Maternal Predictors of Infant Health Outcomes among Hawaiians

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*Native and Part Hawaiians are referred to as Hawaiians in this paper

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Abstract

Disaggregated data, vital statistics, and a comprehensive literature review were used to assess the relationship between Hawaiian maternal predictors and infant health outcomes. Despite near universal health care coverage, Hawaiians continue to use less prenatal care, have average rates of low birth weight, and the highest infant mortality rates compared to other ethnic groups in Hawaii. Specific investigations and interventions are necessary to reduce the disparity of Hawaiian infant health outcomes.

Introduction

Despite near universal health care coverage, Native and Part Hawaiians* experience among the highest morbidity and mortality rates compared to other ethnic groups in Hawaii and in the continental United States.[1-4] Limited Hawaiian-specific analysis, particularly among women and children makes it difficult to successfully target interventions that might address the disparity of poor infant health outcomes among Hawaiians. This is particularly important in maternal and child health where policy interventions are highly effective at improving outcomes.[5] Other studies have found significant associations with ethnic specific maternal characteristics and prenatal care utilization, low birth weight and infant mortality.[1-3,6-10] Interestingly, many of the risk factors commonly associated with health behavior and outcomes are not applicable to Hawaiians because they have universal access to prenatal care. This paper is a comprehensive review of maternal risk factors and infant health outcomes among Hawaiians. The aim is to identify elements that can be used as tools to drive policy, support culturally competent health services, and suggest further areas of research to adequately address Hawaiian maternal and child health care needs.

Methods

Data Collection on Hawaiians

Traditional data collection and reporting often fails to expose health issues related specifically to the Hawaiian population, because Hawaiians are typically grouped with other Pacific Islanders and Asian Americans. Additionally, data is aggregated at the national level making it difficult to assess the true health outcomes for Hawaiians who live in Hawaii.[11] These broad categorizations result in misleading conclusions. For example, in a 1998 Monthly Vital Statistics Report, the authors conclude "mortality rates were lowest for infants born to Asian and Pacific Islanders mothers (5.3), followed by white (6.3), American Indian (9.0), and black (14.6) mothers" at the national level.[12, p.3] The favorably low Asian and Pacific Islanders infant mortality rate is not representative of the Hawaiian infant mortality rate. The limited disaggregated data, when available, demonstrates Hawaiians experience higher rates of infant mortality, in Hawaii and in the U.S.[1,9]

Another common generalization, which further masks the true health status of Hawaiians, are studies that fail to distinguish any ethnic group and report data in aggregate form for everyone living in Hawaii. For example, research conducted by the Casey Foundation examined maternal and infant health outcomes in Hawaii during the 1990s and concluded that children of Hawaii got off to a significantly healthier start to life when compared to national averages.[13] The eight measures that defined a "healthy start to life" were teen births, repeat teen births, births to unmarried women, low maternal education, late or no prenatal care, low-birthweight births, preterm births, and smoking during pregnancy.[13] The disaggregated live birth data by ethnicity was limited to 4 categories; Non-Hispanic white, Non-Hispanic Black, Hispanic and Other. Ethnic-specific data covering all Hawaii-resident, non-military, singleton live births from 1979-1992, revealed more complex and worrisome health outcomes. Compared to whites, Japanese and Filipinos, Hawaiian women had a higher percentage of parity for age (over 3 times the percentage of whites), and a higher percentage of teen births (also over 3 times the percentage of whites).[10] In addition, studies indicate Hawaiian women are more likely to smoke during pregnancy than women in other ethnic groups in Hawaii.[1,14]

In 1975, a Hawaiian non-profit organization, ALU LIKE, Inc., initiated research specific to Hawaiian health issues with funding from the federal government. These and other efforts by community-based organizations have begun to identify and address health issues related specifically to Hawaiians living in Hawaii.[15]

While non-profit agencies and traditional healers work toward improving the health and maximizing the strengths of Hawaiians, the paucity of service and health outcomes data, particularly data that disaggregates Hawaiians versus non-Hawaiian populations, limits Hawaiian specific policy and culturally specific interventions.

Existing Data on Maternal and Child Health among Hawaiians

Hawaiians in general suffer higher rates of preventable chronic disease than other populations in the United States.[1,3,15] In addition (and perhaps related to chronic disease), Hawaiians experience infant mortality at higher rates than other ethnic groups in Hawaii and in the continental U.S.[1-3,9,17,18] These poor health outcomes are surprising, given the near universal availability of health services under the Prepaid Health Care Act requiring most employers to provide coverage in a pre-paid health care plan that includes maternity benefits to employees. Health insurance in 1977 covered approximately 97% of the population; subsequent expansions of Medicaid eligibility in the late 1980s and the enactment of the State Health Insurance Program in 1989 further increased coverage.[10] Despite health service availability, Hawaiians continue to under-utilize services.[15] Further analysis is needed to determine the reasons for under-utilization and the extent of its impact.

Data Utilized for this Paper

A literature review search in PubMed was done to collect publications regarding Hawaiian maternal and infant health. The keywords were: 'Hawaiian infant mortality', 'Hawaiian prenatal care', and 'Hawaiian low birth weight'. Of the 26 articles reviewed, four articles fit the following criteria: published within the past 10 years, used Hawaiian vital records after 1979 (when near universal health care coverage was established), and compared maternal prenatal health utilization and/or infant health outcomes among non-military Hawaiians and other ethnic groups living in Hawaii. Two additional articles were included: one that assessed the relationship of maternal characteristics (including geographic location) and low birth weight among ethnic groups in Hawaii (excluding Hawaiians) and a second article that presented a qualitative study regarding barriers to prenatal care pregnant women from different ethnic groups experience.[7,8] Extracted findings and implications from these studies were combined with current demographic and perinatal data from the Hawaiian Department of Health. The Healthy Hawaii 2000 program initiated by the Department of Health in Hawaii was responsible for gathering data to assess the health status of residents in Hawaii.[16,17] Data from previous studies and vital statistics from the Department of Health were used to perform a detailed review of the maternal risk factors and infant health outcomes of ethnic groups living in Hawaii, with particular attention to Hawaiians.

Results

Despite near universal health care coverage, Hawaiians continue to use prenatal care less, have average rates of low birth weight yet have infant mortality rates that are very high when compared to other ethnic groups in Hawaii (See Table 1).

Initiation and Utilization of Prenatal Care

The initiation to prenatal care and subsequent utilization of prenatal care throughout pregnancy differs among ethnic groups in Hawaii.[17] Hawaiian women, who had the most pregnancies (5,547) and most live births (4,717) of any ethnic group, had the lowest percentage of first trimester prenatal care (77.8%).[17] By comparison, 92.4% of Chinese and 90.2% of

Table 1.— Birth Rates, Maternal Characteristics, Percentages of Low Birthweight and Infant Deaths for Non-Military Ethnic Groups Residing in Hawaii, 2000 (page 7 and 9 of text)

Ethnic Group	Birth Rate (per 1,000 live births)	% Live Births to unmarried mothers	Live Births and Prenatal Care Utilization		Low Birth Weight Rate (<2500 grams) per 1,000 births	Infant Deaths		# of Infant Deaths and Low Birth Weight (< 2500 grams)
			% care in 1st trimester	% no care > 1st trimester		# of Deaths	Rate per 1,000 live births	
Caucasian	13.0	17.1	88.9	10.1	5.3	23	7.7	15
Hawaiian	19.6	55.0	77.8	18.6	7.3	49	7.8	30
Chinese	8.2	10.8	92.4	4.5	6.9			
Filipino	18.6	32.6	83.4	14.0	9.3	23	7.7	16
Japanese	7.9	16.7	90.2	6.5	9.4	11	5.8	8
All Others	19.5	32.5	77.1	18.8	7.4	27	8.0	17
Total		32.3	85.0	13.8	7.5	133	7.6	86

Birth Rate Data from Health Trends in Hawaii http://66.135.230.7/research/Demographics_files/demographics.html?body=sheet015.htm
All other data from Department of Health 2000 Vital Statistics http://www.state.hi.us/doh/stats/vr_00/index.html

Japanese and 88.9% white women living in Hawaii received prenatal care, thereby achieving the national and state "Healthy People Objective" in 2000 [16]. The percentage of women who do not receive care after the first trimester is also highest among Hawaiian women (18.6%), compared to white (10.1%), Chinese (4.5%), Filipino (14.0%) and Japanese (6.5%) women.[17]

The researchers also analyzed the association between maternal characteristics and prenatal care. Using Hawaiian live birth vital record files from 1979-1992, two studies found determinants of inadequate prenatal care use or no prenatal care included women who were: Hawaiian, unmarried, under 18 years old, had high parity for age and low educational attainment.[6,10] Hawaiian women, who are at higher risk for each of these indicators compared to other ethnic groups, represented almost half of the total number of pregnant women who did not receive prenatal care.[6,10] Even once prenatal care is initiated, Hawaiians are at a significantly greater risk of not receiving subsequent care [6,10] Risk factors associated with low prenatal care utilization among Hawaiians were similar to the risk factors other ethnic groups experience, and include high parity for age, unmarried, low educational attainment, same ethnicity as partner, and not born in the U.S. (see Table 2).

To determine other predictors of prenatal care use, the researchers looked at qualitative data comparing Filipino, Japanese and Hawaiian women living in rural East Hawaii (on the Island of Hawaii).[7] One study conducted five focus groups in a community settings with a public health nurse over a two-month period and engaged women in intimate discussions regarding stressors during pregnancy, which may serve as barriers to prenatal care utilization.[7] A content analysis for these groups revealed different themes of stressors for each ethnic group (shown in Table 3). Hawaiian women expressed concerns regarding body image, and conflicts with spouse or mate, which were not identified as stressors among women of the other ethnic groups. Although methodologically limited, the unique cultural differences between women's experiences were found to explain an array of factors associated with prenatal care utilization.

Low Birth Weight

In 2000, the low birth weight rate in Hawaii was 7.5/1,000 live births and varied by ethnicity and geographical area. The low birth weight rate for Hawaiian women was 7.3 per 1,000 live births compared to Filipino and Japanese babies at 9.3 and 9.4, respectively. Caucasian, Chinese and all other ethnic groups in Hawaii have low birth weight rates of 5.3, 6.9, 5.8, respectively. The absolute number of low birth weights, however, is highest among Hawaiians; of the 1,317 total low birth weight births, 345 infants were Hawaiian (26.2%).[17] Table 4 shows the number, rate and percentage of low birth weights across ethnicity.

The wide range of low birth weight (5.3-9.4 per 1,000 births) across ethnic groups in Hawaii can be further disaggregated by census tracts.[8] From the 1980 Census data, covering 155 census tracts, live birth vital record files for infants born between 1979 and 1987 were extracted. This analysis revealed that low birth weight was not associated with low socioeconomic status or inadequate prenatal care. However, single mothers were more likely to give birth to low birth weight infants. Ethnic heterogeneity was also associated with low birth weight. Low birth weight rates were much lower by contrast, in census tracts where one ethnic group comprised one-third or more of the total population.[8]

Another study compared birth weights among Samoan and Hawaiian (excluding Part Hawaiians) infants. Despite the common risk factor of low socioeconomic status, only 2.9% of Samoan births have low birth weight. Hawaiians, who had fewer risk factors compared to Samoans, actually had a higher percentage of low birth weight infants (6.6%).[9] The significant predictor for low birth weight in both groups was marital status (unmarried) and parity (primiparous women older than 17). Thirty eight percent (629/1,649) of Hawaiian mothers were unmarried compared to 29.8% (1,735/5,825) of Samoan mothers were unmarried.[9]

Infant Mortality

Hawaiians have the highest infant mortality rate in Hawaii. The disparity has gradually been decreasing over the past twenty years.[3] In 2000, the infant mortality rate for Hawaiians was 7.8 infant deaths per 1,000 live births. The lowest infant mortality rate in 2000 was among Japanese at 5.8/1,000.[17] Disaggregating the data further reveals that Native Hawaiians (excluding part Hawaiians) experience extremely high infant mortality rates at 13.9 deaths per 1,000 live births. Strikingly, most of these excess deaths occur in the postneonatal period.[8]

The magnitude of the infant mortality problem for Hawaiians can also be described by looking at totals rather than rates. The number of Hawaiian infant deaths (49) was more than double the number of Caucasian infant deaths (23) and Filipino infant deaths (23) and more than four times the number of Japanese infant deaths (11).[17] (See Table 1)

Discussion

Poor health outcomes are associated with socioeconomic status, clinical risk factors, and under-utilization in the U.S.[19] These outcomes are often found in diverse ethnic marginalized populations making it difficult to disentangle the relationship between socioeconomic status, access to care, and clinical factors. Hawaii is unique in that all populations, regardless of socioeconomic status have access to health services. Despite

the equal accessibility to care, this study shows that Hawaiian women and children are experiencing worse health outcomes compared to other groups in Hawaii due to risk factors beyond socioeconomic status and access to care: Hawaiian women use less prenatal care and have higher IMR despite universal access. Three important factors are associated with these findings: Hawaiian women who are unmarried and/or high parity for age use less prenatal care; (2) Hawaiian women do not have a higher rate of low birth weights despite lower socioeconomic status; and (3) Hawaiian infants have an excessive postneonatal mortality rate. These findings could potentially and significantly impact policy and program planning required to eliminate the excess health disparities Hawaiians experience.

Although a relationship between prenatal care utilization and low birth weight is widely assumed, this was not the case for Hawaiians. Unmarried marital

Table 2.— Factors Significantly Associated with Less Than Adequate Utilization of Prenatal Care by Maternal Ethnicity: 1979-1992 Hawaii-Resident Non-Military Singleton Livebirths (page 7 of text)

Maternal Ethnicity	Predictor of Not Following Adequate Prenatal Care Schedule				
	High parity for age	Unmarried	Low educational attainment	Parents of same ethnicity	Non-U.S. born status
Hawaiian	X	X	X	X	X
Caucasian	X	X	X	X	X
Japanese	X				X
Filipino	X	X	X	X	

- High Parity for Age: Defined as one or more previous births for adolescents, three or more previous births for mothers of age 18-21 years, four or more previous births for mothers 22-24 years and five or more previous births for mothers 25 years and older
- Low Educational Attainment: Defined as two or more years below expected grade level of age for adolescents (less than 18 years) or less than 12 years for adults.
- Non-U.S. born status: Women from US Territories included as part of the foreign-born group.

Table 3.— Themes of Stressors by Maternal Ethnicity (page 8 of text)

	Maternal Ethnicity		
	Hawaiian	Filipino	Japanese
Stressor:	Preoccupied with concerns over body image	Discomfort in seeking services outside family	Family-related stress
Stressor:	Conflict with spouse or mate who was perceived as dominant	Preoccupation with need to gain social acceptance in community	Discomfort in sharing troubling thoughts and feelings because they may be burdensome to others
Stressor:	Conflict with family who was perceived as overprotective	Cognitive style emphasizes expectations thru pregnancy are not congruent with lived experiences	Worries about pregnancy and birth complications

Table 4.— Number, Rate and Percentage of Low Birth Weight by Ethnicity of Infant, Born in Hawaii, 2000. (page 8 of text)

Ethnicity of Infant	Number of Low Birth Weight babies under 2500g	Low Birth Weight Rate (per 1,000 births)	% of Low Birth Weight (No. LBW in ethnic group/total no. of LBW babies)
Caucasian	213	5.3	16.2
Hawaiian	345	7.3	26.2
Chinese	46	6.9	3.5
Filipino	327	9.3	24.8
Japanese	199	9.4	15.1
All others	187	7.4	14.2
Total	1,317	7.5	100%

status and high parity for age, not utilization, were the key predictors of low birth weight among Hawaiians. These findings suggest that further research is needed to clarify whether barriers to prenatal care still exist and are not being adequately addressed for these populations. One possibility is that Hawaiian women are not engaging in western medicine for prenatal care, and may instead be seeking traditional practices for prenatal care. The implication is that public health professionals may need to focus on maximizing support services that are culturally competent for women who are not married and have high parity for age.

Perhaps the most troublesome finding of these studies is the high postneonatal deaths rates among Hawaiian infants. High rates of postneonatal death are rare in developed countries, as many causes of death during this stage are identified and prevented. It is surprising to find a high rate of postneonatal mortality because it is considered a "preventable mortality".[9] In the U.S., only Hawaiians and Native Americans experience more postneonatal mortality than neonatal mortality. In Hawaiians, who have near normal percentages of low birth weight, the higher than expected postneonatal mortality rates suggest that more research is needed to explore if poverty and maternal chronic disease, rather than low birth weight, are more important mediators of infant mortality risk in some populations.[9]

Alternatively, these findings may reflect a more general decline in public health in the United States. The nation's low international ranking (27th in 1997) of infant mortality is possibly a reflection of the lack of public health professionals' concern and decreasing public interest in maternal and child health over the past 20 years.[18] Decreased public interest would then translate into lower federal funding that has occurred, in part, because of setting priorities based on aggregate measurements. Overall infant mortality declines mask persistent and remedial problems in segments of the population.[18] The findings from this study on Hawaiian specific infant mortality predictors and outcomes are possibly indicative of this problem.

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