

Cancer in Yap State, Federated States of Micronesia

Abstract: Little is known about the impact of cancer and the extent of cancer-related services in Yap. The purpose of this study, funded by the National Cancer Institute, was to document the state of cancer awareness and services in Yap and to prioritize cancer-care needs. Findings suggest that cancer is the leading cause of death in Yap, yet cancer-related awareness, prevention, detection, and treatment services are limited. A number of needs were identified, and an action plan was developed based on five priority areas: 1) establishing a cancer registry; 2) increasing awareness of cancer risk, prevention, and detection; 3) expanding cancer screening and detection programs; 4) expanding cancer-related training opportunities for clinical staff; and 5) purchasing cancer-related equipment & supplies. **Key Words:** Medically underserved area, needs assessment, oncology services, Pacific Islanders, quality of health care

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Introduction

This paper presents findings from an assessment of cancer awareness and needs in Yap State, Federated States of Micronesia and priorities for cancer infrastructure development in this jurisdiction. Funded by the National Cancer Institute, this work represents one of the first efforts to identify and prioritize cancer infrastructure needs in this jurisdiction.

History, geography and population of Yap State

Yap is one of four geographically separate states that comprise the Federated States of Micronesia (FSM). Altogether, the FSM includes approximately 607 islands, grouped into four states—Yap, Chuuk, Kosrae, and Pohnpei—in the Western Pacific, which lie between 1°S and 14°N latitude and between 135°E and 166°E longitude. Although the islands are situated across a large

expanse of ocean, the FSM has a combined total land area of only 271 square miles. The nation's 600+ islands vary from large, high mountainous islands of volcanic origin to small coral atolls. Yap State is in the Western Caroline Island chain, is the westernmost of the four FSM states, and is only 1,000 miles east of the Philippines¹.

The relationship between the United States and Yap began during World War II. Prior to World War II, Yap and the rest of Micronesia had been under the administration of Japan as a result of the 1920 League of Nations Mandate. After World War II, the United Nations created the Trust Territories of the Pacific Islands and designated the United States as the trustee. The Trust Territories included Pohnpei, Kosrae, Chuuk, Belau, Yap, the Marshall Islands, and the Northern Mariana Islands. As trustee, the role of the United States was to "promote the economic advancement and self-sufficiency of the inhabitants." In 1979 the districts of Yap, Chuuk, Kosrae and Pohnpei formed a federation under the Constitution of the Federated States of Micronesia, making the islands a sovereign and independent nation. Despite this, much of the FSM's economics were still closely tied to the United States. The FSM continued to use the US dollar as currency and in 1982, a Compact of Free Association was made between the US and the FSM in order to fulfill the US promise to promote economic development and self-sufficiency in the islands. US financial support to the FSM was recently renewed in late 2003 thus extending the US's involvement in the region for the next 20 years².

Yap State includes 82 islands, 23 of which are inhabited. The capital is Colonia which is located on Yap Proper, a cluster of four islands (Yap, Gagil-Tomil, Maap, Rumung) connected by roads, waterways, and channels. The other 78 outer islands stretch nearly 600 miles east of Yap Proper. The coastal areas are covered with mangrove trees and occasional coral beaches. Yap State encompasses approximately 500,000 square miles of area; yet it has only 45.8 square miles of land area. Most of the outer islands are coral atolls and are sparsely populated.

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Based on the 2000 preliminary census counts, the total population of the FSM stands at 107,008 residents. Yap is the second smallest of the four FSM states, with only 11,241 (10.5%) of the FSM population. About two-thirds (6,919) of Yap State's resident population resides in Yap Proper (65% of the population). Ulithi Atoll has four inhabited islands (Azor, Falalop, Fatharai, Mogmog) with 1,016 residents (9.1% of the population); Woleai is composed of two lagoons and 22 islands, with 844 residents inhabiting five of the islands (7.6% of the population); 653 (5.8%) reside in Ifalik; 560 (5.0%) reside in Satawal; and less than 5.0% of the population reside in Lamotrek (385); Fais (301), Faraulep (223), Elato (121), Eauripik (118), and Ngulu (38)^{3,4}.

Yap's population is 49% male, and 51% female. The median age is 20.9 years, which is the highest median age among the four states and comparatively higher than the median age of the FSM (18.9 years). As cancer is primarily a disease of older adults, it is interesting to note that only 23% of the population is 40 or older, including 740 (6.5%) residents age 60 or older, 626 (5.6%) age 50 to 59, and 1,314 (11.7%) age 40-49 years³.

According to FSM's 2000 census, there were 2,030 households in Yap, with a median of 5.4 persons per household. About 75% of these households reported cash income, with a median household income of approximately \$6,489. About 92% of Yap residents age 10 or older are able to read and write³.

Transportation on Yap Proper is becoming easier because of the construction and improvement of paved roads, although many villages are still difficult to access. Three outer island communities have runways (Woleai, Ulithi, Fais). They are serviced by Pacific Missionary Airways (PMA), which offers free evacuation for medical emergencies and charges the Yap State government only fuel costs for other (non-emergent) medical trips. PMA also acts secondarily as a passenger airline. Otherwise, inter-island transport is restricted to cargo ships and the "field trip ship" that makes a monthly run through the outer islands and atolls of Yap to transport mail, supplies, and health personnel. Continental Air Micronesia flies between Yap and Guam, where connections can be made to Hawai'i and the continental U.S. Flights from Yap to the Philippines transit through the Republic of Belau (Palau).

Health care delivery in Yap

Within the FSM, the health care delivery environment differs for each of the four states and depends on the availability of resources, the geography of the state, and

the extent to which the health care system has been decentralized, as recommended in the 1995 FSM Economic Summit⁵. The center of each State's health system is a public hospital. Yap Memorial Hospital has an emergency room, outpatient clinics, inpatient wards, surgical suites, a dental clinic, a pharmacy, laboratory and X-ray services, physical therapy services, and health administration and data management offices, but no ventilator or dialysis units. The hospital and its services are easily accessible to the residents of Yap Proper, who can drive or walk there. For residents who live on the outer islands, access is more difficult because of transportation issues described above.

The Division of Public Health provides primary care and preventive services. In Yap Proper, 11 public health nurses and outreach workers provide services from offices located at the Yap Memorial Hospital. On the outer islands, 18 dispensaries are staffed by 24 health aides. Dispensary personnel are trained to provide health education and primary care services. Complicated medical cases must be referred to the hospital in Yap Proper.

Cases that cannot be treated in Yap may be referred to the Medical Referral Committee (MRC), which considers physicians' requests to transfer patients to facilities

outside of Yap for medical treatment. The MRC is composed of the State Director of Health Services (SDHS), the hospital Chief of Staff, the patient's referring physician, and the Medical Referral Coordinator. No log is kept of referral denials and reasons for them, but key informants reported that the MRC typically denies cases for which cost of treatment will be high and treatment benefits will be low, for example in cases of end-stage metastatic cancer.

Pertinent to any cancer survey on Yap is the common practice of betel nut chewing. Traditionally betel nut is chewed with pepper leaf and lime (a chalky powder produced by burning coral). The combination of the three ingredients makes the chewer's saliva red and produces a mild intoxicating effect. Sometimes, tobacco (alone or soaked in vodka) is added to the "chew." Thus, Yapese are likely to be at higher-than-average risk for oral cancers secondary to the betel nut and tobacco use.

Methods

A cancer needs assessment was conducted in Yap in spring 2003 by a medical resident and a medical student affiliated with the Department of Family Medicine and Community Health, John A. Burn School of Medicine, University of Hawai'i. As Yap State does not have a

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centralized cancer registry, data on cancer cases were obtained from three unrelated data sources: 1) death certificates, 2) hospital admissions and discharge records, and 3) hospital referral records and MRC records, which list cancer cases referred to outside hospitals.

Death certificates were examined for the years 1998 through 2002. Death certificates were available for 298 individuals, from which tables were constructed presenting data on the leading causes of death and the leading causes of cancer deaths. Cancer deaths were not confirmed pathologically due to limited access to pathology services and diagnostic equipment on Yap.

A summary of the cases referred to the MRC through 2002 were obtained from the Medical Referral Coordinator. A list of patients with diagnoses related to cancer for the years 2000 to 2002 were compiled from the Yap Memorial Hospital discharge forms. No data were available on cases prior to 2000. Patients who, according to death certificates, had died of cancer from 2000 through 2002 were compared with the compiled list. Duplicate cases were identified by matching medical record numbers and birth dates, and duplicates were eliminated from the master list. From these three sources, we found a total of 64 unduplicated cases of cancer for the period 2000 through 2002.

Information about the health care system and cancer-related services in Yap was obtained through key informant interviews with physicians and public health staff. These key informants also identified needs, which were organized into four categories: data; training; equipment and supplies, and services and programs. From these needs, a list of recommendations was developed by the authors. Needs were prioritized and preliminary planning was done by the Pacific Islander delegates of the Cancer Council of the Pacific Islands in the Republic of the Marshall Islands in August 2003. These plans were further refined, and a strategic action plan was developed in November 2003.

Findings: mortality and morbidity

Leading causes of death, 1998-2002

From 1998 through 2002, 298 death certificates were filed (Table 1). For both genders together, cancer was the leading cause of death (17.4%), followed by pneumonia (17.1%) and heart disease (10.4%). Males were over-represented, comprising 201 (67.4%) of the 298 deaths. Among males, 15% of deaths were due to pneumonia, 15% to cancer, 12% to heart disease, and 7% to suicide. Of the total 97 female deaths between 1998 through 2002, 23% were due to cancer, 20% to pneumonia, 7% to heart disease and 7% to COPD (chronic obstructive pulmonary disease).

Table 1. Leading causes of death in Yap State, 1998-2002

	N (%)
Total deaths	298 (100%)
Cancer	52 (17.4%)
Pneumonia	51 (17.1%)
Heart disease	31 (10.4%)
Renal failure	15 (5.0%)
Suicide	15 (5.0%)
Chronic obstructive pulmonary disease	15 (5.0%)
Stroke	14 (4.7%)
Trauma	12 (4.0%)
Infant death	11 (3.7%)
Sepsis	8 (2.7%)
Male deaths	201 (100%)
Cancer	30 (15%)
Pneumonia	30 (15%)
Heart disease	24 (12%)
Suicide	14 (7%)
Female deaths	97 (100%)
Cancer	22 (23%)
Pneumonia	19 (20%)
Heart disease	7 (7%)
Chronic obstructive pulmonary disease	7 (7%)

Source: Yap Memorial Hospital, Medical Records: Death Certificates 1998-2002

Table 2. Cancer deaths in Yap State 1998-2002

	N (%)
Total cancer deaths	52 (100%)
Liver	12 (23.1%)
Lung	11 (21.2%)
Oral	4 (7.7%)
Breast	4 (7.7%)
Cervical	3 (5.8%)
Prostate	3 (5.8%)
Esophageal	2 (3.8%)
Gastric	2 (3.8%)
Uterine	2 (3.8%)
Blood	2 (3.8%)
Duodenum	1 (1.9%)
Thyroid	1 (1.9%)
Colon	1 (1.9%)
Renal	1 (1.9%)
Unspecified	2 (3.8%)
Male cancer deaths	30 (15.0%)
Liver	10 (33.3%)
Lung	4 (13.3%)
Oral/esophageal	4 (13.3%)
Prostate	3 (10.0%)
Female cancer deaths	22 (100%)
Lung	7 (31.8%)
Breast	4 (18.2%)
Cervical	3 (13.6%)
Uterine	2 (9.1%)

Source: Yap Memorial Hospital, Medical Records: Death Certificates 1998-2002

Cancer deaths, 1998-2002

Focusing on the 52 cancer deaths, the top four causes were liver cancer (23.1%), lung cancer (21.2%), oral cancer (7.7%), and breast cancer (7.7%) (Table 2). For males, the top four causes of cancer deaths were liver cancer (33.3%), lung cancer (13.3%), oral/esophageal cancer (13.3%), and prostate cancer (10%). For females, the top four cause of cancer death was lung cancer (31.8%), followed by breast cancer (18.2%), cervical cancer (13.6%), and uterine/endometrial cancer (9.1%).

Cancer cases, 2000-2002

Compiling cases from the three sources of data, we identified 64 unduplicated cancer cases over three years (2000 through 2002) (Table 3). The largest portion of cancer cases involved liver cancer (10 cases, 15.6%), followed by oral cancers (9 cases, 14.1%), lung cancer (7 case, 10.9%), prostate cancer (4 cases, 6.2%), cervical cancer (4 cases, 6.2%), and uterine/endometrial cancers (4 cases, 6.2%).

Findings: cancer-related services

Administration, planning, and data

The most recent Yap State Health Plan was developed for 1996-2001. Despite the fact that cancer is the leading cause of death in Yap State, cancer has not been identified as a priority in the state health agenda⁶. There is no evidence that additional funds will be made available for cancer education, training, equipment purchase, registry development, or preventive, diagnostics, or treatment services. This has been attributed partly to a perception that cancer incidence in Yap is low relative to other diseases.

Physician key informants, however, identified the following cancer risks for Yap State, which are useful in targeting resources for risk awareness and prevention activities: hepatitis B and hepatitis C infections; alcohol use; early sexual activity; betel nut chewing (with tobacco), and smoking. Although Yap does not have the equipment needed to confirm the bacteria *H. pylori*, many physicians suspect that it is associated with ulcers and stomach cancer in Yap.

Table 3. Cancer cases by type of cancer, Yap State, 2000-2002

	N	(%)
Total cancer cases	64	(100%)
Liver	10	(15.6%)
Oral	9	(14.1%)
Lung	7	(10.9%)
Prostate	4	(6.2%)
Cervical	4	(6.2%)
Uterine/endometrial	4	(6.2%)
Hematological	3	(4.7%)
Bone	3	(4.7%)
Breast	3	(4.7%)
Esophageal	2	(3.1%)
Intestinal	2	(3.1%)
Gastric	1	(1.6%)
Brain	1	(1.6%)
Colon	1	(1.6%)
Thyroid	1	(1.6%)
Renal	1	(1.6%)
Laryngeal	1	(1.6%)
Questionable	3	(4.7%)
Unspecified	3	(4.7%)

Source: Yap Memorial Hospital, Medical Records: Aggregate Data 2000-2002

Health statistics in Yap are collected and compiled by the Health Statistics Technician, including death and birth certificates, hospital admission and discharge data, and outpatient data. There is no registry or centralized system allowing the consistent collection of cancer-related data. Additional data-related problems identified by the health statistician include: 1) lack of personnel for collecting and compiling health data; 2) lack of accountability (data are borrowed and not returned); and 3) lack of reliable ways to back-up data (many years of compiled data were lost in computer mishaps).

Following the 2001 Pacific Basin Medical Association (PBMA) conference held in Yap, the physicians of Yap were inspired to develop a registry for cancer in the state, but its use has not been adopted.

Public health services

The Division of Public Health, through its network of 24 outer-island health aides and 11 outreach workers/nurses in Yap Proper, provides cancer-related services in the areas of awareness, outreach, prevention, and screening.

Cervical Cancer Screening. The Maternal and Child Health and Family Planning Programs encourage women to get screening for cervical cancer by getting Pap smears. Because the department receives a limited supply of Pap smear test kits from its contract with a Hawai'i-based lab (about 300 per year), screening is limited to those patients determined to be at high risk. These patients are usually expectant mothers and those who visit the family planning and gynecology clinics. A few more kits are donated by outside organizations and other states of the FSM. In 2002, Pap smears were performed on 387 women, representing approximately 12% of the 3,000 Yapese women over the age of 20 who are eligible for Pap smear screening. It usually takes 3-4 weeks to obtain Pap smear results from Hawai'i. Women with abnormal Pap smear results have been able to undergo colposcopy with cervical biopsies when necessary. The colposcopy machine was donated by an outside organization in March 2002, and personnel were trained in its use. Cone biopsies and hysterectomies are performed when indicated.

Breast Cancer Screening. Physicians perform clinical breast examinations on women who attend the clinics;

however no yearly exams are scheduled. There is no mammography equipment in the state.

Colorectal Cancer Screening. Routine screening for colorectal cancer is not performed. If a patient presents with symptoms, however, a rectal examination is performed, and Hemocult® cards are recommended. There was no flexible sigmoidoscopy or colonoscopy equipment.

Hepatitis B Screening. Hepatitis B screening is done on pregnant women. All new babies are immunized against hepatitis B, and Hepatitis B Immune Globulin is given to babies whose mothers are hepatitis B positive.

Cancer Awareness. The Division of Public Health distributes educational brochures and materials and sponsors school and community presentations (including workshops and health fairs). Radio spots on cancer awareness run for three months at a time. Community presentations and workshops are provided monthly. Presentations for schools and the general public focus on tobacco and alcohol prevention. Presentations about breast and cervical cancer are made to women-only groups, as cultural norms dictate. Public Health sponsors events such as World Health Day and World AIDS Day, onto which they “piggy back” other themes such as diabetes and tuberculosis screening, and key informants felt that information about cancer awareness and screening activities could be distributed through these events. The Division also sponsors educational materials and events to encourage good nutrition and physical activity.

Tobacco Prevention. The Substance Abuse and Mental Health programs work together to coordinate initiatives to prevent and limit tobacco use by minors. These programs and the Police Department enforce a regulation that prohibits vendors from selling cigarettes to minors. Existing tobacco prevention programs are aimed at delaying the onset of tobacco use in younger people through radio announcements, elementary school workshops, and anti-smoking posters placed in public areas.

Medical services

There is no oncologist on Yap. Medical services related to the diagnosis and treatment of cancer are provided primarily by a surgeon, an obstetrician/gynecologist, and several internists at Yap Memorial Hospital. Physicians reported that most cancers are discovered after they become symptomatic.

Services related to diagnosis include breast biopsies, ultrasound, thyroid aspirations, upper gastro-intestinal (GI) studies, and colposcopy. Treatment services provided by physicians include surgical intervention and the maintenance of chemotherapy initiated by medical facili-

ties outside of Yap, for example by the Tripler Army Medical Center (TAMC) in Hawai'i or by St. Luke's Hospital in the Philippines. Patients do not have access to cancer clinical trials in Yap. Telemedicine consultation was initiated in 1997; however the equipment needed for telemedicine does not always function.

Out-of-State Care for Yapese Cancer Cases. During 2002, cancer referrals were made primarily to TAMC in Hawai'i and St. Luke's in the Philippines. The Pacific Island Healthcare Program, funded by the Department of Defense, accepts referrals of cases that can be used in teaching programs. For patients who are accepted, the costs of traveling to Hawai'i and receiving treatment are covered by TAMC. If the patient is not accepted by the program, he/she is sent to St. Luke's in the Philippines for treatment. Patients bound for St. Luke's are responsible for their own travel costs, and the Yap State Government covers most of the hospital bill (patients are responsible for 3.5% of total medical bills). During 1999-2002 there were 25 referrals for cancer; 8 were treated at TAMC and 17 were treated at St. Luke's.

Laboratory and radiology services

Cancer-screening and diagnostic services provided by the laboratory in Yap Proper include complete blood count, prostate-specific antigen (PSA), stool occult blood (for detecting colorectal cancer), alpha-fetal protein (for detecting liver cancer), and beta-HCG (for detecting carcinoma of the uterus). The laboratory also has an analyzer that can determine CEA (for detecting abdominal cancers) and levels of other cancer markers but because these tests are rarely ordered, the laboratory does not stock the necessary reagents.

Biopsied tissue and Pap smears are sent to a laboratory in Honolulu, Hawai'i for evaluation. Turn around time is roughly 2 weeks. Key informants reported that permission to transport biopsies to Hawai'i by airfreight was denied after September 11th, 2001 due to increased regulations by Continental Airlines on what could be sent as airfreight. This prevented physicians from making timely diagnoses. After discussions between the airline, the Center for Disease Control and Prevention (CDC), the World Health Organization (WHO), and the FSM and Yap State governments, airfreight transport of biopsies was resumed in April 2003. Items are now shipped in a large drum and sealed for the flight. Unfortunately, the cost of transport has greatly increased, as Yap State must cover costs associated with the weight of the drum that contains their biopsies.

Radiological services are limited to x-rays. There are no fluoroscopic, mammographic, CT, or MRI units. Radiographic studies that can be preformed include GI series, barium enemas, intravenous pyelograms, and oral and

intravenous cholecystograms. There is no radiologist in Yap, so all films are read by the physicians. Questionable x-rays can be sent for reading by radiologists at TAMC when telemedicine equipment is working.

Non-Governmental Organizations

There are no non-governmental organizations (NGO) currently providing consistent cancer prevention/education programs in the state of Yap. Several groups work to improve the health of the communities, for example the Yap Women's Association (YWA) and the Neighbor Island Women's Association (NIWA), but they do not specifically focus on cancer.

Findings: cancer-related needs

Data needs

Key informants identified a need for a cancer registry in Yap State. They also felt that the hospital and public health staff should receive more training in coding cancer using the ICD-10 coding system, in establishing and maintaining a cancer registry, and in using data to answer cancer-related questions.

Personnel and training needs

Personnel. Physician informants advocated for a pathologist and a cytologist in Yap. These personnel are needed to assure reliable, efficient, and consistent reading of biopsies, fine-needle aspirations, Pap smears, and other cancer-related tests. (There was previously a cytologist on Yap, but he passed away.) They also cited a need for a backup surgeon; an oncologist, or training of existing physicians in chemotherapy; and visiting specialists, such as in urology and ENT (ear, nose, and throat).

The Division of Public Health identified a need for a health educator who could coordinate and cover all fields of prevention from cancer to family planning. They are currently applying for a grant to fund this position, which would augment services being provided by the nurses and outreach workers.

Training. Physicians felt they needed training to upgrade their skills in cancer prevention, detection and treatment. In terms of cancer prevention, physicians wanted training on the causes of cancer and ways to encourage their patients to reduce their personal cancer risk. To improve their ability to diagnose cancer, physicians wanted training in using sigmoidoscopy and colonoscopy to detect colorectal cancer, use of endoscopy and *H. pylori* testing to detect gastric cancer, and use of ultrasound and fine-needle aspiration techniques—and a general refresher course in radiography. In the area of cancer care, physicians wanted training in pain man-

agement, care of terminal patients, and hospice care.

Needed equipment and supplies

Physicians noted a need for sigmoidoscopy, colonoscopy, endoscopy, and ultrasound equipment. They also expressed a need for better radiological equipment, including a CT scan and an MRI. More reliable laboratory equipment and a steady supply of reagents would expand the capacity of laboratory services on Yap. The laboratory and the Division of Public Health also requested more Pap smear kits. Without such resources, patients and lab specimens need to be sent out of country.

Needed services and programs

Key informants felt that the Yap and FSM governments should support cancer screening and prevention programs, and that these programs should be instituted in outer-island communities, as well as in Yap Proper. Personnel at the Division of Public Health felt that cancer-screening protocols should be developed. They believed it would be more cost-effective for Yap to focus limited health funds on prevention and education regarding prevention, rather than on cancer treatment. There was a specific call for more prevention programs focused on youth.

Recommendations by the assessment team

Based on the findings of this report, the assessment team offered five recommendations (not prioritized) for improving cancer-related services in Yap State.

- *Recommendation 1:* Support programs that increase public awareness about cancer risk, prevention, and early detection. These programs should be built on existing departments rather than creating a new cancer prevention department.
- *Recommendation 2:* Expand screening and early detection programs for all types of cancer.
- *Recommendation 3:* Increase governmental participation in cancer prevention, detection, and treatment. Examples include making cancer a priority in the Yap State Health Plan, and increasing taxes on tobacco and alcohol to raise funds for cancer prevention programs.
- *Recommendation 4:* Improve current laboratory services to assure more timely and affordable analysis of test results (especially biopsies and Pap smears).
- *Recommendation 5:* Establish a Cancer Registry for the collection and analysis of cancer data.

Prioritizing and setting objectives

Needs were prioritized and preliminary planning was

Table 4. Action plan for Yap State's five cancer-related priority areas

Objectives	Activities
1. Establish a cancer registry.	a. Purchase computer, printer & related software b. Purchase supplies (paper, etc.) c. Compile data from multiple sources d. Hire and train data entry clerk
2. Increase public awareness of cancer risk factors, and educate public.	a. Develop, print, and distribute pamphlets & posters. b. Develop, produce and broadcast public service announcements for local radio. c. Develop, produce and print in print media. d. Develop a strategy to educate community groups on cancer issues
3. Expand cancer screening and detection programs.	a. Conduct health screenings in clinic to include Pap smear, breast exams, Reagents (PSA, HBstg, CEA, alphafetoprotein) b. Biopsies, as indicated
4. Expand training opportunities for clinical staff (doctor, nurse, lab tech)	Provide training in: ultrasound, colposcopy, sigmoidoscopy, colonoscopy, chemotherapy, and pain management.
5. Purchase equipment & supplies	Ultrasound machine, colonoscope, endoscope, sigmoidoscope

done by the Pacific Islander delegates of the Cancer Council of the Pacific Islands in the Republic of the Marshall Islands in August 2003. These plans were further refined, and a strategic action plan was developed in November 2003 at a meeting in Pohnpei, FSM. This group designated five priority areas:

- *Priority 1:* Establish a Cancer Registry for the collection and analysis of cancer data.
- *Priority 2:* Increase public awareness of cancer risk factors and educate public on cancer risk factors, prevention and early detection. These programs could be built within existing departments rather than creating a new cancer prevention department.
- *Priority 3:* Expand cancer screening and detection programs for all types of cancer.
- *Priority 4:* Expand cancer-related training opportunities for clinical staff (physicians, nurses, and technicians).
- *Priority 5:* Purchase cancer treatment-related equipment & supplies.

The group also developed specific objectives for each priority area. A summary of a one-year action plan for Yap, which was shared with the National Cancer Institute, is shown in Table 4.

Conclusions

Contrary to perceptions on Yap, cancer is the leading cause of death. However, cancer-related services are limited. Yap State needs assistance in establishing a cancer registry, increasing awareness about cancer, expanding cancer screening programs, expanding cancer-related training, and purchasing cancer-related equipment and supplies.

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References

1. Department of Economic Affairs, Federated States of Micronesia. *Federated States of Micronesia: 2000 Population and Housing Census Report*. FSM National Government; 2002.
2. *Federated States of Micronesia: History, Homepage of the National Government of the Federated States of Micronesia*, 1996. Available at <http://www.fsmgov.org/info/hist.html>. Accessed in December 2003.
3. U.S. Census Bureau. *Population and Housing Profile, 2000 Census of Population and Housing, Federated States of Micronesia*. Washington DC: US Census Bureau; 2002.
4. Office of planning and budget, Yap State Government, Yap State Census Report: 1994 FSM Census of Population and Housing, Yap State, FSM, November 1996)
5. *Proceedings of the First FSM Economic Summit*. Office of the President, FSM; Nov 20-24, 1995.
6. *1996-2001 Yap Health Plan*. Division of Public Health; 1995.

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