed toward both the care of the woman and her fetus pregnancy and the care of the newborn following birth. In terms of planning, the issue is how to effectively and efficiently use this new technology for the benefit of all at-risk residents of Guam.

To maintain proficiency in relation to the new and improved techniques, physicians and essential support staff rely, in part, on providing care to a certain number of cases needing specialized services. Units with small volume (less than 1,500 deliveries) do not treat the necessary number of problem cases, regardless of the facility's ability to afford the service.

The general fertility rate for Guam dropped from 222.3 per thousand in 1972 to 180.6 per thousand in 1977, or an average decline of 8.2 per thousand. On the other hand, the U. S. general fertility rate dropped from 87.9 per thousand in 1979 to 66.7 per thousand in 1975, or an average decline of 4.2 per thousand. Although Guam's fertility rate has been declining at a higher average than the U. S., Guam's general fertility rate was much higher than the U. S.

Although both Guam and U. S. fertility rates have been declining, Guam women are expected to have, on the average, more children per 1000 females in the child-bearing ages. This suggests that Guam women and infants are more at risk of experiencing complications and problems associated with pregnancy and childbirth.

AVAILABILITY

GMH services the population's need for perinatal service with 24 bostetric beds, 26 bassinets of which are in the newly created Neonatal Intensive Care Unit, which meets the National Guidelines for Health Planning of no more than 4 beds per 1,000 live births. GMH experienced 5,735 patient days from December, 1977, through November, 1978, at

an average occupancy of 64 percent (the national standard is 75 percent occupancy with 1,500 births per year) and an average length of stay of 2.5 days.

ACCESSIBILITY

Important perinatal services are accessible to Guam's population.

COST

The current cost estimates for delivering obstetrics services in 7,704 patient days without any increase in rate would be $70.00 per unit. With the approved 20.5 percent increase, it will go up to $82.00 per unit. Nursery cost at 6,049 newborn days would be $45.00. The approved 20.5 percent increase at this population base (newborn days) would be $57.00 per unit.

ACCEPTABILITY

It appears that the population of Guam finds the services acceptable offered at GMH in terms of cost, quality, convenience of care, and provider attitudes.

a.5. Inpatient Long-Term Care

DEFINITION

Long term inpatient care means care provided in a licensed facility which 1) maintains and operates 24-hour skilled nursing services for the care and treatment of chronically ill or convalescent patients, including mental, emotional or behavioral problems, and mental retardation or alcoholism.

BACKGROUND AND TRENDS

Long term care can be broadly defined to cover ambulatory, domiciliary, and institutional services provided in various settings including nursing homes; chronic disease hospitals, home health care agencies and sheltered environments for the physically, mentally, and socially retarded, impaired, disabled, or dependent. Long term care provided in an inpatient setting includes skilled nursing care and intermediate care, and these two types of services will be the focus of this plan section.

Long term inpatient care is geared toward those individuals with chronic conditions with the purpose of improving the ability of patients to function independently or to cope with impairments and disabilities. The orientation of such care is generally not to cure, but rather, to prevent deterioration of the patient's conditions.

The increasing age of the population of the United States indicates a growing need for long term care services. The types of long term care services that are most appropriate for this population, however, is a contested issue at this point in time. The ever-increasing use of inpatient long term care facilities has focus attention on alternative services such as home health care and home meal programs which could potentially maintain individuals in their home environment.

Future trends in the utilization of long term inpatient geriatric services will most certainly be affected by growing concern over institutionalization as expressed by the aged themselves and other members of society. Because Guam's population is basically a young one currently, and the projection of those 65 years and older in 1983 is only 2 percent of the total population projection of 99,443, Guam should not experience any dramatic influx of geriatric patients in Long Term Care Facilities. Trends in long term inpatient services tend to develop comprehensive care systems which can include the provision of skilled nursing care with acute hospital services, or the provision of residential care of intermediate care with skilled nursing serivces. Such arrangements can promote the efficient utilization of health resources and help to insure that the patient can easily move between levels of care as needed.

The following analysis of the availability, accessibility, and cost of long term inpatient care is divided into an assessment of skilled nursing facility services and intermediate care facility services.

SKILLED NURSING SERVICES

DEFINITION

Skilled nursing facility means a health facility which provides the following basic services: skilled nursing care and supportive care to patients whose primary need is for availability of skilled nursing care on an extended basis. It provides 24-hour inpatient care and, as a minimum, includes medical, nursing, dietary, pharmaceutical services, and an activity program. The facility must have effective arrangements, confirmed in writing, to provide services required by the patients which are not regularly provided within the facility.

A. Sub-acute Skilled Nursing Care

At one time associated with extended care services closely linked to the acute care (hospital) inpatient setting, this level of care is intended as a continuation of acute care. It is convalescent care for patients who require short-term rehabilitation services with convenient access to ancillary services. Such care is typically provided within the general acute care setting. The typical patient has a wide variety of medical problems and, while not in the acute phase of illness, has an unstable medical condition requiring frequent skilled nursing observations and special services on a 24-hour inpatient basis.

B. Chronic Care of the Skilled Nursing Care Level

This level of care is intended for chronically ill and convalescent patients who have medical problems which require continuous nursing care and support services to maintain a stabilized medical condition. Typically, the patient is over 45 years of age and stays in the facility well over 150 days. A patient may be discharged to a lower level of care setting, to a community care program or to his home.

AVAILABILITY

Guam has a total of 16 licensed skilled nursing beds at Guam Memorial Hospital. The residents of Guam used a total of 4,903 patient days from December, 1977, through November, 1978. The utilization of these beds for this time period was 84 percent with an average length of stay of 106.5 (See GMH Yearly Statistical Report, Dec., 1977 - Nov., 1978.) These 16 beds will meet the need for their demand by the residents of Guam until 1983. This projection was determined by the following method:

$$\frac{1978 \text{ Patient Days} \times \frac{1983 \text{ Total Population}}{1978 \text{ Total Population}}}{36\% \times .95 \text{ (Occupancy Rate)}}$$

Planning for skilled services in this manner attempts to prevent an increase in the number of skilled beds and fosters the utilization of lower levels of service when appropriate to meet patient needs.

ACCESSIBILITY

The general population of Guam has ready access to skilled nursing services at GMH, and these services are available within at least one hour of driving time.

The one negative aspect of citizens' accessibility is that no public transportation system exists. Therefore, some degree of an access barrier does exist.

COSTS

The GMH Rate Setting estimates of 1979 without any increase were $45.00 per unit on 5,227 budgeted patient days, for an anticipated gross revenue of $235,215. If an increase of 20.5 percent is realized, GMH might anticipate gross revenues of #339,755 on $65.00 per unit.

INTERMEDIATE CARE SERVICES

DEFINITION

Intermediate care facility means a health facility, or a district part of a hospital or skilled nursing facility, which provides the following basic services: inpatient care to patients who have need for skilled nursing supervision and need supportive care but who do not require continuous nursing care.

AVAILABILITY

Currently, there are 43 licensed beds for intermediate care and chronic care services. From December, 1977, to November, 1978, there was a total of 15,141 patient days for the combined services. The 99 percent occupancy rate for this period shows that it is used up to capacity.

Future requirements of bed resources depend largely on teh Guamanian peoples' extended family assistance to recuperating family members. Additionally, the de-institutionalization of patients into community care centers as well as the utilization of home health services provided by the Department of Public Health and Social Services should have a significant impact on use of these facilities and services.

ACCESSIBILITY

Currently, the services of intermediate and chronic care facilities are accessible to the population of Guam at GMH.

COST

The cost per unit rate at GMH prior to the 20.5 percent increase was $35.00. The 20.5 percent increase rate per unit brought the price up to $60.00 with an anticipated gross revenue after increase of $1,250,460 with 20,991 patient days.

INPATIENT PEDIATRIC SERVICES

DEFINITION

Pediatric service means the observation, diagnosis and treatment (including preventive treatment) of children and their illnesses, injuries, diseases and disorders.

BACKGROUND AND TRENDS

Inpatient pediatric services are designed to meet the special needs of children under the age of 14 years. The availability of a nursing staff with training and experience in pediatrics as well as a pediatrician (or a physician with training and experience in pediatrics) is an essential part of a pediatric service.

There is a trend toward consolidation of service in this area because of the realization that all hospitals cannot and need not operate pediatric programs because of increased specialization. There is also a trend toward decreasing hospitalization of uncomplicated pediatric cases and to the development of coordinated regional systems for pediatric care. 125

The major factor that will affect the demand for and use of pediatric services on Guam is the rate of growth of the population 14 years of age and under. In 1978, this age group represented 44 percent of the total population or 36,885. In 1983, the proportion of the population represented by this group is expected to increase to 45 percent or 46,373.

The national guidelines for health indicate that the minimum average annual occupancy rate for a facility that has 20 to 39 beds should be at least 65 percent. However, the standard may be adjusted downward when the travel time exceeds 30 minutes for 10 percent or more of the population.

AVAILABILITY

Guam has 25 pediatric beds available in GMH. Overall utilization of pediatric services was 53 percent with 4,880 patient days and an average length of stay of 4.4 days in 1978.

The need for 1983 is for 26 pediatric beds. The method used to calculate bed demand was done as follows:

$$\frac{\text{1978 Patient Days} \times \frac{\text{1983 Population, Age 0 to 14}}{\text{1978 Population, Age 0 to 14}}}{365 \times \text{Occupancy Rate (Standard 65 percent for 20 to 39 beds)}}$$

Enough beds for pediatric service at GMH are available for the population of Guam.

ACCESSIBILITY

It appears that pediatric services are accessible to the citizens of Guam. The only question that is why is the utilization so low - only 53 percent in 1978? Additionally, one might question whether the location of the facility might not be attracting children because it is not close to their families, homes and friends.

COSTS

The following cost information come from the GMHA Rate Setting Estimates approved January 13, 1978, in Resolution No. 78-7-9 for a 20.5 percent increase. Without the increase, the rate per unit for pediatrics for 1979 would be $70.00 for an estimated 5,384 patient days. With the approved 20.5 percent increase, the rate per unit would be $82.00 for the same patient days with an anticipated gross income of $441,488.

a.6 EMERGENCY MEDICAL SERVICES (EMS)

Definition: EMS refers to all of the services needed to prevent loss of life or aggravation of physiological illness or injury. The service is provided at the onset of an emergency medical condition and refers to pre-hospital services and final recovery and rehabilitation of the patient. The nature, seriousness and causes of emergency medical conditions require a combination of general hospital services, a reliable public or private transport services available 24 hours daily and a reliable communications system.

Background and Trends

Emergency Medical Services play a critical role in today's health care system. Victims of accidents, physical or mental trauma often require prompt para-medical care and rapid transportation to medical facilities. To support the development and operation of these services the Emergency Medical Services Act requires the establishment of Emergency Medical Service Regions, based primarily on existing and traditional medical service areas, and provides for the designation of a state agency responsible for the planning and coordination of a statewide emergency medical services system.

Guam passed Public Law 14-11, which calls for the establishment of an Emergency Medical Services Administration Office responsible with the promulgation and implementation of emergency medical services regulations and standards, the development of an effective medical services communication system, the regulation, inspection, certification of emergency medical services facilities, personnel and equipment.

The increased use of hospital emergency facilities by patients seeking primary care is a recent but alarming national trend. It can be assumed that this trend occurred because more patients look upon emergency departments to meet their primary health care needs when it could not be met elsewhere.

The increasing use of emergency rooms by non-emergency patients at Guam Memorial Hospital has implications for the immediate care of emergency patients, continuity of care for the patient requiring only primary care and the cost of services. The non-emergency patients engulfing emergency rooms may make it difficult to provide prompt treatment to true emergencies, while the patient seeking primary care may be required to wait an extended period for services.

Moreover, there is usually little follow-up provided to primary care patients treated in emergency rooms. The cost of primary care provided in a hospital emergency department may be two to five times as costly as the same care provided in a physician's office. Such inappropriate use of these facilities has dramatic implications for health care costs.

One of the basic components of emergency medical services is emergency communications. To address the need for an effective communications system, utilizing the 911 emergency number, a grant application request in the amount of $200,000 has been submitted to the Office of HIghway Safety. Sixty thousand dollars was also requested for the establishment and development of data system necessary to evaluate the problems associated with emergency services provisions and the formulation of a First Respondent's course and Cardio-Pulmonary Resuscitation training (CPR) to be conducted at the community level.

.1 AVAILABILITY

Currently emergency communications rely solely on the present telephone system. Emergency transportation and first contact emergency medical treatment are provided by 32 emergency medical technicains (EMTs). The EMTs, along with the six medic units (ambulances) are part of the Fire Operations Bureau of the Department of Public Safety and are situated at the six fire stations in Tamuning, Barrigada, Dededo, Agat, Inarajan, and Yona. In addition, the Department of Public Safety provides emergency sea rescue and transport services utilizing two boats.

The GMH emergency room always has one physician on duty, however, there are occasions when two physicians are available. If the need arises, specialists in such areas as pathology, radiology, general surgery, and internal medicine are called in to assist in emergency cases.

The emergency room lacks the facilities to accommodate patients requiring acute care in: neurology, neonatal, burns, major trauma, acute cardiovascular and psychiatric. However, facilities at the Intensive Care Unit on the same floor are sufficient to meet these emergency requirements. The Pediatric department also has the necessary equipment for children with serious medical problems.

. ACCESSIBILITY

GMH provides twenty-four hour emergency medical services. Emergency patients are transported to the hospital by private vehicle or ambulance.

Emergency cases from Southern Guam often requires as much as thirty minutes to reach the hospital in Tamuning. Any emergency case can utilize the ambulance service and the emergency medical services. The ambulance service is available on a twenty-four hour basis.

3.9.3 COSTS

All emergency patients are billed for the use of an emergency room. Charges range between a low of $16.00 to a high of $40.00. An additional $11.00 is assessed the patient for private doctor consultation in the emergency room.

Medicaid, self-pay and pre-paid insurance are the methods of payment made by patients. All too often, patients without health insurance fail to pay the charges assessed them; however, their outstanding bill does not prevent them from receiving such a service at another time.

The emergency room generated revenue totaling $268,324 during Fiscal Year 1979, their expenses totaled $273,030 during the same year.

The only information available from the Department of Public Safety Fire Operations Bureau relative to costs is that of the ambulance services which amounts to $12.00 per run.

b. SPECIAL MEDICAL SERVICES

b.1. Chronic Dialysis Services

Definition

Chronic dialysis service means a specialized unit of a hospital or an out-patient facility for the treatment of patients with end-stage kidney disease. The scope of services includes hemodialysis and may include peritoneal dialysis or other means for removing toxic or excessive waste products from the blood.

Background and Trends

Kidney disease are many and varied, ranging from minor, short-term ailments to serious, chronic disease resulting in renal kidney failure. Renal failure is a general term for the condition in which the kidneys are unable to filter waste products from the blood adequately and is characterized by life-threatening disturbances of the body's chemical balance. Renal failure may occur suddenly for a limited period of time (acute renal failure) as a result of acute illness, shock, or drug poisoning. With proper treatment, this condition usually is reversible. Renal failure may also occur as the result of disease and the progressive destruction of kidney tissue and function (chronic renal failure); this condition generally is not reversible.

In minor kidney diseases, and in the early stages of progressive renal destruction, the kidneys usually continue to function adequately, and treatment consists of conservative management techniques. Conservative management refers to any treatments other than chronic dialysis or transplantation, and consists of attempts to reduce strain on the kidneys, delay their progressive destruction, and minimize symptoms in the patient. When tissue destruction has progressed so far that the kidneys are no longer able to perform their essential functions, conservative management is inadequate, and chronic dialysis or transplantation are the only treatments which can extend life. This terminal stage of chronic renal disease is called End-Stage Renal Disease (ESRD). 126

The possibility of preventing ESRD and the potential value of screening programs which would enable early detection are the subjects of considerable controversy. Not wnough is yet understood about some of the major diseases of the kidney to resolve these differences.

Kidney transplantation and chronic dialysis are interdependent forms of therapy, both of which prolong life and restore ESRD patients to productive activity. Chronic dialysis is a process in which the blood from the patient is circulated through a machine which removes excess fluid and body wastes. The survival rate for chronic dialysis patients is approximately 90 percent the first year of treatment and 92 percent each subsequent year. Most ESRD patients require dialysis treatments three times a week, with each treatment lasting between five and six hours.

Transplantation involves the use of kidneys from living, related donors or cadavers. The survival rate of patients receiving a kidney from a living, related donor is approximately 75 percent after two years compared to 50 percent for patients receiving a cadaveric transplant. 127 It is estimated that 70 percent of all ESRD patients are candidates for transplantation; in practice, the percentage of patients receiving transplants is much lower due to the unavailability of organs and the fact that some patients who have adapted to dialysis are unwilling to take the risks associated with transplantation.

Prior to 1973, the number of patients receiving dialysis and transplantation was limited by the number of facilities providing these services and the cost of services which ranged from $9,000 to $23,000 per year for maintenance dialysis. In 1973, however, the federal government became responsible for the cost of treatment of end stage renal disease through the Medicare program. Almost all individuals who receive a transplant or require dialysis are covered for treatment services. Medicare does not pay for all services, however. The average liability for a patient averages $8,500 the first year and $4,700 each subsequent year. The Veteran's Administration and the Armed Services also provide ESRD services for eligible individuals.

The Department of HEW issued interim regulations on participation in the Medicare ESRD program in 1973. Under these regulations, a freeze was placed on the construction or expansion of transplantation and dialysis facilities; however, a process was outlined whereby "exceptions to the freeze" could be granted. In 1976, final regulations were adopted by HEW which require all facilities desiring to participate in the long term program to apply to HEW for approval.

In addition to requiring new approval for facilities operating under the interim guidelines, the final regulations divide the country into 29 ESRD "networks". Each network will have the capability for kidney transplantation, inpatient dialysis, chronic maintenance dialysis and self-dialysis training. The component facilities in each network will establish a Network Coordinating Council which is to be responsible for planning functions.

Each Network is required to form a Medical Review Board to screen the appropriateness of ESRD care, treatment procedures and services delivered to patients. The final regulations also contain conditional and unconditional minimum utilization rates, personnel standards, physical plant standards and require that certain administrative functions be performed.

As the development of networks implies, chronic dialysis services should be considered in view of the need for a comprehensive set of renal disease facilities which provide flexibility while allowing the needs of patients with various levels of independence to be met. ESRD facilities may be classified as follows:

1. RENAL TRANSPLANTATION CENTER: a hospital unit which is approved to furnish transplantation and other medical and surgical specialty services required for the care of the ESRD transplant patients, including inpatient dialysis furnished directly or under arrangement. A Renal Transplantation Center may also be a Renal Dialysis Center.

2. RENAL DIALYSIS FACILITY: a unit which is approved to furnish dialysis service(s) to ESRD patients.
   a) Renal Dialysis Center: a hospital unit which is approved to furnish the full spectrum of diagnostic, therapeutic (including inpatient dialysis furnished directly or under arrangement), and rehabilitative services, except renal transplantation required for the care of ESRD dialysis patients.

b) Limited Care Dialysis Facility: non-hospital institutional dialysis; chronic dialysis performed by trained staff on an outpatient basis.

c) Self-Care Dialysis Facility: a unit where chronic maintenance dialysis is performed by a trained patient with appropriate professional supervision and assistance.

3. ORGAN PROCUREMENT FACILITY: a facility responsible for obtaining cadaveric kidneys for the purpose of transplantation.

4. HISTOCOMPATIBILITY LABORATORY: a facility capable of determining the compatibility, of the tissues of the donor and recipient prior to transplantation.

Renal transplantation centers, organ procurement facilities, and histocompatibility laboratories are Network facilities and will not be discussed further in this section. Renal dialysis facilities which provide chronic dialysis services (as opposed to acute dialysis) can be of several types as indicated above. Combined with home dialysis, these facilities provide a range of choice for the patient and physician and each has a number of advantages and/or disadvantages.

Home dialysis offers advantages that include greater flexibility in the treatment schedule, fostering a patient independence and increased rehabilitation and employment potential as well as significantly lower costs. The DHEW reports that home dialysis averages approximately $60 to $90 per treatment as compared to $150 for center dialysis. Disadvantages include the necessity of havingan assistant (usually the spouse or a child) help in dialysis. Also, the home must have suitable space and an appropriate physical environment. Home dialysis can prove very stressful to the patient. There has been a relative decline in the proportion of patients treated at home from 41 percent in 1972 to the present 25 percent. This may be a result of the lack of financial incentive for the patient to select this form of dialysis. In addition, the philosophy of the medical community in an area will have a significant impact on the number of patients who could be receiving dialysis in the home setting.

A chronic renal dialysis service in a general hospital is the most expensive type of dialysis facility because of high hospital overhead costs. Maintenance dialysis should not ordinarily be performed in a hospital while other settings are capable of providing quality services at lower cost. 128

Maintenance dialysis in a limited care facility is the most rapidly expanding ESRD service. As indicated previously, the patient is provided dialysis services by trained staff in a non-hospital setting. Such a facility can provide lower cost services than a hospital. 129

There has been recent interest in the development of low cost "self-care" outpatient dialysis facilities in which the patient essentially performs the dialysis himself with minimal professional supervision. Self-care facilities offer the advantage of providing a social environment for groups of dialysis patients plus removing the stress associated with home dialysis, since professional staff is available if needed. Definitive cost data is not currently available on this mode of dialysis, but savings of approximately $30/treatment have been reported by several facilities. 130 The number of patients who could successfully utilize self-care dialysis services is unknown at this time.

Both self-dialysis and home care dialysis require training of the patient. These training services should be available either directly or through the local dialysis facility.

Uncertainty as to the future rate of transplantation and lack of agreement concerning the proportion of patients who are candidates for home and self-care dialysis make it extremely difficult to determine future chronic dialysis trends. However, continuing concern over rising health care costs indicate that the less expensive modes of dialysis (including home and self-care) should be emphasized when found adequate to meet the individual patient's needs.

Availability

There are various methods of determing the demand for chronic dialysis services (stations). Most such methods employ incidence data and knowledge of mortality and transplant rates to determine the probable number of patients who will require dialysis services and the number of stations required to meet this demand.

The following six step approach has been employed to determine the chronic maintenance dialysis requirements for the area:

1. Geographic Area to be Served

   As noted in the definition of service areas, a population base of approximately 100,000 is required to support a chronic dialysis facility in a rural area. This population requirement is base on reasonable access time to services and on the minimum number of stations which a facility can economically operate.

2. Current Chronic Dialysis Patients

   The number of current dialysis patients in an area can be established both through a count of existing patients receiving maintenance dialysis in the area, and through patient origin data from facilities outside of the area. This approach yields a total of 28 patients on Guam.

3. Number of new Patients Requiring Services

   There is no general agreement on the incidence of treatable ESRD. The National Kidney Foundation recommends that an incidence of 60 per million should be used. 131 Of the new dialysis patients, approximately 10 percent will die and 90 percent remain in the system by the end of the first year. 132 Therefore, a deflation factor of 10 percent of the new patients must be applied.

4. Number of Carry-Over Patients

   The number of carry-over patients will continue to increase from year to year and should be deflated by 8 percent to account for mortality.

5. Transplants

   A decision to transplant is usually made within the first year of dialysis. Approximately 20 percent of the new patients will be transplanted; 40 percent of these will have graft failure and will return to dialysis. 133

6. Capacity of Dialysis Stations

   On two patient shifts per day, six days per week, each dialysis station can be utilized by four patients at 100 percent capacity (assuming patients are dialyzed three times per week). An 85 percent use rate is generally accepted as optimal for a dialysis facility.

In summary, the principal assumptions used to estimate need are as follows:

1. The annual incidence of ESRD is 60 per million population.

2. Ten percent of all new patients entering chronic dialysis will die during the first year.

3. The overall average mortality of persons receiving chronic maintenance dialysis is 8 percent annually.

4. Approximately 20 percent of all new patients will receive a transplant during the first year; 40 percent of these will have graft failure and will return to chronic dialysis.

5. Chronic dialysis services should operate at 85 percent utilization, based on a capacity of our patients per station.

A formula for determining the need for chronic mainenance stations can, therefore, be written as follows:

$$\frac{192 + 190(I) - .60(20xI)}{4 \times .85} = \text{Number of chronic dialysis stations needed}$$

Where:

C = the number of carry-over patients

I = the annual incidence or expected number of new patients entering chronic dialysis during the year

Because of uncertainties surrounding ESRD treatment, extended projections of patients requiring dialysis are not reliable. Therefore, a projection to 1980 rather than a later date is presented below estimations should be reviewed with caution, however, in that they may overestimate the need for services. This statement is based on the following facts:

1. Each year, the total number of patients will increase until eventually a steady state is reached where the number of new patients entering the system each year will equal the number who are either successfully transplanted or who die. Many experts feel this "steady state" may be reached in the early 1980's. 134 The number of new patients entering dialysis, therefore, may decrease between 1976 and 1980.

2. Patients suitable for (and selecting) home dialysis are not deleted from the estimates. The estimated number of home dialysis patients should be considered prior to the development of new or expanded services.

As of April 1978, GMH dialysis facility is reporting the following information:

- six dialysis stations
- three shifts per day
- 3,089 dialysis from July,1977 to April, 1978: 305 inpatient
- hospital dialysis; 2,784 outpatient dialysis
- twenty-eight patients from July, 1977 to April, 1978, 1 to 16 years or younger
- self-training - 9 patients for 124 dialysis

- one transplant, done off-island
- no home dialysis programs

Accessibility

It appears that the dialysis facilitites at GMH are accessible to all the patients in need of this service, both in location and travel time. As noted previously, substantial financial barriers to dialysis services were eliminated in 1973 with the extension of Medicare coverage to all ESRD patients. The average patient liability with Medicare, however, averages $8,500 the first year and $4,700 each subsequent year. Medicaid, private insurance and/or private foundations and local community organizations may assist in covering this additional cost. These financing programs have generally eliminated cost as a significant barrier to access.

Cost

The annual cost of the entire ESRD program in the United States is about $600 million annually for approximately 50,000 patients or a cost of $12,000 per patient.

The Guam Memorial Hospital proposed official rate increase for Fiscal Year 1979 for hemodialysis services is as follows:

> 4,106 procedures per year at a cost of $158.70 per unit without any increase;
>
> with a 2.5 percent rate increase per unit, it will go to $177.74 with an anticipated gross revenue after the increase of $729,817.

SPECIAL MEDICAL SERVICES

b.2. Burn Care Services

Definition

A Burn Center is an intensive care unit in which there are specially trained physicians, nursing and supportive personnel and the necessary monitoring and therapeutic equipment needed to provide specialized medical and nursing care to burned patients.

Background and Trends

Each year, approximately two million persons sustain burn injuries in the United States and 75,000 require hospitalization. The number of deaths resulting from burns is uncertain, but may be as high as 12,000.

Burns range from minor to major, and the severity and subsequent type of treatment required is dependent on the age of the patient, the depth of the burn, the percent of the body surface burned, the area burned and the state of the patient's health before he was burned. It has been demonstrated that patients with certain types of burns profit by receiving care in a facility designed specifically for the treatemnt of burn patients. The complications secondary to loss of skin function are many, and vast resources are required to provide high quality care to those patients. Other burn victims, although requiring some degree of specialized treatment, do not require care at a highly specialized burn center.

Specialized facilities or burn centers were first developed in the 1940's. They continue to be the source of a great many advances in burn care. Although many areas of the territory still remain unserved, the number of specialized burn care facilities has gradually been increasing.

The level of care necessary for appropriate treatment of burn victims is intricately related to the severity of the burn. Burn severity is generally categorized as minor, moderate, and major. A partial thickness burn of less than 15 percent of the body area or a full thickness burn of less than 2 percent are usually considered minor burns. There is some debate on precisely what constitutes a moderate and major burn, but generally a partial thickness burn of 15 to 30 percent or a full thickness burn of less thatn 10 percent is considered moderate, while more severe burns are considered major. 135

Defining levels of burn care is one of the most controversial issurs in burn medicine today. Historically, burn care has been divided into three levels as follows: 136

Burn Program: At this level, the Guam Memorial Hospital has no specialized facilities or areas for burn care. However, a consistent plan for management of burn patients is implemented by an interested and experienced physician (or jointly by several physicians). As a measure of experience, it is assumed that the physician is treating at least 25 burns per year.

Burn Unit: This denotes a burn program being conducted in a specialized facility which is used only for burns. A limited

amount of research and teaching may be present on an intermittant basis.

Burn Center: This denotes a larger burn unit with special emphasis on research and teaching as well as patient care. The facility provides very intensive burn patient care which requires the support of the research and teaching staffs. In turn, the intensive-care environment provides the ideal classroom for teaching the complexities of burn care and serves as a "laboratory" for research into the many uncertainties of burn treatment. It is assumed that the facility has at least six beds and that at least 50 patients with burns are treated there per year.

In reality, the only difference between the burn unit and the burn center has been research and teaching. There is no evidence that the quality of care differs between the two institutions. For this reason, the American Burn Association has recently moved to drop the classification "burn unit" and to classify facilities as burn centers with or without research and training. In addition, to the burn program and burn center, a third level of care can be defined. A facility which operates a 24-hour physician-staffed basic emergency service should have protocols that will allow for emergency care of burn patients, definitive care for minor burns and referral of major and moderate burn cases to other facilities.

Availability

Currently, burn cases are handled at GMH emergency room. The individuals needing the specialized services offered by a Burn Center are referred off-island to Hawaii.

Accessibility

Treatment for minor and moderate burns is usually on an emergency and secondary basis at GMH. All tertiary burn care services are referred to off-island Burn Center services in Hawaii.

Cost

No cost information is available to determine cost associated with the treatment of burn care patients.

3. DIAGNOSIS AND TREATMENT SERVICES

c. SUBSTANCE ABUSE SERVICES

DEFINITION

The term "substance abuse" generally refers to compulsive involvement with controlled substances, including alcohol, illegal drugs, prescription and nonprescription drugs, and combinations of these. Such involvement decreases a person's ability to deal with other aspects of his life and, in its most severe state, comprises the dominant source of emotional reinforcement for the individual. Although it is often difficult to differentiate between use, misuse and abuse of controlled substances, the differences are quantitative (frequency, quantity, intensity) as well as qualitative (extent to which life style revolves around the activity).

BACKGROUND

Increasingly, American society has become drug oriented, a trend which is reflected by the number of prescriptiondrug sales. The incidence of substance abuse is increasing. Particularly disconcerting is the increase of poly-drug use (the combined use of two or more controlled substance) and the growing number of children, youth and senior citizens who abuse drugs and/or alcohol.

This widespread use of drugs has immense social, economic, medical and behavioral effects on the health of the population. Adverse reactions, resistance, overuse, and overdependence are the harmful side effects of this phenomenon. A psychophysiological dependence occurs for a person who turns to such an involvement and finds relief from the stresses of life.

The eradication of problems related to substance abuse is a Herculean task, and necessitates a comprehensive effortdirected toward many sources.

Top priority among these efforts are primary prevention programs to educate the public about methods of identifying stressful life conditions, negative behavioral reactions to that stress, and coping mechanisms which promote health. In addition, the "escape and pleasure-seeking syndrome" advocated by those who promote the use of alcohol and drugs must be deglamorized. "Alcoholism" has been defined as drinking which significantly interferes with an area of a person's life. These areas may be physical, emotional, social and/or vocational. Hence, many treatment programs which deal with the "whole" person incorporate a wider range of treatment goals which may include drinking behavior, improved family relationships, and improved vocational adjustment. Treatment of the alcoholic is more effective when family members are involved, because it allows them to meet their own treatment needs as well as those of the alcoholic.

The National Institute on Drug Abuse defines "drug abuse" as the use of a licit or illicit chemical substance which results in a individual's physical, mental, emotional or social impairment. The most commonly abused substances are sedatives, narcotics, stimulants, hallucinogens and inhalants. Abused substances include legally and illegally manufactured drugs as well as prescribed drugs. Some drugs, however, are more frequently associated with compulsive use than others. The risk of dependence varies by drug and, in some instances, remains uncertain. The current federal, state and local strategy for controlling drug abuse emphasizes the importance of giving primary attention to compulsive users.

Substance abuse on Guam is a major health problem. The most pressing drug abuse problems focus on heroin use and alcoholism. (See Health Status section of this plan for more descriptive statement of the substance abuse problem.)

AVAILABILITY AND ACCESSIBILITY

The Guam Mental Health and Substance Abuse Single State Agency is an independent government entity on Guam which has principal responsibility for ensuring the quality of and need for substance abuse services currently being provided and those which may come into being at a later time. The following is a description of treatment resources available on Guam. The programs described are only those available to the civilian population of Guam. The U.S. malitary forces on Guam provide services for their personnel and dependents. The military's programs do not accept civilian referrals with the exception of stateside hired Civil Service employees. This is not to say, however, that military programs are ignored by their civilian counterparts or vice versa, as education, prevention, and training are frequently coordinated.

Substance Abuse Treatment Service

The Substance Abuse Treatment Service is one of the twelve services offered by the Community Mental Health Center (CMHC). CMHC, in turn, is a division of the Guam Memorial Hospital Authority. The program is a little under three years old and represents Guam's first attempt at formalizing drug and alcohol treatment. The alcohol segment is still rather underdeveloped, but CMHC plans to formalize an alcohol treatment program.

Modalities (all on out patient in nature):
Methadone detoxification
Methadone maintenance
Darvon IV detoxification
Drug-Free counseling

Services Offered:
One-to-one counseling
Group therapy
Vocational counseling
Referral
Substance abuse education presentation by request

Capacity by Modality:

Methadone detoxification	16 slots
Methadone maintenance	35 slots
Darvon IV detoxification	10 slots
Drug-free counseling	10 slots
Total static capacity	71 slots

Staffing:
Supervisor
Assistant Supervisor RN
1RN Counselor
3 Counselors
1 Clerk/Typist
½ M.D.
Psycholgist and Psychiatrist on Consultation Basis

Seventh Day Adventist Clinic

The Seventh Day Adventist Clinic (SDA) is primarily a medical clinic that responds to most medical problem encountered by any individual. One of the services they offer is detoxification of heroin addicts. SDA developed this program recently to formalize their response to heroin addiction problems.

For several years prior to this time, they were treating heroin addicts like any other patient by giving prescriptions for acute symptoms. The present program is highly structured. Aside from medications. counseling is also offered. In addition, diet, liquid intake, and exercise are regulated. Each patient is required to attend the program every day for 30 days.

Modality:
Darvon IV detoxification (outpatient)

Services Offered:
One-to-one counseling
Nutrition counseling
Referral

Capacity:
Darvon IV detoxification - 5 slots per 30-days period

Staffing:
1 Counselor
1 M.D.

Camarin Center

The Camarin Center was established by the Sisters of The Good Shepherd under the auspices of the Catholic church on Guam. The Good Shepherd Sisters for the most part are trained social workers whose primary mission is to work with troubled persons.

The Camarin Center has been in operation for less than one year.

Modality:
Out-patient drug free

Services Offered:

One-to-one counseling
Family counseling
Bible study
Prayer and study groups
Arts and crafts
Community involvement

Capacity by Modality:
not available

Staffing
4 Counselors
1 Administrator

Drug Crisis Center

The Drug Crisis Center is a creation of the Single State Agency in response to a heroin shortage on Guam which lasted approximately three months. The Crisis Certer, as it is more commonly known, provides a wide variety of modalities, primarily drug-free and very innovative. The function of the program is uncertain at present, as heroin has definitely made its way back into the community. The program may continue with a different emphasis. These changes, however, are still in the planning stages.

Modalities:

Acupuncture detoxification
Parahypnosis detoxification
Darvon IV detoxification
Drug-free counseling

Services offered:

One-to-one counseling
Hotline
Crash pad
Recreation
Referral
Transportation assistance

Capacity by Modality:

The Crisis Center was not established to be limited in its capacity. It was primarily set up to handle as many people as require the services.

Staffing:
Administrator
6 Follow-up counselors
2 LPN's
6 Outreach Workers
Parahypnotist
1.5 M.D.'s
Coordinator
Clerk/Typist

In general, drug abuse services are available on Guam, yet accessibility to these services is a questionable area due to the crisis nature of the services provided and the limited outreach capabilities.

Alcoholism services in Guam are limited, which poses a major problem for alcohol abusers and poly-drug abusers. Limited data are currently available on the need for alcohol abuse services. An analysis of alcohol abuse services will be addressed in the revised HSP in 1979.

COST

Currently, no cost data are available on Substance Abuse Services. A detailed cost analysis on these services will be included in the revised HSP in 1979.

ACCEPTABILITY

Acceptability of Substance Abuse Services in Guam cannot be determined at this time due to the limited data available.

3. DIAGNOSIS AND TREATMENT SERVICES

d. Mental Health Services

Definition

Mental health is an integral part of an individual's total sense of well-being, and cannot be easily separated and defined. Examples of mental health definitions suggest that mental health is looked at as "being within a range of states of well-being, if that state of well-being is an integral part of one's personality rather than a temporary sense of euphoria."[157] Examples of accepted definitions include these:

> Health is a state of complete physical, mental, and social well being, and not merely the absence of disease and infirmities (World Health Organization).
>
> Mental health is ... a complex state of being --a sense of confidence in one's self and one's world. (Joint Commission on Mental Health of Children)
>
> Mental health consists of feeling comfortable about one's self, feeling right about other people, and being able to meet the demands of like without undue stress. (National Association for Mental Health)

Background and Trends

Individual or community mental health status is determined by a complex network of factors such as age, sex, socio-economic class, ethnic group, culture, and physical environment. Gerald Caplan describes a person as needing continual "Supplies" commensurate with his/her current stage of growth and development. These supplies are categorized into three groups: Physical, psychosocial, sociocultural. He states that "just as in physical nutrition, disorder can occur if there are qualitative or quantitative imbalances in these supplies."

Mental health services exist to foster in the community an awareness of mental health principles and programs, and to aid in the coordination of all efforts to establish a more healthy population. They also work with other contacts in the community who are in a position to help troubled individuals so that they do not need the direct intervention of mental health professionals. When direct help to restore the mentally disordered person to an acceptable level of social functioning. The treatment philosophy is one of restoring the person in the shortest amount of time, with the least displacement from the living environment, and with the greatest chance of preventing a reoccurrence of the need for such intervention.

Mental health services are an essential part of any health care delivery system. Statistics indicate that one out of every four persons in the United States receives health services for the treatment of mental health problems. Mental health problems account for 50 percent of hospital bed utilization. Further, it is estimated that between 50 percent to 70 percent of initial diagnosis of

physical health problems, are, in fact, either primarily or secondarily related to emotional problems.

Availability and Accessibility

The majority of mental health services in the Territory of Guam is provided by the Community Mental Health Center under the supervision of the Guam Memorial Hospital Authority and through private psychologists an psychotherapists. The Community Mental Health Center provides inpatient, residential, outpatient, emergency and outreach mental health services for substance abuse and mental health problems of children, youth, adults, and the elderly.

A. Community Mental Health Center Services

Inpatient service provides 24 hour hospital care, housing both acute and long-term care patients. A full range of activities are offered including occupational and physical therapy, recreational therapy, psychotherapy, milieu therapy, chemotherapy, and medical treatment when needed. Inpatient service is operating at a 19 bed capacity. Patients are admitted through the emergency room and by referrals from families and doctors. Patients stay as long as necessary for proper treatment.

Outpatient service provides clinical services to any individual and/or family who is in need of such services. The treatment is provided so that the client may function in the community. The Outpatient Service offers several modalities of treatment which include individual therapy, group therapy, chemotherapy and marriage counseling.

The services for children provided by the Guam Community Mental Health Center include a full range of diagnostic, treatment, liaison and follow-up services. This outpatient treatment facility services emotionally and developmentally disturbed children and their families.

Partial hospitalization provides treatment alternatives to full-time hospitalization. Partial offers a structured day and evening program which offers vaocational rehabilitiation, socialization, psychotherapy and chemotherapy.

Aftercare services assist the patient with reintegration into family and community life. Their treatment includes home visitation and referral to other agencies to aid with jobs, financial support, and other needs the clients may have.

Elderly services provide a full range of diagnostic and treatment services to the aged mentally ill resident of the Guam community. The section operates in close cooperation with all other agencies providing services to the elderly and ties together existing service-providers by providing a linking, integrating, and coordinating function.

Consultation and education services promote and coordinate activities between community agencies and professional personnel in the mental health field. Through the use of various methods, i.e., seminars, workshops, lectures, etc., Consultation and education services inform the community about the current mental health activities and services available.

Progress House is a transitional living unit with housing for either male or female. This service is made available to those residents of the community who were released from the Inpatient Ward and who are not ready for community living. Also, it is for those who, without such a service, would require inpatient care. Progress House also offers a structured daily program which provides self-sufficiency skills as well as vocational rehabilitation programs.

Substance abuse services are for the prevention, treatment, and rehabilitation of alcohol abusers, alcoholics, drug addicts, drug abusers, and persons with drug depending problems. Services available at the Community Mental Health Center include intake evaluation, menthadone detoxification menthadone maintenance, individual and group therapy, and drug free counseling.

Emergency services at the Community Mental Health Center are available 24 hours a day, seven days a week. The program consists of a 24 hour a day walk-in service, 24 hour telephone hotline, home visits and services to other agencies. A mental health professional is available at all times. Rape crisis intervention is also provided.

Screening services are made available to the courts and other public agencies which are considering individuals for referral to the treatment center. Screening services are designed to assist for appropriate treatment.

GUAM COMMUNITY MENTAL HEALTH CENTER
Clinic & Patients' Visits

Service	FY76	FY77	Fy78
Adult Outpatient	1,237	1,543	1,719
Programman Patgon	2,851	1,786	1,592
Elderly Service	*	*	81
Drug and Alcohol	765		14,776
Emergency Service	163	267	225
Partial Hospitalization	1,937	3,872	4,614
Aftercare Services	1,363	1,742	886
Progress House	450-	1,848	2,989
Inpatient Services			
Admissions	95	140	174
Discharges	94	144	181
Patient Care Days	3,772	6,020	6,000
Average Length of Stay	33 days	39 days	35 days

*Not in operation
+May and June, 1978
-from January, 1976

Source: Guam Memorial Hospital Annual Report 1978.

B. Private Sector Mental Health Services

Private sector mental health services are limited in Guam, consisting of primarily one clinic with two psychologists, and two solo practicing psyschologist.

The Behavioral Clinic, located in the village of Tamuning, has two practicing psychologists, who share a load of approximately 120 visits per month. Of the solo practitioners, one has a xlient load of 5 visits per month; the other has a patient load of 6 per month.

Accessibility of mental health services for many citizens of Guam could be a problem in that there is limited informational, educational, and service delivery throughout the island.

Cost

There is no cost information available on mental health services in Guam. Cost information will be included in updating the HSP in 1979.

Aceptability

There is no information currently available that would suggest mental health services in Guam are unacceptable. In future planning cycles, acceptability of mental health services will be analyzed in greater detail.

3. DIAGNOSIS AND TREATMENT SERVICES

e. DENTAL SERVICES

DEFINITION

Dental health services refer to those activities which are utilized in the diagnosis and treatment of diseases and other conditions of the teeth and oral cavity. Service categories include dental restoration, peridontics, and oral surgery. 139

BACKGROUND AND TRENDS

The appropriate use of dental care services is an integral component of each individual's comprehensive health maintenance and care. Dental decay in one of the most common diseases, with over 95 percent of the population having experienced carious lesions at any given time.[140] Periodontal disease (a disorder which affects the structures surrounding and supporting the teeth) is nearly as prevalent. Advance periodontal disease is the leading cause of tooth loss among older adults. Oral cancer and dental defects (including birth defects, accidents, malocclusions and loss of permanent teeth) affect substantial numbers of people.

The character of dental decay is often insidious, and effects on individual function-may appear to be minimal. Except for those in need of immediate, pain-relieving attention, dental health care is usually regarded as elective in nature, of low priority on a health needs scale, and expensive.

Despite the extent of dental disease and the need for dental attention, dental services are generally underutilized by the population. Dental neglect spans all ages, races, and socioeconomic groups, but it is known that makes, nonwhites, persons of lower income, and rural inhabitants visit a dentist less frequently than others.[141]

A dentist's productivity is greatly augmented by the utilization of auxiliary personnel-hygienists, technicians, and dental assistants. With the employment of such auxiliaries, more dental care can be delivered to the public. It has been estimated that the employment of one full-time assistant and one part-time hygienist can increase a dentist's productivity 62.4 percent.[142] A majority of dentists in one state, California, employ part-time hygienists. A manpower study prepared by the California Post-Secondary Education Commission in 1976 indicates that the use of dental auxiliaries has been increasing in recent years. The Commission study recommends the expanded use of such paraprofessionals in private office settings and the establishment of incentive programs to encourage the use of dental auxiliaries in implementing preventive dental care programs in schools. 143

The need for dental services far outweighs the demand for them. It has been suggested that the publis is becoming increasingly aware of the need for dental care and that a greater proportion of those in need of dental services are seeking them than in the past.[144] Such an awareness will impact on the demand for dental services and the suppy of dental manpower. Increased needs can be met with an increase in the employment of auxiliary personnel, an increase in the number of dentists, or a combination of both. Awareness of the importance of dental care may also cause the need for dental services to decrease, as preventive dental techniques become the focus of a comprehensive program of dental care. It is

known that almost all dental disease is preventable with good nutrition, proper brushing and flossing of teeth, and regular professional dental attention.[145]

AVAILABILITY AND ACCESSIBILITY

Dental services in the Territory of Guam are provided by the Department of Public Health Dental Program and by private dental professionals on the Island, and Guam Memorial Hospital to a limited degree.

The Public Health Dental Program provides free dental care to all children under 17 years by public law. The services provided include:

- fluoride mouthwash test program-last 3-years for school children;
- public health dentistry-refer patients to outside professionals
- for food orthodontics, peridontics,pedodontics, endodontics and oral surgery;
- emergency care to all and referral for those over 17;
- screening and treatment for children bussed from their schools

Private dental professionals on Guam provide a full range of dental services including these:

1. General Dental Services: the provision of general dental diagnostic and preventive care including a) preventive services prophylaxis (cleaning), topical fluoride treatments and dental health education; b) x-ray examinations; c) general restorative dental work and d) the establishment of individual treatment plans.

2. Pedodontic services: the provision of dental care to children.

3. Oral Surgical Services: the provision of surgical services and care of the oral area are on both inpatient and outpatient basis.

4. Periodontic Services: the treatment of structures that support the teeth.

5. Endodontic Services: the treatment of pulpal tissues.

6. Orthodontic Services: the realignment of dental structures.

7. Prosthetic Services: the provision of services generally associated with cost crowns, bridges, partial and complete dentures.

The Public Health Dental Program provides dental services at two public health facilities located in the Village of Mangilao in the north central area of Guam, and in Inarajan, in the southern area, of Guam.

Professional dental services are heavily concentrated in the north central area of Guam, primarily in the village of Tamuning.

LIST OF DENTAL FACILITIES IN GUAM BY SPECIALTY AND LOCATION

(10-31-78)

FACILITY	KIND OF PRACTICE	LOCATION
J.F. Madarang, D.D.S. Dental Clinic	General Dentistry/Oral Surgery	Agana
Reynolds/Mulligan Professional Dental Corp.	General Dentistry/Orthodontics	AGana

Ordot Dental Clinic	General Dentistry	Ordot
Dededo Dental Clinic	General Dentistry	Ordot
Family Health Plan	General Dentistry	Tamuning
Orthodontists Clinci	Orthodontics	Tamuning
St. Anthon's Clinic	General Dentistry	Tamuning
Doctor's Clinic	General Dentistry	Tamuning
Guam Dental Clinic	General Dentistry	Tamuning
Dr. Robert Labalan Dental Clinic	General Dentistry/Prothetic	Tamuning
Seventh Day Adventis Clinic	General Dentistry	Tamuning
Guam Polyclinic	General Dentistry	Tamuning
Good Samaritan Clinic	General Dentistry	Tamuning
Public Health Clinic	General Dentistry/Pedodontics	Mangilao
Public Health Clinic	General Dentistry/Pedodontics	Inarajan

NON-MILITARY DENTAL MANPOWER RATES
GUAM - NOVEMBER, 1978

Personnel Category	Actual Number (1)	Manpower Population Ratio Per 10,000	Population Per Provider Ratio (3)	
			Guam	U.S.
Professional Dental				
Dentists - All	27	3.2	3127:1 (78)	727:1 (73)
General Dentistry	22	2.6	3838:1 (78)	2088:1(73)
Oral Surgery	3	0.4	28142:1(78)	2717:1(73)
Orthodontics	2	0.2	42213:1(78)	4566:1(73)
Part-Time				
General Dentistry	3	0.4	28142:1(78)	
Orthodontics	1	0.1	84426:1(78)	
Peridontics	2	0.2	42213:1(78)	
Allied Dental				
Dental Auxiliary	7	0.8	10553:1(78)	
Dental Hygienist	28	3.3	3015:1 (78)	
Dental Assts.	7	0.8	10553:1(78)	
Dental Lab. Tech.	1	0.1	84426:1(78)	
Orthodontics Asst.	2	0.2	42213:1(78)	
Part-Time				
Dental Auxiliary	1	0.1	84426:1(78)	
Dental Hygienist	6			
Dental Asst.	1	0.1	84426:1(78)	
Dental Lab. Tech.	3	0.4	28142:1(78)	

Source: 1. Guam Health Planning and Development Agency - 1978
2. Physician to Population Ratio = $\frac{\text{Total Personnel in Planning Area} \times 10,00}{\text{Number of Persons in Planning Area}}$
3. Population Per Provider Ratio - $\frac{\text{Total Population}}{\text{Number of Providers}}$
4. U.S. Figures: U.S. Bureau of the Census: Population Estimates. Current Population Reports, Series No. 520, 1978

Utilization figures for dental services at the Department of Public Health Dental Program are summarized below. Utilization figures for the professional dental sector are unavailable with the exception of average monthly visits, included below:

YEARLY OPERATIONAL SUMMARY
DEPARTMENT OF PUBLIC HEALTH DENTAL PROGRAM
GUAM - JULY 1977 - JUNE 1978

I. PATIENTS

Source	Number
New - General	7,467
Ortho	27
Penal	123
Crippled Childrens Services	102
Welfare	440
Age	**Number**
1-4	1,535
5-12	19,887
13-16	5,066
Male Patients 1-16	13,540
Female Patients 1-16	13,130
Appointments	20,839
Emergencies	3,335
Uncooperative	816
No Shows	6,079
Completed	3,781

II. OPERATIONAL SERVICES

Services		Number
Examinations		9,549
X-Rays		2.027
Prophy's		8,858
Fluoride Treatments		8,858
Anesthetics		14,658
Medications		199
Extractions - Deciduous		1,963
	Permanent	809
	Post OD. Treat	12
	Roots, Sutures, Inc/Drn	234
Peridontal Treatments		377
Alloy Surfaces - Deciduous		9,120
	Permanent	18,321
Synthetic Surfaces		745
Bases and Temporaries		8,730
Pulpotomies		2,187
Occlusal Adjustments		14
Consultations		3,275
Referrals		563
Orthodontic		244
III. HEALTH EDUCATION SERVICES		14,068
IV. RESEARCH SERVICES		3,693
TOTAL SERVICES		108,502

Source: Monthly Report, June, 1978, From Dental Director of Department of Public Health.

Estimated Total Number of Patient Visits Per Month - Guam Dental Clinic
November -1978

CLINIC	ESTIMATED TOTAL PATIENT VISITS PER MONTH
Dededo Dental Clinic	500
FHP Dental Clinic	1,600
Orthodontists Clinic	540
St. Anthon's Clinic	83
Madarang Dental Clinic	200
Ordot Dental Clinic	510
Doctor' Clinic	150
Guam Dental Clinic	400
Reynolds/Milligan	700
Sablan Dental Clinic	200
Seventh Day Adventist Clinic	1,200
*Guam Polyclinic	
*Good Samaritan Clinic	

*Data Unavailable

Source: Guam Health Planning and Development Agency - November 1975

COST

There is cost information available on dental services in Guam. Cost information will be included in updating the HSP in 1979.

ACCEPTABILITY

It appears at this time that dental services are acceptable to the citizens of Guam.

f.1. Radiation Therapy Services

DEFINITION

Radiation therapy means the use of external ionizing radiation including x-ray and teletherapy and brachytherapy using sealed sources of radioactive material in the treatment of human illnesses with appropriate staff, space, equipment, and supplies.[146]

BACKGROUND AND TRENDS

Radiation therapy is a clinical medical specialty in which patients with cancer (and other tumors or neoplasms) are treated with ionizing radiation. The objective of treatment is to deliver a lethal dose of radiation to cancer cells with minimal damage to surrounding, healthy tissues. While all tissues -- non-cancerous as well as cancerous -- are affected by radiation, cancer cells often are more susceptible to radiation's damaging effects. This difference in responsiveness to radiation is the basic reason radiation therapy is effective in the treatment of cancer.

Just as cancer cells and normal cells react differently to irradiation, various kinds of cancer cells also exhibit different degrees of responsiveness. In addition, normal tissue cells in the various organs vary markedly in their sensitivity to irradiation. Because of these differences, some cancers are more effectively treated by irradiation than are others.

Radiation therapy is the treatment of choice or the optimal treatment for most cancers of the cervix, lymphomas such as Hodgkin's disease, and many head and neck tumors. Some tumors can be equally effectively treated by either surgery or irradiation, but the involved organ's function will be better preserved with irradiation. Still other tumors cannot be effectively irradiated and must be treated, if feasible, using surgery or chemotherapy.

Each of the three types of cancer treatment -- surgery, radiation therapy, and chemotherapy -- may be used individually or in combination with one another. For example, radiation therapy is sometimes used prior to surgery to kill cancer cells at the margins of the tumor which might not be completely removed by surgery, or to reduce a large tumor so that it can be excised. Therapy is also often used after surgery if all of a tumor was not removed and the surgeon and the radiation oncologist are concerned about persistence and growth of the cancer.

Patients who receive radiation therapy -- alone or in combination with surgery or chemotherapy -- are treated with either curative or palliative intent. For example, an individual with Hodgkin's disease or cancer of the vocal cords may be given radiation therapy with elimination of the cancer (cure) as the objective. In some circumstances, cure is not a reasonable objective but considerable prolongation of quality life (in terms of years) is feasible.

And finally, the patient may receive radiation therapy to alleviate discomfort such as pain, bleeding or ulceration. While palliative treatment often requires only moderate doses of radiation, a substantial proportion of patients who receive palliative care are given doses comparable to those given patients who are treated with the prospect of cure, with the same concerns about damage to normal organs in the area of irradiation.

Often the patient will receive several courses of treatment in an attempt to contrl the disease. If the cancer persists after the initial treatment, the patient may be retreated with the same or a different treatment approach. For example, if an individual has received radiation therapy, he or she might be given another course of radiation therapy or started on chemotherapy or a combination of both. From 50 to 70 percent of all cancer patients require radiation therapy at some time during the course of their disease.

Radiation therapy can be accurately delivered using three basic techniques:

1) External irradiation. Irradiation from sources at a distance from the body (often called teletherapy).

2) Local irradiation. Irradiation from sources in direct contact with the tumor.

3) Internal or systemic irradiation. Irradiation by radioactive sources administered intravenously.

External irradiation is the most commonly used mode of therapy. This type of therapy is delivered by three general categories of radiation therepy equipment classified mainly by their energy range:

Type	Energy Range	Radiation Source	Use
Superficial	85-180	x-rays	To treat lesions on and immediately beneath the ski
Orthovoltage	200-400 kilovolts	x-rays	To treat various lesions. Formerly called "deep x-ray: Poor depth dose and prefere: tial absorption in the bone limit use.
Megavoltage (Super-Voltage)	2-50 megavolts	x-rays or gamma rays	To treat deep-seated tumors

Superficial machines are used only to treat lesions which are on or just beneath the skin. Only a small number of cancers can appropriately be treated with this low energy equipment. Irradiation of deep-seated tumors was formerly given largely with orthovoltage equipment. Those machines, however, produce the maximum radiation dose at the skin surface. The dose that can be delivered to a deep tumor is limited by the tolerance of the skin to radiation. Such equipment is relatively inexpensive but has drawbacks in terms of limited depth penetration, irritates the skin, and is generally considered inadequate for treatment of deep-seated cancers.

Megavoltage equipment was intraduced in the mid 1950's and overcame many of the problems associated withorthovoltage. The benefits of megavoltage equipment include:

1) The maximum dose is beneath the skin surface and little skin reaction.

2) The margins of the beam are sharper and thereby reduce the dose of radiation to nearby structures.

3) Penetration is much greater with megavoltage irradiation making it possible to deliver large doses within the body.

4) Differential absorbation of radiation by bone is minimized in the high energy range.

Megavoltage machines are more expensive than orthovoltage because of a high initial cost and necessary protective shielding. However, they have the capacity to treat more patients per day, are reasonably reliable, and provide beams which offer significant clinical advantages.

Future prospects in the field of radiation therapy primarily relate to developments made within the last 25 years. The increasing distinction between diagnostic and therapeutic radiology is expected to continue. As of 1977, the specialty boards will examine in diagnosis and in therapy but not in general radiology.

As far as equipment is concerned, progress in the near future is expected to come through the more effective use of equipment which is available rather than through the development of more powerful apparatus, and through greater appreciation of the treatment approaches combined with surgery and/or chemotherapy. Clinical research in radiobiology may result in the increased application of techniques using oxygen (which increases the responsiveness of cells to radiation), differential chemical radiosensitization, and cell cycle synchronization. Radiation therapy can be expected to continue to make a substantial contribution to the care of cancer patients as long as the methods to prevent the development of cancer remain unknown. 147

4. HABILITATION AND REHABILITATION SERVICES

Definition

Habilitation and rehabilitation services are those services which restore the ill or disabled individual to, or assist the developmentally disabled individual to achieve, the fullest physical, mental, social,vocational and economic usefulness of which he or she is capable.160 Rehabilitation may be distinguished from habilitation in that it refers to the continuing process of restoring the individual to a level of functioning of which he or she was capable before an injury or disabling condition occurred.

Another distinction is that "rehabilitation" begins when the chronic illness or major injury occurs and that "habilitation" begins when a child with a severe birth defect is born.161 Many of the same services and treatment modalities are utilized in both habilitation and rehabilitation. Thus, the following narrative is applicable to both categories of patients.

Background and Trends

The definition of rehabilitation encompasses a wide range of patients, services and settings of care. Disabling conditions result in physicial, social, and emotional handicaps for the individual. Rehabilitation is required for those physical, sensory, mental and developmental conditions, such as chronic heart disease, arthritis, blindness, cerebral palsy, mental retardation, emotional illness, and many others. It has been suggested that perhaps the socially or culturally disadvangaged may be included in the rehabilitation target population.162 Different types of disabling conditions require unique combinations of health care services as well as social, vocational, and educational services. Some individuals are more disabled by a given condition than others for reasons other than the impairment itself, such as age, education, income, family environment, motivation, or attitudinal barriers. Many handicapped persons are afflicted with multiple disabilities increasing their rehabilitation problems.

Social and economic parameters such as age, income, and race have been identified as major factors which influence the probability in an area of needed rehabilitation services.163 The greater number of these factors, the more likely is the potential need.

Habilitation and rehabilitation services include a wide range of activities and programs provided by a large array of medical, vocational, and psychological specialists. Services may be divided into two broad categories: medical habilitation and rehabilitation services, and therapy services. The former is concerned with the medial evaluation of the needs of the ill or disabled individual, and the design amangement and evaluation of a habilitation or rehabilitation techniques used in implementing a program of habilitation or rehabilitation designed to meet the needs of an ill or disabled individual.

Illustrative techniques include physical therapy, occupational therapy, recreational therapy, prostetic/orthotic services, communication therapy, and social/psychological therapy. Other services include medical/surgical acute care, education and training, vocational services (counseling , evaluation, training/work adjustment, placement assistance, and sheltered workshops), and personal/communal care.

Rehabilitation services are directed toward lessening disabilities and restoring functional ability, in contrast to the focus of traditional medicine, which is curative and rehabilitative health care, the major difference being the type of patient undergoing treatment and the extent of the treatment. Any of the services described as "diagnosis and treatment", as well as the whole spectrum of health care services, may be prescribed for the disabled individual.

Planning for habilitation and rehabilitation has generally lagged far behind planning for other health care services. This is primarily a function of two problems: (1) no major effort has been undertaken to develop planning methods for these services, and (2) it is extremely difficult to detain the population at risk for habilitaiton and rehabilitation services. Identifying rehabilitation needs and means of entry into the rehabilitation system represent substantial barriers to planning for these services on Guam. The traditional methods of recognition and referral are from the family physician, the school and the public health nurse. This, by no means, assures total population screening, nor does it imply that those who may recognize a need understand the problem or know where to refer the disabled individual. The average medical practitioner is not cognizant of rehabilitation services of his organization.

Most of the planning in Guam has focused on vocational rehabilitation. Attempts have been made to define the habilitation service requirements of those persons with developmental disabilities. An adequate methodology for determining this population's service requirements is not available at this time, and the development and implementation of such a method will be a priority in future editions of the plan.

Special Problems of the Disabled

Historically, persons with developmental disabilities were cloistered from society, either at home or in the state hospital system. New medical technologies and treatment modalities, as well as new concepts in the social sciences, have produced increasing acceptance of "normalization", which is the principle the individuals with development disabilities can benefit both society and themselves by learning to live as independently as possible. The trend toward maintaining these individuals in dependent situations has led to a growing use of small group living and residential care facilities within the community. Societal attitudes and prejudices, however, continue to prevent many developmentally disabled persons from living independently and becoming gainfully employed despite having the necessary skills, knowledge and education to do so. "Warehousing" these individuals and failing to habilitate them to their full potential may be more costly to society than providing comprehensive habilitation services.

The disabled individual encounters special problems generally unknown or misunderstood by the general population. Problems vary with the type of disability. Architectural barriers prevent many individuals from living in certain homes, getting into and out of buildings and vehicles, etc. Local governments have made limited efforts to eliminate such barriers in public housing and facilities, primarily due to the costs associated with the necessary changes, and weak enforcement of the legislation. Transportation problems of the disabled are complex, in that different types of severely handicapped individuals require different types of transportation alternatives. For example, the needs of the blind individual are quite different from the transportation needs of a quadriplegic.

Besides the limitations placed on the severely handicapped by their impairment and their socio-economic characteristics, their level of participation in the labor market is often affected. The intensity and long duration of rehabilitation services not only create unusually high medical costs, but simultaneously destroy the individual's ability to earn income.

Many severely handicapped individuals are socially isolated, with few opportunities for interaction with others. The majority of their social contacts are limited to family members. Many are prevented from participating in social activities by attitudinal barriers, architectural barriers, and transportation barriers.

The lives of those with developmental disabilities can be further complicated by an inability to cope with the emotional stress related to their handicapping condition, as well as societal non-acceptance and discrimination, which can lead to mental disorders.

A. Vocational Rehabilitation

The Government of Guam Department of Vocational Rehabilitation provides services for the physically and mentally handicapped in Guam. The Department of Vocational Rehabilitation assures the physically and mentally handicapped of Guam full opportunity to receive services as are provided under law to enable them to move from dependency, alienation, and deprivation, toward the realization of their individual potentials, and to be constructive members of society by obtaining the goals of personal and financial independence.

Rehabilitation services offered are tailored to the individual needs of the client, planned carefully to prepare handicapped persons for gainful employment in the rights job. Every client receives a complete medical and/or psychological diagnosis to determine the extend of disability. Furthermore, a vocational evaluation is completed to determine the client's mental and vocational potential and limitations. Counseling and guidance, along with ongoing procedures throughout the process are necessary for the counselor and client to develop a written plan of services, the execution of which may be to work eventually in the job best suited to his needs. Job placement and follow-up are important aspects of the total process; job follow-up is usually rendered by the counselor within a sixty day period after a client has been successfully placed in his job. Some persons will need all of these services; some will need only a few of them. In any event, the counselor will assist each disabled person to obtain whatever rehabilitation services are uniquely necessary for him to achieve his optimum rehabilitation potential.

The Department of Vocational Rehabilitation has a staff of 63 and operates three facilities:

GCIC Building - administrative offices and offices for the 13 counselors who spend most of their time in the communities;

Asan Center - Day Center for the severely handicapped which has a staff of six;

Workshop - Provides vocational training and evaluation. The staff of 22 serves approximately 80 clients.

Field Services

The Field Services division of the Department of Vocational Rehabilitation is charged with implementing and delivering services to eligible handicapped individuals so that they will be able to engage in a gainful occupation and/or independent living, and become a productive member of society.

Field Services is really the heart of the Agency. Field Services is vocational rehabilitation in the most strict definition.

Rehabilitation and Workshop Center

The Rehabilitation and Workshop Center provides vocational and work evaluation, personal and work adjustment, and job placement. These services are available to clients in a wide variety of work settings under constant supervision and counseling. The Workshop provides simulated and industrial settings in some work areas where clients learn trades and develop skills during training. The program offers the opportunity for the handicapped to learn, to develop a skill, to adjust to social skills, and to earn.

Another area of activity within the Rehabilitation and Workshop Center is the provision of employment of sheltered workers. A non-profit organization, The Guam Rehabilitation and Workshop Center, Inc., has a special arrangement with the Department of Vocational Rehabilitation to provide employment opportunities for the severely handicapped. The number of severely disabled employed by the Guam Rehabilitation and Workshop Center, Inc. has averaged about 71. These individuals would otherwise be unemployed, as they are physically unable to enter the competitive labor market.

Disability Determination Service

Under a contractual arrangement between the Government of Guam and the Social Security Administration, the Disability Determination Service Division has the responsibility to carry out the requirements of Section XVI of the Social Security Act in adjuticating the existence of legal disabilities of claimants for Social Security Disability Insurance Benefits as prescribed by the Social Security law.

The Disability Determination Service is responsible for assessing the probable duration and extent of the disability, and for assessing the functional limitations and the ability to engage in substantial gainful activities.

During Fiscal Year 1978, 128 claims were adjudicated.

Trust Funds

The Social Security Act provides for Vocational Rehabilitation services to selected Social Security disability insurance beneficiaries. A trust fund has been established to provide rehabilitation services, the objective being to restore disabled beneficiaries to substantial gainful employment by providing services through the existing Vocational Rehabilitation program and to offset the costs to the trust fund from benefits saved and tax contributions on earnings of rehabilitated workers.

A total of 8 SSDI beneficiaries received services during Fiscal Year 1978.

Innovation and Expansion Project

The Department of Vocational Rehabilitation is using all Innovation and Expansion grant funds to establish a Vocational Evaluation (VE) Unit at the Guam Rehabilitation and Workshop Center.

Vocational Evaulation is the assessment of vocational strengths and weaknesses through the utilization of work, real or simulated, for the purpose of developing a vocational plan of action. The objective of Vocational Evaluation is to facilitate the Rehabilitation Process of handicapped persons as an aid in the development of the individually written rehabilitation plan for each client.

The VE Unit is being established in respect to the uniqueness of Guam and the unique porblems that the disabled community faces. Factors such as geographics, demographics, culture and economics, enter into the picture in designing this unitand program. Due to these varying factors, they plan to develop a VE system which transcends trademarks and meets the information processing needs of the disabled community of Guam. In implementingthe VR program, this project will utilize available resources and individuals and modify existing measurement instruments to incorporate cultural and economic relevance within the VE process.

Developmental Disabilities - Life Skill Center

The Life Skill Center is a special project of the Developmental Disabilities program administered through the Department of Vocational Rehabilitation. The primary objective of the Life Skill Center is to provide multiple experiences in educational and social activities to the DD clients so they may progress from a level of defective and almost totally dependent functioning toward an individually maximal functioning in the skills of daily living and inter-personal relationships.

To facilitate the desired outcome of the young adults' development, the program will also aim toward providing guidance and counseling to the parents and siblings of the participating DD clients so that the training process might carry over into the home environment.

DEPARTMENT OF VOCATIONAL REHABILITATION

ANNUAL REPORT - 1978

Facts & Figures
On Person Rehabilitated

Referrals Sources of 1978 Rehabilitants

Educational Institutions	20
Hospitals	5
Health Organization and Agencies	4
Public Assistance	8
Social Security Administration	7
Workmens Compensation	0
Department of Labor	0
Rehabilitation Agency	2
Other Public Organizations	1
Self-Referred	9
Physician	6
Other Individuals	14

Primary Source of Support Before Rehabilitation

Current Earnings	8
Family and Friends	56
Public Assistance	10
Workmens Compensation	1
SSDI Benefits	0
All Other Public Sources	1
Retirement Benefits	0
All Other Source of Support	0

Marital Status

Married	24
Not Married	52

Dependents

None	60
1 to 3	7
4 or More	9

WORK STATUS OF CLIENTS REHABILITATED WHEN ACCEPTED FOR SERVICES AND CLOSURE

	NO. AT ACCEPTANCE	NO AT CLOSURE
Wage or Salaried Worker (Competitive Labor Market)	3	47
Wage or Salaries Worker (Sheltered Workshop)	1	3
Self-Employed (Except BEP)	0	14
State Agency Managed Business Enterprise (BEP)	0	1
Homemaker	2	7
Unpaid Family Worker	1	2
Non-Working Student	22	0
Non-Working-Other	45	1
Trainee (Non-competitive Labor Market)	0	1

WEEKLY EARNINGS OF CLIENTS REHABILITATED WHEN THEY WERE ACCEPTED FOR SERVICES AND AT CLOSURE

	NO AT ACCEPTANCE	NO AT CLOSURE
$ 0 to $ 49	70	20
$ 50 to $ 99	1	17
$ 100 to $ 149	2	24
$ 150 to $ 199	2	7
$ 200 to $ 249	1	6
$ 250 and over	0	2

NUMBER OF CLIENTS REHABILITATED-BY DISABILITY

DISABILITY	NO OF CLIENTS	%OF CLIENTS
Visual Impairments	4	5.2
Hearing Impairments	9	11.8
Orthopedic	30	39.4
Mental Illness	2	2.6
Mental Retardation	25	32.8
Diabetes	0	0
Epilepsy	0	0
Cardiac	4	5.2
Respiratory	0	0
Other	2	2.6

TOTAL NUMBER OF REHABILITATED CASES REFLECTING THOSE WITH COST TO VR FOR VARIOUS SERVICES AND THOSE WITHOUT COST TO VR

SERVICES	NO WITH COST	NO WITHOUT COST
Diagnostic	76	0
Physical Restoration	30	9
College Training	2	5
Academic	0	13
Business School	1	1
Vocational School	0	2
On-Job-Training	6	21
Personal Adjustment	11	4
Miscellaneous	2	24
Maintenance	25	1

In general, services delivered by the Department of Vocational Rehabilitation seem to be both accessable and acceptable to the citizens of Guam.

B. Crippled Children's Services

Crippled Children's Services in Guam are provided by the Department of Public Health and Social Services. The services are aimed to detect handicapped or potentially handicapped children under 21 years of age residing on Guam, to provide a diagnostic evaluation and the appropriate medical or surgical treatment, (hospitalization if necessary), and continuing care in order to promote maximal physical and mental health and ability of each child to function in a society. Criteria for eligibility for CCS coverage are geared toward providing maximal service within the bounds of available resources.

Patients discharge from CCS 128
- Cardiac 24
- ENT 29
- Eye 16
- CCS Pediatric 32
  - Mental Retardation 23
  - Cerebral palsy 1
  - Congenital multiple anomaly 2
  - Epilepsy 6
- Orthopedic 13
- Plastic 14

Patients not eligible under CCS 112
- ENT 53
- Eye 59

In general, services delivered by the Crippled Children's Services Department of the Department of Public Health and Social Services seem to be both acceptable and accessable to the citizens of Guam.

C. Speech Pathology and Audiology Services

The Department of Public Health and Social Services provides Speech Pathology and Audiology Services for the citizens of Guam. These diagnostic and treatment services serve to habilitate and rehabilitate persons who have disorders of speech, language, and hearing.

DEPARTMENT OF PUBLIC HEALTH AND SOCIAL SERVICES

HEARING AND SPEECH CENTER

Annual Report 1978

Diagnostic Services by Age and Type

CLASSIFICATION — Ages of Persons Receiving Services — July 1977 - June 1978

	Under 1 yr.	1-4 yrs.	5-9 yrs.	10-14 yrs.	15-19 yrs.	20-21 yrs.	2 y
Speech Impairment		10	14	7	4		
Hearing Impairment	29	495	492	138	30	5	
Language Impairment		118	96	21	14		
Learning Disabled		1	60	15	7		
Tested within Normal Limits							
TOTALS	29	624	662	181	55	5	

Total Therapy Hours: 302 Total Patients Service: 1,570

Scoliosis	21	
Slipped capital femoral epiphysis.	2	
Spastic hemiplegia	6	
Subluxation, hip	3	
Supernumberary, digit, left foot	2	
Supernumberary digit, toe	1	
Talipes equino varus	31	
Teratoma	2	
Tibial torsion	16	
Tuberous sclerosis	3	
Valgus deformity	1	
Normal	5	
Plastic		144
Cleft lip	28	
Cleft palate	5	
Cleft lip and apalate	51	
Hypospadia	22	
Microtia	16	
Tuberous sclerosis	22	
CCS Rescreening		89
Mental retardation	10	
Cerebral palsy	3	
Congenital multiple anomaly, bifid vula	1	
Delayed psychomotor development	12	
Epilepsy	6	
Hyperkenetic	11	
Cardiac	8	
ENT	1	
Orthopedic	12	
Plastic	25	
Psychological Evaluation		39
Nutritionist		40
New patients admitted to the program		228
Cardiac		26
Congenital heart disease	17	
Rheumatic fever	5	
Rheumatic heart disease	4	
ENT		77
Eye		62
CCS pediatric		46
Mental retardation	22	
Congenital multiple anomaly	6	
Delayed psychomotor development	10	
Epilepsy	4	
Hyperkenetic	2	
Microcephaly	1	
Rheumatic arthritis	1	
Orthopedic		9
Plastic		8

Cervical ribs	3
Clubfoot	10
Congenital Absence, left foot	2
Congenital multiple deformity	7
Dyschondroplasia	3
Erb's palsy	5
Flexion Contracture, thumb and finger	1
Flexion palsy, right	1
Genu valgum	4
Genu varum	11
Hemiparesis	4
Hip, dislocation	6
Hip, dyplasia	7
Internal tibial torsion	17
Keloid tissue	1
Kyphosis, mild	3
Legg perthe's disease	2
Meningocele	1

Social Service Workers Activities

New cases	630
Old cases	1646
Home visits	1163
Clinic visits	1113
Orthopedic braces	11
Eye glasses	1
Referral to Shriners Hospital	11
Referral to DVR	3
Walker	1
Crutches	1
Wheel Chair	1
Hearing Aids	32
MR Project (Home Training Project).	24

Off-island Referral		22
Number sent off-island	22	
Cardiac	9	
Pediatric	1	
Orthopedic	8	
ENT	1	
Neurological	3	

Metatarsus varus	19
Osteogenesis impecfecta	3
Osteomyelitis	5
Pes planus	18
Poliomyelitis	2
Possible meningitis	1
Post cerebral meningitis	3
Post polio	6
Plano valugs deformity	2
Quadriplegia	1
Rheumatoid arthritis	2
Rickets	6
Sclerosis	1

Crippled Children's Services are located in the Public Health and Social Services building in Mangilao. They provide both inpatient and outpatient services.

CRIPPLED CHILDREN'S SERVICES

Annual Report

(July 1, 1976 to June 30, 1977)

Services Rendered by the Program:

1. In-hospital services
   Total number of patients admitted to the hospital
   - Medical evaluation and management 3
     - Rheumatic Fever 0
     - Rheumatic Heart Disease 3
   - Surgical Procedure 53
     - Cardiac 5
     - Ear 23
     - Nose 1
     - Ophthalmology 1
     - Orthopedic 8
     - Plastic 15

2. Outpatient Services by CCS:
   Specialty Clinics - Physician's Services

		Visits
Cardiac		448
Congenital Heart Disease	300	
Rheumatic Fever	88	
Rheumatic Heart Disease	94	
Normal	6	
ENT		848
Eye		294
CCS Pediatric		384
Mental Retardation.....	194	
Cerebral Palsy	4	
Congenital multiple anomalies ...	1	
Convulsive disorder	47	
Crouzon's syndrome	1	
Delayed psychomotor development..	31	
Epilepsy	50	
Hyperkenetic	43	
Microcephaly	2	
Cardiac	2	
ENT	1	
Orthopedic	3	
Plastic	5	
Orthopedic		311
Amputation, below knee	1	
Brachial plexus palsy	3	
Calcaneo-valgus deformity	7	
Cerebral palsy	50	

Speech Pathology and Audiology Services seem to be available in Guam, however, the most pressing problem with these services at the present time is the limited number of professional staff and the waiting list which currently exists for diagnostic evaluation and therapy services.

Cost

Costs for Habilitation and Rehabilitation Services in Guam include the following:

A. Vocational Rehabilitation Services - Fiscal Year 1978

Local Funds

General Fund	$466,433	
		$466,433

Federal Funds Requiring

VR Program		
Basic Support (20 percent matching)	$794,252	
Innovation and Expansion (10 percent matching)	$ 50,000	
In-Service Training (10 percent matching)	$ 40,000	
		$953,359

Federal Funds, Non-Matching

Disability Determination Services (SSA)	$ 24,000	
Trust Funds (Social Security)	$ 25,000	
		$ 49,000

TOTAL FUNDS AVAILABLE.....$1,469,292

Source: Department of Vocational Rehabilitation Annual Report 1978

EARNINGS OF REHABILITATED INDIVIDUALS (FY 1977-1978)

Before Rehabilitation.....	$ 47,424
After Rehabilitation.....	$372,528
An "INCREASE" of	$352,104

PUBLIC ASSISTANCE BEING RECEIVED (Yearly)

Before Rehabilitation.....	$ 40,248
After Rehabilitation.....	$ 19,092
A "DECREASE" of.....	$ 21,156

This Amount of General Fund Monies ..... $ 466,433
(Guam Taxpayers' Monies)

Brought About An "INCREASE" In Earnings of
Disabled Citizens in The Amount of..... $ 325,104

A "DECREASE" In Public Assistance to
Disabled Citizens In The Amount Of..... $ 21,156

And Provided For Services To Island Residents
Numbering..... 621

Resulting in the Rehabilitation and Employment of 76 Formerly Unemployed Handicapped Residents, Who have thus become Self-Supporting Productive Members of Our Community.

Source: Department of Vocational Rehabilitation Annual Report 1978

D. Crippled Children's Services (Fiscal Year 1977-1978)

Amount encumbered for in-hospital services.....		$36,663.80
Physicians.....	$20,351.50	
Hospital Services.....	$16,312.30	
Physician's fees - outpatient services.....		$10,423.00
Cardiac.....	$1,950.00	
ENT.....	2,898.00	
Eye.....	2,115.00	
M.R. and Pediatric.....	- 0 -	
Orthopedic.....	2,255.00	
Plastic.....	1,210.00	
Off-Island Referral Medical Cost.....		$59,513.70
Cost for travel.....	1,668.80	
Cost for medical/surgical/hospital..	57,344.90	

Expenditures for other outpatient services..... $16,851.84

Drug.....	$3,382.43
X-rays.....	3,336.45
EKGs.....	2,385.00
Physical Therapy.....	3,703.10
Occupational Therapy.....	80.00
Prosthesis and braces.....	2,508.56
Orthopedic supplies.....	- 0 -
Books and supplies.....	210.00
Equipment.....	- 0 -
Hearing aids.....	833.50
EEGs.....	384.00
Laboratory (Prothrombin Time).....	28.80

Source: Department of Public Health and Social Services, Crippled Children's Services (Annual Report, 1978)

E. Speech Pathology and Audiology Services

See next page

DEPARTMENT OF PUBLIC HEALTH AND SOCIAL SERVICES
Speech and Hearing Section

STAFF COSTS
(July 1977-June 1978)

Staff:

Audiological Services	$65,811.15
Learning Disabilities Services	4,989.56
Speech and Language Services	19,237.08
TOTAL	$90,037.79

Source: Department of Public Health and Social Services
Hearing and Speech Center Annual Report 1978

Acceptability

Based upon their utilization rates, Vocational Rehabilitation Services, Crippled Children's Services, and Speech Pathology and Audiology Services on Guam seem to be well-utilized and therefore acceptable to the citizens of Guam.

V. HEALTH DELIVERY SYSTEM

C. EXISTING HEALTH SYSTEM

5. MAINTENANCE SERVICES

THIS SECTION WILL BE DEVELOPED IN THE FY 1980 REVISION OF THE GUAM HEALTH PLAN.

a. DIRECT PATIENT CARE SUPPORT SERVICES

Definition: Personal Health Care Support Services are those services which do not involve direct medical care, but which assist in the prevention, diagnosis and treatment of diseases or ill-health conditions, or in the habilitation, rehabilitation or maintenance of ill or disabled individuals.

Whereas, direct Patient Care Support Services are those services which lead assistance to the prevention, diagnosis and treatment of disease or other ill-health conditions, and to the restoration or habilitation of the ill or disabled.[2] Included in this component are pharmaceutical services, blood bank services, medical social work services, medical records services.

a.1 Pharmacy Services

DEFINITION: Pharmacy services have been identified as services which prepare, preserve, compound, dispense and provide appropriate instruction in the use of drugs.[3] The pharmacist is a licensed professional who is qualified by education to practice pharmacy. Pharmacy services are provided in many health care facilities and through independently operated pharmacies.

BACKGROUND AND TRENDS

Traditionally pharmacy services are predominantly oriented towards drug production and distribution. One innovation is the clinical pharmacy concept where the pharmacist, nurse and physician work together to provide patients with drig information and drug therapy. Reliance on the pharmacist in promoting patient safety in the use of drugs has become more important as the complexity of drug knowledge, physician specialization and drug utilization increases.[4]

Clinical pharmacy services in health care facilities are now moving towards a unit-dose system of drug distribution. This system utilizes trained pharmacy assistants, supervised by pharmacists, in packaging and labeling that amount of drug to be administered per dose.[5] Unit dose system allows for packaging pharmaceuticals in their most common dispensing units of a centralized location. In addition, billing for the service is centralized and dispensing errors are said to decrease. Latest impatient requirement by the Joint Association on the Accreditation of hospitals is the implementation of unit-dose system of drug distribution at Guam Memorial Hospital.

1. AVAILABILITY:

Besides the GMH and DPH&SS pharmacies (excluding military), Guam has eleven (11) clinic and several private free-standing support pharmacies.

Unlike most stateside procedures whereby pharmacists are licensed by a Pharmacy State Board, pharmacists on Guam are licensed by the Director of Public Health and Social Services. All pharmacies must have a licensed pharmacist.

During FY 1978 the GMH pharmacy had a staff of one chief pharmacist, six staff pharmacists, five technicians and one clerk III.

Additionally, the 1978 annual report disclosed the following information:

Unit floor stock requisition (no charge to patients)	$10,190
Cost of floor stock (no charge to patients)	68,310
Total new & refilled outpatient prescriptions	46,894
Revenue of outpatient prescriptions	249,652
Inpatient prescriptions	97,218
Revenue from inpatient prescriptions	756.529

The DPHSS pharmacy staff consist of two full-time pharmacists and one pharmacist aide. It supports programs such as Crippled Children's Services, Communicable Disease Control, Family Planning, Maternal Child Health, Chronic Diseases, Nursing, Laboratory, Dental and Immunization.

The following recaps the activities of the Department of Public and Social Services Pharmacy from Fiscal Year 1975 thru 1978:

	FY 78	FY 77	FY 76	FY 75
Total Number of Prescriptions Filled	6,540.00	4,388.00	5.222	6,277.00
Total Cost of Prescriptions Filled	38,565.61	21,923.32	19,347.37	25,368.53
Total Cost of Pharmaceutical Supplies Issued	11,709.22	20,088.43	24,348.54	42,532.30
Total Cost of Medical Supplies Issued	6,098.76	3,485.10	5,283.14	12,958.51
Total Cost of Supplies Used by the Programs	$56,373.59	45,496.85	48,979.05	80,859.34

Data on privately operated pharmacies (both in clinic settings and drug store settings) are unavailable at this time.

2. ACCESSIBILITY:

The GMH Pharmacy is open daily between the hours of 6:00 a.m. and 12:00 midnight. Charges for drugs required by doctors prescription for hospital inpatients are included and shown on the patients total hospital bill. Outpatient prescriptions are charged directly to the individual. GMH accepts prescriptions written by HMO doctors and charges the individual $1.50 per prescription. The balance of the drug cost is borne by HMO.

The hours of the GMH Pharmacy enable individuals to acquire medication after all other pharmacies are closed. Persons utilizing the emergency room and in need of medication after midnight still receive the necessary medication. GMH has a night medication locker which contains medications most commonly used and is readily accessible for emergencies.

The DPHSS Pharmacy fills prescriptions and dispenses medications to public health patients according to public health doctors order. It is open weekdays between 8:00 a.m. to 5:00 p.m. DPHSS Pharmacy filled 6,540 prescriptions during FY 1978.

The private free-standing support pharmacies are open during regular business hours. Clinic pharmacies are open during regular clinic hours. Clinic hours usually vary among clinics. However, most clinics are open from Monday thru Saturday.

3. COSTS:

Based on previous years' revenue, the GMH pharmacy estimates it will be generating over $1,000,000 in revenue from the sale of drugs and other pharmaceutical supplies this year. Last year alone, $1,463,996 was collected from inpatient and outpatient charges. Its total fiscal year 1979 budget expenses amounted to $559,998.

The Public Health Pharmacy operated with a budget of $56.373.59 during fiscal year 1978.

Data on the pharmaceutical activities of private clinics and drugstores are not available at this time.

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1 Government Studies and Systems, A Taxonomy of the Health System Appropriate for Plan Development, Philadelphia, June 22, 1976, p.34

2 Ibid. p.35.

3 Subcommittee on Health and the Environment, U.S. House of Representatives, A Discursive Dictionary of Health Care, 1976.

4 DHEW, Clinical Pharmacy Services in a Community Hospital, January 1972.

5 Ibid. p.15.

a.2. Blood Bank Services

DEFINITION

The Blood Bank at the Guam Memorial Hospital provides all of the blood-related products to the civilian population in Guam. Blood products for the military population are provided by the Naval Regional Medical Center.

BACKGROUND AND TRENDS

The Blood Bank which is located in the laboratory section of the Guam Memorial Hospital was created by Title XLVII, Section 49106 of the Government Code of Guam, and its operations must adhere to Federal requirements, with strict quality control procedures.

6.1.2A AVAILABILITY:

Blood Bank is located at the central region of the Island and the only provider for the civilian community on the Island. It is staffed by a registered medical technologist (ASCP) and two technicians.

6.1.2B ACCESSIBILITY:

The Blood Bank's service setting is free-standing support and operates on a walk-in and referral basis. Below is the number of patients that have utilized the Blood Bank services:

	1976	1977	1978
Cross Match	3,196	2,753	3,569
Blood Unit Drawn	1,257	948	1,287
Number of Transfusions	980	685	961

6.1.2C COSTS:

Although there is no charge on the unit of blood drawn, only the services connected with blood are charged. Information regarding the cost of operations is not available, however, the program is locally funded.

a.3. Medical Records

DEFINITION

Medical record services are responsible for ensuring that records are kept on all patients that contain sufficient information to document the patient's identity, to justify his/her diagnosis and treatments, and outcomes accurately.[1]

BACKGROUND AND TRENDS

All medical clinics and practitioners on Guam maintain medical records on their patients. Two of the largest health providers, Public Health and Social Services (DPHSS), and Guam Memorial Hospital (GMH), each have a separate medical records library. In addition to DPHSS's central medical records library, each of the satellite health centers also maintain medical records on their patients.

Both DPHSS and GMH lack adequate space and file cabinets to store medical records. Information is unavailable on the number of records maintained by DPHSS. GMH is presently storing approximately 170,000 medical records. Due to GMH's lack of available space to store medical records, half of the records are presently being stored within the new hospital and the other half within the old facility. To resolve, in part, the storage problem, GMH is currently placing those records considered inactive (either the individual has died or has not used hospital services within the past ten (10) years) on microfilm. Furthermore, GMH is currently sorting on computer tape the diagnosis, length of stay, cost, age and sex of patients so that the data on the utilization of services can be made readily accessible without infringing upon the confidentiality of patient's records. On the other hand, DPHSS's lack of adequate storage space and cabinets that lock could have severe implications upon protecting the confidentiality of patient's records.

There are no general local statutes that protect the confidentiality of an individual's medical recordes, the right to review one's own medical record or the right to release medical records to another entity. There are two (2) local laws which address these issues for specific population groups. P.L. 7-101 protects these rights only in the case of those hospitalized for mental illness. Public Law 12-9 protects the confidentiality and the right to release information only in the case of GMH's patient records, but the law does not grant the right to review. These statutes are not applicable to DPHSS's or the private sector's medical records. Although local statutes have little applicability, there are stipulations within federal programs (for example: Medicare/Medicaid) that protect the rights of patients. Furthermore, DPHSS has an inhouse policy which protects patients' rights. In the case of the private sector, federal programs. Thus, only medical ethics protect the confidentiality of patients' records and the right to review or release records varies among the health providers.

A local statute needs to be passed which will guarantee patient rights not only in the public sector, but also the private. The statute should also contain a provision for the release of data to researchers that does not identify the individual.

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1 1978-1979 Health Systems/Annual Implementation Plan, Golden Empire Health Systems Agency, Sacramento, California, P. VII-3.

a.4. Clinical Laboratory Services

DEFINITION

The testing of specimens from the human body to aid in the diagnosis and treatment of physical diseases and other ill-health conditions.

BACKGROUND AND TRENDS

Prior to 1969, Guam Memorial Hospital and the Department of Public Health and Social Services (DPHSS) were the main providers of laboratory services. In addition, the Catholic Medical Center and Seventh Day Adventist Clinic had their own small laboratories and the pathologist at Guam Memorial was reading Pap Smears from various private practitioners, in his home. An attempt was made to start an independent private laboratory but was abandoned presumably because of inadequate demands for the service. There were very few private medical practitioners and most physicians were working for either the Guam Memorial Hospital or Public Health.

Since 1969, there has been an ever increasing number of private medical practitioners which created the need and demand for private laboratory services. The first semblance of an independent laboratory consisted of an effort on the part of a local individual who performed a very limited numbers of tests in his home. He provided services for most of the practicing physicians not associated with the Catholic Medical Center or the Seventh Day Adventist Clinic. Biopathology Laboratory began its operation in 1973 doing Pap Smears and then merged operations with that of the local individual to provide laboratory services for essentially all of the private physicians. At about the same time, Physicians Diagnostic Laboratory began its operation by taking over the Seventh Day Adventist Clinic Laboratory. In 1977, the Guam Medical Laboratories was opened in the James Lee Building. The Catholic Medical Center Lab became the FHP-Guam Medical Center Laboratory.

Guam Memorial Laboratory is still probably the busiest laboratory in termps of volume, although, the FHP laboratory is not far behind. Guam Memorial Hospital also has the most comprehensive service and overall capabilities. The independent laboratories emerged in response to the inability of the hospital to provide efficient service to private medical practitioners. The concept of a reference laboratory doing unusual or specialized procedures was not a major consideration in this development since the limited population and the small volume of such tests is inadequate to realistically support such a laboratory. Unusual and seldom performed tests are referredto large reference laboratories in Hawaii or in California

1. AVAILABILITY:

   Clinical Laboratory Services are currently available through GMH, DPHSS, Physicians Diagnostic Lab., FHP-Guam Medical Center, Guam Medical Lab and Biopathology Lab. The following is a matrix showing the services provided by each of the laboratory.

The combined staff of the six laboratories consist of four (4) Clinical Pathologists, twenty-four (24) Medical Technologists, thirty-four (34) Laboratory Technicians, one (1) Cytologist, two (2) Chemists and two (2) Microbiologists. The following is a breakdown of staff by laboratory:

STAFFING PATTERN OF CLINICAL LABORATORIES

Provider	Staff
FHP-Guam Medical Center Laboratory	3 Medical Technologists 4 Lab Technicians (all part-time)
Guam Medical Laboratories	1 Clinical Pathologist 4 Medical Technologists
BioPathology Laboratory	1 Clinical Pathologist 6 Medical Technologist 5 Lab Technicians
Physician Diagnostic Laboratories	1 Clinical Pathologist 6 Medical TEchnologists 1 Cytologist 1 Lab Technician
Guam Memorial Hospital	1 Clinical Pathologist 6 Medical Technologist 21 Lab Technicians
Department of Public Health & Social Services	4 Medical Technollgists 3 Lab Technicians 2 Chemists 2 Microbiologists

2. ACCESSIBILITY:

All clinical laboratories except the DPHSS are located in the Tamuning area. The GMH Lab., FHP-GUAM Medical Center Lab., DPHSS Lab., Physician Diagnostic Lab (PDL) are situated in an ambulatory setting. The Bio-pathology Lab and Guam Medical Lab are situated in a free-standing support setting within a commercial building.

An initial criterial for all laboratory services is that the patient must first be referred by a physician. FHP-GUAM Medical Center will only provide lab services to patients referred by physicians under their program. DPHSS will only provide services to patients referred by physicians under DPHSS programs. Clinical Laboratory Services are regularly available between 7:00 a.m.-6:00 p.m., week days and between 7:00 a.m. to 12:00 p.m., on Saturdays.

3. COST, QUALITY, CONTINUITY AND ACCEPTABILITY CHARACTERISTICS:

No attempt has been made to examine clinical laboratory services in terms of cost, quality, continuity and acceptability due to time and data constraints.

V. HEALTH DELIVERY SYSTEM

C. EXISTING HEALTH SYSTEM

7. HEALTH SYSTEM ENABLING SERVICES

A. HEALTH PLANNING

B. RESOURCES DEVELOPMENT

C. FINANCING

D. REGULATION (EXCEPT D.1)

THIS SECTION WILL BE DEVELOPED IN

THE FY 1980 REVISION OF THE GUAM

HEALTH PLAN.

7.d.1. HEALTH SYSTEM ENABLING SERVICES (CERIFICATE OF NEED)

DEFINITION

Health System Enabling Services are the intervention by means of rules and regulations which typically influence, control, or set standards relative to the services provided within the health system. It can also mean the settings in which, and the resources by which, these services are provided.

BACKGROUND

The rapid expansion of medical services in the past decade has brought about attempts to regualte services and facilities through the certificate of need review process. The general purpose and intent of the review process is:

> to stimulate public involvement in the process of planning 2nd to modify the health delivery system, when necessary, to meet better needs of the consuming public;
>
> to distribute and most effectively use health care facilities and associated resoureces;
>
> to contain costs.

On October 16, 1978, P.L. 14-150 was signed by Governor Bordallo. It effectively repealed Chapter VIII of Title X of the Government Code ("The Guam Hospital and Medical Facilities Survey and Construction Law") and replaced it with the Certificate of Need Program. Chapter VIII requires that certificates of need be obtained for a variety of projects described in Section 9861 of the public law.

There are provisions for exemption from the certificate of need process and provisions for abbreviated reviews for certain modernization projects.

The federal mandate to establish the Certificate of Need Program is P.L. 93-641, known as the National Health Planning and Resources Development Act of 1974. The Act established health service areas, or geographical regions haveing a population of not less than five hundred thousand or more than a million, and set up health systems agencies, or local planning agencies, to carry out health planning activities. In addition, the Act set up statewide health planning and development agencies (one in each state and territory) to coordinate the planning activities of the local agencies.

Since Guam has a relatively small population, the local and statewide planning agencies are one and the same. This is the Guam Health Planning and Development Agency (GHPDA).

The projects requiring a Certificate of Need to be issued by GHPDA include

construction of a new health care facility;

any change in distribution, relocation, or number of beds or types of services in an existing health care facility which would include ten or more beds, or ten percent, whichever is less;

establishment of a new service;

any project requiring a capital expenditure for a health care facility or health maintenance organization, or for services ro equipment in excess of $50,000 whether by outright purchase, lease or comparable arrangement, or through donation;

predevelopment activity expenditures over $50,000 for the offering of new institutional health services including health studies, surveys, site acquisitions, architectural designs, plans, working drawings, and specifications and any arrangement or commitment made for financing the offering or development of such services.

GENERAL CRITERIA FOR EVALUATING PROJECT PROPOSALS

The following general criteria have been identified for consideration in the certificate of need process:

the resolution of a specific unmet or inadequately met community health need;

the potential for improvement of health status or health care delivery;

the conformity to the goals, objectives, priorities, and recommendations of the Guam Health Plan and the Annual Implementation Plan of the Agency, and the support of other overall or long-range plans of the Territory of Guam, or else relevance to a need not identified in the health plan;

the availability of less costly or more effective alternative means of meeting the need;

relationship of the proposed service to existing or desired patterns of health services utilizations;

the relationship of the proposed health services to ancillary or support services;

the availability of adequate resources (including facilities, manpower, and finance) to successfully implement the proposed service (utilize the equipment) initially and during the duration of need, and the potential for alternative uses of such resources for the provision of other health services;

the immediate and long-term costs associated with the proposed service (equipment), including secondary costs of the effect on existing services or facilities;

the inclusion of provisions for monitoring, measuring the impact, or assuring the quality of the service;

the accessibility and appropriateness adn need of the proposed service location;

conformity of the proposed facility with the State Medical Facilities Plan;

availability of alternative facilities;

appropriateness of the proposed facility location;

ability to fund developmental, operational and maintenance costs over the projeced useful life of the proposed facility;

effect on utilization of existing facilities and patterns of services;

assurance of adequate utility supply and consideration of the costs and method of energy provision and impact on energy consumption;

the costs and construction methods of the proposed facility and the probable impact of the project on the costs of providing health services by the organization proposing such project;

the adequate staffing, equipping and operation of the proposed facility;

the fostering of quality care through efficiency and the promotion of cost-effective factors such as ambulatory care, preventive health services, home health care, or design and construction economics;

the unsuitability of the existing physical facility, feasibility of renovation, alteration, additions, modifications, expansions, etc;

need to bring existing facility into compliance with certification, licensure, safety, or other code requirements and the feasibility of alterations to meet standards.

CERTIFICATE OF NEED PROCESS

An application for Certificate of Need receives approval through a process involving the GHPDA. This is a decision-making process, resulting in either approval or disapproval, which integrates input from the local community through public hearings and public meetings.

The following list enumerates the steps involved in the process of applying for a Certificate of Need:

Filing of a Notice of Intent to the GHPDA

Thirty day preapplication period to enable coordination of the applicant with the GHPDA in the development of the application

Application submitted to the GHPDA

GHPDA must deem the application complete or incomplete with 14 days of filing.

Public hearing may be requested within 20 days of the begining of review.

Within 60 days after commencement of review, the Review Board must make recommendation to the Agency to approve or disapprove the application.

Within 90 days after commencement of review, the Agency shall either approve or disapprove the application.

The applicant may appeal the decision within 30 days. The appeal hearing must be held 30 days therafter.

D. HEALTH CARE SYSTEM PROBLEMS

With a view to the entire range of health status problems faced on Guam at the present and assumed to be enduring for the duration of the initial planning period (5 years), and given the detailed and comprehensive study of the system of health services and resources available on Guam at present, the following major health system deficiencies can be isolated under seven health system problem area headings:

1. Lack of Available and Accessible Services

Despite the impressive array and quantity of health resources available on Guam at the present time, there are serious gaps or deficinecies in resource availability in several health service areas, including geriatric services, alcoholism services, public health and outpatient clinic services, rehabilitation and counseling services, and certain specialized or tertiary care components. The impact of these deficiencies cannot be directly gauged at present. However, it is certain that these resource and service gaps place undue burdens on those who are in need of such services, but who are unable to obtain them for lack of adequate supply. Furthermore, it is likely that certain health status problems are exacerbated because of insufficient services aimed at finding, identifying and treating such problems at an early stage. Finally, lack of availability of appropriate services may lead to over-utilization and inappropriate use of substitute services which then unfairly burdens health resources designed for other purposes (For example, for lack of alcoholic day programs, alcoholics may ultimately congest hospital facilities).

Compounding the problem of unavailable services, and the strains it produces in the existing service delivery systems, is the problem of lack of access to services that are available. Inaccessible services are as a consequence unavailable to segments of the population who are physically distant from such services. Services may thus be actually available, i.e., supplied, and yet effectively unavailable. The concentration of ambulatory and inpatient care resources in the Agana-Tamuning corridor is well documented. While the island of Guam is relatively small by most standards, what is not perhaps fully appreciated are the "costs" in travel time and convenience, if not actual monetary expenses, which dissuade individuals as close as Yigo or Agat from seeking prompt medical attention, or from using available preventive care services. Problems of accessibility are never simply physical distance or time problems. There is an important perceptual element which subjectively ties willingness to use services that are available to the visibility and familiarity of those services. In this respect and given the concentration of various health status problems particularly acute conditions, which recurrently face residents of southern Guam, it is important to mitigate the isolation of populations which are relatively, if not absolutely, remote from available services. If services cannot be physically relocated at this stage, then the possibilities for establishing satellite facilities, mobile units or even transportation services should be explored.

The issue of accessibility also covers a range of barriers to the utilization of available health services and resources, which need to be overcome if all individuals are to have the equal right to a healthful life. Financial barriers in particular may well prevent many Guamanians from seeking services, and unless such barriers are overcome or reduced individual health status will continue to have a strong (negative) association with income.

2. Poor Enviornmental Quality

A review of the planning area description (Ch. 2) and of certain programs concerning environmental management and improvement will indicate the seriousness of deficiencies in the quality of Guam's environment as it affects health status, particularly in the areas of water quality, sewage treatment, highway and traffic safety, and prevalence of carriers of or agents of invertebrate disease (especially parasites). That such fundamental steps as ensuring a safe, adequate, and conveniently and continuously usable water supply, removing or reducing sources of potable water contamination by chemical or fecal pollutants from water supply systems, eliminating obstacles and hazards to safer driving, and carrying out systematic programs to reduce the presence of parasites or to at least improve the population's understanding of means to avoid parasitic infection, especially among children, are all suggestive of serious shortcomings in the current allocation of resources within the health system as a whole. The high incidence rates recorded in general and during recurring outbreaks of such diseases as hepatitis, salmonellosis, measles, and gastroenteritis, in addition to the known widespread prevalence of parasitic infections, leave no room for doubt as to the major contribution that environmental quality - in particular water quality - has on health status and the consequent priority that should be given to reducing environmental sources, agents, reservoirs and carriers of diseases.

The fact that dental caries have been found to be so widely prevalent on Guam among schoolchildren, coupled with the knowledge that known methods for caries control and prevention are available (and feasible to implement) leaves little room for argument against taking immediate steps to alleviate basic health problems.

The issue is not merely one of establishing appropriate standards, surveillance procedures, and control and management techniques. It is also one of ensuring that such actions taken will apply uniformly to all areas of Guam, and will seek to minimize quality differentials in the physical environment as a first step toward providing all individuals with an equal chance of securing a healthy living environment.

3. Inadequate Health Education and Wellness Promotion

Reviewing the major causes of death on Guam for the past seven years should suggest the dilemma that health planning and publicly directed efforts to improve health status currently face. Most major causes of death, both on Guam and in the United States and other developing countries, are known to derive less from environmental factors, which if controlled might reduce disease or disability, and more from social, attitudinal, and personal discretionary factors which often orient individual choice and lifestyle toward behavior which does not promote high levels of health or wellness. Dietary habits, personal preferences and risks taken with respect to driving behavior and smoking habits all have been patterned in socially reinforcedways which do not take into account the long-term consequences of such behaviors. Many young women are unprepared for their first pregnancy and do not seek the proper amount of prenatal care, nor do they alter their nutritional and dietary patterns in order to provide the proper gestational environment. While it may be the case that individuals will continue to choose to ignore behavioral patterns that will promote health and wellness, a serious shortcoming in the health system can be identified in the wide range of basic health information which is not being provided to the population in an appropriate form or manner which would lend itself to scrutiny discussion and eventual practical application. Basic knowledge about the role of nutrition, physical exercise and fitness, and occupational and dental health as they contribute to overall health status is not being disseminated. Likewise, current information about known symptoms, effects and consequences of hypertension, obesity, and venereal disease are poorly disseminated at present. Maternal care, as provided in certain of the health insurance plans, does include attention to basic education of the expectant mother concerning proper care of herself and her infant; yet information on family planning, pre-natal care (including maternal nutrition and behavior), and potential genetic problems for certain mothers is not generally provided to the pool of potential mothers, particularly adolescent and young adult women. The high incidence of dental problems among school-aged children, particularly decayed teeth, suggests not only a range of poor dietary habits (high ingestion of sugars and carbohydrates, for example), but also that little education in appropriate dental hygiene is being given. It is much the same sort of problem when the high death rate associated with automobile accidents is examined. While on the one hand, basic driving habits are a form of discretionary behavior, there is a clear responsibility on the part of public agencies - particularly those concerned with education and traffic safety - to educate the public in safe driving behavior, to alert new and potential drivers, especially adolescents and young adults, to the risks and consequences of bad driving practices, and indeed to provide and enforce disincentives to as well as periodic checks on the extent of dangerous driving and accident-promoting behavior. The fact that driver education is currently not a man-

datory class in the schools, and that driver re-examination or re-education programs are not employed, suggest that feasible approaches to reducing automobile accidents and the resulting deaths and disabilities have not been exhausted by public agencies.

4. Shortage of Manpower Components and Inadequate Training

Contributing to the general unavailability of certain health services are the inadequate levels of health manpower resources, particularly for primary and some secondary health care components. At the same time, insufficient training, qualifications or continuing education, as well as a general lack of alternative manpower types (allied health professionals, nurse practitioners, and physician assistants) have combined to lower the overall effectiveness of health manpower currently deployed on Guam. Given the concentration of private practitioners in the Agana-Tamuning corridor, it is particularly distressing that the numbers of public health nurses are inadequate to provide sufficient preventive, screening and diagnositc services to more remote populations on Guam, especially those in the districts of Yigo, Talofofo, Inarajan, Merizo, Umatac. Furthermore, acknowledging the difficulties for attracting and maintaining an adequate supply of private physicians in both general and specialized practices, it is important to consider all means of extending, complementing or substituting for such manpower with the provision of health care aides, nurse practitioners, physician assistants and the like. It is especially urgent that a cadre of health manpower, whether physicians per se or alternative forms, should be trained and developed from the local Guamanian population in order to ensure that their expertise and practice remains on the island.

5. Inadequate Regulation

There are serious deficiencies in the licensing, certification, and regulation of current health manpower and services on Guam at the present time. This may well be due in part, to the relatively special governmental status that the Territory of Guam has held until recently. However, where inadequate legislative mandates now exist, it should be the responsibility of appropriate public agencies to submit the necessary bills or resolutions in order to begin to upgrade the standards and procedures that every level and component of health care and health service delivery should be subject to. To be sure an inherent dilemma is the conflict between adequate manpower levels, which are influenced by regulatory practices. There is clearly a potential for upgraded manpower standards to dissuade health care providers from working appropriate corrective legislation and agencies monitoring and regulating manpower qualifications and certification to provide adequate incentives for those manpower elements urgently needed on Guam to complete its service delivery system.

Under this heading are re-orted similar deficiencies with motor vehicle licensing and testing which need to be addressed as part of an overall program to upgrade driver competency and responsibility in order to reduce deaths and injuries due to motor vehicle and traffic-related accidents.

Finally, there are basic ambugities in the rules and conduct of present bodies engaged in both PSRO activity and the GHPDA's Certificate of Need process which have to be clarified and resolved if the quality of health care regulation is to improve to the point where it can effectively monitor and guide the future course of health care delivery on Guam.

6. Evaluation of Health Care Activities

The Guam Health Planning and Development Agency must shoulder some responsibility for the present state of uncoordinated and unguided health care delivery on Guam. While this assessment can be made of many, if not most, SHPDA's in the United States, it is important to recognize the specific prolems facing this particular agency in order that they may be consciously addressed and corrected as an integral part of the overall health planning process that takes place now and in the future. It is also important to identify the institutional setting within which the GHPDA must work and which, to a considerable extent, also acts to impede effective health planning

Problems internal to the Guam Health Planning and Development Agency stem largely from the staffing pattern and staffing rotation which have served to deny the agency the necessary continuity of direction, competency of expertise, and coordination of efforts to identify, undertake, and complete planning tasks in a comprehensive fashion. The replacement of directors every other year has not allowed sufficient coherence of policy formulation and direction to be established and adopted by all members of the agency. The result has been that line staff have been forced to work, often without appropriate guidance or training, on unrelated tasks which have thereby consumed amounts of time disproportionate to their contribution to the overall planning process and ultimate product. In particular, relevant goals, objectives and priorities, along with the appropriate tasks and procedures to adopt for their accomplishment, were not specified and agreed to at an early enough stage in the planning process to allow GHPDA to assemble appropriate data elements in an orderly fashion. Basic methods and formats for evaluating both health status and health system levels were not specified until every late date in the planning process. With the current draft of the Guam Health Systems Plan, however, a foundation for future health planning, inter-agency coordination, and evaluation efforts can be undertaken.

It is essential that the critique of the health planning agencies past efforts not be misconstrued. The process of health planning is still very much an art, despite the efforts of the Federal government to provide all manner of technical assistance, methodology, standards and guidelines. The essence of health planning is combined, coordinated, and cooperative efforts among a range of actors and agencies in the field of health care, and these efforts are not easily achieved. What applies to the GHPDA in terms of past inadequacies equally applies to the institutional context within which it has had to work. Despite national-level as well as territorial enabling legislation as mandates for health planning as needed public activity, the level of cooperation.

and coordination between agencies has been inadequate to the task of reorienting the health care system to improve health status or reduce health care costs.

There are four basic reasons for this. First, as with early efforts of GHPDA, there have not been specific policy or mission statements concerning goals, objectives, priorities and tasks, as well as criteria for evaluating progress achieved, for any of the public or semi-public agencies currently involved in health care delivery, including the Department of Public Health and Social Services, Guam Memorial Hospital Authority, and the several health maintenance organizations. Without such basic statements and assessments directed to the internal management of health care activities of the individual agencies, it is difficult to see how these agencies in combination could achieve any comprehensive perspective from which to view the entire health system.

Secondly, there have been insufficient staffing and technical expertise within each major health care agency to enable planning efforts, either singly or in concert with other agencies, to be conducted with any assurance of continuity and competence.

Thirdly, of consequence, there has been minimal amount of attention given to creating the appropriate policy bodies and task forces with established missions that could serve as working entities within which to establish inter-agency communication, cooperative links, and eventual coordination of efforts and policies. In particular, there are as yet, no ongoing multi-level health service planning or coordination activities being undertaken by the Deparmtent of Public Health and Social Services, Guam Memorial Hospital Authority, and the several health maintenance organizations, to name the major entities. Efforts have also not been made to involve, on an on-going basis, representatives from the military health care system - which admittedly tend to operate autonomously - or private practitioners and physician groups on Guam.

Fourthly, and lastly, a major contributing factor to the inadequacy of past health planning efforts has been the isolation of public budget allocation activities from any and all formal health planning activities and undertaken by GHPDA, DPHSS, and GMHA. Public sector planning is tantamount to speculation about alternative futures, prospective assessment, or trend extrapolation alone when not coupled with the means and the ability to designate and allocate (or at least influence the allocation of resources in a pattern consistent with plan recommendations. One of the first plan implementation steps that must be taken is to ensure that proper, coordinated budget drafting authority resides in agencies responsible for plan formulation.

7. Inadequate Health and Financial Records and Information System

By far, the most serious impediment to proper assessment of the health status of the population and evaluation of the impact of the health care delivery system, including requisite corrections and interventions that

can be effected to ultimately improve health system is the fragmented and un-systematic form in which health data currently exist where they exist at all. Despite the comprehensive and information-intensive nature of the requisite standardization and compilation of health data in a manner that would enhance the ability of analysis to derive meaningful planning information.

There are several contributing conditions underlying the present state of disorganization in health information collection and analysis activities. Firstly, a single agency has not been delegated enough authority or responsibility to bring about closer cooperation between all private and public agencies in identifying appropriate date elements required for comprehensive health planning, standardizing the manner in which such elements are to be collected, specifying the appropriate agencies which are to be responsible for their collection, and finally, ensuring that all such data are assembled and stored in a form that would enable various reports and analyses to be produced on a regular and timely basis. With proper staff and expertise, the Guam Health Planning and Development could be the focus of this health information system effort, but it need not be. What is essential is that the basic data components necessary for comprehensive, population-based health planning be collected, integrated, and analyzed as an interrelated whole. Such minimum data components have been specified elsewhere,* but can here be summarized as: 1) population (demographic and socio-economic data, 2) motrality and morbidity, 3) health services: facility, manpower, program, equipment and cost/financial data, and 4) health service utilization data. While this listing identifies a minimum data set, it does not complete the picture.

Given the current state of health data on Guam, several issues need to be immediately addressed. First, the accuracy, reliability and uniformity of reporting of all health status information, but especially reports of illnesses, injuries, disabilities and deaths, must be promoted and enhanced, if reliable estimates of incidence and prevalence of various health status conditions are to be made and used as the basis for health planning. Second, the reliability and utility of such reports, when produced, could be greatly enhanced by a concerted effort to computerize all health data and automate their processing and extraction. With the adoption of reporting forms that are machine-readable, this effort could also facilitate the primary collection of data as well. Thirdly, the manner in which meaningful planning information is derived from available health data is a function of the analytical tools and expertise brought to bear on such data, as well as the basic issues and questions motivating such analysis. The development of appropriate methodologies to analyze data for health planning purposes is admittedly in its infancy, and techniques to summarize, profile, characterize and otherwise describe existing conditions are presently stronger than inferential tools. However, if health planning analyses are to have an objective basis, then methods and models must be developed by which determinants of health status levels and conditions can be assessed and relevant health system components, actitities, or conditions can be identified (at least probabilistically) as appropriate interventions. The role of epidemiological analysis is health status assessment is an obvious one, but its strength in the arena of comprehensive health planning will rest on its ability to logically and analytically link health status changes with specific policies, programs and configurations of health services and health care activities that comprise current or future systems.

*Cf

E. LINKAGE BETWEEN HEALTH STATUS PROBLEMS AND HEALTH SYSTEM DEFICIENCIES

1. Direct and Indirect Impacts of System Deficiencies

The above presentation of major health systems problems identifies those elements of the health care delivery system which are at present adversely affecting health status, or through inappropriate or insufficient provision, are inhibiting improvements in general health promoting conditions among the population.* The health system, however, is not monolithically engaged in direct health status improvement. Some elements are essentially diagnostic, others curative: some programs function to maintain certain health care organizations and interests, while others serve to maintain idnviduals in a given state of health, or to retard or simply isolate deteriorating health.

Given the primary mission of this agency to improve the level of health of the population on Guam, it is essential that those sytem elements which directly affect health status and which have the greatest likelihood of improving conditions which promote health be first identified. These then must be distinguished from those elements which maintain and contribute to given levels or conditions of health or illness yet which only indirectly effect improvements in overall health status.

This agency fully realizes the sensitivity of the issue posed here. Current health systems are largely geared towards treating ill-health and consequences of ill-health, caring for the disabled, and, in general, responding or reacting to manifestations of poor health. To differentiate such systems on the basis of those system elements which contribute to, promote, and actively intervene to improve positive health status is tantamount to redefining the purpose and function of the health system as a whole. Yet, this is precisely and logically what is entailed in a comprehensive approach to health planning for local populations. The active promotion and improvement of positive health status must be seen as the predominant orientation and mission that any integrated system of health services delivery sensitive to the needs and desires of a local population should adopt and implement.*

Four health system problem areas that have direct impacts on health status are:

1. the unavailability and inaccessibility of certain health services - which prevent appropriate health care from being obtained in time to prevent minor health problems from becoming major problems which demand more health care resources in more institutional settings;

2. poor environmental quality (i.e., lack of investment in a health sustaining environment) - which is the direct precursing condition, in a epidemiological sense, for the

propagation of several, severe, communicable diseases.

3. inadequate health education and wellness promotion - which has the effect of denying sufficient information on health problem prevention and healthful behavior with the end result being that early communicable and chronic disease symptoms go untreated. This permits the development of more advanced stages in which health status is more severely impaired and which call for more intensive institutional care; and finally,

4. specific manpower shortage and training inadequacies - which, in conjunction with unavailable and unaccessible services, deny appropriate and timely care, particularly of a preventive or early diagnostic variety, to those who can least afford deteriorated health: mothers, the newborn, and infants.

The remaining three health system problem areas have important but indirect effects on health status conditions identified as critical problems at this juncture in the health planning process. Inadequate regulation, insufficient planning, and an underdeveloped data/information system have the combined effect of reducing the overall capacity of the health care delivery system as a whole from operating efficiently and effectively. Their effect on the system outweighs their combined effect on individuals who have particular health problems or who are being treated by one or more service components of the system.

There exists the possibility that inadequate regulation, licensing and certification procedures diminish the quality of care to any individual; however, in the absence of reports of gross negligence, systematic malpractice, or incompetent service, and given the special status of health care professionals on the island (their relative isolation, hence lack of competitive market for manpower as well as the difficulty of recruiting professionals and needed manpower), this agency considers the problem as one having general, long term impacts on the quality of care delivered to the population as a whole. It is one that effectively curtails or delays service utilization rather than undermines the health or quality of service delivered to any one individual at present, although the potential for quality care to be compromised is clearly present and must be ultimately addressed.

2. Relative Priority of Health System Problem Areas

The matrix presentation of Table VI.1 imbeds within it the prioritization of health system problem areas and specific system problems identified within each area. Problem areas have been ranked according to their contribution to deficits in the health status and adverse health conditions identified previously. These were in turn prioritized and ranked according to productive life or activity lost, mortality, morbidity and risk, as well as condition, prevalence, severity, and duration. Thus, examining

the manner in which identified health status is contingent upon given system deficiencies yields an initial basis for system problem prioritization. The served area most clearly lacking programmatic impact yet potentially capable of yielding the greatest improvement to overall health status over time is health education. Secondarily, unavailable and inaccessible services, particularly of a preventive and primary nature (especially outreach, case-finding, screening and diagnostic services, as well as preventive/health maintenance treatment services) contribute to negative health status conditions on Guam, particularly those related to fetal, infant and maternal health as well as individuals with chronic diseases. Thirdly, the inadequacy of current physical and health environmental services (dealing with water quality, sewage treatment, sanitation and safety) have a definite, but incompletely determined or assessed impact on the incidence and prevalence of infectious diseases and environmentally. related health problems faced by many of Guam's residents. Were prevalence of environmentally related health conditions and diseases (e.g., gastroenteritis, pneumonia, tuberculosis, parasitic-infection, salmonellosis, hepatitis, and dental caries) known in more complete detail - an assessment contingent upon improved data collection and surveillance procedures, which will be addressed by this agency in the future - the current priority of environmental health services might well be elevated to second or even first place. Fourth in prority attention, based on direct contribution to deficits in health status, is the problem area of manpower shortages and inadequate training. Manpower shortages are particularly telling in levels for public health nurses who staff village clinics and practitioners who support them in primary care as well as prventive and protective care services. Such services - or rather their inadequate supply due to these personnel shortages - have the most marked impact on fetal, infant, and maternal health status.

The remaining three health system problem areas contain critical problems which also must be addressed in a comprehensive approach to health planning. However the nature of this remaining set of problems differes from the first (direct impact) set. The problem areas of inadequate regulation and licensing, insufficient planning and coordination, and underdeveloped information base all have a significant adverse impact on the performance of the health care system as a whole. Their presence increases the potential for poorer quality care being delivered to those in need They contribute to the fragmenting, duplicating and wasting of vital health care resources which could otherwise be coordinated and rationalized in the interests of efficiency and equitable distribution of services. And, they deny needed information of a timely and comprehensive nature concerning a full range of health conditions to those agencies, administrator and policy makers who could most benefit from utilization of such information in making important health care delivery, organizational and resource allocation decisions. And of course, ultimately what adversely impacts the health care system as a whole will detrimentally affect health status What is

equally adverse however is the impact that the perception of poor system performance may have on the decisions by individuals to seek institutional and professional sources of care as well as on levels of service utilization.

Thus, for the purpose of clarifying the specific interrelationships that do exist between health system problems and health status problems, system problem areas were differentiated on the basis of those (four) which have a direct adverse impact on health status and those (three) which have an indirect impact. But it is well to bear in mind that for purposes of comprehensive health planning the two sets together (i.e., all seven system problem areas) must be considered as one ensemble, as far as goals and objectives concerning rectification of health system problems and deficiencies are concerned. They are joined also for purposes of establishing a complete, unified, and prioritized set of alternative planning and program intervenitons which would guide health care delivery towards more effective attacks of health status problems.

D. Health Systems Goals and Objectives

1. The Context and Format for System Goals and Objectives Specification.

The rationale for identifying a prioritized set of health status goals and objectives was to clarify the order in which particular health problems and conditions of the population on Guam should be addressed. Health status goals and objectives are the primary and fundamental concern of comprehensive health planning efforts. They identify the desirable and achievable ends (respectively) which any particular planning actions taken should be addressed to and ultimately evaluated by. In an ideal sense, the health system in a given area or territory, with its related services, is a collection of instruments or means for altering (or attempting to alter) health states, conditions and problems identified in the territory's population or to which the population is susceptible. The Guam Health Planning and Development Agency adopts the viewpoint that the health sytem must ultimately be designed to address all identifiable and critical health problems faced by Guam's residents. Current modes and configurations of health service delivery must be viewed as flexible and adaptable in the long run and thus subject to modification and reorganization as the underlying purposes for which the system is designed are redefined or reprioritized in the light of information on existing health problems or on changes in the nature, severity and prevalence of new health problems.

This problem-oriented approach to health system design is not without pitfalls. There are clearly other functions which the health system has, such as employment, investment, and revenue-generation (and in some cases, profit). Moreover the problem-oriented perspective, and the flexibility in organizational outlook which it demands calls for careful and measured adjustment to changing problem configurations, if the necessary mix of services, service providers service resources, as well as the system's capacity to meet these problems, are to remain balanced and effective.

The purpose of this plan is therefore not to offer a critique 'per se' of the existing health system and its performance with respect to previously, implicitly stated health problems - except where it has fallen short of meeting its own performance objectives and standards - but rather to provide a framework within which a comprehensive set of health status problems are clearly idenfitied as priority concerns which the health system must now address. By detailing such a framework, the logical consequence is that the health system itself must be evaluated in terms of its ability to adequately address such problems. Hence, dimensions of the health system itself must be - and have been - identified as critical to the future pursuit of these health status goals and objectives. We therefore arrive at a series of ideal characteristics and their achievable, targetable expressions which define the future criteria (looked at individually), and future orientation (looked at as a whole), by which the health system will be evaluated. Health system goals and objectives thus lay a blueprint for establishing future configurations of health services, manpower, facilities and resources which are responsive to that comprehensive set of health status problems identified and established as the ultimate ends for which health system services are but means to achieve or approach.

The set of seven health system goals and their respective health system objectives and sub-objectives which are specified below are a forward-looking perspective on the necessary changes required in the organization of the current health system, organized at the present time to respond to a set of only implicitly and disparately identified health status problems, needs and demands. They relate to and actively seek to ameliorate a comprehensive set of agreed upon health status problems on Guam which, if solved, will substantially improve the health of the population as a whole. The system goals represent statements of ideal states or conditions or qualities of the health system that should be pursued. In turn, the system objectives represent a translation of these goals into achievable improvements and results wihtin a given period of time: the five year planning horizon adopted for initial health planning purposes.

F. HEALTH SYSTEMS GOALS AND OBJECTIVES

A. Overview

1. Nature of Health Planning Recommendations

A population-based health plan that meets both local, differentiated needs and national, standardized requirements reflects, above all, a process of compromise. Not all locally identified needs can be met, given existing resources, and not all national priorities equally or appropriately apply to the unique situation of Guam, which has been previously characterized. Finally, it should be recognized that there is a large degree of inertia, both in the nature of institutions and channels of resource allocation (including flows of resources through them), and in the way solutions to complex health problems are generated, and all to often perpetuated long past their true utility.

The actions herein recommended to be undertaken within Guam's total health system presented in the following pages cannot be accurately called solutions in any final sense. Not only is the current understanding of health problems is incomplete, mainly due to current data and analytical limitations, but the problems themselves are also changing as well as mutually interacting. Solutions proposed in any health planning document must, per force, be characterized by short term application and modifiability.

The proposed actions, therefore, are the best set of prioritized action-recommendations that can be specified, given current knowledge of (1) dimensions of health status and the health status problems that impact Guam's population; (2) the structure of the health care and health services delivery system as well as problems identified within its components with regard to cost, availability, accessibility, continuity, acceptability, and quality; (3) the epidemiology of various health status problems with paricular attention to the relative influence of genetic, behavioral, and socio environmental factors; and (4) the demonstrable linkages that can be established between identified health status problems and specific health system components which can be enhanced or deemphasized, reoriented or created, or removed.

Without a doubt, an increase in knowledge about any one of the above four areas will alter the perception and possibly the specification of health plan recommendations. Subsequent annual revisions of this planning document will enable future sets of health system recommendations to incorporate and reflect increased understanding of the overall field of health needs and health responses on Guam.

2. Framwork for Health Systems Recommendations

Within the current national perspective on appropriate means and motivation for health systems planning, any recommendations to alter the health system or any of its components must originate with and be linked to specific health status problems and must be targeted to populations and areas in proportion to the criticality of such problems among those groups and areas. To attempt to analyze the effectiveness of the health system or to recommend changes in it apart form consideration of what health problems the system is designed to alleviate is to confuse ends with means. It must be kept in mind at all times that the desired health care and health services delivery system should exist to meet all identifiable and critical health needs of a given area's population. With this principle firmly in mind, and accepted by all parties contributing to health care, providers, consumers and planners alike, there is less likelihood that health institutions will be promoted without some rationale for their existence and contribution to maintenance of or improvements in the health of every individual on Guam.

It is therefore necessary to ensure that health system recommendations are appropriately and logically linked to the underlying health system problems. In turn, health system problems are appropriate planning problems only inso far as they reflect inadequate organization, manpower, facilities, effectiveness or utility to meet specific health status problems. Hence, a framework is required within which the logical ties between health status problems, corresponding health system problems, and alternative and reccommended interventions (actions) to remedy current system or service inadequacies can be properly visualized. Within this framework the specification of health system goals and targeted objectives ehalth of the population. Recommended actions, resource requirements, assigned responsibilities, as well as criteria by which system improvements can be judged all have a direct linkage to the ultimate bases for health care: the health status and health needs of the population

B. The Context and Format for System Goals and Objectives Specification

The national for identifying a prioritized of health status goals and objectives was to clarify the order in which particular health problems and conditions of the population on Guam should be addressed. Health status goals and objectives are the primary and fundamental concern of comprehensive health planning efforts. They identify the desirable and achievable ends (respectively) which any particular planning actions taken should be addressed to and ultimately evaluated by. In an ideal sense, the health system is given area or territory, with its related services, is a collection of instruments or means for altering (or attempting to alter) health states, conditions and problems identified in the territory's population or to which the population is susceptible. The Guam Health Planning and Development Agency adopt the viewpoint that the health system must ulimately be designed to address all identifiable and critical health problems faced by Guam's residents. Current modes and configurations of health service delivery must be viewed as flexible and adaptable in the long run and thus subject to modification and reorganization as the underlying purposes for which the system is designed are redefined or reprioritized in the light of information on existing health problems or on changes in the nature, severity and prevalence of new health problems.

This problem-oriented approach to health system design is not with out pitfalls. There are clearly other functions which the health system has, such as employment, investment, and revenue-generation (and in some cases, profit). Moreover the problem-oriented perspective, and the flexibility in organizational outlook which it demands, calls for careful and measured adjustment ot changing problem configurations, if the necessary mix of services, service-providers, service resources, as well as the system's capacity to meet these problems, are to remain balanced and effective.

The purpose of this plan is therefore not to offer a critique'per se' of the existing health system and its performance with respect to previously, implicitly stated health problems - except where it has fallen short of meeting its own performance objectives and standards - but rather to provide a framework within which a comprehensive set of health status problems are clearly identified as priority concerns which the health system must now address. By detailing such a framework, the logical consequence is that the health system itself must be evaluated in terms of its ability to adequately address such problems. Hence, dimensions of the health system itself must be - and have been - identified as critical to the future pursuit of these health status goals and objective. We therefore arrive at a series of ideal characteristics and their achievable, targeable expressions which define the future criteria (looked at individually), and future orientation (looked at as a whole), by which the health system will be evaluted. Health system goals and objectives thus lay a blueprint for establishing future configurations of health services, manpower, facilities and resources which are responsive to that comprehensive set of health status problems identified and established as the ultimate ends for which health system services are but means to achieve or approach.

The set of seven health system goals and their respective health system objectives and sub-objectives which are specified below are a forward-looking prespective on the necessary changes required in the organization of the current health system, organized at the present time to respond to a set of only implicitly and disparately identified health status problems, needs and demands. They relate to and actively seek to ameliorate a comprehensive set of agreed upon health status problems on Guam which, if solved, will substantially improve the health of the population as a whole. The system goals represent statements of ideal states or conditions or qualities of the health system that should be pursued. In turn, the system objectives represent a translation of these goals into achievable improvements and rsults within a given period of time: the five year planning horizon adopted for initial health planning purposes.

Health System Goals and Objectives

SYSTEM GOAL I. HEALTH EDUCATION AND WELLNESS PROMOTION SERVICES

Improve the quality and coverage of health education and wellness programs and services, with particular attention to provision of basic information and education on health - promoting practices, as well as on risks associated with specific health conditions, in order to increase the general awareness among all residents of Guam of the basic determinants of health and illness.

SYstem Objective 1.1 Diet/Nutrition/Obesity Information

By 1983, achieve 90% coverage of targeted populations of pregnant women and overweight individuals with basic information on appropriate diet and nutritional standards, and on the health risks (especially risks to fetal development and maternal health) associated with improper diet and nutrition.

System Objective 1.2 Physical Fitness/Exercise Information

By 1983, establish services to provide continuing and widespread dissemination of information on the health-promoting value of physical fitness and of various froms of exercise to all residents of Guam

System Objective 1.3 Maternal/Prenatal Health Education

By 1983, achieve 95% coverage of all pregnant women and at least 80% coverage of women in child-bearing years (especially adolescent women) with information and education programs concerning appropriate maternity prenatal and child care.

System Objective 1.4 Family Planning/Genetics Information

By 1983, establish and maintain services which provide complete and continuing information on all aspects of family planning, fertility regulation, and birth control options for all individuals 15 and over; and provide special information services for targeted mothers at risk concerning genetic problems, congeital malformations, and the potential for developmental disabilities.

System Objective 1.5 Occupational Health Promotion

With the 5-year initial planning period, establish information services to inform all employers and employees of particularly hazardous occupations(construction, industry, transportation) of occupational risks as well as preventive measures to reduce such risks.

System Objective 1.6 Home Health and Personal Hygiene

By 1983, achieve at least 75% coverage of all individuals, households and community orgaizations with information provided or made available on conditions for healthy living and practices of personal hygiene.

System Objective 1.7 Dental Health Promotion

By 1983, achieve at least 95% coverage of all school-aged children and 80% coverage of all individuals with information and education provided on appropriate dental hygiene and the risks and diseases associated with inappropriate eating habits or dental cleaning practices.

System Objective 1.8 Special Health Problem/Condition Information

Within the five-year planning period, establish services to reach targeted risk-groups and groups warning signs, risks, inappropriate behaviors and apporpriate preventive, diagnostic and treatment services to contact for such health conditions as hypertension, diabetes, heart disease, stroke, cancer, and venereal disease.

System Objective 1.9 Driver Education and Traffic Safety Promotion

Within the five-year planning period, achieve 100% coverage of all driving license applicants with information on safe drive practices, and with mandatory driver education for all applicants aged 25 or less.

SYSTEM GOAL II AVAILABLE AND ACCESSIBLE DIRECT HEALTH CARE SERVICES

Improve the availability of and accessibility to a full, conprehensive and integrated system of direct health care services (preventive, diagnostic, treatment, habilitative and rehabilitative, and maintenance services) to the maximum extent possible, with emphasis on the development of continuing activities for identification, early diagnosis, and early treatment of acute and chronic conditions, and the provision of appropriate secondary and special health care services in support of direct treatment.

System Objective II.10 Provision of Village-Level Clinic Services and Accessible Pulbic Primary Care

By 1983, establish a network of decentralized public health clinics providing essential primary care services (particularly for pregnant women, mothers and infants), nostic and basic acute care services, covering all to-clinci travel time of 20 minutes.

System Objective II.11 Outreach/Screening/Diagnostic Services

By 1983, establish a continuing provention service emphasizing early detection of acute and chronic conditions in the population, through a series of periodically provided outreach, screening, surveillance, case follow-up, and disgnostic activities; such activities covering all early symptoms or stages of a wide range of acute and chronic disease conditions, especially those among pregnant women, the newborn and infants, as well as the elderly.

System Objective II.12 Counseling Services

Within the five year planning period, establish multiple counseling services able to advise, inform, and treat at least 75% of all individuals indentified and referred with psychiatric, drug and alcohol abuse, suicide, family conflict, or verneral disease problems.

System ObjectiveII.13 Rehabilitation and Maintenance Services

By 1983, expand the limited set of current maintenance services to a complete and comprehensive set of habilitation, rehabilitation, and health status maintenance services, including but not limited to services for the chronic care, treatment and training of the mentally ill and developmentally disable, the physically hanicapped, the unsupported aged in poor health, and the bedridden; such services covering at least 80% of all identified cases, and providing care in a range of settings through such programs as home health care, board-and-care, day care and institutional care in both inpatient and out patient settings.

System Objective II.14 Alcoholism Services

By 1983, expand current services to at least 75% of identified and targeted alcoholics to include a complete range of diagnostic, treatment and recovery services, including detoxification center, and halfway and transitional living houses, in order to meet the full needs of all individuals identified as needing health services to combat alcoholism.

System Objective II.15 Secondary and Tertiary Health Care Elements

By 1983, make the following adjustments to the present set of secondary and tertiary health care services: (15a) Pediatric inpatient beds: attempt to achieve at least 65% occupancy rate for beds assigned to pediatric inpatient care, inorder to saisfy fully the National Guidelines; (15b) End stage renal service/dialysis: establish a program to promote self-care and home-based dialysis treatment, as one means of lowering overall costs associated with ESRD treatment; (15c) Crippled children's services: expand screening, diagnostic and therapeutic services for all crippled children on Guam, and in particular those with hearing/speech/communication disorders, in order to achieve at least 95% coverage of all children with potneial or actual crippling health problems; and (15d) Chronic of beds allocated to Intermediate Care for chronically ill individuals as well as geriatric cases, and expand associated services to meet the long term treatment, health maintenance, and rehabilitative needs of all such clients requiring impatient as well as mabulatory care. *

With the fulfillment of Objective II.15, all services and service standards included as part of the "National Guidelines for Health Planning" (March, 1978) are adequately met by Guam's health care delivery system. Certain tertiary level health service components are not represented on Guam, including: open heart surgery, cardiac catheterization, and computed tomographic scanning. Because such services are not justified with current population levels or client load/utilization rates, no service planning is required for them at this time; off-island referrals for these procedures service components are found to be adequate at the present time on Guam. These components include: general hospital services (bed capacity and occupancy rate); obstetrical services and neonatal services; neonatal special care unit; pediatric impatient care beds;

radiation therapy; and end-stage renal dialysis units.

System Objective II.16 Geriatric Services

By 1983, provide a comprehensive health program for the continuous care of all elderly individuals with health care needs who are without support from family members, through such services as day care, group home living units, nursing services, home health care, and long term inpatient care for the chronically ill aged.

System Objective II.17 Emergency Medical Services

By 1983, provide a comprehensive emergency medical service capable of responding on-site to home, occupational, vehicle or other accidents, or emergency health problems demanding immediate attention; such service serving 100% of Guam's population and area with the integral capability of reaching emergency sites with a maximum response time of 20 minutes, and delivering victims to secondary and/or tertiary care untis within 30 minutes.

System Objective II.18 Physical Accessibility

By 1983, ensure that the entire population's access to enssential primary care services and initial diagnostic and treatment service sites is provided for through the following means: (18a) decentralized and distribute over the entire island primary care service centers (in particualr, public health clinics) to ensure that travel time from any given residence to a primary care site is no greater than 30 minutes; (18b) extend clinic visiting hours to ensure that all residents have at least one primary card and emergency outpatient service center accessible within 45 minutes' travel time between 8:00 a.m. and 8:p.m. daily; and (18c) provide some form of public transportation service (possibly a demand-responsive mini-bus service) throughout the island to enable any resident at least daytime mobility and access to any and all health services at no or minimal cost.

System Objective II.19 Fianancial Access

Within the five year planning period, ensure that all residents of Guam have guaranteed access to a complete, services (preventive, diagnostic, treatmen, habilititative and rehabilitative, and maintenance) regardless of ability to-pay; and adopt a uniform, sliding payment scale for public services, varying according to the ability to pay, and applicable to any individual seeking health care.

SYSTEM GOAL III. QUALITY HEALTH PROMOTING EVIRONMENT

Improve the overall quality of and minimize health hazards associated with the physical and built enviroment of Guam, with particular attention to water purity, adequate safe and non-polluting sewage and waste disposal, neighborhood and environmental sanitation, parasite and vector control, and traffic and occupational safety.

System Objective III.20 Water Quality/Water Treatment

By 1983, ensure that all water bodies and sources are regularly and continuously monitored for water quality and that such sources are maintained at or treated to ensure maximum purity and minimum biological chemical or inorganic contamination at all times.

System Objective III.21 Sewage Treatment

By 1983, provide at least primary sewage treatment to all sources of sewage on the island, and extend the sewage piping network to all residences which are without adequate and safe on-premises sewage disposal (i.e., cesspool or septic tank facilities); and ensure that all sources of drinking water are free from contamination or pollution by sewage in raw or non-tertiary treated form.

System Objective III.22 Neghborhood Sanitation

By 1983, establish an island-wide program that ensures that each municipality and its component neighborhoods or residential areas on Guam have services and activities in operation identify, monitor, and reduce or eliminate unsanitary conditions and waste- and pollution-related health or safety hazards, including the identification and elimination of unsaitary conditions on public, commercial, and private premises which are in violation of territorial health and safety codes.

System Objective III.23 Parasite Control

By 1983, establish a service to isolate, monitor and reduce or eliminate sources and areas of concentration of or infestation by parasites of major concern as health threats to individuals, especially children (e.g., ascaris, trichuris, and hookworm).

System Objective III.24 Traffic and Highway Safety

By 1983, inventory and assess all existing traffic safety programs and equipment, including stop-lighting and signing pattern, route configurations and traffic flow separation barriers; assess sites and areas of critical traffic safety hazards; and implement an on-going program to upgrade traffic control and traffic safety procedures in order to reduce or eliminate identified hazards.

System Objective III.25 Occupational Safety

By 1983, inventory and assess all sites and conditions in critical occupations and economic activities (especially contract and residential construction) which are demonstrably hazardous to worker/employee health or safety; devise or revise standards for occupational safety; and monitor and enforce compliance with such standards by all critical occupation employers.

SYSTEM GOAL IV. MANPOWER SUPPLY AND TRAINING

Provide a complete and comprehensive mix of health manpower to staff all needed health care and health system service components, and improve the quality of training and service competency through selected basic education and re-education programs.

System Objective IV.26 Support Services Manpower

By 1983, ensure that manpower levels in the following service areas or service programs are adequate to carry out all current service activities and to meet the service objectives specified in this plan: water quality control sewage treatment, neighborhood sanitation, parasite control, traffic and highway safety (recruitment of a traffic engineer included), occupational safety; health services and manpower regulation and certfication; health care services and Guam Health Planning and Development Agency planning and evaluation; and health information system development andimplementation.

System Objective IV.27

By 1983, ensure that recruitment of and continuing funding for nursing staff for upgraded Intermediate Care, chronic care, and geriatric care services; speech pathologists, and necessary therapists for expanded Crippled Children's Services and programs for the handicapped and developmentally disabled; and counseling staff for the multiple counseling services required on Guam (psychiatric, drug and alcohol abuse, suicide, family conflict and juvenile problems, and family planning and venereal disease programs).

System Objective IV.28 Public Health Nurses

By 1983, expand the number of public health nurses (PHNs) to the full complement requisite for complete implementation of expanded, comprehensive and accessible services covering all of Guam's population with basic primary care, outreach, diagnostic and screening services, and immunizations conducted through or in conjunction with public health clinics.

System Objective IV.29 Nurse Practitioners and Allied Health Care Aides

By 1983, establish a local training and recruitment program that will provide Guam with a corps of primary and preventive health care providers as a mix of Nurse Practitioners, Physician Assistants, and other health care aides who will be trained and/or recruited to supplement existing primary care health manpower (physicians, LPNs, and PHNs) as a means of decntralizing preventive and primary care services which they will provide at the village and municiapl levels.

System Objective IV.30 Emergency Services and Paramedic Manpower

By 1983, establish a local training and recruitment program that will develop a full complement of emergency medical services personnel, including associated paramedics, consistent with and able to meet the service demands of an expanded Emergency Medical Services system for all of Guam.

System Objective IV.31 General Health Manpower Training Programs

By 1983, upgrade all local (Guam) health and health-related manpower training programs in order to improve the quality and qualifications of all such personnel licensed, certified, or employed locally, and to ensure that all such personnel meet the minimum qualifications of the respective professional orgaizations (regardless of membership standing).

System Objective IV.32 Continuing Education for Health Manpower

Within the five year planning period, establish guidelines and programs for implementation of recommendations concerning regular and periodic continuing education requirements for each branch and level of health and health-related manpower practising on Guam, including demonstration on the part of all such personnel of involvement in such continuing training and education as a condition for local re-licensing and re-certification for practice.

SYSTEM GOAL V. HEALTH SERVICES AND MANPOWER REGULATION

Improve, integrate and coordinate all health service and health manpower regulatroy activities on Guam designed or re-designed to ensure and enforce the maximum compliance with existing or revised codes, qualifications, tests, and standards for the operation fo health care and health care related services and the practice by all health and health-related personnel, in order that such system regulation will improve the overall performance and quality of component services engaged in direct or indirect health care delivery.

System Objective V.33 Licensing and Certification Procedures

By 1983, establish and implement a program to review, assess, and revise as necessary all existing local licensing and certification procedures and practices, and to introduce new licensing and certification procedures as necessary, in order to ensure that all health and health-related services and personnel meet minimum performance, professional competancy, and quality satnadards.

System Objective V.34 Legislation for Regulatory Powers:

Within the five year period, and pursuant to System Objective V.33, expand regulatory powers and authority through new or revised legislation where necessary, in order to ensure the maximum application, coverage, and enforceability of all new, revised or existing licensing and certification procedures and regulatory activities for health and health-related services and personnel.

System Objective V. 35 Motor Vehicle Testing and Licensing

By 1983, achieve a complete review, assiessment and revision of existing motor vehcile testing and licensing procedures, to ensure that 100% of all new license applicants or re-applicants are subject to stringent driving practice and traffic safety standards competency assessment; with provisions incorporated for mandatory driver re-education and re-testing for established classes of moving violations and traffic safety violations.

System Objective V. 36 P.S.R.O. Enhancement

Within the five yeary planning period, achieve a reassessment and restructuring of Guam's Professional Standards Review Organization, with new mandate and guidelines for the fulfillment of that mandate to establish professional standards for health service performance and to evaluate and report on the assessment of all health care professions and personnel in a systematic, ocmprehensive and timely fashion.

System Objective V.37 GHPDA Certificate of Need Process Clarification

By 1983, under the direction of the Guam Health Planning and Development Agency, review and revise the current procedures and program within which the Cetificate of Need process is carried out, and, as part of this revision, implement a program of covering all health system services intending to expand or modify their configuration of health resources for service delivery with uniform standards, of such changes, and schedule for the timely evaluation of applications for approval of intended service changes.

SYSTEM GOAL VI. HEALTH PLANNING, COORDINATION AND EVALUATION

Improve the effectiveness and efficiency with which health planning, coordination and evaluation efforts in support of health services and programs are conducted, in order to provide the health system as a whole on Guam with the best long run performance capability in response to identified health status problems and conditions.

System Objective VI.38 Guam Health Planning and Development Agency Capabilities Enhancement

Within the five year planning period, adopt a fixed staffing pattern and delegation of planning agency responsibilities and task-assignments in GHPDA, consitent with comprehensive health planning functions and acitivities, with clear lines of direction and supervisory authority; establish minimum planning qualifications consistent with agency responsibilities and task-assignments, which are specific to each staff position; and formulate and implement a detailed schedule of activities, tasks, methods, development, and service evaluation efforts undertaken by the agency.

System Objective VI.39 Health Care Agency Policy Formulation

By 1983, achieve system-wide adoption and implementation of a concerted, GHPDA sponsored program to develop and activate policy-making bodies, boards, or continuing task forces concerned with agency-specific service delivery and administration activities in all major health care agencies, public and private, including but not limited to: Department of Public Health and Social Services, Guam Memorial Hospital Authority, and the island's health maintenance organizations; such bodies to establish agency relevant missions, goals, objectives, priorities, tasks and agency evaluation criteria, consistent with the evolving Guam Health Systems Plan and its specification of agency function and purview.

System Objective VI.40 Health Care Agency Planning-Evaluation Expertise

By 1983, achieve the cooperation of all major health care agencies in their adoption of personnel positions or staff time allocated to agency planning, evaluation and system-wide and GHPDA Plan coordination efforts.

System Objective VI.41 Health Planning-Health Budgeting Linkage

By 1983, establish an ongoing joint planning agency-legislative committee liaison to coordinate planning reccommendations and budget allocation decisions to be incorporated in draft or final budget legislation, in order to ensure that futrue Health System Plans for Guam incorporate the most fessible and implementable set of plan reccemmendations consistent with political and budgetary realities of the Territory.

System Objective VI.42 Inter-Governmental Health Agency Coordination

Within the five year planning period, establish a continuing program of periodic meetings of all governmental agencies (Federal and Territorial) involved directly or indirectly with health care delivery, for the purpose of coordinating and evaluating information, decisions, plans, and projections with respect to health status and health system components, and in order to arrive at a more consistent set of public policies with regard to health care delivery and health problem abatement.

System Objective VI.43 Multi-Level Health Care Services Coordination

Within the five year planning period, under the direction of GHPDA, establish an inter-agency task force composed of representatives of all major health service orgaizations, public and private, large and small, and including military health care representatives if possible, coordinating activities, programs and policies in pursuit of all goals and objectives of the Health Systems Plan adopted by the Territory.

SYSTEM GOAL VII HEALTH INFORMATION SYSTEM IMPLEMENTATION

Strengthen and conslolidate the data-base foundation required for local, population-based comprehensive health planning, by enhancing the coverage, comprehensiveness, and timeliness of such a combined data-base with all appropriate analytical and evaluation methodologies, epidemiological, statistical and financial tools in order to maximize the amount of useful and utilizable information made available to GHPDA and to other agencies for comprehensive health planning.

System Objective VII.44 Comprehensive Morbidity, Provider and Cost Data

By 1983, establish and carry out data collection procedures on a regular and timely basis which enable the compredhesive compilation of morbidity and disability conditions as reported to provider physicians as well as to health clinics, HMOs, or the hospitals (military and civilian); the complete monitoring and updating of basic data sets on health care provider characteristics and activities; and the recording of basic financial, budgetary, and cost data from each health care service and provider; such data coupled with other routinely available and collected data (mortality, vital statistics, service utilization, demographic and socio-economic data) to enable

complete and detailed analyses of changes in health status and health system activity.

System Objective VII.45 Records and Data Elements Standardization

By 1983, establish a completly standardized, consistent and uniformaly accessible set of basic health and population data, which eliminates duplication of data gathering and reporting, and records data elements on standard, coded forms (suitable for machine-reading or key-punching), and with reference to which all regular and necessary analyses of health status, health stauts determinants, health services configuration and performance, and health service utilization can be carried out.

System Objective VII.46 Database Coordination and Centralization

By 1983, establish a single data collection, storage, and analysis entity (or agency locus) which is the central unit to which all data elements will be sent on a regular basis; adopt and implement a computerized system of record storage and record retrieval for all data elements utilized in health planning; and achieve the requisite degree of cooperation and coodination with all health service agencies and service providers - through formal agreements on data gathering, protection of confidentaility of patients and provider where necessary, and sharing of health information and analytical output - in order to guarantee the regular and continued compilation of all essential health planning data elements.

System Objective VII.47 Information System Analytical and Output Capacity

Within the five year planning period, create, intergrate, and maintain a package of analytical methods and procedures which will maximize the use of all collected data for health planning and maximally facilitate the conversion of raw data into interpreted data (i.e., useful, communicable, polciy- or program-relevant information); such methods and procedures to include but not to be limited to standard and graphic summary presentations of health data, epidemiological methods for analyzing determinants of health status conditions, and statistical routines to summarize health data and to explain associations or relationships between different dat aelements, as well as additional contingency procedures for supplementing regular reports and records data sources with special survey data when appropriate and cost-effective to answer specific health planning questions.

V. HEALTH DELIVERY SYSTEM

G. HEALTH CARE SYSTEM RECOMMENDATIONS

THIS SECTION WILL BE DEVELOPED IN THE FY 1980 REVISION OF THE GUAM HEALTH PLAN.

VI. GLOSSARY

ACCEPTABILITY - A measure of consumer satisfaction with the services they receive, the manner in which the services are delivered, the ease with which services are obtained, and their confidence in the providers of the services.

ACCESSIBILITY - The degree to which the system inhibits or facilitates the ability of an individual to gain entry and to receive services and which includes geographic, architectural, transportation, social, time and financial considerations.

ACCREDITATION - The process by which an agency or organization evaluates and recognizes a program of study or an institution as meeting certain predetermined standards.

ACTION - An approach or strategy for effecting change in the health system or in related systems, developed as a potential means for attaining one or more objectives.

ACTION DESIGN - The third major phase of Plan Development that is concerned with the development of long and short range strategies for change in the health system or in related systems.

ADMINISTRATIVE SERVICES - Those services provided to assure adequate management of medical care resources as well as patient care environment.

AFFILIATION - An agreement (usually formal) between two or more otherwise independent programs or individuals which defines how they will relate to each other.

AIP - The Territory of Guam's Annual Implementation Plan document which contains decisions by the GHPDA in cooperation with other health related entities on what and how short-range objectives, priorities, tactical actions and resource changes should occur within the next year on Guam which may bring about the realization of the long-term achievements stated in the GHP.

ALTERNATIVE PLANS - Different combinations or sets of action designs to be analyzed and compared for selection and adoption of the most cost-effective recommended plan.

AMBULATORY SETTING - A location where organized health care services are provided to patients who travel to the site of care, receive a service or services, and leave the site the same day.

AREA HEALTH SERVICES DEVELOPMENT FUND (AHSDF) - This fund is established under Section 1640 of P.L. 93-641, and provides that any fully designated HSA (which has an HSP and AIP established by its board and reviewed by the SHCC, and which is found by the Secretary to be performing its functions satisfactorily) is eligible to apply to the Secretary for a grant to establish and maintain an AHSDF in order to make grants and contracts to public and non-profit private entities to promote non-service delivery projects consistent with the HSA's AIP (See Section 1640).

AVAILABILITY - The extent to which health care services are present in appropriate quantity in a specified geographic area.

BIOMEDICAL AND CONSUMER PRODUCT SAFETY - Those measures taken to ensure that drugs, cosmetics, therapeutic devices and all types of consumer products including cleaning fluids, pesticides and children's toys are safe and appropriate for their intended use, and are clearly labeled as to potential harm resulting from abuse or misuse.

CAPITAL COST - The financial requirements invested in the development of a new activity less the costs of operations, but include all costs incurred prior to the operation of the activity.

CAPITATION - A method of payment for health services in which an individual or institutional provider is paid a fixed, per capita amount for each person served without regard to the actual number or nature of services provided to each person.

CERTIFICATE OF NEED - A certificate issued by a governmental body to an individual or organization proposing to construct or modify a health facility, or offer a new or different health service, which recognizes that such facility or service when available will be needed by those for whom it is intended. Where a certificate is required (for instance for all proposals which will involve more than a minimum capital investment or change bed capacity), it is a condiction of licensure of the facility or service, and is intended to control expansion of facilities and services in the public interest by preventing excessive or duplicative development of facilities and services.

CHARACTERISTICS OF THE HEALTH SYSTEM - The major attributes of the health system which health planning agencies must consider in planning for the health system under P.L. 93-641, including: cost, availability, accessibility, continuity, acceptability and quality.

CLINIC - A facility, or part of one, for diagnosis and treatment of outpatients. Clinic is irregularly defined, sometimes either including or excluding physicians' offices, sometimes being limited to facilities which serve poor or public patients, and sometimes being limited to facilities in which graduate or undergraduate medical education is done.

CLINICAL LABORATORY SERVICES - The testing of specimens from the human body to aid in the diagnosis and treatment of physical diseases and other ill-health conditions.

CMHC - The Community Mental Health Center of Guam is the sole agency that provides comprehensive, princiapply ambulatory, mental health services, primarily to individuals residing on Guam.

COINSURANCE - A cost-sharing requirement under a health insurance policy which provides that the insured will assume a portion or percentage of the costs of covered services. The health insurance policy provides that the insurer will reimburse a specified percentage of all, or certain specified covered medical expenses in excess of any deductible amounts payable by the insured. The insured is then liable for the remaining percentage of the costs, until the maximum amount payable under the insurance policy, if any, is reached.

COMMUNITY HEALTH PROMOTION AND PROTECTION SERVICES - Service directed at the community level toward improving the personal health behavior of community residents and improving the quality of factors in the environment which affect their health.

COMMUNITY HEALTH PROMOTION AND PROTECTION SYSTEM - A major subsystem of the overall health system which includes those services delivered to the community as a whole in order to improve or maintain their health status.

COMMUNITY SETTING - Settings in which community health promotion and health system enabling services, rather than personal health care services or patient-related support services, are provided.

COMPREHENSIVE HEALTH PLANNING - Established by Public Law 89-479 which is the Comprehensive Health Planning and Public Health Services Amendment of 1966 and created the areawide and state agencies who are guided by voluntary councils. All entities concern themselves with environmental and occupational health, health education, personal health behavior, medical resources and services.

CONDITIONAL DESIGNATION - An initial period of designation of health systems agencies and SHPDAs for up to 24 months. At tne end of conditional designation, an agency must be ready to assume all legal and functional requirements stated in P.L. 93-641 and supporting regulations.

CONSUMER - A person who may or is receiving health care services and was or is not associated in any direct or indirect way with the provision of health services.

CONTINUITY - The degree of coordination present in the delivery of health care services to each consumer who can move with ease from one type of service to another, or from one type of setting to another.

COOPERATIVE HEALTH STATISTICS SYSTEM (CHSS) - A program of the National Center for Health Statistics in which Federal, State, and local governments cooperate in collecting health statistics, so that any particular item of data is collected by that level which is best equipped to collect and distribute it to all levels.

COST - The total level of economic investment required for the provision of health services, especially expenditures for capital and operating requirements.

COST-BENEFIT ANALYSIS - A method of comparing alternatives in which "the monetary cost of a program is normally compared with its expected benefits expressed in dollars."

COST CONTAINMENT - The control of the overall cost of health care services within the health care delivery system. Usually subjective cost is contained when the value of the resources committed to a new activity are not considered to be excessive.

COST-EFFECTIVENESS ANALYSIS - A method of comparing the costs and effects of alternative ways for achieving a specific set of results.

CRITERIA - Measures used to assess the performance characteristics of proposed or existing health system services.

DEMAND - The amount of a given service sought by consumers in response to their perceived need for that service.

DENTAL HEALTH SERVICES - All services designed or intended to promote, maintain or restore dental health including educational, preventive, and therapeutic services.

DEPRECIATION - The decline in value of capital assets (assets of a permanent or fixed nature, goods and plant) over time with use.

DETECTION SERVICES - Routine evaluation and screening of individuals without recognized symptoms for the purpose of identifying the individuals at risk who have certain diseases or conditions.

DIAGNOSIS AND TREATMENT SERVICES - Services for evaluating the health status of individuals and identifying and alleviating disease and ill-health or the symptoms thereof.

DIAGNOSTIC RADIOLOGY SERVICES - The detection of physical diseases and other ill-health conditions through the use of radiant energy.

DISABILITY - Any limitation of physical, mental, or social activity of an individual as compared with other individuals of similar age, sex, and occupation.

DIRECT COST - The costs of resources that are solely devoted to the operation of a specific activity, not including the distribution of costs to a cost center which are not specifically attributable to that cost center.

DIRECT PATIENT CARE SUPPORT SERVICES - Those services which lend assistance to the prevention, diagnosis and treatment of disease or other ill-health conditions, and to the restoration or habilitation of the ill or disabled.

EFFECTIVENESS - A characteristic of short or on long-range actions which reflects the degree to which such actions contribute to the attainment of health status or health system objectives.

EMERGENCY MEDICAL SERVICES - Diagnosis and treatment in response to the perceived need of an individual for immediate medical care in order to prevent loss of life or aggravation of physiological illness or injury.

EMERGENCY MEDICAL SERVICE SYSTEM (EMSS) - An integrated system of appropriate health manpower, facilities and equipment which provides all necessary emergency care in a defined geographic area.

FACILITY - A structure, including physical plant and fixed equipment, used in providing services.

FEE-FOR-SERVICE - Method of charging whereby a physician or other practitioner bills for each encounter or service rendered.

FIDUCIARY - Relating to or founded upon a trust or confidence. A fiduciary relation exists where an individual or organization has an explicit or implicit obligation to act in behalf of another person's or organization's interest in matters which affect the other person or organization.

FINANCING - The sources and methods of financing both resources development and health system services.

FINANCIAL FEASIBILITY - The evaluation of the success of a proposed health care service in terms of its ability to pay the costs of its operation and is measured by matching the reasonable revenues to be received to the costs of the activity.

FOOD PROTECTION - Those measures taken to assure wholesome and clean food free from unsafe bacteria and chemical contamination, natural or added deleterious substances, and decomposition during production, processing, packaging, identification guidelines.

FREE-STANDING SUPPORT SETTING - A location where health services are provided which support the delivery of personal health care services without providing direct patient care, and which is not a component of an organization which delivers personal health care services in another setting.

FULL OR FINAL DESIGNATION - The status given a health systems agency that has met all legal and functional requirements of P.L. 93-641.

GAP - A term used to describe the difference between what is expected to be and what not to be.

GENERAL MEDICAL SERVICES - The diagnosis and treatment of non-emergent physical diseases and other ill-health conditions or their symptoms by techniques distinct from those used in obstetric, surgical, diagnostic and therapeutic radiology and clinical laboratory services.

GEPA - Guam Environmental Protection Agency. Local EPA which seeks to protect the community from environmental hazards causing or contributing to disease, illness, injury or death.

GHCC -The Guam Health Coordinating Council represents the community and is the advisory body of the GHPDA with decision-making powers to approve or disapprove plans and grants for state health program.s

GHP - The Guam Health Plan is the state health plan of Guam which represents the community's decisions in broad strategic actions and health resources changes over the next five years or more, including recommendations for their implementation in order that stated goals and objectives may be obtained. May be revised annually.

GHPDA - The Guam Health Planning and Development Agency is an Executive Staff Office of the Territory of Guam which is responsible for all health planning and resources development activities and is designated as the agency charged with regulatory functions by implementing a "Certificate of Need" program.

GMH - Guam Memorial Hospital. Guam's only civilian hospital that provides emergency, acute and long-term care services. It is governed by a Board of Trustees established by Guam's Public Law 14-29 called, the Guam Memorial Hospital Autonomy Act of 1977.

GMHSAA - Guam Mental Health and Substance Abuse Agency. The single state agency of Guam which performs comprehensive planning, implementation, monitoring and other regulatory functions and activities related to mental health and substance abuse.

GOAL - In health planning, a quantified statement of a desired future state or conditions, and differs from an objective by lacking a deadline, and usually by being long range (five to ten years).

GOAL/NEED ANALYSIS - The second major phase of the Plan Development Process and begins with a review of the health status and health system reference projection and ends with the establishment of objectives and priorities.

HABILITATION AND REHABILITATION SERVICES - Services to restore the ill or disabled individual to, or to assist the developmentally disabled individual to achieve, the fullest physical, mental, social, vocational and economic usefullness of which he is capable.

HEALTH ACTION NEEDS - The most efficient and effective set of health system changes that would completely satisfy all health status improvement needs and all health system needs, thus attaining all goals.

HEALTH EDUCATION SERVICES - Those services directed toward informing, educating and motivating the public to adopt personal lifestyles and nutritional practices which will promote optimal health, avoid health risks, and make appropriate use of health care services in the community.

HEALTH ENABLING SYSTEM - A major subsystem of the overall health system which includes those services provided by various governmental and non-governmental agencies in order to ensure the availability, accessbility and acceptability of quality health care services in the most cost-effective manner possible.

HEALTH FACILITIES - Collectively, all buildings and facilities used in the provision of health services. Usually limited to facilities which were built for the purpose of providing health care, such as hospitals and nursing homes, and, thus, does not include an office building which includes a physician's office.

HEALTH MAINTENANCE ORGANIZATION (HMO) - An entity with four essential attributes:

(1) an organized system for providing health care in a geographic area, which entity accepts the responsibility to provide or otherwise assure the delivery of;
(2) an agreed upon set of basic and supplemental health maintenance and treatment services to;
(3) a voluntarily enrolled group of persons; and
(4) for which services the HMO is reimbursed through a pre-determined, fixed, periodic prepayment made by or on behalf of each person or family unit enrolled in the HMO without regard to the amounts of actual services provided.

HEALTH PLANNING - A process which establishes desired future levels for health status and health system performance, designs and selects among alternative actions aimed at modifying the health system so that future levels of both healt- status and health system performance conform to desired levels, and suggests steps for implementation of the recommended actions.

HEALTH STATUS AND HEALTH SYSTEM ASSESSMENT - That part of the plan development process involving the selection of health status and health system indicators, collection or the estimation of past and current data for the selected indicators, and a reference projection of how those indicators will change over a five to ten year period if there are no changes in current plans or programs.

HEALTH STATUS IMPROVEMENT NEEDS - The collection of significant gaps between the projected and desired levels of all health status indicators. These gaps represent the distance between the expected health status and the technically attainable levels to which the community aspires.

HEALTH SERVICE AREA - A geographic region for the effective planning and development of health services usually determined on the basis of factors including population and availability of resources to provide all necessary health services for the residents of the area. In Guam's case, the entire 219 square miles of land mass is the health service area.

HEALTH SYSTEMS - All of the services, functions and resources in a geographical area whose primary purpose is to effect the state of health of the population.

HEALTH SYSTEM ENABLING SERVICES - Organized activities designed to influence the means by which, and conditions under which, health system services are delivered.

HEALTH SYSTEM NEEDS - The collection of significant gaps between the projected and desired levels of all health system indicators. These gaps represent the distance between the expected health system performance and the technically attainable levels to which the community aspires.

HEALTH SYSTEMS PLANS (HSP) - The five years long-range health plan of each separate area of a state that when consolidated form the State Health Plan (SHP). In Guam's case, the Guam Health Plan (GHP) which is the state or territory's health plan may be considered as both the SHP and HSP due to Guam's special status. (See Section 1536, HSA and SHP).

HEALTH SYSTEMS SERVICES - Related activities which utilize health resources and whose primary purpose is to contribute to the improvement or protection of health status of the population of the environment affecting their health.

HEALTH SYSTEMS SETTINGS - Sites in which health resources are utilized in order to deliver health system services.

HILL-BURTON - A Public Law 79-725 called the Hospital Survey and Construction Act of 1946 provided programs for surveying state needs, developing plans for construction of hospitals and public health centers, and assisting in constructing and equipping them.

HOME SETTING - A person's usual or temporary place of residence with the result that the patient does not travel in order to receive services.

INCIDENCE - In epidemiology, the number of cases of disease, infection, or some other event having their onset during a prescribed period of time in relation to the unit of population in which they occur.

INDICATOR - A quantitative measure chosen to reflect the health status of the population or to represent how well the health system is performing, and by which the level and change in community health and in health system performance are judged.

INDIRECT COST - A cost which cannot be identified directly with a particular activity, service or product of the program experiencing the cost. Indirect costs are usually apportioned among the program's services in proportion to each service's share of direct costs.

INDIVIDUAL HEALTH PROTECTION SERVICES - Individual education, routine examination and use of drugs, substances or devices in order to render an individual protected against disease and promote his optimum health.

INPATIENT - A patient who has been admitted at least overnight to a hospital or other health facility (which is therefore responsible for his room and board) for the purpose of receiving diagnostic, treatment or other health services.

INTEREST - The cost incurred for borrowing funds and which is only for the value of funds received for loans given to the entity, and expressed as a percentage of the total loan.

LONG-STAY INPATIENT SETTING - A locationwhere personal health care services are provided to patients who stay overnight, at least fifty percent of whom remain thirty consecutive days or longer.

LONG-TERM CARE - Health and/or personal care services required by persons who are chronically ill, aged, disabled or retarded, in an institution or at home, on a long-term basis.

MAINTENANCE SERVICES - Services provided to individuals with chronic physical and mental ill-health conditions in order to prevent deterioration in those conditions as well as services provided to individuals in need of assistance in activities of daily living.

MANPOWER - Collectively, all persons who provide a given category of services.

MEDICAL HABILITATION AND REHABILITATION SERVICES - The medical evaluation of the needs of the ill or disabled individual, and the design, management and evaluation of a habilitation or rehabilitation program to meet those needs.

MEDICALLY UNDERSERVED POPULATION - The population of an urban or rural area with a shortage of personal health services, or another population group having a shortage of such services.

MEDICARE - A nationwide health insurance program for people aged 65 and over, for persons eligible for social security disability payments for over two years, and for certain workers and their dependents who need kidney transplantation or dialysis.

MENTAL HEALTH SERVICES - The diagnosis and treatment of emotional and mental diseases and conditions or their symptoms through the administration of medication and specialized therapy.

MOBILE SETTING - A movable structure or specially equipped vehicle used to provide continuing or periodic health care services in a location selected to assure geographic accessibility to an identified target population; or a vehicle used to provide health care services during transportation of patients.

MORBIDITY - The extent of illness, injury, or disability in a defined population. It is usually expressed in general or specific rates of incidence or prevalence. Sometimes used to refer to any episode of disease.

MORTALITY - Death. Used to describe the relation of deaths to the population in which they occur. The mortality rate (death rate) expresses the number of deaths in a unit of population within a prescribed time and may be expressed as crude death rates (e.g., total deaths in relation to total population during a year) or as rates specific for diseases and, sometimes, for age, sex, or other attributes (e.g., number of deat-hs from cancer in white males in relation to the white male population during a year).

NEED ASSESSMENT - That part of the plan development process involving Health Status and Health System Assessment and Goal/Need Analysis, up to but not including the establishment of objectives and priorities.

OBJECTIVE - A quantitative statement of desired health status or health system performance expressed as an indicator level to be achieved within a specified time period.

OBSTETRIC SERVICES - The diagnosis and treatment of any abnormalities during pregnancy, and services for the promotion and maintenance of 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.

OCCUPANCY RATE - A measure of inpatient health facility use, determined by dividing available bed days by patient days. It measures the average percentage of a hospital's beds occupied and may be institutionwide, or specific for one department or service.

OCCUPATIONAL HEALTH AND SAFETY - Actions taken to assure the recognition, prevention, and control of occupational health hazards and illnesses, and to promote the physical and mental well-being of employed persons.

OPERATING COST - The financial requirements necessary to operate an activity which provides health services including all costs incurred after the date the activities commenced which normally are costs of personnel, material, overhead, depreciation, and interest.

OVERHEAD - The general costs of operating an entity which are distributed to all the revenue producing operations of the entity, but which are not directly attributable to a single activity.

PATIENT ORIGIN STUDY - A study, usually undertaken by an individual health program or health planning agency, to determine the geographic distribution of the homes of the patients served by one or more health programs. Such studies help define catchment and medical trade areas, and are useful in locating and planning the development of new services.

PDC - The Plan Development Committee is a working committee of the GHCC charged with the preparation of the GHP; and annually review and suggest revisions to the plan as necessary.

PERSONAL HEALTH CARE SUPPORT SERVICES - Services which do not involve direct medical care, but which assist in the prevention, diagnosis and treatment of diseases or ill-health conditions, or in the habilitation, rehabilitation, or maintenance of ill or disabled individuals.

PERSONAL HEALTH CARE SYSTEM - A major subsystem of the overall health system which include those services delivered to individuals in order to improve or maintain their health status.

PH&SS - Department of Public Health & Social Services is Guam's only line department which operates both on a "state" and "local" level with one areawide health center and a network of nineteen village or district health centers.

PLAN - A set of decisions on what short- or long-range actions should be taken to produce future changes in order to attain explicitly stated desired results.

PLANNING CYCLE - The scheduled sequence of a set of formal steps and procedures to be performed over a predetermined period of time. The planning cycle is repeated for each successive planning period and ends with the selection and dissemination of a plan or plans.

PLAN DEVELOPMENT PROCESS - A cyclical process of expressing community values and long-range aspirations for health status and health system performance, projecting and evaluating the capabilities of current-health services to address them, and designing and choosing among actions which will close the gaps between projected and desired levels of community health and health system performance.

PLANNING HORIZON - The future year for which a health system agency or state agency will plan and establish objectives. The planning horizon for any agency is expected to be at least five years into the future.

PLAN IMPLEMENTATION - The process by which an agency promotes the accomplishment of the recommendations in its plan utilizing a combination of methods including advocacy, financial and/or technical assistance to providers, and regulatory controls.

PLAN SELECTION - The fourth phase of plan development involves an analysis of the cost-benefits and cost-effectiveness of implementing each of the available alternative plans.

PLANNING SYSTEM - A formal set of rational procedures involving steps in data collection and analysis for projections of the future, setting of goals and objectives, generation of alternative actions and selection among them to guide the process of decision-making during the development of aplan.

POLICY - A course of action adopted and pursued by a government, party, stateman, or other individual or organization; any course of action adopted as proper, advantageous or expedient.

PREVALENCE - The number of cases of disease, infected persons, or persons with some other attribute, present at a particular time and in relation to the size of the population from which drawn.

PREVENTION AND DETECTION SERVICES - Services delivered to individuals in order to promote optimum physical and mental well-being, including protection from the development of disease and ill-health, or identify disease or ill-health at the presymptomatic or unrecognized symptomatic stage to permit early intervention.

PRIMARY CARE - Basic or general health care which emphasizes the point when the patient first seeks assistance from the medical care system and the care of the simpler and more common illnesses.

PRIORITIES - The relative importance and emphasis attached to various goals, objectives, and by extension, the actions designed to achieve them.

PROFESSIONAL STANDARDS REVIEW ORGANIZATION (PSRO) - A physician-sponsored organization charged with comprehensive and ongoing review of services provided under the Medicare, Medicaid and Maternal and Child Health programs. The purpose of this review is to determine for purposes of reimbursement under these programs whether services are: medically necessary; provided in accordance with professional criteria, norms and standards; and, in the case of institutional services, rendered in an appropriate setting.

PROGRAM - A group of projects providing related services which together address a common purpose.

PROJECT - A set of activities to be carried out by a provider organization that usually include specific manpower, budgets, operations and operating policies.

PROSPECTIVE REIMBURSEMENT - Any method of paying hospitals or other health programs in which amounts or rates of payment are established in advance for the coming year and the programs are paid these amounts regardless of the costs they actually incur.

PROVIDER - A person or organization whose responsibilities involve the provision, administration, teaching or development of health services, or may have an interest in the health industry directly or indirectly.

PSHP - Preliminary State Health Plan. A joint product or document of the GHCC plan development committee and GHPDA which contains detailed statement of goals and objectives for improvement in the health status of the population and in the delivery of health services in a five-year period. GHCC approves/disapproves the Plan and is used in the development of the GHP. (See GHP).

PUBLIC ACCOUNTABILITY - Responsible, liable, explainable. To account means to furnish a justification or detailed explanation of financial activities or responsibilities to furnish substantial reasons or convincing explanations.

PUBLIC LAW 93-641 - The National Health Planning and Resource Development Act of 1974 amends the Public Health Service Act and replaces the Hill-Burton, Comprehensive Health Planning and Regional Medical Programs. The Act established by adding to the PHS Act two titles, XV, a section on the national health planning and resources development program, and XVI, which replaced the Hill-Burton loan program for hospital and facility construction and modernization by calling for a State Medical Facilities Plan.

PUBLIC LAW 14-150 - Guam's enabling legislation of 1978 which provided the establishment of the GHPDA and GHCC as a permanent section of the administration of the local government to assure the establishment of a health systems program and the full participation of Guam in the U.S. Public Law 93-641. The local statute further established a "Certificate of Need" (CON) program.

QUALITY - The degree to which health care services are delivered in accordance with established professional standards in terms of structure, process and outcome.

RADIATION SAFETY - Actions taken to protect the community from unnecessary exposure to ionizing and non-ionizing radiation from controlable industrial and nuclear sources, and to minimize dxposure of patients and medical personnel to clinical radiation.

REFERENCE PROJECTION - Forecasts of expected future levels, on various types of health planning data, if no actions are taken to alter current activities and commitments.

REGIONAL MEDICAL PROGRAM (RMP) - Public Law 89-239 created RMP and can be found in Title IX of the PHS Act. The program provides support to regional organizations to improve the care of heart disease, cancer, strokes and related diseases, usually oriented towards initiating and improving continuing education, nursing services, and intensive care units.

REGULATION - The intervention of government or accreditation associations in the health system by means of rules and regulations which typically influence, control or set standards relative to the services provided within the health system, the settings in which, and the manner in which providers of service are reimbursed.

REHABILITATION - The combined and coordinated use of medical, social, educational and vocational measures for training or re-training individuals disabled by disease or injury to the highest possible level of functional ability.

REIMBURSEMENT - The process by which health care providers receive payment for their services usually by third parties who for the most part represent their patients.

RELATED FACTOR - Any factor judged to have an impact on the quality of a population's health or the ability of the health system to perform as desired.

RELATED SYSTEMS - Any system which exists for a primary purpose other than improving and maintain health, but which may also effect the state of health of residents and the performance of the health system.

RESEARCH - Scientific investigation or inquiry mainly within the biomedical, behavioral, technological, organizational and services delivery categories.

RESOURCES - Manpower, facilities, equipment, and money.

RESOURCE CAPACITY - The amount, type and distribution of services that can be provided by the usable, available resources in a given geographic area.

RESOURCES DEVELOPMENT - Activities which focus especially upon the recruitment and education of health care professionals, or the construction and modernization of health care professionals, or the construction and modernization of health care facilities.

REVENUE - The gross amount of earnings without any deductions that is received by an entity for the operation of a specific activity.

SECONDARY CARE - Services provided by medical specialists who generally do not have first contact with patients (e.g., cardiologists, urologists, dermatologists)..

SECTION 1122 - A section of the Social Security Act added by Public Law 92-603. The Section provides that payments will not be made under Medicare or Medicaid with respect to certain disapproved capital expenditures determined to be inconsistent with state or local health plans.

SECTION 1512 - A segment of the Public Law 93-641 which calls for the creation of a Health Systems Agencies and Governing Bodies.

SECTION 1516 - A segment of the Public Law 93-641 delegating the Secretary of the DHEW to make in each fiscal year a planning grant to each health systems gency. GHPDA receives a 100% federal grant from this section along with SHPDA funds as authorized by Section 1536 of the same law.

SECTION 1521 - A segment of Public Law 93-641 which calls for the establishment of the State Health Planning & Development Agencies.

SECTION 1523 - A segment of Public Law 93-641 which articulates the functions of the SHPDA.

SECTION 1524 - A segment of Public Law 93-641 which calls for the establishment of the State Health Coordinating Councils and their functions.

SECTION 1536 - A segment of Public Law 93-641 which identifies Guam as a unique entity entitled to both SHPDA and HSA funds if Guam choses to perform HSA functions.

SECTION 1640 - A segment of Public Law 93-641 calling for the Secretary of DHEW each fiscal year to make a grant to each HSA from the Area Health Development Funds for projects and programs in accordance with the priorities established in the AIP.

SHARED SERVICES - The coordinated, or otherwise explicitly agreed upon, sharing of responsibility for provision of medical or non-medical services on the part of two or more otherwise independent hospitals or other health programs.

SHORT-STAY INPATIENT SETTING - A location where personal health care services are provided to patients who stay overnight, at least fifty percent of whom leave less than thirty (30) days following admission.

STATE MEDICAL FACILITIES PLAN (SMFP) - A document presenting the decisions reached by the GHPDA and approved by the GHCC specifying the State requirements for medical facilities, and the Area Health Services Development Fund financial assistance which should be provided for medical facility construction, modernization and conversion, and the priorities for such assistance.

SKILLED NURSING FACILITY (SNF) - A nursing facility participating in the Medicaid and Medicare programs that meets specified requirements for services, staffing and safety.

SPECIFIC PLAN - A document presenting a detailed description of the set of actions and resources required to achieve one or a related set of objectives including the identification of service elements, types of organizations, structure, financing, detailed resources, timing, and implementation phases.

STANDARD - The quantitative and/or qualitative level to be achieved with respect to a particular criterion to represent acceptable performance as judged by the Agency establishing the standard.

STATE HEALTH PLAN (SHP) - A plan composed of the health systems plans of the Health Systems Agencies (HSA) in the state. Since Guam has no HSAs the preliminary SHP alone is considered at a state level and which the GHCC finalizes and adopts as the SHP of Guam (See Guam Health Plan).

SUBSTANCE ABUSE - The indiscriminant consumption of alcohol and drugs.

SURGICAL SERVICES - The diagnosis and treatment of physical diseases and conditions or their sysmptoms by means of operative techniques, in conjunction with the administration of anesthesia, when appropriate.

TERTIARY CARE - Services provided by highly specialized providers (e.g.,) neurologists, neurosurgeons, thoracic surgeons, intensive care units). Such services frequently require highly sophisticated technological and support facilities.

THERAPEUTIC RADIOLOGY SERVICES - The treatment of physical diseases or other ill-health conditions through the use of radiant energy.

THERAPY SERVICES - The therapeutic techniques used in implementing a program of habilitation or rehabilitation designed to meet the needs of an ill or disabled individual.

THIRD-PARTY PAYER - Any organization, public or private, that pays or insures health or medical expenses on behalf of beneficiaries or recipients (e.g., commercial insurance companies, Medicare and Medicaid).

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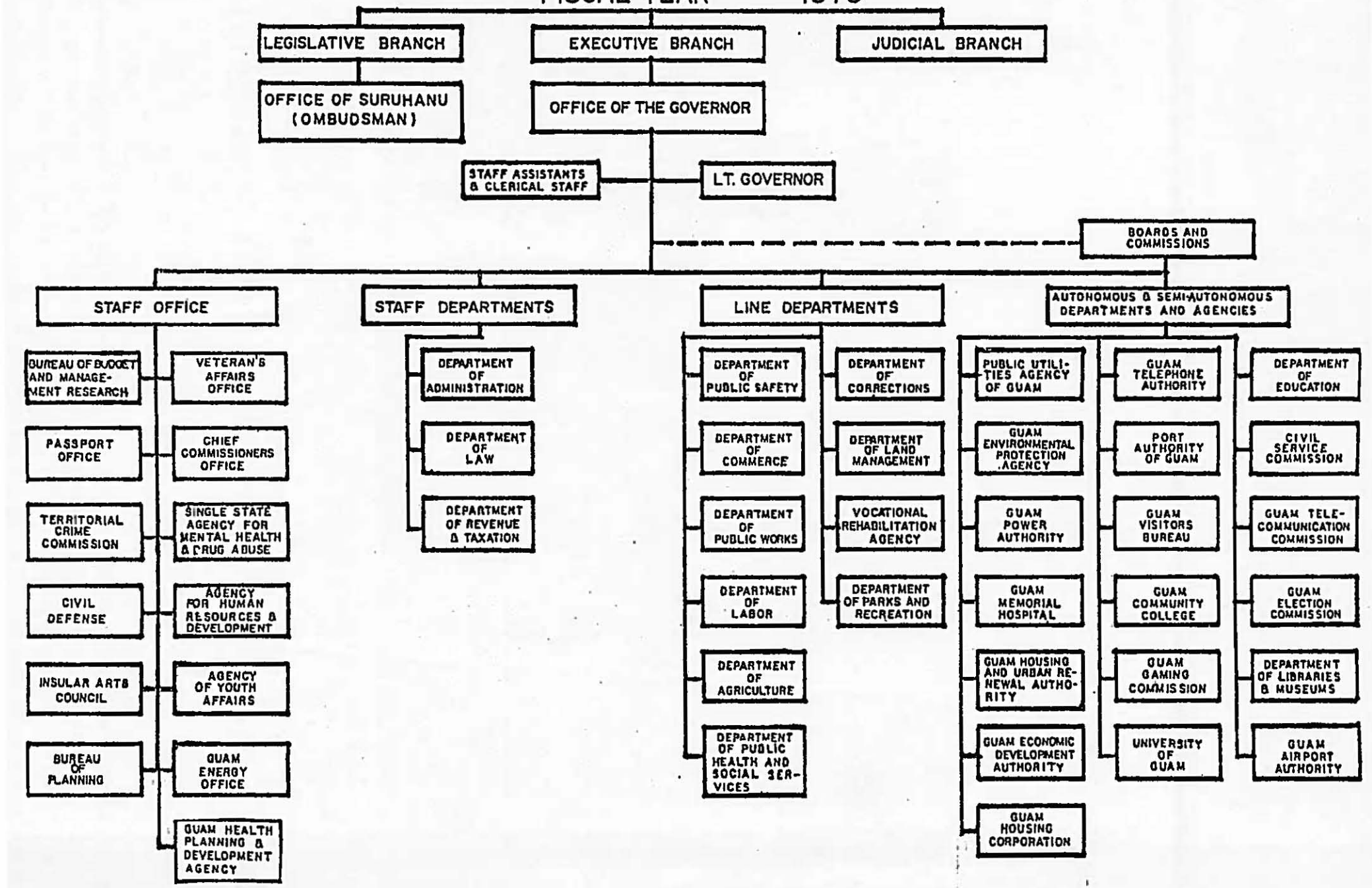
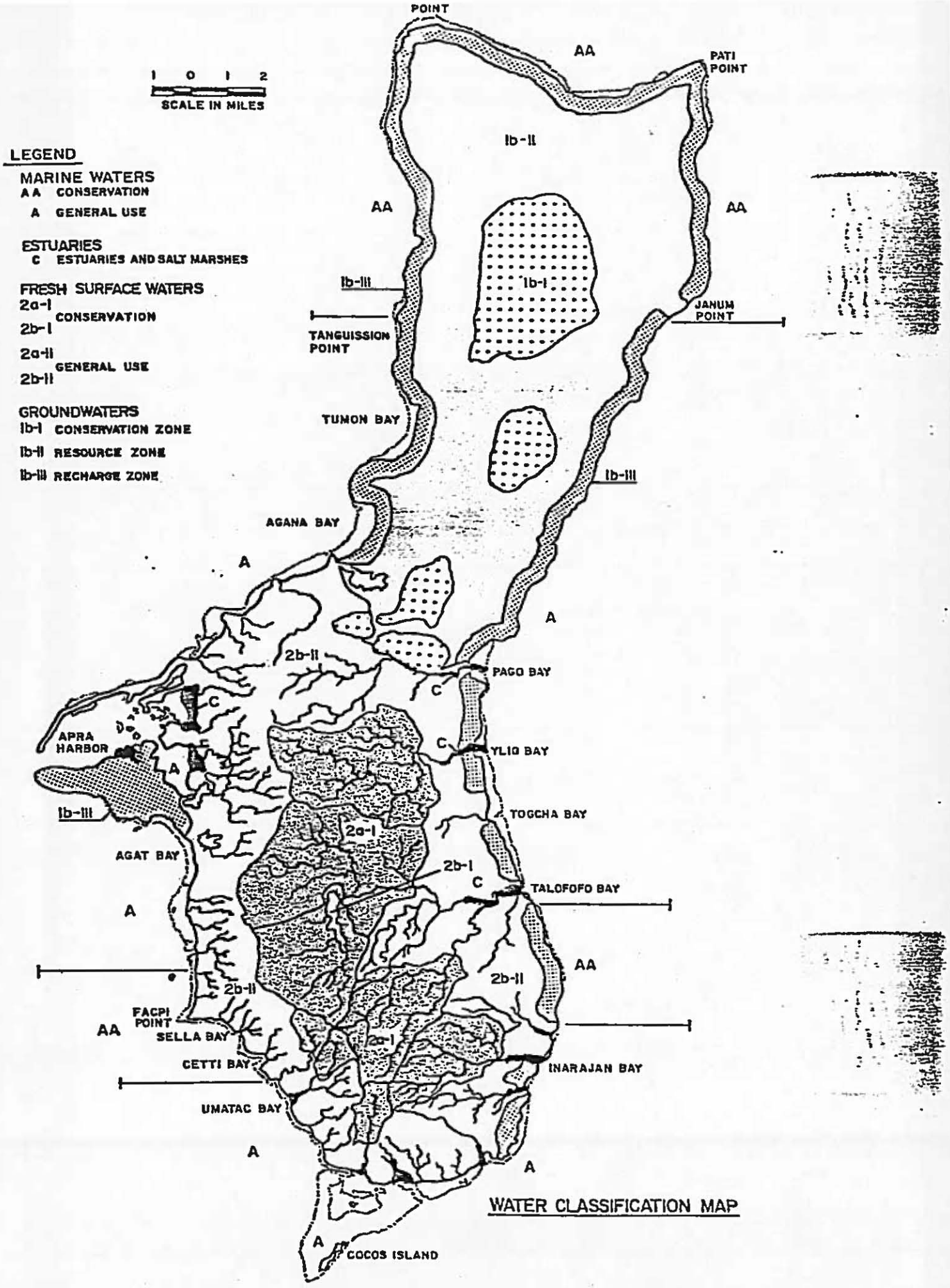
IX. APPENDIX

A. PLANNING AREA PROFILE

GOVERNMENT OF GUAM
ORGANIZATIONAL CHART
FISCAL YEAR 1979




POINT
AA
PATI POINT
1 0 1 2
SCALE IN MILES
LEGEND
MARINE WATERS
AA CONSERVATION
A GENERAL USE
ESTUARIES
C ESTUARIES AND SALT MARSHES
FRESH SURFACE WATERS
2a-I
2b-I
CONSERVATION
2a-II
2b-II
GENERAL USE
GROUNDWATERS
Ib-I CONSERVATION ZONE
Ib-II RESOURCE ZONE
Ib-III RECHARGE ZONE
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AA
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Ib-III
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JANUM POINT
TANGUISSION POINT
TUMON BAY
Ib-III
AGANA BAY
A
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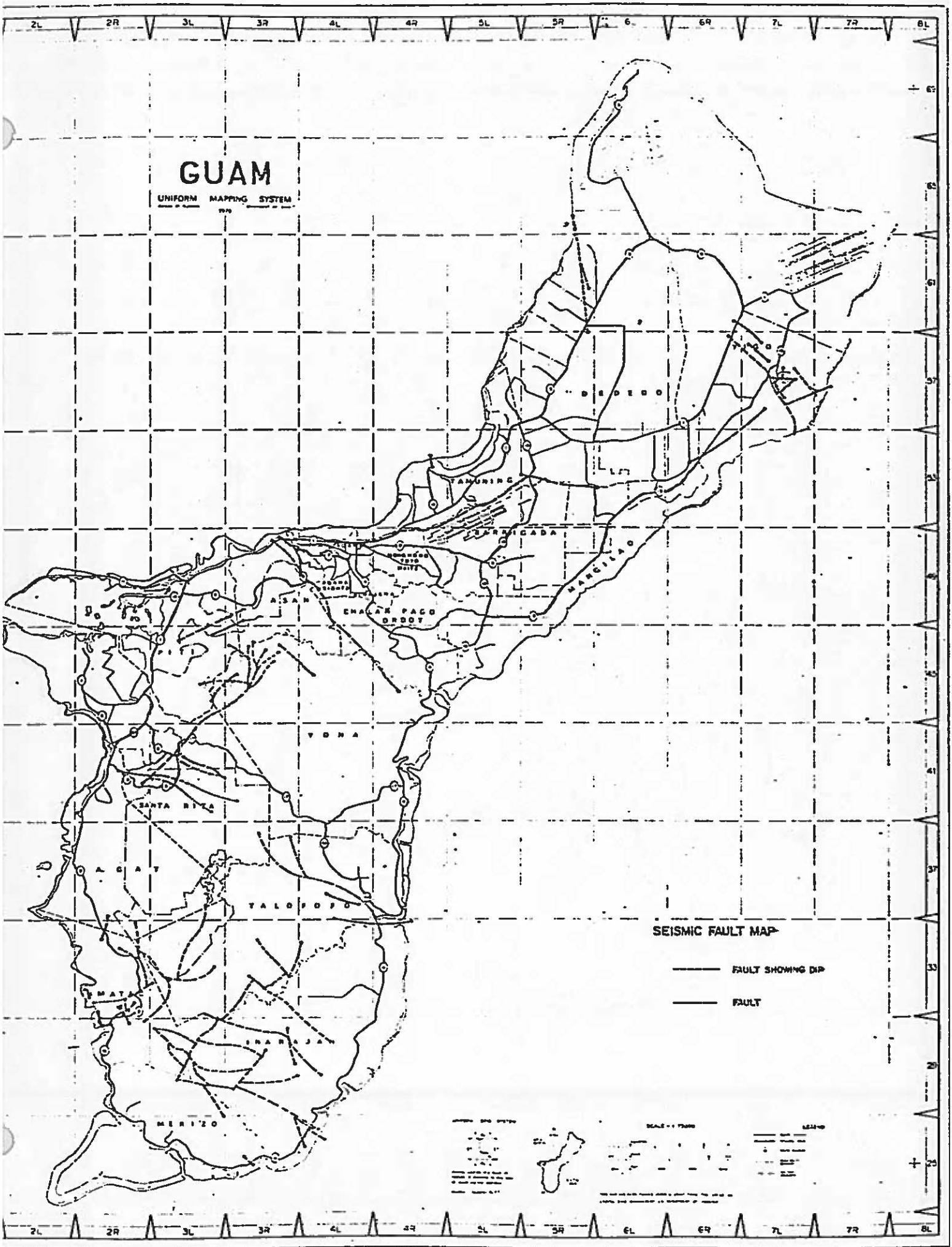
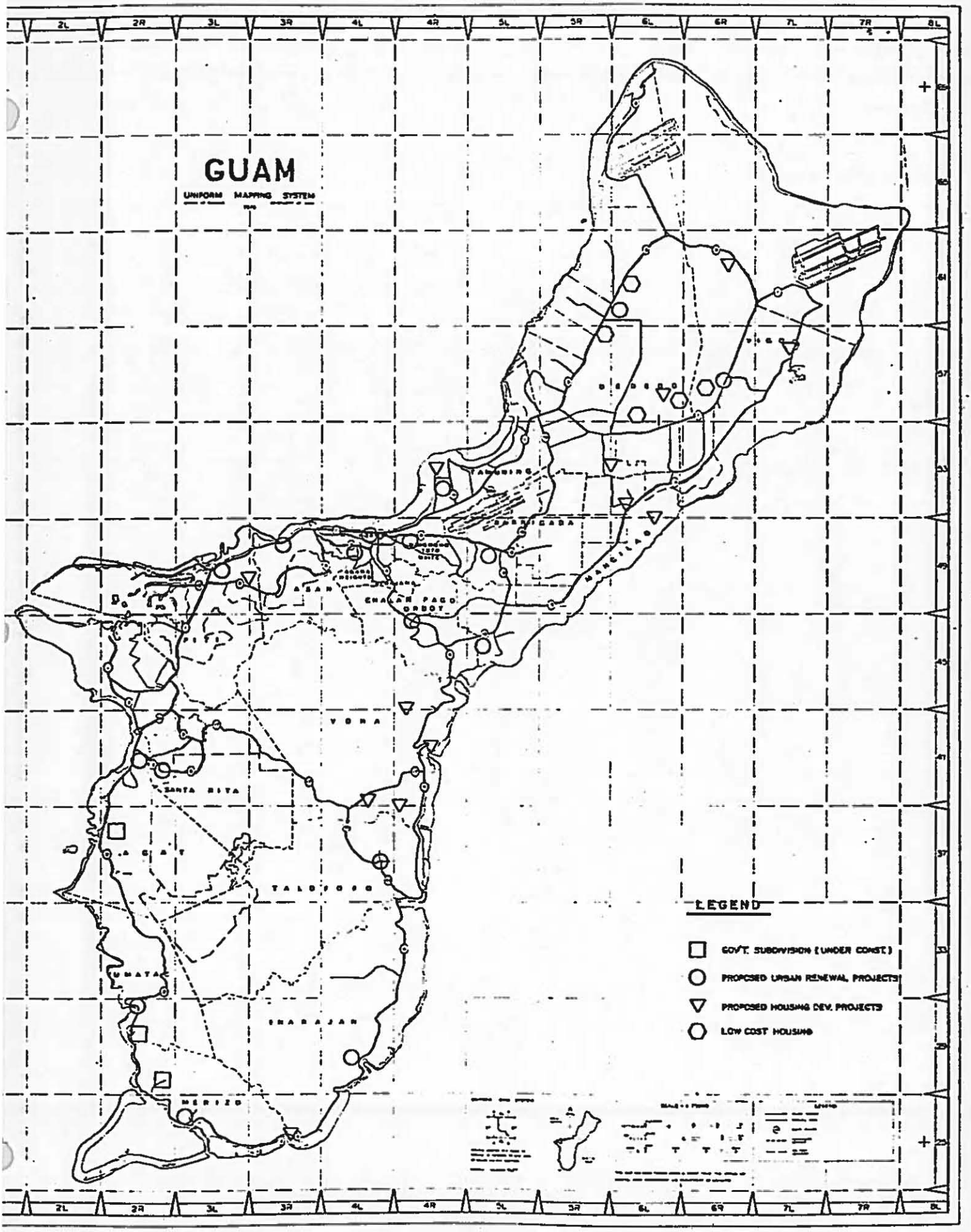
2b-II
PAGO BAY
C
C
APRA HARBOR
C
YLIG BAY
A
Ib-III
TOGCHA BAY
2a-I
AGAT BAY
2b-I
C
TALOFOFO BAY
A
AA
2b-II
2b-II
FACPI POINT
AA
SELLA BAY
2a-I
CETTI BAY
INARAJAN BAY
UMATAC BAY
A
A
A
COCOS ISLAND
WATER CLASSIFICATION MAP


GUAM
UNIFORM MAPPING SYSTEM
SEISMIC FAULT MAP
FAULT SHOWING DIP
FAULT
DEDEDO
TAMUNING
BARRIGADA
MANGILAO
ASAN
PITI
AGAT
SANTA RITA
TALOFOFO
YONA
INARAJAN
MERIZO


GUAM
UNIFORM MAPPING SYSTEM
TAMUNING
TUMON
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SINAJANA
AGAT
SANTA RITA
YONA
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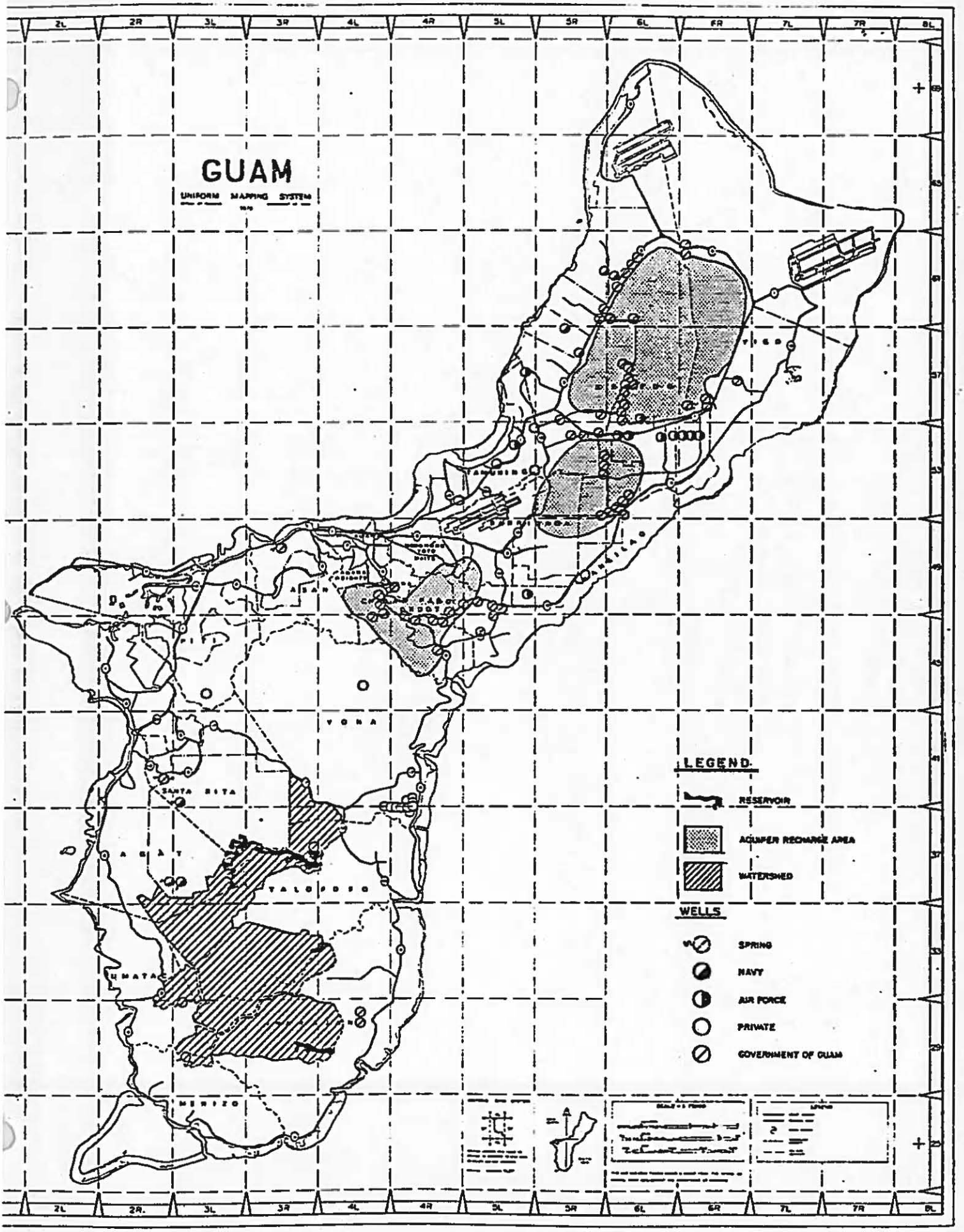
MERIZO
LEGEND
GOV'T. SUBDIVISION (UNDER CONST.)
PROPOSED URBAN RENEWAL PROJECTS
PROPOSED HOUSING DEV. PROJECTS
LOW COST HOUSING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UNIFORM MAPPING SYSTEM
ASAN
AGAT
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MERIZO
YONA
TALOFOFO
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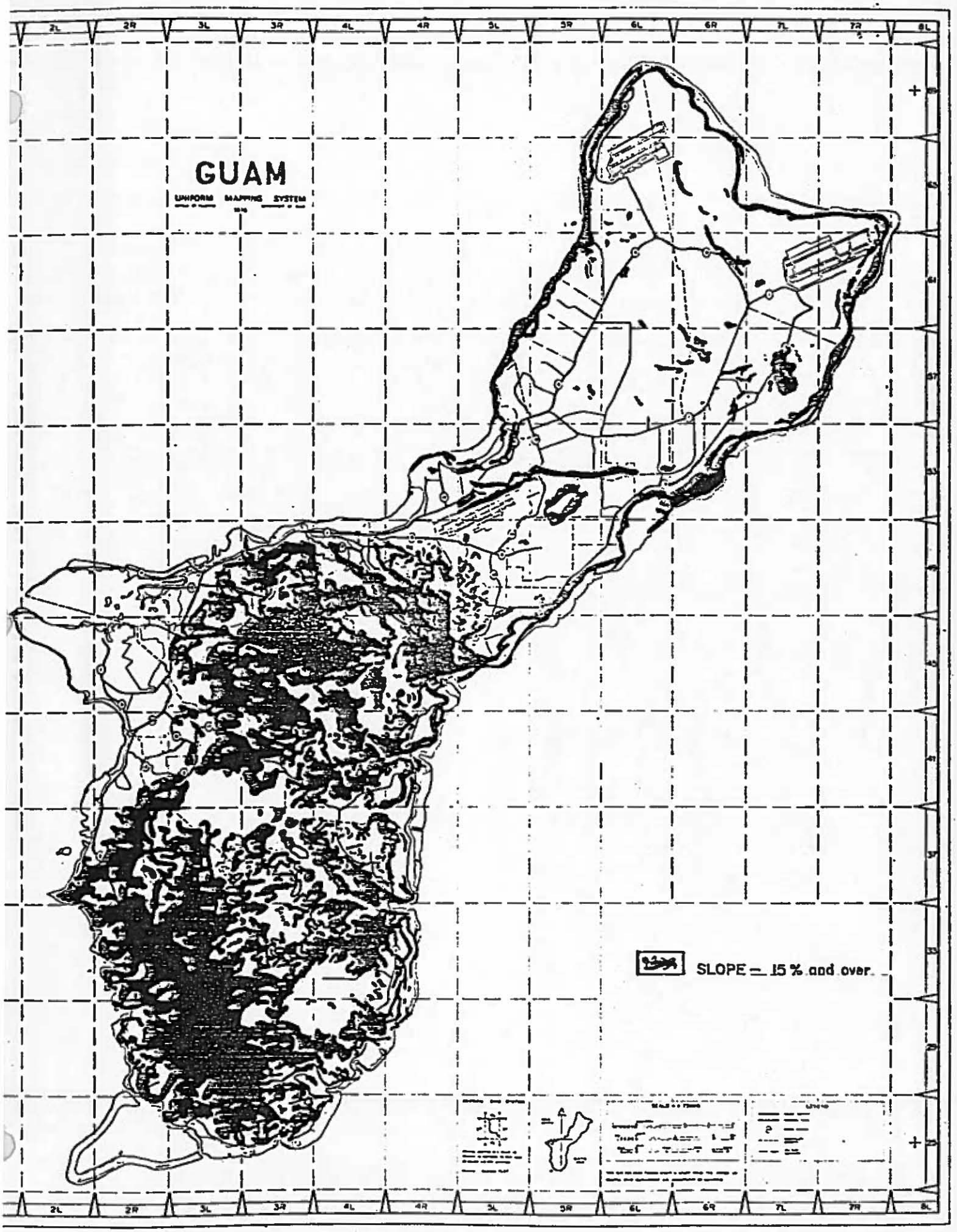
RESERVOIR
AQUIFER RECHARGE AREA
WATERSHED
WELLS
SPRING
NAVY
AIR FORCE
PRIVATE
GOVERNMENT OF GUAM


GUAM
UNIFORM MAPPING SYSTEM
SLOPE = 15 % and over

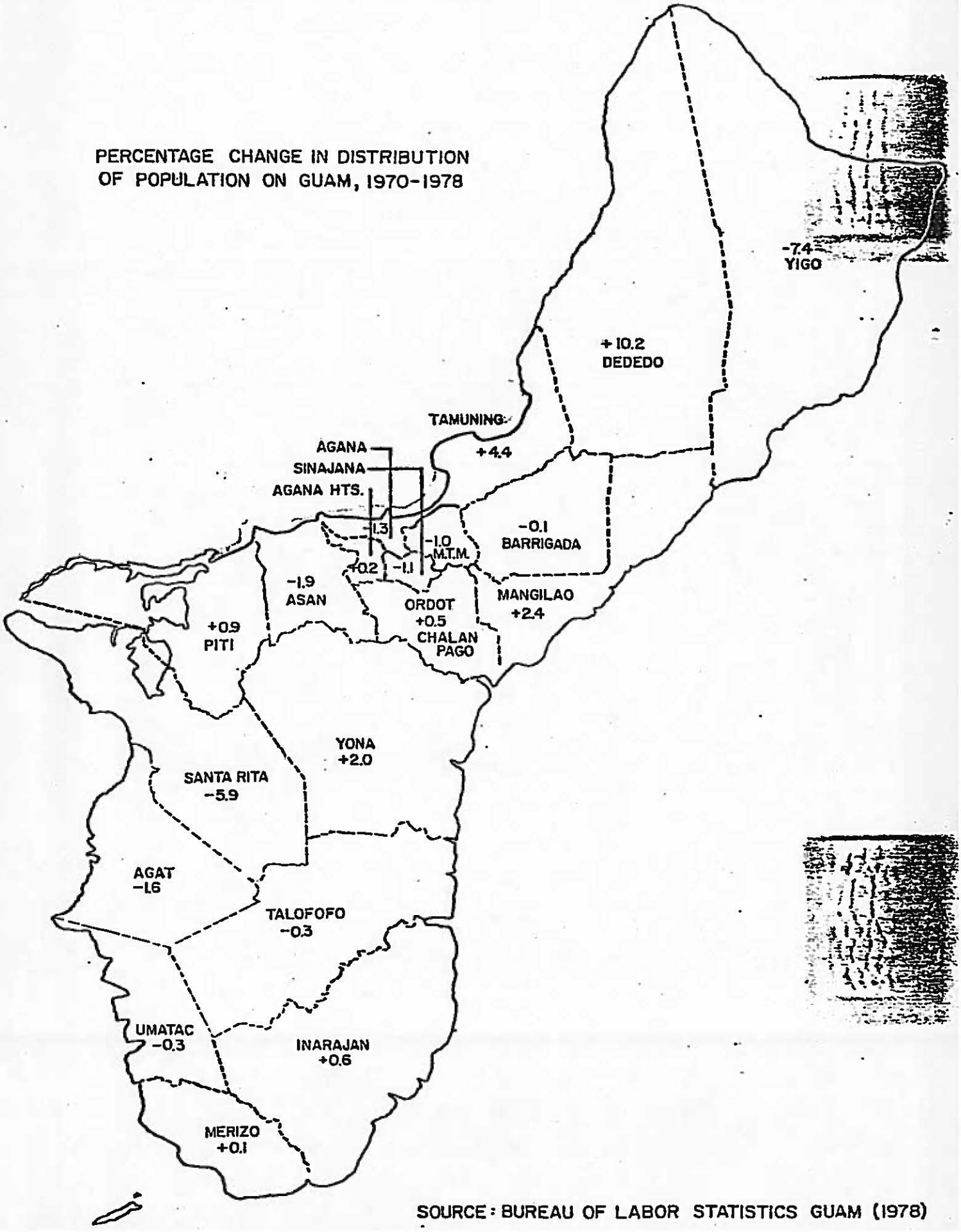
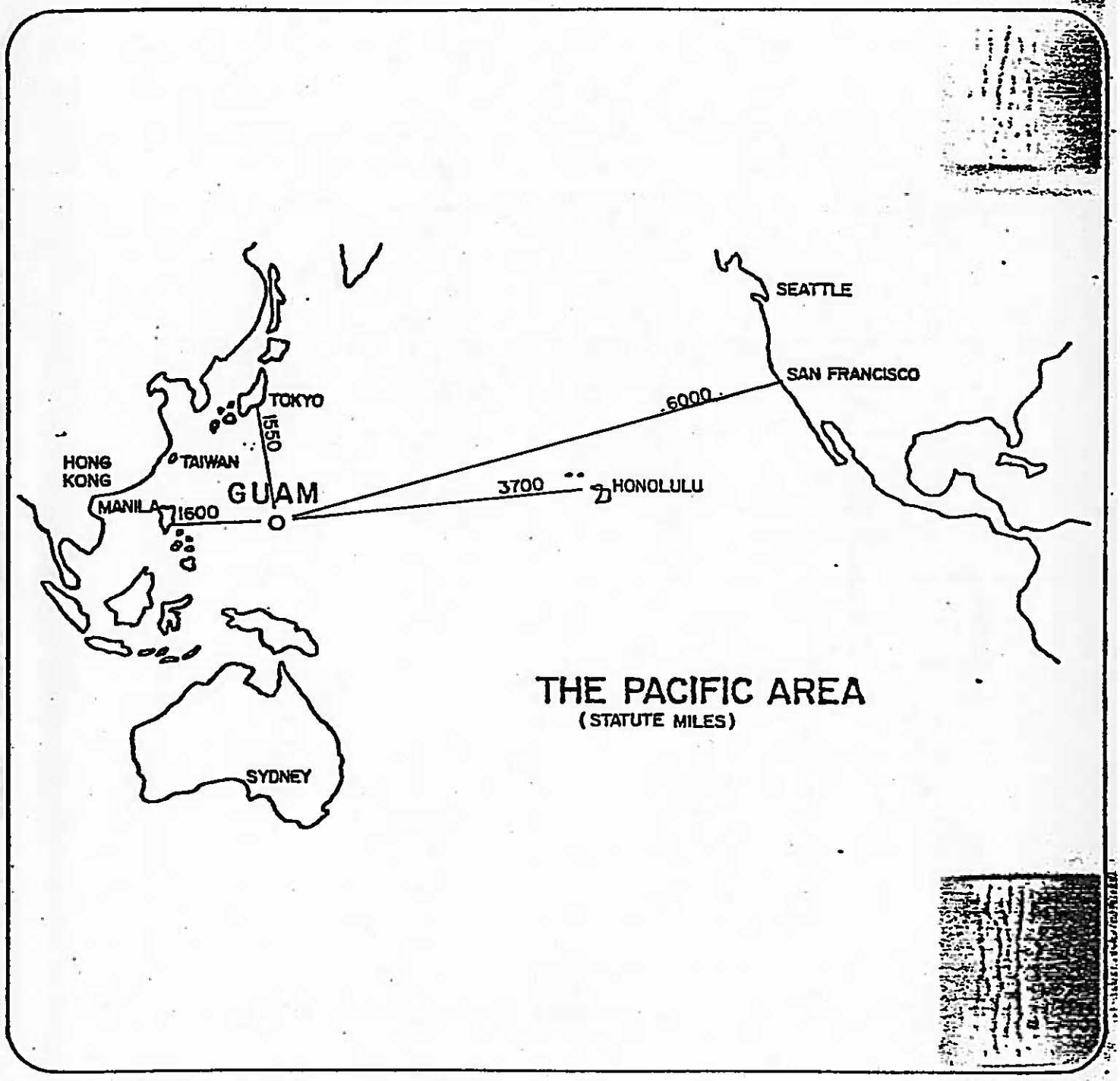

PERCENTAGE CHANGE IN DISTRIBUTION
OF POPULATION ON GUAM, 1970-1978
-7.4
YIGO
+10.2
DEDEDO
TAMUNING
+4.4
AGANA
SINAJANA
AGANA HTS.
-1.3
-1.0
M.T.M.
+0.2
-1.1
-0.1
BARRIGADA
-1.9
ASAN
ORDOT
+0.5
CHALAN
PAGO
MANGILAO
+2.4
+0.9
PITI
YONA
+2.0
SANTA RITA
-5.9
AGAT
-1.6
TALOFOFO
-0.3
UMATAC
-0.3
INARAJAN
+0.6
MERIZO
+0.1
SOURCE: BUREAU OF LABOR STATISTICS GUAM (1978)

FIGURE III.1

LOCATION OF GUAM IN
THE PACIFIC AREA



SOURCE: BUREAU OF PLANNING

TABLE III.1

TYPHOONS SIGNIFICANTLY AFFECTING GUAM (1800-1976)*

APRIL	1807	NOVEMBER	1900
MAY	1847	OCTOBER	1911
AUGUST	1848	NOVEMBER	1913
SEPTEMBER	1855	JULY	1918
APRIL	1859	MARCH	1923
NOVEMBER	1860	NOVEMBER	1940
NOVEMBER	1861	AUGUST	1941
FEBRUARY	1864	SEPTEMBER	1946
JUNE	1868	NOVEMBER	1949
NOVEMBER	1870	NOVEMBER	1957
AUGUST	1872	NOVEMBER	1962
DECEMBER	1876	APRIL	1963
OCTOBER	1891	MAY	1976
MAY	1900		

* LIMITED TO CASES IN WHICH THE 'EYE' OR CENTER OF THE TYPHOON PASSED DIRECTLY OVER OR JUST SOUTH OF GUAM (+60 NM) AND WITH WIND SPEEDS OF OVER 64 KNOTS (74 + MPH).

SOURCE: COMPREHENSIVE DEVELOPMENT PLAN: GUAM
BUREAU OF PLANNING 1978

EARTHQUAKES IN THE MARIANAS/GUAM REGION, 1902-1975
(6.0 AND ABOVE IN MAGNITUDE)

YEAR	MONTH	MAGNITUDE
1902	SEPTEMBER	8.10
1905	JULY	7.25
1909	DECEMBER	7.40
1912	OCTOBER	7.00
1914	NOVEMBER	8.10
1919	JUNE	6.00
1921	FEBRUARY	6.25
1924	JANUARY	6.25
1925	JULY	6.25
1925	JULY	6.00
1927	JULY	6.00
1928	FEBRUARY	6.00
1928	DECEMBER	6.00
1929	JANUARY	6.25
1929	MARCH	6.75
1929	MAY	6.25
1929	NOVEMBER	7.20
1929	DECEMBER	6.25
1930	JANUARY	6.25
1930	OCTOBER	7.10
1931	JANUARY	7.20
1931	SEPTEMBER	7.10
1931	OCTOBER	6.50
1931	NOVEMBER	6.25
1932	JANUARY	6.00
1932	FEBRUARY	6.00
1932	MARCH	6.23
1932	MARCH	6.75
1932	JUNE	6.00
1932	NOVEMBER	6.00
1932	NOVEMBER	6.50
1933	MAY	6.25
1933	JULY	6.00
1933	NOVEMBER	6.00
1934	FEBRUARY	6.50
1934	OCTOBER	6.50
1934	DECEMBER	6.00
1935	JULY	6.00
1935	SEPTEMBER	7.00
1935	OCTOBER	7.10
1935	DECEMBER	6.50
1936	MARCH	6.00
1936	APRIL	6.75
1936	OCTOBER	6.75
1936	NOVEMBER	6.25
1937	MAY	6.25
1937	AUGUST	6.50
1937	SEPTEMBER	6.25
1939	NOVEMBER	6.25
1940	JANUARY	7.30
1940	AUGUST	6.00
1940	DECEMBER	7.30
1941	JULY	6.25
1941	AUGUST	6.75
1942	JUNE	7.00
1942	JUNE	7.10
1943	MARCH	6.75
1943	APRIL	7.00
1944	AUGUST	6.90
1944	DECEMBER	6.75
1945	JULY	7.10
1947	JUNE	7.20
1947	JUNE	7.00
1948	DECEMBER	6.75
1949	JULY	7.10
1949	JULY	6.75
1950	MAY	7.00
1950	JULY	6.80
1950	AUGUST	6.63
1950	AUGUST	6.50
1953	FEBRUARY	6.75
1953	JULY	7.00
1954	NOVEMBER	6.63
1956	FEBRUARY	7.00
1956	DECEMBER	6.50
1957	MAY	7.00
1957	JUNE	6.75
1957	JUNE	6.00
1959	JANUARY	6.75
1959	MARCH	6.00
1959	APRIL	6.50
1959	DECEMBER	6.13
1960	SEPTEMBER	6.38
1961	APRIL	6.50
1961	JULY	6.50
1961	AUGUST	6.38
1962	MARCH	7.00
1962	MAY	6.50
1964	JULY	6.00
1965	JANUARY	6.10
1966	FEBRUARY	6.20
1966	MAY	6.00
1966	JUNE	6.03
1970	MARCH	6.20
1970	SEPTEMBER	6.30
1970	SEPTEMBER	6.00
1971	OCTOBER	6.00
1971	OCTOBER	6.00
1974	MAY	6.40
1975	NOVEMBER	6.10

SOURCE: COMPREHENSIVE DEVELOPMENT PLAN: GUAM
BUREAU OF PLANNING 1978

TABLE III.3

POPULATION
1970 — 1985

YEAR	POPULATION *	CHANGE - %
1970	64,510	
1971	66,838	3.6
1972	69,166	3.5
1973	71,494	3.4
1974	73,822	3.2
1975	76,089	3.1
1976	78,868	3.6
1977	81,647	3.5
1978	84,426	3.4
1979	87,205	3.3
1980	89,938	3.1
1981	93,102	3.5
1982	96,266	3.4
1983	99,430	3.3
1984	102,594	3.2
1985	105,706	3.0

AVERAGE ANNUAL GROWTH RATE 1970 — 1975 = 3.4 %

* CIVILIAN POPULATION ONLY

SOURCE: QUINTON — BUDLONG SERIES "A" POPULATION ESTIMATES

TABLE III. 4

AGE-SEX CHARACTERISTICS
CIVILIAN POPULATION ESTIMATES *
(AS OF SEPTEMBER 1975)

AGE GROUP	MALE NUMBER	PERCENT	FEMALE NUMBER	PERCENT	TOTAL
UNDER 5	4,800	46.6	5,500	53.4	10,300
5-9	5,600	52.8	5,000	47.2	10,600
10-14	6,400	53.8	5,500	46.2	11,900
15-19	4,700	52.8	4,200	47.2	8,900
20-24	3,200	47.1	3,600	52.9	6,800
25-29	3,000	50.0	3,000	50.0	6,000
30-34	1,700	43.6	2,200	56.4	3,900
35-39	1,900	47.5	2,100	52.5	4,000
40-44	1,900	46.3	2,200	53.7	4,100
45-49	2,200	53.7	1,900	46.3	4,100
50-54	1,600	53.3	1,400	46.7	3,000
55-59	1,100	50.0	1,100	50.0	2,000
60-64	900	56.2	700	43.8	1,600
65 & OVER	900	38.0	1,500	62.0	2,400
TOTAL	39,900	50	39,900	50	79,800
UNDER 15	16,800		16,000		32,800
% TOTAL	42.1		40.1		41.1
65 & OVER	900		1,500		2,400
% TOTAL	2.2		3.7		3
MEDIAN AGE	18.1		19.6		18.9

* EXCLUDING NON-IMMIGRANT ALIENS AND MILITARY DEPENDENTS STAYING ON MILITARY BASES.

SOURCE: BUREAU OF LABOR STATISTICS, GOVGUAM DEPT. OF LABOR

TABLE IV. 2

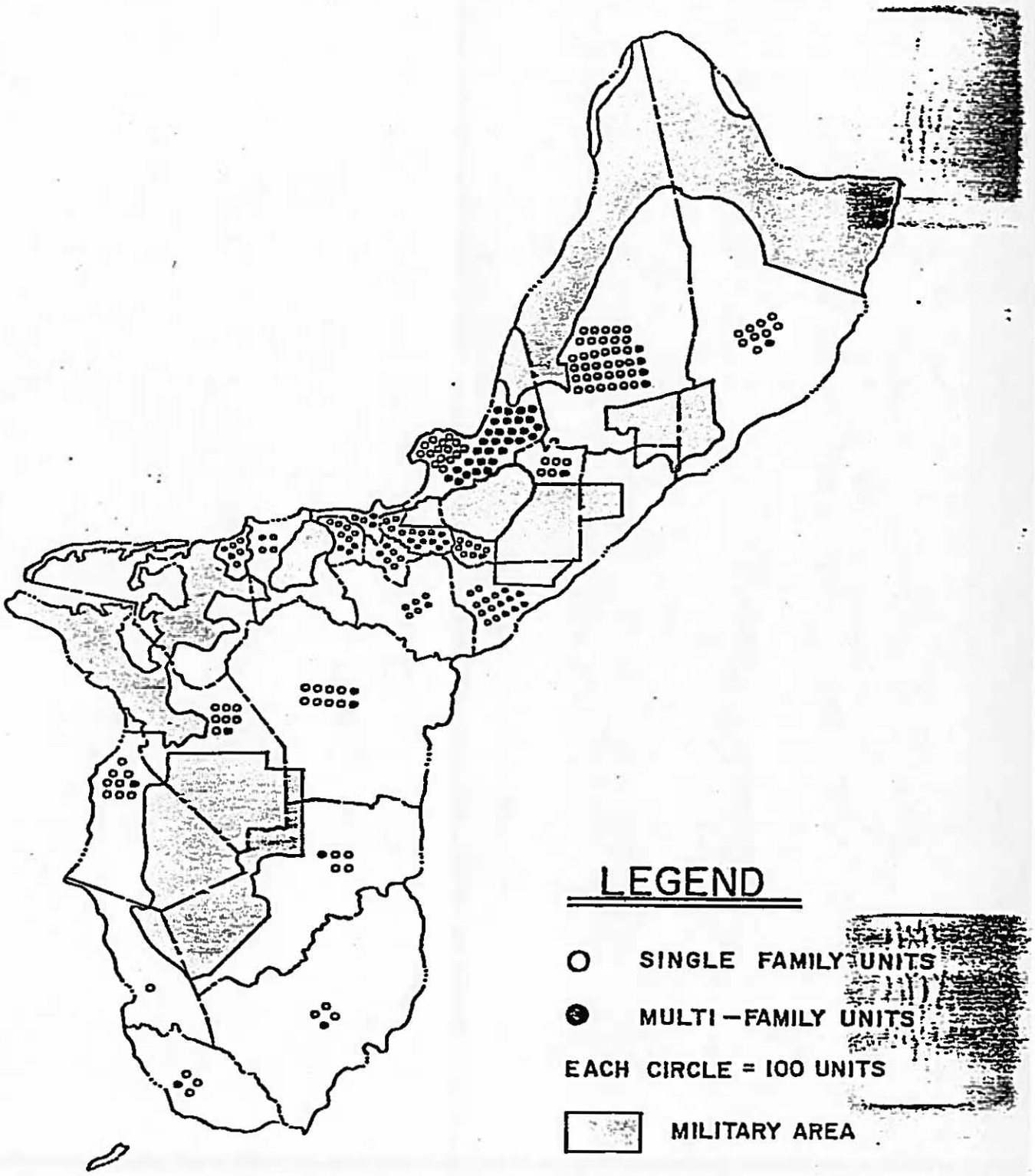
MORTALITY RATES: GUAM-U.S. 1970-77

GUAM				U.S.			
YEARS	CRUDE DEATH RATES	MALE	FEMALE	YEARS	TOTAL	MALE	FEMALE
1970	5.5	6.9	3.9	1970	9.5	10.9	8.1
1971	5.4	6.8	3.9	1971	9.3	10.7	8.0
1972	5.9	6.6	5.2	1972	9.4	10.8	8.1
1973	6.1	7.0	5.0	1973	9.4	10.7	8.1
1974	6.1	6.8	5.2	1974	9.2	10.4	8.0
1975	5.8	7.2	4.2	1975	8.9	10.1	7.7
1976	5.3	6.7	3.8				
77	4.7	5.6	3.6				
AVERAGES	5.6	6.6	4.3	AVERAGES	9.3	10.6	8.0

SOURCE: STATISTICAL REPORTS 1970-77, OFFICE OF VITAL STATISTICS; DPHSS

SOURCE: STATISTICAL ABSTRACT OF THE U.S., 1977; U.S. DEPT. OF COMMERCE

DISTRIBUTION OF HOUSING UNITS ON GUAM
(PRIVATE LAND AREAS)



SOURCE: RESIDENTIAL DEVELOPMENT POLICY REPORT
BUREAU OF PLANNING, 1976.

TABLE III.6

PROJECTED POPULATION BY AGE GROUP AND PERCENTAGE DISRIBIUTION ON GUAM, 1975-1990

AGE GROUP	TOTAL CIVILIAN POPULATION				PERCENTAGE OF POPULATION			
	1975	1980	1985	1990	1975	1980	1985	1990
0-4	10,277	17,358	19,787	22,113	12.90	19.30	18.70	18.00
5-9	10,617	14,110	16,751	19,094	13.30	15.70	15.80	15.50
10-14	11,894	8,554	14,067	16,700	14.90	9.50	13.30	13.60
15-19	8,940	8,836	8,435	13,870	11.20	9.80	8.00	11.30
20-24	6,785	7,559	8,712	8,316	8.50	8.40	8.20	6.80
25 29	5,987	5,883	7,454	8,590	7.50	6.50	7.10	7.00
30 34	3,911	7,345	5,730	7,260	4.90	8.20	5.40	5.90
35 39	3,991	4,455	7,154	5,581	5.00	5.00	6.80	4.50
40-44	4,071	4,285	4,340	6,968	5.10	4.80	4.10	5.70
45-49	4,071	3,554	3,925	3,976	5.10	4.00	3.70	3.20
50-54	3,033	2,905	3,256	3,595	3.80	3.20	3.10	2.90
55-59	2,235	2,096	2,661	2,982	2.80	2.30	2.50	2.40
60-64	1,596	1,085	1,459	1,852	2.00	1.20	1.40	1.50
65-+	2,396	1,913	1,975	2,260	3.00	2.1	1.90	1.80
TOTAL	79,824	89,938	105,706	123,157	100.00	100.00	100.00	100.00

SOURCE: 1975, BUREAU OF LABOR STATISTICS, GOVERNMENT OF GUAM.
1980-99, QUINTON-BUDLONG.

TABLE III.7

PROJECTED POPULATION BY SEX AND AGE GROUP 15-44 ON GUAM, 1975-90

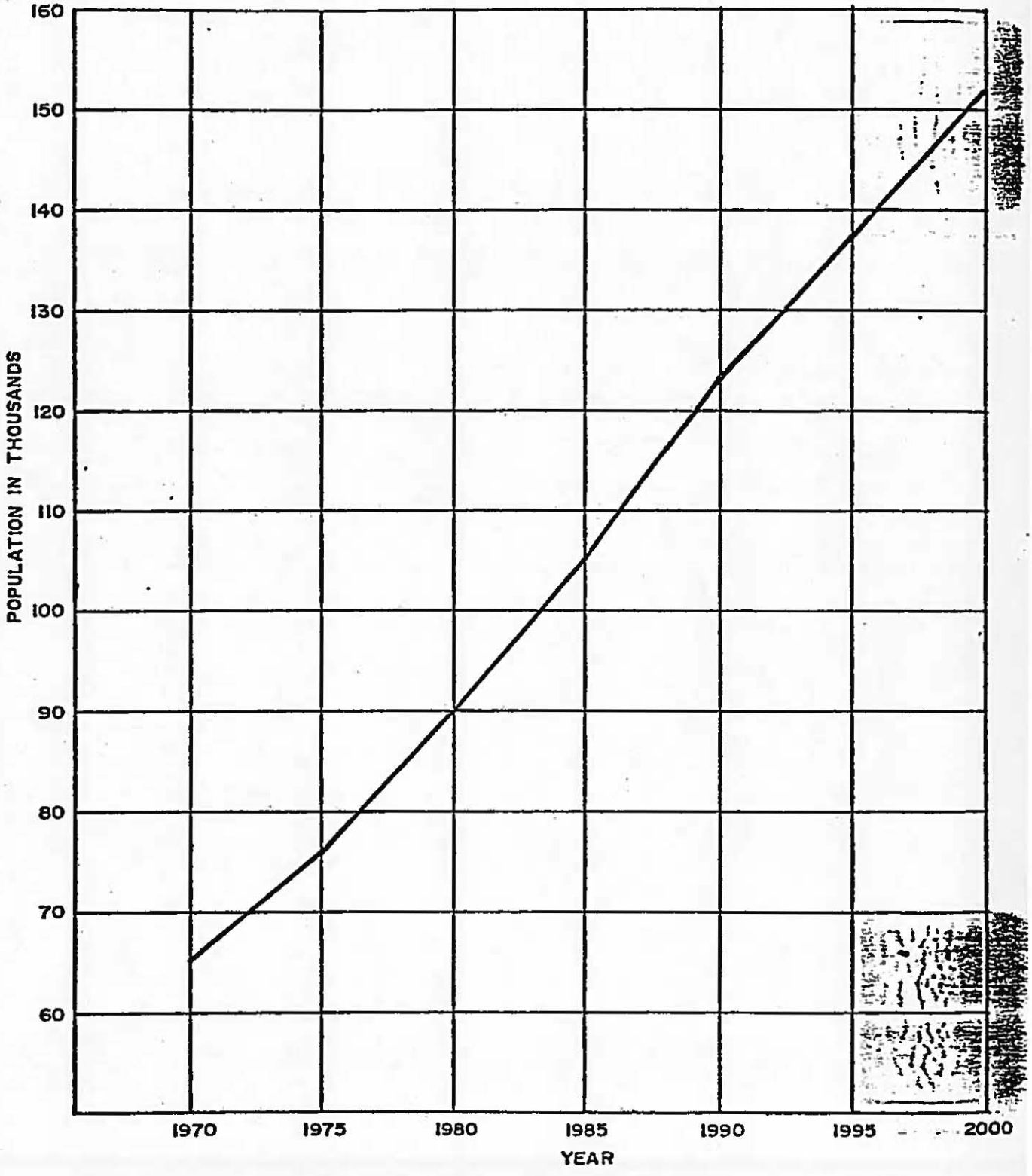
AGE GROUP	1975			1980			1985			1990		
	MALE	FEMALE	SEX RATIO	MALE	FEMALE	SEX RATIO	MALE	FEMALE	SEX RATIO	MALE	FEMALE	SEX RATIO
15—19	4,381	4,559	49:51	4,548	4,288	51:49	4,323	4,112	51:49	7,101	6,769	51:49
20—24	3,325	3,460	49:51	3,887	3,672	51:49	4,484	4,228	51:49	4,262	4,054	51:49
25—29	2,934	3,053	49:51	2,985	2,898	50:50	3,833	3,621	51:49	4,421	4,169	51:49
30—34	1,916	1,995	48:51	4,108	3,237	56:44	2,907	2,823	50:50	3,733	3,527	51:49
35—39	1,956	2,035	49:51	2,398	2,057	54:46	4,001	3,153	56:44	2,831	2,750	51:49
40—44	1,995	2,076	49:51	2,376	1,909	55:45	2,336	2,004	54:46	3,897	3,071	56:44
TOTAL	16,507	17,178	49:51	20,302	18,061	53:47	21,884	19,941	52:46	26,245	24,340	52:48

NOTE: SEX RATIO PER 100 IN AGE GROUP.

SOURCE: 1975, BUREAU OF LABOR STATISTICS, GOVERNMENT OF GUAM.
1980-99, QUINTON-BUDLONG.

FIGURE III.7

GUAM ESTIMATED AND PROJECTED POPULATION
1970–2000



NOTE: 1990–2000 EXTENSION OF QUINTON-BUDLONG USING POPULATION PROJECTION METHOD.

SOURCE: QUINTON-BUDLONG POPULATION ESTIMATES, 1970–1990.

TABLE III. 8

EMPLOYEES ON PAYROLLS ON GUAM, BY INDUSTRY 1971 — 1977

INDUSTRY DIVISION	NUMBER (IN THOUSANDS) 71 SEPT.	72 SEPT.	73 SEPT.	74 SEPT.	75 SEPT.	76 SEPT.	77 SEPT.
TOTAL	26.8	30.4	38.0	37.0	33.8	29.5	32.6
TOTAL PRIVATE	14.3	17.0	22.6	21.1	18.4	15.6	18.0
FEDERAL	5.9	6.1	7.4	7.2	6.2	6.4	6.5
TERRITORIAL	6.6	7.3	8.0	8.7	9.2	7.5	8.1

SOURCE: BUREAU OF LABOR STATISTICS, DEPARTMENT OF LABOR, GOVERNMENT OF GUAM

TABLE III. 9

HIGHLIGHTS OF THE EMPLOYMENT AND UNEMPLOYMENT SITUATION ON GUAM - 9/75 to 12/77

	SEPT. 1975	SEPT. 1976	DEC. 1977
CIVILIAN LABOR FORCE	28,090	26,910	28,420
TOTAL EMPLOYMENT	25,390	24,600	26,460
TOTAL UNEMPLOYMENT	2,700	2,320	1,960
UNEMPLOYMENT RATES (% OF LABOR FORCE)	9.6	8.6	6.9
AVERAGE DURATION OF UNEMPLOYMENT (WEEKS)	6.7	7.1	11.5

NOTE: SUM OF INDIVIDUAL ITEMS MAY NOT EQUAL TOTALS DUE TO ROUNDING. DATA ON UNEMPLOYMENT AND LABOR FORCE DOES NOT INCLUDE NON-IMMIGRANT ALIENS.

SOURCE: BUREAU OF LABOR STATISTICS, DEPARTMENT OF LABOR, GOVERNMENT OF GUAM

TABLE III. 12

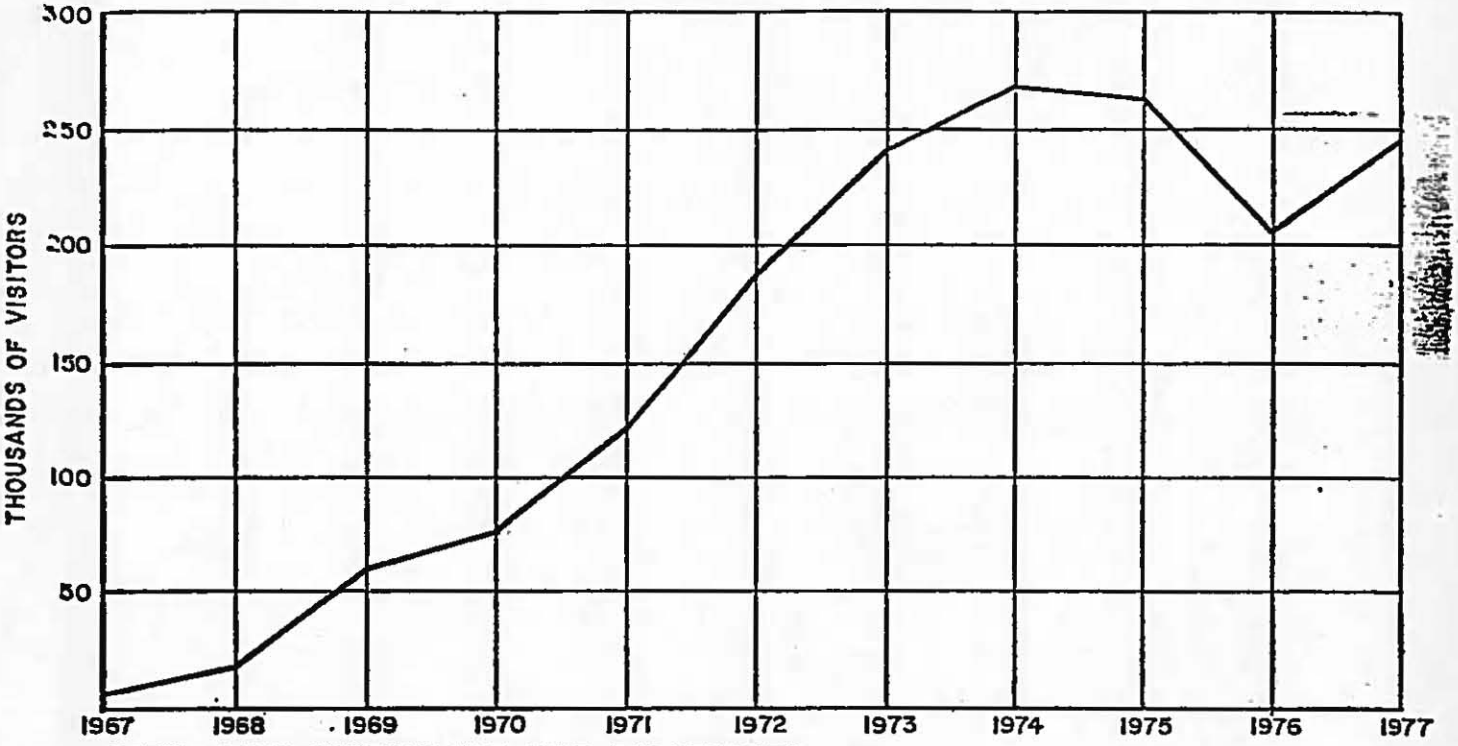
ENROLLMENT PROJECTIONS BY GRADE LEVELS

	SENIOR HIGH SCHOOLS									
	ACTUAL		PROJECTED							
	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85
	2,085	2,220	2,085	2,007	1,924	2,007	1,917	1,890	1,993	1,960
	1,761	1,715	1,776	1,668	1,605	1,539	1,605	1,534	1,512	1,594
	1,285	1,307	1,320	1,367	1,284	1,236	1,185	1,236	1,181	1,164
	5,131	5,242	5,181	5,042	4,813	4,782	4,707	4,660	4,686	4,718

E: STATISTICAL SERVICES UNIT, DIVISION OF CURRICULUM & INSTRUCTION, DEPARTMENT OF EDUCATION, 1976

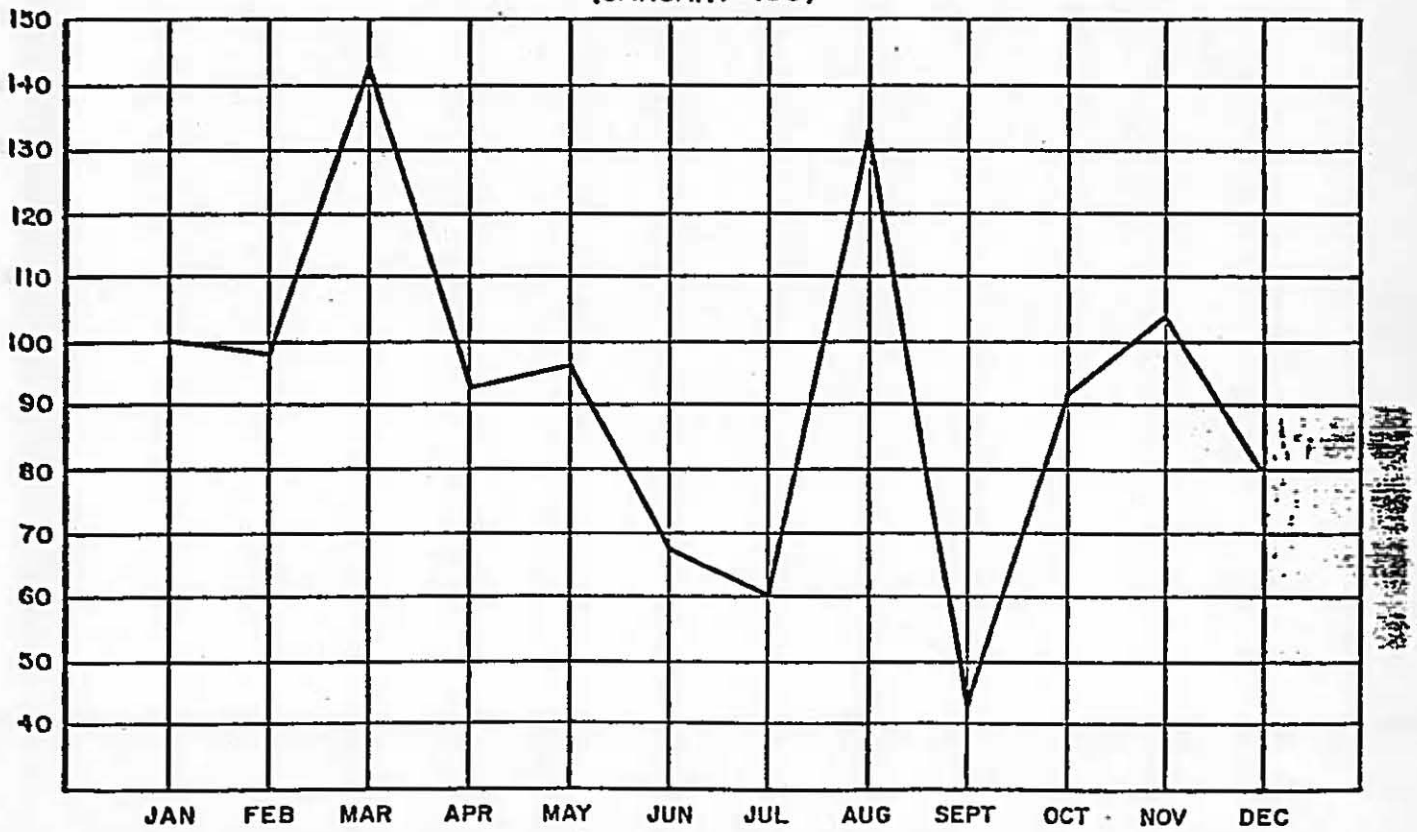
FIGURE III.8

VISITOR ARRIVALS TO GUAM
1967–1977



NOTE: DOES NOT INCLUDE SHIP PASSENGERS.
SOURCE: GUAM VISTORS BUREAU.

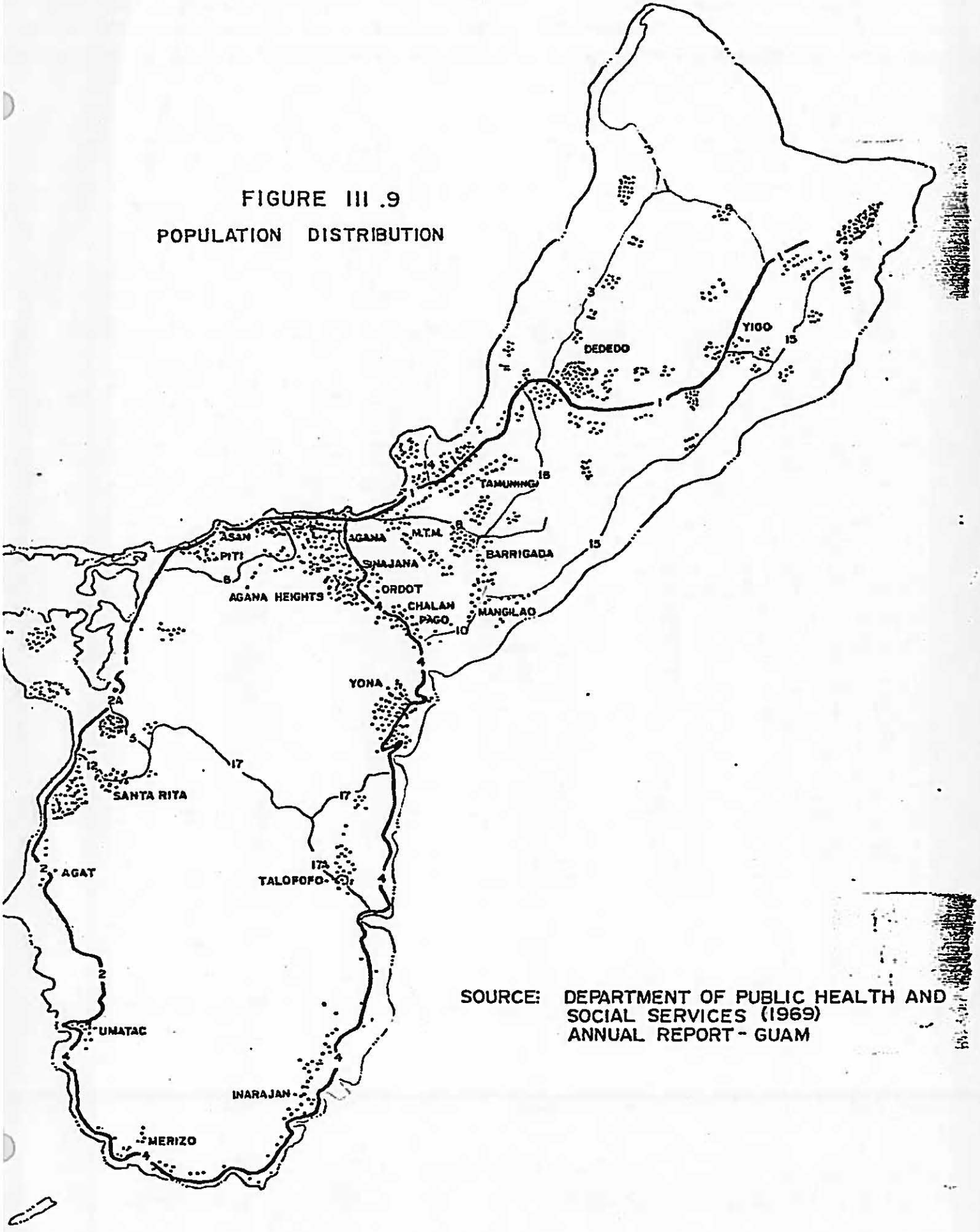
SEASONAL INDEX OF TOURIST ARRIVAL TO GUAM
(JANUARY=100)



SOURCE: GUAM'S VISITOR INDUSTRY, AN ECONOMIC ASSESSMENT
BUREAU OF PLANNING, GOVERNMENT OF GUAM, 1977.

FIGURE III .9

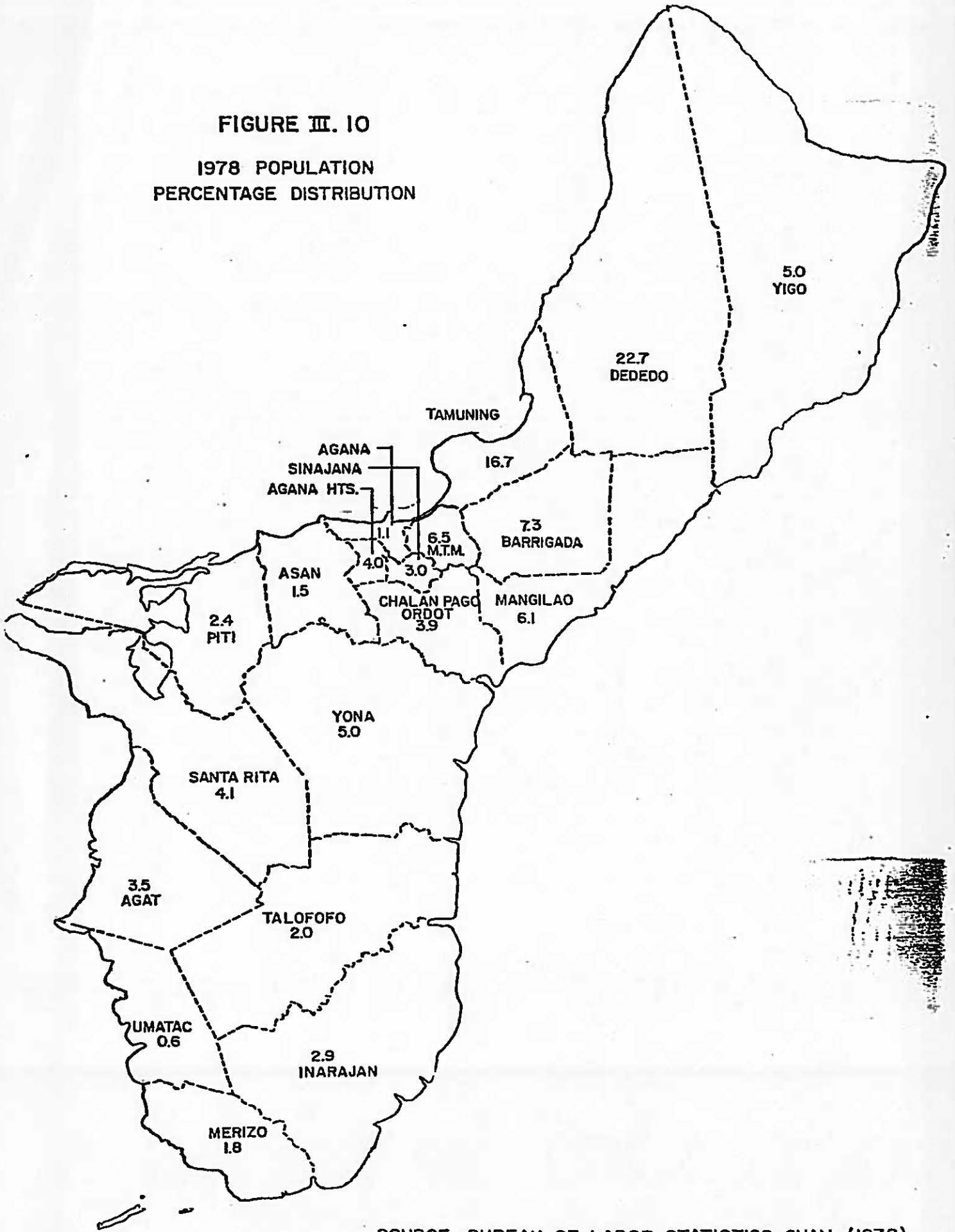
POPULATION DISTRIBUTION



SOURCE: DEPARTMENT OF PUBLIC HEALTH AND SOCIAL SERVICES (1969) ANNUAL REPORT - GUAM

FIGURE III. 10

1978 POPULATION PERCENTAGE DISTRIBUTION



SOURCE: BUREAU OF LABOR STATISTICS GUAM (1978)

TABLE III.10

EMPLOYEES ON PAYROLLS ON GUAM BY INDUSTRY AND CITIZENSHIP STATUS: MARCH 1977

INDUSTRY[1]	NUMBER				PERCENT DISTRIBUTION[2]			
	Total	U.S. Citizen	ALIEN Immigrant	ALIEN non-Immig't	Total	U.S. Citizen	ALIEN Immigrant	ALIEN non-Immig't
ALL INDUSTRIES	30,816	21,851	5,027	3,938	100.0%	70.9%	16.3%	12.8%
PRIVATE SECTOR	16,901	8,926	4,076	3,899	100.0	52.8	24.1	23.1
AGRICULTURE AND FISHERIES	147	38	15	94	100.0	25.9	10.2	63.9
CONSTRUCTION	4,019	563	470	2,986	100.0	14.0	11.7	74.3
MANUFACTURING	977	591	313	73	100.0	60.5	32.0	7.5
TRANSPORTATION & PUBLIC UTILITIES	1,476	1,147	198	131	100.0	77.7	13.4	8.9
TRADE	5,411	3,296	1,893	222	100.0	60.9	35.0	4.1
FINANCE, INSURANCE, REAL ESTATE	1,268	947	273	48	100.0	74.7	21.5	3.8
SERVICES	3,603	2,344	914	345	100.0	65.1	28.6	39.3
PUBLIC SECTOR	13,915	12,925	951	39	100.0	92.9	6.8	0.3
FEDERAL GOVERNMENT	6,318	5,646	656	16	100.0	89.4	10.4	0.3
LOCAL GOVERNMENT	7,597	7,279	295	23	100.0	95.8	3.9	0.3

TANDARD INDUSTRIAL CLASSIFICATION MANUAL. 1967 EDITION.
ECAUSE OF ROUNDING. SUMS OF INDIVIDUAL ITEMS MAY NOT EQUAL TOTALS.
TE: SUMS OF INDIVIDUAL ITEMS MAY NOT ADD TO TOTALS BECAUSE NOT ALL INDUSTRIES ARE SHWON SEPARATELY.
URCE: BUREAU OF LABOR STATISTICS, DEPARTMENT OF LABOR, GOVERNMENT OF GUAM.

TABLE IV.30

GUAM AND U.S. CIRRHOSIS OF THE LIVER MORTALITY RATES BY SEX AND GROUP
1975

	MALE		FEMALE	
	GUAM	U.S.	GUAM	U.S.
ALL AGES	.32	.201	.03	.099
15-24	.14	.004	.000	.004
25-44	.09	.126	.000	.061
45-64	1.84	.519	.30	.272

SOURCE: STATISTICAL REPORTS 1970-1975, OFFICE OF VITAL STATISTICS, DPHSS.
STATISTICAL ABSTRACT OF THE U.S. 1977, U.S. DEPT. OF COMMERCE.

TABLE III. 11

COMPARATIVE LISTING OF WAGES IN GOVGUAM VS PRIVATE SECTOR *

JOB TITLE	PRIVATE SECTOR	GOVGUAM	DIFFERENCE
ACCOUNTANT	$3.96	$4.82	$0.86
AUTO MECHANIC	2.76	4.04	1.28
ADMINISTRATIVE SECRETARY	3.30	5.64	2.34
CLERK	2.30	3.58	1.28
CARPENTER	3.04	3.93	0.89
CARPENTER FOREMAN	3.33	4.68	1.35
CONSTRUCTION WORKER	2.30	3.10	0.80
CONTROLLER	6.00	6.87	0.87
CUSTODIAN	2.30	3.32	1.02
DENTAL ASSISTANT	2.65	3.93	1.28
DIESEL MECHANIC (HELPER)		3.68	
ELECTRICIAN	3.22	4.05	0.83
ELECTRICIAN FOREMAN	3.52	4.82	1.30
ENGINEERING AIDE	3.64	4.15	0.51
FARM WORKER	2.30	3.84	1.54
HEAVY EQUIPMENT OPERATOR	3.24	3.87	0.63
HOUSEKEEPER	2.50	3.17	0.67
MACHINIST	3.36	4.05	0.69
MAINTENANCE MAN	2.50	4.39	1.89
PAINTER	2.94	4.27	1.33
PIPEFITTER	3.20	4.05	0.85
LUMBER	3.20	4.05	0.85
SURVEY AIDE	2.58	3.58	1.00
SECRETARY	2.30	3.66	1.36
WELDER	3.16	4.05	0.89

* WAGES GIVEN IN EARNINGS PER HOUR.

SOURCE: PRIVATE SECTOR: GUAM INVENTORY OF JOB OPENINGS, DECEMBER 1976.
GOVERNMENT OF GUAM: GOVERNMENT OF GUAM CLASS LIST AND PAY RANGE SCHEDULE, JANUARY 21, 1975.

TABLE III. 5

ETHNIC PROFILE OF THE CIVILIAN POPULATION (AS OF SEPTEMBER 1975)

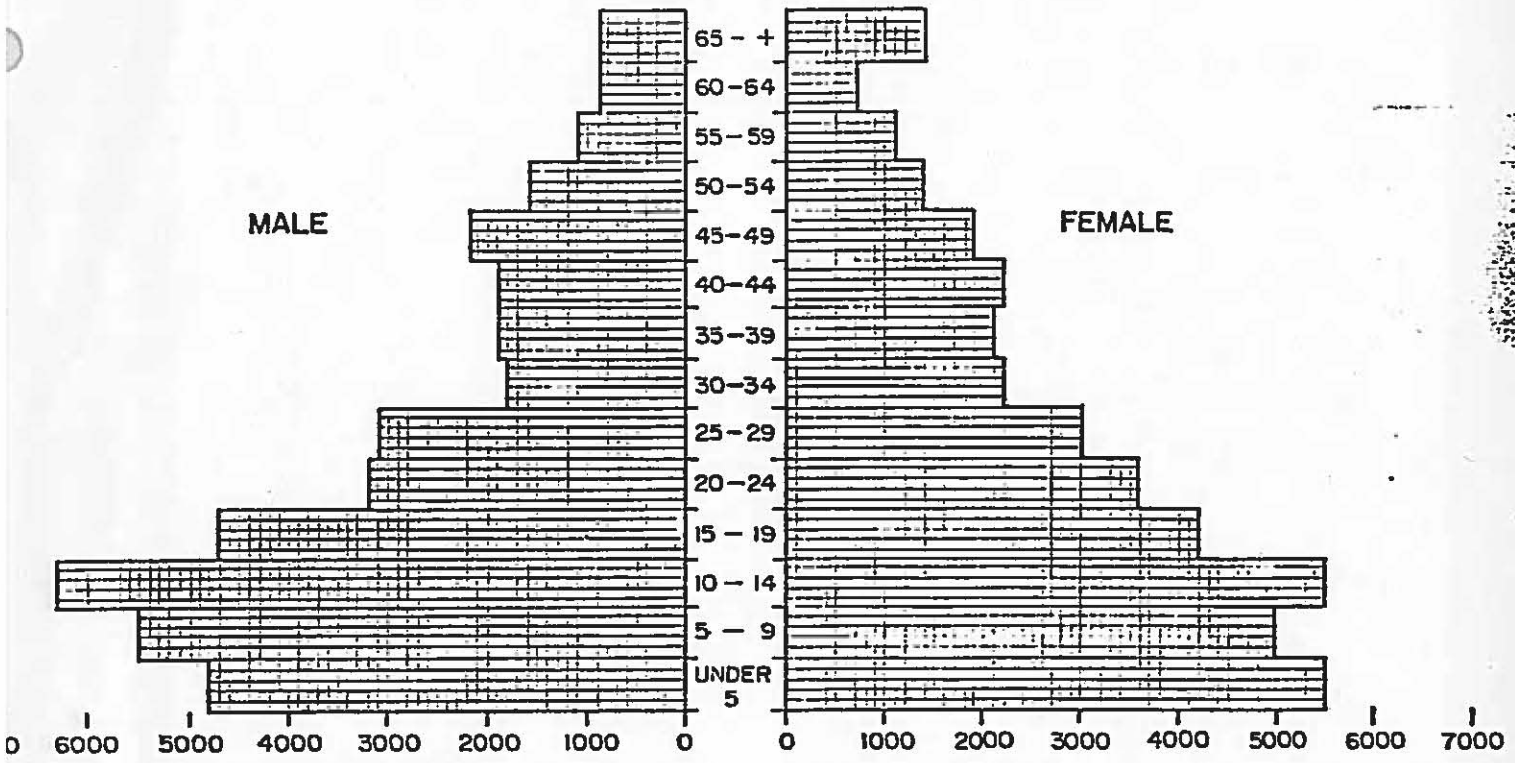
ETHNIC COMPOSITION			AGE DISTRIBUTION OF THREE MAJOR ETHNIC GROUPS			
ETHNICITY	NUMBER	PERCENT OF POPULATION	AGE	ETHNICITY		
				CHAMORRO	FILIPINO	CAUCASIAN
ALL GROUPS	79,800	100.0	ALL AGES	44,300	15,400	7,200
CHAMORRO (GUAM)	44,300	55.	0 - 15	19,700	5,500	2,000
FILIPINO	15,400	19.3	16 - 19	4,300	900	400
CAUCASIAN	7,200	9.0	20 - 24	3,900	1,000	1,000
CHAMORRO-FILIPINO	3,300	4.1	25 - 34	4,700	2,600	1,400
CHAMORRO-CAUCASIAN	2,400	3.01	35 - 44	4,400	1,900	1,100
CHAMORRO-OTHER	1,400	1.8	45 - 54	3,500	2,200	700
OTHER MIXTURE	2,000	1.8	55 +	3,800	1,300	600
MICRONESIAN	1,100	1.4	MEDIAN AGE	18.1	25.8	26.1
JAPANESE	900	1.1				
CHINESE/KOREAN	1,000	1.3				
OTHER	800	1.0				

SOURCE: BUREAU OF LABOR STATISTICS, GOVGUAM 1975

FIGURE III.13

CIVILIAN POPULATION PYRAMID

AGE GROUPS



Source: BUREAU OF LABOR STATISTICS, GUAM DEPARTMENT OF LABOR SEPTEMBER 1975

TABLE III.13

FAMILIES ON GUAM BY MONEY INCOME LEVEL
1976

INCOME LEVEL	NUMBER OF FAMILIES 1/	PER CENT
UNDER $3,000	1,700	11.3
$3,000-$4,999	1,000	6.8
$5,000-$6,999	1,000	6.6
$7,000-$10,999	3,300	21.6
$11,000-$14,999	2,100	13.8
$15,000-$19,999	2,600	17.0
$20,000-$29,999	2,200	14.5
$30,000 AND OVER	1,300	8.4
TOTAL	15,400	100.0
MEDIAN FAMILY INCOME[2]	$11,961	($14,958-U.S.)
MEAN FAMILY INCOME[2]	$14,411	($16,870-U.S.)

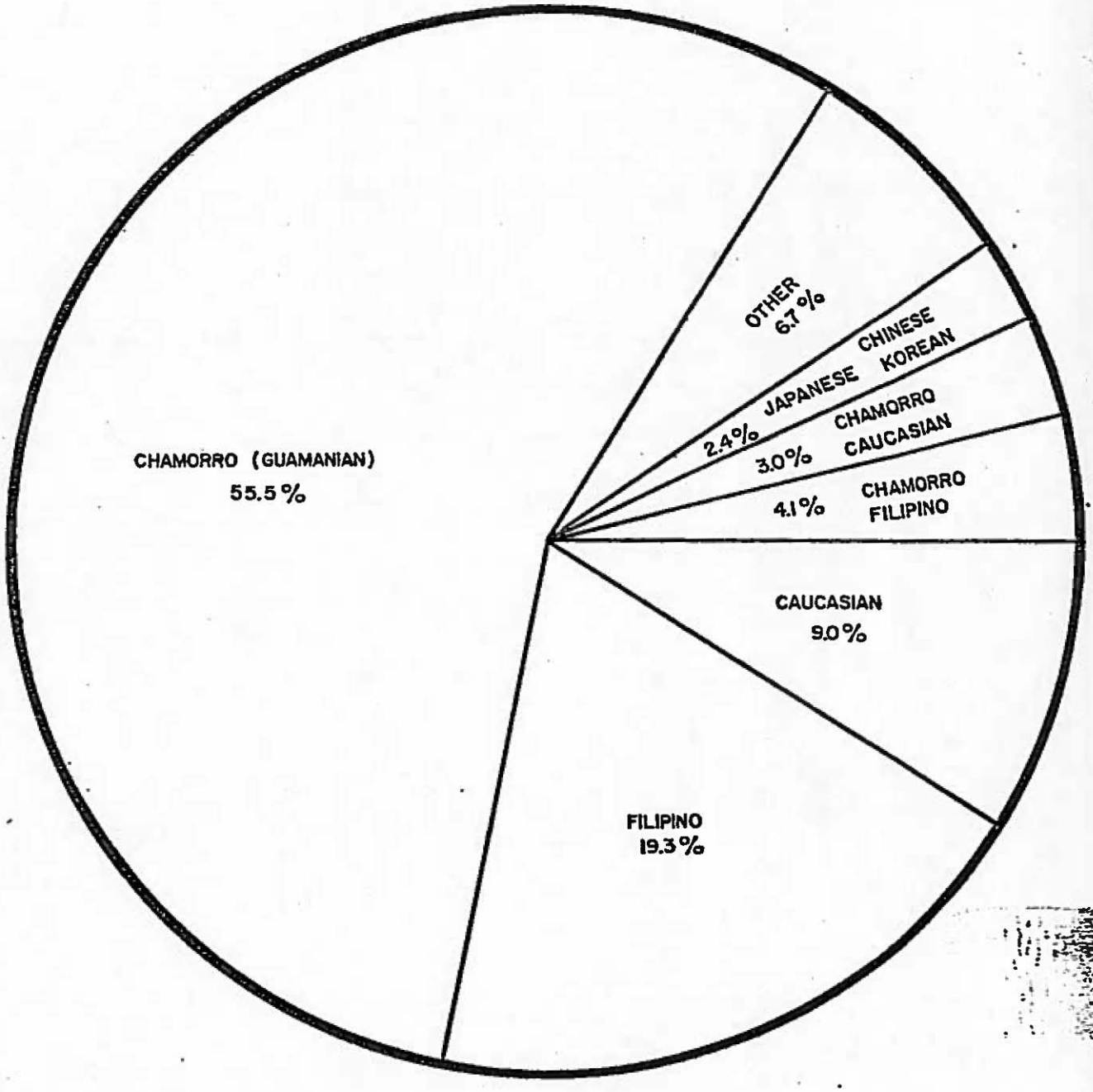
1/ EXCLUDES NON-RESIDENT ALIEN FAMILIES, AND FAMILIES LIVING ON MILITARY BASES.

2 UNWEIGHTED AVERAGE.

SOURCE: BUREAU OF LABOR STATISTICS, DEPARTMENT OF LABOR, GOVERNMENT OF GUAM. STATISTICAL ABSTRACT OF THE U.S., 1977, U.S. DEPARTMENT OF COMMERCE, BUREAU OF THE CENSUS.

FIGURE III.14

ETHNIC COMPOSITION OF CIVILIAN POPULATION OF GUAM



SOURCE: 1975 BUREAU OF LABOR STATISTICS, GOVERNMENT OF GUAM.

TABLE III.14

NUMBER AND PERCENT OF FAMILIES BELOW POVERTY LEVEL BY FAMILY SIZE

1975

FAMILY SIZE	ALL FAMILIES[1]	FAMILIES BELOW POVERTY LEVEL	
		NUMBER	PERCENT OF ALL FAMILIES
TOTAL	16,560	4,140	25.0
2	2,510	570	22.7
3	2,640	500	18.9
4	3,100	600	19.4
5	2,290	660	28.8
6	1,900	530	27.9
7	1,320	350	26.5
8	1,170	360	30.8
9	530	170	32.1
10+	1,000	400	36.4

[1] EXCLUDES NON-RESIDENT ALIEN FAMILIES AND FAMILIES LIVING ON MILITARY BASES.

SOURCE: NEWS, GUAM DEPARTMENT OF LABOR, AUGUST 30, 1975

TABLE III.15

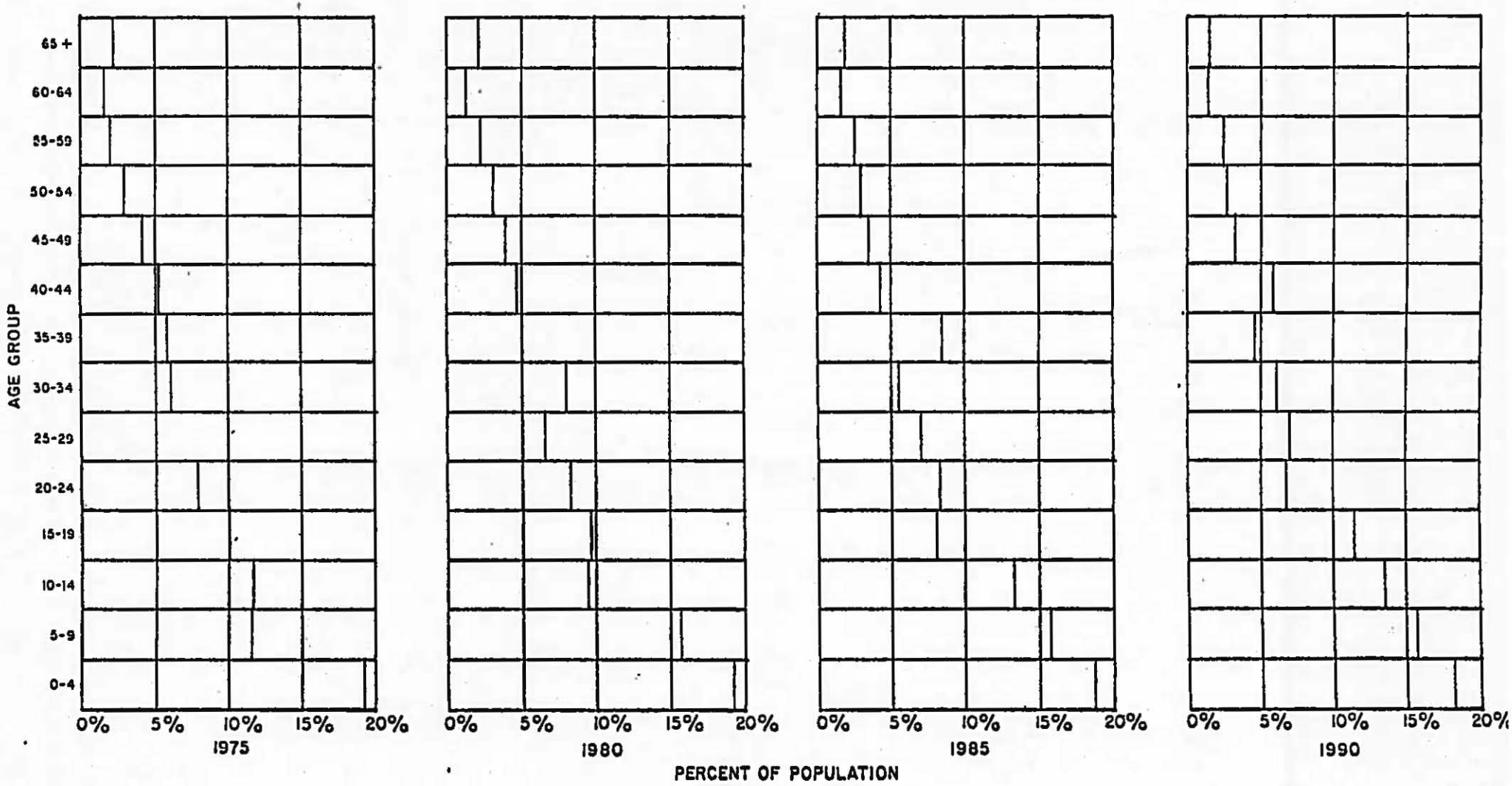
GUAM CONSUMER PRICE INDEX
SEPTEMBER 1972 = 100)

	1974	1975	1976	1977
ALL ITEMS	130.0	139.2	141.1	148.6
FOOD	141.3	152.2	157.3	163.8
HOUSING	126.9	132.4	131.7	141.3
APPAREL & UPKEEP	107.4	133.2	141.1	152.0
TRANSPORTATION	131.2	139.6	140.6	148.7
HEALTH & REC.	121.0	127.7	128.3	132.2

SOURCE: COST OF LIVING OFFICE, ECONOMIC RESEARCH CENTER, DEPARTMENT OF COMMERCE, GOVERNMENT OF GUAM

FIGURE III.15

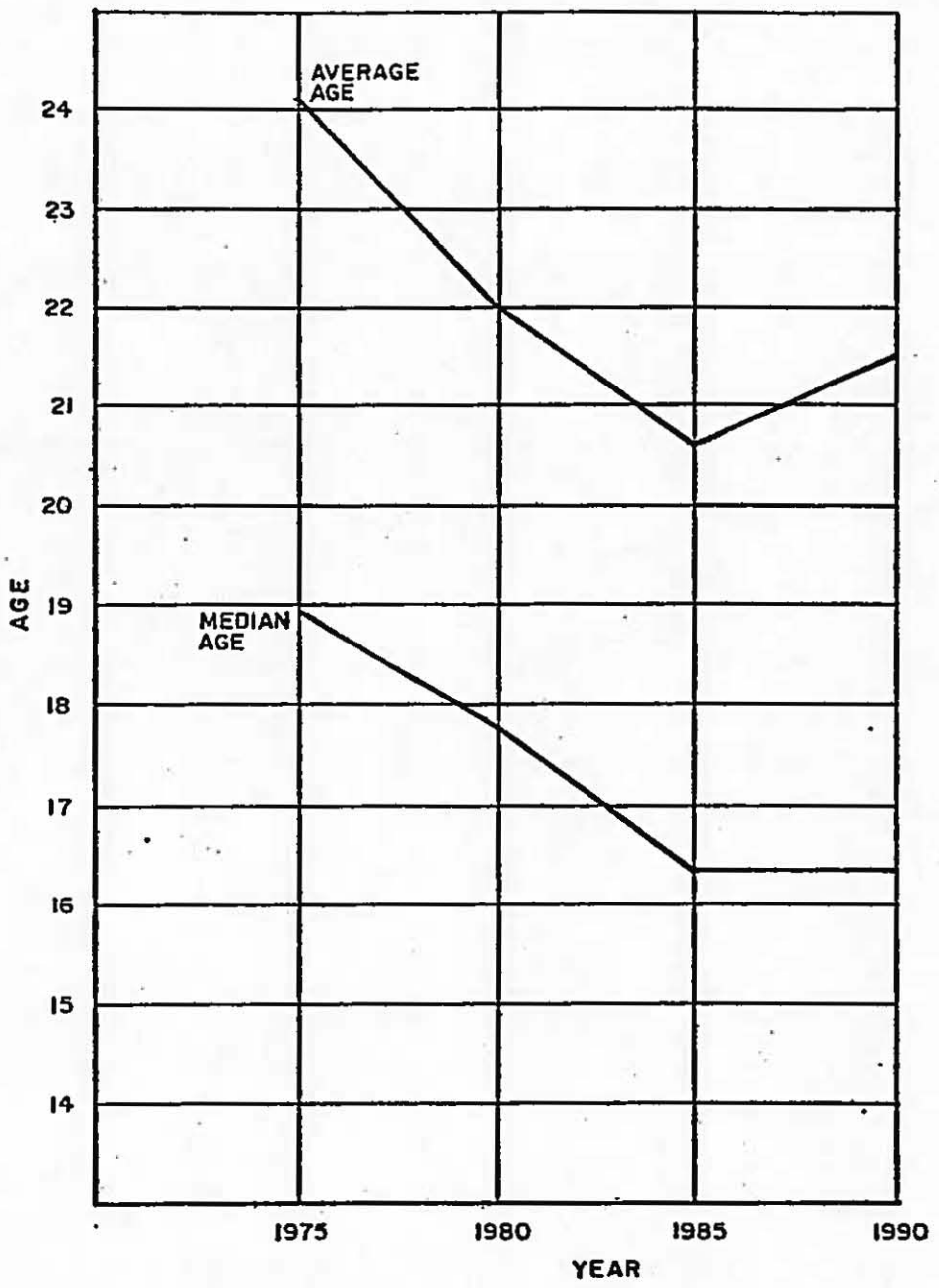
PERCENT DISTRIBUTION OF PROJECTED POPULATION ON GUAM BY AGE GROUP



SOURCES: 1975, BUREAU OF LABOR STATISTICS, GOVERNMENT OF GUAM.
1980-1990, QUINTON-BUDLONG.

FIGURE III.16

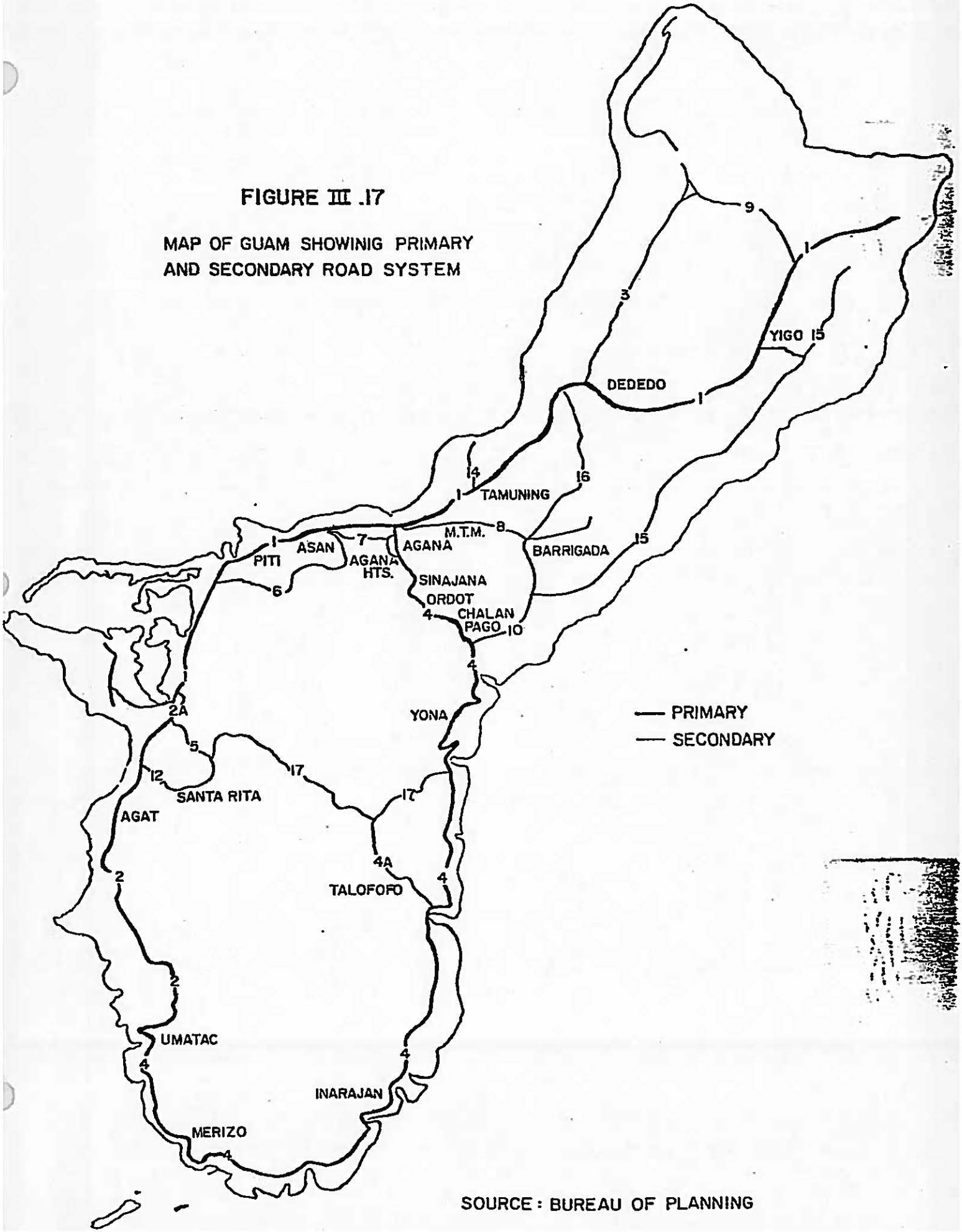
PROJECTIONS FOR MEDIAN AND AVERAGE AGE OF POULATIONS ON GUAM, 1975-1990



SOURCE: 1975, BUREAU OF LABOR STATISTICS, GOVERNMENT OF GUAM.
1980-1990, QUINTON-BUDLONG.

FIGURE III .17

MAP OF GUAM SHOWINIG PRIMARY AND SECONDARY ROAD SYSTEM



SOURCE : BUREAU OF PLANNING

TABLE III.17

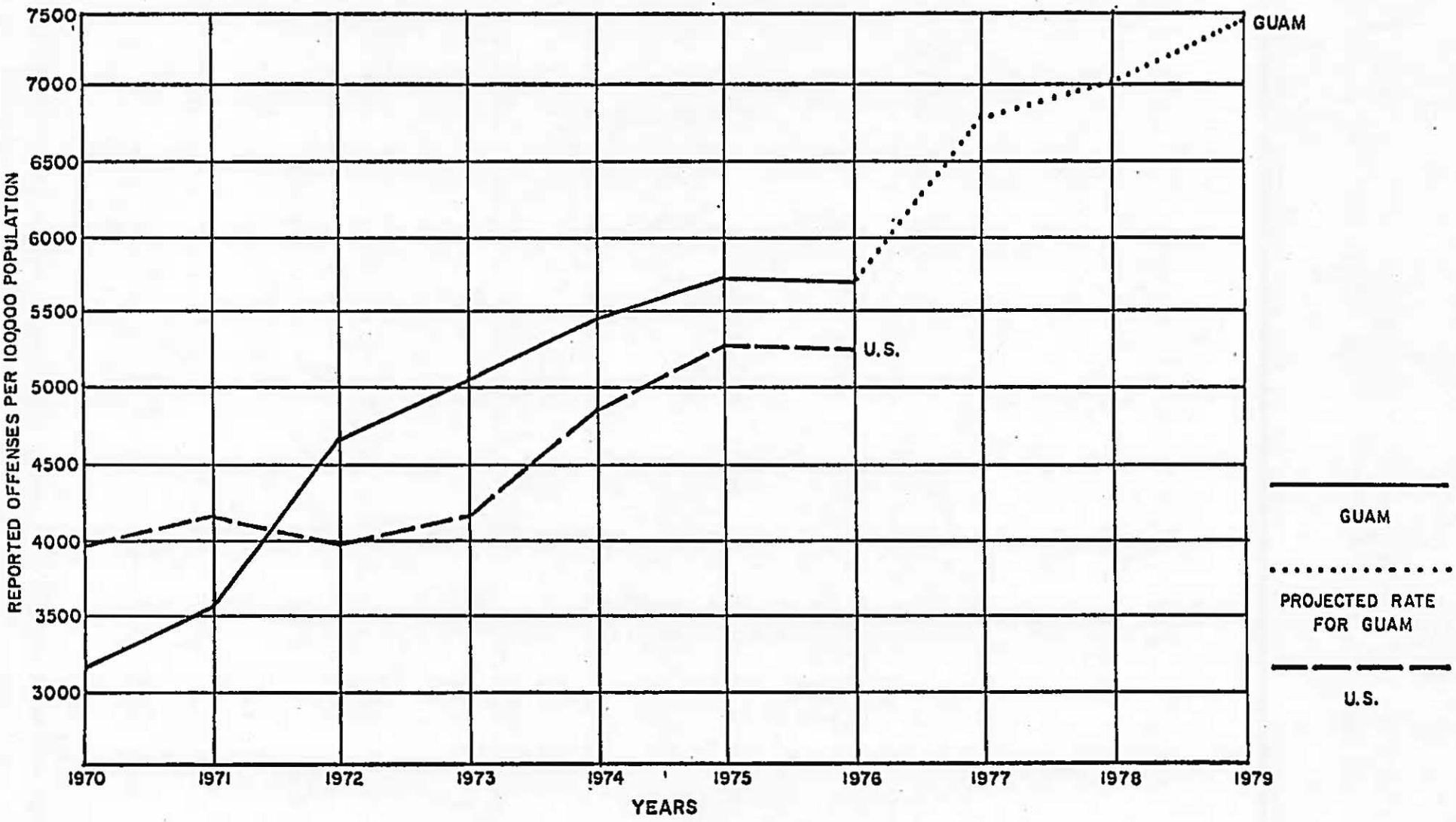
GEOGRAPHIC DISTRIBUTION OF FEDERAL FUNDS IN TERRITORIES AND OTHER AREAS ADMINISTERED BY THE U.S.

	FY 1977 FEDERAL FUNDS (DOLLAR AMOUNTS IN THOUSANDS)
DEPARTMENT OF AGRICULTURE	
FOOD STAMP BONUS COUPONS, FNS	$ 9,795
NATIONAL SCHOOL LUNCH PROGRAM-CASH, FNS	1,152
SCHOOL BREAKFAST PROGRAM, FNS	268
DEPARTMENT OF HEALTH, EDUCATION AND WELFARE	
COMMUNITY MENTAL HEALTH CENTERS-STAFF & CONSTRUCTION, ADMHA	184
COMPREHENSIVE PUBLIC HEALTH SERVICES FORMULA GRANTS, HSA	299
CRIPPLED CHILDRENS SERVICES, HSA	251
DEVELOPMENTAL DISABILITIES - BASIC SUPPLEMENT, OS	70
DEVELOPMENTAL DISABILITIES - SPECIAL PROJECT, OS	40
DISEASE CONTROL-PROJECT GRANTS, CDC	45
DRUG ABUSE PREVENTION FORMULA GRANTS, ADMHA	32
FAMILY PLANNING PROJECTS, HSA	85
HEALTH PLANNING-HEALTH SYSTEMS AGENCIES, HRA	143
HEALTH PROFESSIONS-START-UP ASSISTANCE, HRA	18
MATERNAL AND CHILD HEALTH SERVICES, HSA	396
MEDICAL ASSISTANCE PROGRAMS, SRS	577
MENTAL HEALTH-CHILDREN'S SERVICES, ADMA	135
NURSE TRAINING IMPROVEMENT-SPECIAL PROJECT, HRA	77
PROGRAM FOR AGING-NUTRITION PROGRAM, OS	508
STATE HEALTH PLANNING AND DEVELOPMENT AGENCIES, HRA	113
ENVIRONMENTAL PROTECTION AGENCY	
ABATEMENT AND CONTROL, EPA	362
AIR POLLUTION CONTROL PROGRAM GRANTS, AWM	60
CONSTRUCTION GRANTS FOR WASTEWATER TREATMENT WORKS, WHM	4,690
PUBLIC WATER SYSTEM SUPERVISION-STATE PROGRAM GRANT, WHM	7
SOLID WASTE DISPOSAL PLANNING GRANTS, AWM	20
TOTAL	$ 19,327

SOURCE: GEOGRAPHIC DISTRIBUTION OF FEDERAL FUNDS, FY '77 BY THE U.S. COMMUNITY SERVICES ADMINISTRATION.

FIGURE IV.22

PART I*ACTUAL REPORTED OFFENSES PER 100,000 POPULATION

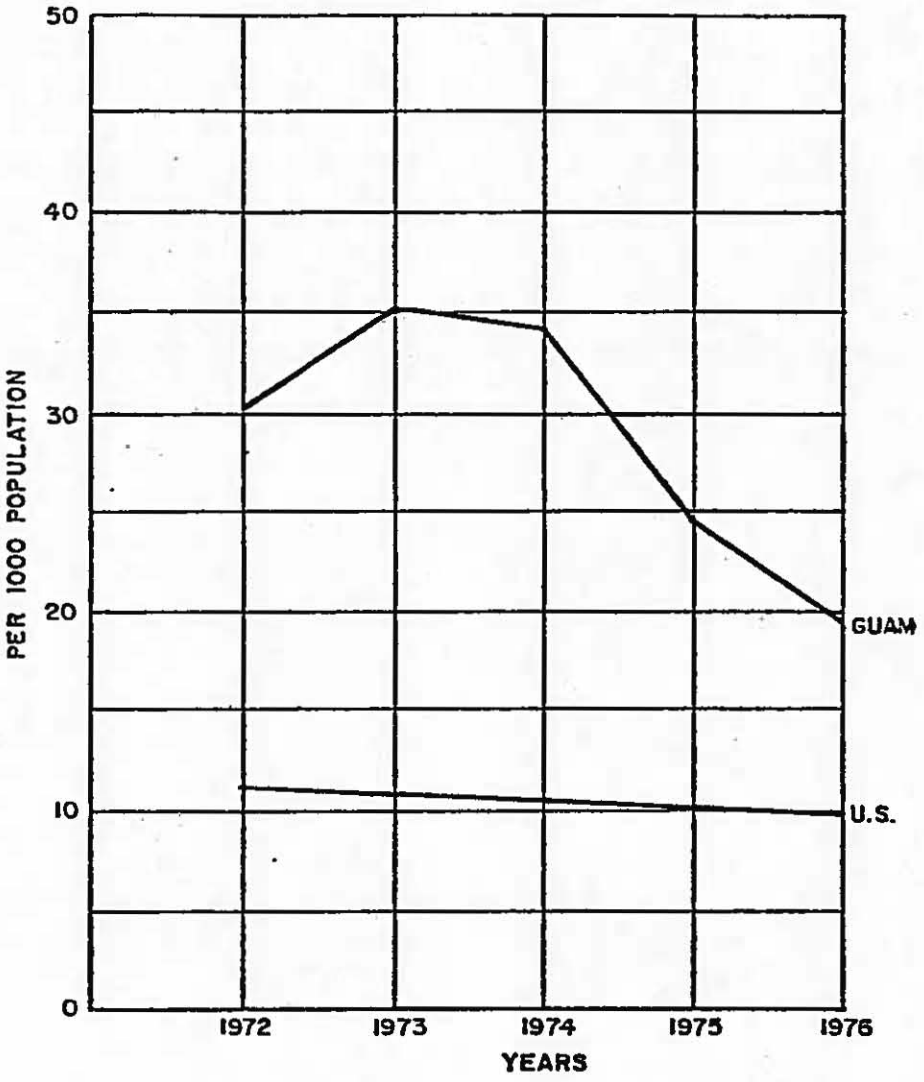


* = "PART I" IS THE TITLE GIVEN BY THE U.S. FEDERAL BUREAU OF INVESTIGATION TO DENOTE THE FOLLOWING OFFENSES: MURDER, FORCIBLE RAPE, ROBBERY, AGGRAVATED ASSAULT, BURGLARY, LARCENOUS THEFT, AND MOTOR VEHICLE THEFT.

SOURCE: COMPREHENSIVE CRIMINAL JUSTICE PLAN, 1978, TERRITORY OF GUAM
STATISTICAL ABSTRACT OF THE U.S. 1977 U.S. DEPT OF COMMERCE

FIGURE IV.23

CRUDE MARRIAGE RATES, GUAM–U.S.
1972—1976

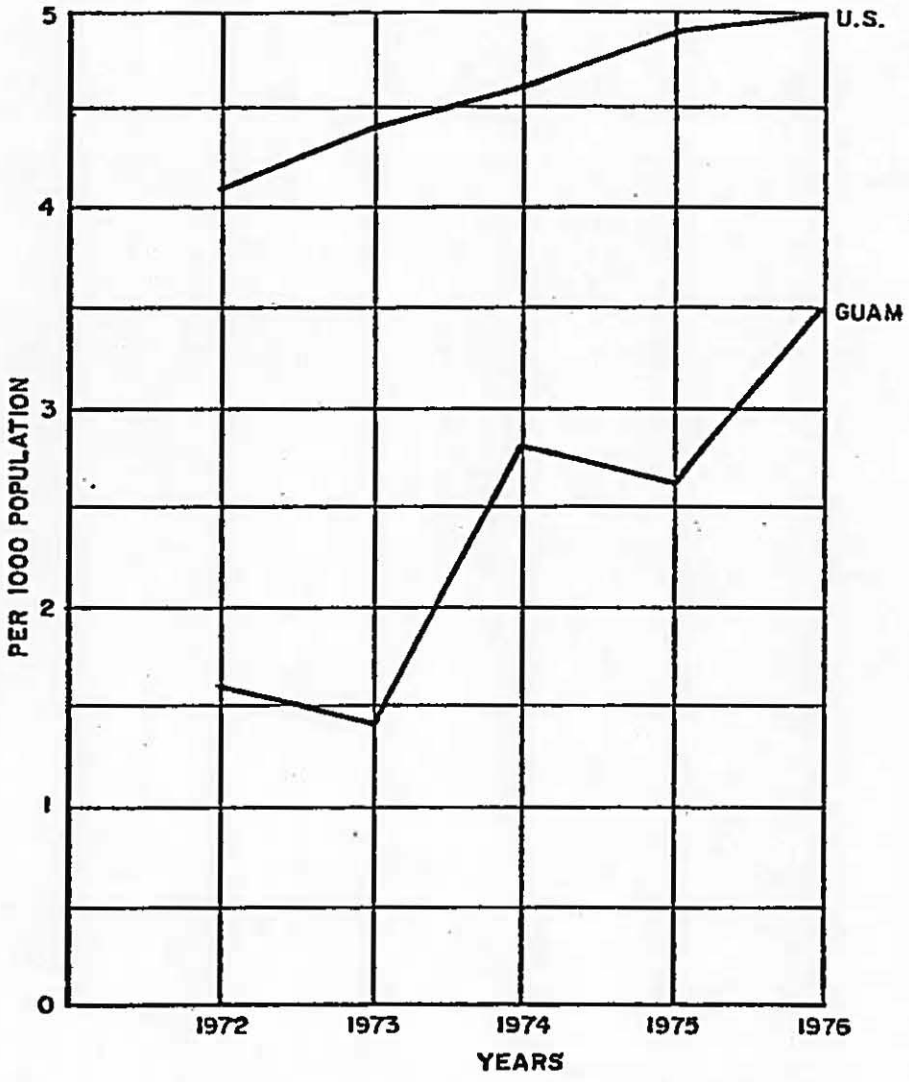


SOURCE: STATISTICAL REPORTS 1972-76, OFFICE OF VITAL STATISTICS, DPHSS.

STATISTICAL ABSTRACT OF THE U.S. 1977, DEPT OF COMMERCE.

FIGURE IV.24

CRUDE DIVORCE RATES, GUAM-U.S.
1972-1976



SOURCE: STATISTICAL REPORTS 1972-76, OFFICE OF VITAL STATISTICS, DPHSS.

STATISTICAL ABSTRACT OF THE U.S.1977, DEPT OF COMMERCE.

B. HEALTH STATUS

HEALTH SYSTEM SERVICES MATRIX

SYSTEM LEVEL	I. Protection (ID Chlrt Qlty)	II. Prevention (Scrn Nutrnt)	III. Diagnosis Treatment (Scrn Prim Sec Tert)	IV. Habilitation (ID Lifsr Home)	V. Maintenance (H/C Hsty)	VI. Support (Pharm Records Admin)	VII. Enabling (Plan Reso Resch)
Infant Mortality							
Neonatal Mortality	x	x	x				x
Village Inf.Mortality							
Fetal Deaths	x						x
Premature	x		x				x
Congenital Anomaly	x	x				x	x
Early Inf. Diseases	x	x x	x x			x	x
Birth Weight	x	x					x
Otitis Media	x	x	x			x	x
Infant Salmonella	x	x				x	x
All Accidents	x						
Motor Vehicle Accidents	xx		x x	x	x		
Young Males in Motor Vehicle Accidents	x						
Other Accidents	xx	x	x x x	x	x	x	
Drown. Fall	x	x	x x				
Occupational Injury	xx		x x	x	x		
Heart Disease	x		x	x	x	x	
Ischemic Heart			x	x	x	x	
Hypertension	x	x x				x	x
Obesity	x	x x				x	x
Cancer	x	x	x	x	x	x	
Cerebrovascular Disease	x		x	x	x	x	
ALS/PD		x			x	x	x
Cirrhosis	x	x	x			x	
Diabetes	x	x x				x	
Pneumonia Mortality	xx		x			x	
Pneumonia Morbidity	xx		x			x	
Bronchitis	x		x			x	
Venereal Disease	x	x	x			x	x
Hepatitis	x		x			x	
Mumps/Measles	x	x				x	
Tuberculosis	xx	x	x		x	x	x
Salmonella Shigella	x		x			x	x
Parasites	x	x	x			x	x
Dental Caries	x	x	x			x	x
DMF		x	x			x	
Suicide	x	x	x	x x	x	x	
Drug Abuse	x	x	x	x x	x	x	x
Alcohol Abuse	x	x	x	x x	x	x	x
	24	13	12	6	7	18	15

SYSTEM SETTING

1. Community
2. Home
3. Mobile
4. Ambulatory
5. Short Inpatient
6. Long Inpatient
7. Support Indirect

HEALTH STATUS PROBLEMS

TABLE IV.1

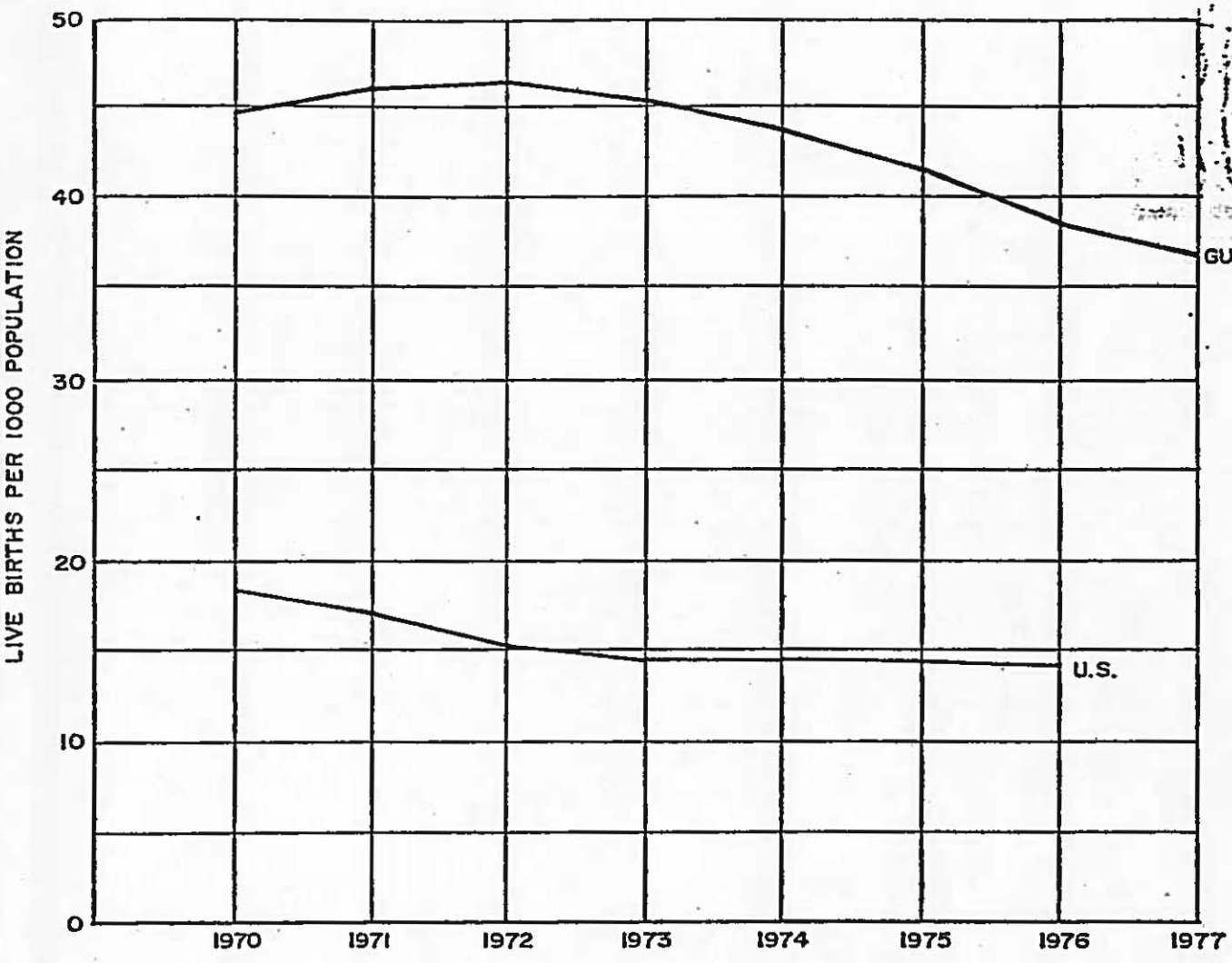
FREQUENCY DISTRIBUTION OF MORTALITY: 1970-1977 BY AGE AND SEX

YEARS	TOTAL	TOTAL BY SEX		SEX BY FIVE YEAR AGE GROUP																																			
				UNDER 1		1-4		5-9		10-14		15-19		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65-69		70-74		75-79		80-84		85 OVER		UNKNOWN	
		MALE	FEMALE	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1970	355	239	116	38	24	7	5	2	2	2	3	15	2	10	4	8	4	11	0	5	4	24	3	15	4	14	6	15	8	27	11	10	7	15	7	10	8	7	8	3	6	1	0
1971	364	244	120	42	21	5	6	0	1	5	2	24	3	16	3	4	1	9	0	6	3	14	1	8	9	16	7	24	9	14	7	16	12	16	10	7	4	10	6	7	15	1	0
1972	409	243	166	25	24	4	6	5	3	3	2	11	6	15	5	15	5	9	5	12	8	17	3	14	6	16	10	20	10	29	13	14	11	15	12	3	14	13	11	2	10	1	2
1973	435	268	167	44	31	5	4	0	3	2	1	14	3	17	2	7	1	9	4	13	3	11	8	23	8	20	7	24	14	25	17	16	16	13	7	12	16	7	13	5	9	1	0
1974	449	269	180	43	32	3	7	3	3	1	1	10	5	16	5	10	2	13	8	13	2	12	5	14	10	18	9	25	10	20	13	22	16	19	10	9	18	16	13	2	1	0	0
1975	441	290	151	35	29	4	6	2	0	2	0	12	3	20	1	8	5	7	3	16	2	10	2	29	7	34	8	21	14	28	10	16	10	17	17	16	11	7	12	5	11	1	0
1976	420	279	141	30	25	6	1	1	0	2	2	11	0	19	0	13	0	9	2	8	3	18	5	17	8	23	7	21	16	23	7	24	16	27	14	10	13	10	8	9	11	0	0
1977	380	243	137	23	21	0	4	1	0	4	0	14	4	21	3	18	2	5	4	9	4	8	9	22	3	19	5	27	13	19	6	20	14	12	11	9	13	5	9	6	12	1	0
YEARLY VERAGE	406	259	147	35	26	4	5	2	1	2	1	14	3	17	3	10	2	9	3	10	3	14	4	18	7	20	7	22	12	23	10	17	13	17	11	9	12	9	10	5	9	1	0

)URCE: STATISTICAL REPORTS 1970-77, OFFICE OF VITAL STATISTICS, DPHSS

FIGURE IV.1

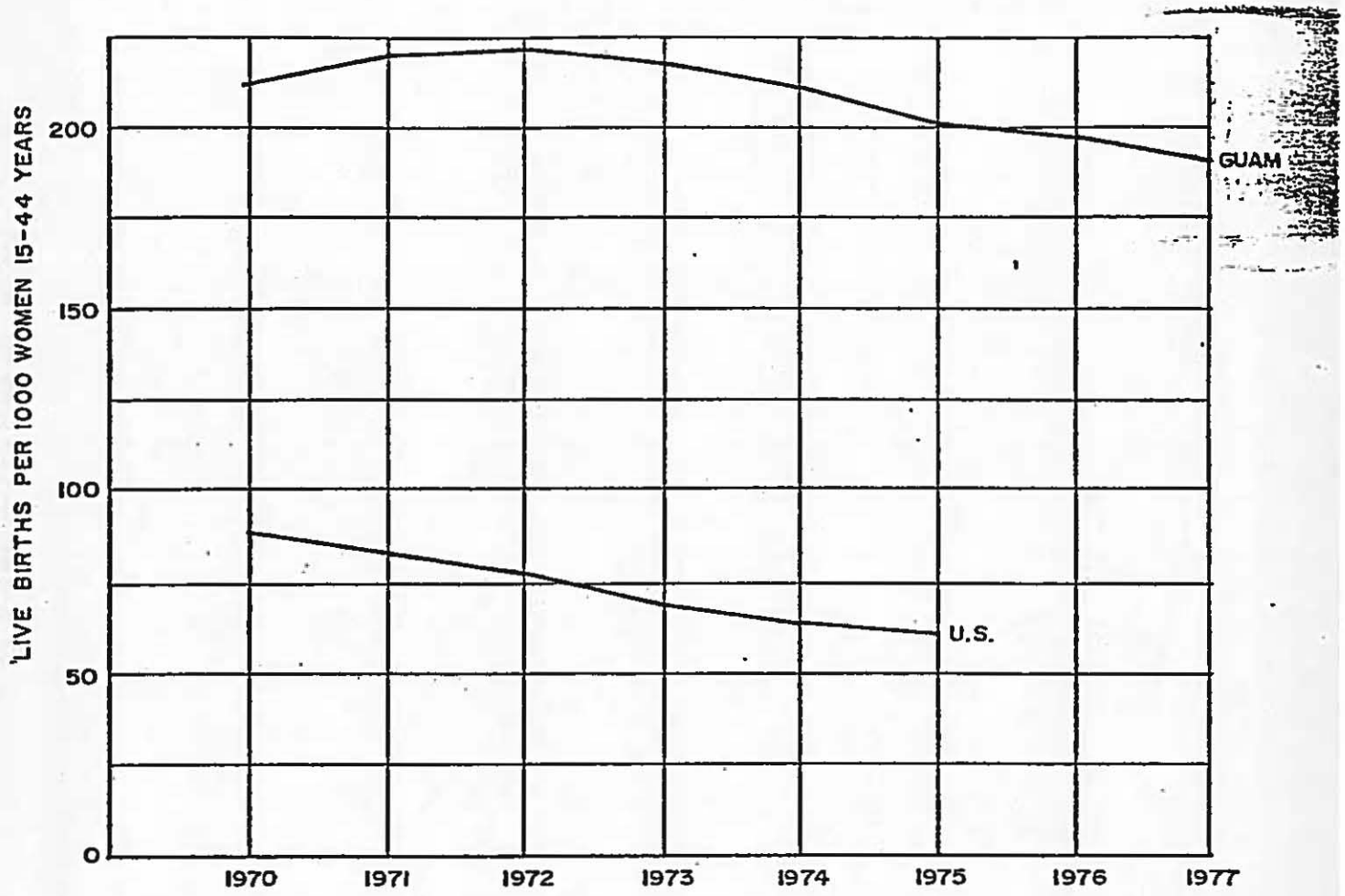
CRUDE BIRTH RATES: GUAM – U.S.
1970 – 1977



SOURCE: STATISTICAL REPORTS 1970–77, OFFICE OF VITAL STATISTICS, DPHSS.
STATISTICAL ABSTRACT OF THE U.S. 1977.

FIGURE IV.2

GENERAL FERTILITY RATES: GUAM-U.S.
1970–1977



SOURCE: STRATISTICAL REPORTS 1970–77, OFFICE OF VITAL STATISTICS, DPHSS.
STRATISTICAL ABSTRACT OF THE U.S. 1977.

TABLE IV. 3

AGE-SEX SPECIFIC MORTALITY RATES FOR GUAM 1970-77

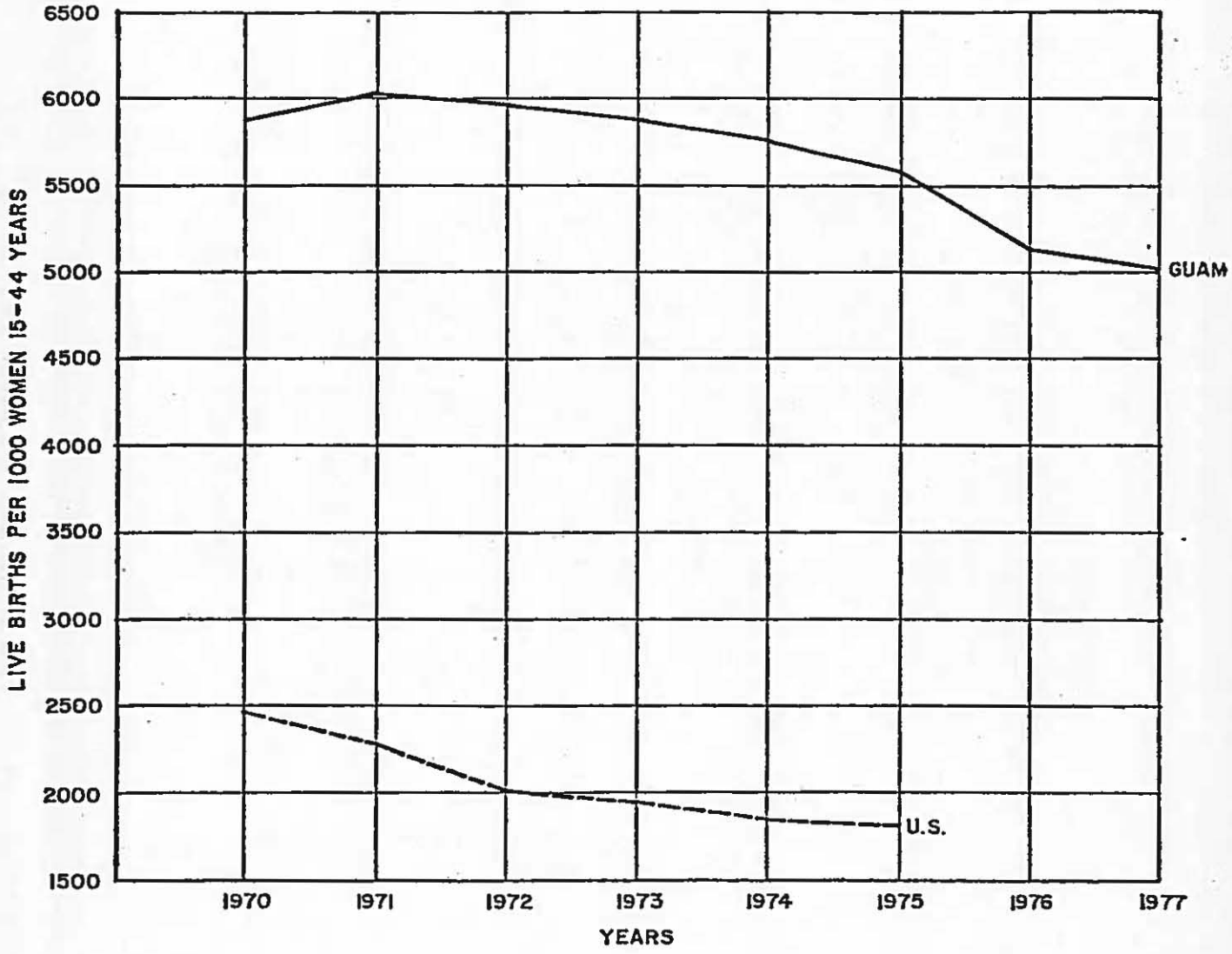
YEARS	UNDER 1		1 - 4		5 - 14		15 - 24		25 - 34		35 - 44		45 - 54		55 - 64		65 - 74		75 - 84		85 & OVER	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1970	25	17	2	2	.5	.6	2.0	.9	3.8	1.0	6.6	2.3	11.9	5.7	26.4	15.5	51.6	25.2	116.4	78.0	88.2	109.1
1971	26	14	1	2	.6	.4	5.5	.9	2.4	.1	4.5	1.3	9.2	8.7	23.9	13.1	62.4	38.9	111.8	47.8	218.8	300.
1972	15.2	15.3	1	2	.9	.6	3.6	1.7	4.2	2.1	6.4	3.4	10.8	8.3	30.8	19.0	53.5	39.9	101.3	117.4	66.7	222.2
1973	26.4	19.8	1	1	.2	.5	4.4	.8	2.7	1.0	5.2	3.3	6.8	7.5	30.8	25.7	50.8	39.2	115.9	133.6	178.6	225.
1974	25.4	20.9	0	1	.4	.5	3.7	1.5	3.6	1.9	5.4	2.0	10.6	9.1	28.3	19.2	68.3	43.6	147.1	140.3	76.9	28.6
1975	22.5	18.1	1	1	.4	0	4.6	.6	2.2	1.5	5.6	1.1	19.1	6.9	30.9	20.2	52.5	45.2	130.7	103.6	294.1	440.
1976	18.7	17.3	1	0	.3	.2	4.1	0	3.3	.4	5.5	2.2	11.8	6.6	26.8	18.9	77.6	50.3	107.5	90.9	473.7	407.4
1977	15	14	0	1	.5	0	4.6	1.0	3.4	1.0	3.6	3.5	11.7	3.4	27.2	15.2	46.6	41.9	71.4	91.7	285.7	413.8

AGE - SEX

JRCE: STATISTICAL REPORTS 1970-77, OFFICE OF VITAL STATISTICS, DPHSS

FIGURE IV.3

TOTAL FERTILITY RATES: GUAM-U.S.
1970—1977



SOURCE: STATISTICAL REPORTS 1970—77, OFFICE OF VITAL STATISTICS, DPHSS.
STATISTICAL ABSTRACT OF THE U.S. 1977.

TABLE IV.4

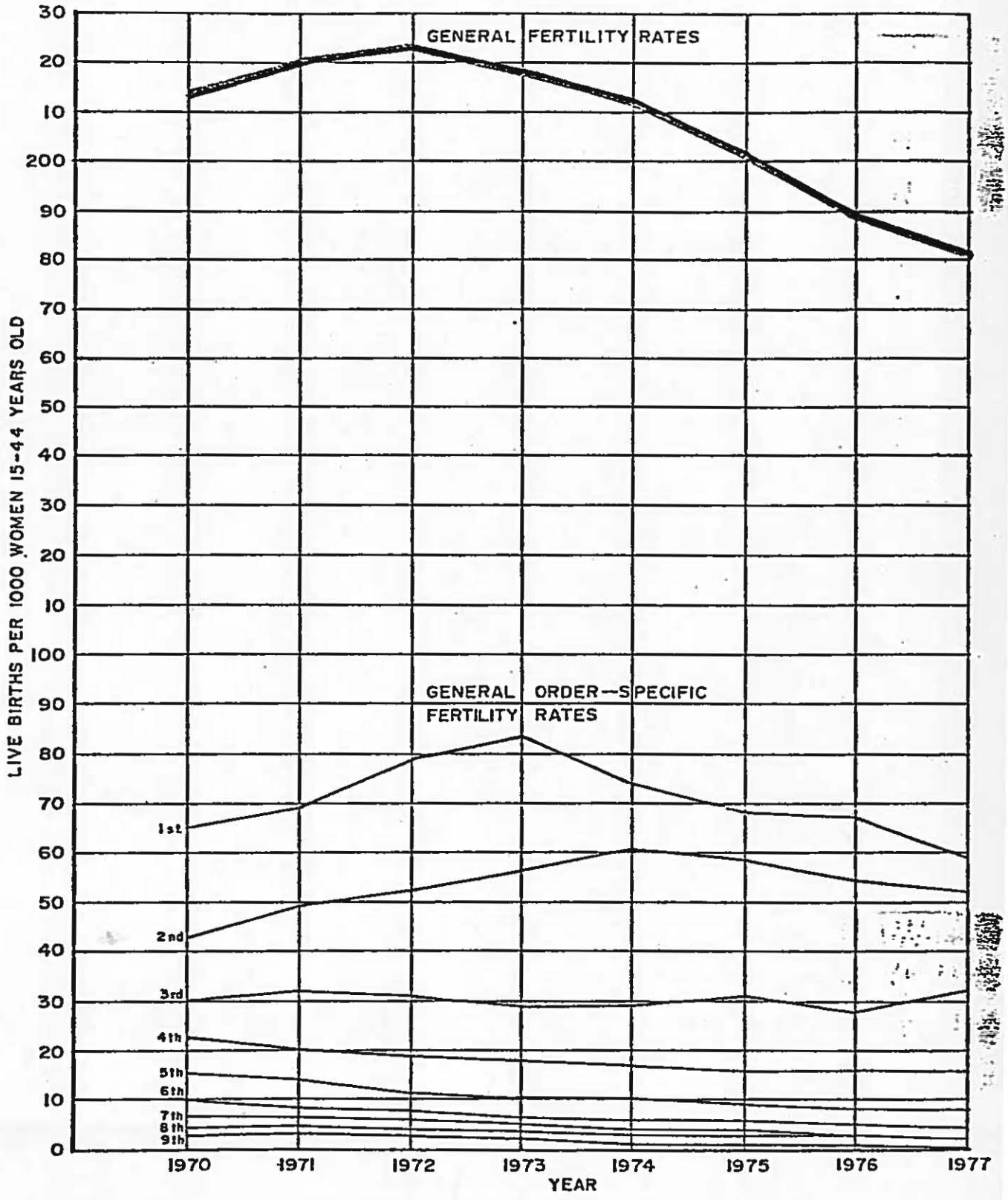
MORTALITY RATES FOR THE U.S.
1970 - 1975

YEARS	UNDER-1		1 - 4		5 - 14		15 - 24		25 - 34		35 - 44		45 - 54		55 - 64		65 - 74		75 - 84		85-OVER	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1970	24.1	18.6	.9	.8	.5	.3	1.9	.7	2.2	1.0	4.0	2.3	9.6	5.2	22.8	11.0	48.7	25.8	100.1	66.8	178.2	155.2
1971	21.4	16.6	.9	.7	.5	.3	1.9	.7	2.1	1.0	3.9	2.3	9.3	5.0	22.3	10.8	47.6	25.0	99.2	65.3	197.5	162.3
1972	20.1	15.9	.9	.7	.5	.3	1.9	.7	2.1	1.0	3.9	2.2	9.4	5.0	22.5	10.8	48.2	25.3	101.2	65.8	196.0	162.
1973	20.3	15.7	.9	.7	.5	.3	1.9	.7	2.1	.9	3.8	2.2	9.2	4.9	22.1	10.8	47.3	24.5	101.1	65.6	198.1	162.
1974	19.7	15.3	.8	.7	.5	.3	1.8	.6	2.1	.9	3.6	2.0	8.9	4.7	21.1	10.5	45.8	23.6	97.9	63.3	188.8	153.
1975	18.3	14.4	.8	.6	.4	.3	1.8	.6	2.0	.9	3.5	1.9	8.6	4.6	20.3	10.1	44.1	22.5	95.2	60.3	175.7	140.

SOURCE: STATISTICAL ABSTRACT OF THE U.S., 1977, U.S. DEPT. OF COMMERCE.

FIGURE IV.4

GENERAL FERTILITY AND GENERAL ORDER-SPECIFIC FERTILITY RATES: 1970–77



SOURCE: STATISTICAL REPORTS 1970-77, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV.5

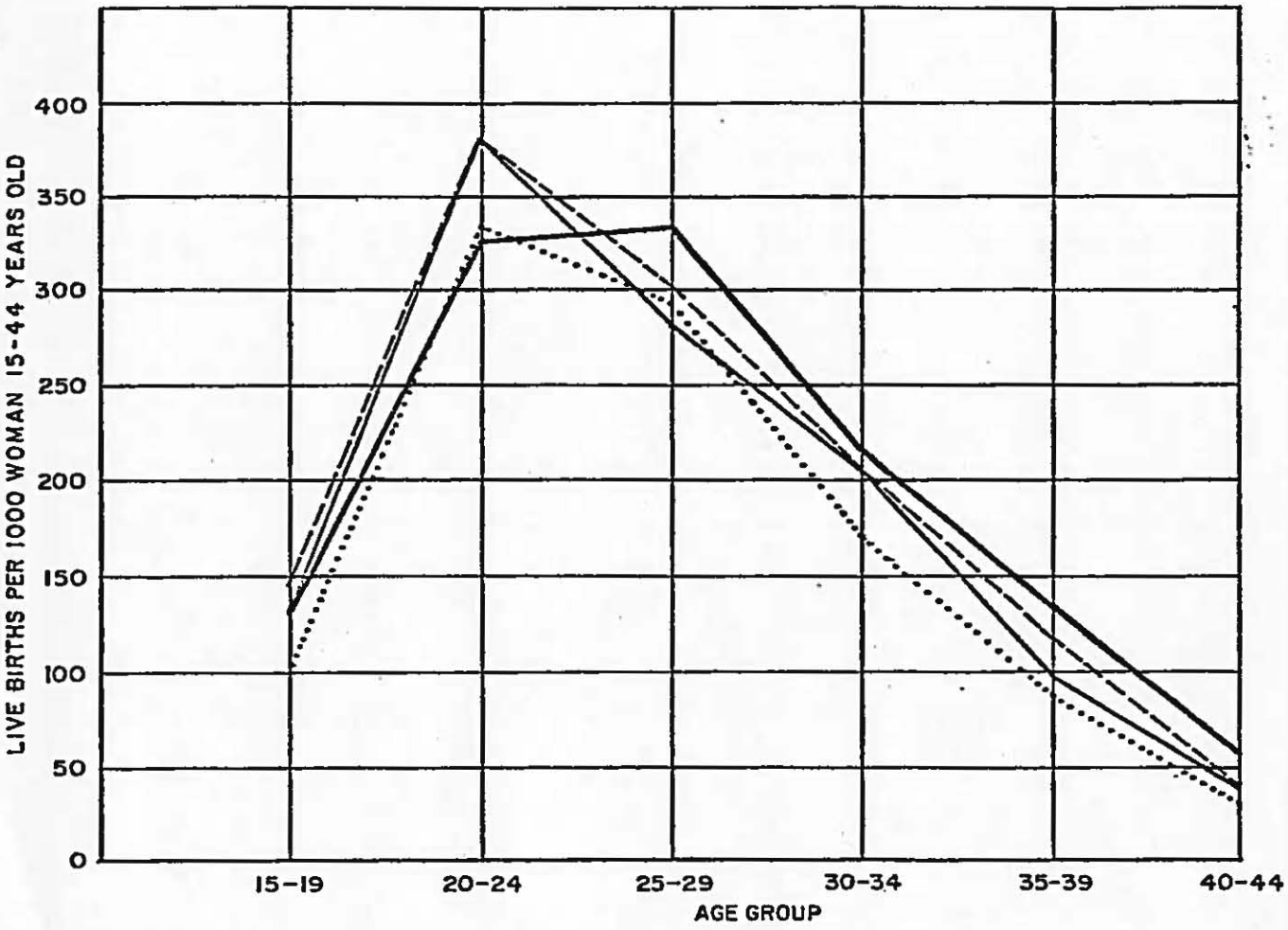
SUMMARY TABLE OF LEADING CAUSES
OF DEATH AVERAGED OVER 1971—1977

RANK	CAUSE OF DEATH	AVERAGE NO. OF DEATHS	RATE/1000	% OF TOTAL AVG. DEATHS
1	HEART DISEASE	75.3	1.02	17.9
2	MALIGNANT NEOPLASMS	37.7	0.51	9.0
3	MOTOR VEHICLE ACCIDENTS	34.3	0.46	8.1
4	DISEASES OF EARLY INFANCY	31.6	0.43	7.5
5	NON-MOTOR VEHICLE ACCIDENTS	29.1	0.39	6.9
6	CEREBROVASCULAR DISEASE	26.8	0.36	6.4
7	PNEUMONIA	21.0	0.28	5.0
8	OTHER DISEASE OF CNS (ALS/PD)	18.4	0.25	4.4
9	CIRRHOSIS OF THE LIVER	13.3	0.18	3.1
10	DIABETES	11.1	0.15	2.6
11	CONGENITAL ANORMALIES	10.8	0.15	2.6
12	HOMICIDE	8.7	0.12	2.1
13	SUICIDE	7.4	0.10	1.8
	ALL OTHER CAUSES	95.1	1.28	22.6
	ALL CAUSES	420.6	5.68	100.0

SOURCE: STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS, DPHSS.

FIGURE IV.5

AGE-SPECIFIC BIRTH RATES: 1970-1977
(TWO YEAR AVERAGE)

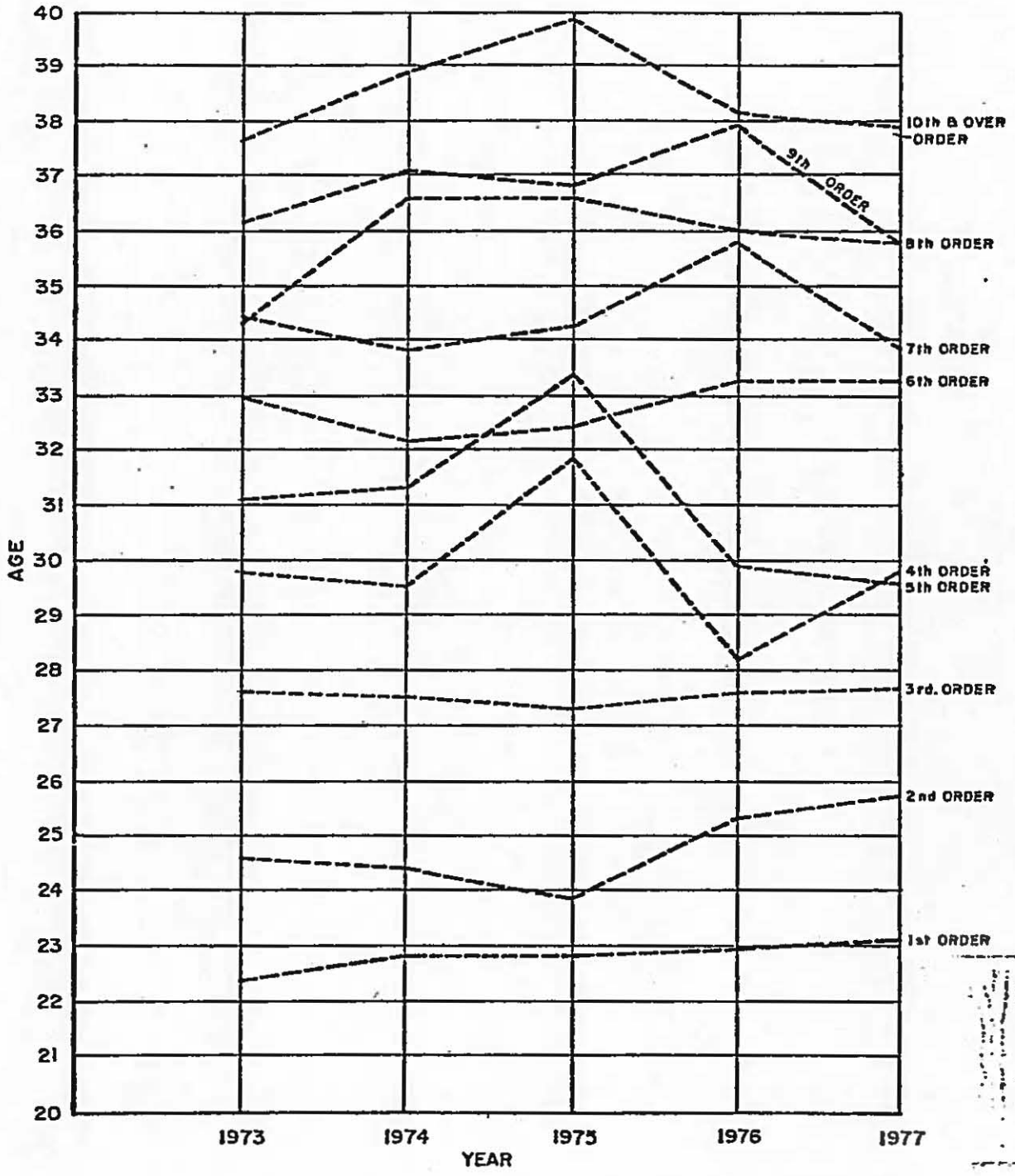


SOURCE: STATISTICAL REPORTS 1970-77, OFFICE OF VITAL STATISTICS, DPHSS.

——— = 1970-71
— — — — = 1972-73
——— = 1974-75
..... = 1976-77

FIGURE IV.6

MEDIAN AGE OF MOTHER BY BIRTH ORDER
1973-1977



SOURCE: STATISTICAL REPORTS 1973-77, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV.6

LEADING CAUSES OF DEATHS ON GUAM

1925

CAUSE	NUMBER	RATE
BACILLARY DYSENTERY	32	1.92
TUBERCULOSIS	13	0.78
TYPHOID FEVER	8	0.48
HOOKWORM	2	0.12
ASCARIASIS	2	0.06
MEASLES	1	0.06
PERITONITIS	1	0.06
TOTAL DEATHS	97	583
TOTAL POPULATION	16,648	

TABLE IV.7

LEADING CAUSES OF DEATHS ON GUAM

1960

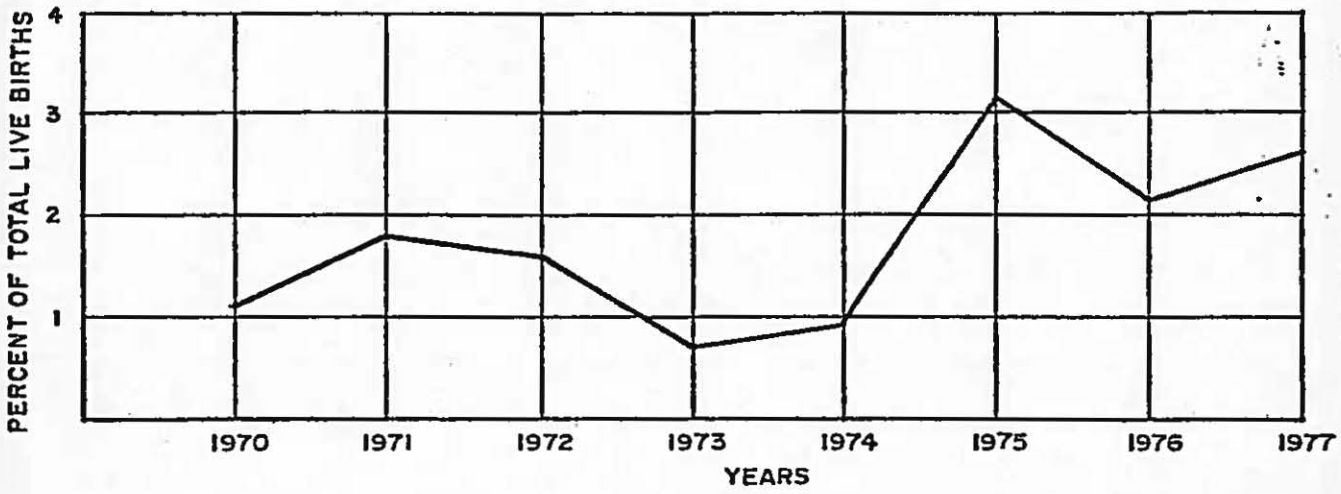
CAUSE	NUMBER	RATE
DISEASES OF THE HEART AND ARTERIES	61	0.91
DISEASES OF EARLY INFANCY AND PREMATURITY UNQUALIFIED	37	0.55
PNEUMONIA AND OTHER DISEASES OF THE RESPIRATORY SYSTEM	30	0.45
ACCIDENTS OTHER THAN MOTOR VEHICLE	29	0.43
VASCULAR LESIONS OF THE CNS	18	0.27
ALL OTHER DISEASES OF THE CNS AND SENSE ORGANS *	17	0.25
MALIGNANT NEOPLASMS	15	0.22
MOTOR VEHICLE ACCIDENTS	14	0.21
TUBERCULOSIS, PULMONARY	10	0.15
MENINGITIS, NON-MENINGOCOCCAL	6	0.09
TOTAL DEATHS	351	524
TOTAL POPULATION	67,004	

* PRIMARILY AMOYTROPHIC LATERAL SCLEROSIS- PARKINSENISM DEMENTIA

SOURCE: DEPT. OF PUBLIC HEALTH AND SOCIAL SERVICES

FIGURE IV.7

BIRTHS WITH NO PRENATAL VISITS AS PERCENT OF TOTAL LIVE BIRTHS: 1970-77



SOURCE: STATISTICAL REPORTS 1970-77 OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV.8

FREQUENCY DISTRIBUTION OF INFANT MORTALITY
1970-1977

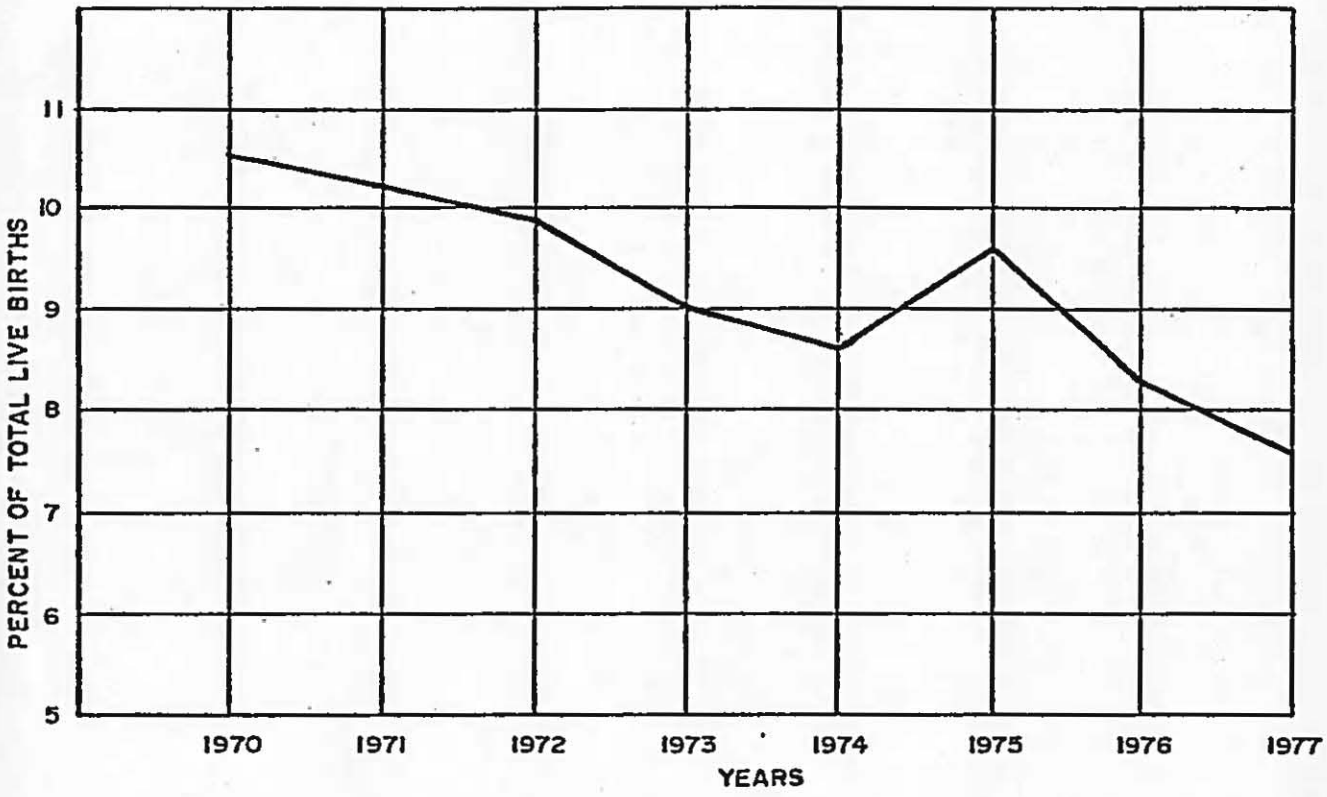
YEAR	BOTH SEXES	DISTRIBUTION BY ETHNICITY				TOTAL	MALE		TOTAL	FEMALE	
		GUAMANIAN	FILIPINO	CAUCASIAN	OTHERS		NEONATAL	POST NEONATAL		NEONATAL	POST NEONATAL
1970	62	36	8	11	7	38	N/A	N/A	24	N/A	N/A
1971	63	34	9	12	8	42	31	11	21	17	4
1972	49	22	4	16	7	25	19	6	24	17	7
1973	76	70	1	4	1	43	29	14	33	25	8
1974	75	42	12	14	7	43	34	9	32	25	7
1975	65	26	12	11	15	35	30	5	30	26	4
1976	55	30	11	11	3	30	20	10	25	17	8
1977	46	N/A	N/A	N/A	N/A	24	N/A	N/A	22	N/A	N/A
YEARLY AVERAGE	61	37	8	11	7	35	27	9	26	21	6

NOTES: 1. N/A = NOT AVAILABLE.
2. NEONATAL = 0-28 DAYS.
3. POST NEONATAL = 29 DAYS - UNDER 1 YEAR.
4. AVERAGE COLUMN MAY NOT ADD UP TO TOTAL AVERAGE.

SOURCE: STATISTICAL REPORTS 1970-77, OFFICE OF VITAL STATISTICS, DPHSS

FIGURE IV.8

LOW BIRTH WEIGHT* INFANTS AS PERCENT OF TOTAL LIVE BIRTH: 1970-77



* = WITH WEIGHT OF 5 lb. 8 oz. OR LESS.

SOURCE: STATISTICAL REPORTS 1970-77, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV.9

MOTOR VEHICLE ACCIDENTS MORTALITY RATES, GUAM-U.S.
1971-1977

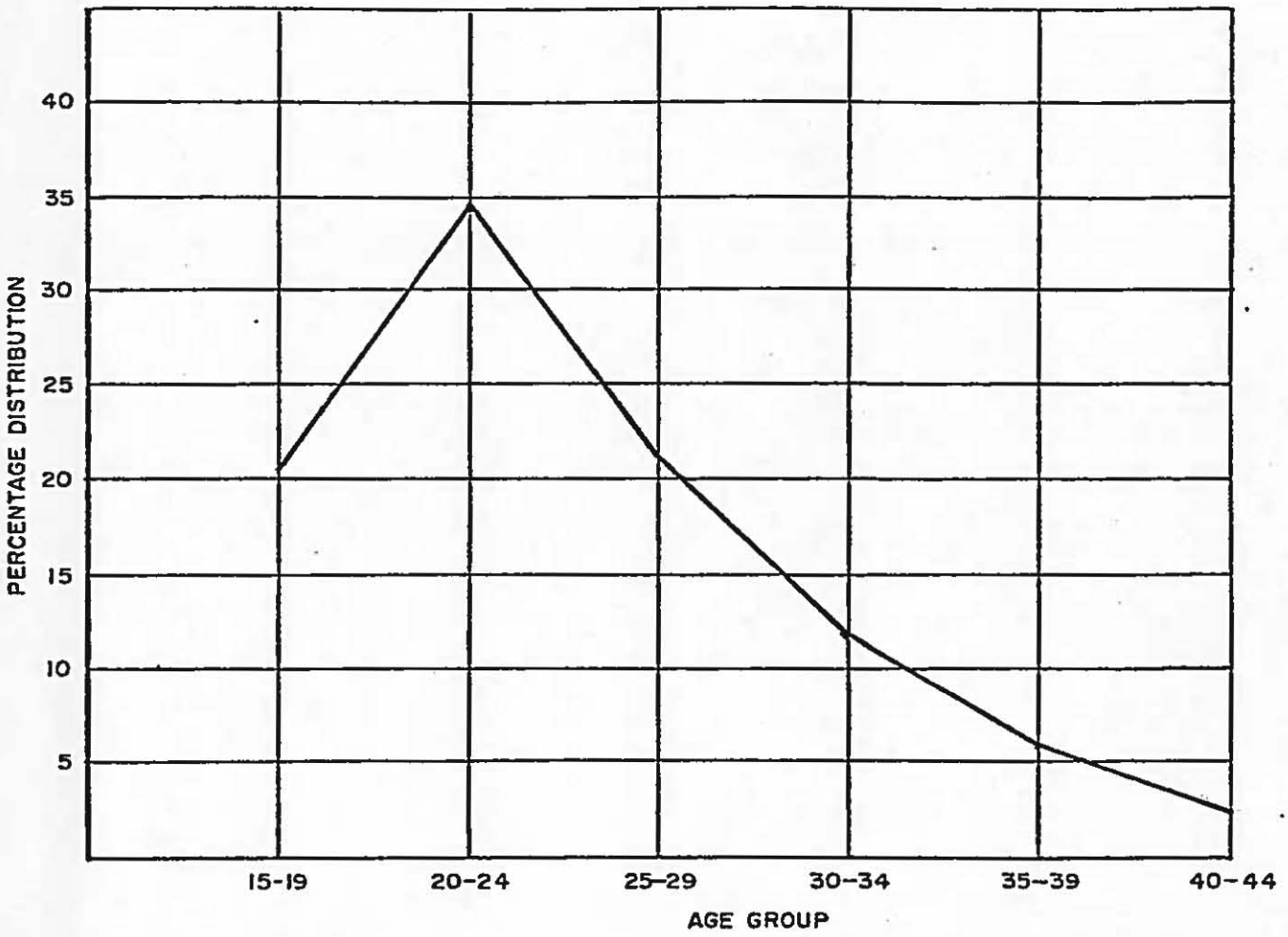
YEARS	GUAM TOTAL	GUAM SEX MALE	GUAM SEX FEMALE	U.S. TOTAL
1971	.583	.920	.193	.264
1972	.520	.783	.101	.270
1973	.601	.994	.150	.265
1974	.338	.508	.145	.220
1975	.434	.666	.168	.215
1976	.330	.596	.02	
1977	.465	.623	.287	
AVERAGE	.459	.709	.174	

SOURCE: STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS, DPHSS.

SOURCE: STATISTICAL ABSTRACTS OF THE U.S. 1975 & 1977, U.S. DEPT. OF COMMERCE.

FIGURE IV.9

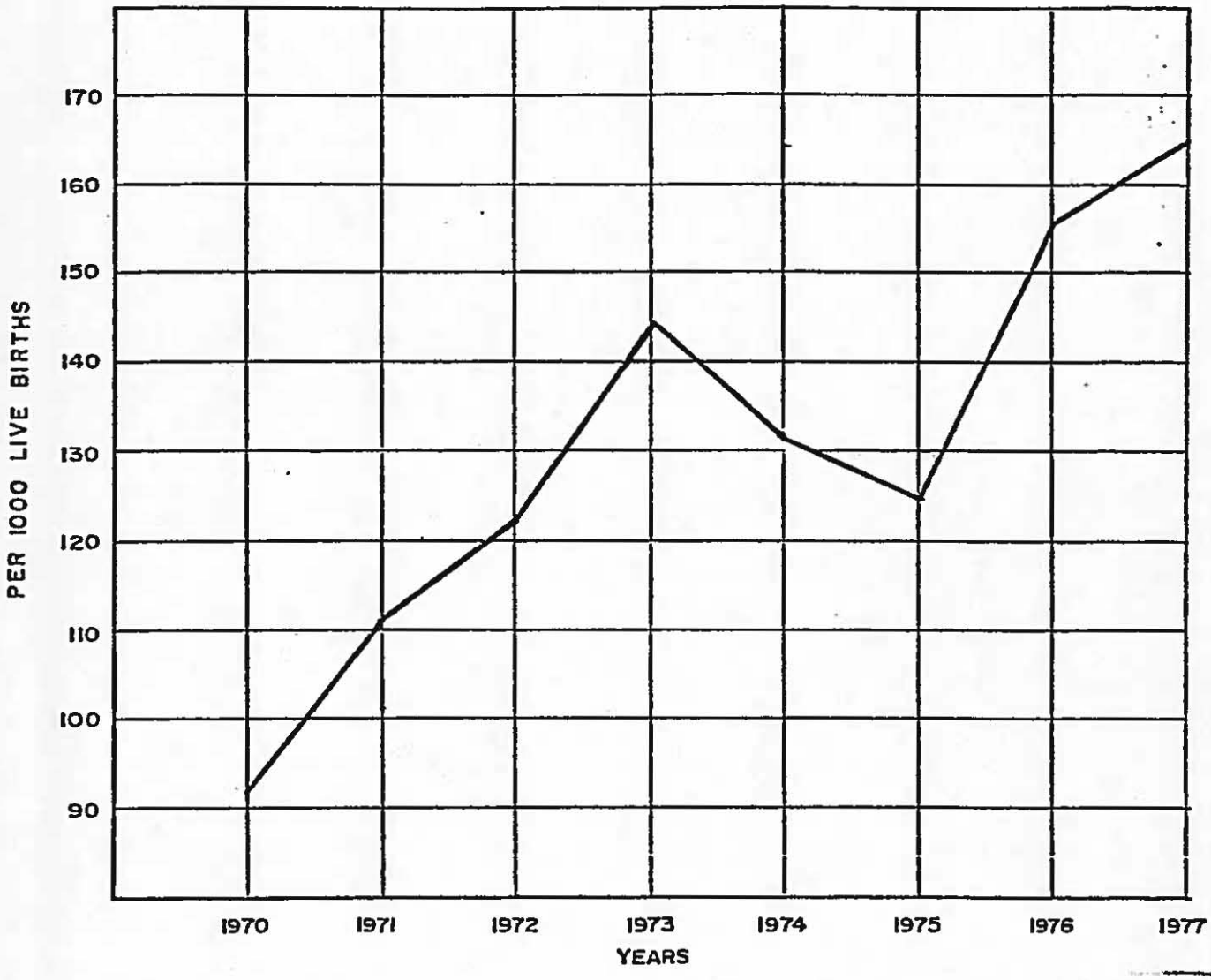
AVERAGE YEARLY PERCENTAGE DISTRIBUTION OF LOW BIRTH WEIGHT INFANTS BY AGE OF MOTHER (1970-77)



SOURCE: STATISTICAL REPORTS 1970-77, OFFICE OF VITAL STATISTICS, DPHSS.

FIGURE IV.10

ILLEGITIMACY RATIO
1970–1977



SOURCE: STATISTICAL REPORTS 1970-77, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV. 10

FREQUENCY DISTRIBUTION OF MOTOR VEHICLE ACCIDENT MORTALITY 1971-1977

YEAR	TOTAL	SEX		AGE GROUP													
				0 - 4		5 - 14		15 - 24		25 - 44		45 - 64		65 - 74		75/OVER	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1971	39	33	6	1	0	3	2	20	3	6	1	2	0	0	0	1	0
1972	36	29	7	0	0	1	1	10	3	14	3	4	0	0	0	0	0
1973	43	38	5	1	0	0	2	15	1	12	2	9	0	1	0	0	0
1974	25	20	5	0	1	2	0	4	1	10	3	3	0	1	0	1	0
1975	33	27	6	2	0	1	0	9	2	7	1	8	3	0	0	0	0
1976	26	25	1	0	0	2	0	6	0	16	1	1	0	0	0	0	0
1977	38	27	11	1	3	1	0	11	2	11	4	1	3	1	0	0	0
AVERAGE	34	28	6	1	.50	1.50	1	11	2	11	2	4	1	.50	0	.28	0

SOURCE: STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS, DPHSS

TABLE IV. 12

ACCIDENTAL ACCIDENTS MORTALITY RATE PER 1,000 POPULATION 1971-1977[a]

YEAR	TOTAL	SEX		AGE GROUP													
				0 - 4		5 - 14		15 - 24		25 - 44		45 - 64		65 - 74		75/OVER	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1971	.37	.61	.1	.39	0	.11	0	1.37	0	.61	0	.71	.65	0	0	0	3.86
1972	.52	.76	.25	0	.37	.23	.24	1.25	.15	1.17	0	1.14	.64	0	0	0	3.88
1973	.48	.84	.06	1.12	.11	0	0	.84	0	.75	.12	1.54	0	1.75	0	15.62	0
1974	.51	.63	.38	.58	.56	.11	.35	1.13	.15	.82	.35	.42	0	0	1.69	5.1	0
1975	.33	.47	.17	.13	.14	.11	0	.43	0	.62	.22	.82	.3	1.59	0	10.36	8.1
1976[b]	.32	.55	.05	0	0	0	0	1.24	0	.44	.22	1.39	0	0	0	9.76	0
1977	.26	.32	.18	.12	.13	.1	0	.4	.14	.52	.32	.19	0	2.91	0	0	0
AVERAGE	.4	.6	.27	.33	.19	.09	.08	.95	.06	.7	.18	.89	.23	.79	.24	5.83	2.26

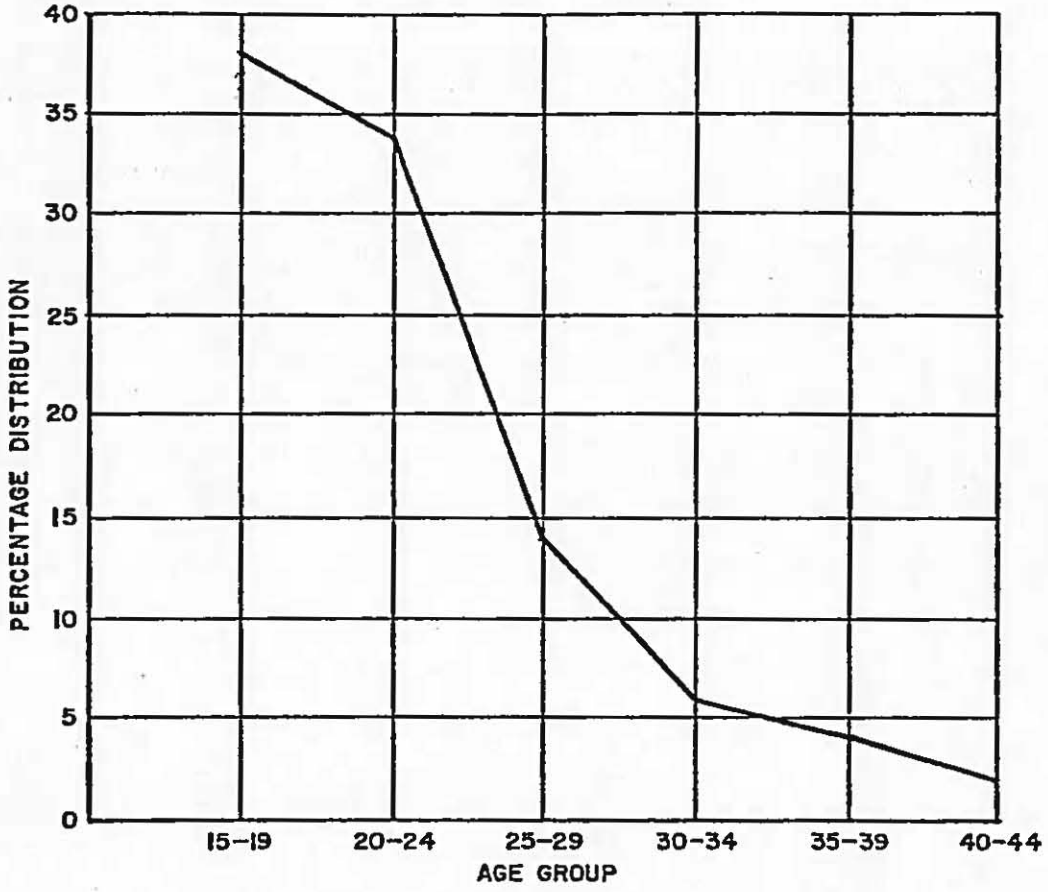
a) EXCLUDES ACCIDENTAL DEATHS DUE TO MOTOR VEHICLES, HOMICIDE, SUICIDE AND OTHER EXTERNAL CAUSES. RATIO ROUNDED TO NEAREST 1/100.

b) EXCLUDES AIRPLANE CRASH VICTIMS (46)

SOURCE: STATISTICAL RECORDS, 1971-77; OFFICE OF VITAL STATISTICS, DPHSS

FIGURE IV.11

AVERAGE YEARLY PERCENTAGE DISTRIBUTION OF ILLEGITIMATE LIVE BIRTHS BY AGE OF MOTHER (1970–1977)



SOURCE: STATISTICAL REPORTS, 1970–77, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV. 11

FREQUENCY DISTRIBUTION OF ACCIDENTAL ACCIDENTS MORTALITY 1971 - 1977 [a]

YEAR	TOTAL	SEX		AGE GROUP													
				0 - 4		5 - 14		15 - 24		25 - 44		45 - 64		65 - 74		75/OVER	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1971	25	22	3	2	0	1	0	10	0	6	0	3	2	0	0	0	1
1972	36	28	8	0	2	2	2	9	1	12	0	5	2	0	0	0	1
1973	34	32	2	7	1	0	0	6	0	8	1	7	0	1	0	3	0
1974	38	25	13	4	5	1	3	8	1	9	3	2	0	0	1	1	0
1975	25	19	6	1	1	1	0	3	0	7	2	4	1	1	0	2	2
1976 [b]	25	23	2	0	0	0	0	9	0	5	2	7	0	0	0	2	0
1977	21	14	7	1	3	1	0	3	1	6	3	1	0	2	0	0	0
AVERAGE	29	23	6	2	2	1	1	7	.5	7	1	4	1	.5	.0	1	.5

a) EXCLUDES ACCIDENTAL DEATHS DUE TO MOTOR VEHICLES, HOMICIDE, SUICIDE, AND OTHER EXTERNAL CAUSES.

b) EXCLUDES AIRPLANE CRASH VICTIMS (46)

SOURCE: STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS, DPHSS

TABLE IV. 14

ACCIDENTAL ACCIDENTS MORTALITY RATIO BY AGE GROUP PER 100 TOTAL DEATHS BY AGE 1971-1977 [a]

YEAR	AGE GROUP													
	0 - 4		5 - 14		15 - 24		25 - 44		45 - 64		65 - 74		75/OVER	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1971	4.26	0	20	0	25	0	18.75	0	4.76	6.25	0	0	0	4
1972	0	6.9	25	40	33.33	9.09	23.53	0	6.25	5	0	0	0	2.7
1973	14.8	2.78	0	0	19.35	0	20	6.25	7.61	0	3.45	0	12.5	0
1974	8.7	12.82	25	75	30.77	10	18.75	17.64	2.6	0	0	3.85	3.7	0
1975	2.56	2.86	25	0	9.37	0	17.07	16.67	3.57	2.56	3.03	0	7.14	5.88
1976 [b]	0	0	0	0	30	0	10.42	20	8.33	0	0	0	6.9	0
1977	4.17	12	20	0	8.57	14.28	15	15.79	1.15	0	6.25	0	0	0
AVERAGE	4.93	5.34	16.43	16.43	22.34	4.77	17.65	10.9	4.9	1.26	1.82	.55	4.32	1.8

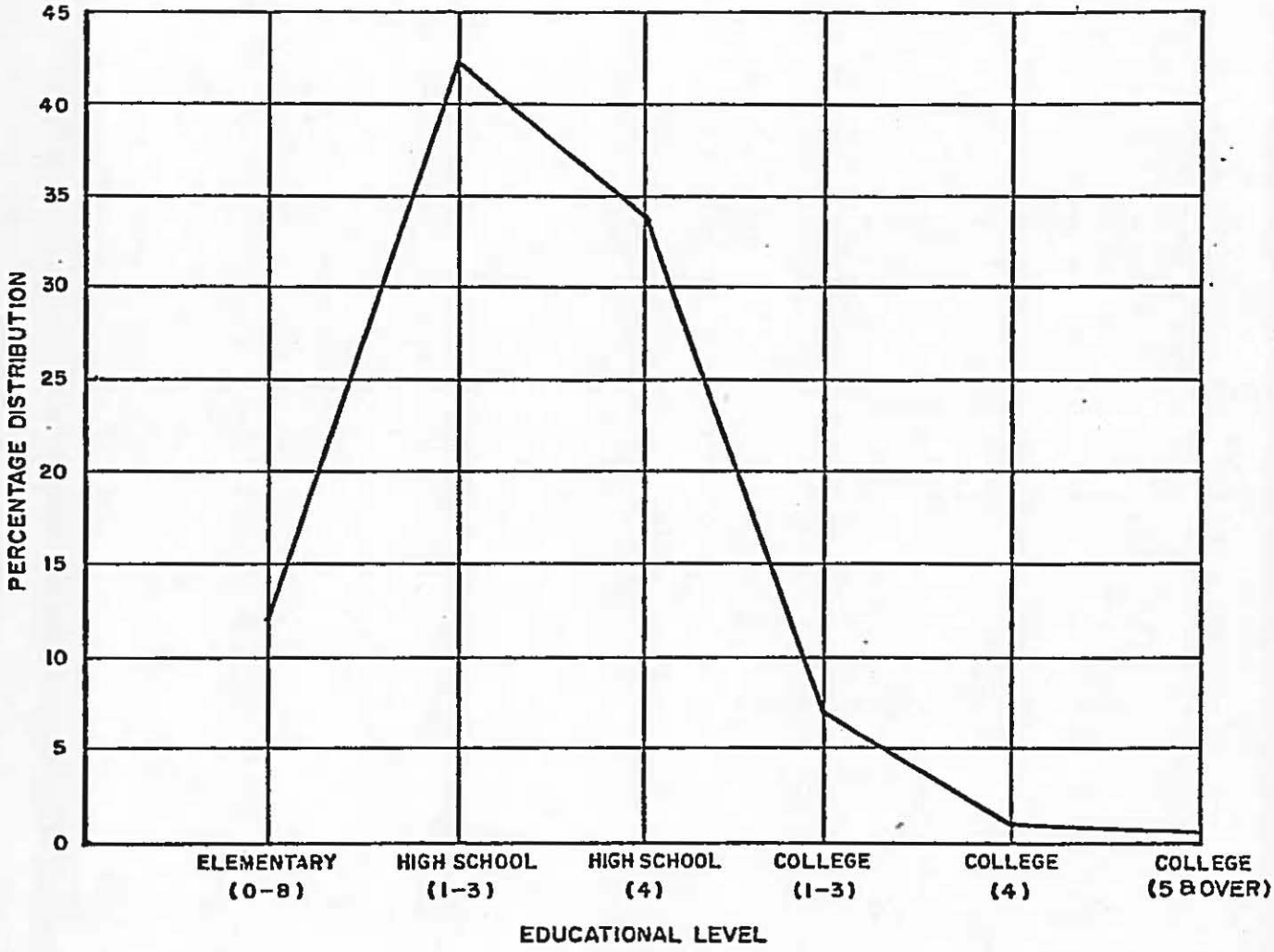
a) EXCLUDES ACCIDENTAL DEATHS DUE TO MOTOR VEHICLES, HOMICIDE, SUICIDE AND OTHER EXTERNAL CAUSES.

b) EXCLUDES PLANE CRASH VICTIMS (- IN ACCIDENT RATE & PER 100 CALCULATIONS.

SOURCE: STATISTICAL REPORTS, 1971-77; OFFICE OF VITAL STATISTICS, DPHSS

FIGURE IV.12

AVERAGE YEARLY PERCENTAGE DISTRIBUTION OF ILLEGITIMATE LIVE BIRTHS BY EDUCATION OF MOTHER



SOURCE: STATISTICAL REPORTS 1970-77, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV.13

ACCIDENTAL ACCIDENTS MORTALITY RATIO PER 100 TOTAL DEATHS[a]

1971 - 1977

YEARS	TOTAL	SEX	
		MALE	FEMALE
1971	6.87	9.02	2.5
1972	8.8	11.52	4.82
1973	7.81	11.98	1.2
1974	8.46	9.29	7.22
1975	5.67	6.55	3.97
1976[b]	5.95	7.64	1.44
1977	5.53	5.76	5.10
AVERAGE	7	9	4

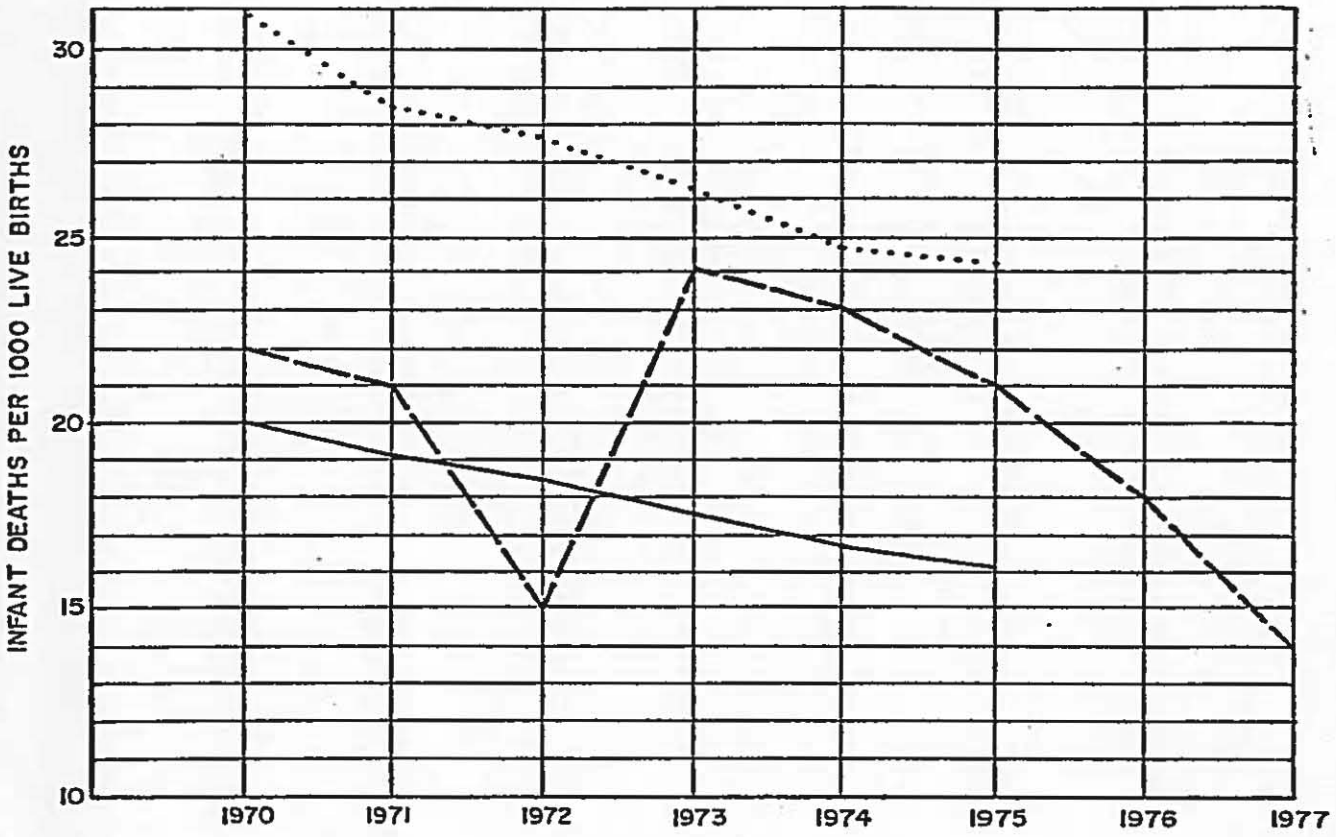
a. EXCLUDES ACCIDENTAL DEATHS DUE TO MOTOR VEHICLES, HOMICIDE, SUICIDE AND ALL OTHER EXTERNAL CAUSES.

b. EXCLUDES AIRPLANE CRASH VICTIMS (46)

SOURCE: STATISTICAL REPORTS, 1971 - 1977; OFFICE OF VITAL STATISTICS, DPHSS

FIGURE IV.13

INFANT MORTALITY RATES :1970-1977



..... = U.S., ALL OTHERS EXCEPT WHITE.

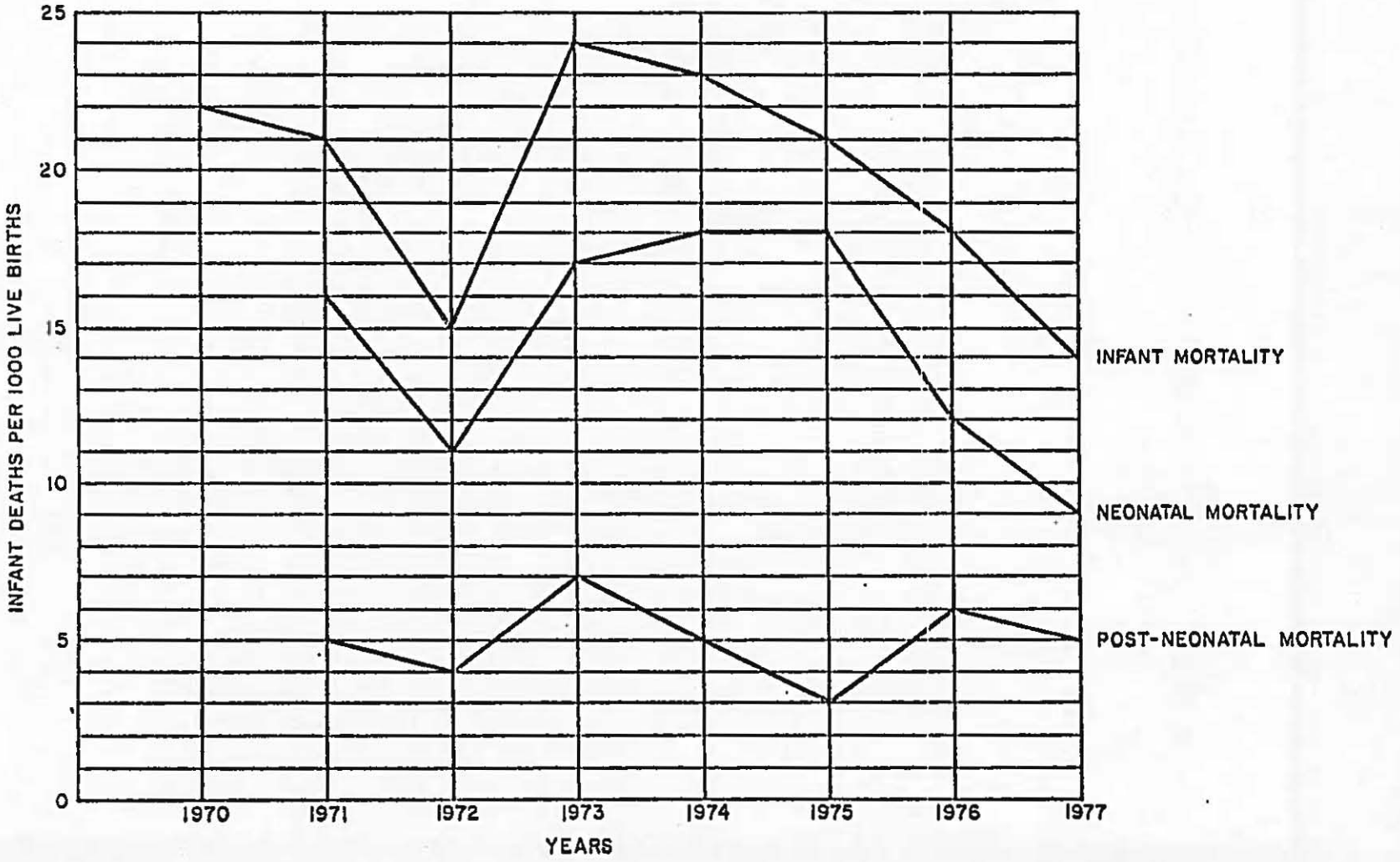
——— = GUAM.

——— = U.S., ALL RACES.

SOURCE: HEALTH UNITED STATES 1976-1977, U.S. DHEW.
STATISTICAL REPORTS 1970-77, OFFICE OF VITAL STATISTICS, DPHSS.

FIGURE IV.14

GUAM INFANT MORTALITY RATES: 1970-77
NEONATAL AND POST-NEONATAL



SOURCE: STATISTICAL REPORTS 1970-77, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV.15

HEART DISEASE MORTALITY RATES, GUAM - U.S.
1971 - 1977

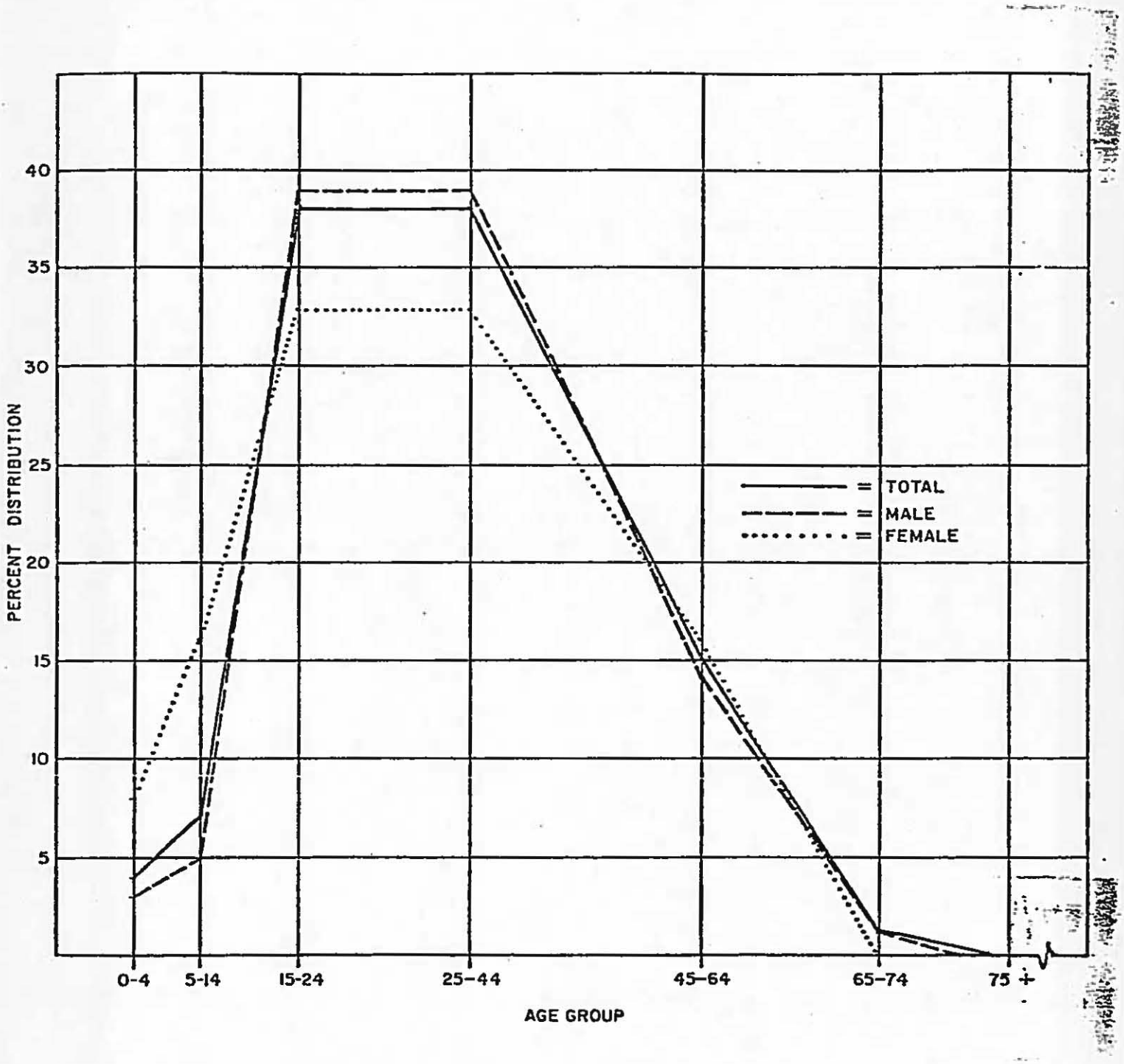
YEARS	GUAM	U.S.
1971	.77	3.6
1972	1	3.6
1973	.9	3.6
1974	1.1	3.5
1975	1.3	3.3
1976	1.2	N/A
1977	.9	N/A

SOURCE: STATISTICAL REPORT 1971-77, OFFICE OF VITAL STATISTICS, DPHSS

SOURCE: STATISTICAL ABSTRACT OF THE U.S. 1977, U.S. DEPT. OF COMMERCE

FIGURE IV.15

AVERAGE YEARLY PERCENTAGE DISTRIBUTION
OF MOTOR VEHICLE ACCIDENT DEATHS
BY AGE GROUP AND SEX 1971-1977



SOURCE: STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV.16

HEART DISEASE MORTALITY RATES BY SEX AND AGE
1971 - 1977

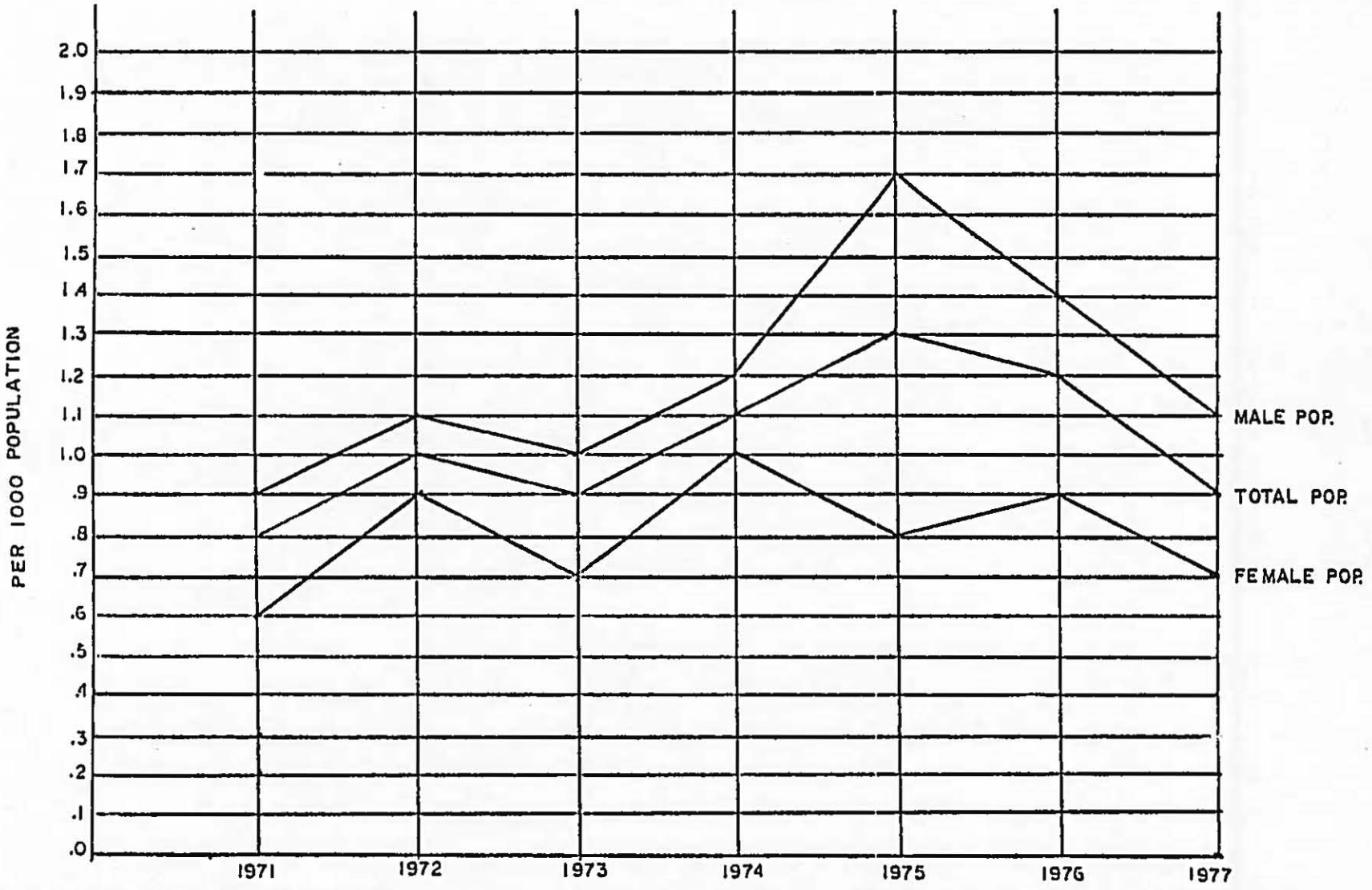
AGE GROUP

YEARS	TOTAL		UNDER - 1		1 - 4		5 - 14		15 - 24		25 - 44		45 - 64		65 - 74		75 OVER	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1971	.9	.6	1	0	0	0	0	0	0	2	1	0	4.5	2	19.5	8.8	16.3	23.2
1972	1.1	.9	0	0	0	.2	0	0	.1	.2	.4	.3	3.9	2.6	24	12.2	31.9	27.1
1973	1	.7	0	0	.2	0	0	0	0	0	.2	.1	4.2	2.2	14	6.8	41.7	42.8
1974	1.2	1	.7	1.5	0	0	0	0	0	0	.5	.3	4.5	2.7	13.3	15.1	61.2	43
1975	1.7	.8	.7	0	0	0	0	0	.4	0	.7	.2	7	2.7	17.5	13.4	51.8	40.5
1976	1.4	.9	0	0	.2	.2	0	.1	.3	0	.5	.2	4.6	3.5	27.4	15.1	43.90	34.90
1977	1.1	.7	0	0	0	0	0	0	0	0	.6	.3	5.2	1.7	10.2	8.2	22.2	37.8
YEARLY AVERAGES	1.2	.8	.3	.2	.05	.05	0	.01	.11	.33	.55	.27	4.8	2.5	17.9	11.4	38.4	35.6

SOURCE: STATISTICAL REPORTS 1971-1977, OFFICE OF VITAL STATISTICS, DPHSS

FIGURE IV.16

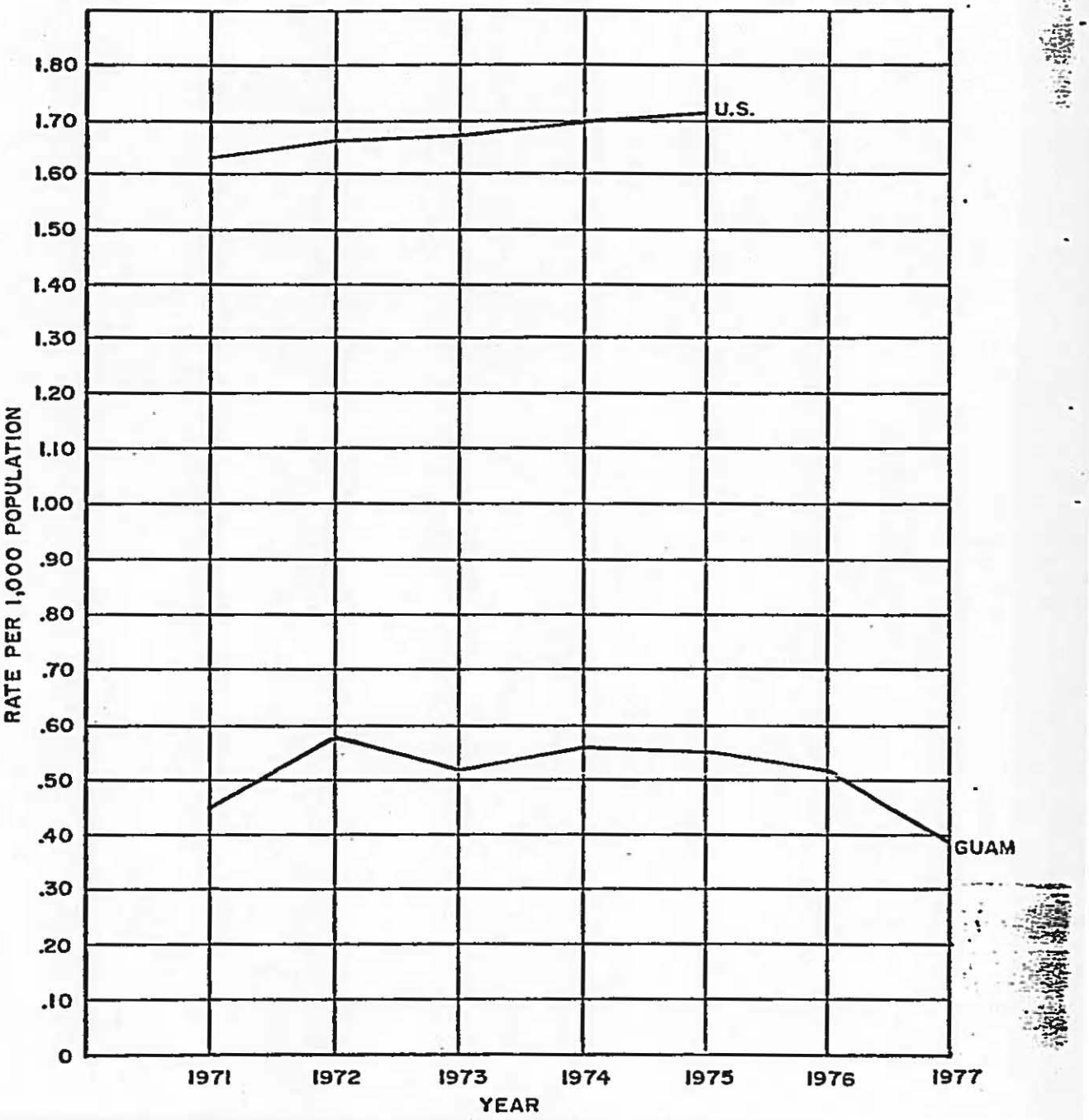
GUAM HEART DISEASE MORTALITY RATES: 1971-1977



SOURCE: STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS, DPHSS

FIGURE IV.17

NEOPLASM MORTALITY RATES, GUAM - U.S.
1971–1977



SOURCES: STATISTICAL ABSTRACT OF THE U.S., 1977 U.S. DEPT. OF COMMERCE.
STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV.17

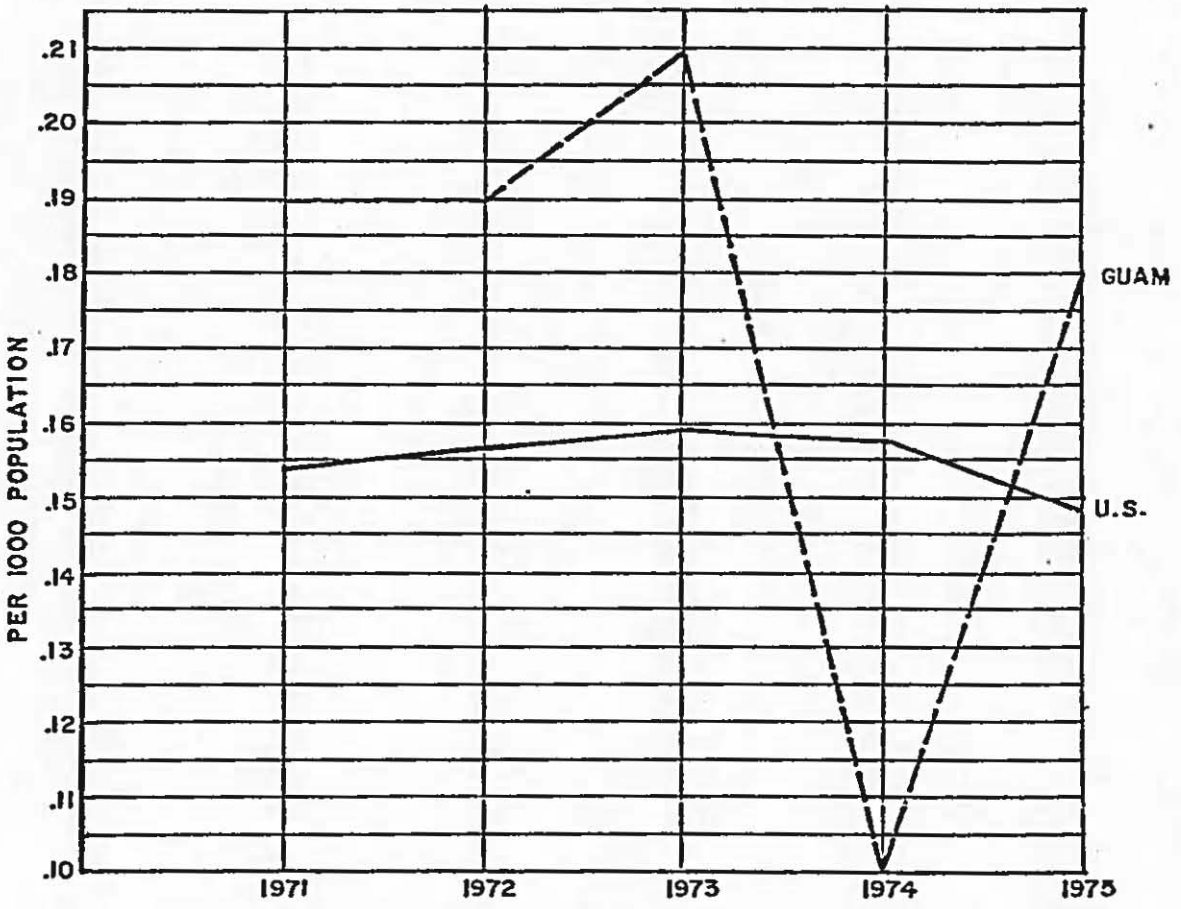
FREQUENCY DISTRIBUTION OF HEART DISEASE MORTALITY
1971 - 1977

YEARS	TOTAL	MALE	FEMALE	UNDER 1		1 - 4		5 - 14		15 - 24		25 - 44		45 - 64		65 - 74		75 OVER	
				M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1971	52	34	18	1	0	0	0	0	0	0	1	1	0	19	6	10	5	3	6
1972	71	41	30	0	0	0	1	0	0	1	1	4	6	17	8	13	7	6	7
1973	61	38	23	0	0	1	0	0	0	0	0	2	1	19	7	8	4	8	11
1974	82	48	34	1	2	0	0	0	0	0	0	6	3	21	9	8	9	12	11
1975	96	67	29	1	0	0	0	0	0	3	0	8	2	34	9	11	8	10	10
1976	93	59	34	0	0	1	1	0	1	2	0	6	2	23	12	18	9	9	9
1977	71	46	25	0	0	0	0	0	0	0	0	7	3	27	6	7	5	5	11
YEARLY AVERAGES	75	47	28	.42	.28	.28	.28	.14	.14	.85	.28	4.8	2.42	23	8.14	10.71	6.7	7.57	9.28

SOURCE: STATISTICAL REPORTS 1971-1977, OFFICE OF VITAL STATISTICS, DPHSS.

FIGURE IV.18

GUAM - U.S., CIRRHOSIS OF THE LIVER MORTALITY RATES
1971 — 1975



SOURCE: STATISTICAL REPORTS 1971-1975, OFFICE OF VITAL STATISTICS, DPHSS.
STATISTICAL ABSTRACT OF THE UNITED STATES, 1977, U.S. BUREAU OF THE CENSUS.

NEOPLASM MORTALITY RATES 1971-1977

ARS	TOTAL	MALE	FEMALE	0 - 4		5 - 14		15 - 24		25 - 44		45 - 64		64 - 74		75/OVER	
				M	F	M	F	M	F	M	F	M	F	M	F	M	F
1971	.45	.56	.32	0	0	0	0	.137	.156	.406	.13	1.66	1.3	9.7	5.3	16.3	3.86
1972	.58	.67	.48	0	0	.227	0	0	.308	.391	.125	2.287	2.23	11.07	5.2	15.95	7.75
1973	.52	.50	.54	0	.166	0	.119	.280	0	0	.120	1.98	3.42	8.75	3.41	15.62	7.73
1974	.56	.66	.46	0	.152	0	.118	.425	.151	.091	.230	1.69	3.35	11.66	6.71	0	11.71
1975	.55	.47	.64	0	.14	0	0	.143	0	0	0	3.48	1.78	3.18	6.7	31.03	2024
1976	.52	.56	.35	0	0	0	0	.137	0	.174	.216	1.98	.68	18.26	10.05	14.63	7.75
1977	.39	.57	.26	0	0	0	0	0	0	.086	.316	2.3	.55	10.2	5.02	9.21	7.43
YEARLY AVERAGES	.50	.57	.43	0	.065	.032	.033	.16	.087	.164	.162	2.19	1.92	10.4	6.05	14.88	9.5

SOURCE: STATISTICAL REPORTS 1971-1977, OFFICE OF VITAL STATISTICS, DPHSS

TABLE IV.22

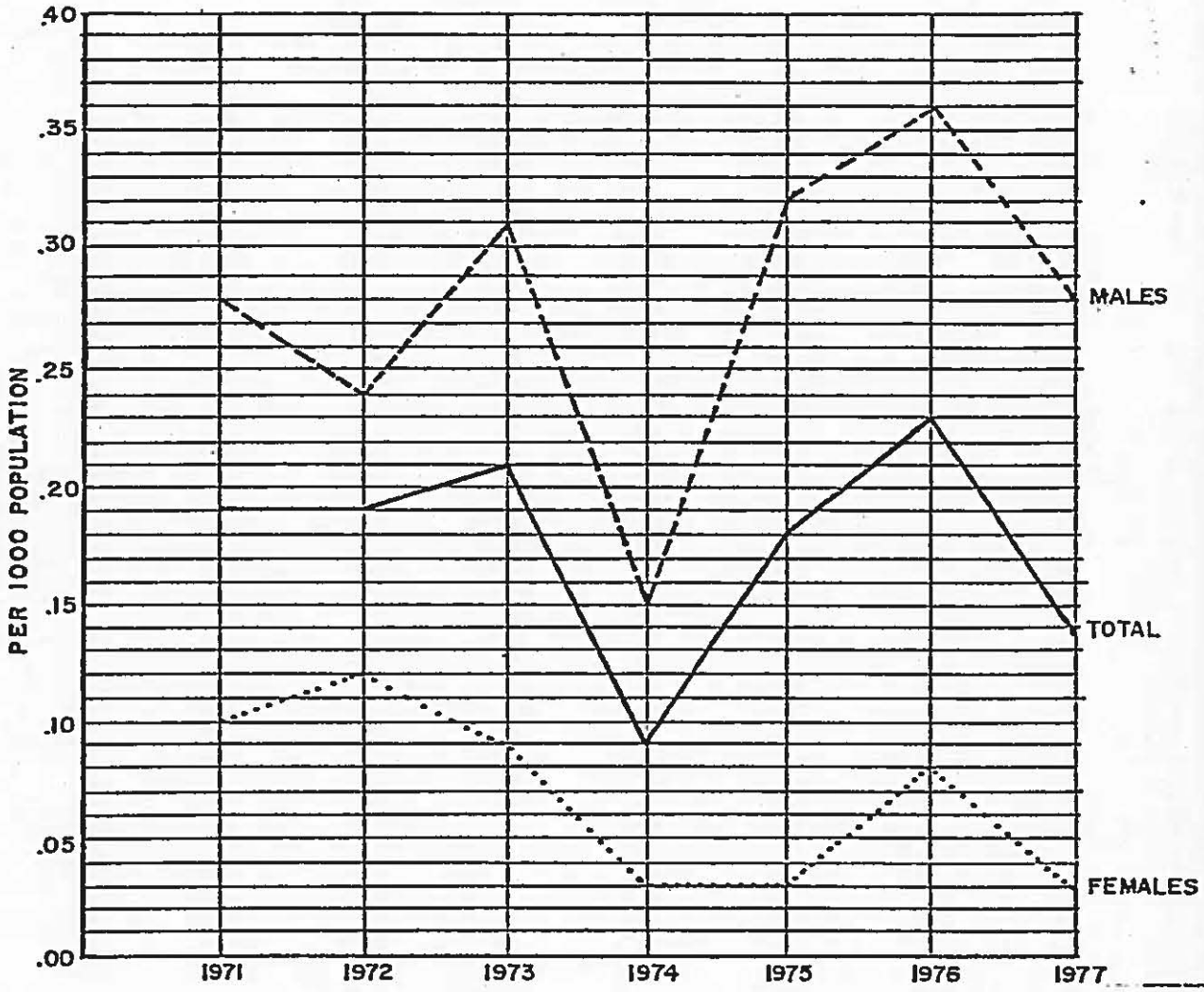
NEOPLASM MORTALITY RATIO PER 100
TOTAL MALE AND FEMALE DEATHS:
1971-1977

YEAR	TOTAL	SEX	
		MALE	FEMALE
1971	8.2	8.2	8.0
1972	9.8	10.3	9.0
1973	8.5	7.1	10.8
1974	9.3	7.0	12.8
1975	9.5	8.9	10.4
1976	9.7	9.3	9.3
1977	8.4	9.0	7.3
YEARLY AVERAGES	9.0	8.6	9.7

SOURCE: STATISTICAL REPORTS 1971-77, OFFICE VITAL STATISTICS, DPHSS

FIGURE IV.19

GUAM CIRRHOSIS OF THE LIVER MORTALITY
RATES: 1971-1977



SOURCE: STATISTICAL REPORTS, 1971-1977; OFFICE OF VITAL STATISTICS, DPHSS

TABLE IV.20

SITE SPECIFIC NEOPLASM MORTALITY RATES 1971 - 1976

SPECIFIC NEOPLASM SITE	YEARS						YEARLY AVERAGES
	1971	1972	1973	1974	1975	1976	
BUCCAL CAVITY AND PHARYNX	.01	.07	.01	.04	0	.04	.03
DIGESTIVE ORGANS AND PERITONEUM	.12	.09	.07	.11	.14	.16	.11
RESPIRATORY SYSTEMS	.12	.19	.14	.15	.16	.13	.15
BONE, CONNECTIVE TISSUE, SKIN & BREAST	.07	.03	0	.08	.08	.08	.05
GENITOURINARY ORGANS	.06	.04	.08	.04	.04	.05	.05
LYMPHATIC AND HEMATOPOIETIC TISSUE	.04	.1	.1	.08	.03	.01	.06
OTHERS AND UNSPECIFIED SITES	.01	.04	.1	.05	.1	.04	.06

OURCE: STATISTICAL REPORTS 1971-1976, OFFICE OF VITAL STATISTICS, DPHSS

TABLE IV.10

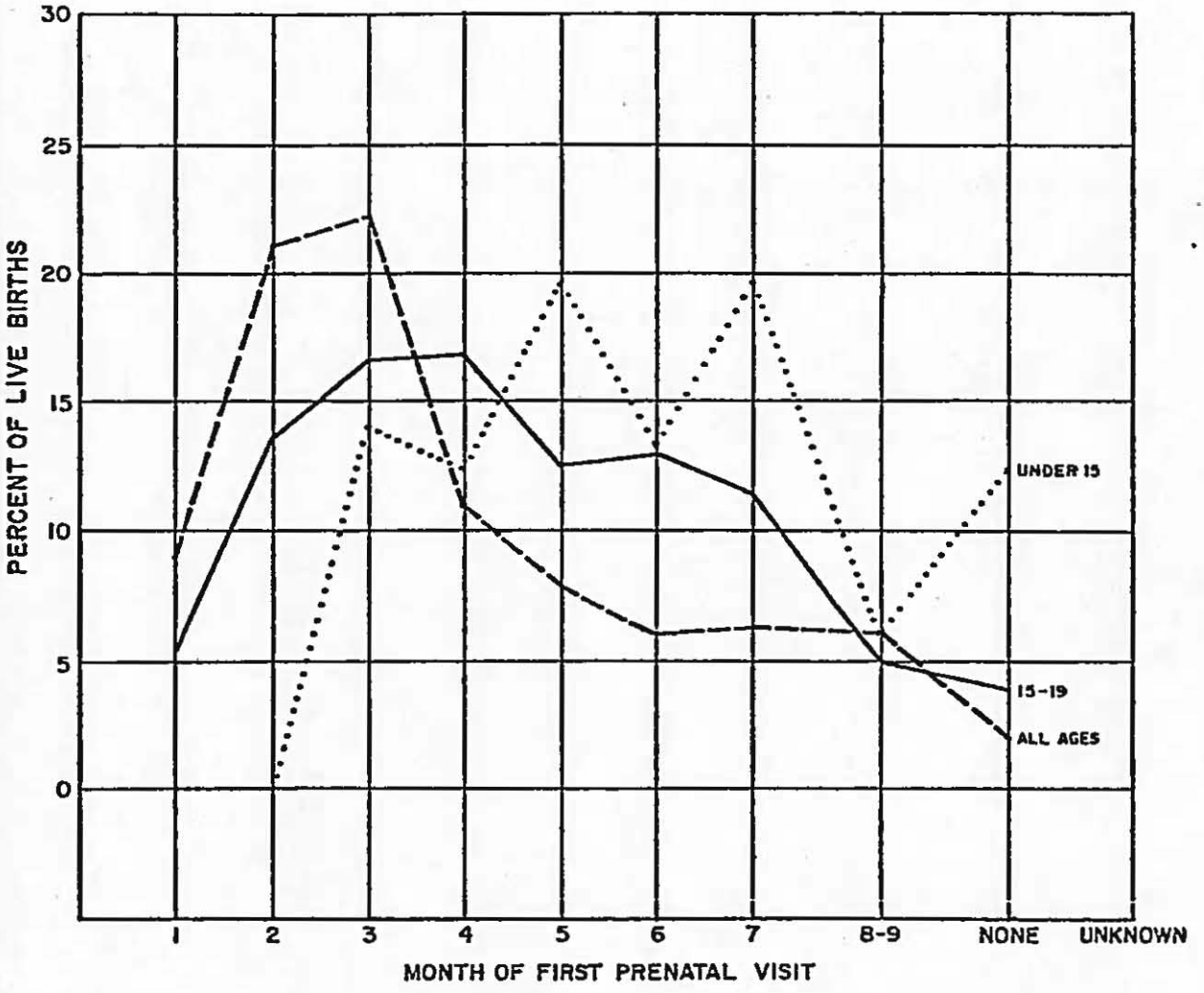
HEART DISEASE MORBIDITY STATISTICS 1973-1976

EARS	REPORTED CASES PER 1000 POPULATION	REPORTED CASES PER/1000 POPULATION										% DISTRIBUTION BY ETHNICITY FREQUENCY			
		SEX		AGE GROUP											
		M	F	UNDER 1	1-4	5-14	15-24	25-44	45-64	65-74	75 OVER	GUAMANIAN	FILIPINO	WHITE	OTHERS
1973	10	10	10	0	0	1	2	5	55	193	24	77	11	10	2
1974	10	10	11	0	1	0	1	6	41	123	301	74	12	8	6
1975	13	12	14	0	0	1	1	7	48	180	395	73	11	8	7
1976	13	12	15	0	0	1	3	6	49	195	343	74	14	9	3
YEARLY VERAGES	11.5	11	12.5	0	0	.75	1.75	6	48	173	346	75	12	9	4

OURCE: GUAM MEMORIAL HOSPITAL.

FIGURE IV.20

AVERAGE PERCENT OF LIVE BIRTHS BY AGE OF MOTHER
AND FIRST PRENATAL VISIT 1976 AND 1977 *

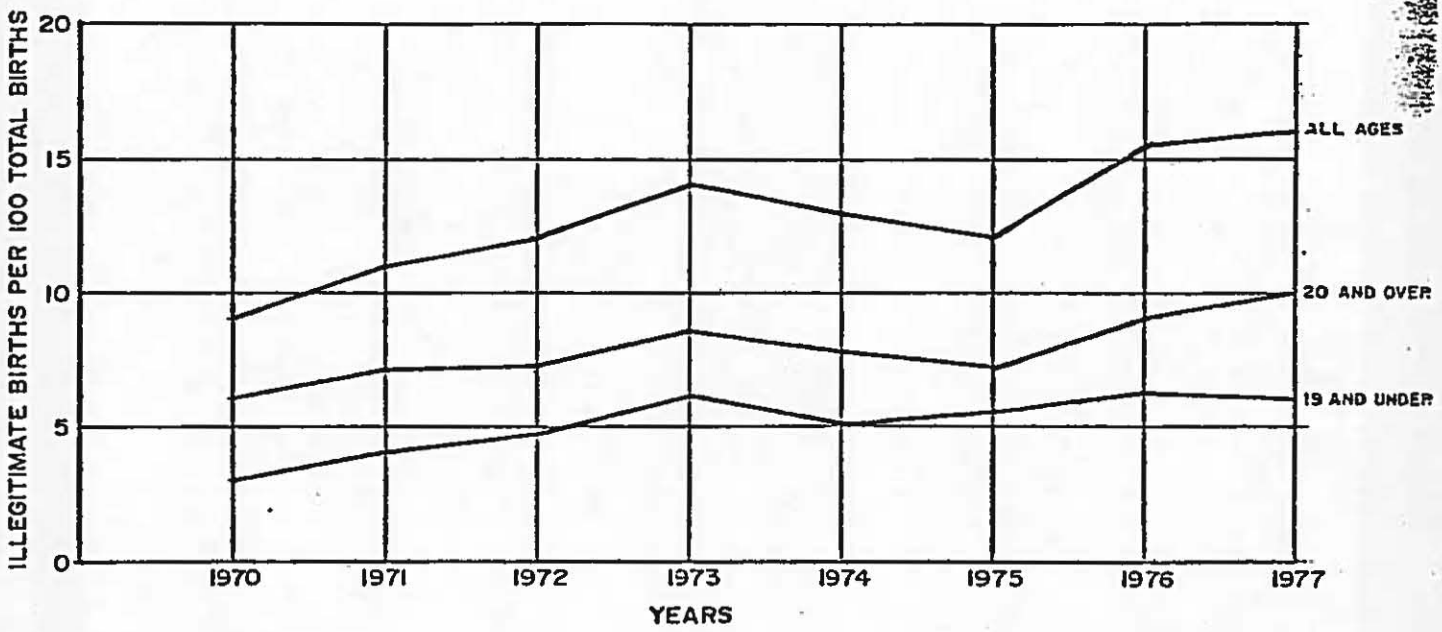


* = DATA IS AVAILABLE ONLY FOR THESE YEARS.

SOURCE: STATISTICAL REPORTS 1976-77, OFFICE OF VITAL STATISTICS, DPHSS.

FIGURE IV.20

ILLEGITIMATE BIRTH RATIO PER 100 TOTAL
LIVE BIRTHS BY AGE OF MOTHER
1970–1977



1970–77 AVERAGES

ALL AGES = 13.05/100
20 AND OVER = 7.86/100
19 AND UNDER = 5.8/100

SOURCE: STATISTICAL REPORTS 1970–77, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV.21

FREQUENCY DISTRIBUTION OF NEOPLASM MORTALITY
1971-1977

YEARS	TOTAL	MALE	FEMALE	0 - 4		5 - 14		15 - 24		25 - 44		45 - 64		65 - 74		75 +	
				M	F	M	F	M	F	M	F	M	F	M	F	M	F
1971	30	20	10	0	0	0	0	1	1	4	1	7	4	5	3	3	1
1972	40	25	15	0	0	2	0	0	2	4	1	10	7	6	3	3	2
1973	37	19	18	0	1	0	1	2	0	0	1	9	11	5	2	3	2
1974	42	26	16	0	1	0	1	3	1	1	2	8	11	7	4	0	3
1975	42	19	23	0	1	0	0	1	0	0	0	17	6	2	4	6	5
1976	41	28	13	0	0	0	0	1	0	2	2	10	3	13	6	3	2
1977	32	22	10	0	0	0	0	0	0	1	3	12	2	7	3	2	2
YEARLY AVERAGES	37	22.7	15	0	.42	.28	.28	1.57	.57	1.7	1.4	10.4	6.28	6.4	3.57	2.86	2.4

SOURCE: STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV.23

NEOPLASM MORBIDITY

AGE GROUP	1972	1973	1974	1975	AVERAGES
1 — 10	25	16	18	13	18
11 — 20	31	15	18	19	21
21 — 30	61	52	50	50	53
31 — 40	67	39	71	57	58
41 — 50	91	59	91	90	83
51 — 60	53	49	59	60	55
61 — 70	49	46	42	43	45
71 — 80	9	10	14	36	17
81 +	—	3	4	14	5
TOTAL CASES	386	289	367	382	356
RACE:					
GUAMANIAN	226	166	207	224	206
FILIPINO	81	70	76	73	75
MICRONESIAN	13	4	12	21	12
ASIAN	5	4	14	11	8
CAUCASIAN	61	45	58	53	54
GUAM:					
INCIDENCE RATE (PER 1000 POPULATION)	5.6	4.0	5.0	5.0	4.9
DISABILITY DAYS		2889	2921	3129	2978
DISABILITY DAYS/PERSON		10.0	7.9	8.2	6.8

SOURCE: GUAM MEMORIAL HOSPITAL.

CEREBROVASCULAR MORALITY RATES PER 1000 POPULATION:
1971 - 1977

YEARS	TOTAL	MALE	FEMALE	UNDER 14		15 - 24		25 - 44		45 - 64		65 - 74		75 - OVER	
				M	F	M	F	M	F	M	F	M	F	M	F
1971	.45	.47	.42	0	.08	.14	0	.31	0	1.43	.33	9.75	10.60	10.87	19.31
1972	.36	.27	.47	0	0	.14	.15	.20	.25	.69	1.28	0	1.74	21.28	23.26
1973	.52	.50	.54	0	0	0	0	.38	.24	2.20	1.56	3.50	5.12	15.63	31.13
1974	.35	.36	.35	0	.07	0	0	0	.12	1.70	1.22	3.33	3.36	20.41	15.63
1975	.30	.27	.34	0	0	0	0	.09	0	1.02	.89	4.78	6.70	10.33	20.24
1976	.27	.21	.32	0	0	0	0	.09	.11	.40	1.44	6.09	1.68	9.76	19.38
1977	.32	.30	.34	0	0	0	0	.09	0	2.11	1.67	0	6.70	4.61	11.15
AVG. 1971-77	.36	.33	.40	0	.02	.04	.02	.17	.10	1.36	1.20	3.92	5.13	13.27	20.01

SOURCE: STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS, DPHSS

TABLE IV.26

FREQUENCY DISTRIBUTION OF CEREBROVASCULAR MORTALITY
1971-1977

YEARS	TOTAL	SEX		UNDER 14		15 - 24		25 - 44		45 - 64		65 - 74		75 - OVER	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F
1971	30	17	13	0	1	1	0	3	0	6	1	5	6	2	5
1972	25	10	15	0	0	1	1	2	2	3	4	0	1	4	6
1973	37	19	18	0	0	0	0	4	2	10	5	2	3	3	8
1974	26	14	12	0	1	0	0	0	1	8	4	2	2	4	4
1975	23	11	12	0	0	0	0	1	0	5	3	3	4	2	5
1976	21	9	12	0	0	0	0	1	1	2	5	4	1	2	5
1977	26	13	13	0	0	0	0	1	0	11	6	0	4	1	3
AVG. 1971-77	26.86	13.29	13.57	0	.29	.29	.14	1.71	.86	6.43	4.00	2.29	3.00	2.57	5.14

SOURCE: STATISTICAL REPORTS: 1971-1977, OFFICE OF VITAL STATISTICS, DPHSS

TABLE IV.27

DISEASES OF THE CENTRAL NERVOUS SYSTEM MORTALITY RATIO PER 100 TOTAL DEATHS
1971—1977

YEAR	TOTAL	SEX	
		M	F
1971	2.75	1.64	5
1972	2.44	3.7	.6
1973	5.06	3.37	7.78
1974	6.01	7.81	3.33
1975	4.76	4.14	5.96
1976	4.52	4.32	4.32
1977	5.26	4.53	6.57
AVERAGE	4.4	4.21	4.79

SOURCE: STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV.28

FREQUENCY DISTRIBUTION OF DISEASES OF THE CENTRAL NERVOUS SYSTEM MORTALITY
1971—1977

YEAR	TOTAL	SEX		AGE GROUP													
				0 – 4		5 – 14		15 – 24		25 – 44		45 – 64		65 – 74		75/OVER	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1971	10	4	6	0	0	0	0	0	0	0	0	1	6	1	0	2	0
1972	10	9	1	0	0	0	0	0	0	1	0	7	1	1	0	0	0
1973	22	9	13	0	0	0	0	0	0	0	4	8	5	1	4	0	0
1974	27	21	6	0	0	0	0	0	0	0	0	14	4	7	2	0	0
1975	21	12	9	0	0	0	0	1	0	0	0	8	5	3	2	0	2
1976	19	13	6	0	0	0	0	0	0	0	0	10	4	3	1	–	1
1977	20	11	9	0	0	0	0	0	0	0	2	6	2	5	3	0	2
AVERAGE	18.4	11.2	7.1	0	0	0	0	.14	0	.14	.85	7.7	3.8	.3	1.7	.28	.71

SOURCE: STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS, DPHSS.

FREQUENCY DISTRIBUTION OF CIRRHOSIS OF THE LIVER MORTALITY
1971—1977

YEAR	TOTAL	SEX		AGE GROUP											
				UNDER 14		15 —24		25—44		45-64		65-74		75/OVER	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F
1971	13	10[a]	3	0	0	0	0	0	1	8	2	1	0	0	0
1972	13	9	4	0	0	0	0	2	1	7	2	0	1	0	0
1973	15	12	3	0	0	0	0	4	1	7	1	1	1	0	0
1974	7	6	1	0	0	0	0	1	0	4	1	1	0	0	0
1975	14	13	1	0	0	1	0	1	0	9	1	2	0	0	0
1976	18	15	3	0	0	0	0	4	0	9	2	1	1	1.	0
1977	13	12	1	0	0	0	0	1	0	11	1	0	0	0	0
AVERAGE	13,29	11	2.29	0	0	.14	0	1.86	.43	7.86	1.43	.86	.43	.14	0

a) INCLUDES 1 DEATH WITH AGE UNKNOWN

SOURCE: STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV.32

CIRRHOSIS OF THE LIVER MORTALITY RATES PER 1000 POPULATION
1971—1977

YEAR	TOTAL	SEX		AGE GROUP											
				UNDER 14		15—24		25—44		45—64		65—74		75/OVER	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F
1971	.19	.28[a]	.10	0	0	0	0	0	.13	1.91	.65	1.95	0	0	0
1972	.19	.24	.12	0	0	0	0	.20	.13	1.60	.64	0	1.74	0	0
1973	.21	.31	.09	0	0	0	0	.38	.12	1.54	.31	1.75	1.71	0	0
1974	.09	.15	.03	0	0	0	0	.09	0	.85	.30	1.65	0	0	0
1975	.18	.32	.03	0	0	.14	0	.09	0	1.84	.30	3.18	0	0	0
1976	.23	.36	.08	0	0	0	0	.35	0	1.79	.58	1.52	1.68	4.88	0
1977	.16	.28	.03	0	0	0	0	.09	0	2.11	.28	0	0	0	0
AVERAGE	.18	.28	.07	0	0	.02	0	.17	.05	1.66	.44	1.44	.73	.70	0

a) INCLUDES 1 DEATH WITH AGE UNKNOWN.

SOURCE: STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV.33

GUAM-U.S. DIABETES MORTALITY RATES:
1971-1975

YEAR	U.S.	GUAM
1971	.19	.10
1972	.19	.23
1973	.18	.22
1974	.18	.11
1975	.17	.08
YEARLY AVERAGES	.18	.15

SOURCE: STATISTICAL REPORTS 1971-75, OFFICE OF VITAL STATISTICS, DPHSS
"PROVISIONAL STATISTICS: ANNUAL SUMMARY FOR THE U.S. 1975"

TABLE IV.35

DIABETES MORTALITY RATES
1971-1977

YEARS	TOTAL	SEX	
		MALE	FEMALE
1971	.10	.11	.10
1972	.23	.19	.28
1973	.22	.16	.30
1974	.11	.08	.15
1975	.08	.12	.03
1976	.23	.12	.35
1977	.09	.05	.13
YEARLY AVERAGES	.15	.12	.19

SOURCE: STATISTICAL REPORTS, 1971-77; OFFICE OF VITAL STATISTICS; DPHSS.

TABLE IV.36

FREQUENCY DISTRIBUTION OF DIABETES MORTALITY : 1971-1977

YEARS	TOTAL	SEX		UNDER-25		25 - 44		45 - 64		65 - 74		75+	
		MALE	FEMALE	M	F	M	F	M	F	M	F	M	F
1971	7	4	3	0	1	0	0	0	1	3	1	1	0
1972	16	7	9	0	0	0	1	5	4	2	1	0	3
1973	16	6	10	0	0	0	0	3	7	2	2	1	1
1974	8	3	5	1	0	1	0	0	4	1	1	0	0
1975	6	5	1	0	0	0	0	5	1	0	0	0	0
1976	18	5	13	0	0	0	0	2	4	2	6	1	3
1977	7	2	5	0	0	0	0	1	1	1	2	0	2
YEARLY AVERAGE	11.14	4.57	6.57	.14	.14	.14	.14	2.29	3.14	1.57	1.86	.43	1.29

SOURCE : STATISTICAL REPORTS, 1971-77; OFFICE OF VITAL STATISTICS, DPHSS

TABLE IV.29

DISEASES OF THE CENTRAL NERVOUS SYSTEM
MORTALITY RATES PER 1000 POPULATION :
1971-1977

YEAR	TOTAL	SEX	
		MALE	FEMALE
1971	.15	.11	.19
1972	.14	.24	.03
1973	.31	.24	.39
1974	.37	.53	.17
1975	.28	.3	.25
1976	.24	.31	.16
1977	.25	.25	.24
YEARLY AVERAGES	.25	.28	.2

SOURCE : STATISTICAL REPORTS 1971 - 1977; OFFICE OF VITAL STATISTICS, DPHSS.

CEREBROVASCULAR MORTALITY
RATIO PER 100 TOTAL DEATHS:
1971-1977

YEARS	TOTAL DEATHS	MALE	FEMALE
1971	8.24	6.97	10.83
1972	6.11	4.12	9.04
1973	8.51	7.12	10.78
1974	5.79	5.20	6.67
1975	5.22	3.79	7.95
1976	5.01	3.24	8.51
1977	6.84	5.35	9.49
AVERAGES 1971 - 1977	6.53	5.11	9.04

SOURCE: STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV.37

FREQUENCY DISTRIBUTION OF DIABETES MORBIDITY
1973-1976

EARS	TOTAL	SEX		AGE GROUPS								ETHNIC DISTRIBUTION			
		M	F	UNDER 1	1 - 4	5 - 14	15 - 24	25 - 44	45 - 64	65 - 74	75 OVER	GUAM	FILIPINO	CAUCASIAN	OTHE
1973	388	141	247	0	1	0	8	61	213	102	3	330	42	14	2
1974	344	102	242	0	4	2	8	56	194	57	23	294	18	16	16
1975	374	134	240	0	0	0	7	65	182	68	52	318	30	8	18
1976	435	158	277	0	2	2	6	61	221	99	44	365	40	17	13
Y S	385	134	251	0	2	1	7	61	202	81	30	327	32	14	12

SOURCE: GUAM MEMORIAL HOSPITAL

TABLE IV.38

DIABETES MORBIDITY DISABILITY DAYS:
1973-1976

YEARS	TOTAL DAYS	TOTAL CASES	AVERAGE
1973	4325	388	11.14
1974	3876	344	11.27
1975	5175	374	13.84
1976	5352	435	12.30
YEARLY AVERAGES	4682	385	12.16

SOURCE: GUAM HEALTH PLANNING AND RESOURCES DEVELOPMENT AGENCY

TABLE IV.34

DIABETES MORTALITY RATIO

1971-1977

YEARS	TOTAL DEATHS	MALE	FEMALE
1971	1.92	1.64	2.50
1972	3.91	2.88	5.42
1973	3.68	2.25	5.99
1974	1.78	1.12	2.78
1975	1.36	1.72	.66
1976	4.30	1.80	9.22
1977	1.84	.82	3.65
YEARLY AVERAGES	2.6	1.7	4.3

SOURCE: STATISTICAL REPORTS, 1971-77; OFFICE OF VITAL STATISTICS, DPHSS.

GUAM AND U.S. PNEUMONIA MORTALITY RATE
1971—1977

	YEARS							YEARLY AVERAGES
	1971	1972	1973	1974	1975	1976	1977	
GUAM	0.36	0.32	0.28	0.28	0.26	0.29	0.21	0.28
U.S.	0.27	0.28	0.27	0.25	0.25	N. A.	N. A.	0.26

SOURCE: STATISTICAL REPORTS 1971-77 OFFICE OF VITAL STATISTICS, DPHSS.
STATISTICAL ABSTRACT OF THE U.S. 1977, U.S. DEPT. OF COMMERCE.

TABLE IV.61

AVERAGE PERCENT OF LIVE BIRTH WEIGHTS BY AGE OF MOTHER
1970—1977

UNDER 19 YEARS	
LIVE BIRTH WEIGHT	AVERAGE
UNDER 1 lb. 1oz.	.02
1 lb. 2oz. — 2 lb. 3oz	.47
2 lb. 4oz. — 3 lb. 4 oz.	1.04
3 lb. 5oz — 4 lb. 6oz.	3.28
4 lb. 7oz. — 5 lb. 8oz.	8.68
5 lb. 9oz. — 6 lb. 9oz.	28.7
6 lb. 10oz — 7 lb. 11oz.	37.68
7 lb. 12oz. — 8 lb. 13	15.19
8 lb. 14oz. — 9 lb. 14oz.	42.8
9 lb. 15oz. — 11 lb.	.44
11 lb. 1oz. and over	.04
UNKNOWN	.10

ALL AGES	
LIVE BIRTH WEIGHT	AVERAGE
UNDER 1 lb. 1oz.	.09
1 lb. 2oz. — 2 lb. 3oz.	.30
2 lb. 4oz. — 3 lb. 4oz.	.53
3 lb. 5oz. — 4 lb. 6oz.	1.65
4 lb. 7oz. — 5 lb. 8oz.	6.64
5 lb. 9oz. — 6 lb. 9oz.	25.49
6 lb. 10oz. — 7 lb. 11oz.	38.99
7 lb. 12oz. — 8 lb. 13oz.	20.51
8 lb. 14oz. — 9 lb. 14oz.	4.51
9 lb. 15oz. — 11 lb.	.85
11 lb. 1oz. and over	.22
UNKNOWN	.12

SOURCE: STATISTICAL REPORTS 1970-77, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV.40

FREQUENCY DISTRIBUTION OF PNEUMONIA MORTALITY
1971–1977

YEARS	TOTAL	SEX		UNDER–1		1 — 4		5 — 14		15 — 24		25 — 44		45 — 64		65 — 74		75/OVER	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1971	24	13	11	2	3	1	1	0	0	0	0	1	0	3	1	4	4	2	2
1972	22	8	14	2	2	0	0	0	0	0	0	1	0	3	3	1	1	1	8
1973	20	11	9	3	1	0	1	0	0	1	0	1	0	1	2	3	1	2	4
1974	21	11	10	1	1	0	0	0	0	0	1	2	1	1	0	5	1	2	6
1975	20	10	10	0	4	0	0	0	0	0	0	1	0	3	0	4	2	2	4
1976	23	15	8	3	2	0	0	0	0	1	0	2	0	3	0	3	2	3	4
1977	17	10	7	1	2	0	0	1	0	1	0	2	0	1	1	1	1	3	3
YEARLY AVERAGES	21	11	10	2	2	0	0	0	0	0	0	1	0	2	1	3	2	2	4

SOURCE: STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV.41

PNEUMONIA MORTALITY RATES
1971-1977

SEX BY AGE GROUP

YEARS	TOTAL	SEX		UNDER-1		1 — 4		5 — 14		15 — 24		25 — 44		45 — 64		65 — 74		75/OVER	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1971	.36	.4	.4	1.2	2.1	.3	.3	0	0	0	0	.1	0	.7	.3	7.8	7.1	10.9	7.7
1972	.32	.2	.4	1.2	1.3	0	0	0	0	0	0	.1	0	.7	1	1.8	1.7	5.3	31
1973	.28	.3	.3	1.8	.6	0	.2	0	0	.2	0	.1	0	.2	.6	5.3	1.7	10.4	15.6
1974	.28	.3	.3	.6	.7	0	0	0	0	0	.2	.2	.1	.2	0	8.3	1.7	10.2	23.4
1975	.26	.2	.3	0	2.5	0	0	0	0	0	0	.1	0	.6	0	6.4	3.4	10.4	16.2
1976	.29	.4	.2	1.9	1.4	0	0	0	0	.1	0	.2	0	.6	0	4.6	3.4	14.6	15.5
1977	.21	.2	.2	.6	1.4	0	0	1	0	.1	0	.2	0	.2	.3	1.5	1.7	13.8	11.2
YEARLY AVERAGES	.25	.3	.3	.1	1.4	0	0	0	0	0	0	.14	0	.45	.31	5	3	10.8	17.22

SOURCE: STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS, DPHSS.

PNEUMONIA MORTALITY RATIO PER 100 TOTAL DEATHS
1971-1977

YEARS	TOTAL	SEX	
		MALE	FEMALE
1971	6	10	9
1972	5	3	8
1973	4	4	5
1974	4	4	5
1975	4	3	6
1976	5	5	5
1977	4	4	5
YEARLY AVERAGES	5	5	6

SOURCE: STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS, DPHSS

TABLE IV.46

CASES OF GONORRHEA ON GUAM
1974-1978 (INCOMPLETE DATA)

YEAR	TOTAL	GUAM (ON-ISLAND)			OFF-ISLAND
		CIVILIAN	MILITARY	TOTAL	
1974	211	0	0	137	74
1975 (PART)	271+	0	0	171	100
1976	354	111	105	216	138
1977	218	64	63	127	91
1978 (PART)	226+	0	0	161	65
YEARLY AVERAGES	256	87.5	84	162.4	93.6
AVERAGE RATE/ 000 POPULATION	0	1.11	3.82	1.61	0

CE: HEALTH PLANNING AND DEVELOPMENT AGENCY CONSULTANTS

TABLE IV.43

AVERAGE YEARLY PNEUMONIA MORTALITY RATIO PER 100
TOTAL DEATHS IN AGE GROUP: 1971-77

AGE GROUP	MALE	FEMALE
UNDER 1	5	8
1-4	0	0
5-14	0	0
15-24	0	0
25-44	3	0
45-64	2	0
65-74	8	7
75 +	8	12

SOURCE: STATISTICAL REPORTS 1971-77, OFFICE OF VITAL STATISTICS DPHSS

DISTRIBUTION OF JUVENILE OFFENDERS BY TYPE OF FELONY OFFENSE
1974 - 1976

	NUMBER OF OFFENSES		
FELONY:	1974	1975	1976
ARSON	0	2	4
ARMED ROBBERY	1	11	12
ROBBERY	0	40	43
BURGLARY	200	100	34
BOMB SCARE	1	1	0
GRAND THEFT	8	22	14
KIDNAPPING	1	1	1
MURDER	0	1	0
POSSESSION OF STOLEN GOODS	0	2	4
POSSESSION OF CONTROLED SUBSTANCE	0	1	2
MOTOR VEHICLE THEFT	3	20	32
MANSLAUGHTER	0	0	1
ASSAULT W/DEADLY WEAPON	3	21	5
TOTAL	217	222	152

SOURCE: TERRITORY OF GUAM COMPREHENSIVE CRIMINAL JUSTICE PLAN 1978, p.128

BRONCHITIS MORBIDITY DATA: 1972-1975

YEARS	1972	1973	1974	1975	YEARLY AVERAGES
TOTAL CASES	150	74	157	209	147
ETHNIC DISTRIBUTION					
GUAMANIAN	126	56	132	178	123
FILIPINO	15	8	12	10	11
MICRONESIAN			2	2	1
ASIAN		1	6	1	2
WHITE	9	9	5	18	10
INCIDENCE RATE (YEARLY)	1.5	.7	1.4	1.8	1.56
DISABILITY DAYS	N/A	564	955	1702	1073[a]

a = AVERAGE OF 1973-75.
SOURCE: GUAM MEMORIAL HOSPITAL.

TABLE IV.44

PNEUMONIA MORBIDITY DATA: 1972-1975

YEARS	1972	1973	1974	1975	YEARLY AVERAGES
TOTAL CASES	204	155	213	290	215
ETHNIC DISTRIBUTION					
GUAMANIAN	175	129	182	243	182
FILIPINO	9	18	18	26	18
MICRONESIAN	5	3	4	7	5
ASIAN	2	0	2	4	2
WHITE	13	5	7	10	9
INCIDENCE RATE	2.9	2.7	2.9	3.8	2.97
DISABILITY DAYS	NA	3107	2414	4218	3246

SOURCE: GUAM MEMORIAL HOSPITAL.

TABLE IV.45

INCIDENCE OF HEPATITIS 1973-77 ON GUAM BY CIVILIAN AND MILITARY POPULATION

HEPATITIS A

YEAR	CIVILIAN	RATE PER 1000 POPULATION	MILITARY	RATE PER 1000 POPULATION	COMBINED	RATE PER 1000 POPULATION
1973	29	0.40	54	2.45	83	0.89
1974	184	2.49	127	5.77	311	3.24
1975	41	0.54	74	3.36	115	1.17
1976	41	0.52	15	0.68	56	0.55
1977	33	0.40	6	0.27	39	0.38
AVERAGE	65.6	0.86	55.2	2.51	120.8	1.23
RAGE EXCLUDING 1974	36.0	0.47	37.2	1.69	73.2	0.74

HEPATITIS B AND TYPE UNSPECIFIED

YEAR	CIVILIAN	RATE PER 1000 POPULATION	MILITARY	RATE PER 1000 POPULATION	COMBINED	RATE PER 1000 POPULATION
1973	2	0.03	16	0.73	18	0.19
1974	43	0.58	142	6.45	185	1.93
1975	17	0.22	44	2.00	61	0.62
1976	31	0.39	8	0.36	39	0.39
1977	31	0.38	30	1.36	61	0.59
AVERAGE	24.8	0.32	48	2.18	72.8	0.74
RAGE EXCLUDING 1974	20.2	0.26	24.5	1.11	44.7	0.45

ALL HEPATITIS

YEAR	CIVILIAN	RATE PER 1000 POPULATION	MILITARY	RATE PER 1000 POPULATION	COMBINED	RATE PER 1000 POPULATION
1973	31	0.43	70	3.20	101	1.08
1974	227	3.07	269	12.20	496	5.18
1975	58	0.76	118	5.40	176	1.79
1976	72	0.91	23	1.00	95	0.94
1977	64	0.78	36	1.60	100	0.96
AVERAGE	90.4	1.18	103.2	4.70	193.0	1.97
RAGE EXCLUDING 1974	56.2	0.73	61.7	2.81	118.0	1.19

SOURCE: PUBLIC HEALTH DISEASE REPORTS

TABLE IV.46

AVERAGE INFECTIOUS DISEASE INCIDENCE RATES BY VILLAGE ON GUAM: HEPATITIS A & B PER 1000 POPULATION AND MILITARY BASES

HEPATITIS A

RANK	VILLAGE	RATE
1	UMATAC	14.03
2	INARAJAN	4.04
3	TALOFOFO	3.46
4	AGANA	2.89
5	MERIZO	2.63
6	MILITARY BASES	2.45
7	ASAN-MAINA	1.69
8	AGAT	1.35
9	SINAJANA	0.91
10	CHALAN PAGO	0.90
11	BARRIGADA	0.55
12	MANGILAO	0.48
13	DEDEDO	0.47
14	PITI	0.46
15	YONA	0.32
16	AGANA HEIGHTS	0.27
17	YIGO	0.26
18	MONGMONG	0.24
19	TAMUNING	0.22
20	SANTA RITA	0.15
	CIVILIAN AREAS	0.78
	MILITARY AREAS	2.45
	ISLANDWIDE	1.24

HEPATITIS B

RANK	VILLAGE	RATE
1	MILITARY BASES	0.54
2	MANGILAO	0.48
3	MERIZO	0.46
4	AGANA	0.26
5	ASAN-MAINA	0.19
6	YIGO	0.16
7	AGAT	0.13
8	SANTA RITA	0.07
9	AGANA HEIGHTS	0.07
10	TAMUNING	0.05
11	MONGMONG	0.04
12	BARRIGADA	0.04
13	DEDEDO	0.02
-	CHALAN PAGO	0.00
-	INARAJAN	0.00
-	PITI	0.00
-	SINAJANA	0.00
-	TALOFOFO	0.00
-	UMATAC	0.00
-	YONA	0.00
	CIVILIAN AREAS	0.10
	MILITARY AREAS	0.54
	ISLANDWIDE	0.20

SOURCE: DEPT. PUBLIC HEALTH AND SOCIAL SERVICES.

/ERAGE INFECTIOUS DISEASE INCIDENCE RATES PER 1000 POPULATION BY VILLAGE AND MILITARY BASES ON GUAM: MEASLES AND MUMPS

1973-1977

MEASLES

RANK	VILLAGE	RATE
1	AGANA	131.4
2	PITI	57.1
3	ASAN-MAINA	31.0
4	MILITARY BASES	30.9
5	TALOFOFO	22.8
6	MONGMONG	20.2
7	TAMUNING	15.9
8	SINAJANA	15.0
9	BARRIGADA	12.2
10	AGANA HEIGHTS	11.1
11	AGAT	11.1
12	MANGILAO	7.3
13	DEDEDO	5.8
–	CHALAN PAGO	0.0
–	INARAJAN	0.0
–	MERIZO	0.0
–	SANTA RITA	0.0
–	UMATAC	0.0
–	YIGO	0.0
–	YONA	0.0
	CIVILIAN AREAS	23.9
	MILITARY AREAS	30.9
	ISLANDWIDE	24.9

MUMPS

RANK	VILLAGE	RATE
1	UMATAC	1,228.1
2	MERIZO	494.6
3	AGANA	341.7
4	AGAT	168.5
5	MILITARY BASES	131.8
6	INARAJAN	122.1
7	SINAJANA	90.6
8	DEDEDO	86.4
9	TALOFOFO	83.0
10	SANTA RITA	60.1
11	BARRIGADA	29.2
12	MONGMONG	28.3
13	YONA	26.8
14	PITI	22.9
15	TAMUNING	22.3
16	MANGILAO	21.9
17	CHALAN PAGO	20.8
18	ASAN-MAINA	18.8
19	AGANA HEIGHTS	13.5
20	YIGO	10.5
	CIVILIAN AREAS	97.3
	MILITARY AREAS	131.8
	ISLANDWIDE	105.0

OURCE: DEPT. OF PUBLIC HEALTH AND SOCIAL SERVICES

INCIDENCE OF MUMPS 1973-1977 ON GUAM BY CIVILIAN AND MILITARY POPULATION

YEARS	CIVILIAN	RATE PER 1000 POPULATION	MILITARY	RATE PER 1000 POPULATION	COMBINED	RATE PER 1000 POPULATION
1973	29	0.40	24	1.09	53	0.57
1974	288	3.90	100	4.54	388	4.05
1975	25	0.33	11	0.45	36	0.37
1976	20	0.25	6	0.27	26	0.26
1977	8	0.10	4	0.18	12	0.11
YEARLY AVERAGE	74	0.97	29	1.32	103	1.05
ERAGE EXCLUDING 1974	20.5	0.27	11.25	0.51	31.7	0.32

URCE: PUBLIC HEALTH DISEASE REPORTS.

TABLE IV.50

AVERAGE INFECTIOUS DISEASE INCIDENCE RATES PER 1000 POPULATION AND RANKING FOR 1972-1976: MEASLES AND MUMPS

MEASLES			MUMPS		
RANK	STATE	RATE	RANK	STATE	RATE
1	IDAHO	0.64	1	W. VIRGINIA	1.27
2	N. HAMPSHIRE	0.54	2	WISCONSIN	1.18
3	UTAH	0.52	3	RHODE ISLAND	1.15
4	WISCONSIN	0.51	4	IOWA	1.14
5	MICHIGAN	0.41	5	WASHINGTON	0.95
6	N. DAKOTA	0.39	6	GUAM	0.91
7	MONTANA	0.38	7	ALASKA	0.89
8	PUERTO RICO	0.37	8	MICHIGAN	0.69
9	KANSAS	0.29	9	MASSACHUSETTS	0.64
10	INDIANA	0.28	10	TENNESSEE	0.59
14	GUAM	0.23	13	VIRGIN ISLANDS	0.47
15	VIRGIN ISLANDS	0.23	20	PUERTO RICO	0.39
30	T.T.P.I.	0.10	35	HAWAII	0.19
39	HAWAII	0.06	NA	T.T.P.I.	NA
42	ALASKA	0.05			
U.S. FIVE-YEAR AVERAGE		0.14	U.S. FIVE-YEAR AVERAGE		0.28

SOURCE: DEPT. OF PUBLIC HEALTH AND SOCIAL SERVICES

TABLE IV.53

)ENCE OF MEASLES (RUBEOLA) 1973-1977 ON GUAM BY CIVILIAN AND MILITARY POPULATION

YEARS	CIVILIAN	RATE PER 1000 POPULATION	MILITARY	RATE PER 1000 POPULATION	COMBINED	RATE PER 1000 POPULATION
1973	43	0.60	4	0.18	47	0.50
1974	17	0.23	3	0.14	20	0.21
1975	16	0.21	17	.0.77	33	0.34
1976	12	0.15	4	0.18	16	0.16
1977	2	0.02	3	0.14	5*	0.05
EARLY AVERAGE	18	0.23	6.2	0.28	24.2	0.24
AGE EXCLUDING 1973	11.9	0.15	6.7	0.31	18.5	0.18

CLUDES 1 OFF-ISLAND CASE WHICH WOULD BRING THE TOTAL TO 6.
OURCE PUBLIC HEALTH DISEASE REPORTS.

TABLE IV.47

AVERAGE INFECTIOUS DISEASE INCIDENCE RATES PER 1000 POPULATION AND RANKING FOR 1972-1976: HEPATITIS A AND B

HEPATITIS A			HEPATITIS B		
RANK	STATE	RATE	RANK	STATE	RATE
1	T.T.P.L.	2.24	1	ALASKA	0.13
2	ALASKA	1.54	2	GUAM	0.13
3	GUAM	1.10	3	NEW JERSEY	0.12
4	OREGON	0.43	4	CALIFORNIA	0.12
5	NEW MEXICO	0.38	5	OREGON	0.10
6	FLORIDA	0.37	6	WASHINGTON, D.C.	0.09
7	TENNESSEE	0.35	7	NEW YORK CITY	0.08
8	MONTANA	0.33	8	HAWAII	0.07
9	RHODE ISLAND	0.33	9	FLORIDA	0.07
10	VERMONT	0.30	10	MICHIGAN	0.07
22	HAWAII	0.23	47	PUERTO RICO	0.01
31	PUERTO RICO	0.18	51	VIRGIN ISLANDS	0.01
55	VIRGIN ISLANDS	0.06	NA	T.T.P.L.	NA
U.S. FIVE-YEAR AVERAGE		0.20	U.S. FIVE-YEAR AVERAGE		0.05

SOURCE: DEPT. OF PUBLIC HEALTH AND SOCIAL SERVICES

AVERAGE INFECTIOUS DISEASE INCIDENCE RATES PER 1000 POPULATION BY VILLAGE & MILITARY BASES ON GUAM 1973-1977: TUBERCULOSIS (ALL FORMS)

RANK	VILLAGE	RATE
1	ASAN-MAINA	1.87
2	AGANA	1.32
3	AGAT	0.94
4	SINAJANA	0.91
5	MERIZO	0.77
6	TAMUNING	0.72
7	CHALAN PAGO	0.69
8	DEDEDO	0.67
9	SANTA RITA	0.60
10	MANGILAO	0.57
11	BARRIGADA	0.51
12	MONGMONG	0.48
13	UMATAC	0.44
14	YIGO	0.42
15	TALOFOFO	0.41
16	AGANA HEIGHTS	0.40
17	YONA	0.27
18	PITI	0.23
19	INARAJAN	0.19
20	MILITARY BASES	0.04
	CIVILIAN AREAS	0.66
	MILITARY AREAS	0.04
	ISLAND WIDE	0.52

SOURCE: DEPT. OF PUBLIC HEALTH AND SOCIAL SERVICES.

VERAGE INFECTIOUS DISEASE INCIDENCE RATES PER 1000 POPULATION BY VILLAGE AND MILITARY BASES ON GUAM: SALMONELLOSIS AND SHIGELLOSIS

1973-1977

SALMONELLOSIS

RANK	VILLAGE	RATE
1	UMATAC	2.19
2	INARAJAN	1.76
3	AGANA	1.64
4	TALOFOFO	1.56
5	ASAN-MAINA	0.94
6	AGAT	0.83
7	YIGO	0.79
8	MANGILAO	0.50
9	SANTA RITA	0.47
10	YONA	0.47
11	SINAJANA	0.45
12	TAMUNING	0.38
13	MONGMONG	0.35
14	DEDEDO	0.35
15	MILITARY BASES	0.28
16	MERIZO	0.19
17	BARRIGADA	0.18
18	CHALAN PAGO	0.17
19	AGANA HEIGHTS	0.17
20	PITI	0.14
	CIVILIAN AREAS	0.48
	MILITARY AREAS	0.28
	ISLANDWIDE	0.44

SHIGELLOSIS

RANK	VILLAGE	RATE
1	INARAJAN	0.70
2	TALOFOFO	0.52
3	ASAN-MAINA	0.47
4	MERIZO	0.39
5	MONGMONG	0.15
6	BARRIGADA	0.14
7	SINAJANA	0.11
8	MILITARY BASES	0.11
9	CHALAN PAGO	0.09
10	AGANA HEIGHTS	0.08
11	TAMUNING	0.08
12	YIGO	0.07
13	DEDEDO	0.06
-	AGANA	0.00
-	AGAT	0.00
-	MANGILAO	0.00
-	PITI	0.00
-	SANTA RITA	0.00
-	UMATAC	0.00
-	YONA	0.00
	CIVILIAN AREAS	0.15
	MILITARY AREAS	0.11
	ISLANDWIDE	0.15

SOURCE: DEPT. PUBLIC HEALTH AND SOCIAL SERVICES

INCIDENCE OF SALMONELLOSIS 1973-1977 ON GUAM BY CIVILIAN AND MILITARY POPULATION

YEARS	CIVILIAN	RATE PER 1000 POPULATION	MILITARY	RATE PER 1000 POPULATION	COMBINED	RATE PER 1000 POPULATION
1973	8	0.11	2	0.09	10	0.11
1974	11	0.15	3	0.14	14	0.15
1975	65	0.85	0	0.0	65	0.66
1976	26	0.33	10	0.45	36	0.36
1977	71	0.87	16	0.73	87*	0.84
AVERAGE	36.2	0.47	6.2	0.28	42.4	0.43

*EXCLUDES 2 OFF-ISLAND CASE WHICH WOULD BRING THE TOTAL TO 89.
SOURCE: PUBLIC HEALTH DISEASE REPORTS.

TABLE IV.56

AVERAGE INFECTIOUS DISEASE INCIDENCE RATES PER 1000 POPULATION AND RANKING FOR 1972-1976: SALMONELLOSIS AND SHIGELLOSIS

SALMONELLOSIS			SHIGELLOSIS		
RANK	STATE	RATE	RANK	STATE	RATE
1	HAWAII	0.04	1	T.T.P.I.	0.80
2	GUAM	0.24	2	ALASKA	0.28
3	ALASKA	0.23	3	WASHINGTON, D.C.	0.23
4	COLORADO	0.22	4	COLORADO	0.28
5	MARY LAND	0.19	5	UTAH	0.22
6	WISCONSIN	0.18	6	ARIZONA	0.22
7	WASHINGTON, D.C.	0.18	7	NEW MEXICO	0.22
8	GEORGIA	0.16	8	CALIFORNIA	0.18
9	ARKANSAS	0.16	9	MONTANA	0.18
10	VIRGINIA	0.15	10	HAWAII	0.16
54	PUERTO RICO	0.03	27	GUAM	0.08
55	VIRGIN ISLANDS	0.02	51	VIRGIN ISLANDS	0.03
NA	T.T.P.I.	NA	56	PUERTO RICO	0.005
U.S. FIVE-YEAR AVERAGE		0.11	U.S. FIVE-YEAR AVERAGE		0.09

SOURCE: DEPT OF PUBLIC HEALTH AND SOCIAL SERVICES.

TABLE IV.59

CLIENT ORIENTED DATA ACQUISITION PROCESS (CODAP)
ADMISSION DATA FOR GUAM AND U.S.: FY1978
(PERCENTAGE DISTRIBUTION)

PERCENTAGE DISTRIBUTION OF CLIENTS BY PRIMARY DRUG AT ADMISSION		
PRIMARY DRUG	GUAM PERCENTAGE	U.S. PERCENTAGE
HEROIN	98%	54%
NON-TREATMENT METHADONE	—	1.3
OTHER OPIATES/ SYNTHETICS	—	3.5
ALCOHOL	—	8.3
BARBITUATES	—	5
TRANQUILIZERS	—	3
OTHER SEDATIVES/ HYPNOTICS	—	2
AMPHETAMINES	—	5.2
COCAINE	—	2
MARIJUANA/HASHISH	—	10.5
HALLUCINOGENS	—	3.7
INHALANTS	—	2
OTC	—	0
OTHER	—	1
NONE	1	—
UNKNOWN	1	—

PERCENTAGE DISTRIBUTION OF CLIENTS BY SEX		
SEX	GUAM PERCENTAGE	U.S. PERCENTAGE
MALE	76%	72.2%
FEMALE	24	27.8

PERCENTAGE DISTRIBUTION OF CLIENTS BY AGE		
AGE	GUAM PERCENTAGE	U.S. PERCENTAGE
18 AND UNDER	1%	10.5%
18—20	20	11.1
21—25	47	29.4
26—30	22	25.9
31—44	9	18.2
45 +	1	5.0

PERCENTAGE DISTRIBUTION OF CLIENTS BY FREQUENCY OF DRUG USE		
FREQUENCY OF USE	GUAM PERCENTAGE	U.S PERCENTAGE *
NONE DURING MONTH PRIOR ADMISSION	1%	18%
1 X/MONTH	0	2
1 X/WEEK	0	2.3
2-3 X/WEEK	1	6.8
> 3 X/ WEEK	1	3
1 X DAILY	0	15.5
2-3 X DAILY	10	35.5
> 3 X DAILY	85	19.4
UNKNOWN	2	—

* = HEROIN ADDICTS ONLY.

SOURCE: SINGLE STATE AGENCY FOR DRUG ABUSE.

TABLE IV.60

FETAL DEATH RATE PER 100 PREGNANCIES: 1971 - 1976

YEARS	UNDER 19	20 AND OVER	ALL AGE GROUP
1971	.94	1.34	1.22
1972	405	1.23	1.11
1973	1.74	.87	1.01
1974	1.03	1.22	1.19
1975	1.72	1.67	1.99
1976	1.13	1.47	1.42
YEARLY AVERAGES	1.16	1.3	1.31

SOURCE: STATISTICAL REPORTS, 1971-1976, OFFICE OF VITAL STATISTICS, DPHSS.

TABLE IV.54

AVERAGE INFECTIOUS DISEASE INCIDENCE RATES PER 1000 POPULATION AND RANKING FOR 1972-1976: TUBERCULOSIS (ALL FORMS)

RANK	STATE	RATE
1	HAWAII	0.53
2	WASHINGTON, D.C.	0.47
3	GUAM	0.43
4	T.T.P.I.	0.43
5	ALASKA	0.26
6	ALABAMA	0.23
7	SOUTH CAROLINA	0.22
8	TENNESSEE	0.22
9	ARKANSAS	0.22
10	MARYLAND	0.21
17	PUERTO RICO	0.18
40	VIRGIN ISLANDS	0.09
	U.S. FIVE-YEAR AVERAGE	0.15

SOURCE: DEPT. OF PUBLIC HEALTH AND SOCIAL SERVICES.

C. HEALTH SYSTEM