

"HEALTH POLICIES -
CHOICES FOR THE PACIFIC"

SPC OCTOBER 1988

Compiled by: Bureau of Planning
Date: October 1988

HEALTH POLICIES - CHOICES FOR THE PACIFIC

The attached savingsgram and the SPC agenda do not provide sufficient information for us to determine whether the half-day health seminar is a part of the SPC agenda or separate from it. We cannot determine if the Governor needs to make a statement on the health status of Guam's people. Therefore, we are only including position papers on the following:

1. Hepatitis B
2. Dental Health
3. Dengue Fever
4. AIDS
5. Chronic Diseases (if timely submitted)
6. Guam Health Plan 1985-1990 (excerpts)

Should a statement from the Governor be required, it is suggested that members of the Guam delegation develop it in Noumea using the above papers to the extent possible.

POST BOX D5
NOUMEA CEDEX
NEW CALEDONIA

BOITE POSTALE D5
NOUMEA CEDEX
NOUVELLE CALEDONIE

CABLE ADDRESS:
'SOUTH PACOM' NOUMEA
TELEPHONE: 26.20.00
TELEX: SOPACOM 3139 NM
FAX: (687) 26.38.18

ADRESSE TELEGRAPHIQUE:
'SOUTH PACOM' NOUMEA
TELEPHONE: 26 20 00
TELEX: SOPACOM 3139 NM
FAX: (687) 26.38 18

TO : Representatives of Governments and Administrations
Routine Distribution

SAVINGRAM No. : 48 DATE: 19 August 1988

FILE No. : SPC 10/28/22

SUBJECT : South Pacific Conference Theme: Health Policies
- Choices for the Pacific

Reference : Report of the Twenty-seventh (1987) South Pacific
Conference (Paragraph 40)

1. The Twenty-seventh South Pacific Conference recommended that health be selected as the theme for the Twenty-eighth Conference in Rarotonga.

Background

2. Health improvement is an important aspect of the Pacific islands social and economic development. The Pacific has been facing many changes in the past decades and health has been an integral part of this evolution. The infectious diseases brought into the Pacific by the first western visitors decimated many populations. During this century, public health measures such as immunisation and water and sanitation systems have dramatically reduced infant mortality rates and improved the ability of the adults to fulfil their social and economic role.

3. In many parts of the Pacific, chronic diseases common in industrialised countries, such as hypertension and diabetes, are now replacing infectious diseases as the major causes of illness and death. However, in some Pacific countries, malnutrition among children is still a serious and, in some areas, a growing problem. Governments are also faced with new health problems, such as the deadly disease AIDS. Pacific island governments must combat these problems with limited health budgets, at the same time as health care costs continue to increase dramatically.

4. To meet these challenges and to improve the access of health care to people, some Pacific island countries have been changing their health care systems from the hospital-based, curative systems inherited by their colonial powers, to a community-based, primary health care approach.

Objectives

5. Real improvements in the health of a population requires policy changes and political support. The South Pacific Conference should take the opportunity of this meeting of high-level representatives from the Island governments to discuss general health issues and health-related policy decisions. The purpose of these discussions will be to raise the awareness of health issues and problems among government representatives.

Agenda

6. The Conference will address the theme 'Health Policies - Choices for the Pacific', during a half-day seminar. Country delegates will present papers on health issues, policies and activities and programmes developed in their countries.

7. The discussions should be as non-technical as possible, unless a consensus of delegates wishes to discuss a specific technical issue.

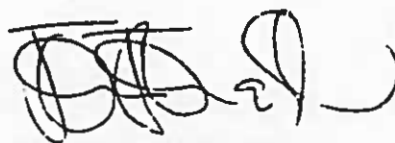
8. Delegates should be prepared to share their country's experiences and to discuss the major health concerns and issues facing their countries.

Health Fair

9. This will be a continuous activity during the conference and will be prepared and managed by the SPC health officers (3) in conjunction with the Cook Islands Health Department.

10. Proposed activities include:

- Displays of health materials (posters, video, slides); reports, pictures and summary papers of various health activities in the Pacific island region.
- Handouts will be provided to conference delegates, including brochures on general and in-country health activities and fact sheets on specific health topics.
- Voluntary screening activities to informally assess the health and nutritional status of delegates. This could include measuring delegates' weight, height and blood pressure, giving them a questionnaire on risk factors and dietary habit, as well as taking blood tests once or twice during the conference. Results will be generated instantly by computer.
- 'Nutrition teas' organised during breaks by the SPC and Cook Islands nutritionists.
- Exercise and sports activities organised around the conference. Tennis, golf, fun-runs and other activities could be included.



Jon Jonassen
Acting Secretary-General

DRAFT GUAM COUNTRY PAPER

The attached country paper was developed by Karen Cruz, Department of Public Health and Social Services, at the request of George Palican. According to Ms. Cruz, the environmental pollution section needs to be reviewed for accuracy.

The paper was not finalized due to time constraints. However, we suggest that it be used in conjunction with the other health papers should the need arise.

DRAFT



GUAM COUNTRY PAPER

28TH SOUTH PACIFIC CONFERENCE

(Rarotonga; Oct. 10-12, 1988)

1. Geography, Demographic Structure, and Background Information

Guam is an unincorporated territory of the United States. Our government, in its present form, was established under the Organic Act which became law on August 1, 1950. The Guam Commonwealth Act which was recently drafted and chosen through plebescite will, once ratified by the U. S. Congress, become Guam's paramount law.

Location. Guam is the southernmost of a chain of islands in the Western Pacific known as the Marianas. It is the westernmost territory of the United States, and lies about 5,800 miles from the U.S. mainland and about 3,300 miles west of Hawaii. Although remote from the United States, Guam is geographically closer to the Asian rim countries; Tokyo, Taipei, Manila and Hongkong are all within 3 hours flight time.

Background and Government Structure. Guam was ceded to the United States by the Treaty of Paris in 1898 after the Spanish-American War. For the next 40 years, Guam remained relatively unaffected by changes occurring in the outside world. Health measures instituted by the U. S. Naval government started a rapid population growth, and between 1898 and 1940 the island's population more than doubled, from 10,000 to more than 22,000.

Guam was invaded and captured by the Japanese on December 8, 1941 a day after the attack on Pearl Harbor. Liberation and reoccupation by American Forces occurred on July 1944. The Naval Government was re-established in

DRAFT

1946 and functioned much as it had before World War II. Reconstruction brought on an expanded economy with a high demand for goods and services by the civilian and military population.

In 1950 the U.S. Congress passed the Organic Act of Guam which, as I have mentioned earlier, established Guam's present system of government. It also changed the status of Guamanians from nationals to citizens of the United States. Responsibility for the island's administration was shifted from the U.S. Navy to the U.S. Department of the Interior. The Government of Guam was set up with three branches of government; executive, legislative, and judicial. The legislative branch is uni-cameral and is composed of 21 senators who are elected at large. The executive branch is headed by the Governor who, prior to 1970, was appointed by the President of the United States, and was directly responsible to the Department of Interior. In 1970, Guam elected its own governor for the first time.

Population. The 1980 census showed that the major ethnic groups are Chamorros (49%), Filipinos (22%) Caucasians (19%) and "Others" (10%). The Chamorros, who are the indigenous population, number about 49,000 and are unified by a common language and cultural heritage. The second major civilian ethnic group is Filipino, who number about 22,000, many of whom are recent and transient residents who may migrate to the mainland United States when they gain full citizenship. Caucasians are the next largest ethnic group numbering around 19,000. This group is composed mainly of Americans, most of whom were born in the mainland United States. The "Others" group are predominantly Micronesians from the former U.S. Trust Territories, especially the Commonwealth of the Northern Mariana Islands, who number around 2,500. Other ethnicities include Chinese, Vietnamese, Japanese, Korean, etc., all totalling about 6,000 at the 1980 census. The total population of Guam in 1980 was 105,979; 86,438 or 82% were civilians and 19,541 or 18% are military personnel and dependents.

DRAFT

Guam has quite a young population, the median age is 22.2 years.

Health Care Delivery System. There has been tremendous and rapid change in the structure of Guam's health care delivery system in the past forty years. Organized health services used to be provided free-of-charge to the people of Guam by the U.S. Navy, who built and staffed the first hospital in Agana as well as dispensaries in various villages. Diverse public health services and programs were introduced to the island and more and more private physicians have elected to practice medicine on Guam. At present, a sophisticated network of private and governmental providers deliver health care to Guam residents in a variety of ways. Private physicians have increased from 22 in 1971 to the current number of 151. Today, almost 89% of Guam's health care is provided by the private sector. This increase is largely due to the establishment of such third-party payment mechanisms as Medicaid, Medicare, and prepaid health plans (Health Maintenance Organizations) which encourage and enable individuals to such treatment from private health care providers.

Despite the efforts to shift the emphasis of health care provision to the private sector, government still dominates the island's health system through its control of Guam's only civilian hospital; its operation of regional public health centers; its participation in the federal Medicaid and Medicare programs; and its status as the island's largest employer providing health benefits to its 9,000 employees and their dependents.

II. Health Issues, Problems, Concerns, Experiences

Within a period of 38 years from the date granting civilian rule, Guam has much to be proud of in terms of our political, economic and social development. In comparison to most of our neighboring islands, Guam is one of the most progressive and advanced communities in Micronesia. However, this rapid growth and development has not occurred without its negative side effects.

DRAFT

Environmental Pollution. It is ironic that the U. S. military's presence on Guam has been felt and perceived both negatively and positively by the island community. The military's role as peace-keepers and as vanguards of freedom in our area of the Pacific is, without question, vital to national security. However, certain of their activities as of late, have raised a public outcry with regards to environmental pollution. Their frequent use and disposal of toxic substances have caused serious concern and doubts as to the propriety of their actions.

It was recently discovered that Guam's only aquifer is substantially contaminated from toxic waste. Most of the aquifer is located under Andersen Air Force Base, in the northern part of the island. The U. S. Government has been asked to determine the extent of the contamination and to rectify the situation.

Likewise, the Navy has been charged by our Guam Environmental Protection Agency for violating federal pollution control laws with regard to indiscriminate dumping of toxic substances at the southern end of the island. Such toxic by-products as PCBs and furans have been detected at Guam's major power plant and have been attributed to the Navy's failure to comply with federal laws. I raise this point of the military's presence on Guam to illustrate the growing problem in the area of environmental health. Although Guam is far from being a highly industrialized nation with bustling manufacturing centers, it does share a common problem--that is, what to do with the waste products it produces, particularly those that are considered highly toxic or hazardous.

The preceding are examples of man-made environmental pollution on Guam. An example of a natural health hazard, involves our Agana Bay marina. Due to a typhoon that hit our island in January of this year, the sewage outfall line was badly damaged, and as a result, untreated sewage has been seeping out to the marina area at an alarming rate. This pollution caused by human

DRAFT

waste was beyond tolerable levels of safety and, consequently, the Department of Public Health and Social Services, in conjunction with Guam Environmental Protection Agency, closed off the marina and a good part of the bay to fishing, swimming, and other water sports such as surfing, snorkeling, etc. This type of pollution is largely due to a natural disaster, however, one wonders about the infrastructure and whether it is adequate to handle the amount of effluence being discharged at any given time; the consequences of which are certainly hazardous to health and could even be life threatening.

Changing Disease Patterns. Guam is certainly one of the distinct island entities that has shown a dramatic change in its disease patterns. Where once infectious and communicable disease were prevalent and were leading causes of death, chronic diseases such as heart disease, diabetes, cancer have now taken its place.

The Office of Vital Statistics, of the Department of Public Health and Social Services lists "Diseases of the heart" as the leading cause of death on Guam from 1960 to the present. One of the major risk factors for cardiovascular disease is hypertension.

It is difficult to make a conclusive statement about the prevalence of hypertension on Guam because there is little accurate, monitored, data available. However, card registers of diabetes and hypertension and other chronic disorders (including gout, arthritis, etc.) are maintained by Public Health. High blood pressure screening activities indicate about 20% of persons screened have an elevated blood pressure.

Two weeks ago, the results of a recently concluded health survey of the southern residents of the island showed a very high rate of diseases associated with obesity. This survey was conducted by doctors from the National Institutes of Health. They found that the prevalence of high blood pressure and diabetes

DRAFT

was twice the U.S. mainland's rate. Gout and arthritis were also found to be common, especially arthritis. These two chronic diseases were also much higher than the U.S. rate.

However, this same research effort, funded in part by the Guam Lytico-Bodig (ALS - Parkinson Dementia) Association, confirmed a decreasing incidence of the once predominant disease lytico (ALS), but also found that the bodig (PD) cases have not changed. The survey also found that there are a large number of people with dementia similar to Alzheimer's disease.

I share with you this piece of information so you may appreciate its value in view of the fact that Guam has the highest incidence of ALS-PD in the world. Guam recognizes the dramatic changes it is undergoing with respect to disease prevalence particularly diseases associated with westernized "lifestyle". As such, we are addressing the health care problems and redefining the government's role in maintaining and improving health. Behavioral factors such as smoking, excessive drinking, poor dietary habits, and the lack of physical activity increase a person's chances for incurring hypertension, heart disease, stroke, cancer and a host of other chronic diseases for which medical science has no ready cure. Yet the prevailing notion equates better health with advanced medical treatment. What is needed is a greater focus on prevention of chronic diseases which will in turn reduce the ever escalating health care costs.

Newly Emerging Health Problems. Guam's signs of growth, economically and politically, are quite apparent. However, it is equally apparent that we have become susceptible to disease afflicting a modern society. Since 1985, five cases of AIDS have been reported. Of the five, two acquired AIDS through blood transfusions during surgery in offisland hospitals, three were in high-risk categories--two were homosexuals and one was a hemophiliac.

DRAFT

Four of the five have died. Within the same time frame, a total of five individuals have tested seropositive for the AIDS virus on the ELISA and Western Blot Confirmatory Test.

I realize that five cases of AIDS, four of which resulted in death, in and of itself, is not a significant number; but to Guamanians, this devastating and deadly disease has afflicted five too many.

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

Federal Assistance. In the health field, Guam has been the recipient of various federal grants ranging in scope from health facility and sewer construction grants to nutrition, communicable disease control, maternal and child health and other service delivery grants, as well as the Medicare/Medicaid programs. Although the Government of Guam is relatively autonomous, it relies considerably on federal assistance to help bolster the economy.

Health Objectives. In the Governor's Conference on Health Promotion/Disease Prevention held last year in September, Guam set forth its health objectives for the year 1990 and beyond. This local effort to develop territorial health objectives stemmed from similar projects conducted for the United States. In the three major categories of Prevention Health Services, Health Protection, and Health Promotion, were 15 working groups which were set up to address

DRAFT

the health priority areas identified by the U. S. These priority areas ranged from high blood pressure control to sexually transmitted disease under Preventive Health Services, toxic agent control to surveillance and control of infectious diseases under Health Prevention, smoking and health to control of stress and violent behavior under Health Promotion.

I believe efforts like this indicates a "healthy"-- no pun intended - approach to dealing with our society's ills and maladies.

I thank you for allowing me to share with you some of my country's health problems, issues, concerns and experiences.

Thank you and Si Yu'us Maase!

JOSEPH F. ADA
Governor of Guam

THE CONTROL OF HEPATITIS B ON GUAM
SEPTEMBER 1988

for Oct 88
P.H.O.A
J

INTRODUCTION

Hepatitis B is one of the most common and widespread viral infection of man and is now considered a major health concern worldwide (1). Sero-epidemiological surveys have revealed that about 5% of the world's population are asymptomatic carriers. The carrier rate in North America and Western Europe may be as low as 0.1%, but in many Asian and African countries it may exceed 15% (2).

In the United States, hepatitis B is now the most commonly reported type of hepatitis. In 1978, 15,000 cases of clinical hepatitis B were reported to the Centers for Disease Center (CDC), for an incidence of 6.9 per 100,000 population. The incidence rate of reported disease increased by 33% in 1981. It continued to increase reaching a rate of 11.5 per 100,000 population in 1985. Based on a comparison with the overall infection rate estimated in 1978, the incidence of HBV infection in the United States is now estimated at over 300,000 cases per year (3).

Seventy-five percent of patients with hepatitis B have mild or subclinical disease, 25% develop jaundice, 5% require hospitalization, and 0.1% die of fulminant disease, and 6 to 10% of infected patients become chronic carriers. Such carriers may remain infectious for many years or for life and there is no effective treatment to alleviate this condition. The United States currently contains an estimated pool of 500,000 - 1,000,000 HBV carriers.

It is estimated that over 25% of carriers develop chronic active hepatitis which often progresses to cirrhosis. Furthermore, HBV carriers have a risk of developing primary liver cancer (primary hepatocellular carcinoma) that is 12 - 300 times higher than that of other populations. In addition, it is estimated that 4,000 persons die from hepatitis B-related cirrhosis each year in the United States and that more than 800 die from hepatitis B-related liver cancer (4).

The prevalence of hepatitis B virus infection has been studied on many Pacific Basin Islands, i.e. Ponape, Fiji, Western Samoa, American Samoa, Tonga, Nauru, Solomon Islands, etc. All islands studied appeared to show a similar hyperendemic pattern, with generally 5-15% of the population being HBsAg-positive (HBV carriers), and up to 90% of the population have evidence of past HBV infection. In most populations where age-specific attack rates have been measured, the majority of infections have occurred perinatally or during childhood (5,6,7,8,9,10).

BACKGROUND

The Territory of Guam is the largest and southernmost island of the Mariana Islands in the Pacific region known as Micronesia. The island is the westernmost possession of the United States, and is an unincorporated territory. Guam is located approximately 6,000 miles west of San Francisco, 1,500 miles southwest of Japan, and approximately 1,500 miles

east of the Philippines. The population is estimated to be 121,624 (1980 census) which is composed of 47.5% Chamorros/Part Chamorros, 19.3% Filipinos, 25% Caucasians, and the remainder a mixture of Japanese, Koreans, Chinese, Micronesians, Vietnamese, etc. Approximately 30% of the population reside in the villages of the northern region, 43% in the central region, and 27% in the southern region.

The reporting of hepatitis B and all notifiable diseases is coordinated through the Territorial Epidemiologist utilizing the passive and/or active morbidity/mortality reporting system. Such reporting requirement of hepatitis and other communicable diseases of public health importance is mandated by law.

Table 1 depicts the total incidence rate of clinical and/or laboratory confirmed hepatitis infections reported to the Department of Public Health & Social Services.

TABLE 1
Incidence Rate Per 100,000 Population of Viral Hepatitis From
1978-1987, Territory of Guam

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Hepatitis A	45.4	40.6	46.2	12.9	1.8	5.3	1.9	20.5	16.8	4.9
Hepatitis B	13.8	17.4	4.7	4.6	5.4	7.1	8.7	7.7	10.1	6.6
Viral Hep. unspecified	44.4	69.5	75.5	20.3	16.3	8.9	22.6	11.9	17.6	9.0
Total	103.7	127.5	126.4	37.9	16.3	21.3	45.2	40.1	44.4	20.6

The above data shows that the incidence rate of all forms of hepatitis on Guam is generally higher than in developed countries. It appears, however, that there is a downward trend in the incidence of clinical hepatitis B on Guam during the last 10 years. Although, the presence on individuals of serological markers, particularly for hepatitis B, which is generally not reported not to mention the subclinical hepatitis cases is much higher indicating that much of the population may have had HBV infection.

The annual death rate of primary liver cancer did not significantly increase in the last 5 to 10 years either. A 5-year death rate from 1982-1986 indicated that it averaged at approximately 2 per 100,000 population per year. For 1987 however, the rate was significantly higher at 6.6 per 100,000 with a mean age of cases estimated at 60.9 while the median age is 60.

Liver cirrhosis from all causes also has not dramatically increased during the last 5 years. Although for 1987, death rate of liver cirrhosis at 12.3 per 100,000 population was more than twice the rate of the previous year at 5.0 per 100,000, it is still within the peaks seen in previous years. The age of reported cases in 1987 ranged from 29-79, mean age of 50.4, and a median age of 49 (see Tables 2 and 3).

TABLE 2
LIVER CIRRHOSIS DEATHS BY AGE AND SEX
FROM 1983-1987, GUAM

AGE	1983		1984		1985		1986		1987	
	M	F	M	F	M	F	M	F	M	F
20-29					1		1		1	
30-39	2		1						1	
40-49	3		2		3	1	1		5	1
50-59	2	1	3	1	5		2		3	2
60-69	3	1	1		1	1	1		1	
70+			1		3		1		1	
TOTAL	10	2	8	1	13	2	6		13	2

TABLE 3
LIVER CANCER DEATHS BY AGE AND SEX
FROM 1983-1987

AGE	1983		1984		1985		1986		1987	
	M	F	M	F	M	F	M	F	M	F
20-29										
30-39		1								
40-49							1		1	1
50-59	2		2						1	
60-69			1			1			2	
70+			2				1		2	1
TOTAL	2	1	5	0	0	1	2	0	6	2

SEROPREVALENCE STUDY

The prevalence of hepatitis B virus infection has been studied on a limited scale in a cross section of Public Health clients in 1983 (11). Evidence from this report suggested that HEV infection was endemic in our region.

A total of 327 participants was drawn which included 111 (34 percent) males and 216 (66 percent) females of which 231 (71 percent) were Chamorros, 59 (18 percent) Filipinos and 37 (11 percent) all other (micronesians, Asians and Caucasians).

The findings had indicated that 48.0 percent of the sampled population have anti-HBc markers as evidence of current or past infection. While the prevalence of anti-HBs was at 41.3 percent and a prevalence of HBsAg at 5.2 percent. Of the 171 individuals with positive serologic markers, 70.2 percent had evidence of immunity to previous infection while 9.9 percent represent HEV carriers. The different serologic profiles observed among the participants are shown on Tables 4, 5, and 6.

In terms of ethnicities, significant differences exist demonstrating evidence of present or past HEV infection. Micronesians had anti-HBc prevalence at 85.7 percent while Filipinos and Chamorros at 56.7 percent and 41.6 percent respectively. As to the prevalence of HBsAg-positive (HEV carriers), Micronesians had a prevalence of 19.0 percent, Filipinos at 11.6 percent and Chamorros at 2.6 percent. Furthermore, for those identified with hepatitis B surface antigenemia, slightly more than half at 56.3 percent were detected among women at child-bearing age.

This is extremely significant because mother to infant transmission at birth is one of the most efficient modes of HEV transmission. If the mother is positive for both HBsAg and HBeAg, about 70-90 per cent of infants will become infected and up to 90 per cent of these infected infants will become carriers (4). Twenty five per cent of these chronic carriers may die of cirrhosis or primary hepatocellular carcinoma (12). If the mother is only HBsAg-positive, transmission occurs less frequently and rarely leads to HEV carrier state. However, severe acute disease, including fatal fulminant hepatitis in the neonate, has been reported (13,14).

It has been shown from carefully conducted, randomized, controlled clinic trials that for perinatal exposure to and HBsAg (+), HBeAg (+) mother, a regimen combining one dose of hepatitis B immune globulin (HBIG) at birth with hepatitis B vaccine series started soon after birth is 85-90 per cent effective in preventing development of the HEV carrier state (12,15). Other regimens involving either multiple doses of HBIG alone, or the vaccine series alone, have 70-90 per cent efficacy while a single dose of HBIG alone has only 50 per cent efficacy (16).

SCREENING ACTIVITIES

In March 1985, the Department of Public Health and Social Services' Maternal and Child Health Program began screening as a pilot project all

TABLE 4

AGE & SEX SPECIFIC RATES OF THE SEROLOGIC PATTERNS
FOR THE SWEETED POPULATION

M A L E						F E M A L E						T O T A L						
AGE	POP	A	B	C	D	E	POP	A	B	C	D	E	POP	A	B	C	D	E
16-19	9			2(22.2)			47	4(8.5)		11(23.4)	1(2.1)	5(10.6)	56	4(7.1)		13(23.2)	1(1.8)	5(8.9)
20-29	39	4(10.3)		17(43.6)	2(5.1)	1(2.3)	85	4(4.7)		22(25.9)	8(9.4)	2(2.4)	124	8(6.5)		39(31.5)	10(8.1)	3(2.4)
30-39	21			9(42.9)			30	1(3.3)		11(36.7)	1(3.3)	1(3.3)	51	1(2.0)		20(39.2)	1(2.0)	1(2.0)
40-49	8			3(37.5)			11			3(27.3)	2(18.2)		19			6(31.6)	2(10.5)	
50-59	11	1(9.1)	1(9.1)	7(63.6)		1(9.1)	19	1(5.3)		4(21.1)	2(10.5)	3(15.8)	30	2(6.7)	1(3.3)	11(36.7)	2(6.7)	4(13.3)
60-69	14			9(64.3)	2(14.3)		10			7(70.0)			24			16(66.7)	2(8.3)	
70+	9			7(77.8)			14	1(7.1)		8(57.1)	2(14.3)	1(7.1)	23	1(4.3)		15(65.2)	2(8.7)	1(4.3)
TOTAL	111	5(4.5)	1(0.9)	54(48.6)	4(3.6)	2(1.8)	216	11(5.1)		66(30.6)	16(7.4)	12(5.6)	327	16(4.9)	1(0.3)	120(36.7)	20(6.1)	14(4.3)

A = Total HBsAg Anti-HBs Anti-HBc
 B = 16 + + +
 C = 120 - + +
 D = 20 - + +
 E = 14 - + +

Table 5

AGE & SEX SPECIFIC RATES OF THE SEROLOGIC
PATTERN OBSERVED AMONG THE FILIPINOS

AGE	MALE					FEMALE					TOTAL							
	POP.	A	B	C	D	E	POP.	A	B	C	D	E	POP.	A	B	C	D	E
16-19							6					1(16.7)	6					1(16.7)
20-29	6	1(16.7)		4(66.7)			10	1(10.0)			3(50.0)	1(10.0)	16	2(12.5)		3(50.0)		1(6.3)
30-39	4			3(75.0)			7	1(4.3)			1(10.0)	3(42.9)	11	1(9.1)		6(54.5)		
40-49	4			1(25.0)			5				2(40.0)	2(40.0)	9			3(33.3)		
50-59	4	1(25.0)	1(25.0)	2(50.0)			7	1(4.3)			1(4.3)	1(4.3)	11	2(18.2)	1(9.1)	3(27.3)		
60-69	4			1(25.0)	2(50.0)		1				1(100)	1(100)	5			2(40.0)	2(40.0)	
70+	2			2(100)			2	1(50.0)			1(50.0)		4	1(25.0)		3(75.0)		
TOTAL	24	2(8.3)	1(4.2)	13(54.2)	2(8.3)		38	4(10.5)			12(31.6)	2(5.3)	62	6(9.7)	1(1.6)	25(40.3)	2(3.2)	2(3.2)

Table 6

AGE & SEX SPECIFIC RATES OF THE SEROLOGIC
PATTERN OBSERVED AMONG THE CHAMORROS

AGE	MALE					FEMALE					TOTAL							
	POP.	A	B	C	D	E	POP.	A	B	C	D	F	POP.	A	B	C	D	E
16-19	6					1(16.7)	36	2(5.6)		6(16.7)		4(11.1)	42	2(4.8)		6(14.3)		5(11.9)
20-29	21	1(4.8)		8(38.1)			69	3(4.3)		16(23.2)	8(11.6)	1(1.4)	90	4(4.4)		24(26.7)	8(8.9)	1(1.1)
30-39	14			5(35.7)			22			8(36.4)		1(4.5)	36			13(36.1)		1(2.8)
40-49	4			2(50.0)			4				1(25.0)		8			2(25.0)	1(12.5)	
50-59	5			4(80.0)			11			3(27.3)	2(18.2)	3(27.3)	16			7(43.8)	2(12.5)	3(18.8)
60-69	9			7(77.8)			9			6(66.7)			18			13(72.2)		
70+	7			5(71.4)			10			7(58.3)	2(16.7)	1(8.3)	19			12(63.2)	2(10.5)	1(5.3)
TOTAL	66	1(1.5)		31(46.9)		1(1.5)	163	5(3.1)		46(28.2)	13(7.9)	10(6.1)	229	6(2.6)		77(33.6)	13(5.7)	11(4.8)

A =
 B =
 C =
 D =
 E =

HBsAg
 +
 +
 -
 -
 -

Anti-HBs
 -
 +
 +
 -
 +

Anti-HBc
 +
 +
 +
 +
 -

their prenatal patients using HBsAg marker. Infants born to seropositive mothers were, consequently, vaccinated at birth with HBIG plus a series of heptavax within 7 days and again at 1 and 6 months.

In this screening activity, the program had identified a total of 19 seropositive or 3.1 per cent prenatal patients from a total of 609 patients screened in 1985. While in 1986, 32 out of the 717 prenatal patients screened were HBsAg-positive representing 4.5 percent. For 1987, only 19 out of the 653 or 2.9 per cent prenatal patients screened were identified as HBsAg positive.

Tables 7, 8, and 9 illustrate the ethnic distribution of all the prenatal patients screened and the proportion of HB surface antigenemia among the different ethnic groups identified in the serosurvey. A clear pattern seemed apparent between the Chamorro and Filipino populations. The prevalence rate in the Chamorro population is less than 3 percent while in the Filipino population the prevalence rate is approximately 10 percent. These findings were consistent with the results of the earlier seroprevalence study. In the other population, there is a very marked variation in findings. Among other things, this is very likely due to under representation of that particular population that it makes it difficult to draw a general conclusion.

Similar prenatal screening activity was conducted in the other sectors of the community in the same time period. Family Health Plan/Guam Medical Clinic (FHP/GMC) identified 8 of their 150 prenatal patients or 5.3 percent as HBsAg-positive. While Naval Regional Medical Center (NRMC) which primarily serves the military population had a positivity rate of 4.5 percent.

Another outcome of the 1983 seroepidemiological survey was the screening of the Division of Public Health health care workers in certain occupational categories to determine: a) their HBV status whether these health care workers are at a higher risk of the disease than the general population, and; b) to provide free vaccination to those who are identified as susceptible.

Blood samples were collected and tested for hepatitis B surface antigen (HBsAg) and either antibody to hepatitis B core antigen (anti-HB core) or antibody to hepatitis B surface antigen (anti-HBsAg). There were no obvious differences in HBV antigen carriage rates between males and females at 12.0 and 12.3 per cent respectively. However, the antigen prevalence rates by ethnic group were significantly higher among the Filipinos at 17.2 per cent followed by the Chamorros at 11.1 per cent and the Caucasians at 4.0 per cent.

Similar trend was also observed in terms of the prevalence rates for all markers at 60.3 per cent for Filipinos, although, between the Chamorros and Caucasians it was reversed at 19.4 and 32.0 per cent respectively. As to occupation, there was some evidence that a greater degree of exposure to patients, needles, blood, etc., as observed among our laboratory personnel appeared to have a much greater risk for HBV which explained why this group has a much higher prevalence rates in antigen or antibody

TABLE 7
HBsAg PREVALENCE AMONG PRENATAL PATIENTS AT
PUBLIC HEALTH'S MCH PROGRAM
1985

ETHNIC GROUP

	CHA	FIL	MIC	CAU	OR	TOTAL
POPULATION	423	100	63	13	10	609
HBsAg-(+)	7	11	1	-	-	19
PERCENTAGE	1.7	11.0	1.6	-	-	3.1

TABLE 8
HBsAg PREVALENCE AMONG PRENATAL PATIENTS AT
PUBLIC HEALTH'S MCH PROGRAM
1986

ETHNIC GROUP

	CHA	FIL	MIC	CAU	OR	TOTAL
POPULATION	493	105	93	16	10	717
HBsAg-(+)	12	10	8	2	-	32
PERCENTAGE	2.4	9.5	8.6	12.5	-	4.5

Table 9
HBsAg PREVALENCE AMONG MCH PRENATAL PATIENTS
AT PUBLIC HEALTH, 1987

ETHNIC GROUP

	CHA	FIL	MIC	CAU	OR	TOTAL
POPULATION	451	101	76	15	10	653
HBsAg-(+)	4	6	7	-	2	19
PERCENTAGE	0.8	5.9	9.2	0	20.0	2.9

Chamorros: Include Guamanians, Saipanese

Micronesians: Include Trukese, Palauans, Yapese, etc.

Oriental: Include Koreans, Vietnamese, Chinese, etc.

compared to the other occupational categories (see Tables 10 and 11).

RECOMMENDATIONS/STRATEGIES

The choice of an effective strategy varies from country to country depending on the prevailing epidemiologic pattern of HBV in any given community. Another factor deals with the availability of resources to prevent it. Although, the vaccine has been proven to be highly immunogenic and very safe with over 30 million doses of the vaccine distributed worldwide, the current high price of the vaccine is the central issue in determining the strategy necessary for the prevention of hepatitis B. Currently, the high vaccine cost is the only major deterrent to universal vaccination.

In our area where the prevalence rates of HBV infection and HBsAg-positive (HBV carriers) are significantly lower compared to the other jurisdictions in the Pacific Region, it was decided to identify subgroups who are at a much higher risk within our population. As a result, the Department began to screen virtually all public health prenatal patients for HBsAg in 1985. This strategy was based on the following factors: a) An intermediate HBV carrier prevalence rate among our child-bearing population, b) relatively cheaper cost of screening test, and c) the high cost of the vaccine.

The presence of HBsAg positive pregnant women in our area clearly underscores the importance of continuing this screening program until such strategy is no longer cost-effective, i.e. lower vaccine cost which favors universal vaccination approach.

Since 1985, all newborns of HBsAg positive mothers identified in our screening program were given hepatitis B immune globulin (HBIG) and the first dose of hepatitis B vaccine (heptavax) shortly after birth with the second and the third dose of the vaccine given at 1 and 6 months respectively. Vaccine coverage for those infants who received their hepatitis B vaccine since the beginning of the screening program was approximately 76 per cent for the three (3) doses while 89 per cent of the infants have at least completed the second dose of the series.

The primary objective of the global immunization programme against hepatitis B is to prevent chronic HBV carrier state thereby preventing chronic hepatitis, cirrhosis, and hepatocellular carcinoma. These sequelae of HBV infection have only been identified with the long term carrier state.

Prevention of infections per se is of little importance because infections which do not lead to the carrier state are rarely of clinical or public health significance. HBV prevention programmes should therefore be targeted at infants and young children who are the group most at risk of becoming carriers (17).

Over the next few weeks, the Department will start to implement a mass vaccination program targeting our newborns and young children which we consider our first and highest priority. This is made possible with the availability of the hepatitis vaccine to be donated by Merck, Sharpe, and Dohme.

Table 10
PREVALENCE OF HBV MARKERS BY SEX AND OCCUPATION
AMONG DEPARTMENT OF PUBLIC HEALTH EMPLOYEES, 1985

Occupational Category	PERCENTAGE PREVALENCE							
	Male			Female			Total	
	Pop	HBsAg All (+) Markers		Pop	HBsAg All (+) Markers		Pop	HBsAg All (+) Markers
Medical	5	20.0 40.0		2	- -		7	14.3 28.6
Dental	13	- 38.5		20	- 40.0		33	- 39.4
Nursing	-	- -		54	16.7 38.91		54	16.7 38.9
Lab	4	- 50.0		11	27.3 27.3		15	20.0 53.3
Maintenance	17	11.8 23.5		7	14.3 14.3		24	12.5 20.8
Other	11	27.3 63.6		12	- 8.3		23	13.0 34.8
Total	50	12.0 40.0		106	12.3 34.9		156	12.3 36.5

Table 11
PREVALENCE OF HBV MARKERS BY SEX AND ETHNICITY
AMONG DEPARTMENT OF PUBLIC HEALTH EMPLOYEES, 1985

Occupational Category	PERCENTAGE PREVALENCE							
	Male			Female			Total	
	Pop	HBsAg All (+) Markers		Pop	HBsAg All (+) Markers		Pop	HBsAg All (+) Markers
Chamorro	27	14.8 29.6		45	8.9 13.3		72	11.1 19.4
Filipino	7	14.3 85.7		51	17.6 56.9		58	17.2 60.3
Caucasian	16	6.3 37.5		9	- 22.2		25	4.0 32.0
Total	50	12.0 40.0		105	12.4 35.2		155	12.3 36.8

During the last Scientific Meeting on the Control of Hepatitis B Infection in Infants and Children in High Risk Areas of the World in 1987 co-organized by the South Pacific Commission where Guam is a member state, the following guidelines for hepatitis B control were developed which include:

- Immunization strategies with high priority given to immunization of newborns in conjunction with the Expanded Programme on Immunization (EPI). Immunization of children up to at least age five should be considered after immunization of neonates has been achieved.

- Screening of pregnant females and administration of HBIG to infants of highly infectious mothers; this can be considered if appropriate technology already exists to address perinatal transmission.

- A comprehensive information and education programme on Hepatitis B immunization; this is essential at the decision makers' level as well as for the health personnel.

Prepared by: -

Efren A. Dolor, M.P.H.
CDC Program Coordinator
DPH & SS

REFERENCES

1. World Health Organization, 1977: Advances in Viral Hepatitis. Report of WHO Expert Committee on Viral Hepatitis: WHO Technical Report Serial No. 602, 38-42.
2. Krugman S: Hepatitis B Immunoprophylaxis. Laboratory Medicine. 1983. 14: 727-32.
3. ACIP: Update on Hepatitis B Prevention. MMWR 1987. 36: 353-66.
4. ACIP: REcommendations for Protection Against Viral Hepatitis. MMWR 1985. 34: 313-34.
5. Kuberski T, LeGonidec G, Gust ID et al: Hepatitis B virus infections in Melanesians and Polynesians in New Caledonia. Am J Epidemiology 1981. 114: 355-61.
6. Mazzur S, Bastiaans JS, Nath N: Hepatitis B virus (HBV) infections among children and adults in the Solomon Islands. Am J Epidemiology 1981. 113: 510-19.
7. Zhuang H, Coulepis AG, Zimmet P et al: Seroepidemiology of infection with hepatitis B virus in Fiji. Am J Epidemiology 1982. 116: 608-16.
8. Diwan A: Unpublished data. Personal communication. 1984.
9. Gust ID, Dimitrakakis M, Zimmet P: Studies on hepatitis B surface antigen and antibody in Nauru I. Distribution among Nauruans. Am J Trop Med Hyg 1978. 27: 1030-6.
10. Wainwright RB, MacMahon BJ, Bender TR et al: Prevalence of hepatitis B virus infections in Tonga. Identifying high-risk groups for immunization with hepatitis B vaccine. International J Epidemiology 1986. 15: 567-71.
11. Crisostomo C: Unpublished data. Personal communication. 1983.
12. Beasley RP, Hwang LY, Lee GC et al: Prevention of perinatally transmitted hepatitis B virus infections with hepatitis B immune globulin and hepatitis B vaccine. Lancet 1983. 11: 1099-102.
13. Sinatra FR, Shah P, Weissmann JY, Thomas DW, Merritt RJ, Tong MJ: Perinatal transmitted acute icteric hepatitis B in infants born to hepatitis B surface antigen-positive and anti-hepatitis B e positive carrier mothers. Pediatrics 1982. 70: 557-9.
14. Delaplane D, Yoger R, Crussi F, Shuman ST: Fatal hepatitis B in early infancy: the importance of identifying HBsAg-positive pregnant women and providing immunoprophylaxis to their newborns. Pediatrics 1983. 72: 176-80.

15. Stevens CE, Toy PT, Tong MJ et al: Perinatal hepatitis B virus transmission in the United States. Prevention by passive-active immunization. JAMA 1985. 253: 1740-5.
16. Beasley RP, Hwang LY, Stevens CE et al: Efficacy of hepatitis B immunoglobulin for prevention of perinatal transmission of the hepatitis B virus carrier state: final report of a randomized double-blind placebo controlled trial. Hepatology 1983. 3: 135-41.
17. Beasley RP. Expanded Programme on Immunization: Hepatitis B Immunisation Strategies. WHO/EPI/GEN 88.5.

TERRITORY OF GUAM
DENTAL HEALTH PROGRAM REPORT
SEPTEMBER 1988

I. Introduction and Background

The oral health status of the people of Guam is similar to that seen in many rapidly developing areas of the world. As a result of an expanding economy and changing life-styles, the Guamanian diet has dramatically changed as the Island rebuilt from the destruction of the 2nd World War. This major dietary change has been the replacement of locally produced, non-processed foods with mass produced, packaged foods that are convenient to obtain and use. The result of this change has been that the amount of complex carbohydrates consumed in such indigenous foods as taro, breadfruit, rice and taploca has been reduced and the amount of refined carbohydrates, especially sugars, has greatly increased.

These dietary changes in an environment with a fluoride deficient water supply resulted in a rapid increase in cavities in children that soon reached epidemic proportions. The Government of Guam, recognizing this serious health problem, enacted Public Law 12-130 in 1974 which called for free basic dental care to be provided for all children up to 17 years of age. A Dental Program was established in the Department of Public Health and Social Services to provide this care. Unfortunately, the funding available for the Program has not been sufficient to support the manpower, equipment and supplies necessary to provide complete basic dental treatment for all of the eligible population. Over the years, the Program provided emergency care for the relief of pain to all, but complete care was afforded to only a minority. Dental health surveys conducted in 1977 and 1984 found that children on Guam averaged twice the number of cavities compared to similar aged children on the mainland of the U.S.A.

II. Preventive Dental Health Approach

With the Government budget unable to support the funding necessary to provide comprehensive treatment for all eligible children, an alternative approach, emphasizing the reduction of the disease problem through prevention rather than treatment, was undertaken. This alternative became possible because safe and effective methods for the prevention of cavities in children, specifically fluorides and dental sealants, had become available. The rationale for this approach was that preventive methods could reduce the disease problem to a level that could be treated by an affordable public health dental program.

A. Use of Fluorides

The use of fluorides began in the mid-1970's with a weekly mouth-rinsing in elementary and middle schools. School Health Counselors in each school were trained by the Dental Program staff and they supervised the teachers who conducted the rinsing in the classroom. The project was federal funded for three years and since then the cost has been assumed by the Government of Guam. Public water fluoridation was completed in January 1986. Because the water supply is obtained from multiple wells and springs, forty-six individual fluoridators are needed to properly fluoridate the water supply. The servicing and maintenance of the fluoridators is the responsibility of our government water company, the Public Utility Agency of Guam. Our Department regularly monitors the fluoride levels in the water at numerous sites throughout the Island and consults with the Public Utility Agency of Guam to ensure that the safety and efficacy of the method is maintained.

B. Dental Sealant Program

Despite the use of fluorides, some cavities continue to occur in many children. Most of these cavities begin in the pits and grooves of the chewing surface of the back teeth where food and bacteria can become trapped. In order to protect these surfaces from decay, a thin plastic coating, called a dental sealant can be applied in the dental clinic.

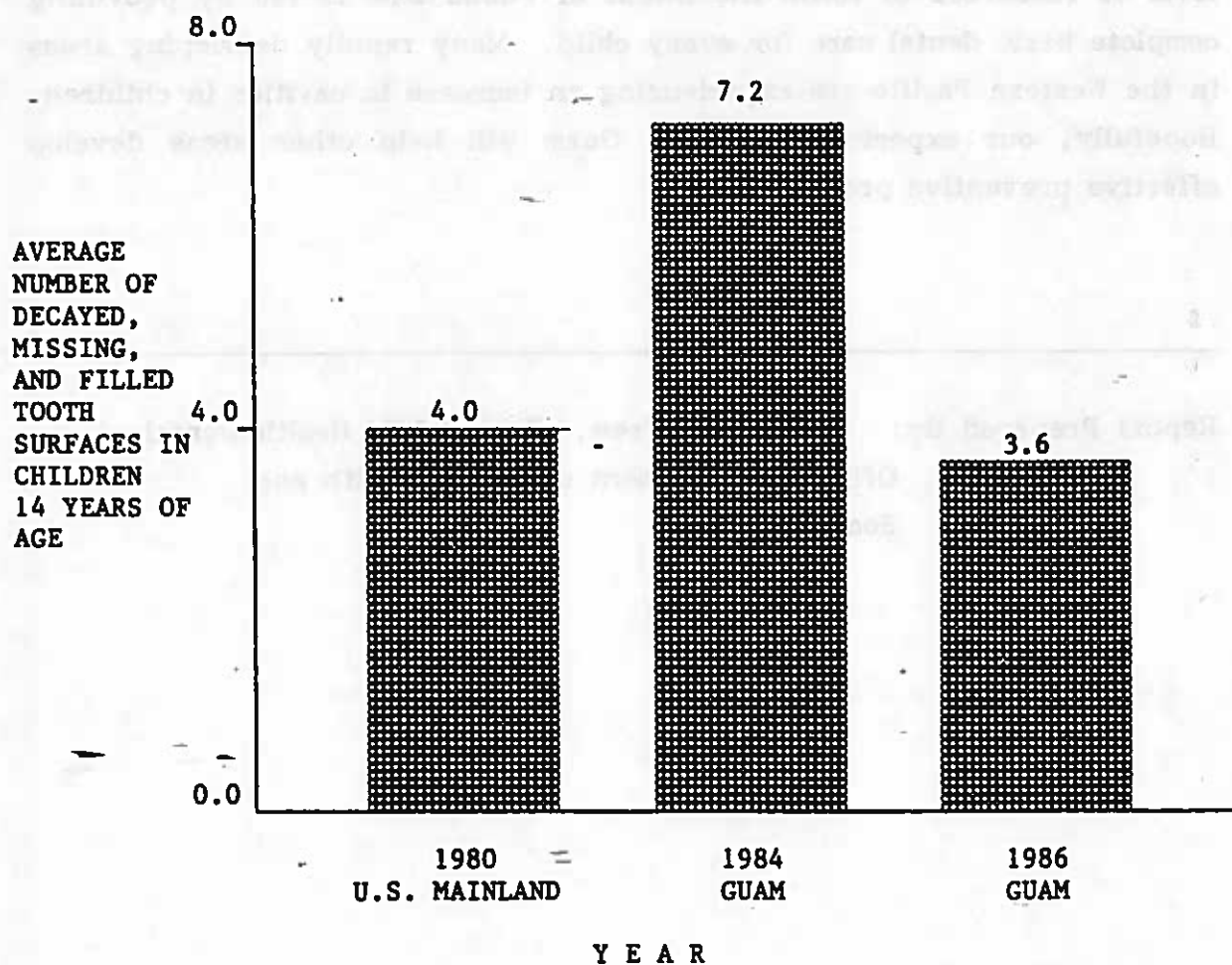
The application of dental sealants to prevent decay began in our public health dental clinics in 1983 with approximately 8,000 children, or one-half of those in grades 1 to 8, treated that year. The following year the entire population of over 16,000 children in these grades was treated. Beginning with the 1985-86 school year, over 18,000 children in grades K to 8 have been treated each year. The children are bussed to the clinics each school day, and each child receives sealant treatment and oral health education during a single, two-hour, annual visit.

With the addition of an oral health education segment to support the fluoride and sealant efforts, the children's dental health program was completed. This program is a cooperative effort between our Department, the Department of Public Works, and the Department of Education. It provides all school children in grades K to 8 with a weekly fluoride mouthrinse in school, annual dental sealant treatments at public health dental clinics, oral health education in both schools and clinics, and fluoridated water at home and at school. All public and private schools participate and there is no charge to individuals for any of the services provided.

The first results of the preventive program are shown in Figure 1 on the page following. A survey conducted in 1986 found that 14 year old children on Guam had 3.6 decayed, missing, or filled teeth, compared to 7.2 in 1984. The level of decay had been reduced over the two year period, from almost double the level, to a level similar to that of the average mainland child of the same age. This 50 percent reduction over the first two years of the program is increasing annually as more children have all their back teeth sealed shortly after they erupt. Likewise, the preventive effects of water fluoridation increases with each year of exposure. A second evaluation is scheduled for early 1989 and is expected to find continued improvement in the health status of our children.

FIGURE 1

Dental Decay: Guam vs. U.S. Mainland
1980, 1984, 1986



III. Conclusion

Because the preventive program has used much of the equipment and personnel already available for treatment, the total cost of the program has proven to be no more, and the cost per child much less, than was the case before the preventive approach was undertaken. In addition, the success of the preventive program is reducing the prevalence of dental caries in children on Guam to a level that soon will permit the current level of resources to fulfill the intent of Public Law 12-130 by providing complete basic dental care for every child. Many rapidly developing areas in the Western Pacific are experiencing an increase in cavities in children. Hopefully, our experience here on Guam will help other areas develop effective preventive programs.

**Report Prepared By: Ralph A. Frew, Chief Public Health Dental
 Officer, Department of Public Health and
 Social Services**

DENGUE FEVER CONCERNS

Although dengue has not been a wide-spread problem in the Pacific since 1980, we are particularly concerned that the recent outbreak in Palau may signal a new period of increased activity for this disease. Since there is no specific treatment to cure dengue infections and a vaccine is not yet available, health agencies must rely entirely on preventive measures to control the spread of this disease. Unfortunately, it is frequently difficult to generate much interest in pursuing effective preventive measures until cases of the disease have occurred locally and then it may be too late to take effective action.

Although to our knowledge the most efficient mosquito vector of dengue, Aedes aegypti, is no longer present on Guam, a secondary vector species, Aedes albopictus, has been associated with dengue epidemics in other areas and is common here. Reports from the military vector control program on Guam indicate that Aedes albopictus mosquito populations are reaching high levels on some bases and consequently they have begun a periodic insecticide spraying program in critical areas under their jurisdiction.

Our department's Vector Control Program continues to monitor the area around Guam's ports of entry including the Guam International Airport terminal and Commercial Port to eliminate potential mosquito breeding sites and, hopefully, to prevent any contact between local mosquitos and any infected visitors to Guam. We have alerted both customs and quarantine officers and local physicians to promptly report suspected cases of dengue fever in disembarking passengers or island residents.

When suspected cases have been identified, they are asked to, as much as possible, avoid being bitten by mosquitos. In addition, an inspection is made around the general area of their residence to identify possible mosquito breeding sites and citations are issued by environmental health inspectors if necessary. Unfortunately virtually all areas of Guam have either artificial litter (discarded bottles and cans, etc) or natural litter (coconut half-shells) that can serve as breeding places for Aedes mosquitoes and many areas may have both types of litter. Strict enforcement of public nuisance laws to eliminate the most serious mosquito breeding problems such as accumulations of old tires or wrecked cars is essential; continued public education about the importance of vigilance in keeping litter from accumulating around private homes is equally as important but probably more difficult to promote.

Although one case of dengue in an individual returning to Guam after travel to Palau has been confirmed, so far there is no evidence that the disease is being spread here. Hopefully continued vigilance on the part of both government agencies and individual citizens will prevent dengue and other serious mosquito borne disease from becoming serious public health problems on Guam.

The continued communication between Pacific Island Health officers for purposes of alerting each other to the possible transmission of disease(s) such as dengue is also an important factor for all of us in our efforts to prevent or contain disease outbreaks.

PREPARED BY:
ROBERT L. HADDOCK, DVM, MPH
Territorial Epidemiologist
Guam
9/21/88



GUAM

AIDS

**AIDS '88 REPORT
TERRITORY OF GUAM**

**DEPARTMENT OF PUBLIC HEALTH AND SOCIAL SERVICES
COMMUNICABLE DISEASE CONTROL UNIT**

**TERRITORY OF GUAM
AIDS PREVENTION PROGRAM REPORT
SEPTEMBER 1988**

I. GUAM'S AIDS PREVENTION PROGRAM

A. Introduction

The acquired immunodeficiency syndrome (AIDS) continues to grow as a major public health problem in the United States with over 71,000 reported cases of AIDS, and over 2 million reported cases of individuals infected with the AIDS virus.

The AIDS virus, referred to as Human Immunodeficiency Virus (HIV), is transmitted sexually, through contaminated needles, through blood and blood components, and perinatally. Without a vaccine or therapy, the main bases for AIDS prevention are a thorough understanding of the risk factors for HIV infection, and efforts to change the behaviors which contribute to those factors.

B. Incidence of AIDS on Guam

To date, five cases of AIDS have been diagnosed on Guam since June 1985. Four of the five have died. Of the five cases, one was reported in 1985, two in 1986, one in 1987, and one in 1988. All five AIDS cases were reported to the Department of Public Health by the Guam Memorial Hospital. The five reported AIDS cases meet the 1987 revised CDC definition for AIDS.

Within this same time frame, a total of five individuals have tested seropositive for the AIDS virus on the ELISA and Western Blot Confirmatory Test. All these cases were identified by the DPH AIDS counseling and test site.

C. Guam At Risk For AIDS

Risk for the continued introduction of AIDS remains a high possibility with the existence of a large potential for development of AIDS cases due to the significant number of individuals within the following groups which practice high risk behaviors:

- Homosexuals or Gays - Male population estimated at ±8,000.
- Intravenous Drug Users - Number of individuals with a past or present intravenous drug addiction is estimated at +130.
- Heterosexuals with Multiple Sex Partners - Male and female population is estimated at +2,000.

Based on these estimates there are approximately ±10,130 individuals who may need evaluation for the HIV virus. The same groups, as well as the

Territory of Guam
AIDS '88 Report

general population, will be the target audience for the dissemination of information relative to prevention, reduction of high risk practices, and elimination of myths about the AIDS infection.

The risk for the spread of AIDS in the community is also exacerbated by the existence of a large transient population comprising close to 30 percent of Guam's population who may be potential carriers for HIV and AIDS. This highly mobile and transient group is composed of the active military and their dependents, temporary alien labor work force, teachers, and short term contract specialists.

Furthermore, the island's growing tourist industry with an average of 356,670 visitors yearly may also play a part in the increase of Guam's vulnerability for AIDS.

Figure 1 on the page following shows increases in yearly cumulative totals of those tested for AIDS categorized by sex. Between November 14, 1985, and July 1988, 637 or 68 percent of those tested were females, and 294 or 32 percent were males. The majority of the female participants is composed largely of massage parlor workers who are required to undergo HIV testing as part of health certificate clearances every three months.

Of the total number tested, five HIV seropositives were recorded which represent a .53 percent positivity rate. The five HIV seropositive cases and the total tested represent a seroprevalence of 5.3 per 1,000 population.

D. Mandatory Screening Activity

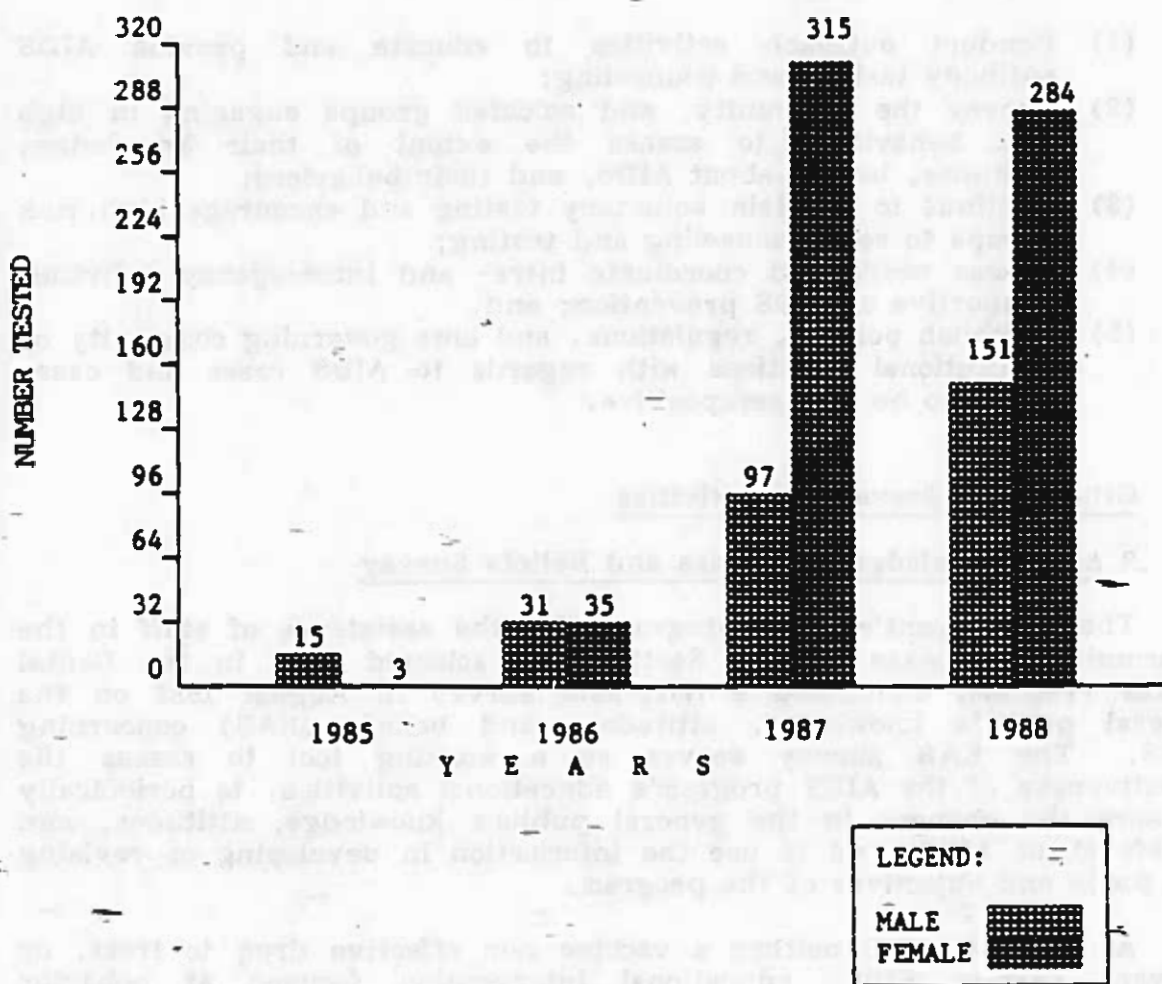
The U.S. Public Health Service regulations governing medical examination of aliens have been amended to include AIDS to the list of dangerous contagious diseases. With this amendment effective December 1, 1987, all aliens applying for adjustment of status are required by U.S. Immigration and Naturalization Service to undergo HIV testing as part of medical examination requirements. Between December 1987 and August 1988, a total of 93 immigrant clients have undergone HIV testing. The ethnic distribution of this group consists of 44 Filipinos, 6 Koreans, 6 Japanese, 27 Palauans, 1 German, 1 Columbian, 1 Indian, 4 Chinese, and 3 Vietnamese. At present, none of this group tested HIV seropositive.

The DPHSS has established regulations wherein massage parlor employees are required to renew their health certificates every three months to continue employment. Health certificate renewal consists of medical examination clearance which includes HIV testing. This group is composed chiefly of female Koreans who represent the majority of female clients utilizing the program. So far none of this group tested HIV seropositive.

**Territory of Guam
AIDS '88 Report**

FIGURE 1

**AIDS PROGRAM
COUNSELING AND TESTING SITE
NOVEMBER 14, 1985 - JULY 31, 1988**



The Guam Memorial Hospital Authority has also been conducting ELISA tests on all blood donors since 1985, and continues to do so. They also make the ELISA test available on a voluntary basis for their in-patients.

E. Public Health's AIDS Prevention Program

In response to the concerns raised by AIDS, the Department of Public Health and Social Services established an AIDS Prevention Program composed of an AIDS Counseling and Test Site component, and AIDS Health Education and Risk Reduction component. The Department applied for and has been receiving federal funds for its program since Fiscal Year 1986. The Public Health Facility in Mangilao provides AIDS counseling and testing on a voluntary basis. The Department also provides health education activities for the general public which includes outreach activities for identified high risk groups. Our basic response has been to:

- (1) Conduct outreach activities to educate and provide AIDS antibody testing and counseling;
- (2) Survey the community, and selected groups engaging in high risk behaviors, to assess the extent of their knowledge, attitudes, beliefs about AIDS, and their behaviors;
- (3) Continue to maintain voluntary testing and encourage high risk groups to seek counseling and testing;
- (4) Assess needs and coordinate intra- and inter-agency activities supportive of AIDS prevention; and
- (5) Establish policies, regulations, and laws governing community or institutional practices with regards to AIDS cases and cases found to be HIV seropositive.

F. Other AIDS Prevention Activities

° AIDS Knowledge, Attitudes and Beliefs Survey

The Department's AIDS program with the assistance of staff in the Communicable Disease Control Section and selected staff in the Dental Health Program, conducted a telephone-survey in August 1988 on the general public's knowledge, attitudes, and beliefs (KAB) concerning AIDS. The KAB survey serves as a working tool to assess the effectiveness of the AIDS program's educational activities, to periodically measure the changes in the general public's knowledge, attitudes, and beliefs about AIDS, and to use the information in developing or revising the scope and objectives of the program.

At present, with neither a vaccine nor effective drug to treat, or prevent against AIDS, educational intervention focused at behavior modification is the only viable alternative. Prior to the AIDS program's survey, information on the public's views in AIDS was merely conjectural, and did not form an adequate basis for effective planning.

**Territory of Guam
AIDS '88 Report**

This AIDS KAB survey is the AIDS program's first effort in the periodic assessment of the general public. Four hundred respondents selected through a systematic sampling approach, participated in the survey.

However, because of time and funding limitations, data compiled for the 1988 report, which is due for completion in late October 1988, is not as comprehensive as originally planned. Only generalized findings will be presented in the report which will be forwarded to the federal grantor agency upon completion. With adequate federal funding requested for Grant Year 1989, it is anticipated that a more comprehensive survey and analysis will be available by December of 1989.

G. Public Information/Education Activities

AIDS public information and education activities were particularly active during this period. In July 1988, the AIDS Coordinator and the STD Supervisor were featured on K-57 Radio Talk Show concerning the AIDS KAB survey. They also appeared on the local public broadcasting television station (KTGF) to discuss AIDS. The publicity surrounding the AIDS survey generated interest in AIDS education and prevention, and as a result, requests for presentations have been steady. The JAYCEES selected AIDS education as one of their select projects for the year. In August, the AIDS staff assisted the JAYCEES in establishing displays and exhibits on AIDS at one of the major shopping centers on Guam. Furthermore, during JAYCEES International month in October, the JayCees have requested a presentation on AIDS for their membership. Throughout the month of June, July, and August, radio announcements on AIDS were aired. In addition, newspaper advertisements were appearing simultaneously in the local daily newspaper. AIDS posters and materials have been distributed to health clinics, fire stations, health providers, government agencies, hotels, night clubs and bars, and adult book stores.

H. Collaborative Efforts With Other Pacific Islands

The AIDS staff has also been receiving inquiries from islands in the Western Pacific Region on our AIDS prevention program. The World Health Organization recently sent representatives to Guam to review our AIDS program. Their review was extremely positive, and indicated that it could serve as the resource for other programs in Micronesia. As a result, we have thus far sent AIDS materials to Pohnpei at their request.

II. LONG TERM OBJECTIVES

OBJECTIVE A

To operate the AIDS Counseling and Test Site Program at the central facility of the DPHSS in Mangilao. The Communicable Disease Control Section of the Department will accommodate and conduct supervision and assistance in the operation of the CTS Program.

OBJECTIVE B

To provide the delivery of sensitive and effective pre- and post-test counseling of clients in terms of confidentiality assurance, AIDS education, risk behavior evaluation, the significance, procedures and interpretation of test results, notification of partner(s) and scheduling of additional counseling support.

OBJECTIVE C

To assure the confidentiality of all client records and records of test results in accordance with the confidentiality requirements of section 318, (e), (5), of the Public Health Service Act.

OBJECTIVE D

To maintain the capability of the Public Health Reference Laboratory's utilization of the QUANTUM II (Abbott), to perform the ELISA test procedure and timely submission of test results to AIDS Program Coordinator.

III. REPORT OF PROGRESS ON MEETING SHORT TERM AIDS PREVENTION OBJECTIVES (May - December 1988)

OBJECTIVE A

To maintain procedures for confidential notification of sex and needle-sharing partners of AIDS cases and HIV seropositive individuals.

° Progress:

1. The Program Coordinator and Medical Social Worker have undergone training in counseling and partner notification techniques. The Program Coordinator participated in a workshop training sponsored by Centers for Disease Control. This training involved HIV Serologic Test Counseling and Partner Notification Techniques, which was held on February 22-26, 1988, at the State Health Building, Berkeley, California. The Medical Social Worker attended training on Psychosocial Counseling for persons with HIV infection, AIDS and related diseases. This workshop, sponsored by the World Health Organization, was held in Singapore from June 27 to July 1, 1988.
2. The AIDS Program is currently working on the development of its protocol. The standards and procedures will be consistent with CDC requirements in the delivery of pre- and post-counseling, and partner notification. It is expected that by the end of the project period or early Fiscal Year 1989, completion of the protocol will be accomplished.
3. At present, the AIDS Program has begun initial notification of partners of an AIDS patient who died in January 1988. The

**Territory of Guam
AIDS '88 Report**

Program has communicated with 3 of 4 contacts associated with the AIDS victim. Of these informed contacts, two underwent testing in June 1988 with negative results, while the third refused to undergo further counseling and testing.

OBJECTIVE B

To coordinate with Public Health's Tuberculosis (TB) and Maternal Child Health (MCH) clinics in the voluntary referral of their high risk patients for HIV counselling and testing services.

° Progress:

1. Coordination has been established between the AIDS and TB Program in the referral of clients. Referral for counseling and HIV testing is offered to all active TB patients who fall under one of the high risk categories on a voluntary basis. In addition, clients that are identified to be HIV seropositive are encouraged to visit the TB program for a PPD skin test. At present, two HIV seropositives were referred for PPD skin test and three active TB patients were referred for HIV counseling and testing.
2. The AIDS Program is currently working with MCH clinic in the coordination of the referral of clients for counseling and HIV testing.
3. Other entities with established coordination for the referral of clients for counseling and HIV testing include immigration, Sexually Transmitted Diseases (STD) clinic and private clinics. Between May 1987 to August 1988, a total of 462 STD clients, 93 immigration clients, and 25 referrals from private clinics were tested. Of these groups, none tested HIV seropositive.

OBJECTIVE C:

To reach other private providers in the coordination of voluntary patient referrals for HIV counseling and testing as Public Health Laboratory is the only entity with free ELISA testing available for the general public.

° Progress:

1. The CTS is currently working to launch promotional efforts on its free HIV counseling and testing services to this group. A transmittal letter has been developed to be attached with literatures on AIDS and counseling techniques. It is expected between the end of this project period and early Fiscal Year 1989, that implementation of this project will be accomplished. For your perusal, attached is a copy of transmittal letter to be distributed to the various private providers.
2. Private physician/clinic referral is arranged by either client

**Territory of Guam
AIDS '88 Report**

visitation or blood serum delivered to AIDS Program for HIV testing. Table 1 depicts the private clinics who have participated in the program. Of the total tested as of August 1988, none have tested HIV seropositive.

TABLE 1

**Private Providers and HIV Referrals
Guam: May - August 1988**

Clinic	Visit	Client Only	Blood Serum Male	Female	Total
Family Health Plan	2	15	12	5	17
Harmon Medical Clinic	0	3	3	0	3
Family Medical Clinic	4	0	2	2	4
ITC Center Clinic	1	0	1	0	1
TOTAL	7	18	18	7	25

OBJECTIVE D

To coordinate with the Department of Mental Health and Substance Abuse (DMHSA) to offer voluntary counseling and testing to the estimated 130 patients on the methadone program and other program categories that come in for drug evaluation and counseling.

- ° Progress: -

Attempts in reaching the IV drug population via coordination with the DMHSA has had minimal success due to the phasing out of the methadone maintenance program in 1986. To date, only one IV drug abuser has been referred for counseling and testing. The drug and alcohol program is currently reassessing the need to reintroduce the methadone program. However, in the meantime, the drug and alcohol program has agreed to continue working with AIDS program in a joint effort to reach IV drug population.

The population currently utilizing the Drug and Alcohol Program consists primarily of those persons with alcohol problems. Approximately four IV drug abusers underwent detoxification treatment in 1986. Once informed that the methadone program no longer was being offered as part of drug treatment, the utilization of the drug and alcohol program decreased considerably among the IV drug population. A total of 12 persons requested for methadone between January and July 1987.

OBJECTIVE E

To establish coordination with GMH for the timely submission of current data regarding their ELISA blood screening program.

° Progress:

1. The AIDS Program has communicated with the Infection Control Officer (ICO) of GMH to request data concerning the hospital's HIV tests performed on in-patients and blood donors. With the support of the ICO and the Administrator of the GMH Laboratory, data will be provided by the GMH to the AIDS program on a monthly basis.
2. Figure 2 on the page following depicts the yearly totals of the hospital's blood donor HIV screening activities between October 1985 and June 1988.
3. The GMHA is the only other civilian health facility with the capability of performing the ELISA test. The hospital conducts the tests strictly for blood donors and their in-patients. They collaborate with Public Health in the submission of their ELISA seropositives for Western Blot confirmatory testing at Centers for Disease Control. Of the total blood donors tested by GMHA since October 1985, none have tested HIV seropositive.
4. A total of 89 in-patients were tested with their consent between October, 1985, and June, 1988. Of this total, five were HIV seropositive, and confirmed AIDS cases based on CDC's 1987 revised definition for AIDS.

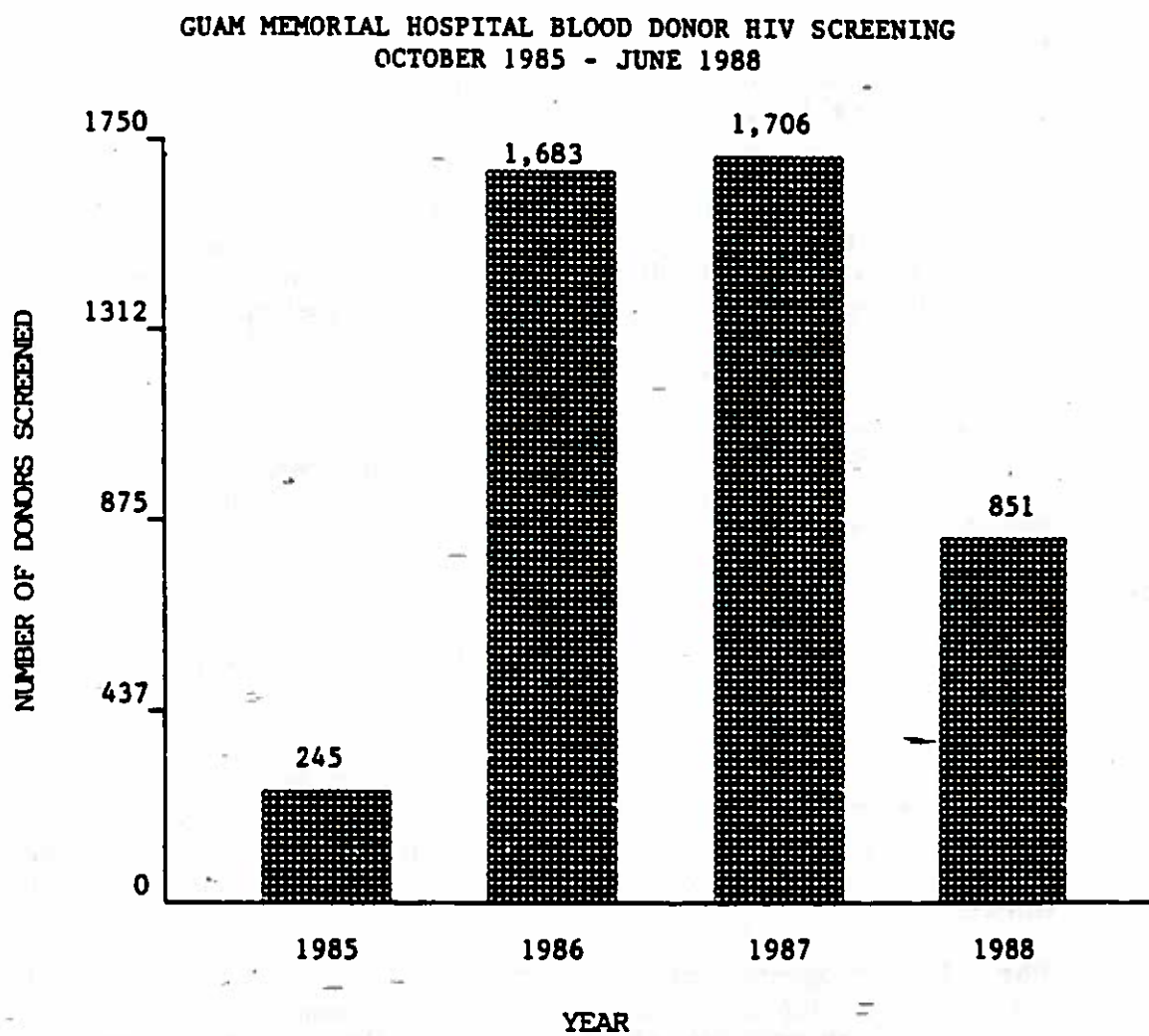
OBJECTIVE F

To establish and maintain a system for referral of HIV seropositive cases for additional counseling and medical evaluation.

° Progress:

1. The AIDS Program recorded three new HIV seropositive cases between April and July, 1988. These persons have been counseled and encouraged to visit their physician for medical work-up.
2. The AIDS Program provides further counseling support of HIV seropositive clients. Partner notification was impractical as all three HIV seropositive cases explained that contacts were from off-island and remained either anonymous or were unable to provide addresses of partners.
3. Collaborative efforts with the DMHSA is ongoing in the development of a referral system of HIV clients for additional counseling support.

FIGURE 2



Territory of Guam
AIDS '88 Report

OBJECTIVE G

To collaborate with gay clubs to reach at least 5 percent of the estimated 8,458 homosexual population for HIV counseling and testing.

° Progress:

1. Approximately 24 gay clients visited the program for counseling and testing since November 1985. Of this total, seven participated between January and June 1988.
2. Efforts to collaborate with the owner of the sole known gay nite club have resulted in minimal success. Approval has been given by the owner for dissemination of AIDS materials. However, arrangements to conduct testing at the club site was unsuccessful.
3. The AIDS Program is faced with a difficult challenge of continuing it's efforts in reaching the gay community. Reasons vary for the decreased involvement of this group for counseling and HIV testing. Guam being a small community with extended families, has led most gay persons to keep their activities private for fear of discrimination most especially from family and relatives. With this, an area of concern is the possibility of clients falsifying their risk behavior to blanket true gay lifestyle.
4. An attempt to reach a gay group coordinated by another nite club owner seems promising with estimated numbers between 10 and 15 interested gay persons for counseling and testing. The AIDS Program is following up with the club owner for assistance and information for voluntary counseling and testing services.

IV. SHORT TERM OBJECTIVES - (JANUARY - DECEMBER, 1989)

OBJECTIVE A

To routinely offer on a voluntary basis HIV/AIDS risk reduction counseling and laboratory testing services to the Department's STD clinic.

OBJECTIVE B

To routinely offer on a voluntary basis HIV/AIDS risk reduction counseling and laboratory testing services to the Department's TB clinic.

OBJECTIVE C

To routinely offer on a voluntary basis HIV/AIDS risk reduction counseling and laboratory testing services to the Department's MCH clinic.

Territory of Guam
AIDS '88 Report

OBJECTIVE D

To establish standards and implement procedures for confidential notification of sex and needle sharing partners of persons with AIDS and HIV infection.

OBJECTIVE E

To establish and maintain a system for the referral of HIV sero-positive individuals.

OBJECTIVE F

To promote the AIDS Program to the various private providers as the Department is the only health facility with HIV testing capability, free and voluntary to the general public.

OBJECTIVE G

To continue collaboration with the Guam Memorial Hospital for the timely submission of current data regarding their ELISA blood screening program.

OBJECTIVE H

To maintain collaborative efforts with Department of Mental Health and Substance Abuse in the referral of their clients for voluntary HIV counseling and testing.

OBJECTIVE I

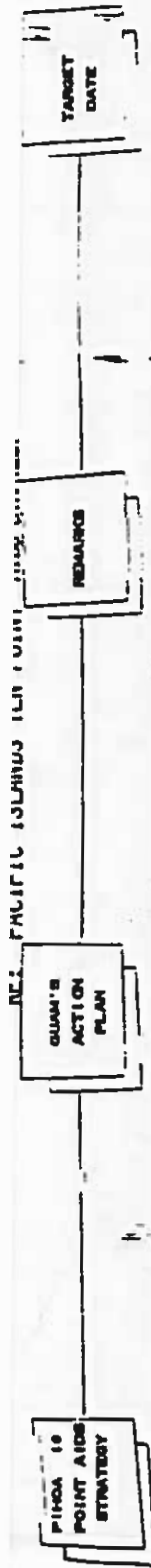
To reach the gay community on a voluntary basis for HIV/AIDS risk reduction counseling and testing services.

OBJECTIVE J

To coordinate with the Department of Corrections (DOC) to offer voluntary counseling and testing services to the estimated 146 DOC inmates.

V.

**GUAM'S ACTION PLAN ADDRESSING THE
PACIFIC TEN POINT STRATEGY
FOR AIDS PREVENTION**



2. All six Pacific jurisdictions will seek CDC AIDS education and prevention cooperative agreements.

2. Pacific Island Health Officers Association (PIHOA) will seek clinical staff AIDS continuing medical education opportunities through the HRSA/PHS supported AIDS education and training center project for PHS Region IX, and will encourage expansion of the project immediately to the University of Hawaii School of Medicine.

3. PIHOA will encourage CDC and PHS to continue Pacific field assignments of public health/AIDS expert staff to provide consultation and guidance.

4. Each Pacific jurisdiction will establish ELISA test capacity for detecting HIV antibody and will refer repeatedly positive ELISA blood samples to the Hawaii State Department of Health for Western Blot confirmation testing.

3-1 Gov Guam will continue to seek CDC AIDS education and prevention cooperative agreements.

2-1 We need more information prior to establishing action plan.

3-1 GovGuam will continue to encourage PHS and CDC to provide physicians/epidemiologists on field assignments for consultation and guidance in AIDS.

4-1 Guam will continue to maintain ELISA test capacity and refer positive ELISA blood samples to CDC - Atlanta for free confirmatory testing.

Since 1985, Guam's AIDS program under the Department of Public Health and Social Services (DPHSS) has been and continues to be operational as part of the CDC cooperative agreements.

Visitation of health officials from not only CDC but also WHO is ongoing to provide technical assistance of AIDS programs. So far this year, Messrs. Sykes and Sanders of CDC, and Dr. Shrestha (Health Education) and Dr. Fournier (Epidemiologist) of WHO have been on-island to assist Guam in AIDS program components.

Since 1985 ELISA tests have been performed at the Guam Memorial Hospital (GMH) for screening blood donors, and at the DPHSS for voluntary testing of high-risk groups and the general public (alternative test site). All repeatedly positive ELISA samples are referred to CDC-Atlanta for FREE Western Blot confirmatory testing.

6/1988

GUAM AIDS ACTION PLAN
RE: PACIFIC ISLANDS TEN POINT AIDS STRATEGY



5. Antigenic blood donors will be counseled and evaluated for HIV risk factors, and as any blood bank may be established, ELISA tests will be performed on all donated samples to screen for potential HIV infection.

5-1 Guam will continue its on-going program.

The CHB is Guam's sole civilian blood bank. The blood bank screening program has been and continues to perform ELISA testing on all blood donors for potential HIV infection.

Ongoing

6. Pacific jurisdictions encourage the continuation of PHS Section 301 grants to support the continued development of medical care and public health systems infrastructure, particularly focused on communicable disease detection, treatment, and prevention.

6-1 Guam will continue to apply for PHS Section 301 grants to support our programs for communicable disease detection, treatment and prevention.

The CDC Unit of the DPHSS for the last 15 years has been and will continue to seek PHS Section 301 grants for sexually transmitted diseases, tuberculosis, and immunization. Since 1985, we have been applying for AIDS grants under this same grant program. Under PHS Health Block grants, programs such as Maternal Child Health, Health Education and Risk Reduction, and others are pursued.

October 1st annual due date.

7. Pacific jurisdictions will seek continuation of existing levels of National Health Service Corps assignments to provide direct clinical care and to provide for clinical AIDS case management.

7-1 Guam will again seek approval from HHS to assign physicians to Guam.

The last HHS physician assignments phased out in 1987. No additional assignments were authorized due to fiscal constraints of HHS and in part to the inability of the designated health center to attract a sufficiently high number of clients to meet center goals and objectives under community health center grants.

September 1988

6/1988

GUAM AIDS ACTION PLAN RE: PACIFIC ISLANDS TEN POINT AIDS STRATEGY

PIHDA 10
POINT AIDS
STRATEGY

GUAM'S
ACTION
PLAN

REDACTED

TARGET
DATE

8. Pacific jurisdictions will continue participation in the EDNA/PHS AIDS Drug Reimbursement Program and will seek initial participation in the PHA/HAID program of expanded availability of AIDS-related immunological new drugs (INDs). 8-8. tripartite, through collaboration with a California AIDS Treatment Evaluation Unit (ATU).

8-1 Guam will seek additional information on the California AIDS treatment evaluation unit.

The Guam AIDS program is a participant of the August 1986 AIDS Drug Reimbursement program and received an allotment of \$30,000 for AIT treatment for medically indigent AIDS patients. Furthermore the health insurance plans approved for participating Guam workers covers AIDS treatment up to \$30,000.

9. Pacific health agencies will seek the active participation of community health center project boards of directors to generate local citizen participation in AIDS education program development and implementation.

9-1 The Guam AIDS HERN component will seek 1 representative from the Southern Region Community Health Center Board of Directors to join the AIDS/HERN Program Review Panel, and 1 representative from the community-at-large.

The AIDS HERN program currently utilizes the AIDS Program Review Panel composed of 1 member from the gay population, 2 members from Department of Education, 1 physician from private practice, 1 from health insurance groups.

10. PIHDA will seek assistance to develop criteria for appropriate off-island referral of PHAs, perhaps by applying the Walter Reed - Department of the Army AIDS staging system for clinical evaluation.

10-1 We need more information prior to establishing action plan.

September 1986

6/1988

III, HEALTH STATUS

A. Definition of Health Status

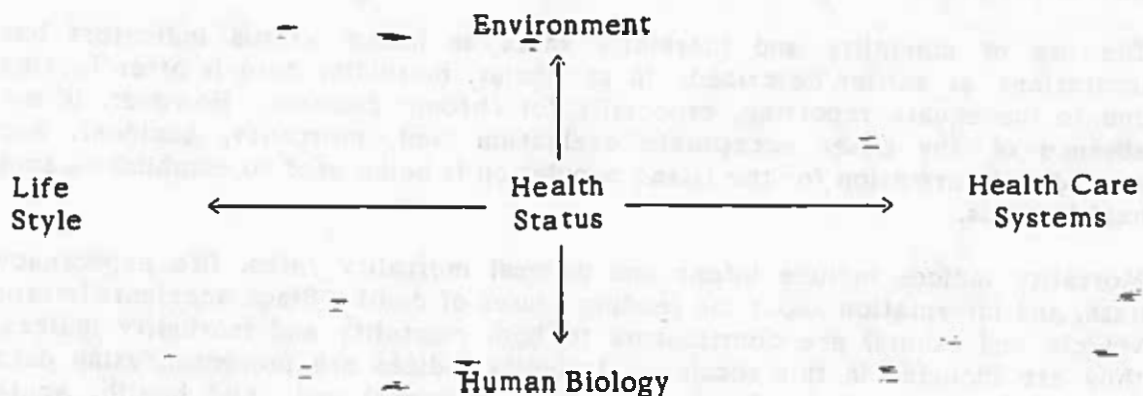
An investigation of health status identifies the level of health enjoyed by a person or population as measured by a specific set of data. Before such health status can be measured, however, it is necessary to define "health." A widely used and generally accepted definition is that of the World Health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

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

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

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

FIGURE 8
THE HEALTH FIELD CONCEPT



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

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

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

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

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

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

B. Health Status Indicators

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

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

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

C. Mortality Indices

(1) Infant Mortality

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

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

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

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

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

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

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

(2) Mortality

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

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

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

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

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

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

Standardized crude death rate for 1,000 population for 1980

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

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

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

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

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

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

(3) Life Expectancy

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

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

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

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

*Excluding military population.

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

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

(4) Leading Causes of Death

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

TABLE 14
The Ten Leading Causes of Death
Guam: 1983

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

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

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

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

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

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

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

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

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

Source: Statistical Abstract of the United States, 1984.

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

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

D. Accidents

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

(1) Motor Vehicle Accidents

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

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

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

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

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

(2) Other Accidents and Adverse Effects

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

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

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

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

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

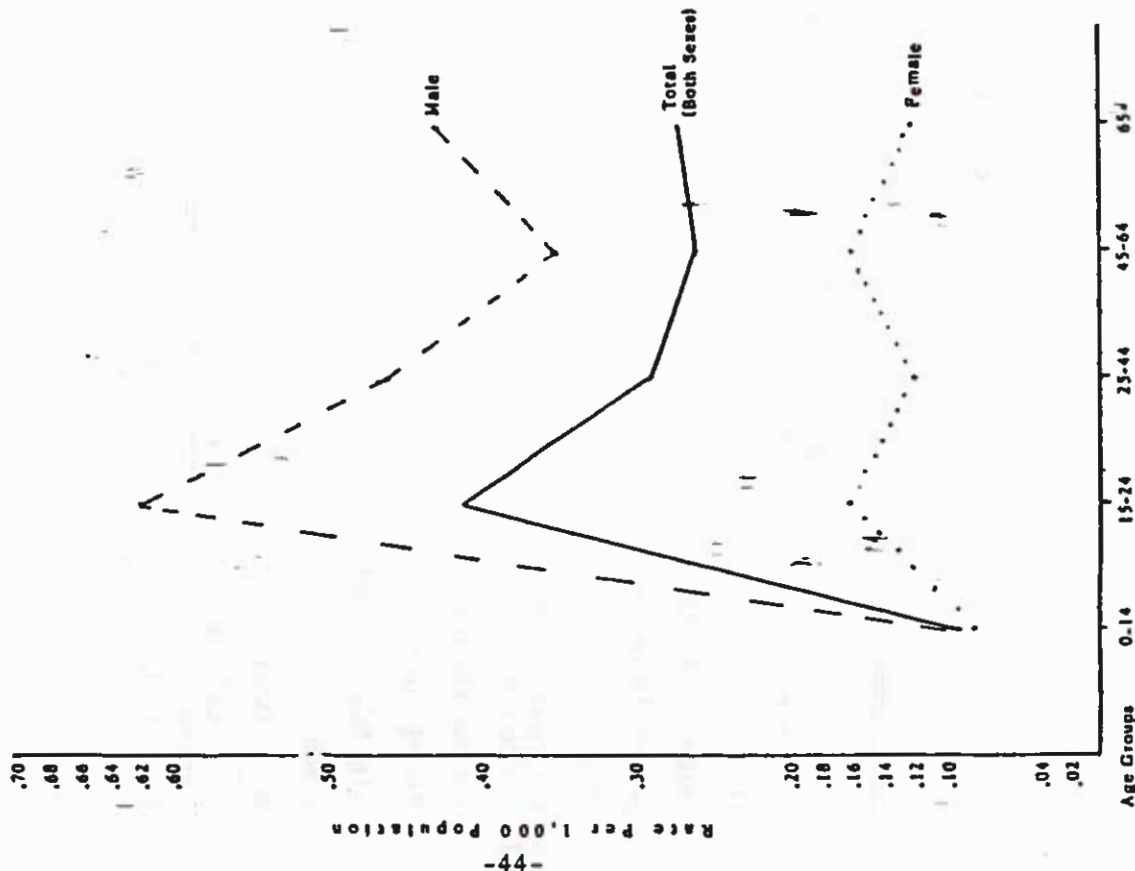
TABLE 19
Deaths from Other Accidents and Adverse Effects
for Civilian Population
Guam: 1979 - 1983

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

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

FIGURE 9

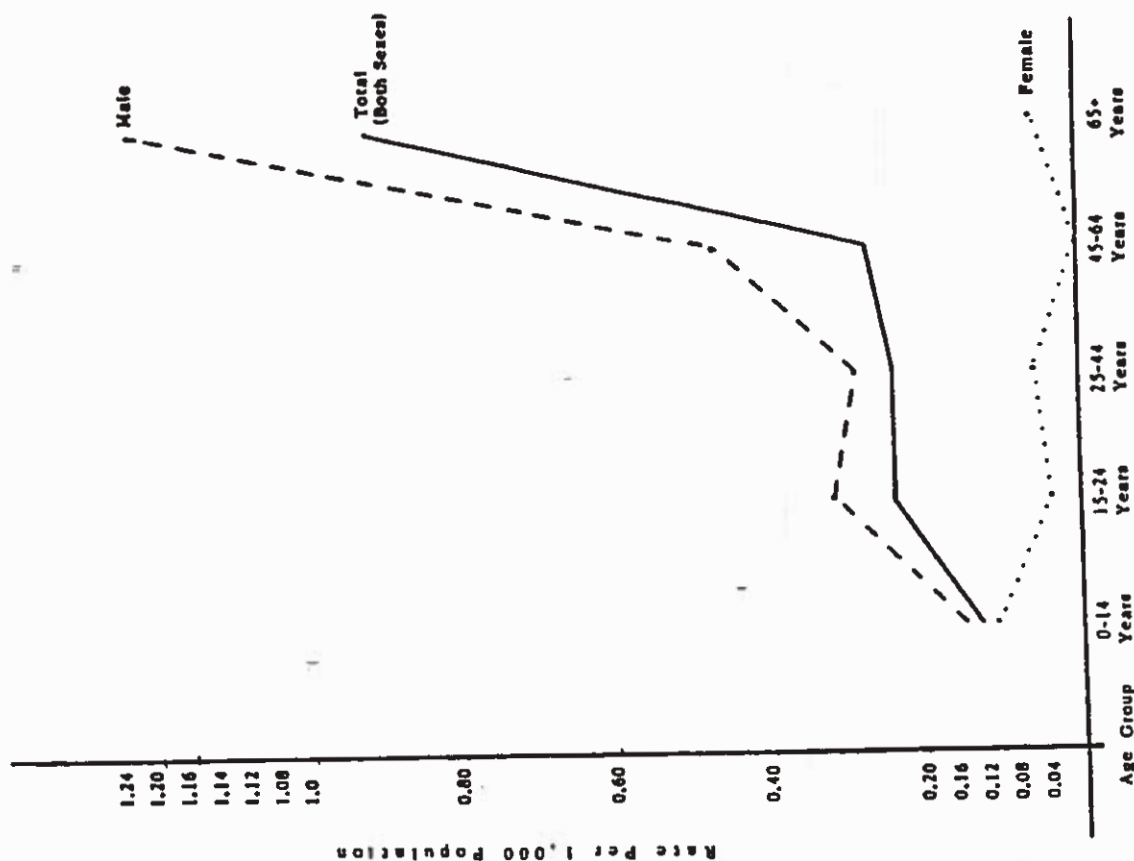
5-YEAR AVERAGE OF
MOTOR VEHICLE FATALITY RATES
PER 1,000 CIVILIAN POPULATION
GUAM: 1979 - 1983



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

FIGURE 10

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



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

E. Morbidity

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

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

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

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

(1) Diseases Related to the Environment

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

(a) Salmonellosis

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

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

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

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

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

TABLE 20
Incidence of Salmonellosis
Guam: 1980-1984

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

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

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

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

(b) Shigellosis

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

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

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

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

TABLE 21
Incidence of Shigellosis
Guam: 1980 - 1984

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

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

(2) Communicable and Infectious Diseases

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

(a) Vaccine Preventable Communicable Diseases

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

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

Diphtheria	Pertussis (whooping cough)
Tetanus	Polio
Measles	Mumps
Rubella	

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

TABLE 22
Incidence of Immunizable Diseases
Guam: 1976 - 1980

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

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

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

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

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

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

*3 x DTP, 3 x TOPV, MMR

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

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

(b) Infectious Diseases

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

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

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

(i) Tuberculosis

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

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

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

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

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

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

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

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

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

TABLE 25
TB Cases by Age and Sex of Patient
Guam: 1984

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

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

TABLE 26
TB Cases by Ethnicity of Patient
Guam: 1984

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

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

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

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

(ii) Influenza

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

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

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

TABLE 27
Incidence of Influenza
Guam: 1975 - 1984

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

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

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

(iii) Pneumonia

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

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

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

TABLE 28
Incidence of Pneumonia
Guam: 1974 - 1983

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

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

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

(iv) Hepatitis

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

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

Hepatitis Type A

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

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

TABLE 29
Incidence of Hepatitis A
Guam: 1975 - 1984

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

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

Hepatitis Type B

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

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

TABLE 30
Incidence of Hepatitis B
Guam: 1975 - 1984

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

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

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

(c) Sexually Transmitted Diseases (STDs)

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

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

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

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

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

(i) Gonorrhea

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

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

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

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

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

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

(ii) Syphilis

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

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

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

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

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

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

TABLE 31

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

Year	Civilian Population		Military Population		Total Population	
	# of Cases	Incidence Per 1,000	# of Cases	Incidence Per 1,000	# of Cases	Incidence Per 1,000
1980	162	11.9	190	10.3	352	3.35
1981	141	1.6	236	11.5	377	3.44
1982	164	1.8	248	13.7	412	3.78
1983	194	2.1	244	12.3	438	3.90
1984	271	2.9	403	16.7	674	5.61

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

TABLE 32

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

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

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

(iii) Non-Gonococcal Urethritis (NGU)

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

(iv) Trichomonas

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

(v) Other Sexually Transmitted Diseases

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

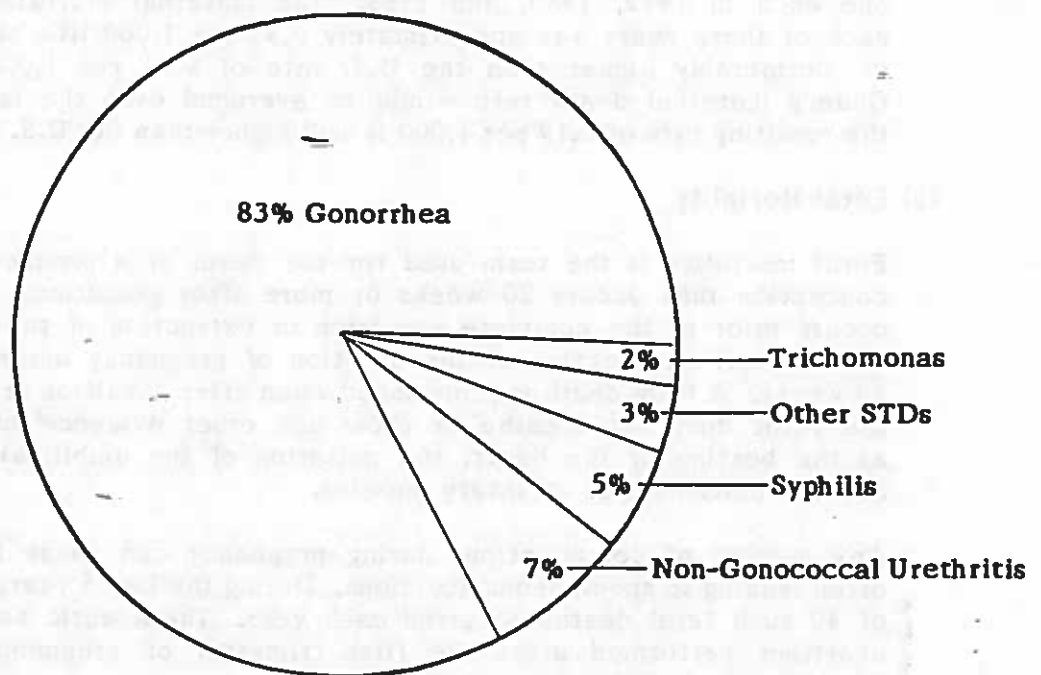
(vi) Acquired Immune Deficiency Syndrome (AIDS)

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

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

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

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



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

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

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

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

(a) Maternal Mortality

Maternal mortality refers to a death attributed to complications of

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

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

(b) Fetal Mortality

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

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

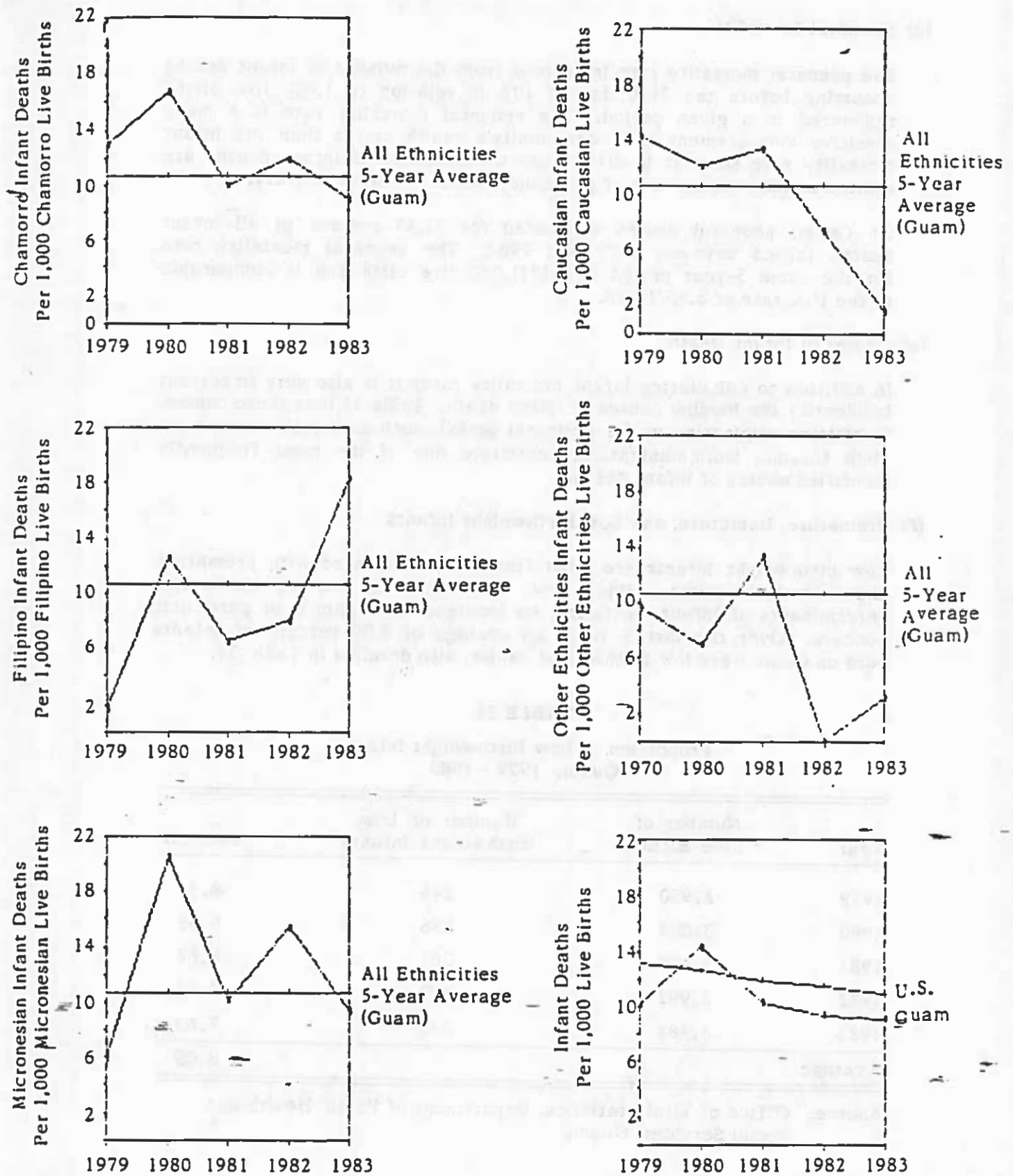
(c) Infant Mortality

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

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

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

FIGURE 12
INFANT MORTALITY BY ETHNICITY
GUAM: 1979 - 1983



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

(d) Neonatal Mortality

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

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

(e) Causes of Infant Death

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

(f) Premature, Immature, and Low Birthweight Infants

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

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

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

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

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

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

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

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

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

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

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

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

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

(f) Congenital Anomalies

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

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

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

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

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

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

(4) Health Problems of Children

(a) Otitis Media

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

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

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

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

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

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

(b) Dental Health

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

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

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

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

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

(5) Chronic Diseases and Disabilities

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

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

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

(a) Diseases of Circulatory System

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

(ii) Cerebro-Vascular Disease

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

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

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

(b) Neuromuscular Diseases

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

TABLE 36
Deaths Caused by Cerebro-Vascular Disease
Guam: 1974 - 1983

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

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

(c) Musculoskeletal Diseases

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

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

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

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

(d) Diseases of the Pulmonary System

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

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

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

(e) Diseases of the Endocrine and Metabolic Systems

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

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

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

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

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

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

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

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

(f) End Stage Renal Disease (ESRD)

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

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

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

(6) Mental Health

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

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

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

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

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

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

(a) Alcohol and Drug Abuse

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

(b) Violent Crimes Against Persons

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

(i) Homicide

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

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

(ii) Other Violent Crimes

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

TABLE 39
Violent Crimes Against Persons
Guam: 1980 - 1984

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

Source: Guam Police Department.

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

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

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

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

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

(c) Suicide

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

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

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

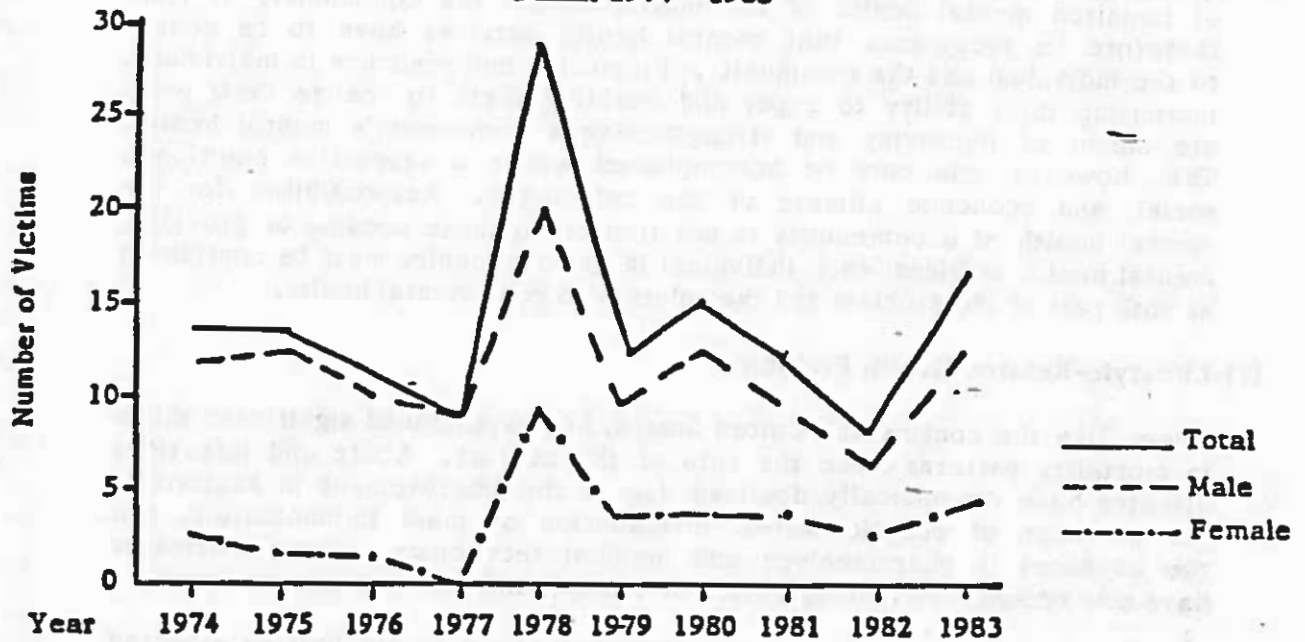
TABLE 40
Suicide Rates Per 1,000 Population
Guam: 1974 - 1983

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

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

FIGURE 13

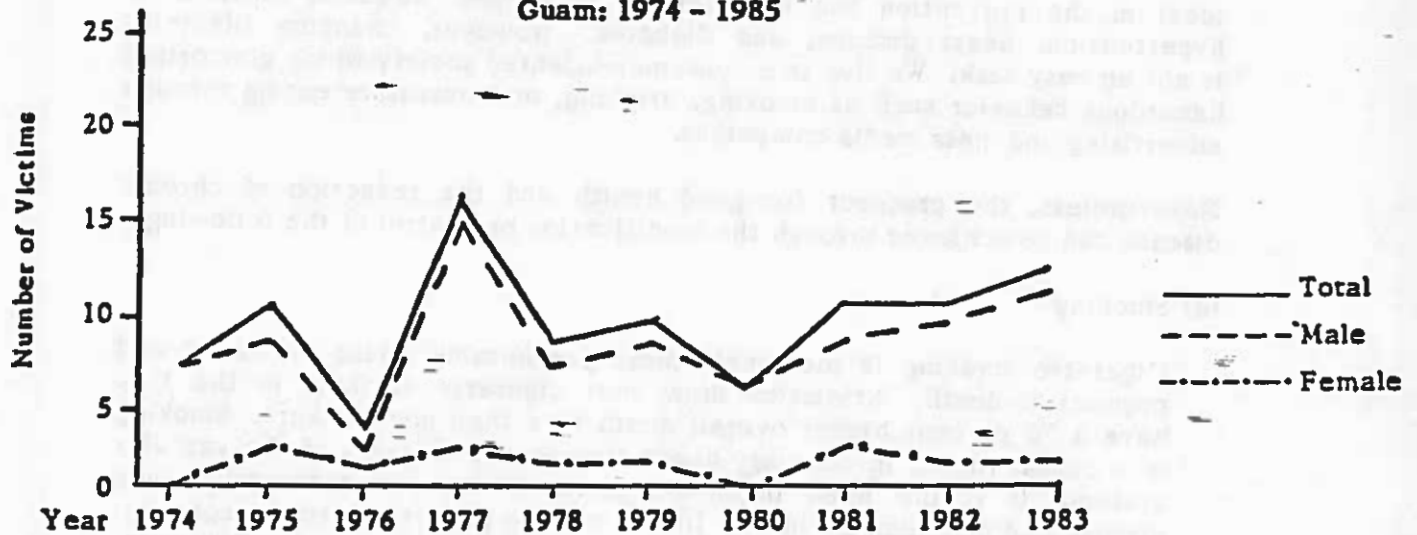
**Homicide Count by Sex of Victim
Guam: 1974 - 1983**



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

FIGURE 14

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



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

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

(7) Lifestyle-Related Health Problems

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

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

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

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

(a) Smoking

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

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

(b) Lack of Exercise

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

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

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

(c) Poor Eating Habits

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

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

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

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

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

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

(d) Excessive Stress

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

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

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

F. Summary

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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