Cancer in the Territory of Guam

Abstract: The purpose of this study, funded by the National Cancer Institute, was to assess cancer awareness and service needs in Guam. Guam maintains a cancer registry, and data suggest that cancer is the second-leading cause of death in Guam. A chapter of the American Cancer Society has been established on the island. Although basic cancer diagnosis and treatment services can be provided on Guam, many cancer patients must travel to Hawai'i, the U.S. continent, or to Asian countries to seek more advanced medical care. This places a severe strain on the island's limited financial resources that, in turn, affects all aspects of health care for the people of Guam. Key informants identified a number of cancer-related service needs, and an action plan was developed based on five priority areas: 1) increasing the capacity of cancer prevention and control staff; 2) increasing public awareness of cancer risk factors; 3) expanding the capacity of the Guam Cancer Registry; 4) establishing a Cancer Prevention and Control Advisory Board for the Territory; and 5) improving early detection and screening for priority cancers. *Key Words:* Medically underserved area, needs assessment, oncology services, Pacific Islanders, quality of health care, health services research

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Introduction

This paper presents findings from an assessment of cancer awareness and needs in Guam, and priorities for cancer infrastructure development in this jurisdiction. This work was funded by the National Cancer Institute.

History, geography and population of Guam

Guam is Micronesia's largest and most populous island and is the southernmost island in the Mariana Archipelago. It is located approximately 3,700 miles west of Hawai'i and 1,300 miles southeast of Japan. Guam was colonized by the Spanish for 300 years beginning in the 17th century. The U.S.-occupied Guam in 1898 after the Spanish-American War, and over the next 40 years the island adopted many aspects of American culture. The island was captured by Japanese military forces on December 19, 1941, and occupied until July 21, 1944, when U.S. military forces recaptured it.

With the Organic Act of Guam, passed by the U.S. Congress and signed by President Harry S. Truman in 1950, the island became an unincorporated U.S. territory, a civilian government was installed, and Guamanians were granted U.S. citizenship. Guam's government structure resembles that of a U.S. state, with a 15-seat unicameral legislature, a governor, and a lieutenant governor. On a national level, Guam sends a non-voting representative to the U.S. Congress, and Guam's residents do not vote in U.S. federal elections. Approximately a third of Guam is controlled by the U.S. military, which maintains naval and air force bases on the island[1].

Guam is approximately 30 miles long by 4 to 9 miles wide and has a total land area of about 210 square miles. According to the 2000 census, Guam's total population was 154,805, with 48.9% females and 51.1% males. The median age of the population was 27.4 years. The major ethnic groups represented on the island were the indigenous Chamorros (37%), Filipinos (26%), Asians (13%), Caucasians (6.8%), and Micronesians other than Chamorro (8%). There were 32,367 family households with an average family size of 4.27 and a median family income of $41,229[2]. In 2001, an estimated 23% of Guam's population was living below poverty, compared to only 12.7% of the general U.S. population[3].

Health care delivery in Guam

The only civilian inpatient medical facility on Guam is the Guam Memorial Hospital Authority (GMHA), which has an emergency room (often inappropriately used as an outpatient clinic), inpatient wards, surgical suites, a pharmacy, laboratory and X-ray services, physical therapy

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services, and health administration and data management offices.

The Department of Public Health and Social Services (DPHSS) maintains Guam's Vital Statistics Registry in the Office of Vital Statistics, Office of Planning and Evaluation. It also maintains the Guam Cancer Registry (GCR) within the Office of Epidemiology and Research and sponsors some programs in cancer prevention and control within the Bureau of Community Health Services (BCHS). Although 30 years ago the DPHSS operated village health clinics in every major village on Guam (14 total), budget restrictions and loss of public health nursing positions have resulted in the closure of all but three facilities, the Central Diagnostic and Treatment Facility, the Northern Regional Community Health Center, and the Southern Regional Community Health Center.

Many businesses on Guam provide their employees with the option to purchase health insurance. However the economic downturn experienced by Guam over the past 10 years coincident with Japan's financial woes has resulted in a high rate of unemployment (15 % in 2001), and more than 20% of the population lacked any type of health insurance (including government programs) in 2003. Although the DPHSS operates a locally-funded Medically Indigent Program (MIP) designed to pay for medical expenses of low-income families without other health insurance, financial support for the program has been reduced. In addition, many private physicians practicing on Guam, the island's principal source of outpatient care, now refuse to accept MIP patients because of chronically late payments and denial or reduction of claims. An additional element responsible for a major drain on financial resources available to both government and private health providers is the need to send many patients to off-island health centers for diagnostic or treatment services not available on Guam. This further exacerbates an already chronic problem of trying to find adequate resources to meet the needs of a medically underserved population.

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Method

The cancer needs assessment was conducted on Guam in January 2003 by individuals affiliated with the Department of Family Practice and Community Medicine, John A. Burns School of Medicine, University of Hawai'i. In addition to consulting with the GCR, information on cancer mortality and morbidity was obtained from a review of death records and off-island referrals for cancer treatment.

Cancer mortality data in Guam have been collected for the GCR by reviewing death certificates filed since 1970. All deaths occurring on Guam must be reported and documented with a death certificate. Certification by the attending physician is required if the deceased received medical treatment within 72 hours prior to death. Otherwise the death is certified by the Chief Medical Examiner, a board-certified forensic pathologist. The DPHSS publishes annual vital statistics reports in which the leading causes of death and other data are presented. The authors reviewed the report for the years 1995 through 2001, and were able to combine data to determine the six leading causes of death for that 7-year period[4].

The GCR is maintained by the Office of Epidemiology and Research, DPHSS. Data for the registry is compiled from death certificates (including death certificates forwarded by the 50 states when Guam residents die in the U.S.), cancer-related pathology reports, physician reports of newly diagnosed cancer patients, and reports from the Cancer Institute of Guam (CIG, a private-practice physician group) and the Guam Unit of the American Cancer Society Hawai'i-Pacific (ACS).

The U.S. Naval Hospital, Guam, maintains independent health records and does not share cancer data with the GCR. However, the GCR may obtain information about some cancer cases among military personnel (especially Guam residents serving in the U.S. armed forces) who seek assistance from the ACS. The ACS may also provide information on non-residents who come to Guam for cancer care.

Information on cancer-related services available on Guam was obtained through key informant interviews with selected individuals and interviews with groups of physicians and public health staff. Needs identified by these informants 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 delegates of the Cancer Council of the Pacific Islands (advisory board to the Pacific Cancer Initiative) held 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 an additional meeting in Pohnpei, Federated States of Micronesia (FSM).

Findings: mortality and morbidity

Leading causes of death, 1995-2001

For the 7-year period 1995 through 2001, a total 4,646 deaths were recorded. The leading cause of death in Guam was cardiovascular disease, accounting for 27.0% of deaths (Table 1). Cancer was the second most common cause of death, accounting for 15.4% of deaths. Other causes of death included injuries/trauma (8.8%), stroke (8.2%), diabetes (4.5%), and suicide (4.4%)[4].

Table 1. Leading causes of death in Guam, 1996-2001

	N	(%)
Total deaths	4,646	(100.0)
Cardiovascular disease	1,254	(27.0)
Cancer	715	(15.4)
Injury/trauma	407	(8.8)
Stroke	379	(8.2)
Diabetes	209	(4.5)
Suicide	206	(4.4)
All other categories	1,476	31.8)

Cancer deaths, 1995-2001

The report *Cancer on Guam 1995-2001* listed 790 cancer deaths for this period, compared to only 715 cancer deaths recorded in the DPHSS annual reports of mortality. This discrepancy arises principally because the GCR includes individuals whose primary cause of death may have been attributed to heart disease or stroke, even though they had a concurrent cancer diagnosis.

Table 2. Cancer deaths in Guam, 1995-2001

	N	(%)
Total cancer deaths	**790**	**(100.0)**
Lung	206	(26.1)
Colorectal	73	(9.2)
Lymphoma/leukemia/multiple myeloma	73	(9.2)
Breast	60	(7.6)
Head and neck	60	(7.6)
Other/ill-defined	51	(6.5)
Prostate	48	(6.1)
Liver	43	(5.4)
Stomach	32	(4.1)
Uterine	22	(2.8)
Pancreatic	21	(2.7)
Cervical	16	(2.0)
Soft tissue	16	(2.0)
Esophageal	13	(1.6)
Ovarian	13	(1.6)
Skin	10	(1.3)
Bladder	9	(1.1)
Central nervous system	9	(1.1)
Thyroid	7	(<1)
Renal	5	(<1)
Testicular	2	(<1)
Gallbladder	1	(<1)

Table 3. Cancer cases by type of cancer, Guam, 1995-2001

	N	(%)
Total cancer cases	**1,336**	**(100.0)**
Lung	242	(18.1)
Breast	224	(16.8)
Colorectal	138	(10.3)
Lymphoma/leukemia/multiple myeloma	100	(7.5)
Head and neck	97	(7.3)
Prostate	93	(7.0)
Other/ill-defined	70	(5.2)
Liver	51	(3.8)
Uterine	50	(3.7)
Cervical	36	(2.7)
Stomach	36	(2.7)
Ovarian	33	(2.5)
Thyroid	28	(2.1)
Skin	27	(2.0)
Pancreatic	23	(1.7)
Bladder	21	(1.6)
Soft tissue/bone	21	(1.6)
Esophageal	15	(1.1)
Central nervous system	10	(<1)
Renal	10	(<1)
Testicular	9	(<1)
Gallbladder	2	(<1)

Based on the 1995-2001 reported cancer deaths (n=790), the 5 leading causes of cancer mortality for Guam residents for 1995-2001 are presented in Table 2. The leading cause of cancer death was lung cancer (26%), followed by colorectal cancer (9%), lymphoma/leukemia/multiple myeloma (9%), breast (8%), and head and neck cancers (8%)[4].

There were 486 cancer deaths for men and 304 cancer deaths for women (not shown in table). For men, the 5 leading causes of cancer deaths were lung cancer (31%), lymphoma/leukemia/multiple myeloma (11%), head and neck (10%), prostate (10%), and colorectal cancer (9%). These 5 cancers accounted for 72% of all male cancer deaths. For women, the 5 leading causes of cancer deaths were breast cancer (20%), lung (18%), other/ill-defined (10%), colorectal (10%), and uterine cancers (7%). Lymphoma/leukemia/multiple myeloma ranked sixth (6%) and cervical cancer ranked seventh (5%). Of note, 74% of the total cancer deaths for males were lung cancer deaths (152 out of 206), 60% were colorectal deaths (44 out of 73), and 74% of the total were lymphoma/leukemia/multiple myeloma deaths (54 out of 73)[4].

Cancer cases, Guam 1995-2001

Cancer incidence data have been collected prospectively by the GCR since 1998, and data for this report were obtained from the report *Cancer on Guam 1995-2001* provided by the DPHSS. Approximately 60% of new cases were identified from pathology reports, 25% from death certificates, and the remainder through reports by physicians, the ACS, and the CIG[4].

There were 1,336 new cancer cases recorded during the 7-year period, 1995 through 2001 (Table 3). The most frequently diagnosed cancer was lung cancer (18%), followed by breast cancer (17%), colorectal cancer (10%), lymphoma/leukemia/multiple myeloma (7%), and head and neck cancers (7%). Of the 1,336 cases, 685 were in men and 651 were in women (not shown in table). For men, the 5 leading types of cancers were lung cancer (25%), prostate cancer (14%), colorectal cancer (12%), head and neck cancers (11%), and lymphoma/leukemia/multiple myeloma (10%). For women, the 5 most common cancers were breast cancer (34%), lung cancer (11%), colorectal cancer (9%), uterine cancer (8%), and cervical cancer (6%)[4].

Findings: cancer-related services

Administration, planning, and data

The maintenance of the GCR, initiated in 1998, is mandated by law although the legislature has not earmarked funds for this purpose. The Guam Territorial Epidemiologist, in addition to his other responsibilities, is the only individual working to maintain the GCR. A computerized cancer registry data software system called *CanReg3*, a product developed by the World Health Organization (WHO) International Agency for Research on Cancer, is utilized. Although the WHO funded and provided training in data entry using this software, further training in the analyses of registry data would be useful. The present software provides for comprehensive data entry and analysis of patient demographic data, tumor typology and morphology, pathology reports, treatment and follow-up, and monitoring of clinical status. Unfortunately, due to the lack of support staff, it has not been possible to collect data on treatment or treatment outcomes that typically require on-site visits to clinics or doctors' offices to review patient medical records. Although several reports on cancer mortality and incidence have been generated from the cancer registry, it is unclear what use is made of the information to guide public health activities or health policy on cancer. Cancer programming is primarily determined by whether or not grant funding is available. Guam does not have a current territorial health plan in place.

Public health services

In addition to maintaining the GCR, the DPHSS sponsors a tobacco prevention program and a breast and cervical cancer screening program.

Breast and Cervical Cancer Screening Program (BCCEDP). Guam's BCCEDP was established in 1998 and is supported by a grant from the U.S. Centers for Disease Control and Prevention (CDC). Its purpose is to identify and provide breast and cervical cancer screening for low-income women who are uninsured or underinsured. The program does not pay for confirmatory workup or treatment once cancer is diagnosed. Women with abnormal screening results are referred to the Guam Seventh Day Adventist Clinic, which is a large, private, missionary clinic that sees both insured and uninsured patients and provides some free or low-cost care to women who cannot otherwise afford it. The BCCEDP currently has enrolled 250 women and has the potential to enroll more participants. However, there may be a reluctance to increase enrollment if follow-up care cannot be found for women who need it.

Tobacco Use Prevention. Smoking is a problem among youth, and the 2001 Youth Behavioral Risk Factor Surveillance Survey (YBRFSS) for Guam found that 37% of young people smoke[5]. This is the highest rate of youth smoking found among all of the U.S. states and territories. To gather additional data on smoking, the DPHSS conducted a Youth Tobacco Survey in 2003, but data were not available for inclusion in this report. Smoking is also a problem among adults. The 2003 Behavioral Risk Factor Surveillance System found that the prevalence of current smoking among adults was 34.3%, an increase of 7.5% from the previous year's rate of 31.9%[6]. These rates are also some of the highest in the nation.

Guam's Tobacco Prevention and Control Program supports two health educator positions. Because it is funded through a CDC chronic disease grant, the two health educators have responsibilities for education in injury prevention and overall wellness (e.g., nutrition, obesity), along with tobacco use prevention. The program provides tobacco education to community and school groups. It pays for anti-smoking advertisements on radio and television, and develops and distributes educational materials. The health educators stress that there are cultural barriers in delivering tobacco prevention programs on Guam. They see a need to build trust through community contacts and to change norms about smoking as an activity linked to relaxation and socialization. They believe their educational messages are more effective when targeted to family networks (e.g., talking to people who have an influence in the family clan system) rather than to the public at large. This program also sponsors tobacco compliance checks on stores to discourage the sale of tobacco products to minors. These

compliance checks are conducted throughout the year, and the current rate of non-compliance is estimated at 22%.

Medical services

Guam was designated a Health Professional Shortage Area (HPSA) for Primary Medical Care by the U.S. Department of Health and Human Services in 1988[7]. However, for many years, basic cancer workup and treatment services have been provided. For example, there are surgeons and surgery services on Guam proficient at cancer biopsy and excision, and there are 10 OB/GYN physicians who can perform basic gynecologic cancer surgery and treatment. Through CIG, a fulltime oncologist sees 50 to 75 adult patients a week (pediatric oncology cases are referred to Hawai'i) and provides training for the nurses who supervise chemotherapy provided for homebound patients. Until facilities were destroyed in a 2002 typhoon, CIG also offered radiation therapy services. Since that typhoon, patients needing radiation treatment have been referred to a sister clinic located on the island of Maui in Hawai'i. Patients pay for their own transportation and lodging, but CIG makes available an apartment on Maui for $600/month.

Due to losses associated with the 2002 typhoon and increasing malpractice and facility insurance rates, the owners of the current CIG have considered closing the facility. Closure would mean that cancer patients would not have access to an oncologist on Guam for at least several months and that more patients would need to seek care off-island. Guam's OB/GYN physicians also are troubled by the high cost of malpractice insurance, and some of the older physicians intend to retire soon. Additionally, there is no dedicated OB/GYN outpatient physician employed by the DPHSS, suggesting a need for more OB/GYN physicians in Guam, particularly for low-income patients.

Laboratory and radiology services

Radiology services on Guam are provided primarily by GMHA, which is able to perform X-rays, CT scans, MRIs, mammograms, and ultrasounds. There are three pathologists in Guam who can read tissue biopsies (one is with the U.S. military). Pap smears, TSH (to check for thyroid cancer), prostate-specific antigen (PSA), cancer tumor marker stains, and special tissue stains are sent to Diagnostic Laboratory Services (DLS) in Hawai'i.

Non-governmental organizations (NGOs)

The American Cancer Society (ACS) has a chapter in Guam. The Guam Unit was established in 1969 as part of the Hawai'i-Pacific Inc. Division. For the past 30 years, the Guam Unit has provided important cancer education and information to the local community. The staff and volunteers work together to present programs that address a wide variety of cancer-related topics, such as tobacco cessation, early cancer detection and prevention, cancer patient support groups, nutrition education and physical activity. Through the work of excellent volunteers, a national cancer research program is supported by annual fundraising events and other income development activities. The Guam Unit also provides patient services to cancer patients in the form of assistance to travel off-island for treatment, equipment loans, rehabilitation supplies, and other medical necessities.

National and international organizations

The Pacific Island Cancer Control Network (PICCN) is a program of the University of California at Irvine funded by the National Cancer Institute to provide community cancer education outreach. It also attempts to identify and train persons of Chamorro, Samoan, and Tongan ancestry interested in cancer research. Participants in this program attend a 3-week training course on cancer epidemiology, research methods, and grant writing. They also have an opportunity to apply for funding for pilot research projects. To date, three individuals from Guam have completed training, and one was awarded funding for research on factors that affect the utilization of cancer screening services among Chamorros[8].

Findings: cancer-related needs

Data needs

Guam has a cancer registry, but the Registrar has requested training and technical assistance to improve the program. The Registrar would also like training in analyzing and presenting cancer registry data. It was also noted that physicians and medical records personnel also need training in cancer coding.

Personnel and training needs

Personnel. Guam needs additional OB/GYN physicians because many of the older physicians are retiring early due to high malpractice insurance rates. The DPHSS needs an OB/GYN physician dedicated to outpatient care so that low-income women will have better access to care for gynecological cancers. The Department also needs a cancer programs coordinator who can help assure that cancer-related services are comprehensive, coordinated, and effective. If the current CIG closes and the current oncologist relocates, Guam will need another oncologist.

Training. Physicians requested training on patient education related to cancer risk, chemotherapy, and palliative and terminal care. Nurses requested on-site, hands-on training in cancer prevention and specialized nursing

Table 4. Action Plan for Guam's Five Cancer-Related Priority Areas

Objectives	Activities
Increase the capacity of DOPH staff in social marketing, research, evaluation, and grant writing	• Train staff in communication and social marketing strategies • Develop a communication plan • Train staff in research and evaluation • Develop a research and evaluation plan • Train staff in grant writing • Draft at least one proposal for a program in cancer prevention & control
Increase public awareness of cancer risk factors	Follow details outlined in the communication plan
Expand the capacity of the Guam Cancer Registry.	• Provide training in ICD-10 coding • Provide training in data registry management
Establish a Cancer Prevention & Control Program	• Meet with cancer partners and stakeholders • Develop Strategic Plan for Program
Improve early detection and screening for priority cancers	• Identify protocols for detection and screening • Train clinicians and public health staff in protocols • Provide equipment and supplies for screening clinics

care for cancer patients, including care of terminally ill patients. Public health staff requested training on cancer risk factors, cancer education and outreach, and principles of screening and detection.

Needed equipment and supplies

The BCCEDP outreach clinics, which are held on a rotating basis in outlying villages, are in need of lightweight easily transported examination tables and other supplies appropriate for such clinics.

Needed programs and services

Given that cancer is the second-leading cause of death in Guam, there is a need to develop a comprehensive and coordinated system of services to address the problems of morbidity and mortality related to cancer. Prevention and early detection programs need to be in place to reduce cancers that may be prevented, such as lung cancer, and cancers that can be cured if detected early, such as breast, cervical and colorectal cancers. In addition, funding is needed to improve access to cancer diagnosis and treatment services for low-income people.

Recommendations by the assessment team

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

- *Recommendation 1:* Increase public awareness about cancer risks, prevention, and the benefits of early detection and treatment. This can be done in part by advertisements, health fairs and other community events.
- *Recommendation 2:* Develop and implement free screening program for all cancers to increase the number of cancers detected at early stages.
- *Recommendation 3:* Provide assistance in maintaining and improving the Guam Cancer Registry. Improve collection of cancer data from U.S. armed forces personnel on Guam, and of Guam residents diagnosed or treated in Hawai'i or in the continental U.S.
- *Recommendation 4:* Provide chemotherapy training for nurses and physicians that are part of the community and are committed to practice in Guam for an extended period of time.

Prioritizing and setting objectives

Needs were prioritized and preliminary planning was conducted 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 for Guam:

- *Priority 1:* Increase the capacity of DPHSS cancer prevention and control staff.
- *Priority 2:* Increase public awareness of cancer risk factors through public education.
- *Priority 3:* Expand the capacity of the Guam Cancer Registry.
- *Priority 4:* Establish a Cancer Prevention & Control Program to coordinate control activities for cancers other than breast and cervical.
- *Priority 5:* Improve early detection and screening for priority cancers.

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

Conclusions

Cancer is the second-leading cause of death on Guam. Guam has more cancer-related services than most U.S.-associated jurisdictions in the Pacific. For example, Guam maintains a cancer registry and seeks to expand its capacity. Additionally, a chapter of the American Cancer Society operates in Guam. However, assistance is needed to strengthen and expand existing cancer-related services, particularly for low-income individuals. Key informants requested assistance with increasing the capacity of cancer prevention and control staff within the DPHSS; increasing public awareness of cancer risk factors; expanding the capacity of the Guam Cancer Registry; creating a Cancer Prevention & Control Program; and improving early detection and screening for priority cancers.

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ʻA ʻohe pilo uku.

No reward is a trifle.

Even a small gift is appreciated.

Hawaiian proverb