

Micronesian Migrant Health Issues in Hawaii: Part 2: An Assessment of Health, Language and Key Social Determinants of Health

Ann M. Pobutsky¹, Dmitry Krupitsky¹ and Seiji Yamada²

¹*Chronic Disease Management and Control Branch, Hawaii State Department of Health.*

²*University of Hawaii at Manoa, John A. Burns School of Medicine,
Department of Complementary and Alternative Medicine,*

Abstract

Up to 15,000 or more Micronesian migrants currently live in Hawaii. Factors driving this recent emigration include inadequate employment opportunities, a limited economic base, and insufficient health and educational infrastructures in the U.S. affiliated Micronesian island entities in the Western Pacific. The aim of this study was to examine reasons why Micronesians were relocating to Hawaii, since there was evidence of healthcare related migration. This study provides the results of an assessment of health and key social determinants among Micronesian migrants conducted in 2007. Results show that diabetes is the most prevalent reported medical condition (35%) among adults >40 years of age. Micronesian migrants in Hawaii report coming to Hawaii for health care, but also for educational and employment opportunities.

© 2009 Californian Journal of Health Promotion. All rights reserved.

Keywords: Micronesians, migration, health, social determinants of health

Introduction

Micronesian Migrants

There were at least 12,000 and up to 15,000 or more Micronesian migrants from the United States affiliated island states in the Western Pacific living in the State of Hawaii in 2009. The first Compact of Free Association (COFA) negotiated in 1986 allowed citizens of the Freely Associated States (FAS) free entry into the U. S. as migrants without visas or time limits. The Micronesian islands (and atolls) of Palau, Yap, Chuuk, Pohnpei, Kosrae, the Marshalls and Northern Marianas in the western Pacific comprise the former “Trust Territories of the Pacific Islands (TTPI)” which were placed ‘in strategic trust’ under the U.S. government by a 1947 United Nations Mandate after World War II. After the Compact of Free Association with the U.S. went into effect in 1986, the former

TTPI became the Freely Associated States (FAS) of Micronesia. The FAS consists of the Republic of Palau, the Republic of the Marshall Islands (RMI) and the Federated States of Micronesia (with the FSM comprising the states of Yap, Chuuk, Pohnpei and Kosrae). The 1986 Compact was for the FSM and RMI; the Republic of Palau later negotiated a separate Compact agreement. The Northern Mariana Islands became a Commonwealth in 1975.

It is postulated that Micronesian peoples migrate to Hawaii (or to the U.S. Territory of Guam or the Commonwealth of the Northern Mariana islands-CNMI) for medical or economic reasons because of the insufficient health care systems (Diaz, 1997; Tokuda, Cernada and Kuruhara, 2001; Cagurangan, 2008), inadequate employment and educational opportunities, and a limited economic base in Micronesia (Hezel,

1984; Hezel, 2007). This on-going migration is also due to the complex historical and political relationship between the U.S. and its affiliated island states in Micronesia. The U.S. began a deliberate Americanization process by creating a cash-based government economy and dependency on U.S. federal monies in the 1950's which accelerated throughout the 1960-70's. This U.S. government based economy continued, but at greatly reduced federal funding levels as a result of the re-negotiated relationship with the U.S. under the Compact of Free Association (COFA) in the 1980's. Since there is a limited resource base and little cash economy outside of the one created by the federal government, Micronesians have moved away from their home islands to places like the U.S. Territory of Guam, the CNMI and Hawaii.

Demographic Estimates of Micronesian Population in Hawaii

There was an extraordinary increase in the numbers of non-Chamorro Micronesians in Hawaii during the 10-year period between the 1990 and 2000 U.S. decennial censuses. Chamorros are the indigenous people of the Mariana Islands, including the island of Guam and the term 'Guamanian' is sometimes used to refer to people and/or residents of the island of Guam¹. In the 1990 US Census there were 2,210 Chamorro/Guamanians counted in Hawaii and 1,848 "other Micronesians," for a total of 3,968. By the 2000 U.S. Census there were 3,999 Chamorro/Guamanians in Hawaii and 8,725 "other Micronesians," for a total of 12,724.

In 2003 the U.S. Bureau of the Census conducted a special Census of Micronesians in Hawaii, Guam and the CNMI, which provided a total estimate of 24,607 Micronesian migrants in Hawaii, Guam or the CNMI. The vast majority (20,698) were 'compact impact' or COFA migrants (84.1%), meaning that they migrated after the first COFA went into effect in 1986. The term COFA migrant now refers to Micronesian migrants migrating after either one

of the Compacts of Free Association in 1986 (Compact I) or 2003 (Compact II).

In the Hawaii 2003 census the results indicated there were 8,327 Micronesian migrants of which 7,275 were COFA migrants (87.4%). In Guam, the Micronesian migrants were also estimated to be almost 90% COFA migrants (89.7%) while in the CNMI this was 67.5%. However, it is important to note that the 2003 Census of Micronesians conducted in Hawaii likely reflected an undercount (since the methodology employed did not include counts on Oahu's neighboring islands).

Therefore, by 2008 the crude estimated total Micronesian migrant population (including COFA migrants) was approximately 12,000-15,000². In the 2000 U.S. Census count in Hawaii, most of the non-Chamorro Micronesians were in Honolulu County (the island of Oahu) (6,290) followed by Hawaii County (1,460), Maui County (1,045) and Kauai County (246). The U.S. Census Bureau's 2008 Estimates of Compact of Free Association (COFA) Migrants estimates that 12,215 people from the Freely Associated States (FAS) were residing in Hawaii in 2008 (U.S. Census Bureau, 2009). These estimates are definitely underestimates since data from the U.S. Customs and Border Patrol Office in Honolulu has provided a total of 12,635 unduplicated counts of "migrants admitted and intending to reside in the State of Hawaii" for the year 2008 from the FSM, RMI and Palau. This number increases to 15,372 unduplicated counts in 2009 from the FSM, RMI and Palau, and in both these recent years, 98% of these migrants are from the FSM and RMI³.

² Interpolation based on the 1990 and 2000 US Census counts provides a crude estimated projection of the number of Micronesian migrants in Hawaii (in the absence of reliable counts of births, deaths or migration). Since there were 1,848 non-Chamorro Micronesian migrants in Hawaii in 1990 and 8,725 in 2000, subsequently, by 2010, this number could be about 15,602. This means that in 2008 there could be approximately 14,227 Micronesian migrants in Hawaii, and back in 2003 there were probably about 10,788.

³ U.S. Customs and Border Patrol (2010) tabulations requested by the DOH-BHS-Easy Access Program. Note that not all of these "immigrants admitted" may remain in Hawaii. COFA migrants are allowed to travel freely throughout the U.S. and its' territories and the COFA states without visa requirements.

¹ The U.S. Territory of Guam is geographically and culturally part of Micronesia, yet, it has maintained a separate political relationship with the U.S.

The largest group of Micronesians migrating from the Freely Associated States (FAS) to Hawaii are people from the Republic of the Marshall Islands (RMI), whose history with the U.S. is complicated by nuclear weapons testing after World War II, conducted from the mid-1940s to the mid-1950s (Pollock, 2002) and by ballistic missile and ballistic missile defense testing since then. However, people from the islands of Chuuk, the most populous group in the Federated States of Micronesia (FSM) are the fastest growing community of Micronesians in Hawaii⁴.

Communicable diseases among Micronesians in Hawaii

Micronesian migrants to Hawaii are coming from island areas which have high prevalence of infectious diseases such as Hansen's disease, sexually transmitted disease, and tuberculosis. In Hawaii while more than one-half (54.8%) of new cases of tuberculosis in 2007 came from those born in the Philippines, 17.7% of cases came from those born in Micronesia (Hawaii Department of Health Tuberculosis Control Branch, 2008), and this was an increase over the previous five years. An examination of five-year trends from 2004-2008 in new cases of tuberculosis from all Pacific island jurisdictions show that 65 out of 77 cases (84.4%) came from the Freely Associated States of Micronesia (Hawaii Department of Health, Tuberculosis Control Branch, 2008).

Sexually transmitted diseases are also major health concerns for Micronesians in Hawaii (Hawaii Department of Health, STD-AIDS Prevention Services Branch, 2008). During 2003 to 2007, of the 27,486 total cases of reported Chlamydia in Hawaii, 53% reported race/ethnicity information. The proportion of Micronesians with chlamydia was 1,065/14,637 cases (7.3%). For gonorrhea cases (5,025), there were slightly higher proportions who reported race/ethnicity at 62%. Among those with reported race/ethnicity, there were 193/3,128 Micronesian cases of gonorrhea (6.2%). For the most infectious syphilis cases (primary and

secondary), there were 2/60 Micronesian cases (3.3%) and for latent (non-infectious) syphilis cases there were 98/197 (49.7%). Cases of both Chlamydia and gonorrhea have been steadily increasing among Micronesians, while gonorrhea has decreased by about 50% and Chlamydia has increased in the entire population during this time period (2003-2007). Recent increases in the number of Chlamydia and gonorrhea cases among Micronesians may be due to increased targeted screening among this population through ethnic health fairs and through the Hawaii Chlamydia Screening Program (Hawaii Department of Health, STD/AIDS Prevention Branch, 2008). Micronesians represent disproportionately more cases of sexually transmitted diseases than would be expected since they comprise less than 1% of Hawaii's total population, and this has serious public health implications as mucosal inflammation caused by syphilis, gonorrhea, Chlamydia, and other STDs increase the risk of HIV infection. AIDS cases among non-Hawaiian Pacific Islanders are still few in numbers: 10 AIDS cases (10/244) in 2003-2004 and 16 (16/595) cases in 2000-2004). However, HIV transmission among Micronesians may potentially increase without early detection. This is of particular concern in Micronesian communities because young Micronesians tend not to present for healthcare unless they feel very ill (Hawaii Department of Health, STD/AIDS Prevention Branch, 2008).

Hansen's disease is endemic in Micronesia. In Hawaii prior to 1996, new cases were mainly diagnosed from among Filipinos and Samoans; however, this trend has changed, with the combined new case totals (65%) from the Federated States of Micronesia and the Republic of the Marshall Islands outnumbering the Philippine and Samoan totals (Hawaii Department of Health, Hansen's Disease Program, 2008). The incidence is low in jurisdictions such as Yap and Kosrae in the FSM, yet other states in the FSM and the RMI are recognized by the World Health Organization as having the highest case detection rates of Hansen's disease in the Western Pacific region (World Health Organization, 2007).

⁴ For a more detail description and background on these issues, see: <http://www.csuchico.edu/cjhp/3/4/59-72-pobutsky.pdf>.

Non-communicable Diseases among Micronesians in Hawaii

Limited data collection or access to data applies to both communicable and non-communicable diseases in this population. There is currently not enough population based data or information about chronic diseases among Micronesian migrants in Hawaii except for cancer, including radiation induced cancer. Anecdotal evidence suggests that there are significant problems of cancer, obesity, diabetes, and cardiovascular diseases.

Women in the Marshall Islands have high breast and cervical cancer rates in their home islands, along with high rates of thyroid cancers (Palafox, Yamada, Ou et al, 2004). Cervical cancer rates are also very high in some of the islands in the FSM (Kosrae) and the Republic of Palau (Katz, Palafox, Johnson et al, 2004). Further, referrals for breast and cervical cancers, followed by thyroid cancer were the top 3 types of cancer referred to the Tripler Army Medical Center in Hawaii from the various Micronesian jurisdictions (Person, 2004).

In order to better assess the needs of medically underserved, low income women for breast and cervical cancer screening in Hawaii, data were obtained from a Community Health Center serving one of most diverse clientele in the state (including Micronesians) in 2007. These data showed higher proportions of women with abnormal pap smears among Native Hawaiians, Micronesians, Hispanics, Filipinas and Tongans compared to the other ethnic groups being served, along with high numbers of abnormal mammograms among Micronesian, Samoan, Tongan and European-American women (Hawaii Department of Health, Breast and Cervical Cancer Program, 2008).

Throughout the Pacific islands the prevalence of obesity has increased and many Pacific peoples are at risk for obesity and diabetes. Numerous studies of Pacific populations have illustrated that the problems of dietary related chronic diseases, especially diabetes and obesity, are also pervasive for Pacific Islanders (e.g. Native Hawaiians, Samoans and Micronesians) (Chung

et al., 1990; Maskarinec, Novotny and Tasaki, 2000; McMurray and Smith, 2001, Curtis).

Additional surveillance is needed to assess the health situations of Micronesian migrants coming to Hawaii. The ability to track and monitor the incidence and prevalence of both communicable and non-communicable diseases is apparent. It is also important to track costs and the number of people served in programs. Anecdotal reports and programmatic statistics suggested that seeking medical care and treatment was one key reason increasing numbers of Micronesians were migrating to Hawaii over the past several decades since the COFA.

Commonly used statewide/nationwide surveys to assess health status of populations, such as Hawaii Behavior Risk Factor Surveillance System (BRFSS), the Hawaii Health Survey (HHS) and the National Survey of Children's Health (NSCH), all have sampling strategies that are likely to under-count the Micronesian migrant population. The likelihood of being randomly selected to participate in the survey is proportionate to the adult population. In the case of the Micronesian adults, that chance is very small since there are only an estimated 6,000 to 7,500 Micronesian adults in the entire state. These types of surveys are conducted through landline telephones, and this is a barrier for this population to participate since many Micronesian households do not have landline phones and this even further reduces their chances of participating in any of the landline surveys. For these reasons, the numbers of Micronesians that participate in these surveys are typically not adequate enough to perform reliable statistical estimates of behavior or disease prevalence. One key reason for conducting a house-to-house assessment for such "hidden populations" is to obtain needed information.

This assessment was designed to assess the health status, language ability and some of the key social determinants of health of the Micronesian migrant population in Hawaii. The assessment was intended to be descriptive and

exploratory because not much was known about the health status of Micronesian migrants, aside from some very limited programmatic statistics. For social determinants of health, again, not much was known about Micronesian migrants, but information from community meetings held with the Volunteer Resource Center of Hawaii “More Better Together” Grant on Oahu in 2006 had shown that Micronesian migrant community members articulated interest in employment, education and other issues as well as health issues within their community. In addition, generally not enough data is collected on the socio-economic status of immigrants and migrants to the U.S., and this is particularly limited in scope for smaller non-Hispanic ethnic groups such as Vietnamese or Micronesians (Holmes, 2006; Clark, Berkowitz King, 2008).

Social determinants of health are what Raphael (2006) refers to as “the nonmedical and non-behavioral precursors of health and illness.” Social determinants of health refer to aspects of the social, economic and physical environment which influence people’s circumstances as well as their health. The Centers for Disease Control and Prevention highlights socio-economic status, transportation, housing, access to services, discrimination by social grouping (e.g. race, gender or class) and social or environmental stressors as important social determinants of health (CDC, 2009). Raphael (2006) has identified some key social determinants of health, based on a synthesis of the definitions from various organizations such as the World Health Organization and Canada’s Ottawa Charter. His comprehensive list includes: aboriginal status, early life, education, employment and working conditions, food security, health care services, housing, income and its distribution, the social safety net, social exclusion and unemployment and employment security (Raphael, 2006).

Methods

Participants

In order to better conduct this assessment, the Department of Health worked with community-based partners using a participatory approach. Community partners included service and

volunteer organizations that serve Micronesians in Hawaii, such as the Department of Health’s Nations of Micronesia (NOM) workgroup and the Volunteer Resource Center of Hawaii (VRCH). NOM is a Department of Health workgroup comprised of health programs that provide services to Micronesians and their community partners. VRCH is a non-profit community partner organization providing assistance to the Micronesian community and church organizations. During community and organizational meetings which were set up with the Micronesian community as part of a Community Building grant with the VRCH (Mo’ Better Together) and the community group the Micronesian Community Network (MCN), Micronesian leaders were included and consulted about the methods for conducting the assessment. This approach follows the Rapid Assessment Response and Evaluation (RARE) model, which includes multiple methods and community participation (Brown, Hernandez and Saint-Jean, 2008; Issel, 2009).

Sampling

This assessment used purposive sampling and several strategies were utilized to obtain information. It was determined that Micronesians would be hired to do the actual assessments, since they could use their own community knowledge and networking to find where the other Micronesians were residing. The sampling frame used was based on known residential areas or enclaves where Micronesians were residing, and a “snowball sampling” strategy was used to obtain additional interviews whereby existing participants provided information on where other Micronesians were staying in that neighborhood/area or others, and this is how , future participants were obtained A Micronesian teacher, a Micronesian graduate student and a service provider were hired to coordinate the data gathering since they were knowledgeable about specific areas where Micronesian migrants reside. This technique is also known as “respondent-driven sampling” and although this technique does have limitations, it is useful for obtaining information on “hidden populations” (Salganak and Heckathorn, 2004). “Hidden populations” refer to those groups that are stigmatized,

marginalized or difficult to reach because of stigmatized health or other social problems (e.g. HIV-AIDS or Hansen's disease). In the case of Micronesians, work within the Department of Health's network of service organizations (Nations of Micronesia) had already established that Micronesians were evident at homeless shelters and beaches, as well as specific public housing and residential areas on Oahu.

Recruitment

Three coordinators were hired (2 women, 1 man) to supervise a total of 18 hired interviewers (12 women and 6 men). A Micronesian teacher assisted with coordinating hired Micronesian university students as interviewers, and a supervisor from the Volunteer Resource Center of Hawaii, assisted with additional hired students and community outreach workers. Interviewers were paid based on the number of completed household interviews. The initial sample was identified and recruited using respondent driven sampling. Snowball sampling was used to identify and recruit additional participants. This technique began with interviews taking place based on current knowledge of where Micronesians were known to reside (beginning with public housing, homeless shelters and beaches). Further networking ("snowball sampling") through communication with the Micronesian household respondents resulted in additional household contacts. Micronesian migrants were interviewed at residences and homes in neighborhoods where there were known Micronesian enclaves on the islands of Oahu (in Waipahu and Kalihi) and on Hawaii (in Kona). Interviews took place at Micronesian community events, beaches, homeless shelters, churches, and at an adult community education school. One-fourth of the interviews took place at three public housing sites on Oahu (i.e. Kuhio Park Terrace, Mayor Wright Housing and Palolo Housing).

Materials

The assessment included health status, language ability, occupation and place of employment, disability status, public assistance (welfare or food stamps), educational level, school and housing arrangements. The instrument used was

a one-page household checklist for listing each household member in a column and rows for the topic areas. The second page contained the open-ended questions. Interviewers were provided with a completed household checklist with responses filled in, along with instructions on how to fill out the checklist as part of their training. Questions were asked only of the main adult respondent about all of their household members, including any youth and children. The interviewer filled out the household checklist based on the respondents' answers. The household checklist included each household members' age, their relationship to the head of household, gender, years of education, health problems and chronic conditions, substance use (e.g. smoking, betel nut and alcohol use), type of health insurance and place where they seek healthcare, occupation and place of employment, name of school, language spoken at home, English language ability and type of public assistance (if any). The household checklist had both fixed responses and open-ended responses. The respondents were asked to mention any medical conditions that any household member had. A second page listed open-ended questions which were asked of the respondent only for the entire household. These additional open-ended questions on reasons for migrating were asked of the respondent about the entire household. Other open-ended questions were asked on whether any household members were encountering any problems with housing, healthcare, employment, or education as a result of their migration to Hawaii.

Design and Procedures

Interviewers were trained to fill out the household checklist and open-ended questions with the respondent. The instrument was not translated into Marshallese or Chuukese, but since interviewers who spoke these Micronesian languages conducted the interviews, they provided translation as needed. Interviews took from 15 minutes to an hour, depending on the size of the household. A respondent from each household responded for the entire household on all items (15 items asked for each household member) and 5 open-ended questions for the household as a whole. Respondents who completed an assessment received a \$10.00

Long's drugstore gift card. Respondents could refuse to participate at any time or refuse to answer questions. Verbal consent to participate was required. Verbal consent was obtained by the interviewer and a letter about the project was provided to the respondent. This project was cleared and exempted from the Department of Health IRB/Human Subjects Committee, since no identifying information was collected.

Data Analysis

All responses on the household checklist were transcribed verbatim onto the checklist and questionnaire forms. All data were quantifiable and were entered into a computer data base, and data were analyzed using PASW version 17.0 (SPSS, 2009). Most of the data analysis compared the two key migrant groups: Marshallese (RMI) and Chuukese (FSM), since Chuukese represented 9 out of 10 of those from the FSM in this assessment. All of the notes from the open-ended responses were typed into a Microsoft Word file. These qualitative data were later organized into themes by the research investigators. These themes were derived from the most numerous responses to the open-ended questions, and then summarized by the frequency of the responses. These procedures were followed for all of the open-ended responses and the results are summarized in Table 5. Responses to the open-ended questions were not entered into a database and therefore cross-tabulations by ethnicity were not done. Health conditions were organized and coded into categories of Allergies, Arthritis, Asthma, Cancer, Chronic Pain, Diabetes, Eyesight, Heart Cardiovascular, Liver, infectious Disease, Lungs, Neurology and Mental Health, Osteoporosis and other bone problems, Thyroid Problem, Skin, Urology, Women's Health, Other and No Medical Conditions (Refer to Table 2, for details). Most of the health categories were not mutually exclusive with exception of asthma which was counted three times as allergies, asthma and lung; hepatitis which was counted twice as infection and liver; lung cancer which was counted twice as lung and cancer; breast and cervical/uterine cancer which were counted as cancer and women's health, and tuberculosis were counted twice as lung and infection.

Results

Sample Demographics

There were 454 households who participated in the assessment with a total of n=2,522 individuals who were enumerated and assessed by proxy (respondent) for all health, education, language, employment, school and public assistance questions. The respondent provided information on all household members. Therefore, the sample consists of N=2,522 individuals. The respondent was usually (more than 80% of the time) the head of the household (68.4%) or their spouse (13.6%). The average household size was 6.8 people and the household size ranged from 1-2 household members to 17 household members. The majority of the participants were Marshallese (52.6%), followed by Micronesians from the FSM (45.7%). Of the respondents from the FSM, the majority were Chuukese (88%), followed by Pohnpeians, Kosraeans, Yapese and others of mixed ethnicity (12%). This breakdown of migrant populations approximates what we know from previous censuses conducted in Hawaii.

Marshallese (RMI) had a significantly higher average number of household members (7.4) than households from the FSM (6.0) (t-test, p-value<0.01). The average age of respondents was 24 years and the age range was infants less than 1 year to elderly up to 86 years. Slightly more females (52.7%) participated than men (47.1%) for both RMI and FSM households. Households consisted mainly of a head of household (male or female) with spouse and/or children, in-laws and/or parents and other relatives, including nieces, nephews and cousins. This pattern was similar for both RMI and FSM households. There were more than 40 terms used to describe relatives and household members among both groups.

Table 1 provides the age and sex distribution by ethnicity for the Micronesian migrants by the two main ethnic groups in this assessment. There are very few people over age 65 years who were a part of households that participated in the survey. The majority of migrants are

working age (19-64 years) or under 18 years. There were slightly more females among the working age group than males among both major ethnic groups (Marshallese and Chuukese). The 2003 Census of Micronesians found that more than one-half of the total

“compact impact” or COFA migrant population was comprised of those less than 18 years of age (57.3%), while this assessment had less than one-half under 18 years in the entire sample of all household members (44%, n=1,168).

Table 1
Age and sex distribution by ethnicity* of Micronesian migrants in Hawaii

	Females			Males		
	Chuukese	Marshallese	Other	Chuukese	Marshallese	Other
	n	n	n	n	n	n
Age	(%)	(%)	(%)	(%)	(%)	(%)
< 18	214 (40.0)	291 (41.9)	26 (38.2)	215 (47.1)	298 (49.5)	33 (34.7)
19-64	307 (57.4)	365 (52.6)	38 (55.9)	208 (45.6)	286 (47.5)	57 (60.0)
65	14 (2.6)	38 (5.5)	4 (5.9)	33 (7.2)	18 (3.0)	5 (5.3)
TOTAL	535 (100%)	694 (100%)	68 (100%)	456 (100%)	602 (100%)	95 (100%)

*72 had missing information for age or sex or ethnicity.

Health Status

The majority of respondents did not report any health problems for themselves or household members (76.4%) (refer to Table 2). For those who were reported to have health problems, chronic diseases and conditions and disability were the vast majority (e.g. diabetes, hypertension/heart problems, asthma/lung conditions and cancer). Diabetes was the most frequently reported condition (by proxy) on this assessment at 8.7%. Among older adults, one in three adults 40 years old and older was reported

to have diabetes (35%). In contrast, the 2008 statewide Behavioral Risk Factor Surveillance Survey found that among people over 40 years of age in Hawaii, only 12% reported diabetes (Hawaii State Department of Health, BRFSS, 2008).

More than one in five (22.3%) adults 40 and older reported (by proxy) to have a cardiovascular medical condition (such as high blood pressure) or event (stroke or heart attack). For both children and adults, more than 4% were

reported to have asthma or allergies. Seven percent of adults 40 and older were reported to have problems with their lungs (with these reported medical conditions including asthma,

other respiratory, lung disease, TB with medications, pneumonia, lung cancer, chronic coughing, TB and constant coughing).

Table 2
Medical conditions reported among Micronesian migrants in Hawaii, 2007.

Medical Conditions	Total sample*	39 Years & younger	40 Years & older	Chuukese	Marshallese	Pohnpeian	Kosraean	Other
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Allergies	108 (4.3%)	84 (4.2%)	23 (4.6%)	34 (3.4%)	62 (4.7%)	5 (5.5%)	4 (15.4%)	108 (4.3%)
Arthritis	43 (1.7%)	10 (0.5%)	31 (6.2%)	19 (1.9%)	17 (1.3%)	4 (4.4%)	2 (7.7%)	35 (1.4%)
Asthma	106 (4.2%)	82 (4.1%)	22 (4.4%)	32 (3.2%)	62 (4.7%)	5 (5.5%)	4 (15.4%)	73 (2.9%)
Cancer	25 (1%)	6 (0.3%)	20 (4%)	5 (0.5%)	18 (1.4%)	1 (1.1%)	---	35 (1.4%)
Chronic Pain	25 (1%)	12 (0.6%)	12 (2.4%)	20 (2%)	4 (0.3%)	1 (1.1%)	---	0 (0%)
Diabetes	219 (8.7%)	42 (2.1%)	176 (35%)	68 (6.8%)	142 (10.8%)	4 (4.4%)	---	108 (4.3%)
Eyesight	15 (0.6%)	2 (0.1%)	14 (2.8%)	4 (0.4%)	11 (0.8%)	1 (1.1%)	---	---
All Cardio-Vascular	164 (6.5%)	52 (2.6%)	112 (22.3%)	79 (7.9%)	65 (4.9%)	9 (9.9%)	4 (15.4%)	217 (8.6%)
Hypertension only	83 (3.3%)	14 (0.7%)	68 (13.5%)	41 (4.1%)	30 (2.3%)	5 (5.5%)	2 (7.7%)	144 (5.7%)
Infectious disease	38 (1.5%)	8 (0.4%)	28 (5.6%)	17 (1.7%)	15 (1.1%)	4 (4.4%)	2 (7.7%)	35 (1.4%)
Liver	8 (0.3%)	2 (0.1%)	5 (1%)	5 (0.5%)	3 (0.2%)	---	---	0 (0%)
Lungs	126 (5%)	90 (4.5%)	36 (7.2%)	49 (4.9%)	67 (5.1%)	5 (5.5%)	4 (15.4%)	73 (2.9%)
Neurology/ Mental Health	25 (1%)	20 (1%)	6 (1.2%)	12 (1.2%)	11 (0.8%)	2 (2.2%)	2 (7.7%)	---
Osteoporosis/ other bone	20 (0.8%)	10 (0.5%)	10 (2%)	19 (1.9%)	1 (0.1%)	0 (0%)	0 (0%)	---
Other	73 (2.9%)	50 (2.5%)	23 (4.6%)	45 (4.5%)	26 (2%)	1 (1.1%)	2 (7.7%)	---
Skin	3 (0.1%)	2 (0.1%)	1 (0.2%)	2 (0.2%)	1 (0.1%)	---	---	---
Thyroid Problem	10 (0.4%)	4 (0.2%)	5 (1%)	3 (0.3%)	5 (0.4%)	---	---	35 (1.4%)
Urology	30 (1.2%)	16 (0.8%)	14 (2.8%)	10 (1%)	18 (1.4%)	---	---	35 (1.4%)
Women's Health	15 (0.6%)	4 (0.2%)	10 (2%)	8 (0.8%)	7 (0.5%)	1 (1.1%)	---	---
No Medical Conditions	1927 (76.4%)	1722 (86%)	189 (37.6%)	752 (75%)	1018 (77.2%)	71 (78%)	15 (61.5%)	2053 (81.4%)
TOTAL	2,522 (100%)	2,002 (100%)	503 (100%)	1,002 (100%)	1,319(100%)	91(100%)	24 (100%)	70 (100%)

*17 had missing information for age.

Diabetes and cardiovascular diseases were the most common medical conditions reported for Chuukese (6.8% and 7.9% respectively), Marshallese (10.8% and 4.9%) and others in the total sample. Cancer, although a small proportion of reported health conditions, was reported among 1.4% of Marshallese and 0.5% of Chuukese, but was 4% among adults 40 years and older. One in three adults 40 years and older were reported to have diabetes and one in five were reported to have cardiovascular disease (Table 2). Eighty six percent of adults under 40 and children were reported to not have any medical conditions (Table 2); whereas ten percent reportedly had more than two medical conditions.

Although reported risk factors were similar for both Chuukese and Marshallese ethnic groups for reported alcohol use (16.4% and 19.0% respectively), Marshallese were slightly more likely to report current smokers in their households (19.6%) than Chuukese (15.2%). Those who reported Chuukese ethnicity were more likely to report betel nut chewing (13.1%) than those of Marshallese ethnicity (4.7%). Both Chuukese and Marshallese males were more likely to smoke (23.5% and 28% respectively) and use betel nut (16.5% and 7.2%) than females

(8.1% and 11.1% for smoking; betel nut chewing 10.2% and 2.5% respectively).

Regarding health insurance coverage, the majority (60.3%) were reported to be covered by Hawaii MEDQUEST (income based health insurance, including Medicaid-Fee for Service). When examining health insurance by group, 67.4% of Chuukese and 61.6% of Marshallese were covered by MEDQUEST. Much smaller proportions reported insurance coverage with Kaiser (3.6%) or HMSA (12.5%). This makes sense since many Micronesians would be eligible based on low-income levels and since children are eligible for MEDQUEST automatically in Hawaii. Of those in the assessment (n=2,522), 12.7% (n= 321) were reported to not have any health insurance. Chuukese were slightly more likely to report not having health insurance (15.1%) than Marshallese (12.4%). Marshallese were slightly more likely to report insurance with Kaiser (4.5%) and HMSA (14.4%) than Chuukese (2.1% Kaiser and 9.5% HMSA). This could be a result of the Marshallese having had a longer migration stream (for education, healthcare and/or jobs) to Hawaii than the Chuukese or others from the FSM, mainly due to the propinquity of the Marshall Islands to Hawaii.

Table 3
Number of medical conditions reported among Micronesian migrants in Hawaii, 2007.

Number of Medical Conditions	Total Sample		Chuukese		Marshallese		Pohnpeian		Kosraean		Other	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
0	1927	(76.4%)	752	(75%)	1018	(77.2%)	71	(78%)	12	(91.7%)	57	(81.4%)
1	325	(12.9%)	140	(14%)	164	(12.4%)	8	(8.8%)	1	(4.2%)	9	(12.9%)
2	121	(4.8%)	55	(5.5%)	58	(4.4%)	4	(4.4%)	1	(4.2%)	1	(1.4%)
3	126	(5%)	45	(4.5%)	69	(5.2%)	6	(6.6%)	0	(0%)	2	(2.9%)
4	15	(0.6%)	6	(0.6%)	7	(0.5%)	1	(1.1%)	0	(0%)	1	(1.4%)
5 and more	10	(0.4%)	4	(0.4%)	4	(0.3%)	1	(1.1%)	0	(0%)	0	(0%)
TOTAL	2,522	(100%)	1,002	(100%)	1,319	(100%)	91	(100%)	13	(100%)	70	(100%)

A quarter of those in the assessment (n=2,522) were reported (by proxy) to have at least one medical condition (23.6%) and 11% of the sample were reported (by proxy) to have two or more medical conditions (Table 3). Eleven percent of Chuukese and 10.4% of Marshallese were reported to have more than one chronic condition.

Language

Of the 2,522 individuals reported in this assessment, about one-half (48.8%) were reported (by proxy) to speak only their native languages at home and the other half were reported to use both their native language and English (45.2%), with 5.8% speaking only English.. Among the Marshallese, 52% were reported to only speak Marshallese at home, with 41.9% speaking Marshallese and English, 3.8% spoke English only and the remainder a combination of languages with English. Among those from the FSM, 41.9% were reported speaking only Chuukese at home, followed by 37.4% speaking Chuukese and English, and 6.6% speaking only English at home. A small proportion (5.1%) were reported (by proxy) to speak Pohnpeian at home, with 2.4% reporting both Pohnpeian and English. A few were reported to speak Kosraean and English or

combinations of Micronesian languages (e.g. Marshallese and Chuukese or Chuukese and Japanese).

More than one-half of those in this assessment (58.5%, n=1,475) reported by proxy that their English ability was excellent or good with another 20.7% reporting that their English ability was ‘fair’ and 14.8% reporting ‘poor’ English. Less than 1% reported no English ability. Marshallese reported a higher proportion with excellent or good English ability (62.8%) than Chuukese (53%), and thus a slightly lower proportion reporting poor ability. Most of those reporting poor English ability tended to be older and more than one respondent noted that “the kids were picking it (English) up fast (at school)” in Hawaii.

Education

The majority of those in this assessment (n=2,522) who were less than 18 years of age were reported to be in school (69.3%) or were small children/infants (22.4%) (Table 4). Among adults over 18 years, 17% were reported to have less than a high school education, 23.7% had some high school education and 36% were high school graduates. One-sixth (16.5%) reported some college and 4.8% were reported to be

Table 4
Educational level by age reported among Micronesian Migrants.

	Ages < 18 years	Ages 19 + years
	n (%)	n (%)
Head Start/preschool	11 (1.2)	0
8 years or less	487 (54.3)	224 (17.0)
Some high school	136 (13.8)	312 (23.7)
High school graduate	24 (2.7)	473 (36.0)
Some college	0 (0.0)	218 (16.5)
College graduate and above	0 (0.0)	63 (4.8)
Not applicable (infants)	201 (22.4)	7 (0.5)
Unknown	19 (2.1)	12 (9.1)
None	19 (2.1)	7 (0.5)
TOTAL	897 (100%)	1319 (100%)

college graduates or held graduate degrees. Both Chuukese and Marshallese reported similar proportions of adult household members with less than a high school education (29.3% among

Marshalllese and 34.2% among Chuukese). Both groups also reported similar proportions of adult members not having graduated from high school (about 30-35%)(Table 5).

Table 5
Educational level by ethnicity reported among Micronesian Migrants.

	Chuukese	Marshalllese
	n (%)	n (%)
Head Start/preschool	4 (0.4%)	9 (0.8)
8 years or less	334 (35.2)	320 (29.2)
Some high school	181 (19.1)	236 (21.6)
High school graduate	157 (16.7)	308 (28.1)
Some college	116 (12.2)	83 (7.6)
College graduate and above	30 (3.1)	18 (1.7)
TOTAL	822 (100%)	974 (100%)

Although, members of Marshallese households reported more members as high school graduates (28.1%) than Chuukese households (16.7%), Chuukese households reported more members with some college level education or graduates (15.3 %) than Marshallese households (9.3%). For both groups of Micronesians in the entire sample of all household members, however, the proportion who report graduating from high school is much lower than in Hawaii, with Hawaii having an estimated 67% graduating among all students in 2004-2005 (Alliance for Excellent Education, 2009).

Public Assistance

More than one-half of the Micronesians in this assessment were reported (by proxy) not to be receiving public assistance (52.3%, n= 1,963). Some reported themselves or family members to be receiving various kinds of assistance. About one-fifth (20.4%) reported some members receiving Temporary Assistance for Needy Families (TANF) or Temporary Assistance for Other Needy Families (TANOF). About one-fourth (26.8%) reported some members receiving food stamps (16%) or food stamps and TANF/TANOF (10.8%). A minority were reported to receive other types of assistance (e.g. Social Security retirement or disability, or SSI etc.). Many more Marshallese members reported

receiving assistance such as TANF/TANOF (28%) than FSM household members (12.3%), while slightly more FSM household members were reported to be receiving food stamps (17.2%) than RMI household members (14.6%). More FSM household members were reported receiving a combination of food stamps and TANF/TANOF (16.6%) than RMI household members (7.7%). It is important to note that traditional welfare (TANF) and food stamps require a 5 year residency for eligibility; however, Compact of Free Association (COFA) migrants are eligible for TANOF if they have children under 18.

Employment/Occupation

The majority of those in this assessment reported being employed (57.3%). About one-fourth of adults were reported to be unemployed (or retired, disabled, or at home caring for children or other relatives), and about one-third of the sample consisted of children. Most Micronesian migrants, who reported being employed, reported being in occupations in service industries such as restaurants/food service, hotels/cleaning services, security guards, retail sales, airport/airline services, and delivery services. FSM households were slightly more likely to report members being unemployed (28%) than RMI households (24.4%), and

slightly more likely to report having more students (under 18 years of age) in their households (34.4%) than the RMI households (31.9%).

Housing

More than two-thirds (69.1%, n=454) of Micronesian households reported living in an apartment (40.1%) or house (29%), with another 15.6% of households in shared housing or public housing or other arrangements. However, 16.3% of the households in this sample were reported to be homeless or living in a homeless shelter. One-fourth of the sampled households (26.2%) were conducted at public housing projects. Micronesians may have found a niche in public housing since they are likely eligible based on low income and other criteria, or as they transition out of homeless shelters. Further evidence of housing issues is the high (average) number of persons per household at 6.8 (or about 7 persons) and the average number of bedrooms reported for apartments and houses was only 2.3, suggesting crowded housing arrangements.

Reasons for Migrating

There were also several open-ended questions asked of the respondents (n=454) for the entire household as part of this assessment. Respondents were asked (1) why they came to Hawaii and to provide their reasons for migrating, (2) if there were any health issues among any household members, especially regarding access to health insurance (3) where they stayed, how many people were in the house and if they had trouble finding/keeping a place to stay, (4) any employment, education or language problems they were experiencing and (5) what they think should be done to address health and language issues among Micronesian migrants.

The top 3 responses to the open-ended questions for reasons for migrating to Hawaii among Micronesians in this assessment were to obtain

(1) better medical/health care for themselves or family members (34.7%), (2) better education for themselves, their children or other relatives (33.1%) and (3) better employment/job opportunities (22.2%). Some examples of the stories told are included in Table 6, such as migrating for medical reasons for self or family member (n=241), education for self or family member (n=230), jobs (n=154), joining relatives or spouse (n=37) and other responses such as “for a better life” or “better opportunities” or “to care for the sick” or “babysit for relatives”. A typical response was “My husband came for medical treatment and the family followed later” or respondents mentioned coming to Hawaii for ‘doctoring’ or for specific treatments for cancer or kidney dialysis or for school. Here is an example of why one Chuukese woman came to Hawaii from the interviewers notes:

The head of household is the respondent and she came to Hawaii in year 2001. She came here to seek medical attention, because when she was on Guam after 2001 the medical insurance she had on Guam couldn't pay for surgery. Now (in Hawaii) the doctor finds out her problem with her right knee and scheduled already for surgery. The day she was scheduled for surgery the doctor finds out that she was worried and nervous and decided to postpone her surgery and treat her with medication. Also her daughter was an eighth grader and she wanted her daughter to finish school here. Now her daughter is 19 years old, a high school graduate, who speaks good English, and sometimes she thinks that she has helped her daughter to accomplish her education (high school) by moving them all here. Her daughter also finished the Youth Challenge Program and got her certificate. But her daughter cannot go to college because they don't have sufficient resources.

Table 6

Reasons for Migrating (usually a combination of factors involving the entire family).

Top Responses (n=695):	Typical examples:
Migrated for medical reasons for self or family members (34.7%, n=241)	<p>Came in 2001 for a family member to go to the doctor for diabetes related blindness (he can see now) and they had the leg amputated below the knee and heart problems. Another family member has surgery for cancer.</p> <p>Respondent came for medical reasons – to treat diabetes. Family members came later for work, school.</p> <p>Two family members came for doctoring one week ago. RMI government usually sends patients to the Philippines but RMI ran out of budget and so people are using their own money to come here for doctoring.</p>
Migrated for education for self or family members (33.1%) n=230)	<p>I want to find a better education for my kids;</p> <p>We came for school for the children and to look for work and money; better medical care.</p>
Migrated for employment/jobs (22.2%)(n=154)	<p>The daughter came to Hawaii first, to look for better jobs. The second daughter came later for school. Sons came for work. Respondent came to help the family.</p> <p>Respondent moved to Hawaii from Guam for the husband to find a better job.</p> <p>Respondent came to Hawaii to find a better opportunity, for a better job and a better life. He sent for his wife’s and kids tickets after working here for 3 years. He moved then here cause in Chuuk he couldn’t find anything to do (no job, no income).</p>
Migrated to visit family/take care of family members (5.3%)(n=37)	<p>Respondent came initially to visit his family and ended up staying and living here.</p> <p>I was hired to babysit my cousin’s kids when I was in Chuuk, I came here with my son and stayed worked with the couple and worked for them for 5 months. I moved out from them to find a place because my name wasn’t included in their household members or wasn’t approved (legally) to be in that house.</p> <p>I came to Hawaii 16 years ago with the father of my son. We got married here in Hawaii. The father</p>

of my first son was a military man. The marriage did not work out so I took my son and when back to Pohnpei. Two years later I came from Guam to Hawaii to work.

Other responses:

To have a better life, better opportunities;

To have a better life.

Respondent moved to Hawaii for medical treatment and because she saw a better future for her family here too;

To move to a better place to work and educate her kids.

Issues or Problems with Health, Education and Language

When asked about any health issues, the majority (71.1%, n= 323 of 454 household responses, reporting for their entire household), did not report any issues while 28.9% did report problems with accessing health care such as problems filling out insurance forms or interacting with organizations/agencies (Table 7. Likewise, the majority of the respondents did not report any educational issues (64.6%, n=275 out of 426 household responses), however for those that did report issues related to education, 12.9% lacked time to go to school, 9.2% reported financial constraints, 8% reported language difficulties, and 5.4% mentioned other problems.

Although, one-half of respondents did not report housing related problems among their household or household members, 33.5% reported problems including overcrowding and difficulty paying rent; many were homeless. A recent Homeless Service Utilization Report (Yuan, Kole and Yuen, 2008) found that Other Pacific islanders, along with Native Hawaiians/part-Hawaiians and European-Americans were the largest ethnic groups accessing homeless shelter services. A recent study of the health needs of homeless people on Oahu also found a high percentage of Micronesians in their sample, which also suggests that Micronesian migrants face housing problems (Hoover and Nakaso, 2007; Withy, Amoa, Andaya et al, 2008).

For employment issues, the majority of respondents (54.2%), mainly women, reported barriers to employment and being unable to work due to care-giving responsibilities for children and other relatives. For language issues, about one-half (47.7%) did not have any problems whereas the remainder reported some problems (5.2%) or numerous problems (47.1%). Many reported problems accessing ‘the system’ for health or social services, and many times this was a language issue. One woman stated: “Sometimes my parents need help with translation at the doctor’s office and government offices. I take time from work to go.” Another women said: “Most of the Micronesians including herself (the respondent), don’t speak English. To communicate with her doctors and kids schools, she always needs a translator.” One man who was a high school graduate said he needed to “...continue taking some English classes to improve and communicate better to get a better job.”

Some reported other socio-cultural assimilation issues and some reported job and housing discrimination. Media sources in Hawaii have documented discrimination and prejudice against Micronesian migrants (Hezel and Samuel, 2006; La France, 2009) and this has definite implications for health and socio-economic status (Holmes, 2006). Some respondents did state they felt prejudice or discrimination. One woman felt that “cases workers were unfair at welfare and medical

[MEDQUEST] offices”, while another reported that at the school, “among the kids, Micronesians are always discriminated against.”

For suggested community-based interventions to address some of the health, language and other issues facing Micronesian migrants, respondents suggested (1) hiring more language interpreters and translators in health, social service and other

agencies, (2) ensuring access to ESL or language classes for Micronesians, (3) assisting with educational costs and (4) treating Micronesians fairly in the workplace and in the community. Some respondents noted that “lack of language skills is the biggest problem” and there is a need for “education for the adult population such as ESL education or English learning classes.” Some Micronesian migrants felt that

Table 7
Health care access, education and language problems or issues facing Micronesian migrants in Hawaii.

Health issues:	n	(%)	Examples of health care access issues:
No health issues	239	(71.1)	Problems getting health insurance; problems filling out forms; lack of response from agency; family members not having health insurance; pending applications.
Problems accessing health care or insurance	97	(28.9)	
Total	336	(100)	
Education issues:	n	(%)	Examples of educational problems/issues:
No education issues	275	(64.6)	Cannot go back to school because of work or children or lack of time; cannot afford the tuition; difficulty understanding English; difficulty understanding children or grandchildren’s homework.
Lack of time	55	(12.9)	
Too expensive	39	(9.2)	
Language difficulties	34	(8.0)	
Other (passport, paperwork etc.)	23	(5.4)	
Total	426	(100)	
Housing issues:	n	(%)	Examples of housing problems/issues:
Household stays in:			Overcrowding; difficulty paying rent; keeping up with the high rent.
Apartment	331	(79.8)	
House	49	(22.8)	
Homeless/shelter	35	(8.4)	
Total	415	(100)	
Household has problems:			
No housing problems	106	(50.0)	
Housing problems	71	(33.5)	
Homeless/shelter	35	(16.5)	
Total	212	(100)	
Employment issues (for those not working):	n	(%)	Examples of barriers or reasons for not working:
Unable to work	103	(54.2)	Care giving or babysitting prevents them from working; disabled/sick and unable to work; language barriers; jobs not providing sufficient income; only part-time jobs available.
Other barriers	29	(30.5)	
Language barriers	58	(15.3)	
Total	190	(100)	
Language issues:	n	(%)	Examples of language issues or problems:
No language issues	222	(47.7)	Limited language skills impedes (some) family members from obtaining needed services; needing translators; relatives are acting as translators.
Sometimes have problems	24	(5.2)	
Numerous problems	219	(47.1)	
Total	465	(100)	

*Many respondents did not answer all questions.

discrimination was an issue and “Micronesians should be treated fairly in the workplace” and there should be efforts made to “stop discrimination.” A respondent stated that “racism is a problem here in Hawaii, especially when applying for a job.” Another respondent stated that Micronesians have a “fear of others (and) being discriminated against and mistreated.”

Study Limitations

The main study limitation has to do with the sampling strategy, which could have been influenced by selection bias introduced by survey interviewers and how they decided to find Micronesian migrants in the various communities in Hawaii. This is inherent in the snowball sampling technique whereby participants recruit other participants via social networks. This may have resulted in oversampling of both homeless and of those in public housing and under-sampling of those in houses or other residential areas. Micronesians were deliberately hired to conduct the assessment in order to minimize such selection bias. The Micronesian migrants are themselves migrants from these small island jurisdictions, are keenly aware of where their kinsmen are, through what is known as the “coconut wireless” or “word of mouth” in these small Hawaii communities, and thus they were hired for their knowledge of where other Micronesian migrants were residing. Therefore, while the sample might be non-representative and the results might not necessarily be representative of the Micronesian community as a whole, this study presents a picture of some of the issues facing recent Micronesian migrants to Hawaii. Interviewers were trained to fill in the assessment checklist, yet there is likely to be interviewer bias in this assessment in filling out the open-ended questions. Survey coordinators with backgrounds in education and college student interviewers may have over-emphasized education as issues for Micronesian migrants. However, Micronesians are familiar with how education is a stepping stone to better employment. The U.S. government invested heavily in primary, secondary and higher education for Micronesians when the jurisdictions were under the Trust Territory of

the Pacific Islands (TTPI), especially from the 1960’s until the 1980’s. Seeking higher education in Guam, Hawaii or the U.S. was a precursor for employment in the U.S. funded governments of the TTPI. Divestment in all of Micronesia that ensued after the Compacts led to a decline in both government jobs and funding of education and health infrastructures (Hezel, 2006; 2007).

It is also likely that there was recall bias and bias in having one respondent provide information for all household members. All information captured on household members was provided by one respondent per household through proxy. The respondents were mainly head of households or their spouses (82%), so it is likely that they were very knowledgeable about people in their household. Further, it is not known if the self-reported health conditions were based upon a doctor’s diagnosis, and therefore, some of the estimates here are likely underestimates.

Discussion

Micronesian migrants in Hawaii continue to struggle to adjust to their new circumstances in a new place, although many have not reported any problems and are essentially just another migrant group. To summarize, regarding their health status, the majority of respondents did not report any health problems among themselves or members of their household, yet for those who were reported to have health problems, chronic diseases were the vast majority of these reported conditions. Diabetes was the most frequently reported medical condition in this study with one in three adults 40 years old and older reported having diabetes which is consistent with the recent studies that found a very high prevalence of diabetes in the Marshall islands of at least 20% (Yamada, Dodd, Soe et al, 2004). A recent pilot study on Oahu among Marshallese showed that the majority of patients had poor glycemic control and had co-morbidities such as untreated hypertension (Reddy, Shehata, Smith and Maskarinec, 2005).

For health insurance, the majority (61.3%, n= 1,471 of 2,400 responding) reported (by proxy) being covered by Hawaii MEDQUEST (income

based health insurance, including Medicaid-Fee for Service). A sizeable proportion (28.9%) reported problems accessing health care such as filling out insurance forms or interacting with organizations/agencies. As noted earlier, many Micronesians reported problems communicating or writing in English for themselves or their relatives.

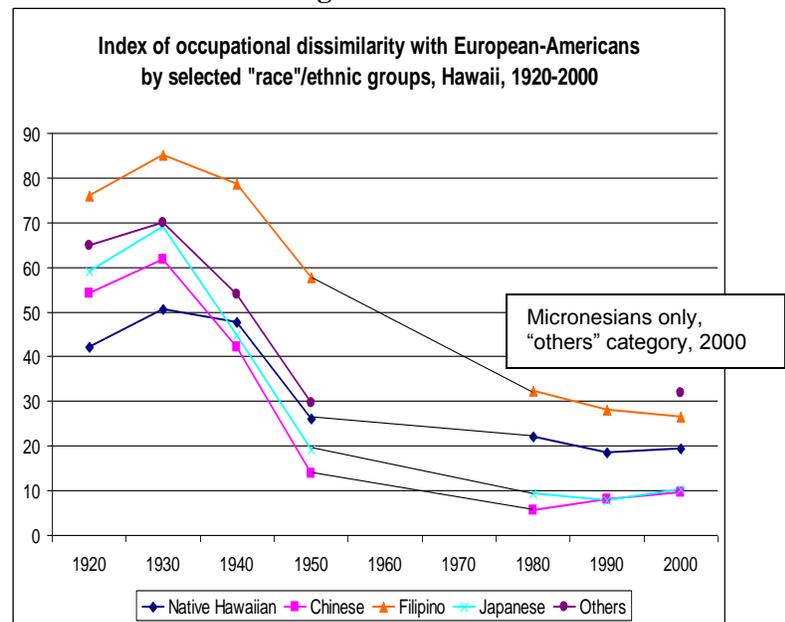
About one-half report of the sample were reported (by proxy) to speak only their native languages at home, while the other half reported using both their native language and English. For language problems, about one-half (47.7%) reported not have any problems; whereas, the remainder reported having some problems (5.2%) or numerous problems (47.1%). Many reported problems accessing ‘the system’ for health or social services, and many times this was a language issue.

Regarding education, the majority of household members less than 18 years of age were reported to be in school (69.3%) or were infants (22.4%). However, the proportion of reported high school graduates is much lower than in Hawaii. The majority of respondents did not report any educational issues (64.6%, n= 275 of 426 responses), but some said they lacked time to go to school, some reported financial constraints, and some reported language difficulties.

More than one-half of Micronesians households did not report members receiving public assistance and the majority of the sample reported being employed. Most Micronesian migrants who reported being employed reported occupations in service industries. The graphic in Figure 2 depicts the changing occupational structure of Hawaii’s ethnic groups over time and where Micronesians were in this occupational structure in 2000. An index of dissimilarity in occupation was calculated for ethnic groups in Hawaii from 1920-2000 using the U.S. Census. As an illustration, Filipinos in the 1920’s and 1930’s show the greatest divergence from Europeans/European-Americans, since the majority of Filipinos were laborers and the majority of the comparison group were in management, skilled labor, business or professions. The same pattern was

seen for Chinese and Japanese. Over time as all groups left the plantations, they became more diversified in their occupational structure and became closer to the comparison group pattern by the later part of the 20th century. Filipinos and Native Hawaiians however, remain the most divergent from the comparison group and from the Chinese and Japanese. The ‘others’ group depicted in the graph prior to World War II included all other ethnic groups (such as Koreans or Puerto Ricans), who follow a similar pattern as the Chinese and Japanese. Since data on Micronesians were available in the 2000 US Census, the ‘other’ category was changed to comprise only Micronesians in the 2000 Census. It is notable that the Micronesians place on the graph is even more divergent than the Filipinos, and that they are clustered mainly in lower paying service and labor occupations, and few are in business or the professions. As one of Hawaii’s newer migrant groups, Micronesians are at the bottom of the occupational ladder and

Figure 2



The index of dissimilarity is calculated as the sum of absolute differences in occupational distributions at each time period for each ethnic group using European-Americans as the comparison group. The higher the number, the more divergent the occupational distribution is from the comparison group, and the closer each group gets to zero, the closer each group gets to the occupational distribution of the comparison group.

the low wages paid in the service industries where Micronesian migrants tend to work, coupled with high prices for housing and rentals, contribute to poverty and low socio-economic status of Micronesian migrants. Poverty is linked to poor health and the high cost of housing in Hawaii compounds the problem of survival for people of low income. Findings from this assessment of Micronesian migrants found that discrimination in job seeking as well as language problems are areas of concern for these migrants.

Just over two-thirds (69.1%, n= 288 of 415 responding households) of Micronesian households reported living in an apartment (40.1%) or house (29%). However, 16.6% (n= 69 of 415 responding households) were reported to be homeless or living in a homeless shelter. Further evidence of housing issues is the high (average) number of persons per household at 6.8 (or about 7 persons) and the average number of bedrooms reported for apartments and houses was only 2.3, suggesting crowded housing arrangements. Marshallese (RMI) households had a much higher average number of household members (7.4) than households from the FSM (6.1).

Data was obtained on housing from the Department of Health's Easy Access Project (EAP), which provides services and referrals for immigrants and migrants along with language translation services from the Bilingual Health Services Program. The statistics for calendar years 1999-2008 on Micronesian migrants show that Micronesian migrants comprised 12.8% of the EAP service population, yet they comprise less than 1% of Hawaii's total population. EAP data illustrate problems other than health that Micronesian migrants face, particularly for housing. Micronesians, like most of the EAP clients (e.g. immigrants from the Philippines or China), need assistance finding jobs and many do not speak English very well. Yet EAP program statistics show that Micronesians reported the lowest ratio of rooms per number of persons in their residence (averaging 5 rooms for 8-10 people), and they were most likely to report unsatisfactory housing conditions than other immigrants and migrants in the EAP. For

housing, although more than one-half of respondents did not report problems, one-third (33.5%) reported problems including overcrowding, and problems paying rent; many were homeless. The high cost of housing was mentioned repeatedly as an issue Micronesian migrant's face in Hawaii.

Regarding employment issues, the majority (54.2%), mainly women, reported barriers to employment and being unable to work due to care-giving responsibilities for children and other relatives. Some Micronesian migrants reported other socio-cultural assimilation issues and some reported job and housing discrimination.

For suggested community-based interventions to address some of the health, language and other issues facing Micronesian migrants, respondents suggested hiring more language interpreters and ensuring access to ESL, assisting with educational costs and treating Micronesians fairly in the workplace and in the community.

The top three responses to the open-ended questions about reasons for migrating to Hawaii among Micronesians in this assessment were for better medical/health care, better education and better employment/job opportunities. Based on the responses in this assessment, the migration pattern observed here is that of chain migration. Chain migration is a migration process which is based upon a small number of individuals who migrate, then send information back to their home country, which subsequently results in additional migration from the originating country (mainly through relatives) (Mayhew, 2004). For Micronesians, the vast sums of U.S. monies spent on education allowed many Micronesians to study in various parts of the U.S. from the 1960's to the 1980's, which in turn allowed many of them to remain where they studied and establish new homes. One of these key areas has been the state of Hawaii, which is one possible impetus for the chain migration spurred by the economic changes after the 1986 Compacts of Free Association.

It is notable that health care and education were the two key reasons for migrating since

employment is usually a key reason migration. And, although there were some differences between the Chuukese and Marshallese on some indicators, this is probably more a reflection of the longer time period of the migration stream from the RMI to Hawaii, as evidence by the 2003 U.S. Census of Micronesians data, as well as the propinquity of the Marshall Islands to Hawaii. Marshallese reported more high school graduates, more employer based health insurance, better English ability and higher proportions on TANF/TANOF (which has a 5 year residency requirement). Chuukese reported less high school graduates, but also more college graduates than the Marshallese, more government-based health insurance, and more language problems.

There are no important differences between the Micronesian migrants coming from the Republic of the Marshall Islands versus the Federated States of Micronesia (migrants mainly from Chuuk), with the exception that Marshall Islanders have some socio-economic circumstances that suggest they have had a longer migration stream than those from other Micronesian islands. The Republic of the Marshall Islands is closer to Hawaii than the nearest Pacific urban center of Guam, and Marshallese having been traveling to Hawaii for several decades for healthcare associated with nuclear weapons testing and radiation induced cancers.

The impact of this Micronesian migration to Hawaii includes health and social service costs to the State (MEDQUEST and public housing). There are definite challenges for the Department of Health (DOH) to garner resources and design culturally appropriate means (including translators) to alleviate the burden of disease. The DOH is focusing its resources on infectious diseases (TB, STD's, Hepatitis B, Hansen's etc) and the issues of tracking and adherence to medications for a population that can migrate freely in the U.S. The DOH is also focusing on the development of culturally tailored messaging

and resources to address chronic diseases such as diabetes, along with current projects for translated materials, and education on sanitary practices (garbage disposal, lice) in crowded housing. Additional surveillance should be needed within DOH programs to include Micronesian ethnicity in program statistics. Given that diabetes is a main health concern among Micronesians living in Hawaii, efforts to target diabetes among this population should be a priority.

Acknowledgements

From the Hawaii State Department of Health, Community Health Division, Barbara Yamashita, along with Christina Teel and Valerie Yoshida of the Hawaii Comprehensive Cancer Control Program, Chronic Disease Management and Control Branch, all provided support and assistance for this project throughout its entirety.

From the Volunteer Resource Center of Hawaii, Mary Matayoshi supervised the overall data collection effort while Richard Salvador and Fay Uyeda coordinated the data collection in the field for the health assessments, along with their numerous volunteers: Howard Abraham, Talia Cardines, Melissa Chun, Lydia Cruz, Mideko Epel, Valentine Harrell, Hercules Huihui, Orsi Johnson, Sister Bitrina Kirway, Charlene Loek, Lani M. Perkins, Leilani C.U. Perkins, Kimeko Richim, Romelia Shiroma, Whitney S.M. Shiroma, Edelene Uriarte and Alan Vandermyden. On the Big Island of Hawaii, health assessments were collected by Merlina M. Ishoda. Nancy Harkins, Ina Krupitsky and Christopher Matt all helped with the data entry.

Funding

This work was initially funded by CFDA 93.919 and also by CFDA 93.283 (both under cooperative agreement number 5U58DP000799-01) from the Centers for Disease Control and Prevention (CDC) and does not necessarily represent the official views of the CDC.

References

- Alliance for Excellent Education. (2009). *Understanding high school graduation rates in Hawaii*. Retrieved March 17, 2009, from http://www.all4ed.org/files/Hawaii_wc.pdf
- Borjas, G.J. (2006). Making it in America: Social mobility in the immigrant population. NBER Working Paper 12088. Cambridge, MA: National Bureau of Economic Research. Retrieved January 7, 2009, from <http://www.nber.org/papers/>
- Brown, D.R., Hernandez, A., Saint-Jean, G., Evans, S., Tafari, I., Brewster, L.G., Celestin, M.J., Gomez-Estefan, C., Regalado, F., Akal, S., Nieranberg, B., Kauschiner, E.D., Schwartz, R., & Page, J.B. (2008). A participatory action research pilot study of urban health disparities using rapid assessment response and evaluation. *American Journal of Public Health*, 98, 14-24.
- Butt, L. (2002). Introduction. Culture, change and well-being: health transitions in the Pacific. *Pacific Health Dialog*, 9, 251-253.
- Cagurangan, M.V. (2008, September 30). Poor health care plagues the Pacific Islands. *Marianas Variety*. Retrieved October 8, 2008, from <http://pidp.eastwestcenter.org/pireport/2008/October/10-01-10.htm>
- Centers for Disease Control and Prevention. (2009). Social determinants of health. Retrieved January 24, 2010, from <http://www.cdc.gov/socialdeterminants/>
- Chung, C.S., Tash, E., Raymond, J., Yasunobu C., and Lew, R. (1990). Health risk behaviors and ethnicity in Hawaii, *International Journal of Epidemiology*, Vol. 19, pp. 1011-1018.
- Clark, R.L. & Berkowitz King, R. (2008). Social and economic aspects of immigration. *Annals of the New York Academy of Sciences*, 1136, 289-297.
- Curtis, M. (2004). The obesity epidemic in the Pacific Islands. *Journal of Development and Social Transformation*, 1(1) 37-42.
- Diaz, A. (1997). The health crisis in the US associated Pacific islands: moving forward. *Pacific Health Dialog*, 4, 116-129.
- Hawaii State Department of Health (2008-2009). Data from the Hawaii Breast and Cervical Cancer Control Program, the STD/AIDS Prevention Services Branch, and the Hansen's Disease Program.
- Hawaii State Department of Health (2006). Hawaii Diabetes Prevention and Control Program. Retrieved January 24, 2010, from <http://hawaii.gov/health/family-child-health/chronic-disease/diabetes/resourcesandtools.html>
- Hawaii State Department of Health (2007). Hawaii Tuberculosis Control Program. Retrieved January 24, 2010, from <http://www.hawaii.gov/health/family-child-health/contagious-disease/tb/stats.html#hawaii>
- Hezel, F. (1984). A brief economic history of Micronesia. Micronesian Seminar. Retrieved January 24, 2010, from <http://www.micsem.org/pubs/articles.htm>
- Hezel, F. (2007) Is that the best you can do? A tale of two Micronesian economies. Retrieved January 24, 2010, from <http://www.micsem.org/pubs/articles.htm>
- Hezel, F.X., & Samuel, E. (2006). Micronesians abroad. Micronesian Counselor. Retrieved January 24, 2010, from http://www.micsem.org/pubs/counselor/frames/microsabroad_fr.htm
- Hodge, A.M. , Dowse, G. K. and Zimmet, P.Z. (1996). Obesity in Pacific populations. *Pacific Health Dialog*, 3 (1),

- Hoover, W., & Nakaso, D. (2007, July 8). Micronesians fill Hawaii shelters. Honolulu Advertiser. Retrieved January 24, 2010, from <http://the.honoluluadvertiser.com/article/2007/Jul/08/ln/FP707080365.html>
- Holmes, S.M. (2006). An ethnographic study of the social context of migrant health in the United States. *PLoS Medicine*, *10*, http://medicine.plosjournals.org/archive/1549-1676/3/10/pdf/10.1371_journal.pmed.0030448-S.pdf
- Issel, L.M. (2009). *Health program planning and evaluation: a practical, systematic approach for community health* (2nd ed.). Chicago, IL: Jones and Bartlett Publishers, p. 124.
- Jackson, R. (1997). Dietary genocide: eating to an early death in Micronesia. *Pacific Health Dialog*, *4*, 88-89.
- Katz, A.R., Palafox, N.A., Johnson, D.B., Yamada, S., Ou, A.C., & Minami, J.S. (2004). Cancer epidemiology in the freely associated U.S. Pacific Basin jurisdictions: challenges and methodologic issues. *Pacific Health Dialog*, *11*, 84-87.
- Kroon, E., Reddy, R., Gunawardane, K., Briand, K., Riklon, S, Soe, T., & Diaz Balaoing, G. (2004). Cancer in the Republic of the Marshall Islands. *Pacific Health Dialog*, *11*, 70-77.
- LaFrance, A. (2009, Feb. 25). Legal aliens. *Honolulu Weekly*. Retrieved December 13, 2009, from <http://honoluluweekly.com/cover/2009/02/legal-aliens/>.
- Mayhew, S. (2004). *A Dictionary of Geography*. Oxford University Press. Retrieved February 3, 2010 from <http://www.encyclopedia.com/doc/1O15-chainmigration.html>.
- Maskarinec, G., Novotny, R., & Tasaki, K. (2000). Dietary patterns are associated with body mass index in multi-ethnic women. *Journal of Nutrition*, *130*, 3068-3072.
- McMurray, C. & Smith, R. (2001). *Diseases of Globalization*. London: Earthscan Publications Ltd.
- Nations of Micronesia workgroup. Hawaii State Department of Health. Retrieved February 3, 2010 from <http://nationsofmicronesia.wordpress.com/>.
- Palafox, N.A, Yamada S., Ou A.C., Minami, J.S., Johnson, D.B., & Katz, A.R. (2004). Cancer in Micronesia. *Pacific Health Dialog*, *11*, 78-83.
- Palafox, N.A., Buenconsejo-Lum, L., Riklon, S., & Waitzfelder, B. (2002). Improving health outcomes in diverse populations: Competency in cross-cultural research with indigenous Pacific Islander populations. *Ethnicity & Health*, *7*, 279-285.
- Palafox, N.A. & Yamada, S. (1997). The health predicament of the U.S.-Associated Pacific Islands: What role for primary health care? *Asian American and Pacific Islander Journal of Health*, *5*, 48-56.
- Person, D. (2004). The Pacific Island Health Project: easing the cancer burden in the United States Associated Pacific Islands. *Pacific Health Dialog*, *11*, 243-247.
- Pobutsky, A. M., Buenconsejo-Lum, L., Chow, C., Palafox, N. A. & Maskarinec, G. G. (2005). Micronesian migrants in Hawaii: health issues and culturally appropriate, community-based solutions, *Californian Journal of Health Promotion*, *3*, 59-72.
- Pollock, N. (2002). Health transitions, fast and nasty: the case of Marshallese exposure to nuclear radiation. *Pacific Health Dialog*, *9*, 275-282.
- Popkin, B.M., Horton, S.H. & Kim, S. (2001). The nutrition transition and prevention of diet-related diseases in Asia and the Pacific. *Food and Nutrition Bulletin*, *22*, supplement.
- Raphael, D. (2006). Social determinants of health: Present status, unanswered questions and future directions. *International Journal of Health Services*, *36*, 651-657.

- Reddy, R., Shehata, C., Smith, G., & Maskarinec, G.G. (2005). Characteristics of Marshallese with type 2 diabetes on Oahu: A pilot study to implement a community-based diabetic health improvement project. *California Journal of Health Promotion*, 3, 36-47.
- Salganek, M.J. & Heckthorn, D.D. (2004). Sampling and estimation in hidden populations using respondent driven sampling. *Sociological Methodology*, 34, 193-239. Retrieved September 30, 2009, from http://www.princeton.edu/~mjs3/salganik_heckthorn04.pdf
- Shell, E.R. (2001 June). New world syndrome. *Atlantic Monthly*. Retrieved December 13, 2009, from <http://www.theatlantic.com/doc/200106/shell>
- Shmulewitz, D., Auerbach, S.B., Lehner, T., Blundell, M.L., Winick, J.D., Youngman, L.D., Skilling, V., Heath, S.C., Ott, J., Stoffel, M., Breslow, J.L., & Friedman, J.M. (2001). Epidemiology and factor analysis of obesity, type II diabetes, hypertension, and dyslipidemia (Syndrome X) on the island of Kosrae, Federated States of Micronesia. *Human Heredity*, 51, 8-19.
- Simon, S.L., Bouville, B., & Land, C.E. (2006). Fallout from nuclear weapons tests and cancer risks. *American Scientist*, 94, 48-57. Retrieved January 1, 2009, from <http://www.americanscientist.org/issues/feature/2006/1/fallout-from-nuclear-weapons-tests-and-cancer-risks/1>
- SPSS. (2009). PASW Statistics. Retrieved February 3, 2010, from <http://www.spss.com>
- Tokuda, A.A., Cernada, G.P., & Kurahara, D.K. (2001). Health care in the Freely Associated States in Micronesia: strategies beyond the Compacts. *Pacific Health Dialog*, 8, 207-212.
- US Department of Commerce, Bureau of the Census. (2004). 2003 Census of Micronesians in Hawaii, Guam and the Commonwealth of the Northern Mariana Islands. Washington, D.C.: unpublished tabular data. Source: Michael J. Levin.
- US Department of Commerce, Bureau of the Census (2009). Final Report: 2008 Estimates of Compact of Free Association (COFA) Migrants, April. Retrieved January 26, 2009, from http://uscompact.org/FAS_Enumeration.pdf
- US Department of the Interior Office of the Inspector General. (2008). *Insular area health care: At the crossroads of a total breakdown*. Retrieved October 21, 2008, from <http://www.doioig.gov/upload/2008-G-0040.pdf>
- US General Accounting Office. (2001). *Foreign relations: Migration from Micronesian nations has had significant impact on Guam, Hawaii, and the Commonwealth of the Northern Mariana Islands*. Report to Congressional Requesters. Retrieved October 21, 2008, from <http://www.gao.gov/new.items/d0240.pdf>
- US General Accounting Office. (2003). Compact of free association: An assessment of the amended Compacts and related agreements. Statement of Susan S. Westin, Managing Director, International Affairs and Trade, Testimony Before the Sub-Committee on Asia and the Pacific, Committee on International Relations, House of Representatives, June 18th.
- Withy KM, F Amoa, JM Andaya and SP Berry (2008). Healthcare needs of the homeless of Oahu. *Hawaii Medical Journal*, 67, 213-217.
- World Health Organization (2004). *Country health information profile: Republic of the Marshall Islands*. Retrieved December 13, 2009, from <http://www.who.int/countries/mhl/en/>
- World Health Organization. (2004). *Country health information profile: Federated States of Micronesia*. Retrieved December 13, 2009, from <http://www.who.int/countries/fsm/en/>
- World Health Organization. (2008). Weekly epidemiological record. No. 33, 83, 293–300, 15 August. Retrieved October 27, 2008, from <http://www.who.int/wer/2008/wer8333.pdf>

- World Health Organization. (2007). Epidemiologic review of Leprosy in the Western Pacific Region. Retrieved October 27, 2008, from http://www.wpro.who.int/NR/rdonlyres/3FE404EA-973F-4288-BA9F-A0DFE4482104/0/2007_Leprosy_Review.pdf
- Yamada, S., Dodd, A., Soe, T., Chen, T.H., & Bauman, K. (2004). Diabetes mellitus prevalence in out-patient Marshallese adults on Ebeye Island, Republic of the Marshall Islands. *Hawaii Medical Journal*, 63, 45-51.
- Yuan, S., Kole, S., & Yuen, S. (2008). Homeless service utilization report: Hawaii 2008. Honolulu: University of Hawaii at Manoa, Center on the Family. Retrieved January 7, 2009, from <http://uhfamily.hawaii.edu/publications/brochures/HomelessServiceUtilization2008.pdf>

Author Information

*Ann M. Pobutsky, PhD
Chronic Disease Epidemiologist
Community Health Division
Hawaii State Department of Health
1250 Punchbowl St., Rm. 218
Honolulu, HI 96813
Email: ann.m.pobutsky@doh.hawaii.gov
Phone: (808) 586-4485

Dmitry Krupitsky, PhD
Chronic Disease Management and Control Branch,
Hawaii State Department of Health

Seiji Yamada, MD, MPH
University of Hawaii at Manoa,
John A. Burns School of Medicine, Department of
Complementary and Alternative Medicine

* corresponding author