

Cancer in Pohnpei State, Federated States of Micronesia

Abstract: A cancer needs assessment, funded by the National Cancer Institute, was conducted in Pohnpei State (Pohnpei), Federated States of Micronesia (FSM). Findings revealed that cancer is the third leading cause of death in Pohnpei, 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) increasing community awareness about cancer (especially, cervix, breast, liver and lung) and related risk factors; 2) securing funding for cancer prevention and control planning and activities; 3) establishing a fully staffed cancer prevention and control office; 4) building local capacity for cancer cytology; and 5) increasing capacity to obtain and process lab specimens for high-risk patients. **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 Pohnpei, funded by the National Cancer Institute. This work represents one of the first efforts to identify and prioritize cancer infrastructure needs for Pohnpei.

History, geography and population of Pohnpei State

Altogether, the Federated States of Micronesia (FSM) includes approximately 607 islands in the Western Pacific, grouped into four states—Yap, Chuuk, Kosrae, and Pohnpei—that 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 atolls¹. Based on

the 2000 preliminary census, the total population of the FSM stands at 107,008 residents. Pohnpei is the second largest state, with 34,486 (32.2%) of the FSM population, and serves as the capital of the country².

The relationship between the United States (US) and Pohnpei began during World War II. Prior to World War II, Pohnpei and the rest of Micronesia had been under the administration of Japan. After World War II, the United Nations created the Trust Territories of the Pacific Islands and designated the US as the trustee. The Trust Territories included Pohnpei, Kosrae, Chuuk, Belau, Yap, the Marshall Islands, and the Northern Mariana Islands. In 1979 the districts of Kosrae, Chuuk, Yap, and Pohnpei formed a federation under the Constitution of the FSM, making the islands a sovereign and independent nation. Despite this, much of the FSM's economy was 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 negotiated 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 years³.

The State of Pohnpei consists of the main island of Pohnpei and eight smaller outer islands. The island of Pohnpei is the largest island in the FSM and has a land mass of 129 square miles. The island itself is volcanic, with a central rain forest and a mountainous interior. The elevated interior has eleven peaks of over 2,000 feet with the highest peak, Nahnalaud at 2,595 feet above sea level. Pohnpei proper is encircled by a series of inner-fringing reefs, deep lagoon waters, and an outer barrier reef with a number of islets found immediately offshore^{1,2,4}.

The island of Pohnpei is subdivided into five municipalities and the central government town. The municipalities include Madolenihmw, U, Nett, Sokehs, and Kitt. The central area is Kolonia, where the majority of the government buildings and offices and the Pohnpei State Hospital

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are located. To the south of Pohnpei lie the outer islands of Kapingamarangi (410 miles from Pohnpei), Nukuor (308 miles), Sapwuahfik (100 miles), Oroluk (190 miles), Pakin (28 miles), and Ant (21 miles). To the east are the islands of Mwoakilloa (95 miles) and Pingelap (155 miles). These outer islands together comprise a land mass of 133 square miles and 331 square miles of lagoons⁵.

Travel on the island of Pohnpei proper is increasingly easier with the development and improvement of paved roads to outlying communities from the central area. Not all roads are paved, however, and many residents of Pohnpei proper have a difficult time accessing health care. The outer islands have much less accessibility because inter-island transport is restricted to cargo ships and the "field trip ship," which makes a monthly run through the outer islands of Pohnpei to transport mail, supplies, and health personnel. However, outer islands are building runways, making them more accessible by small plane⁴.

The median age of the population in Pohnpei state is 18.9 years, which makes this the second youngest population in the FSM. In examining the distribution of the population by age groups, there are 18,194 (52.8%) children and adolescents 19 years of age and under; 5,488 (15.9%) young adults between 20-29 years of age; 4,168 (12.1%) people between 30-39 years; 3,297 (9.6%) between 40-49 years; 1,623 (4.7%) between 50-59 years; 980 (2.8%) between 60-69; and 736 (2.1%) elderly 70 years and older⁵.

Health care in Pohnpei

The Pohnpei State Department of Health Services (PSDHS) operates the Pohnpei State Hospital and provides primary care, preventive, dental, and public health services.

The Pohnpei State Hospital has 90 acute beds and provides emergency, inpatient, surgical, labor and delivery, pediatrics, physiotherapy, lab, radiology, and hemodialysis services. Altogether, the hospital employs 80 medical and health care staff. Cases that cannot be treated in Pohnpei may be referred to the Medical Referral Committee (MRC), which considers physicians' requests to transfer patients to facilities outside of Pohnpei for medical treatment.

The Division of Primary Health Care Services of the PSDHS has 36 employees. Programs include: Maternal and Child Health Program, Immunization Program, Family Planning, sexually transmitted infections, non-Communicable Disease, and nutrition. In addition to services provided at

the central public health office, located in Nett, the Division is responsible for the Community Health Center (CHC), five dispensaries on Pohnpei Island, and five dispensaries on the outer islands. These dispensaries are staffed by health assistants who provide primary health and preventive health care in the rural areas.

Methods

The cancer needs assessment was conducted in January 2003 by staff from Papa Ola Lōkahi and the Department of Family Practice and Community Medicine, John A. Burns School of Medicine, University of Hawai'i.

Pohnpei State does not have a centralized cancer registry. Thus, data for this report were obtained from death certificates and reports, a computerized hospital admissions and discharge data system, and a computerized system of cancer cases referred to outside hospitals. Mortality data are collected and compiled by the Office of Health Statistics, and the Pohnpei State Department of Health reports leading causes of deaths annually. Data on

inpatients at Pohnpei State Hospital are maintained in a computerized admissions and discharge data system. Discharge summaries are included in this database. Based on the hospital discharge summaries in the medical records, a listing of patients with ICD-10 codes related to cancer was compiled. Medical Referral Committee data were examined to identify cancer patients referred for off-island care. These data are maintained in a Microsoft Excel spreadsheet, and variables include: name of the patient, referral hospital, date of referral, diagnosis or reason for referral, insurance status, and escort. Data from these three sources were compiled and compared to construct a complete, unduplicated list of patients diagnosed with cancer in Pohnpei State.

Information about the health care system and cancer-related services in Pohnpei was obtained through key informant interviews with physicians and public health staff. Needs were identified by these key informants as well, and these were organized in 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 Pohnpei delegates of the Pacific Cancer Council (later renamed 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.

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Findings: mortality and morbidity

Leading causes of death

For the five-year period 1998 through 2002, 741 deaths were recorded (Table 1). The leading cause of death was heart disease, accounting for 20% of deaths, followed by stroke (10%) and cancer (9%). Among males, the leading cause of death was heart disease, followed by stroke, chronic obstructive pulmonary disease, and cancer (not shown in table). Heart disease also was the leading cause of death for females, followed by cancer, sepsis, and stroke.

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

	N	(%)
Total deaths	741	(100.0%)
Heart disease	151	(20.4%)
Stroke	73	(9.9%)
Cancer *	68	(9.2%)
Chronic obstructive pulmonary disease	62	(8.4%)
Sepsis	59	(8.0%)
Pneumonia	31	(4.2%)
Accident	31	(4.2%)
Diabetes mellitus	13	(1.8%)
Cirrhosis	10	(1.3%)
Suicide	10	(1.3%)
All other deaths	233	(31.4%)

Causes of cancer death, 1998-2002

Of the 68 total cancer deaths, the leading cause of cancer death was cervical cancer (14.7%), followed by lung cancer (13.2%), and cancer of the liver (8.8%). There were 38 cases of cancer-related deaths in males, with 21% attributed to lung cancer, 11% to gastric cancer, 11% to prostate cancer, and 8% each for liver and pancreatic

Table 2. Cancer deaths in Pohnpei, 1998-2002

	N	(%)
Total cancer deaths	68	(100.0%)
Cervical	10	(14.7%)
Lung	9	(13.2%)
Liver	6	(8.8%)
Gastric	5	(7.4%)
Prostate	4	(5.9%)
Nasopharyngeal	4	(5.9%)
Breast	3	(4.4%)
Pancreas	3	(4.4%)
Laryngotracheal	3	(4.4%)
Colorectal	3	(4.4%)
Esophageal	2	(2.9%)
Leukemia	2	(2.9%)
Lymphoma	2	(2.9%)
Uterine/endometrial	3	(4.4%)
Other	4	(5.9%)
Unspecified	5	(7.4%)

cancer (not shown in table). Of the 30 female cancer deaths, 33% were due to cervical cancer, 10% to liver cancer, 10% to cancer of pharyngeal structures, and 10% to breast cancer.

Cancer cases

A total of 153 unduplicated cases of cancer were identified for the period 2000-2002 (Table 3). The most common type of cancer was cervical cancer, which accounted for 24 (15.7%) of the cases. The second-most common type was head and neck cancer (11.1%), which included cancers of the pharynx, oropharynx, nasopharynx, larynx, trachea, and salivary glands. Another 14 patients (9.2%) had prostate cancer, 11 (7.2%) had lung cancer, and 10 (6.5%) had liver cancer.

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

	N	(%)
Total cancer cases	153	(100.0%)
Cervical	24	(15.7%)
Head and neck	17	(11.1%)
Prostate	14	(9.2%)
Lung	11	(7.2%)
Liver	10	(6.5%)
Colorectal	7	(4.6%)
Breast	6	(3.9%)
Pancreas	5	(3.3%)
Gastric	5	(3.3%)
Leukemia	4	(2.6%)
Lymphoma	4	(2.6%)
Uterine/endometrial	4	(2.6%)
Esophageal	3	(2.0%)
Ovary	3	(2.0%)
Kidney	1	(<1%)
Pregnancy mole	1	(<1%)
Thyroid	1	(<1%)
Skin	1	(<1%)
Teratoma	1	(<1%)
Osteosarcoma	1	(<1%)
Unspecified	8	(11.8%)
Suspected and referred	22	(14.4%)

Findings: cancer-related services

Administration, planning, and data

The most recent health plan available for Pohnpei was for the years 1995-2000. Despite the fact that cancer is the third-leading cause of death in Pohnpei, cancer was not a priority in past Pohnpei State health plans. There is no evidence of funds earmarked for cancer and no plans for professional training programs related to cancer prevention, education, diagnosis, treatment, or management.

The Pohnpei State Office of Health Statistics is headed

by the Health Statistician, who is assisted by two data technicians and four data clerks. Information about cancer is captured in death certificates, hospital admission and discharge records, outpatient, and off-island referral data. However, there is no comprehensive cancer registry for tracking cancer patients' diagnoses, treatments, and outcomes. A major problem identified by the Health Statistician is inconsistency among physicians in the diagnosis and staging of cancers in medical records and death certificates. Without specific diagnoses, the data technicians have a difficult time assigning ICD-10 codes for the diagnoses. The Health Statistician also noted that many times, medical and death record forms are submitted late and/or are incomplete when submitted, reducing the ability of the data staff to optimize billing and to prepare timely and accurate reports about the health status of Pohnpeians.

Public health services

Cancer awareness, outreach, and prevention services provided through the Division of Primary Health Care Services include breast and cervical cancer screening and tobacco prevention.

Breast and Cervical Cancer Screening. Pap smears and education on cervical cancer are provided in the prenatal, postpartum, family planning, and gynecology clinics operated by the Maternal and Child Health and the Family Planning Programs. In addition, a mobile team of public health staff travel to outer islands twice a year and to communities on Pohnpei more frequently to provide education on public health issues, including breast and cervical cancer prevention and screening. Staff estimate that 1,300 Pap smear tests are performed each year, which represents 16% of the 8,000 women over 20 years of age who are eligible for Pap smear screening. For women with abnormal Pap smear tests, department protocol calls for follow-up services with colposcopy or cervical biopsy. Unfortunately, the colposcopy unit has not been operational for the past year because of a broken light bulb. Physicians perform clinical breast examinations as part of the physical examination provided to women who attend the clinics; however, breast examinations are not consistently performed by all physicians.

Tobacco Prevention. The Substance Abuse and Mental Health Division has a staff of 12, two of which are designated as Tobacco Prevention Educators. These individuals are responsible for providing tobacco awareness, education, and prevention activities in the community. During the year, staff provides educational sessions on tobacco prevention to students in the schools, youth groups, and community groups. Other tobacco prevention services include five-to-six public radio programs a year, participation in the FSM National Smoke-Out Day,

and the placement of billboards on major roadways with tobacco prevention messages. In collaboration with the Pohnpei Police Department, the program monitors up to 200 local stores to monitor that they comply with the FSM regulation that prohibits the sale of tobacco products to minors. These compliance checks are conducted three times a year. During the most recent compliance check, 32% of stores were found to be noncompliant.

Medical services

Medical services related to the diagnosis and treatment of cancer are provided by the surgeons, obstetrician/gynecologists, pediatricians, and internists at the Pohnpei State Hospital, as well as by several private physicians in the community. There is no oncologist in Pohnpei and, of the physicians who practice at the hospital, none have received specialized training in the treatment and management of cancer patients. Physicians at Tripler Army Medical Center (TAMC) in Hawai'i can provide consultation on the diagnosis, treatment, and management of selected cancer cases.

Services related to the diagnosis of cancer that are available include biopsies through aspiration, Trucut, or excision of the thyroid, lymph nodes, and skin. Treatment services are limited to surgical intervention and the maintenance of chemotherapy that was initiated at an out-of-country facility (although maintenance chemotherapy has been provided only for patients with lymphomas). There is no on-island radiation facility, and there is no on-island access to clinical trials. Telemedicine consultation with TAMC through the store-and-forward computer system has not been functional for the past year because of the lack of a dedicated telephone line.

During the years 1998 to 2002, a total of 532 patients were referred for off-island care, 42 (7.9%) of which were referred for cancer or suspected cancer. Of the 42 patients, 12 patients were referred to Tripler Army Medical Center in Hawai'i, one patient was referred to Straub Hospital in Hawai'i, and 29 (69%) patients were referred to medical facilities in the Philippines. Two thirds (67.3%) of these patients had insurance and 32.7% did not. There is no documentation of patients who were denied off-island referrals.

Laboratory and radiology Services

The services provided by the laboratory for cancer screening and diagnosis include testing for prostate-specific antigen (PSA), and stool occult blood. All Pap smear screening, histology, and special chemistry tests are sent to Honolulu, Hawai'i for processing and reading. Results from biopsies and specimen analyses sent to Honolulu have a turn around time of two to four weeks. The contractual arrangements for the histology and spe-

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

Objective	Activities
1. Establish a fully staffed cancer prevention & control office	a) Hire cancer coordinator b) Hire cancer health educator c) Equip office with computers and other supplies
2. Secure funding for cancer prevention & control planning and activities	Contract grant writer with experience in federal grant writing to complete minimum 3 grants.
3. Build local capacity for cancer cytology	Provide training to local cytologist
4. Increase community awareness about cancer (cervix, breast, liver & lung) and related risk factors	a) Develop and produce materials for dissemination b) Conduct community education on all islands
5. Increase capacity to obtain and process lab specimens for high-risk patients	a) Obtain, package and send specimens for processing b) Outreach and education to patients with positive results

cial chemistries are with Aloha Laboratory in Honolulu and have been operational for the last 10 years with no problems.

Radiological services are limited to diagnostic x-rays only. There are no fluoroscopic units, mammograms, CT scanners, or MRI units. The special diagnostic studies that are available from radiology include upper gastro-intestinal (GI) series, barium enema, intravenous pyelograms, and oral and intravenous cholecystograms. The physicians read their own x-rays.

Non-Governmental Organizations

There are no non-governmental organizations in Pohnpei State that provide services related to cancer prevention and control.

Findings: cancer-related needs

Data needs

Although data about cancer are collected through death records and medical records, Pohnpei does not have a cancer registry. The Health Statistician and data staff requested training in developing and maintaining a cancer registry, in analyzing and interpreting cancer data, and writing reports related to cancer data. They also recognized a need for a refresher course in ICD-10 (International Classification of Diseases, 10th revision) coding for themselves and for physicians.

Personnel and training needs

Personnel. Requested was a full-time State Cancer Coordinator to staff a new office of cancer prevention and control. Also requested for this office were a health

educator and a grant writer, although it was thought that the office could contract with, rather than hire, a grant writer to develop proposals as needed.

Training. Physicians requested training in ultrasound evaluation of large organs and in ultrasound-directed biopsy. They wanted training in diagnostic evaluation methodologies, including laparoscopy, colposcopy, and colonoscopy. To better manage cancer patients, they believed they would benefit from training in palliative care, pain management, and hospice.

Public health nurses also wanted training in ultrasound techniques. In addition, public health staff requested training on cancer risk factors, cancer education and outreach, cancer risk, and principles of screening and detection.

The training needs identified by laboratory staff including training to expand the capability of performing additional laboratory tests, such as liver function tests and screening for Hepatitis C and D. Radiology staff wanted assistance establishing a telehealth link for radiology consultation.

Needed equipment and supplies

Equipment and supplies would be needed for the newly established office for cancer prevention and control. Supplies also are needed for the production of health education materials.

Needed program and services

Cancer is among the leading causes of death in Pohnpei State, however cancer services are limited. There is a need to develop a comprehensive and coordinated system of

services to address the problems of morbidity and mortality related to cancer. As noted previously, there is a need for a State Cancer Coordinator who will be responsible for assuring that cancer-related services are comprehensive, coordinated, and effective.

Recommendations by the assessment team

Based on the findings of this report, the assessment team offered four recommendations for improving cancer-related services in Pohnpei.

- *Recommendation 1:* Increase public awareness about cancer risk, prevention, and the benefits of early detection and treatment.
- *Recommendation 2:* Develop and implement cancer screening programs to increase the number of cancers detected at early stages.
- *Recommendation 3:* Improve capability of providing diagnostic and treatment services for cancer
- *Recommendation 4:* Establish an FSM National Reference Laboratory in Pohnpei State to provide additional and specialized laboratory services for screening and diagnosis of cancer.

Prioritizing and setting objectives

Needs were prioritized and preliminary planning was done by the Pacific Islander delegates of the Pacific Cancer Council (now known as the Cancer Council for 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 for Pohnpei State:

- *Priority 1:* Establish fully staffed cancer prevention and control office.
- *Priority 2:* Secure funding for cancer prevention & control planning and activities.
- *Priority 3:* Build local capacity for cancer cytology.
- *Priority 4:* Increase community awareness about cancer (especially, cervix, breast, liver and lung) and related risk factors.
- *Priority 5:* Increase capacity to obtain and process lab specimens for high-risk patients. The group also developed specific objectives for each priority area. A summary of a one-year action plan for Pohnpei, which was shared with the National Cancer Institute, is shown in Table 4.

Conclusions

Cancer is the third-leading cause of death on Pohnpei, yet few cancer-related services exist. Priority needs include: establishing a fully staffed cancer prevention and control office; securing funding for cancer prevention and control planning and activities; building local capacity for

cancer cytology; increasing community awareness about cancer (especially, cervix, breast, liver and lung) and related risk factors; and increasing capacity to obtain and process lab specimens for high-risk patients.

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