Cancer Health Disparities
The term cancer health disparities describes the unequal burden of cancer incidence, morbidity, and mortality in different population groups. By and large, the higher burden of cancer is observed in racial or ethnic minorities, immigrant communities, inner city populations, and insular, rural, or otherwise geographically isolated populations. In rare instances, however, the majority Caucasian population suffers a higher burden of cancer, e.g., melanoma. There are multiple and overlapping causes for cancer health disparities, including genetic makeup, cultural norms and beliefs, behavior, environmental factors, as well as social aspects such as socio-economic status, poverty, and education. Reducing cancer health disparities is an important and integral component of the nation’s effort to improve the health of all Americans. The science of cancer health disparities aims to better understand the causes of health disparities and to develop better means of prevention, diagnosis, and therapy, although some of the social aspects of cancer health disparities may be beyond the reach of the biomedical community.

Minority Institution/Cancer Center Partnership Program
Given the importance of cancer health disparities, the National Cancer Institute (NCI) is undertaking significant efforts to address the unequal burden of cancer. Through NCI’s Center to Reduce Cancer Health Disparities (CRCHD), multiple programs have been established to address this important public health issue. Here we are reporting on CRCHD’s Minority Institution/Cancer Center Program (MI/CCP) and its implementation by the Cancer Research Center of Hawai‘i (CRCH) and the University of Guam (UOG). The MI/CCP started in 2001 when the NCI initiated this novel program. The underlying concept is to create partnerships between NCI-designated cancer centers, which collectively represent the nation’s powerhouses in cancer research, training, education, outreach, and, where applicable, clinical care with institutions of higher learning which traditionally serve ethnic minorities. The emphasis in these partnerships is on research, but training and outreach are also required components. By pairing researchers from NCI-designated cancer centers with faculty members at a minority-serving institution the intent is to develop the research capacity at minority-serving institutions and simultaneously direct interest and resources at NCI-designated cancer centers to address issues of cancer health disparities. By providing opportunities in education and training at the undergraduate, graduate, and postgraduate levels for minority students as well as for faculty development at minority institutions, it is intended to grow the number of minority investigators for careers in cancer research with the hope that they may eventually serve their communities. These unique MI/CCP partnerships are funded through U56 Comprehensive Planning Grants (now being phased out by the NCI) and leading to U54 Comprehensive Partnership Grants, both of which are subject to peer review.

The Cancer Research Center of Hawai‘i and University of Guam Partnership
After an exploratory visit by a delegation from CRCH to Guam in 2001, the two institutions decided to engage in a long-term partnership in cancer. The partnership received funding through a U56 Comprehensive Planning Grant in 2003, and was recently awarded a U54 Comprehensive Partnership Grant which provides $12.6 million to the two institutions over the next five years. There are currently only nine U54-funded partnerships in the country (Table 1) of which the CRCH/UOG partnership is characterized by a number of very unique aspects:

- Both the State of Hawai‘i and the Territory of Guam are characterized by two distinct multi-ethnic populations that are very different from any other part of the country. Hawai‘i’s five major ethnic groups include Caucasians, Japanese, Hawaiians/part-Hawaiians, Filipinos, and Chinese. In addition, over 10% of the population is comprised of “other” minorities. In Guam, more than one third of the population is represented by Chamorros/part-Chamorros. In addition there is a relatively large Filipino population along with smaller population groups representing Micronesians, Caucasians, and Asians.

- The CRCH/UOG partnership is the only MI/CCP partnership in the nation where the minority population served by the minority institution is Pacific Islanders.

- The CRCH/UOG partnership is characterized by a very unique geography, with a geographic region that encompasses Hawai‘i, Guam, the Commonwealth of the Northern Mariana Islands and the other US-associated Pacific Island jurisdictions – a region larger than the continental US. The two partner organizations are separated by 3,800 miles, four time zones, and the international date line (Figure 1). The island jurisdictions are distant, fragmented, and isolated. Access to health care services and information is limited and the health care infrastructure is inferior compared to Hawai‘i and the US mainland.

- The unique ethnic and geographic characteristics of the CRCH/UOG partnership provide for unique opportunities in cancer
research, addressing issues of particular relevance to the island populations served by the partnership. Similarly, unique opportunities are available for cancer education, training, and outreach activities in the region, with Guam being the population center of Micronesia.

In line with the overall objectives of the MI/CCP program, the CRCH/UOG partnership aims to build capacity in cancer research, education and training at the University of Guam, to develop outreach activities to raise the awareness about cancer and cancer prevention in Hawai‘i, Guam, and the other US-associated Pacific jurisdictions, and to broaden the involvement of CRCH faculty in addressing cancer health disparities. Specific goals of the partnership include:

- To develop the cancer research capabilities at UOG.
- To increase the number of faculty at UOG engaged in cancer research, training, education, and outreach.
- To increase the number of faculty at UOG who will serve as principal investigators on investigator-initiated grant awards in cancer research.
- To increase the number of peer-reviewed publications by UOG faculty.
- To further develop the focus of CRCH research on cancer health disparities among Pacific Islanders.
- To increase the number of peer-reviewed publications by CRCH faculty addressing cancer health disparities.
- To increase the number of UOG students engaged in cancer research.
- To increase the number of cancer researchers of Pacific Islander ancestry in the United States.
- To raise the awareness of cancer and cancer prevention in the ethnic minority communities served by CRCH and UOG.
- To ultimately reduce the impact of cancer on the populations of Hawai‘i, Guam, and the U.S.-associated Pacific Island jurisdictions.

![Figure 1.— Map of the Pacific.](image)

**Accomplishments**

Since the establishment of the partnership, and with funding from the U56 Comprehensive Planning Grant, significant progress has been made in research, training, and the establishment of the Guam Cancer Registry. In addition, there was an overall impact on cancer awareness and public health policy in Guam.

**a) Research.** It is fair to say that prior to the initiation of the CRCH/UOG partnership there was no cancer-related research being conducted at UOG. Since 2003, several research projects conducted jointly by UOG and CRCH faculty have been successfully completed. One project, entitled “Advancing a Research Agenda for Tobacco Prevention and Control on Guam” sought to increase capabilities at UOG to conduct research focused on tobacco control and modifiable behaviors, and to establish university-community partnerships to conduct community-based participatory research and awareness programs aimed at tobacco control and cancer prevention. Another project, entitled “Cultivation of Microorganisms from Marine Invertebrates and Screening of Extracts of Pure Compounds for Possible Anti-Cancer Activities” took advantage of UOG’s well-established Marine Laboratory and CRCH’s Natural Products and Cancer Biology Program, with the goal to isolate and identify novel natural products from Guam’s marine biosphere as potential new lead compounds for anti-cancer drugs. A third research project, entitled “Evaluation of Risk Factors for Chronic Disease Among Adults on Guam,” developed tools to accurately measure food and nutrition intake, including a food frequency questionnaire used to conduct a survey among adult Chamorros and Filipinos in Guam. Another study entitled “Factors Associated with Betel Nut Use on Guam” analyzed betel nut chewing prevalence, and looked at associations of betel nut use and health-related conditions and behaviors. It is beyond the scope of this manuscript to provide detailed results from these research projects. However, all research projects were successfully conducted and resulted in multiple conference presentations and peer-reviewed publications.$^{1,9}$

<table>
<thead>
<tr>
<th>Partnership</th>
<th>Population Served</th>
</tr>
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<tbody>
<tr>
<td>Memorial Sloan Kettering Cancer Center and City College of New York</td>
<td>African American</td>
</tr>
<tr>
<td>University of Texas-MD Anderson Cancer Center and University of Puerto Rico</td>
<td>Hispanic (Puerto Rico)</td>
</tr>
<tr>
<td>University of California at San Diego and San Diego State University</td>
<td>African American, Hispanic, Asian</td>
</tr>
<tr>
<td>Johns Hopkins University and Howard University</td>
<td>African American</td>
</tr>
<tr>
<td>Vanderbilt-Ingram Cancer Center and Meharry Medical College</td>
<td>African American, Hispanic</td>
</tr>
<tr>
<td>University of Alabama at Birmingham, Tuskegee University and Morehouse School of Medicine</td>
<td>African American</td>
</tr>
<tr>
<td>Fred Hutchinson Cancer Research Center and New Mexico State University at Las Cruces</td>
<td>Hispanic (U.S. border population)</td>
</tr>
<tr>
<td>Arizona Cancer Center and Northern Arizona University</td>
<td>Native Americans</td>
</tr>
<tr>
<td>Cancer Research Center of Hawai‘i and University of Guam</td>
<td>Pacific Islanders</td>
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b) Training and Faculty Development. Multiple students in Master’s Degree programs at UOG completed their Master’s thesis research in a cancer related discipline under the mentorship of a UOG faculty member. One Master’s student, after graduation from UOG, continued her graduate education at CRCH and received a PhD degree in 2009.10 Every year since 2003, with support from the U56 Grant, one UOG faculty member spent up to three months at CRCH to develop a collaborative research project with a CRCH faculty member.

c) Guam Cancer Registry. Prior to funding from the U56 Grant, collection of cancer data was limited to analyses of death certificates by the Guam Department of Public Health and Social Services. Over the past six years, with support from the U56 Grant, the Guam Cancer Registry was developed to now facilitate the identification, registration, and review of all available health and vital records for all patients diagnosed with cancer and/or treated on Guam. The U56 Grant served to leverage funding from the Centers from Disease Control and Promotion to expand the Guam Cancer Registry and to build capacity for cancer data collection and reporting in the other 5 U.S.-associated Pacific Island jurisdictions. The Guam Cancer Registry is now a full member of the North American Association of Central Cancer Registries, and provides an important resource for the Territory of Guam, and for current and future research projects as part of the CRCH/UOG partnership. Several manuscripts, as well as the recently published Guam Cancer Facts and Figures 2003-2007, have resulted from the work at the Guam Cancer Registry.11-15

d) Overall Impact. In addition to specific progress in U56-funded projects and programs, the CRCH/UOG partnership, directly or indirectly, had a beneficial impact on cancer awareness and public health policy in Guam, with long-lasting beneficial consequences for the Territory of Guam. These include:

• UOG formally established the Cancer Research Center of Guam with its own building on the UOG campus. The building was formally dedicated in May 2004, with the Acting Governor and 80% of all Guam legislators in attendance. May 19, 2004 was officially proclaimed Cancer Research Center of Guam Day by the Governor.

• In 2006, the Board of Regents of UOG declared the UOG campus tobacco-free. Similar rules were subsequently enacted for the Guam Community College, the Governor’s complex in Hagatna, and all buildings of the Government of Guam.

• In June 2006, the Guam Legislature passed Public Law 20-80, locally known as the Natasha Perez Protection Act, which made all enclosed public places, including restaurants, on Guam smoke-free.

• In early 2010, Guam Public Law 30-80 was enacted, increasing the tax on cigarettes from $1.00 per pack to $3.00 per pack, representing the single largest tax increase for cigarettes ever enacted in the country, and placing Guam among the US jurisdictions with the highest tax on cigarettes. Similarly steep tax increases were enacted for other tobacco products. Significantly, all proceeds from tobacco taxes will be deposited into the Healthy Futures Fund, not to be commingled with the Guam general fund. Fifteen percent of the taxes collected will be transferred into the Guam Cancer Trust Fund for programs supporting cancer screening, treatment, and support services, and one percent of the taxes collected shall be used to maintain the Guam Cancer Registry.

Outlook

Truly remarkable results have been achieved over the past six years since establishing a cancer partnership between CRCH and UOG, with relatively modest funding from the U56 Comprehensive Planning Grant. It is anticipated that with the significantly increased support from the U54 Comprehensive Partnership Grant, the CRCH/UOG partnership will be able to make significant progress in the years to come to understand and address the needs of the population of Hawai’i, Guam, and the US-associated Pacific Island jurisdictions by expanding the cancer research efforts, by providing increased opportunities for education and training in cancer-related disciplines, and by raising the awareness for cancer, ultimately reducing the impact of cancer on the island communities served by CRCH and UOG.

More information is available on the website of Cancer Research Center of Hawai’i (www.crch.org), the website of the Cancer Research Center of Guam (www.uog/cancer), and the website of NCI’s Center to Reduce Cancer Health Disparities (http://crchd.cancer.gov).

Acknowledgement

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References


