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Cancer-related knowledge, attitudes, and behaviors among Chamorros on Guam

Ronald G. Balajadia, M.S.^a, Lari Wenzel, Ph.D.^{b,c}, Jimi Huh, M.A.^b, Jamie Sweningson, M.P.H.^b, and F. Allan Hubbell, M.D., M.S.P.H.^{b,c}

^aDepartment of Public Health and Social Services, Agana, Guam

^bDepartment of Medicine, University of California Irvine, CA 92697, USA

^cCenter for Health Policy Research, 101 Academy, Irvine, CA 92697, USA and Chao Family Comprehensive Cancer Center, UCI Medical Center, 101 City Drive, Orange, CA 92868-4076, USA

Abstract

Condensed Abstract: Cancer is the second leading cause of death among Chamorros, the indigenous population of Guam, yet little has been published about cancer control needs of this population. This paper provides important data about Chamorro's knowledge, attitudes and screening behaviors that can help to guide a comprehensive cancer control program on Guam.

Background—Cancer is the second leading cause of death among Chamorros, the indigenous population of Guam. This study assessed cancer related knowledge, attitudes, and preventive behaviors (KAB) among Chamorros on the island.

Methods—We conducted a self-administered English language survey regarding cancer-related KAB using a non-probability purposive sample design in 266 self-identified Chamorros (149 women and 117 men) over the age of 50 years. The survey included demographics; health status; access to medical care; and KAB about breast, cervical, prostate, colorectal, lung, and nasopharyngeal cancer. Descriptive statistics and bivariate analysis were used to assess the data.

Results—Overall, 83.3% of women reported having a mammogram and 62.8% reported having a Pap smear within the past two years. Only 20.3% of men reported having a prostate specific antigen (PSA) test within the past year. Of concern, only 43.1% had heard of PSA. Only 38.3% of participants reported ever having fecal occult blood testing, 15.5% ever having sigmoidoscopy, and 33.1% ever having colonoscopy. Respondents who had a regular source of care were more likely to receive up to date mammography screening ($p < 0.01$). Likewise, those who had visited their doctor within the past year were more likely to be screened for breast ($p < 0.01$), cervical ($p < 0.05$), prostate ($p < 0.01$), and colorectal cancer ($p < 0.05$). In addition, residents living in the south were less likely to report screening for breast ($p < 0.05$), prostate ($p < 0.05$), and colorectal ($p < 0.01$) cancer.

Conclusion—These results provide important data about Chamorro's KAB that can help to guide a comprehensive cancer control program on Guam.

Corresponding Author: F. Allan Hubbell M.D., M.S.P.H., Professor and Chair, Department of Medicine, UCI Medical Center, 101 City Drive, Building 200, #720, Orange, CA 92868-4076, USA; Email: fahubbel@uci.edu; Tel (714) 456-3291; Fax (714) 456-7875.

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Keywords

cancer; cancer prevention and control; cancer screening; special populations; Chamorros

INTRODUCTION

Cancer is the second only to cardiovascular disease as the leading cause of death in the United States (US) (1). While much progress has been made regarding the prevention, early detection and treatment of this disease, not all ethnic groups have benefited. Pacific Islanders, in particular, have only recently been the focus of studies regarding cancer control, and some of the findings have been disturbing. For example, we now know that Native Hawaiians have the highest incidence of breast cancer of any ethnic group in the US (2).

In the study reported herein, we describe the results of the first comprehensive evaluation of cancer related knowledge, attitudes, and preventive behaviors (KAB) of Chamorros, the indigenous population of Guam. Before describing the study, it is important to describe the island of Guam, the Chamorro people, traditional health beliefs, the medical care system, and the importance of cancer in this population.

Guam, Micronesia's largest island, is located approximately 1,550 miles south of Japan. Except for a brief period during World War II, Guam has been under the administrative jurisdiction of the US since the end of the Spanish American War in 1889. In 1950, the Organic Act of Guam deemed the island a civilian territory and the residents US citizens. Guam is a major tourist destination in the western Pacific. In addition, it is home to important US military facilities including naval and air force bases. The island is divided into three main regions; the northern, central, and southern. The regions contain 19 villages that are governed by Mayors. The northern portion of the island is controlled by the US military, the central area contains most of the tourist resorts, and the southern section is the most remote.

Chamorros are the most populous ethnic group on Guam, making up 37% of the population, and the third most populous Pacific Islander group living in the US (3). According to the 2000 Census, 398,835 "Native Hawaiians and other Pacific Islanders" lived in the US. Of these, 140,652 were Native Hawaiian, 91,029 were Samoan, and 58,240 were Guamanian/Chamorro. In addition, 154,805 Guamanians/Chamorros lived on the US Territory of Guam. Ethnic groups other than Chamorros on the island include Filipinos (26%), Asians (13%), non-Latino Whites (6.8%), and Micronesians other than Chamorro (8%). Chamorros are, on average, young (25.4 years, compared to the national U.S. average of 33 years) and have large families (3.9 persons) (3). Most Chamorros speak English fluently and have adopted western-style behaviors.

Traditionally, Chamorros believed that illness had either natural or spirit causes and that rapport and respect must exist with the *taotaomona* (ancient spirits of the island) (4). If this rapport was not maintained illness could occur. Chamorros sought health care from *suruhana* (female) and *suruhanu* (male) healers. The traditional healing methods involved medicinal remedies using natural plants, roots and flowers as well as mystical body lotions, dietary advice, massage, and a curing power. Over the years, these cultural beliefs and practices have blended with American values, and today Chamorros often use both Western physicians and traditional healers (5).

Western style medical care on Guam is provided by a civilian hospital, the Guam Memorial Hospital Authority, three public health clinics, and private practitioners and clinics (6). The island has a Breast and Cervical Cancer Screening Program supported by the Centers for Disease Control and Prevention. The program pays for screening for uninsured and

underinsured women but does not cover confirmatory work up or treatment if cancer is found. The Cancer Institute of Guam (CIG), a private practice physician group, provides specialized cancer care including chemotherapy. Until the facilities were destroyed by a typhoon in 2002, CIG also offered radiation therapy services. Since then, patients have been sent off island for this care. Likewise, many cancer-related diagnostic tests are sent off island for evaluation. A recent assessment of the cancer control on Guam identified, among other things, the need for training for health care professionals in chemotherapy, palliative care and other treatment of identified cancers (6).

Cancer is the second leading cause of death for all residents of Guam including Chamorros (7). The age adjusted incidence rates for cancer of all sites for Chamorros (200.64 per 100,000) is lower than that of the general US population (249.65 per 100,000). The most common cancers among Chamorro women are breast cancer followed by colorectal and lung cancer. The same cancers are the leading causes of cancer death in women with lung cancer being first followed by breast and colorectal cancer. The most frequently diagnosed cancers and cancers causing mortality among Chamorro men are lung cancer followed by prostate, colorectal, and nasopharyngeal cancer.

In this study, we evaluated cancer related KAB in Chamorros residing on Guam with particular emphasis on the use of cancer screening services. The study is important for several reasons. First of all, very little information exists about cancer control in this indigenous population and the availability of comprehensive screening has been suspect. Second, based upon findings in other indigenous Pacific Islander populations, we anticipated limited knowledge about cancer and low levels of screening for the disease. Finally, to improve cancer control, it is important to understand what Chamorros know about the disease and its early detection and treatment.

MATERIALS AND METHODS

We conducted a self-administered English language survey regarding cancer-related KAB among 266 (149 women and 117 men) self-identified Chamorros over the age of 50 years on the island of Guam in the summer of 2004. The University of California, Irvine Human Subjects Review Committee approved the study protocol.

Research Design, Sampling Strategy, and Data Collection

A non-probability purposive sample design was used to recruit the participants (8). To ensure participation of residents from each region of the island, we randomly selected 11 villages (of a total of 19) from three distinct regions: three villages from the northern, four from the central, and four from the southern regions. With the assistance of the Mayors' offices (the traditional center of governance), we distributed and posted flyers and made announcements inviting residents within each selected village to participate. Participants were invited to various locations across these 11 villages where they completed the self-administered survey. Trained Chamorro interviewers were available at the meetings to answer questions. The survey took approximately 30 minutes to complete. No incentives were provided; however participants were invited to partake in a traditional Chamorro meal.

Survey Instrument

In preparation for the survey, we consulted the Pacific Islander Cancer Control Network Guam advisory board (9) to determine the cancers of most interest. We also conducted a series of focus groups with Chamorro residents representing each of the three regions to determine knowledge and attitudes about cancer that might be unique to this population. In brief, the findings revealed that there was great concern about cancer and its impact on Chamorros. Some participants believed that exposure to radiation from nuclear testing carried by the trade winds

from the Marshall Islands to Guam was a major cause of cancer. Most participants did not believe that *taotaomona* caused cancer or that *suruhanas* should treat cancer.

The survey instrument contained questions derived from the focus group findings, the National Health Interview Survey (NHIS) and the NHIS Cancer Control Supplement (10,11). We asked detailed questions about cancer in general and about breast, cervical, and prostate cancer – cancers in which the community advisory boards were particularly interested. We also asked a limited number of questions about other common cancers among Chamorros: colorectal, lung, and nasopharyngeal cancer. The survey included questions concerning knowledge about risk factors, utilization of cancer screening and early detection exams, family resources (health insurance coverage, employment status, and family income), and demographic characteristics. The attitudinal questions measured important concepts in cancer control such as beliefs about the importance of early detection and prevention of cancer and fear of the disease. The knowledge and attitude questions employed a 4-point Likert scale and don't know responses (12). As a measure of acculturation, we modified an acculturation scale that has been widely used among Latinos (13).

Statistical Analysis

We used descriptive statistics and bivariate analysis to assess the data. When assessing the knowledge and attitude variables, we dichotomized the 4-point Likert scale from “Strongly Disagree,” “Disagree,” “Agree,” “Strongly Agree” to “Disagree” vs. “Agree”. Demographic characteristics and medical care access measures were the predictor variables in the bivariate analyses. Self-reported use of cancer screening tests [mammography, Pap smear, prostate specific antigen (PSA), fecal occult blood test (FOBT), sigmoidoscopy, and colonoscopy] was the outcome variable.

RESULTS

Demographic characteristics for the entire population (N=266) are described below. Table 1 displays these demographic characteristics by gender. The majority of participants were born on Guam (97%). Approximately three fourths of the sample reported having high school or more education. Over 68% of the sample was married and the majority was either employed (32.9%) or retired (49.8%). About one fifth of the respondents reported having a household income less than \$25,000. Only a small proportion (18.3%) reported that they spoke Chamorro better than English.

Approximately 30% of respondents lived in the southern part of the island. As described below, living in this area was predictive of lower use of several cancer screening tests. Compared with residents of the north and central regions, these individuals were poorer, less likely to be employed, more likely to speak Chamorro, and more likely to travel for greater than 30 minutes to receive health care ($p<0.05$ in each case) (data not shown).

Measures of health status and access to medical care appear in Table 2. Of note, the majority (71.8%) of respondents reported excellent, very good, or good health. The majority of respondents had a regular source of medical care (92.8%), with the most common site being a doctor's office, and had visited their regular source of care within the past year (81.3%). Approximately one third of participants had received care off island at some time in their lives.

The results regarding knowledge and attitudes about cancer in general appear in Table 3. The respondents were unlikely to believe that cancer was caused by *taotamonas* (2.7%) or that *suruhanos* could treat cancer (7.7%). Only a small proportion (3.8%) reported they would go to a *suruhano* for treatment of cancer; however, approximately one third had visited a *suruhano* for some type of medical care.

Breast Cancer

Of the breast cancer risk factors evaluated, the women were most likely to agree that family history (54.1%) and high fat diet (54.5%) increased risk and least likely to believe that early menses (8.8%) did so (Table 4). It is noteworthy that approximately 30% of women acknowledged that loss of breast due to cancer would have a significant negative effect on their relationship.

Table 5 reports knowledge about and use of breast cancer screening methods. The large majority of respondents had heard of breast self examinations (94.6%), clinical breast exams (87.1%), and mammography (100%). The large majority (94.4%) also knew that mammograms could detect breast cancer early; and 43% expressed fear that the mammogram would detect breast cancer. Only a minority of respondents reported problems with barriers to mammogram screening such as lack of child support (7%) or transportation (8.0%), knowing where to get the test (17%), or needing help arranging it (15.6%). Moreover, 47% reported examining their breast once per month, 63.6% reported having a clinical breast exam within the past year, and 83.3% reported having a mammogram within the past 2 years. In the bivariate analysis, having health insurance ($p<0.05$), having a regular source of care ($p<0.01$), and having an ambulatory visit within the past year ($p<0.01$) were associated with increased self-reported mammogram use within the past two years whereas living in the southern part of Guam was associated with decreased use ($p<0.05$). Having a regular source of care was associated with ever having a mammogram ($p<0.01$).

Cervical Cancer

Table 6 displays cervical cancer related knowledge and attitudes. Over half of the participants responded that factors related to sexual activities such as having multiple sexual partners (56.8%) and having a sexually transmitted virus (59%) increased risk for the disease. However, 45.8% also thought that having a family history of cervical cancer was a risk factor.

Results regarding knowledge about cervical cancer screening appear in Table 7. Of note, the large majority knew that a Pap smear could detect cervical cancer early (81.7%) and had heard of the human papillomavirus (68.1%). Few experienced difficulty taking time to get a Pap smear (13.4%) or needed to have more information about how to obtain a Pap smear (9.7%). All but one woman (99.3%) reported having a Pap smear ever, 35.8% within the past year, 62.8% within the past two years, and 84% within the past five years. The bivariate analysis revealed that younger women (50–69 years) ($p<0.001$), those with household incomes of more than \$25,000 per year ($p<0.05$), and those who had an ambulatory visit within the past year ($p<0.05$) were more likely than others to reported having a Pap smear within the past two years.

Prostate Cancer

Table 8 displays the frequency distribution of prostate cancer-related knowledge and attitudes. The majority of respondents believed that the risk of prostate cancer increased with older age (79%), high fat diets (61.6%), and smoking (56.9%). A minority believed that having prostate cancer would adversely affect their marriages in general (41.9%) or affect their sexual relationships (45.5%).

Knowledge about PSA and self reported use of screening appears in Table 9. Of particular note, only 43.1% of the respondents had heard of PSA. Moreover, only 38.9% of respondents reported ever having a PSA and 20.3% had received the test within the prior year. Of those who had heard of the PSA, the percentages were approximately 88% and 52%, respectively. Of those respondents who had a PSA, 52.3% reported receiving the test within the last year. Most said that their doctor recommended the test or they made a joint decision regarding ordering the test. The large majority (92.7%) received the exam as part of a routine check up.

In the bivariate analysis, none of the demographic or access variables were associated with receipt of a PSA within the past year. Individuals with a high school education or more ($p<0.05$) and those who had an ambulatory care visit within the past year ($p<0.01$) were more likely than others to report ever having a PSA. On the other hand, respondents living in the south ($p<0.05$) were less likely to report ever having the test.

Colorectal, Lung, and Nasopharyngeal Cancer

Knowledge, attitudes and behaviors related to colorectal, lung and nasopharyngeal cancer appear in Table 10. The majority of respondents believed that low fiber diets (57.3%), high fat diets (62.1%) and smoking (52.5%) increased risk for colorectal cancer. Approximately one third of respondents reported ever having a colonoscopy. In the bivariate analysis, having health insurance ($p<0.05$), and having an ambulatory visit within the past year were associated with ever having a colonoscopy. Respondents living in the south were less likely than others to report ever having the test.

The majority of participants knew that radiation exposure (67.8%), smoking (85.7%), and second hand smoke (83.3%) increased risk for lung cancer. Likewise, the majority believed that heavy alcohol intake (54%), chewing betel nut (54.6%), smoking (77%), and chewing tobacco (76.2%) increased risk of nasopharyngeal cancer.

DISCUSSION

This study provides the most comprehensive evaluation of cancer-related knowledge, attitudes, and behaviors among Chamorros ever published. The majority of respondents agreed with the medically recognized risk factors such as family history for breast cancer, sexually related activities for cervical cancer, dietary factors for colorectal cancer, smoking for lung cancer and chewing betel nut, a common practice in Guam, for nasopharyngeal cancer. However, the finding that less than half of the men had heard of the PSA test for prostate cancer was troublesome. Few Chamorros reported that ancient spirits, traditionally believed to be responsible for some illnesses on Guam, caused cancer. While approximately one third of participants had visited a traditional healer, very few would seek their care for cancer.

According to our results, Chamorros in our sample are being screened fairly well for breast and cervical cancer but less well for prostate and colorectal cancer. We did not determine the reasons for these findings; however, it is likely that the existence of clear guidelines for breast and cervical cancer screening and an active screening program for these cancers are at least partially responsible. Screening guidelines for prostate and colorectal cancer are less clear and no active screening programs exist on the island for these cancers. Unfortunately there are no effective screening tests for lung or nasopharyngeal cancer.

The US Preventive Services Task Force (USPSTF) recommends screening for breast cancer with mammography every 1–2 years for women aged 40 and older (14). Approximately 83% of Chamorro women in this study reported screening mammograms within this time frame. As such, they are meeting the Healthy People 2010 objectives of having 70% of women over the age of 40 years receive screening mammograms within the prior two years (15). Since we studied only women over the age of 50 years, it is possible that the proportion of women in the 40–50 year age group would have lower screening rates. However, for the older women, these findings are very encouraging. Our respondents reported higher rates than participants in a study in southern California, the only other published study regarding breast cancer screening specifically in Chamorro women (16). That study found that 25% Chamorro women over 40 years of age had a screening mammogram within the past year. Approximately 63% of women 50 years of age and older reported having mammography within the past two years (personal communication). At the national level, analysis of 2000 National Health Interview Survey

revealed that approximately 70% of women over the age of 40 years and 73% of women over the age of 50 years reported having a mammogram within the past two years (17).

For cervical cancer, the USPSTF recommends beginning screening with Pap smears within 3 years of onset of sexual activity or age 21 (whichever comes first) and screening at least every 3 years thereafter until at least age 65 (14). National goals for cervical cancer screening include 97% of women ever having a Pap smear and 90% having one within the past three years (15). All but one woman in this study reported ever having a Pap smear, 62.8% within 2 years, and 84% within the past five years (because of the way the question was asked, we do not have data regarding Pap smears within the past three years). To our knowledge, there are no other published results on Pap smear use among Chamorro women. At the national level, 82.4% of women over the age of 25 years report having a Pap smear within three years; however, only approximately 70% of women over the age of 50 years (the age group of our sample) had the test within that time frame (17).

Screening guidelines for prostate cancer are less clear. The USPSTF concludes that the evidence is insufficient to recommend for or against routine screening for prostate cancer using PSA testing or digital rectal examination (DRE) (14). The American Cancer Society (18) believes that health care professionals should offer the PSA blood test and DRE yearly, beginning at age 50, to men who have at least a 10-year life expectancy. Because of the uncertainty regarding screening, the Healthy People 2010 report did not set specific goals for prostate cancer screening rates (15). Only 38.9% of respondents reported ever having a PSA and 20.3% had received the test within the prior year. Of those who had heard of the PSA, the percentages were much higher (81% and 55%, respectively). In the only other published study of PSA use among Chamorros, Wu and colleagues (19) found that 72.1% reported ever having a PSA and 41.9% had the test within the prior year in a convenience sample of men in San Diego. At the national level, 41% of men over the age of 50 years reported having a PSA test within the past year (17).

The USPSTF strongly recommends screening for colorectal cancer with fecal occult blood testing, sigmoidoscopy, and/or colonoscopy but find insufficient evidence to make recommendations about which screening strategy is best (14). The American Cancer Society (18) recommends one of five screening options beginning at age 50 for men and women: 1) FOBT or fecal immunochemical test (FIT) every year, or 2) flexible sigmoidoscopy every 5 years, or 3) an FOBT or FIT every year plus flexible sigmoidoscopy every 5 years, or 4) double-contrast barium enema every 5 years, or 5) colonoscopy every 10 years. National goals for colorectal screening by 2010 include having at least 50% of Americans over the age of 50 years having received fecal occult blood testing within two years and having a sigmoidoscopy ever (15). In our study, we asked only about ever having the screening tests. Overall, 38.3% of respondents reported ever having FOBT, 15.5% ever having sigmoidoscopy, and 33.1% ever having a colonoscopy. These figures fall well below the national goals. In the study of Chamorros in San Diego, investigators found that 40.3% of women and 24% of men reported ever having FOBT and that 42% of women and 33% of men reported ever having either sigmoidoscopy or colonoscopy (19,20). At the national level, 37.5% of women and 41% of men reported having either FOBT within the past year or colorectal endoscopy (15).

A number of factors were associated with increased cancer screening rates. For example, respondents who had a regular source of care were more likely to receive up to date mammography screening. Likewise, those who had visited their doctor within the past year were more likely to be screened for breast, cervical, prostate, and colorectal cancer. In addition, residents living in the north and central parts of the island were more likely to report screening. Efforts to encourage Chamorros to have a regular health care provider and visit her/him regularly could increase screening rates. Establishing cancer screening services at the public

health clinic in the south or providing screening services in a mobile van in that area could also improve cancer control on Guam.

Because there are no effective screening tests for lung or nasopharyngeal cancer (14), primary prevention has been the main focus of efforts to control them. The most important risk factor for both of these cancers is tobacco use (21). Moreover, there is good evidence that smoking cessation decreases rates of these cancers. For example, compared with persistent smokers, a 30% to 50% reduction in lung cancer mortality risk has been noted after 10 years of cessation (23). In our study, it was encouraging to note that the majority of respondents knew that smoking was a risk factor for these cancers (85.7% for lung cancer and 77.0% for nasopharyngeal cancer). On Guam, the Department of Mental Health and Substance Abuse has an active tobacco control program. Key activities include technical assistance in the development of tobacco control-related policy and legislation, education and communications campaigns, training of key community leaders and volunteers on the harmful effects of tobacco use, and provision of cessation services to the Guam community.

Another risk factor for oral cancer on Guam deserves comment, chewing betel nut. Betel nut, or Areca nut, is the seed of the Betel Palm. Betel nuts are chewed for their effects as a mildly euphoric stimulant. On Guam, Betel nut (called Pugua in the native Chamorro language) is used as a social pastime and can be found in many large gatherings. Betel nut chewing is an independent risk factor for oral cancer (24). In our study, only 54.6% of respondent knew that the chewing betel nut increased the risk of oral cancer. This finding points out the need for educational efforts that address the danger of this habit.

The study had several limitations. First of all, the sample was not selected randomly; therefore, the results may not be generalizable to all Chamorros on Guam. Likewise, we could not determine if the associations between demographic and access variables and use of cancer screening tests were independent associations because of the relatively small sample size. Finally, data came from self-reports and were subject to recall and desirability response bias. Because of the tendency for subjects to answer questions the way they think the interviewer would prefer (desirability response bias), they may have over-estimated the frequency of cancer screening test use (25–27).

In conclusion, our results suggest that screening for prostate and colorectal cancer is lagging behind screening for breast and cervical cancer for Chamorros on Guam. Culturally appropriate educational programs, encouraging regular visits to a health care provider, and outreach to those less likely to receive screening, such as residents of the southern part of Guam, could improve screening rates. The Pacific Islander Cancer Control Network has contributed to improved cancer education by developing and distributing brochures in English and Chamorro regarding cancer screening. However, cancer control requires more than screening. The paucity of health care professionals trained in chemotherapy use, palliative care, and other treatment of identified cancers limits care that can be provided (5). The expense of off island cancer care can be a barrier, particularly for low-income residents. Therefore, a comprehensive cancer prevention and control program on Guam is needed. Our report provides important information about Chamorro's perspectives and screening behaviors that can help to guide such cancer control programs.

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Table 1

Demographic characteristics by Gender (N=266)

Variable	Male (n=117)*	Female (n=149)*
Age	107	137
50–59	47 (43.9)	69 (50.4)
60–69	39 (36.4)	36 (26.3)
70 and older	21 (19.6)	32 (23.4)
Marital Status	116	148
Married	90 (77.6)	90 (60.8)
Separated/Divorced/Widowed	20 (17.2)	42 (28.4)
Never married	6 (5.2)	16 (10.8)
Education	104	145
Less than high school	17 (14.8)	33 (22.8)
High school graduate	55 (47.8)	60 (41.4)
More than high school	32 (37.4)	52 (35.9)
Household Income	104	122
<25,000	20 (19.2)	37 (30.3)
25–50,000	34 (32.7)	34 (27.9)
>50,000	50 (48.1)	51 (41.8)
Did not answer		
Have Health Insurance	116	146
Yes	102 (87.9)	117 (80.1)
No	14 (12.1)	29 (19.9)
Type of Health Insurance		
Government	46	49
Medicaid	3 (6.5)	2 (4.1)
Medicare	22 (47.8)	33 (67.3)
Military (VA, Champus)	20 (43.5)	12 (24.5)
Medical Indigent Program	1 (2.2)	2 (4.1)
Private	114	141
Yes	77 (67.5)	95 (67.4)
No	37 (32.5)	46 (32.6)
Employment Status	110	139
Employed	32 (29.1)	50 (36.0)
Retired	75 (68.2)	49 (35.3)
Unemployed	3 (2.7)	40 (28.8)
Language Spoken	116	141
Chamorro better	26 (22.4)	21 (14.9)
Both equally	80 (69.0)	93 (66.0)
English better	10 (8.6)	27 (19.1)
Language Read	115	142
Chamorro better	4 (3.5)	4 (2.8)
Both equally	35 (30.4)	54 (38.3)
English better	76 (66.1)	83 (58.9)
Region of Residence	114	142
North	39 (34.2)	55 (38.7)
Central	40 (35.1)	48 (33.8)
South	35 (30.7)	39 (27.5)
Family Size	115	144
Single resident	11 (9.6)	21 (14.6)
Couple/Cohabitation	33 (28.7)	39 (27.1)
Three or more	71 (61.7)	84 (58.3)

* The total numbers reflect the number of respondents who answered the question regarding each variable. Not all respondents answered each question. Percentages may not total up to 100 due to rounding errors.

Table 2**Health Status and Access to Medical Care**

Variable	Total N(%)[*]
Health Status	263
Excellent	18 (6.8)
Very good	59 (22.4)
Good	112 (42.6)
Fair	66 (25.1)
Poor	8 (3.0)
Have a regular source of care	264
Yes	245 (92.8)
No	19 (7.2)
Type of regular source of care	204
Doctor's office	111 (44.6)
Emergency room	3 (1.2)
Hospital outpatient clinic	28 (11.2)
Health center	38 (15.3)
Public health clinic	4 (1.6)
Other	20 (8.0)
Last visit to health care	252
Less than 1 year ago	205 (81.3)
1–2 years ago	29 (11.5)
2–3 years ago	8 (3.2)
More than 3 years ago	10 (4.0)
Ever received healthcare off-island	265
Yes	88 (33.2)
No	177 (66.8)

* The total numbers reflect the number of respondents who answered the question regarding each variable. Not all respondents answered each question. Percentages may not total up to 100 due to rounding errors.

Table 3

General Knowledge and Attitudes about Cancer (N=266)

Variables	Total N(%)
Would rather not know if I had cancer	261
Disagree	161 (61.7)
Agree	85 (32.6)
Don't know	15 (5.7)
Cancer is caused by <i>taotamonas</i>[#]	263
Disagree	226 (85.9)
Agree	7 (2.7)
Don't know	30 (11.4)
Cancer is punishment from God	260
Disagree	232 (89.2)
Agree	12 (4.6)
Don't know	16 (6.2)
At this age, I do not worry about cancer	263
Disagree	200 (76.0)
Agree	48 (18.3)
Don't know	15 (5.7)
Cancer is spread through air	265
Disagree	160 (60.4)
Agree	64 (24.2)
Don't know	41 (15.5)
Faith in God will cure cancer	232
Disagree	72 (27.4)
Agree	169 (64.3)
Don't know	22 (8.4)
Cancer is brought by foreigners	263
Disagree	198 (75.3)
Agree	32 (12.2)
Don't know	33 (12.5)
Faith in God will protect me from getting cancer	232
Disagree	123 (48.8)
Agree	97 (38.5)
Don't know	32 (12.7)
Neglecting health causes cancer	262
Disagree	97 (37.0)
Agree	152 (58.0)
Don't know	13 (5.0)
God empowers doctors to cure cancer	260
Disagree	96 (36.9)
Agree	139 (53.5)
Don't know	25 (9.6)
I would get cancer treatment that is unpleasant if it improves my chances of living longer	259
Disagree	46 (17.8)
Agree	189 (73.0)
Don't know	24 (9.3)
Cancer is caused by environment	262
Disagree	53 (20.2)
Agree	172 (65.6)
Don't know	37 (14.1)
Having a blood relative who has had cancer puts me at risk for cancer	269
Disagree	87 (33.0)
Agree	149 (56.4)
Don't know	28 (10.6)
Cancer is caused by smoking	264
Disagree	36 (13.6)
Agree	212 (80.3)
Don't know	16 (6.1)
Cancer is caused by diet, the types of food you eat	263
Disagree	57 (21.7)
Agree	182 (69.2)
Don't know	24 (9.1)

Variables	Total N(%)
Ever gone to a <i>suruhano</i>⁺ for health care	158
Yes	92 (35.7)
No	166 (64.3)
Can a <i>suruhano</i>⁺ treat cancer?	155
Yes	12 (7.7)
No	143 (92.3)
If I get cancer, I would seek treatment by a <i>suruhano</i>⁺	263
Disagree	236 (89.7)
Agree	10 (3.8)
Don't know	17 (6.5)

* The total numbers reflect the number of respondents who answered the question regarding each variable. Not all respondents answered each question. Percentages may not total up to 100 due to rounding errors.

Taotamonas: ancient spirits

⁺ *Suruhano*: traditional healer

Table 4

Breast Cancer Knowledge and Attitudes among Chamorro Women (N=149)

Variables	Total N (%)
Getting older increases chance of breast cancer	145
Disagree	65 (44.8)
Agree	59 (40.7)
Don't Know	21 (14.5)
Diet high in fat increases chance of breast cancer	143
Disagree	35 (24.5)
Agree	78 (54.5)
Don't Know	30 (21.0)
Giving birth after age 30 increases chance of breast cancer	141
Disagree	77 (54.6)
Agree	23 (16.3)
Don't Know	41 (29.1)
Relative with breast cancer increases risk	146
Disagree	48 (32.9)
Agree	79 (54.1)
Don't Know	19 (13.0)
Using birth control pills increases risk	145
Disagree	38 (26.2)
Agree	55 (37.9)
Don't Know	52 (35.9)
Exposure to X-rays increases risk	144
Disagree	39 (27.1)
Agree	63 (43.8)
Don't Know	42 (29.2)
Starting menses before age 12 increases risk	147
Disagree	79 (53.7)
Agree	13 (8.8)
Don't Know	55 (37.4)
How important are breasts to feel like a woman	143
Very important	104 (72.7)
Somewhat important	27 (18.9)
Not important	12 (8.4)
Would loss of breasts affect relationship	105
A lot	33 (31.4)
Somewhat	20 (19.0)
Very little	52 (49.5)
Would loss of breast affect sexual relationship	98
A lot	32 (32.7)
Somewhat	15 (15.3)
Very little	51 (52.0)

* The total numbers reflect the number of respondents who answered the question regarding each variable. Not all respondents answered each question. Percentages may not total up to 100 due to rounding errors.

Table 5

Breast Cancer Screening Knowledge and Behaviors among Chamorro Women (N=149)

Variables		N(%)	TOTAL*
Heard of a breast self-exam	Yes	139 (94.6)	147
	No	8 (5.4)	
Know how to check for lumps in your breasts	Yes	134 (96.4)	139
	No	5 (3.6)	
How often do you examine your breasts	Once a month	63 (47.0)	134
	< once a month	70 (52.3)	
	Never	1 (0.7)	
Heard that doctors should examine breasts	Yes	121 (87.1)	139
	No	18 (12.9)	
Have you had a doctor examine your breasts	Yes	134 (98.5)	136
	No	2 (1.5)	
Last time a doctor examined your breasts	Within last 12 months	84 (63.6)	132
	Between 1–2 years ago	31 (23.5)	
	> 2 years ago	17 (12.9)	
Heard of mammogram	Yes	148 (100)	148
	No	0 (0)	
Mammogram can detect cancer early	Disagree	5 (3.5)	141
	Agree	134 (94.4)	
	Don't Know	2 (2.1)	
A mammogram may be painful	Disagree	47 (31.8)	148
	Agree	95 (64.2)	
	Don't Know	6 (4.1)	
Afraid a mammogram may find breast cancer	Disagree	75 (52.4)	143
	Agree	62 (43.4)	
	Don't Know	6 (4.2)	
Embarrassed when getting mammogram	Disagree	125 (85.6)	146
	Agree	18 (12.3)	
	Don't Know	3 (2.1)	
Difficult to take time to get mammogram	Disagree	116 (80.6)	144
	Agree	25 (17.4)	
	Don't Know	3 (2.1)	
Difficulty to find caregivers for child or older person	Disagree	126 (88.7)	142
	Agree	10 (7.0)	
	Don't Know	6 (4.2)	
Need more information on what, where, and how to get a mammogram	Disagree	112 (79.44)	141
	Agree	24 (17.0)	
	Don't Know	5 (3.5)	
Need help arranging mammogram	Disagree	116 (82.3)	141
	Agree	22 (15.6)	
	Don't Know	3 (2.1)	
Difficult to get transportation to get mammogram	Disagree	127 (92.0)	138
	Agree	11 (8.0)	
Ever had a mammogram	Yes	142 (96.6)	147
	No	5 (3.4)	
Most recent mammogram	Within last 12 months	70 (50.7)	138
	Between 1–2 years ago	45 (32.6)	
	Between 2–5 years ago	17 (12.3)	
	>5 years ago	6 (4.3)	

* The total numbers reflect the number of respondents who answered the question regarding each variable. Not all respondents answered each question. Percentages may not total up to 100 due to rounding errors.

Table 6

Cervical Cancer Knowledge and Attitudes among Chamorro Women (N=149)

Variables	N (%) *
Sex at early age increases risk of cervical cancer	143
Disagree	62(43.4)
Agree	35(24.5)
Don't Know	46(32.2)
Smoking increases risk of cervical cancer	141
Disagree	48(34.0)
Agree	57(40.4)
Don't Know	36(25.5)
Having multiple sex partners increases risk of cervical cancer	139
Disagree	23(16.5)
Agree	79(56.8)
Don't Know	37(26.6)
Blood relative with cervical cancer increases risk	142
Disagree	47(33.1)
Agree	65(45.8)
Don't Know	30(21.1)
Having sexually transmitted virus increases risk	144
Disagree	15(10.4)
Agree	85(59.0)
Don't Know	44(30.6)

*

The total numbers reflect the number of respondents who answered the question regarding each variable. Not all respondents answered each question. Percentages may not total up to 100 due to rounding errors.

Table 7

Cervical Cancer Screening Knowledge and Behaviors among Chamorro Women (N=149)

Variables	N(%) *
Heard of Pap smear	148
Yes	146 (98.6)
No	2 (1.4)
Pap smear can detect cancer early	131
Disagree	107 (81.7)
Agree	13 (9.9)
Don't Know	11 (8.4)
Have ever heard of human papillomavirus	135
Yes	30 (22.2)
No	92 (68.1)
Don't Know	13 (9.6)
Pap smear would be painful	143
Disagree	79 (55.2)
Agree	60 (42.0)
Don't Know	4 (2.8)
Concerned Pap smear may find cervical cancer	145
Disagree	57 (9.3)
Agree	81 (55.9)
Don't Know	7 (4.8)
Embarrassed when getting Pap smear	146
Disagree	93 (63.7)
Agree	49 (33.6)
Don't Know	4 (2.7)
Difficult to take time to get Pap smear	142
Disagree	119 (83.8)
Agree	19 (13.4)
Don't Know	4 (2.8)
Difficulty to find caregivers for child or older person	143
Disagree	125 (87.4)
Agree	6 (4.2)
Don't Know	12(8.4)
Need more information on what, where, and how to get a Pap smear	144
Disagree	123(85.4)
Agree	14(9.7)
Don't Know	7(4.9)
Ever had a Pap smear	144
Yes	143(99.3)
No	1(0.7)
Most recent Pap smear	137
Within last 12 months	49(35.8)
Between 1–2 years ago	37(27.0)
Between 2–5 years ago	29(21.2)
>5 years ago	22(16.1)

* The total numbers reflect the number of respondents who answered the question regarding each variable. Not all respondents answered each question. Percentages may not total up to 100 due to rounding errors.

Table 8Prostate Cancer Knowledge and Attitudes among Chamorro Men (*N*=117)

Variables	N (%)
Old age increases prostate cancer risk	121
Agree	87 (79.0)
Disagree	17 (14.5)
Don't know	17 (14.5)
Diet high in fat increases risk of prostate cancer	117
Agree	72 (61.6)
Disagree	25 (21.4)
Don't know	20 (17.1)
Smoking increases risk of prostate cancer	117
Agree	66 (56.9)
Disagree	32 (27.6)
Don't know	19 (15.5)
Having a blood relative with prostate cancer increases the risk of prostate cancer	117
Agree	55 (47.0)
Disagree	40 (34.2)
Don't know	22 (18.8)
Having multiple sex partners increases risk of prostate cancer	117
Agree	28 (24.0)
Disagree	60 (51.3)
Don't know	29 (24.8)
How much would prostate cancer affect marriage	111
A lot	24 (20.5)
Somewhat	25 (21.4)
Very little	26 (22.2)
Don't know	36 (30.8)
How much would prostate cancer affect sexual relationship	109
A lot	29 (24.8)
Somewhat	23(19.7)
Very little	17(14.5)
Don't know	40(34.2)

* The total numbers reflect the number of respondents who answered the question regarding each variable. Not all respondents answered each question. Percentages may not total up to 100 due to rounding errors.

Table 9

Prostate Cancer Screening Knowledge and Behaviors among Chamorro Men (N=117)

Variables		N(%)	Total
Have heard of prostate-specific antigen (PSA)	Yes	50 (43.1)	106
	No	56 (56.9)	
Ever had PSA	Yes	44 (41.5)	106
	No	62 (59.5)	
Had PSA within last 12 months	Yes	23 (21.7)	106
	No	83 (78.3)	
PSA can detect prostate cancer *	Agree	35 (87.5)	40
	Disagree	1 (2.5)	
	Don't know	4 (10.0)	
PSA is accurate in finding prostate cancer *	Very accurate	11 (27.5)	40
	Somewhat accurate	23 (57.5)	
	Don't know	6 (15.0)	
Concerned that PSA would find cancer *	Agree	25 (53.2)	47
	Disagree	18 (38.2)	
	Don't know	4 (8.5)	
Difficult to take time to get PSA *	Agree	38 (82.6)	46
	Disagree	4 (8.7)	
	Don't know	4 (8.7)	
Need more information on what, where and how to get PSA *	Agree	28 (59.6)	47
	Disagree	15 (31.9)	
	Don't know	4 (8.5)	
Transportation is not a problem to get PSA *	Agree	19 (38.3)	45
	Disagree	26 (55.4)	
	No	62 (59.5)	
Ever had PSA *	Yes	44 (88.0)	50
	No	6 (12.0)	
Most recent PSA *	Within last 12 months	23 (52.3)	44
	1-2 years ago	13 (29.5)	
	2-5 years ago	5 (11.4)	
	>5 years ago	3 (6.8)	
Who decided you should have PSA? *	Decided my own	10 (23.8)	42
	Doctor ordered	21 (50.0)	
	Both Doctor and I agreed	10 (23.8)	
	Other	1 (2.4)	
Why did you have PSA? *	Routine check-up	38 (92.7)	41
	Medical problem	3 (7.3)	

##* Percentages may not total up to 100 due to rounding errors

* Asked of respondents who had heard of a PSA

Table 10

Colon, Lung and Nasopharyngeal Cancer Knowledge, Attitudes, and Behaviors (N=266)

Variables		N(%)	Total
COLON CANCER			
Diet low in fiber, fruits and vegetables increases risk of colorectal cancer	Disagree	54 (20.8)	260
	Agree	149 (57.3)	
	Don't know	57 (21.9)	
Diet high in fat increases risk of colorectal cancer	Disagree	35 (13.7)	256
	Agree	159 (62.1)	
	Don't know	62 (24.2)	
Smoking increases risk of colorectal cancer	Disagree	61 (23.6)	259
	Agree	136 (52.5)	
	Don't know	62 (23.9)	
Having a blood relative who has had colorectal cancer increases risk of colorectal cancer	Disagree	65 (25.1)	259
	Agree	120 (46.3)	
	Don't Know	74 (28.6)	
Ever had fecal occult blood test?	Yes	97 (38.3)	254
	No	75 (29.6)	
	Don't know	81 (32)	
Ever had sigmoidoscopy	Yes	38 (15.5)	245
	No	207 (84.5)	
Ever had colonoscopy	Yes	83 (33.1)	251
	No	168 (66.9)	
LUNG CANCER			
Diet low in fruits and vegetable increases risk of lung cancer	Disagree	113 (43.6)	259
	Agree	79 (30.5)	
	Don't know	67 (25.9)	
Being exposed to radiation increases risk of lung cancer	Disagree	32 (12.4)	258
	Agree	175 (67.8)	
	Don't know	51 (19.8)	
Smoking cigarettes, pipes or cigars increases risk of lung cancer	Disagree	14 (5.4)	259
	Agree	222 (85.7)	
	Don't know	23 (8.9)	
Inhaling someone else's cigarette smoke increases risk of lung cancer	Disagree	17 (6.6)	258
	Agree	215 (83.3)	
	Don't know	26 (10.1)	
Having diseases of the lung such as tuberculosis or bronchitis increases risk of lung cancer	Disagree	28 (10.9)	258
	Agree	162 (62.8)	
	Don't know	68 (26.4)	
Pollution in the air increases risk of lung cancer	Disagree	14 (5.4)	258
	Agree	201 (77.9)	
	Don't know	43 (16.7)	
NASOPHARYNGEAL CANCER			
Excessive drinking of alcohol beverages increases the risk of cancer of the oral cavity	Disagree	53 (20.3)	261
	Agree	141 (54.0)	
	Don't know	67 (25.7)	
Chewing betel nut increases the risk of cancer of the oral cavity	Disagree	65 (25.0)	260
	Agree	142 (54.6)	
	Don't know	53 (20.4)	
Smoking cigarettes, pipes or cigars increases the risk of cancer of the oral cavity	Disagree	23 (8.8)	261
	Agree	201 (77.0)	
	Don't know	37 (14.2)	
Use of chewing tobacco increases the risk of cancer of the oral cavity	Disagree	24 (9.2)	261
	Agree	199 (76.2)	
	Don't know	38 (14.6)	

* The total numbers reflect the number of respondents who answered the question regarding each variable. Not all respondents answered each question. Percentages may not total up to 100 due to rounding errors.