Cancer in American Samoa

Abstract: This study, funded by the National Cancer Institute, assessed cancer awareness and service needs in American Samoa. Cancer is the second-leading cause of death in American Samoa, yet cancer specific resources are lacking. Assistance is needed to help: 1) increase cancer outreach and community awareness; 2) increase the cancer capacity of health professionals; 3) improve laboratory capacity for cancer screening and detection; and 4) establish a comprehensive and coordinated system of cancer services. *Keywords:* Medically underserved area, needs assessment, oncology services, Pacific Islanders, quality of health care, health services research.

Lu'ukia Ruidas*
Aaron Adaoag*
Victor Tofaeono Williams**
Margaret L. Sesepasara***

Introduction

This paper presents findings from an assessment of cancer awareness and needs in American Samoa and on priorities for cancer infrastructure development in this jurisdiction. The cancer needs assessment and prioritization process were funded by the National Cancer Institute.

History, geography and population of American Samoa

Archaeological evidence suggests that the first Polynesian settlement in Samoa occurred around 1,000 to 600 BC[1]. Its long isolation from the western world ended in 1722 when the Dutch explorer Jacob Roggeveen came upon the islands. In the 1770s, trading and whaling ships used Samoan ports as a stop over on their long journeys. After missionaries landed in Samoa in 1836, power struggles ensued among the British, Americans, and Germans until the Treaty of Berlin was signed in 1899. The treaty gave the United States rights over the Samoan islands east of longitude 171.5° and west of Greenwich. The group of Samoan islands west of longitude 171.5° was ceded to Germany and is now called Samoa. In 1929, U.S. Congress formally accepted sovereignty over the territory. In 1951, administration of the territory was transferred from the Department of the Navy to the Department of the Interior, the current administrator. The first territory's Constitution was signed in 1960.

Currently, American Samoa is an unincorporated territory of the United States. American Samoans are U.S. nationals, rather than U.S. citizens. Being nationals, American Samoans cannot vote in U.S. elections. They do, however, elect their own Governor and Lt. Governor every four years. The government system also consists of a Legislative branch (or *Fono*) that includes a Senate, whose members are nominated by Samoan chiefs, and a House of Representatives, whose members are elected by the people every 2 years. American Samoans also elect a non-voting delegate to the U.S. House of Representatives[1].

American Samoa lies in the heart of the South Pacific, north of Tonga and southwest of Hawai'i. The Territory consists of a group of seven islands in the southern Pacific Ocean, including Tutuila, the Manu'a group (Ta'u, Olosega, and Ofu), Aunu'u, Rose Island, and Swains Island (a privately owned coral atoll).[1]The total area of American Samoa is approximately 77 square miles. Tutuila, the largest island, covers an area of 55 square miles and, based on the 2000 Census, had a population of 57,291 people. Pago Pago, the capital of the Territory, is the political, administrative and commercial center of American Samoa. English is the official language of American Samoa, although many American Samoans speak both English and Samoan.

According to the 2000 census, there were 29,264 males (51.1%) and 28,027 females (48.9%) in American Samoa.[2]The population is predominantly Samoan (88%). Other ethnic groups include Tongan, Caucasian, Filipino, and other Asian. The median age of the population is 21.3 years (meaning that half the population is 21 or younger) and only 5% of the population is age 60 or older. The median household income is $18,219, but 58% of all families in American Samoa have income below the U.S. federal poverty level.[2] Education is free and mandatory for all children between 6 and 18 years. Tuna fishing and tourism are the major industries in American Samoa. Agriculture is the principal occupation. The most impor-

*Second-year residents in the Department of Family Medicine and Community Health at the John A. Burns School of Medicine, University of Hawai'i when this study was conducted. **Assistant Medical Director of the Lyndon B. Johnson Tropical Medical Center. ***Nurse practitioner with the Maternal and Child Health program. Contact Dr. Neal A. Palafox, Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai'i, 95-390 Kuahelani Ave., Mililani HI, 96789, Tel: 808-627-3230. Email: npalafox@hawaii.edu.

tant crops being cultivated include taro, coconuts, bananas, oranges, pineapples, papayas, breadfruit, and yams[1].

Health care delivery in American Samoa

The Department of Health (DOH) is responsible for 5 community-based primary care clinics, through which residents can receive free care. DOH also provides public health services, including health education, family planning, HIV prevention, maternal and child health, immunization, nutrition, chronic disease management, breast and cervical cancer screening, tobacco prevention, and other programs.

The LBJ Tropical Medical Center was established in 1968 and was named in honor of Lyndon B. Johnson, who was U.S. president at that time. The facility is under the authority of a five-member board that is selected by the Governor of American Samoa. LBJ serves a population of about 62,000 residents, as well as visitors to the Territory. It has an emergency room, 150 patient beds for general medical services, laboratory services, radiological services, and outpatient services in medicine, surgery, dentistry, and obstetrics/gynecology. The hospital generates financial resources from user fees, private insurance payments, local government appropriations, and federal health care financing through the Medicaid and Medicare programs. There also is a private medical clinic and a private dental practice on the main island.

Beginning in the 1980s, there have been several attempts to start and maintain a cancer registry. Early attempts were thwarted by inadequate staffing and storing capabilities. In 1991, Typhoon Val destroyed cancer registry data collected up to that point.

Complex medical cases that cannot be treated in American Samoa are referred to the Medical Referral Committee, composed of hospital physicians and administrators. Interesting teaching cases are referred to the Pacific Island Healthcare Program funded by the Department of Defense (DoD). If accepted into this program, costs of transportation to Honolulu and care at the Tripler Army Medical Center (TAMC) are covered by DoD. Other patients can be sent to other facilities in Honolulu, New Zealand, or the continental U.S., and hospital appropriations and non-governmental organizations pay for the patient's transportation, living arrangements, and medical care. Because off-island care is expensive, there is a policy recommending denial of off-island referral requests for patients with a poor prognosis and/or less than six months to live.

Methods

The cancer needs assessment was conducted in American Samoa in spring 2003 by medical residents affiliated with the Department of Family Practice and Community Medicine at the John A. Burn School of Medicine, University of Hawai'i.

Data related to overall cause of death and cancer deaths were obtained from the Health Information System Office within the Department of Health. Information regarding gender-specific causes of death, however, is not available. Causes of death are collected and compiled manually by the Health Information System Office and data are reported annually in a statistical yearbook published by the Department of Commerce. Manual, rather than computerized, storage of the data limits the ability to conduct sophisticated analyses.

Beginning in the 1980s, there have been several attempts to start and maintain a cancer registry. Early attempts were thwarted by inadequate staffing and storing capabilities. In 1991, Typhoon Val destroyed cancer registry data collected up to that point. In February 2003, another cancer registry was established. Data are compiled from hospital discharge summaries, pathology reports, and death certificates. Registrars have been adding cases retrospectively so that the registry includes cases diagnosed in 2000. Information being collected includes patient name, date of birth, gender, area of residence, primary cancer site, date of diagnosis, method of diagnosis, stage, type of treatment (if any), date of death, and cause of death. These data are limited to cancer cases diagnosed on-island.

Off-island referral data were obtained from interviews with the referral coordinator. Information about current cancer related services was obtained through interviews with physicians, nurses, and public health staff. Additionally, every individual interviewed was asked to identify factors that needed improvement to provide better cancer education, screening, diagnosis, and treatment. Needs were organized into four categories: data, training, equipment and supplies, and services and programs. A list of recommendations was developed from these needs. Needs were prioritized and preliminary planning was done by the Pacific Islander delegates of the Cancer Council of the Pacific Island 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.

Table 1. Leading causes of death in American Samoa, 1998-2001

Cause of death	N	%
Heart disease	213	(22)
Cancer	152	(16)
Diabetes	84	(9)
Stroke	65	(7)
Injury/trauma	61	(6)
Septicemia	42	(4)
Chronic obstructive pulmonary disease	41	(4)
Perinatal conditions	41	(4)
Pneumonia	31	(3)
Nephritis/nephrosis	30	(3)
All other categories	210	(22)
Total deaths	**955**	**(100)**

Source: Health Information System Office, Department of Health, American Samoa

Findings: mortality and morbidity

Leading causes of death, 1998-2002

For the four-year period 1998 through 2001, 955 deaths were recorded (Table 1). The leading cause of death was heart disease, accounting for 22% of deaths, followed by cancer (16%), diabetes (9%), stroke (7%), and injuries (6%). However, the majority of people who die of heart disease also have diabetes, so the common thinking is that diabetes is really the leading cause of death.

Cancer deaths, 1998-2002

Table 2 shows the types of cancer leading to death. The leading cause of cancer death was cancers of the lung and respiratory tract (19%), followed by cancer of the liver (12%), prostate (11%), stomach (10%), colon (9%), and breast (8%)[4].

Men account for 57% of cancer deaths over age 45, compared to 43% for women (not shown in table). However, 71% of cancer deaths under the age of 45 occur in women, compared to only 21% in men younger than 45. Unfortunately, because of information retrieval difficulties, the gender-specific data for types of cancer causing death were not available[4].

Cancer cases, 2000-2002

The cancer registry includes data on 100 cases of cancer diagnosed between 2000 and 2002 (Table 3). The most common form of cancer recorded in the registry is breast cancer, accounting for 13% of cases. This is followed by uterine cancer (11% of cases), lung (10%), prostate (10%), cervical (8%), stomach (8%), and liver cancer (5%)[4].

Findings: cancer-related services

Administration, planning, and data

Three health plans for American Samoa have been developed in the past. The first was a health policy plan addressing health care financing and general policies. The second was a health manpower and development plan, which addressed appropriation of staffing and staff training. The third plan, not yet approved, is a five-year action plan for 2000-2005 based on the World Health Organization (WHO) stages-of-life model, addressing strategies to promote healthy lifestyles in three main areas of concern: preparation for life, protection of life, and quality of life in later years. None of the three health plans are currently in active use. Although cancer is the second-leading cause of death[5], it is not identified as a priority in any of the health plans.

The Health Information System Office of the Depart-

Table 2. Cancer deaths by site, American Samoa, 1998-2001

Cancer deaths	N	(%)
Lung, trachea, bronchi	29	(19.3)
Liver, intrahepatic bile ducts	18	(12.0)
Prostate	17	(11.3)
Stomach	15	(10.0)
Colon	13	(8.6)
Breast	12	(8.0)
Brain	4	(2.6)
Pancreas	4	(2.6)
Rectum/Anus	4	(2.6)
Lymphoid	3	(2.0)
Lip, oral cavity, pharynx	3	(2.0)
Uterus	3	(2.0)
Female genital organs	2	(1.3)
Digestive organs other than stomach	2	(1.3)
Larynx	1	(<1)
Skin	1	(<1)
Mesothelial, soft tissue	1	(<1)
Bladder	1	(<1)
Urinary tract	1	(<1)
Hodgkin's	1	(<1)
Non-Hodgkin's lymphoma	1	(<1)
Leukemia	1	(<1)
All other sites	15	(10.0)
Total cancer deaths	**152**	**(100.0)**

Source: Health Information System Office, Department of Health, American Samoa

ment of Health collects all health data. Cancer-related data, obtained from death certificates and hospital discharges, are included in a cancer registry that was established in February 2003. The cancer registry is maintained by a staff member from the federally funded Breast and Cervical Cancer Early Detection Program (BCCEDP). The biggest obstacle to maintaining the cancer registry is the lack of a centralized system that allows for the consistent collection of cancer-related data from hospital records, pathology reports, death certificates and hospital discharge summaries.

Public health services

Cancer awareness, outreach, and prevention services are limited to lung, breast and cervical cancer. There are no prostate, skin, or colon cancer awareness programs.

Breast and Cervical Cancer Screening: Breast and cervical cancer awareness is provided by the Breast and Cervical Cancer Early Detection Program (BCCEDP) funded by the Centers for Disease Control and Prevention (CDC). There are approximately six staff members who provide education and awareness about breast and cervical cancer and who produce educational posters and brochures.

Cancer screening endeavors are limited to Pap smears and mammograms provided by the BCCEDP and individual obstetrician/gynecologists. Abnormal Pap smears and mammograms are appropriately referred from the BCCEDP to an OB/GYN or surgeon.

Colon Cancer Screening: Screening for colorectal cancer is very limited. People with symptoms, such as blood in the stool, receive colonoscopies or barium enemas to rule out colorectal cancer. Currently, two surgeons in American Samoa are trained to perform colonoscopies.

Tobacco Prevention: The Tobacco and Drug Prevention Program, funded by CDC, consists of two staff members who provide outreach education about lung cancer. The program sponsors an annual community fair and the annual Smoke-Out Day. The program also educates schoolteachers who then educate students about tobacco use and lung cancer. The program frequently participates in sting operations to enforce the Tobacco Restriction Act prohibiting the sale of tobacco to minors.

Table 3. Cancer cases by primary site, American Samoa, 2000-2002.

Primary site	N	(%)
Breast	13	(13)
Uterus	11	(11)
Lung	10	(10)
Prostate	10	(10)
Cervix	8	(8)
Stomach	8	(8)
Liver	5	(5)
Gallbladder	4	(4)
Brain	3	(3)
Rectum	3	(3)
Bone marrow	2	(2)
Foot	2	(2)
Leg	2	(2)
Nasopharynx	2	(2)
Nose	2	(2)
Ovary	2	(2)
Pancreas	2	(2)
Ano-rectum	1	(1)
Appendix	1	(1)
Axilla	1	(1)
Bile duct	1	(1)
Finger	1	(1)
Oropharynx	1	(1)
Palm	1	(1)
Colon	1	(1)
Testicle	1	(1)
Thyroid	1	(1)
Unknown	1	(1)
Total cancer cases	**100**	**(100)**

Source: Cancer Registry as of May 21, 2003, LBJ Hospital

Medical services

Medical services related to the diagnosis of cancer are provided by surgeons and gynecologists at the LBJ Tropical Medical Center, and the Assistant Director of Medical Services at LBJ is a member of a national professional society for practitioners specializing in breast cancer, the American Breast Society. Diagnostic services include colposcopy and biopsies of the breast, lymph nodes, skin, colon, and thyroid. Treatment services are limited to surgical interventions. There are no oncologists or hematologists in American Samoa. All patients requiring radiation and chemotherapy are referred off-island for the duration of the treatment and follow-up. However, LBJ has the capacity to provide maintenance chemotherapy, usually started at Honolulu medical facilities. There is no access to clinical trials.

Off-Island Referrals: About 400 off-island referrals, for all medical conditions, are made each year. The data regarding the number of referrals for cancer diagnosis and treatment and the number of patients denied off-island care were not readily available.

Laboratory and radiology services

The services provided by the laboratory for cancer screening and diagnosis include prostate-specific antigen (PSA) and stool occult blood. All Pap smear screening, histology, and special chemistry tests are sent to Diagnostic Lab Services (DLS) in Honolulu for processing and interpretation. Generally, biopsy and Pap smear results are returned in 4-5 days by fax.

Radiological services include diagnostic x-rays, mammograms, CT scans, and ultrasound. A radiologist with the Nevada Imaging Center in Las Vegas reads all mammograms. Other radiographs are read by radiologists at the LBJ Tropical Medical Center.

Non-Governmental Organizations

The *Galeai Poumele Cancer Foundation* is a non-government organization in American Samoa that provides financial assistance to cancer patients who are referred off-island for cancer care. The organization also provides community awareness of cancer through billboards and brochures. In the past, American Samoa had a cancer society, and efforts are being made to reactivate this group.

Findings: cancer-related needs

Data needs

Although cancer is the second-leading cause of death in American Samoa, the territory's health planning documents do not include cancer as a priority. A cancer registry is being developed, but several additional staff members should be trained to assist with its maintenance. Staff also would benefit from training in analyzing, interpreting, and reporting cancer-related data so that these data could be used to guide public policy and funding decisions.

Personnel and training needs

Personnel: A pathologist specializing in histochemistry is needed to increase American Samoa's ability to diagnosis and appropriately treat cancer. Additionally, there is a need for better coordination of public and private sector individuals to focus on developing a comprehensive and coordinated system of cancer services and to increase community awareness of cancer.

Training: Several interviewees, including physicians, felt that on-island physicians would benefit from an overall review of cancer screening guidelines, training in diagnostic methodologies including colonoscopies and colposcopies, and training in providing closer, more complete follow-up of diagnosed cancer patients. Public health personnel requested updated information on cancer risk factors and primary and secondary prevention strategies. Laboratory personnel requested technical training to expand the screening and diagnostic capabilities of the lab.

Needed equipment and supplies

Staff identified a need for a vehicular transportation to support DOH outreach efforts, allow for provision of after-hour education programs, and support patients receiving services (including hospice) at home. Health promotion materials are needed, including posters, videos, brochures, billboards, and t-shirts. Additionally, the laboratory needs supplies and diagnostic reagents. Should a central cancer services office be established, furniture, office equipment, and supplies would be needed.

Needed program and services

American Samoa needs a comprehensive and coordinated system of services to address cancer-related community awareness, cancer screening, diagnosis, and treatment. As mentioned earlier, a full-time person would need

Table 4. Action plan for American Samoa's four cancer-related priority areas

Objectives	Activities
1. Establish a comprehensive and coordinated system of services	a. Hire and train a full-time Cancer Coordinator b. Establish a Cancer Office c. Strengthen the Cancer Registry d. Provide infrastructure for Cancer Office (office furniture, equipment, supplies) e. Establish and coordinate a Cancer Coalition and Cancer Society
2. Increase cancer capacity of health professionals	a. Provide training for physicians in interpreting/reading mammograms, CT films, etc. b. Hire a pathologist c. Train clinical staff (nurses, CHA, clerks) in cancer control d. Train public health staff in preventive education and awareness programs
3. Improve laboratory capacity for cancer screening and detection	Purchase laboratory equipment & supplies, reagents, etc.; packaging; and expenses related to securing results
4. Increase outreach and community awareness	a. Acquire car for outreach, after-hour program education and promotion, & support of home/hospice clients b. Develop and produce promotional educational materials (posters, videos, brochures, billboards, t-shirts, etc.) c. Conduct cancer fairs and community activities d. Develop & produce radio and TV PSAs e. Sponsor healthy activities to increase cancer awareness

to be hired to lead this work. Interviewees also felt that a public awareness campaign was needed. To aid in an island wide cancer awareness effort, interviewees also recommended that the non-governmental, non-profit cancer society be revitalized.

Recommendations by the assessment team

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

- *Recommendation 1:* Provide education and awareness to the community regarding risk factors, prevention, and early detection of the most prevalent cancer types.
- *Recommendation 2:* Develop and implement screening and early detection programs for prevalent cancer types.
- *Recommendation 3:* Improve the capability to provide diagnostic and treatment services for all cancer types.
- *Recommendation 4:* Garner funding to aid with the medical costs associated with cancer treatment.

Prioritizing and setting objectives

Needs were prioritized and preliminary planning was done by the Pacific Islander delegates of the Pacific Cancer Council 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 four priority areas:

- *Priority 1:* Establish a comprehensive and coordinated system of cancer services.
- *Priority 2.* Increase cancer capacity of health professionals.
- *Priority 3.* Improve laboratory capacity for cancer screening and detection.
- *Priority 4.* Increase cancer outreach and community awareness.

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

Conclusions

Cancer is the second-leading cause of death in American Samoa. Therefore, assistance is needed to strengthen and expand existing cancer-related services. Great assistance is needed to establish a comprehensive and coordinated system of services, to increase the cancer capacity of health professionals, to improve laboratory capacity for cancer screening and detection, and to increase cancer outreach and community awareness.

Acknowledgements

This work was funded by a grant from the National Cancer Institute (supplement CA86105-03) to Papa Ola Lōkahi and conducted in collaboration with 'Imi Hale—Native Hawaiian Cancer Network (Dr. Clayton Chong, PI). We thank the following individuals in American Samoa who contributed to this report: Dr. Heidiliza Cayari, Dr. Fawzi Jadallah, Charles McCuddin, Jane Neru, Dr. Iotamo Saleapaga, Laina Suiaunoa, Dr. Joseph Tufa, Diana Tuinei, Moira Wright, and Amy Zlot.

References

1. CIA. *The World Fact Book*. Available at http://www.cia.gov/cia/publications/factbook/geos/gq.html. Accessed in December 2003.
2. U.S. Census Bureau. *Population and Housing Profile, 2000 Census of Population and Housing, American Samoa*. Washington DC: US Census Bureau; 2002.
3. American Samoa Department of Health. *Health Information System Office Data*. Pago Pago: American Samoa Government; 2002.
4. *American Samoa Cancer Registry 2000-2002*. Pago Pago, American Samoa: Department of Health; 2003.
5. World Pacific Health Databank, 2002 revision. Available at http://www.wpro.who.int/chips/chip02/indicators/in_ams3.htm. Accessed in June 2004.

■