EXPLORING FACTORS RELATING TO PREVENTIVE CANCER SCREENINGS FOR NATIVE HAWAIIAN AND PACIFIC ISLANDER ADULTS

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Dedication

This dissertation is dedicated to my family, whose love and support championed me through this wild ride of a program.

Thank you mom and dad for your unquestioning love and for always uplifting me throughout this journey, even if you still do not know what my degree is in or what I research.

To my sister Summer, you show me every day how to balance life priorities and I am still amazed with all that you do for your family.

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Abstract

Native Hawaiian and Pacific Islander (NHPI) populations experience adverse health consequences due to unequal access to health promoting resources such as money, power, prestige, and knowledge/education. These communities are further hindered by sociocultural, geographic, and environmental factors that contribute to cancer health disparities. These populations face increased cancer incidence and mortality rates. However, further insight into influences on preventive health such as cancer screenings is needed. This dissertation examines sociological, psychological, and public health theoretical and conceptual frameworks explaining preventive health service utilization within these groups. This study utilizes a mixed methods approach to examine influences to cancer screenings through the use of a secondary data analysis of a 2017-2018 Hawai‘i Health Information National Trends Survey (HINTS) and 16 semi-structured interviews conducted in the State of Hawai‘i. Interviewees were recruited from two of the public housing site locations of the original survey consisting of Native Hawaiian, Chuukese, and Marshallese adults. An aim of this study is to triangulate findings from both a regression analysis and a thematic analysis of the interview findings to determine social factors that influence cancer screening behaviors. Another aim is to highlight the social drivers of health behaviors that one methodological approach might not have captured. Health comprehension, acculturation, and perceived racism/mistrust in healthcare were social factors of interest as demonstrated by influential causes from in the literature. These social factors are measured within a regression analysis fitted through the use of an expanded Andersen Model, Behavioral Model for Vulnerable Populations, to highlight cultural influences that might not be measured in more limited models. These social factors are also integrated within the interview guide used for discussion points. Results show that health comprehension barriers include language barriers and

misunderstandings due to a cultural norm of being uncomfortable asking doctors questions or a fear of being seen as unintelligent or not informed about healthcare options. Individuals who hold a neutral acculturation to both their ethnic culture and Western culture are less likely to be screened for cancer. Within public housing, inter-group views are held, as many Native Hawaiian interviewees felt that other Pacific Islander groups engage in unhealthy behaviors and lifestyles. A sense of fighting for resources between groups within public housing surfaced from these findings. Those who have not experienced racism are more likely to be screened for two of the cancers. The interviewees mainly discuss mutual respect with their doctors and positive interactions with their providers. Chuukese women speak of stories of others within their community who felt they were treated differently in healthcare. From the interviews, major themes emerged in that NHPIs fear cancer and other concerns such as being treated differently if they were to be diagnosed and anxieties surrounding a fear of the unintended costs of screenings. All of the interviewees highlight a belief in a higher power and that God is in control of their life and health. This demonstrates the role of God and faith in decision making for NHPI communities. Small, close circles where informational exchanges take place mainly consist of family and cohabitants. There is a lack of strong social ties and networks to other NHPI communities and organizations that could facilitate the use of health-based resources. Additionally, family members are not discussing health or family histories of disease. All of which is instrumental in early detection of illnesses and screening behaviors. NHPI populations feel a need to prioritize their family above their own needs, and are not engaging in self-care such as cancer screenings. This dissertation contributes to the understanding of the health of NHPIs and adds to the fields of medical sociology and public health by highlighting social processes found to be influential to NHPI cancer screening behaviors in Hawai‘i.

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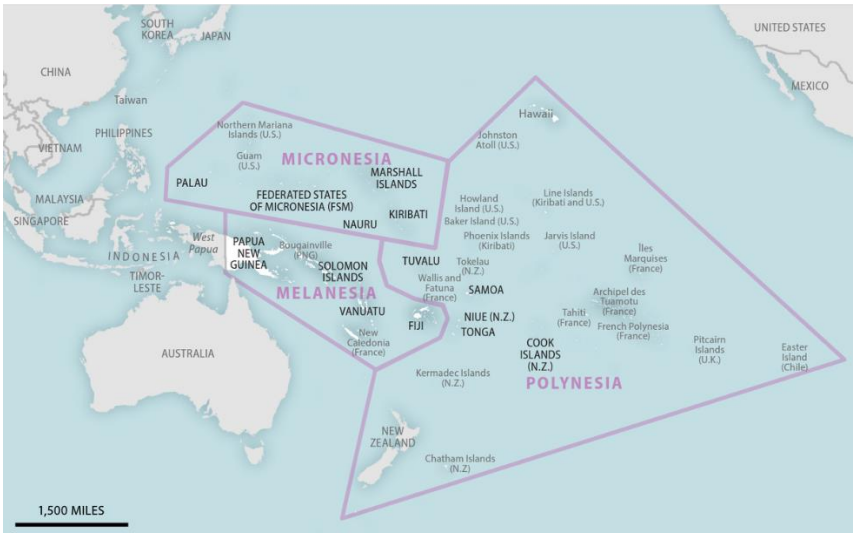
Chapter 1 Introduction

As populations age and disease information evolves, it is important that sociological research and services around the world focus on cancer and cancer screenings (Kerr et al., 2018). Medical sociologists have long been concerned about health inequalities and disparities as a focus of inquiry relating to distinct social constructs. These constructs include socioeconomic status (SES), gender/sex, age, race/ethnicity, cultural identities, and immigration-related factors that influence social interaction and behaviors. However, more attention needs to be placed on these social factors and how they may affect cancer screenings utilizing sociological theory and understandings as it relates to human behavior (Cockerham, 1983; Link & Phelan, 1995). Unequal access to health promoting resources such as money, power, prestige, knowledge, and education caused in part by an unequal capitalist society, further exacerbate adverse health conditions for underrepresented groups all over the U.S. such as Native Hawaiian and Pacific Islander (NHPI) communities. Recent focus on racial capitalism (racism and capitalism mutually constructing harmful social conditions) provides a justification for racial and socioeconomic inequalities as fundamental causes of health inequity (Phelan & Link, 2015). Both affect disease outcomes through multiple risk factors and perpetuate unequal access to resources that can be used to minimize health risks for minority populations (Laster Pirtle, 2020; Link & Phelan, 1995). This dissertation examines sociological, psychological, and public health theoretical and conceptual frameworks as they explain preventive health behaviors and health service utilization within NHPI populations. Furthermore, this dissertation also aims to highlight how cultural factors may also interact (such as social interactions and cultural beliefs about health) to influence health behaviors and utilization. Additionally, this dissertation highlights how these unique social factors are missing within existing frameworks (i.e., The Andersen Model) that are

not paying attention to ethnic and cultural misunderstandings that influence health behaviors for different groups.

As a racial/ethnic group, Pacific Islanders (PI) originate from any of the three major subregions of Oceania (see **Figure 1**) including Polynesia, Melanesia, and Micronesia, and are one of the fast-growing populations within the United States (U.S.) (Godinet et al., 2019). PIs demonstrate strong collectivist societies in which strong cultural ties and values drive behaviors and ethics (Godinet et al., 2019; Mulder et al., 2016). Strong familial, social, spiritual, and cultural connections, as well as transnational connections provide foundations for both positive and negative behaviors relating to health (Godinet et al., 2019). PI are often combined with Native Hawaiians in surveys and studies as a single group. Population estimates for the year 2021 indicate 1.5 million (0.5% of all people in the US) people identified themselves as NHPIs, either alone or in combination with one or more races/ethnicities (FACTS, 2023). In comparison to other racial/ethnic groups, NHPIs have higher rates of alcohol consumption, smoking, and obesity related to inactive lifestyles, dietary intake high in saturated fats, loss of culture, and unequal access to resources such as knowledge and medical insurance (Hixson et al., 2012; U.S. Department of Health and Human Services, 2020). Moreover, these communities have limited access to cancer prevention and control programs. This includes education on the aforementioned individual risk factors as conditions that increase risks for non-communicable and communicable diseases and various types of cancers.

FIGURE 1: MAP OF PACIFIC ISLANDS: ORIGINATING FROM COUNTRIES WITHIN THE OCEANIC REGIONS OF POLYNESIA, MELANESIA, AND MICRONESIA



Health disparities must be examined through many lenses. Fundamental causes such as SES as a driver of health disparities and health equity frameworks examine how systematic unequal economic and social conditions affects the health of people (Kabutaulaka et al., 2017). There is no single factor that explains health outcomes and health disparities among PI communities. The lens of the socio-ecological health perspective considers how individuals' environmental, social, and political contexts affect their health, as well as cultural/historical trauma attributing to health disparities experienced by many indigenous populations (Kabutaulaka et al., 2017). Contextual insight relating to cultural, ethnic and social factors and how they influence health behaviors for PI remains an area needing further understanding. However, limited data exists regarding the health of U.S. Associated Pacific Islanders (USAPI) because of their inadequate representation in healthcare assessments and report tracking, thus hindering contextual insight. In addition, these distinct groups are often aggregated together under one ethnic group for many quantitative reports and data collection reporting (Ohtsuka & Ulijaszek, 2007). Numerous national data reporting agencies lump distinct PI communities into

one or two groups, as groups are often too small to report measurement of differences in statistical significance between groups (Srinivasan & Guillermo, 2000). As a result, health outcomes and health equity in NHPI populations are not adequately measured or understood. Characteristics relating directly to ethnic distinctions of one group cannot be isolated if they are lumped together with other PI communities. Aggregated groups often hinder the progress of creating healthcare polices targeted towards individualized groups (Srinivasan & Guillermo, 2000). Therefore, examining ethnic groups through disaggregation and identifying the role of social factors as influences on health behaviors remains a need for a better understanding of NHPI health for future interventions. Further examination of NHPI populations continue to highlight poor health and cancer outcomes when compared to other populations (Leon Guerrero et al., 2020; Ohtsuka & Ulijaszek, 2007).

The poorer health status of NHPIs compared to other majority racial/ethnic groups in the U.S. is a result of the political and social colonization of these populations. Also included are many other factors such as economic disadvantages, environmental adverse impacts, historical trauma, and a history of racism that has led to cancer-based inequalities for these groups (Palafox & Hixon, 2011). Cancer is now the second most common cause of mortality in in the U.S., exceeded only by heart disease. The American Cancer Society estimates that roughly 1.9 million new cancer cases are expected to be diagnosed in the U.S. in 2023, as well as approximately 609,820 deaths due to cancer in the U.S. in 2023 (Society, 2021, 2023; Van Dyne et al., 2020). Recent findings from the Hawai‘i Tumor Registry indicate that breast cancer mortality was highest in Native Hawaiian women compared to other racial/ethnic groups, and overall cancer incidence was highest with Native Hawaiian women (Registry, 2022). According to the same report, Native Hawaiian women have higher lung and bronchus cancer incidence and mortality

compared to other ethnic groups, and among males, overall cancer mortality was highest in Native Hawaiians and "other" ethnic group, which includes PI populations (Registry, 2022). Numerous factors may account for NHPI disadvantaged health statuses such as colonization, erasure of ethnic cultural traditions/language, unequal access to health-promoting resources within preferred languages, and racism. However, one overlooked contributing factor behind disparate NHPI cancer incidence and mortality rates is preventive healthcare utilization amongst these racial/ethnic groups.

Taken together, this dissertation strives to fill in a gap of interdisciplinary work regarding medical sociological and public health-related fields by exploring crucial factors hindering preventive healthcare utilization among NHPIs in the State of Hawai‘i. The objective of this research is to provide further insight into previously documented health inequalities and higher rates of chronic diseases that go beyond traditionally explored demographic characteristics and lower SES of these groups. This study utilizes theories of multi-system interactions as affecting health outcomes of underserved communities. Examining "why" these groups report lower-than-average cancer screening rates provides an opportunity to further medical sociological insight into health inequalities within these groups by utilizing an interdisciplinary approach to investigating this topic through the lenses of sociology and public health. Specifically speaking, this dissertation seeks to contribute to the understanding of the health of NHPIs and to add to the field of medical sociology by examining social processes associated with cancer screening behaviors in Hawai‘i. This dissertation serves as an extension of a University of Hawai‘i Cancer Center (UHCC) study employing an exploratory pilot study and analysis. This dissertation employs Socio-Ecological Health Perspectives, social factors as a fundamental cause, the Behavioral Model of Health Service Use, the Behavioral Model for Vulnerable Populations, and

the Health Belief Model as theoretical and conceptual foundations. These allow for an understanding how various social factors described within the literature review interact with one another to contribute to health inequities for NHPI communities. Social factors of interest for this dissertation include health comprehension, acculturation, and perceived racism and mistrust in healthcare as known contributing factors to healthcare inequities within medically underserved populations. These factors were central to both the variable selections in the quantitative secondary analysis and incorporated into the interview guide for the qualitative semi-structured interviews used in this dissertation. Cancer screenings within the framework of this study and HINTS survey include screening for colorectal cancer, breast cancer, and cervical cancer. It is the goal of this dissertation to uncover from social inquiry, drivers of disparate screening rates found from a previous study (Cassel et al., 2020) within Native Hawaiian, Chuukese, and Marshallese adults living within two public housing sites on Oahu through a mixed methods data analysis.

Chapter 2 Literature Review and Social Factors of Focus

According to the 2017 U.S. Census Bureau, there are an estimated 1.5 million NHPIs alone or in combination with one or more ethnicities who reside in the U.S., representing roughly 0.5% of the U.S. population (FACTS, 2023; U.S. Department of Health and Human Services, 2020). An estimated 367,000 NHPIs resided in Hawai‘i in 2017, and the 2019 census estimates Native Hawaiian Pacific Islanders (NHPIs) represent 10% of the population of Hawai‘i (Bureau, 2019; U.S. Department of Health and Human Services, 2020). However, these populations are often lumped together and discrepancies exist in how ethnicity/race is measured within reporting, which masks true ethnic estimates. Most estimates believe there are fewer than 8,000 Native Hawaiians (NH) living today; however, the number of those who are part-Hawaiian have increased over the years (Bureau, 2019; U.S. Department of Health and Human Services, 2020). In 2019, 24.2% of Hawai‘i’s population was multicultural, identifying as two or more races compared to 2.8% of the U.S. (Bureau, 2020; Burrage et al., 2023). Additionally, 23.7% of the NHPI population in the U.S. lives in Hawai‘i (Bureau, 2020; Burrage et al., 2023). This indicates that Hawai‘i is a unique multi-ethnic environment comprised of ethnically-diverse populations in comparison to the continental U.S.

Pacific Islanders (PI) are the second fastest growing population in the U.S., with 40% increases between 2000 and 2010 (Burrage et al., 2023; McElfish, Yeary, et al., 2019). NHPIs are indigenous to Oceania, which is made up of the region between Asia and the Americas comprised of the Pacific regions of Polynesia (e.g., the Hawai’i Islands, Tonga, Sāmoa, Tuvalu, Tokelau, Wallis and Futuna, Niue, Cook Islands, and French Polynesia), Melanesia (e.g., Papua New Guinea, Solomon Islands, Fiji, New Caledonia, and Vanuatu), and Micronesia (e.g., Marshall Islands, Federated States of Micronesia, Northern Mariana Islands, Saipan, Nauru,

Kiribati, Guam, and Palau). PI are unique in the characteristics of their distinct cultures such as customs, beliefs, symbols, languages, norms, values, and artifacts ((WHIAAPI), 2012; Whiten et al., 2011). When discussing PI, it is important to remember that this encompasses over 30 distinct cultural and linguistic groups. Each group is comprised of distinct languages (often multiple languages within the same region), cultural beliefs/customs regarding behaviors and norms, and unique and complicated histories with the U.S. (FACTS, 2023; McLaughlin & Braun, 1998). NHPIs are collectivist, prioritize the needs of the group as a whole over individualist needs, in nature with deep ties to cultural beliefs, familial norms, and artifacts guiding behaviors.

A growing body of literature highlights that even though each group encompasses unique cultural and social factors regarding decision-making and norms guiding their behaviors, there is a commonality of collectivist rather than individualist guiding values (McLaughlin & Braun, 1998). PI often prioritize family and cultural groups rather than the Western goal of self-interest (McLaughlin & Braun, 1998; Mouttapa et al., 2016). PI communities incorporate strong foundations of family, spirituality, beliefs, customs, and heritage as these positive traditions are carried on generationally. Many population-based estimates and figures lump NHPIs, Asian American sub-groups, and other minority communities into one or a couple of racial/ethnic categories (Halagao, 2016). However, lumping under one or a few large racial categories makes it difficult to recognize the different experiences and health concerns of each group. Moreover, paying attention to distinct sub-groups provides insight into gender, socioeconomic, and other social factors that affect healthcare utilization and behaviors (Halagao, 2016). PI often face health disparities, as migration to the U.S. is often met with inequities in accessing positive

resources to promote healthy living in a Western capitalist society (Blocker et al., 2020; Palafox et al., 2018).

NHPIs Disparate Health & Causes of Health Inequality

Racial/ethnic health disparities exist on multiple levels among minority populations and are influenced through many social factors. Disparities are understood when two or more populations are compared in regards to factors such as health outcomes, access to healthcare, income, education, and environments, in which minority cultures do not share in the progress of the dominant culture (Link & Phelan, 1995; Palafox & Hixon, 2011). Health disparities shed light on power and social differentials based on racial/ethnic characteristics. NHPIs experience increasingly disproportionate access to health on multiple factors ranging from health, lifestyles, lack of health insurance opportunities (state and private), to institutional/systemic barriers to health equity (Palafox & Hixon, 2011; Riklon et al., 2010). PI often migrate to the U.S. in pursuit of education, work, and healthcare opportunities as these are limited in their home countries, yet PI are met with unequal access to healthcare within the U.S. (Aitaoto et al., 2012). NHPIs experience unequal access to health systems within the U.S. and in their home countries. The U.S. has failed to deliver on capacity building and institutional improvements promised within USAPI territories that were overtaken by U.S. military/political controls (Aitaoto et al., 2012; McElfish, Yeary, et al., 2019; Palafox et al., 2018). Before December 2020, Hawai‘i Med-QUEST (MQD) provided coverage to eligible children and pregnant women and many PI populations were unable to access this state-sponsored health insurance. However, it was not until after December 2020 that Compact of Free Association PI groups (Republic of the Marshall Islands, Republic of Palau, and the Federated States of Micronesia) could access state-sponsored

health insurance. PI face poorer health outcomes with a lack of health insurance and resources, as many services are only recently accessible through insurance expansion.

Public health-related studies focusing on health lifestyles indicate low levels of physical activity, poor diets (high in fat and low in fruits and vegetables), high tobacco use, and high rates of overweightness/obesity for NHPIs compared to other majority populations, all of which increase the likelihood of adverse health consequences such as cancer incidence (Moy et al., 2010; Riklon et al., 2010). Infant mortality rates in the Federated States of Micronesia is also six times that of the U.S. population (Palafox & Hixon, 2011). USAPI per capita healthcare expenditures (including health prevention such as vaccines, and medical care) range from $500-$1,310 in many Pacific Islands in comparison to $10,348 spent in the U.S. on health expenditures (Van Dyne et al., 2020). Many public health interventions focus on health status and lifestyles; however, more attention is needed in the area of health belief models and the role of socio-cultural influences on health-based decision-making. Culture provides the environment to assign meaning to social life and decision making (Berry, 2005; Mohr et al., 2020). Additionally, culture entails scripts, narratives, and embodied practices that guide meaning-making and influences decision-making that is interpreted by the individual (Mohr et al., 2020). These carry on through generations as individuals interpret meaning through social systems (often family) and affect health behaviors and decision to engage in healthcare. However, when health is not prioritized or barriers are in place to hinder health, inequities pursue.

There have been well-documented racial and ethnic disparities in the access to health and the quality of the healthcare received for underserved ethnic minority grouped, including NHPIs (James et al., 2017). The U.S. government provided Hawai'i and numerous PI communities canned meats and rice as food commodities because native food supplies were contaminated due

to U.S. military war efforts during WWII (McElfish et al., 2015). This created a lasting reliance on imported processed foods high in saturated fats and refined carbohydrates (McElfish et al., 2015; Stoil et al., 2006). Furthermore, this has led to a non-native diet, and along with sedentary lifestyles, have led to NHPIs suffering from a disproportionate burden of non-communicable diseases such as increased rates of diabetes, cardiovascular diseases, obesity, and hypertension (Hafoka, 2017; McElfish et al., 2015). Within the last five decades, the health of NHPIs has shifted and these populations now face high incidence in preventable chronic diseases and cancer, NHPIs suffer from some of the highest rates of diabetes in the world (Hafoka, 2017; Leon Guerrero et al., 2020). Previous research largely attributes disparate health outcomes for NHPIs to multiple complex socioeconomic factors. NHPIs generally have higher poverty rates, lower incomes, larger families, multi-generational homes, and lower educational statuses (Leon Guerrero et al., 2020; Palafox et al., 2018). All of these socioeconomic factors may be driving forces behind increased health inequalities/disparities through direct and indirect paths. However, the direction of causality is hard to distinguish as these socioeconomic factors attribute to poorer outcomes, and poor life outcomes drive lower socioeconomic statues (SES) for NHPIs. Sociology provides insight into social factors that affect human health and health outcomes through individual factors, as well as structures and processes influencing interactions with healthcare.

Sociological Emphasis on Health Disparities

Sociological empirical and theoretical understandings of influential factors often credit social factors and forces such as racist policies, U.S. political control, and SES as contributing to health inequalities found within underserved populations. Health disparities and inequalities are often originated in structural, cultural, and personal conditions within the lives of individuals.

Health disparities are distributed/facilitated by the social standing or social class of an individual or group through troubled class conflict as resources are not evenly distributed between class standings (Andrew, 1975; Link & Phelan, 1995; Schnittker & McLeod, 2005). This type of focus stemmed from both sociologists and social psychologists who frequently direct attention to "downstream" mechanisms in which social conditions create disparities within physical and mental health and the role of psychosocial factors in stress, coping, health behaviors, and their effects on health inequalities (McKinlay, 1975; Schnittker & McLeod, 2005). Sociologists also call attention to "upstream" explanations to the fundamental social causes of disease. Social processes and factors distribute determinants of health unequally by directing attention to the unequal distribution of knowledge, power, and resources as implicated in health disparities (Link & Phelan, 1995; Schnittker & McLeod, 2005). McKinlay (1975) called attention to "downstream endeavors". These are misplaced surface-level responses to one health issue to the next, and there remains a need to focus attention on upstream endeavors as the real sources of health-based problems and manufacturers of illness (McKinlay, 1975). Social scientists often do not place enough emphasis on the political economy of illness (McKinlay, 1975). Public or private entities benefit from resources and the flow of resources that generate poor health, such as foods and advertising targeting individuals with less socioeconomic resources (McKinlay, 1975). Moreover, structural practices and policies are in place to continue a cycle of class standings and inequities in resources because these practices contribute to financial gains for many private companies (McKinlay, 1975; Schnittker & McLeod, 2005).

SES is associated with nearly all major indicators of health status. SES is linked to disparate health equity with individuals near the top of the income distribution (social gradient in health) benefiting from mortality risks approximately half of those near the bottom, and life

expectancy differing by up to 7 years between income groups (Ross & Wu, 1995; Schnittker & McLeod, 2005). All these findings indicate that class, income, power, and wealth matter in regards to health outcomes, access to beneficial health literacy, healthcare utilization such as preventive care, and positive health outcomes for individuals. Structural social factors thus matter in distinguishing health-promoting or hindering resources between groups. Institutional and structural prejudice and racism contribute to inequities experienced by many groups.

Racial Discrimination as a Fundamental Cause in Healthcare Inequity

Race/ethnicity are influential factors in fundamental causes of disease. Research continues to point to the existence of racial disparities in health. The link between race/ethnicity and inequalities have been proven in previous studies enough to be considered an adequate causal component of health inequalities (Link & Phelan, 1995; Phelan & Link, 2015; Phelan et al., 2004). Williams and Sternthal (2010) discuss the influential role sociologists have shaped the conversation and understanding around race/ethnicity in health. The authors point out that sociologists emphasize social context and structures as determinants of racial differences in disease, highlighting multiple ways that racism affects health (Williams & Sternthal, 2010). The authors conceptualize racism as a multilevel construct, encompassing institutional and individual discrimination, racial prejudice, and internalized racism by pointing to the role of migration history/status as guiding health predispositions and outcomes (Williams & Sternthal, 2010). The authors explore the persistent racial gap in health as large and persistent over time as evident by white men living 6 years longer than African American men and white women had a 4 year advantage over their African American peers in 2006 (Williams & Sternthal, 2010). Research by Aspinall (2001) called attention to the need for explaining ethnic inequalities in health research. Aspinall specifies that ethnicity is a complex term that has powerful influence in measuring

health outcomes and inequalities (Aspinall, 2001). Racial/ethnic disparities are evident in the utilization of health and health-related behaviors in these and other underserved communities, including indigenous communities (Palafox & Hixon, 2011).

Racial/ethnic discrimination in healthcare by healthcare providers, state and government insurance providers, and the healthcare institution as a whole is often associated with poor physical and mental health outcomes of minority populations. Lee, Ayers and Kronenfeld (2009) discuss direct and indirect effects of perceived racial discrimination in healthcare. The authors explore the topic and found African Americans, Hispanics, and Asians report significantly more perceived provider discrimination and poorer health outcomes compared to non-Hispanics within their sample (Lee et al., 2009). Perceiving provider discrimination and having an unsatisfying interaction with a provider had significant positive relationships with delaying seeking healthcare explored through a sample of 5,642 non-Hispanic white, African American, Hispanic, and Asian respondents (Lee et al., 2009). The study indicates that perceived provider discrimination had a direct effect on self-reported health status (Lee et al., 2009). Racism is systemic and seen throughout numerous institutions as affecting healthcare for communities.

Racism and the unequal treatment of racial/ethnic groups are rooted in U.S. history through systemic racism seen within housing, education, employment, and healthcare. Systemic or institutional racism, represents actions, policies, and practices that result in racial/ethnic inequalities in life outcomes, as seen in healthcare through unequal access to health insurance and mistreatment by insurance and medical providers (Elias & Paradies, 2021; Leon Guerrero et al., 2020). These types of social structural barriers to equal and fair healthcare create barriers to self-sufficiency (Elias & Paradies, 2021; Hall et al., 2015). Structural barriers also erode the rights of racial/ethnic minorities to adequate healthcare, which lead to preventable disadvantages

in health and well-being for some (Elias & Paradies, 2021). Furthermore, living with social structural barriers caused by institutional racism may affect underserved communities. Oftentimes, minority populations believe that their life and health are not within their control and to a degree, caused by forces external to them, or predetermined (fatalism tendencies) (Kesavayuth et al., 2020). This locus of control outlook indicates a belief system of control over ones' life is limited and determined by others (Kesavayuth et al., 2020). Healthcare is then seen external to an individuals' control thus limiting a good outlook on health outcomes (Kesavayuth et al., 2020). Underserved communities may not view the possibility of a healthy lifestyle when generational inequalities seem to be a norm and beyond their control. Systemic racism within healthcare by medical and insurance providers poses a critical ethical problem.

Race/Ethnicity in Healthcare Utilization & Biases

The role of race and ethnicity influencing healthcare access and quality of care received is a focus of a great deal of social inquiry. Laiyemo et al. (2010) examine the role of race in healthcare utilization regarding colorectal cancer. The authors examined over 60,000 participants who received flexible sigmoidoscopy colorectal cancer screening. Those with polyps or masses received referrals to physicians for diagnostic follow-up (Laiyemo et al., 2010). The study indicates that 72.4% of Whites and 62.6% of African Americans had a diagnostic colonoscopy within 1 year following the initial FSG screening (Laiyemo et al., 2010). African Americans were less likely to undergo diagnostic evaluation than Whites were. This highlights that healthcare utilization might play a more important role in colorectal cancer screening than biology alone (Laiyemo et al., 2010). Biology of colorectal cancer may not be materially different by race/ethnicity but instead healthcare utilization differences among the races may play a vital role in the observed disparities in colorectal cancer (Laiyemo et al., 2010). The

authors observed a lower rate of diagnostic evaluation following an abnormal screening amongst African Americans compared to Whites (Laiyemo et al., 2010). Research indicates minority individuals are less likely to receive adequate healthcare than their white counterparts (Rhee et al., 2019; Verhagen et al., 2014). Inadequate healthcare based upon racial/ethnic racism contributes to disparities in their health outcomes. This is also seen within healthcare provider interactions.

Healthcare providers are shown to hold negative implicit biases through communication with their patients. Negative implicit bias includes subtle forms of disrespect. This can include approaching non-Caucasian patients with a dominant or condescending tone, or not recommending procedures based on racially motivated views or past behaviors (Hall et al., 2015; Laster Pirtle, 2020). Biases in provider recommendations include recommending different treatment options for patients based on assumptions about their treatment adherence because of race/ethnicity (Hall et al., 2015). Rhee et al. (2019) demonstrate that among older minority individuals, perceived racism was significantly associated with delayed or forgone care. Poor doctor communication significantly and partially mediated the relationship between perceived racism and delayed care (Rhee et al., 2019). Perceived racism was self-reported by racial/ethnical minority-group members aged 65 years and older and measured through the question "*Was there ever a time when you would have gotten better medical care if you had belonged to a different race or ethnic group?"* (Rhee et al., 2019). The authors utilize regression of delayed/forgone care on perceived racism to examine whether perceived racism acted as a determinant of delayed/forgone care. Participants describe if they delayed or did not get a medicine prescribed by a doctor or did not get any other medical care they felt they needed because of perceived racism (Rhee et al., 2019). The authors indicate that perceived racism might contribute to health

disparities within older minority individuals. This is in part through a doctors' role in communicating messages that actually discourage adequate healthcare utilization (Rhee et al., 2019). NHPI communities may experience forms of differential treatment from healthcare providers because of race/ethnicity differences. Differential treatment hinders utilization of healthcare for underserved populations. Mistrust in Western healthcare is also linked with delayed care and treatment.

Mistrust in Healthcare

Underserved populations' experience mistrust with physicians and healthcare. This mistrust may be a result of personal experiences of racism, social interactions with others who have received mistreatment, or a sense of no control over one's health and life because of social structure barriers such as SES and social class inequities (Bajos et al., 2022; Schnittker, 2004). Schnittker (2004) found that Hispanics and African Americans are less trusting of their personal physicians than their white counterparts. The authors highlight that education and income increased physician trust, and racial/ethnic matching alone may not be sufficient to alleviate mistrust (Schnittker, 2004). These findings were in part explained by the physicians' behavior. Moreover, the perceived thoroughness of the last examination, how well the physician listened, and how well the physician explained health to the individual all influence mistrust (Schnittker, 2004). Mistrust in healthcare was central to inequities research of experiences by underserved communities during the COVID-19 pandemic.

The COVID-19 pandemic has shed light on mistrust in healthcare and highlights ethnic and racial inequities in accessing care. Smith et. al (2022) investigated discrimination and mistrust in general medical care in relation to the adherence to COVID-19 protective behaviors. The authors found everyday discrimination and healthcare discrimination was associated with

general medical mistrust (Smith et al., 2022) Additionally, African American participants reported higher general mistrust than Asian, White, and White-Latinx participants (Smith et al., 2022). Leon Guerrero et. al (2023) found that PI communities in Guam had significantly less knowledge about COVID-19 transmission and increased perceived barriers compared to other groups. Micronesians were more likely to not want to know if they had COVID or do not know how to access the healthcare they would need (Leon Guerrero et al., 2023) The authors demonstrate that PI communities may lack trust in healthcare due to historical trauma and lack of access to care, which create disparities in healthcare (Leon Guerrero et al., 2023). There remains a need for further insight into mistrust with physicians and healthcare based on ethnic and cultural factors. A closer examination of troubled sociopolitical history involving NHPIs and the U.S. government may also explain their poor health indicators and problems navigating the healthcare system.

NHPIs Troubled Sociopolitical History & COFA

The U.S. presence in Oceania and colonization over the Pacific Islands has caused a great deal of change to the cultural, economic, and social fabric of these communities with military, political, and religious influences (Riklon et al., 2010; Shek & Yamada, 2011). Colonization and military influence on NHPI communities and their lands are often central to sociological and public health insight into racial/ethnic health disparities. Access to and trust in the U.S. healthcare system is complicated due to NHPIs history with the U.S. government (Blocker et al., 2020). After World War II, the U.S. was awarded military oversight within Micronesian islands and communities, and this act was a Strategic Trust by the United Nations (Burrage et al., 2023; Riklon et al., 2010). The U.S. failed to fulfill its mandate to develop Pacific Island health and educational infrastructure under the Trust Territory of the Pacific Islands (TTPI) administered by

the U.S from 1947 to 1994 (Shek & Yamada, 2011). The former Pacific Trust Territories involving Pacific Islanders were promised increased political, economic, and military relationships with the U.S. through the COFA treaty in 1986 (Riklon et al., 2010).

Despite promises for development in-nations, economic development has not been uniform or sustained in many PI nations (Riklon et al., 2010; Shek & Yamada, 2011). Unstable economic conditions within PI nations leads to a large amount of migration for better life opportunities and resources promised within the U.S. (Riklon et al., 2010). The U.S. Compacts of Free Association (COFA) was meant to address a history of abuses of land and PI communities. COFA provides citizens of the Republic of Palau (ROP), the Republic of the Marshall Islands (RMI), and the Federated States of Micronesia (FSM) economic development support, healthcare, education, and unrestrained travel to the U.S. as a means to counteract historical and cultural damages to PI communities (Riklon et al., 2010; Saunders et al., 2010). Under COFA, these freely associated states receive migration rights as classified "non-immigrants" including the right to reside, seek education, and work in the U.S. with no visa or limitations on the length of stay (Burrage et al., 2023; Riklon et al., 2010; Shek & Yamada, 2011). COFA rights classify these individuals as legal "migrants", and in Hawai'i, there are now an estimated 15,000 to 17,000 migrants, more than any other U.S. state (Department of Business, 2020; Riklon et al., 2010). The COFA agreement allows the U.S. to maintain a control of a large and strategic portion of the Pacific between Hawai'i and Japan (McElfish, Yeary, et al., 2019). Moreover, this agreement aids in a military presence throughout the world. COFA migrants are not allowed to vote, they do pay taxes, and COFA migrants serve in the U.S. military at greater per capita rates than U.S. citizens (McElfish, Yeary, et al., 2019).

However, the U.S. failed to deliver on developing infrastructure within these regions in return for military jurisdiction (Saunders et al., 2010). COFA members and other PI communities migrate to the U.S. because of inadequate employment and educational opportunities along with insufficient healthcare systems found within the PI nations (Riklon et al., 2010). Furthermore, health and economic disparities can be traced back to the Pacific being utilized as a testing ground for the U.S. thermonuclear weapons testing (Palafox & Hixon, 2011). Between 1946-1958, 67 thermonuclear tests were conducted in RMI, which equates to 1.6 Hiroshima bombs per day for the duration of the 12-year period (Palafox & Hixon, 2011). Along with continued U.S. interference and mismanagement of Pacific Island nations, NHPIs often lack trust in the U.S. government and their policies (Palafox & Hixon, 2011; Shek & Yamada, 2011). Direct health effects from nuclear testing within the Pacific Island nations are both acute and chronic including beta burns, bone marrow suppression, hypothyroidism, deaths, and malformation (Palafox & Hixon, 2011). Chronic effects include increases in cancer rates, and indirect sociocultural effects including posttraumatic stress, cultural upheaval, historical trauma, and displacement (Palafox & Hixon, 2011; Riklon et al., 2010). NHPIs report loss of culture, language, and displacement from families as direct and indirect consequences of U.S. military actions within Pacific Island nations and colonization. There remains a legacy of nuclear testing and the subsequent cultural disruption of USAPI and damaging environmental factors contributing to health disparities (Palafox & Hixon, 2011). Recent progresses within U.S. policy for PI includes the expansion of Medicaid benefits to COFA citizens.

COFA & Medicaid

The U.S. only recently restored Medicaid eligibility for COFA citizens effective 12/27/2020, as access to state-sponsored insurance was restricted to vulnerable groups. The lack

of insurance assistance before this date further illuminates the U.S.'s failure to help build capacity and infrastructure with these populations, as health insurance is known to be associated with access to medical services and increased opportunities for positive health outcomes (Pineda et al., 2023). Medicaid is a federal public health insurance program for low-income adults children, pregnant women, the elderly, and adults with disabilities; however, federal welfare reform in 1996 suspended federal funds for COFA citizens through Medicaid (Halliday & Akee, 2020). Despite federal funds for COFA migrants and the Affordable Care Act of 2010, Micronesian communities were a subgroup severely disadvantaged during this time and exempt from coverage (Halliday & Akee, 2020). However, Hawai'i continued to provide coverage through state-funded health insurance in different forms, mainly through a State of Hawai'i Medicaid agency (Med-QUEST) (Halliday & Akee, 2020; Shek & Yamada, 2011). However, a court ruling in 2014 ended Medicaid program coverage for COFA citizens.

Furthermore, most COFA migrants were denied coverage in 2015, further exacerbating health inequalities and access to health-promoting resources for these community members such as preventive health cancer screenings (Halliday & Akee, 2020; Pineda et al., 2023; Shek & Yamada, 2011). COFA pregnant women were allowed to maintain Medicaid coverage; however, this only applied to women during their pregnancy and not all COFA citizens (Halliday & Akee, 2020). COFA individuals were not eligible for the Medicaid expansion made available by the Affordable Care Act. Many were left to navigate confusing Medicaid rules and policies, and seek out unaffordable private health insurance when possible (Halliday & Akee, 2020; McElfish et al., 2015). Along with access to health insurance, social changes that take place within an individual due to migration such as acculturation also influences health inequalities (Cabassa, 2003).

NHPIs & Acculturation

Culture is seen as a dynamic accumulation of meanings, tools, and practices that we are socialized into through various institutions such as the family or built environment (Ferguson et al., 2023; Gone, 2022). The social construction of reality introduced by Sociologists, Berger and Luckmann, theorize the notion of culture (Mohr et al., 2020). Individuals construct social reality through the development, transmission, and institutionalization of shared patterns of thinking, which is carried out across generations (Mohr et al., 2020). Conflicting views of social reality and norms may arise through acculturation when an individual has dual or multiple cultures influencing their construction of reality. Such as Pacific Islanders moving to the U.S. and adapting a new construction of reality and social norms and behaviors. Acculturation is a response to new environments, social dynamics, ecological influences, behaviors, and expectations as an individual develops adaptions to best fit the dueling cultures (Ferguson et al., 2023). Therefore, acculturation is cultural change in non-Western migrants following their intercultural contact and adaptation to the West (Ferguson et al., 2023). Psychological and social exchanges between PI and Western culture may influence observed changes in attitudes, beliefs, values, and behaviors and a sense of cultural identity (Cabassa, 2003). Additionally, an introduction to the Western culture, norms, and ways of thinking may actually cause subsequent changes in the original culture patterns of minority groups (PI) (Berry, 2005; Cabassa, 2003). NHPI adoption of Western norms may include a more individualist mentality of prioritizing the self over others or a transition to Western foods that all may change PI-cultural patterns of normal expectations and staple foods.

Introductions to Western culture and social exchanges due to migration can alter ways of thinking. Cultural disruption involves conflicting cultural behaviors and norms between minority

groups and Western cultural expectations, in this case PI forcefully introduced to the dominant Western culture leading to changed attitudes and beliefs to better fit into U.S. social settings (Berry, 2005; Cabassa, 2003). PI living within the U.S. may feel social obligations to adapt to Western views of normal behaviors from the way they dress, the way they speak, to the expectations of being on time/early for appointments that may be at odds with their ethnic norms. Oftentimes acculturation is a result of PI leaving their communities because of the lack of career opportunities, education, healthcare, and other institutional opportunities that are more prevalent in the U.S. (Moy et al., 2010; Palafox et al., 2018). More acculturated PI, or second generation and beyond migrants, may be better set-up for navigating Western behaviors and institutional expectations like healthcare (Cassel et al., 2020). More acculturated individuals often have increased levels of exchange within Western society because they may have been born here or spent most of their life in the U.S. This adaption to Western behaviors creates better opportunities for navigating institutions such as healthcare for those more acculturated with Western culture (Cassel et al., 2020; Ferguson et al., 2023). Being less acculturated with Western expectations increases the opportunities for health inequalities as Pacific Islanders may not be able to navigate Western healthcare (Cassel et al., 2020; Leon Guerrero et al., 2020). These inequalities are evident within cancer incidence and mortality rates for NHPIs, as these groups may not be equipped to engage in preventive services to mitigate these health risks.

NHPIs & Cancer

Cancer is now the second most common cause of mortality in in the U.S., exceeded only by heart disease (Society, 2021; Van Dyne et al., 2020). The American Cancer Society estimates that roughly 1.9 million new cancer cases are expected to be diagnosed in the U.S. in 2023, as well as approximately 609,820 Americans expected to die of cancer in 2023 (Society, 2023).

This translates to 1,670 deaths per day and excluding non-melanoma skin cancer, at least 42% of newly diagnosed cancers in the U.S. (820,000 cases) can be avoidable in 2023 (Society, 2023). Cancers are potentially avoidable through preventive health behaviors such as cancer screenings and cancer knowledge. Life-saving cancer knowledge includes not using tobacco and reducing excess body weight, in that 19% of cancers caused by smoking and at least 18% of cancers caused by a combination of excess body weight, alcohol consumption, poor nutrition, and physical inactivity could be avoidable (Society, 2023). However, disparate ethnic cancer rates demonstrate that cancer-based resources are not made available to all groups.

Cancer-related inequalities/disparities are evident in racially marginalized groups such as NHPIs through different barriers to health information and cancer controls. However, limited health information systems may affect cancer mortality data from the Pacific Islands (Palafox & Hixon, 2011; Van Dyne et al., 2020). There are difficulties in obtaining reports from off-island medical treatment referrals from the Pacific Island nations, as well as incomplete reporting of true causes of death (Van Dyne et al., 2020). These structural challenges are being addressed through various efforts; however, there still remains barriers to cancer reporting within the Pacific Islands (Leon Guerrero et al., 2020). Cancer inequalities in the Pacific Islands are prevalent. Cervical cancer incidence in the Republic of the Marshall Islands (RMI) is seven times higher than the U.S. incidence (Palafox et al., 2018). Liver cancer in Yap in the Federated States of Micronesia (FSM) is three times the U.S. rate and mammography services and cervical cancer screening in many COFA nations are highly limited (Palafox et al., 2018). In Yap, only 28% of all cervical cancers are caught at stage 1 in comparison to 56% of invasive cancers diagnosed in the U.S. (Pineda et al., 2023; Van Dyne et al., 2020). This further highlights the lack of cancer and health-improving resources for Pacific Islands. NHPIs are less likely than

U.S. populations to be aware of their adverse health conditions and therefore less likely to seek medical care (Moy et al., 2010). Native Hawaiians suffer from high mortality rates for most chronic diseases and short life expectancies (Moy et al., 2010). Racial/ethnic health disparities exist for PI due to various social factors such as language barriers and lack of translated cancer resources for those who are not sufficiently literate in English that contribute to disparities in cancer incidence and mortality rates. Within PI variation in cancer rates is evident in cancer reporting in Hawai`i.

NHPI & Cancer in Hawai`i

Cancer rate reporting can demonstrate disproportional cancer incidence and mortality rates for NHPI; however, ethnicity categorization varies. Most national datasets lump Native Hawaiians and Pacific Islanders into one category or utilize an "other" category due to small sample sizes and lack of opportunities to permit meaningful data analyses (Shimkhada et al., 2021). These national surveys include the National Health Interview Survey, the Early Childhood Longitudinal Survey, and the Medical Expenditure Panel Survey to name a few with limited Asian subgroups (Shimkhada et al., 2021). Limited subgroup categorizations further complicate a true understanding of ethnic-cancer screening rates and practices within the NHPI communities. However, there are sources that are able to disaggregate these data to some degree within the NHPI communities. The U.S. Department of Health and Human Services Office of Minority Health demonstrated the benefit of disaggregating data for different NHPI communities. Colorectal cancer incidence rates for Native Hawaiian men, Native Hawaiian women, Samoan men and Samoan women per 100,000 were 65.7, 44.0, 43.1, and 38.6 respectfully from 1198-2002 (U.S. Department of Health and Human Services, 2020). Similar rates were found for non-Hispanic White men (65.6) and women (47.6). However,

disaggregating from one category demonstrates lesser rates for Samoans compared to Native Hawaiians (U.S. Department of Health and Human Services, 2020). These rates might have been masked behind one category for all NHPIs and affect prevention methods aimed at the right community. Hawai`i's diverse community provides frameworks for reporting cancer rates by unique subgroup comparisons.

In Hawai`i, cancer disproportionately affects the lives of NHPI community members. The most recent Hawai`i Tumor Registry data (2014-2018) indicate that cancers of the colon and rectum are the third most commonly diagnosed cancer in the state of Hawai`i (Registry, 2022). An average of 710 new cases are diagnosed each year, and these cancers are the third leading cause of cancer death in men and the fourth among women (Registry, 2022). Colon and rectum cancer incidence was higher in Hawai`i males compared to the U.S. from 2014-2018, 46.0 compared to 43.5 per 100,000 (Registry, 2022). Additionally, rates for colon and rectum cancers in men during this time demonstrate higher rates for the "Other" group (including Samoan and Micronesians) (59.8) and Native Hawaiians (45.3) compared to Whites (43.0) per 100,000 age-adjusted to the 2000 U.S. population (Registry, 2022). In addition to colon and rectum cancer, breast cancer is the most common cancer diagnosed in Hawai`i for women (Registry, 2022). An average of 1,233 women are diagnosed with invasive breast cancer and an average of 155 women die of breast cancer each year in Hawai`i (Registry, 2022). Breast cancer incidence during this time was highest among Native Hawaiians and Japanese with mortality highest in Native Hawaiians and "Others" (including Samoans, Micronesians, African Americans, and American Indians) (Registry, 2022). Additionally, overall cancer mortality for men and women was highest in Native Hawaiians and "Others" (Registry, 2022). Prostate cancer incidence was highest in the "Other" group, and thyroid cancer incidence was highest amongst Filipino women

(Registry, 2022). These rates highlight the racial and ethnic disparities observed in the distribution of cancer. Disparities can be traced to social inequalities and class disadvantages experienced by NHPIs. As with cancer incidence and mortality rates, cancer screening rates further demonstrate disparities for underserved communities.

Cancer Screenings

Hawai`i as a state has seen increases in cancer screenings in previous years but not for all groups. According to the 2022 Behavioral Risk Factor Surveillance System (BRFSS), 67% of Hawai`i respondents aged 45-75 fully met the U.S. Preventive Services Task Force recommendations for colorectal cancer (CRC) screening, a decrease from 77.1% in 2020 (Prevention, 2015; System, 2022). Early detection and screening of CRC can prevent a majority of colon cancer deaths, 5-year survival rate for patients diagnosed with CRC in an early stage has been shown to be 90% (Stark et al., 2020). However, individuals must follow doctor-recommended screening practices and have access to cancer education and adequate knowledge about screening. Limited English proficiency and unequal physician recommendations for screenings because of racially motivated recommendation practices may hinder prevention efforts in NHPIs communities (Lin et al., 2016). Differences in cancer screening rates are found for different cancer types.

An evaluation of the original Hawai`i HINTS data demonstrates differences in cancer screening rates for NHPI community members. Cassel et. al (2020) found that among participants aged ≥50 years, Native Hawaiians (29%) and Marshallese (32%) were more likely to be referred to a colon cancer-screening test by a physician than Chuukese (20%) (Chi-square p = .04) (Cassel et al., 2020). There were no differences in the reported utilization of CRC screening in these participants across all three ethnic groups (Native Hawaiians, Chuukese, and

Marshallese) (chi-square p = .304) (Cassel et al., 2020). Additionally, only 27% (n=142) of all individuals aged >50 years in all ethnic groups combined were referred to a CRC screening test (Cassel et al., 2020). More than 63% of participants reported never having a screening test for colon cancer with the majority of the respondents living within Hawai`i public housing. The colon cancer screening rates among Native Hawaiians and Micronesians in this study were remarkably lower than the overall screening rates in Hawai`i. During this study recruitment time in 2018, according to the BRFSS, 67% of individuals aged 50 to 75 years reported ever having had a colon cancer screening (Cassel et al., 2020; Prevention, 2019). Early and regular screening for precancerous colon lesions can prevent nearly 90% of colon cancers (Lin et al., 2016). Therefore, these rates found within these Hawai`i public housing communities indicate lower-than-average screening percentages that deserve further investigation to truly understand screening discrepancies. Domingo, Chen & Braun (2018) examined BRFSS data from 2011-2014. The authors found that Filipinos (OR 0.56), Chinese (OR 0.70), and Native Hawaiians (OR 0.75) were significantly less likely than whites to be CRC compliant with income, higher education, employment, and regular health provider and check-ups as predictors of CRC compliance (Domingo et al., 2018). Social factors are crucial in influencing healthcare utilization and cancer control initiatives. Spirituality and faith, for instance, are often cited as influential factors within NHPI communities and may interact to influence engagement with healthcare. There are many reported social influences to healthcare and cancer prevention for underserved communities that may demonstrate barriers to care.

Noteworthy Barriers to Care for NHPIs

Spirituality

Other social factors such as religion and spirituality are shown to influence health utilization and cancer prevention measures. Spirituality is of great significance to NHPI communities, as spirituality demonstrates a constructed pattern of influential guiding behaviors. For example, religious-cultural norms regarding health behaviors such as sex, contraceptives, and taboo topics such as invasive screenings may guide health beliefs and behaviors for many groups (DiStefano et al., 2012; McLaughlin & Braun, 1998). Strong ties to religion and spiritualty may hinder engaging in protective health behaviors and prevention if they are seen as going against guiding principles. Religion influences collectivist decision-making in minority communities. Religion along with social practices may be ingrained in these communities' guiding beliefs, and may influence medical care by accepting health fates and predetermined health statuses as determined by a higher power (McLaughlin & Braun, 1998). Fletcher et. al (2013) discussed the role of religion within PI communities. According to them, PI often hold strong ties to religion and are heavily involved in religious groups (Fletcher et al., 2013) Faith and religious communities are a frequent coping agent for PI community members as a social institution during disaster responses (Fletcher et al., 2013). The role of the church is seen as a key agent in various forms to key humanitarian, health, and community organizations for providing counseling, psychological support, and health-based guidance (Fletcher et al., 2013; McLaughlin & Braun, 1998). Religious institutions are avenues for both hindering engagement with healthcare, as well as ideal locations for facilitating healthcare resources and education.

Spirituality holds a great deal of influence over PI as an institution guiding behaviors and belief systems regarding health. Neuendorf et. all (2021) examines various characteristics of

community-based sexual health trainings within Pacific Island territories through a scoping review of research. The authors discuss how customary practices, social bonds, and faith within PI communities hold strong influences over the potential provision of sexual health and overall health wellbeing education and resources (Neuendorf et al., 2021). However, the authors demonstrate how the framing of morality within PI faith-based institutions may constrain potential access to sexual and reproductive health services and partnerships (Neuendorf et al., 2021). Mortality frames health for PI because free expression of sexual/reproductive health is often constrained by traditional patriarchal cultures that hold conservative religious practices and norms that look down on these behaviors (Neuendorf et al., 2021). Spiritualty and faith hold a spiritual dimension and moral compass for various aspects of NHPI lives and play a central role in the ethnic and cultural identity of these communities (Manuela & Sibley, 2015; McElfish, Yeary, et al., 2019; Neuendorf et al., 2021). Spirituality is inherently linked with the subjective perspectives of well-being of self, family, and larger social groups with NHPI communities (Manuela & Sibley, 2015). Furthermore, religion is hard to untangle from cultural patterns of thinking and is often an artifact of the self and family (Manuela & Sibley, 2015). Therefore, spiritualty may be viewed as a guiding light and as a predetermined force of influence. Religion may affect the utilization of health services, treatment, adherence to medical advice, and health-based risk behaviors (such as screenings) because faith and religion are so intertwined within the mindset of NHPIs. With religious strong ties, PI community members do not often engage in discussions with their children about safe sex and the use of contraceptives, which are all preventive health behaviors (Neuendorf et al., 2021). Additionally, certain groups such as Samoans believe the topic of discussing bathroom habits and certain body parts are taboo, which demonstrate barriers to colorectal cancer awareness campaigns. Other barriers to healthcare and

preventive resources for NHPIs include documented influences such as social determinates of health.

Other Influences of Health Behaviors

Literature cites various social factors contributing to health and cancer inequities within NHPI communities, often viewed as social determinants of health (SDOH) that demonstrate gender differences. Pacific Islander men often engage in little to no preventive health behaviors such as normal doctor check-ups and screenings (Neuendorf et al., 2021). Little engagement with healthcare is often guided by cultural values and belief patterns where gender roles, masculinity, and social norms intersect and men do not want to be viewed as sick or weak by seeking medical help (Neuendorf et al., 2021; Sinclair et al., 2019). PI women, on the other hand, often place their children's health above their own and do not engage in health-seeking behaviors and preventive care themselves (McElfish, Yeary, et al., 2019). Not prioritizing health often goes hand-in-hand with unhealthy lifestyles, as many PI women who prioritize the health of their family and not their own, experience higher levels of obesity (McElfish, Yeary, et al., 2019; Sinclair et al., 2019).

Additionally, NHPIs bear a disproportionate burden of chronic mental health conditions compared to other ethnic groups. Few studies disaggregate Native Hawaiians and PI from Asian categories to show true rates of health influencers such as depression (Kaholokula et al., 2019). Hooker et al. (2019) indicate the 2014 and 2015 Centers for Medicare and Medicaid Services Health Outcomes Survey (HOS) expanded race/ethnicity categories. This survey expands race/ethnicity categories to include eleven unique Asian and Pacific Islander-origin race categories (Hooker et al., 2019). Depression among older adults was 21% for NHPIs in comparison to 9% for non-Hispanic Whites (Hooker et al., 2019). Moreover, NHPIs have higher

odds (OR = 1.82) of screening positive for depression compared to Whites (Hooker et al., 2019). There remains a need to further investigate SDOH influencing health behaviors and health utilization for NHPI communities.

Many SDOH influence engagement with health behaviors and health seeking practices for underserved communities. McElfish et. al (2019) examined various diabetes-based interventions targeting NHPI communities. The authors cite various studies and interventions, and SDOH that serve as barriers to healthcare utilization and access for Marshallese communities (McElfish, Purvis, et al., 2019). Transportation continues to be a barrier to accessing care and being able to take part in health promoting activities like education and keeping health provider appointments that encourage preventive care (McElfish, Purvis, et al., 2019). Social support and child care are also contributing factors to missed appointments and not engaging in healthcare utilization (McElfish, Purvis, et al., 2019; Yeary et al., 2017). Language, health literacy, lack of health insurance, and inadequate transportation to access healthy foods remain barriers identified throughout various research conducted with NHPI communities (Leon Guerrero et al., 2020; McElfish et al., 2018; Sinclair et al., 2013; Yeary et al., 2017). Moreover, various social and cultural factors often interact and cause barriers to seeking care for NHPI communities as they are collectivist societies and place the needs of family and others above their own (Cassel et al., 2020; McElfish, Yeary, et al., 2019). Taking care of children or grandchildren, social and familial obligations, honoring cultural practices, and community events may be seen as a priority over self-care and healthcare utilization. Language barriers, transportation, monetary constraints, lack of insurance, and inability to navigate the healthcare landscape may also hinder NHPI communities from engaging in health-promoting practices.

Many sociological and public health-focused theoretical and conceptual understandings driving health behaviors and outcomes exist that aid in understanding the relationship between social factors that hinder the utilization of health services and cancer screenings. A closer examination of the theoretical and conceptual foundations and understandings driving this dissertation will be discussed in the preceding chapter.

Chapter 3 Theoretical Guidance

Health and cancer inequities exist within Hawai`i for NHPI community members as discussed in the previous chapter. This dissertation must examine the theoretical understandings of the connectiveness between health and cancer inequities and the social factors influencing healthcare utilization to make this claim. Numerous contributing factors to health and cancer disparities with NHPI communities were discussed previously. However, theory allows for an understanding of how social factors and situations may influence engaging in healthcare and utilizing cancer screenings through structural (macro) and social (micro) relationships. Sociology is the development of systematic knowledge about social life and social action. Theory helps shape and guide sociological inquiry and attempts to bring order to the results of inquiry by explaining objects of social reality through candid reporting of how these topics are connected through theoretical understandings (Calhoun et al., 2012; Lofland & Lofland, 1995; Merton, 1957). Theory and conceptual understandings help to organize the knowledge we have and wish to know by providing a substantiated explanation for empirical observation and analysis, as well as mapping out patterns and connections of social life (social relationships) (Calhoun et al., 2012). Theory in observations and research serves multiple purposes. Theory provides patterns for habitual thinking, a framework for orienting social factors, calls attention to gaps in our knowledge, and is the basis of fruitful formulations of analytical schemes and hypotheses in an attempt to explain aspects of the natural world (Parsons, 1950). Theoretical and conceptual understandings allow us to make assertions or statements about the relationships between social structures and abstract social observations to organize and further knowledge (Merton, 1957; Parsons, 1950).

This dissertation employs Socio-Ecological Health Perspectives, social factors as a fundamental cause, the Behavioral Model of Health Service Use, the Behavioral Model for Vulnerable Populations, and the Health Belief Model as theoretical and conceptual foundations. These theoretical approaches provide understanding of how various social factors described within the literature review interact with one another to contribute to health inequities for NHPI communities. Social factors of interest for this dissertation include health comprehension, acculturation, and perceived racism and mistrust in healthcare as indicated by literature discussed in the Chapter 2 as known contributing factors to healthcare inequities within historically underserved populations. Other social factors of interest for the quantitative analysis of this dissertation will be discussed within Chapter 4 in relation to the methodological approach to use logistic regression. Cancer screenings within the framework of this study and the Hawai`i HINTS survey included screening for colon cancer, breast cancer, and cervical cancer.

Therefore, the following theoretical and conceptual frameworks provide an explanation of this researcher's claim of an association between these social factors contributing to NHPI community members' disengagement with cancer screenings.

Socioecological Health Perspective

A socioecological health perspective considers how individuals' environmental, social, and political contexts affect their health, as well as cultural/historical trauma attributing to health disparities experienced by many indigenous populations (Bronfenbrenner, 1977; Kabutaulaka et al., 2017). This type of theoretical understanding helps to explain that there is a complex interplay between individual, relationships, community, and societal factors that can influence the health of people through multiple levels (Prevention, 2022; Scarneo et al., 2019). The framework was first established by Bronfenbrenner in the 1970s as an ecological-type systems

theory. This was later redefined as a framework to promote behavioral changes related to health with an individual's environment nested in multiple structures influencing health promotion through various health behaviors (Bronfenbrenner, 1977; Scarneo et al., 2019). Within this theoretical framework, there are five levels of influence: (1) intrapersonal (e.g., physical and cognitive characteristics, prior experiences), (2) interpersonal (e.g., community and stakeholder influence), (3) organizational (e.g., structured communities and institutions to which the individual belongs), (4) community (e.g., broader contexts such as cultural or social norms, physical environment), and (5) policy (e.g., policies affecting the individual through local, state, federal legislation) (Lee et al., 2017; McLeroy et al., 1988; Scarneo et al., 2019). Human behavior is determined by multiple levels of influence. Therefore, there are various opportunities for an individual's health to be affected through multiple avenues that can increase instances for inequities to ensue (Lee et al., 2017). The five levels of influence point to the individual as the central focus and their behaviors (Baron et al., 2014). Furthermore, the four other spheres influence individual behaviors with higher degrees of impact and interact across these different levels (Baron et al., 2014; Lee et al., 2017). Therefore, applying a socioecological framework demonstrates a theoretical insight into the interface between health outcomes and the different levels of influence over individuals and their behaviors, as well as within cancer behaviors (Baron et al., 2014). Socioecological perspectives demonstrate a theoretical framework to enhance strategic effectiveness across these various levels. Moreover, this perspective provides insight into opportunities to reduce cancer burden if we understand where to direct health promotion within these intersected influences of an individual's life (Akinyemiju et al., 2022).

Many empirical studies use the sociological perspective framework to examine disparities in cancer screenings. Daley et al. (2011) utilize the socioecological framework to guide their

qualitative analysis for cervical cancer barriers to screening in Florida counties. They interviewed 21 healthcare professionals and 8 key informants involved in the design or implementation of cervical cancer prevention programs from various high risk for cervical cancer counties within Florida (Daley et al., 2011). The counties were selected because they were considered high-risk counties and higher than the state average rates for either cervical cancer incidence or mortality (Daley et al., 2011). They utilize the socioecological framework and the five levels of influence. The framework provides a means to decipher major categories of barriers to cervical cancer screenings and categorizes those barriers into political, community, institutional, and individual beliefs affecting cervical cancer screening and treatment from providers perspectives (Daley et al., 2011). Lee & Carvallo (2014) also utilize the framework as a conceptual model for a study with Vietnamese and Korean American women. The authors employ the socioecological framework for their qualitative analysis of these women and identify multilevel influences on cervical cancer screening at the individual (pregnancy, poverty, personality), interpersonal (family responsibility), and community (lack of availability, community size) levels (Lee & Carvallo, 2014). These two studies demonstrate how the model can help explain the interfering influences on screening behaviors, as well as areas to take into consideration for community-based interventions to improve cancer screenings (Daley et al., 2011; Lee & Carvallo, 2014). This aids in the explanation of an association between different social factors and their potential for impacting NHPI opportunities to engage in healthcare. The socioecological perspective provides an insightful framework for investigating barriers to cancer screenings because it illuminates the daily challenges and complexities for individuals in seeking care (Daley et al., 2011). Social factors strongly influence health behaviors and inequities, and are associated with theoretical explanations of causal relationships within social sciences.

Social Factors as a Fundamental Cause

Research discussing disparities in health often credit social factors affecting access to health promoting resources and health literacy as influential causes of health disparities. Medical sociologists continue to focus academic and research inquiry around the fact that society's poor and less-privileged members and communities face worse health conditions (predisposing and enabling) and die much younger than wealthier and privileged members of society despite advances in health sciences and resources (Link & Phelan, 1995; Palafox et al., 2018; Phelan & Link, 2013). Smoking, lack of exercise, and poor diets strongly influence sickness and mortality within medically underserved groups despite increases in science and health promotion around these individual behavioral risks (Phelan & Link, 2013; Registry, 2022).

Socioeconomic inequalities in health and mortality have persisted over time, and this well-documented fact fueled Link and Phelan to provide a theory of explanation of why this persists despite advances in health and improved access to care/medicines for some with the theory of fundamental causes. Link and Phelan (1995) argue with the theory of fundamental causes of disease that greater emphasis needs to be placed on social conditions as creating disparate access to resources such as power and knowledge that can promote health because health inequalities persist under conditions, even when advances should eliminate or reduce them for some (Link & Phelan, 1995; Phelan & Link, 2013). The creation of this theory of understanding stems on the basis that, "we cannot claim to understand why health inequalities exist if we cannot explain why they persist under conditions that should eliminate or reduce them, and if we can understand why they persist, this may provide clues to the more general problem of the causes of health inequalities" (Phelan & Link, 2013, p. 106). The authors argue that social factors such as SES, racism, social support, and social connectedness are in fact

fundamental causes of health inequities/disparities. Therefore, these social factors are causal factors of indifference leading to health inequalities as unequal access to power and knowledge lead some to experience adverse health consequences (Link & Phelan, 1995; Phelan et al., 2004). Moreover, these factors further lead to unequal access to important health promoting resources (power, money, knowledge, prestige) through multiple mechanisms (Link & Phelan, 1995; Phelan et al., 2004). Variables such as race/ethnicity, gender, and SES status are closely tied to health promoting resources and thus fundamental causes of diseases within underserved populations, as these are unequally distributed within communities (Link & Phelan, 1995; Phelan & Link, 2015; Phelan et al., 2004).

Within this theory are four essential features of a fundamental social cause of health inequalities. The authors demonstrate that in order for a social cause to be considered influential, it must influence multiple disease outcomes, as well as affect those disease outcomes through multiple risk factors (Phelan & Link, 2013; Phelan et al., 2004). Additionally, social causes must involve access to resources that can be used to avoid risk or harm of the disease, and the association between the social cause and health is reproduced over time through the replacement of intervening mechanisms (Phelan & Link, 2013). Furthermore, it is the persistent and influential effect on health and health inequities even in the face of dramatic changes and increases in health advances/life-saving treatments that can lead us to label any factor "fundamental" (Link & Phelan, 1995; Phelan & Link, 2013). Cancer screenings have increased over the past decades and advances to life-saving treatments and early detection saves lives as it is becoming more feasible to detect cancer or its precursors earlier thus preventing cancer mortality (Aflague et al., 2023; Akinyemiju et al., 2022; Phelan & Link, 2013). However, access to these screenings is often contingent upon medical insurance access and people with more

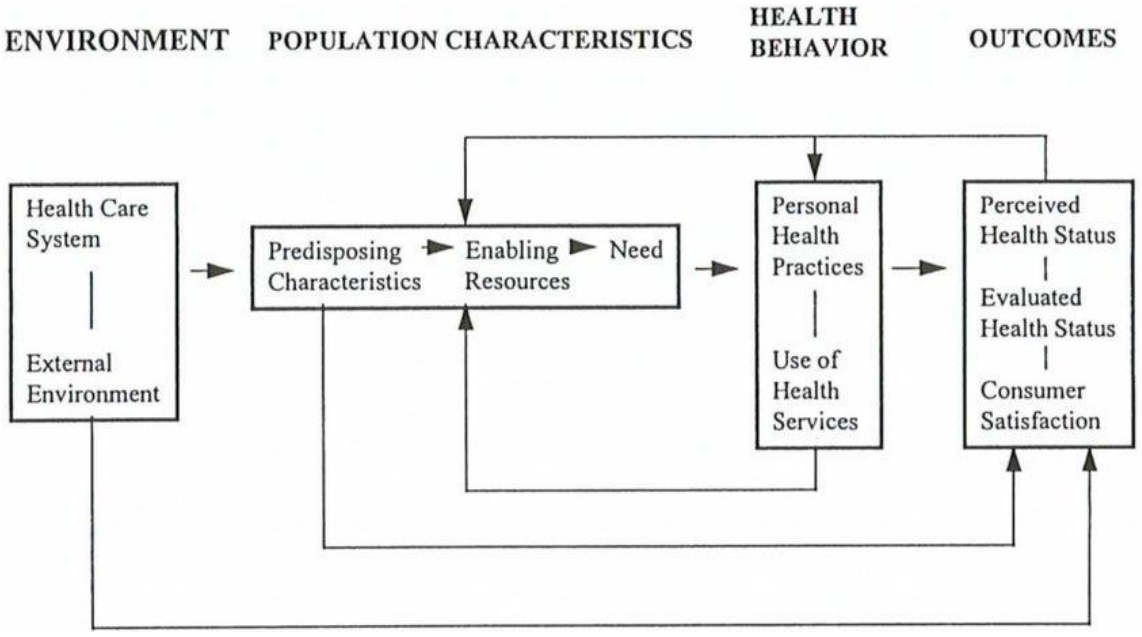
resources. Link et al. (1998) demonstrate using BRFSS data that screening for cervical and breast cancer were indeed associated with education and income (Link et al., 1998). Social factors such as SES and racism are related to multiple disease outcomes such as cancer through multiple pathways over time (Link et al., 1998; Phelan & Link, 2013). However, individuals with more resources and knowledge higher on the SES scale avoid risk and adverse health consequences by being afforded the opportunity to adopt protective strategies such as cancer screenings or genetic testing (Phelan & Link, 2013). Key resources such as power, money, knowledge, and prestige are not normally distributed in society as health inequalities persist because of fundamental social causes (as discussed within NHPI communities within this dissertation). The Andersen Model provides a conceptual framework to further demonstrate how key resources affect access to and engagement in healthcare through various stages of life.

Andersen Behavioral Model in Healthcare Utilization

Healthcare utilization entails a demand for healthcare based on a need-related factor that is met by some health service offered by the healthcare system (Babitsch et al., 2012; Phillips et al., 1998). However, studies find differences in healthcare utilization and access based upon social characteristics and social factors (Babitsch et al., 2012; Pineda et al., 2023; Rehuher et al., 2021). Medical Sociologist, Ronald M. Andersen, originally developed the Behavioral Model of Health Service Use in the late 1960s. The model assists in the understanding of why and how families use health services, conceptualizing and operationalizing equitable access to healthcare, and promotes health policy that encourages equitable healthcare access (Andersen, 1968; Andersen, 1995). The original theoretical framework postulates that healthcare utilization takes place when families are predisposed to receive medical care (Andersen, 1968). Additionally, utilization occurs when conditions are met to make health services available to families, and

where the family perceives a need for health services and responds to that need (Andersen, 1968). Revised many times, this model attempts to answer the "how's" and "why's" of health service use dynamics (Andersen, 1968; Andersen, 1995). The Andersen model has shifted from the original focus on the family as the unit of analysis to the individual-level and societal focus. Moreover, the model now focuses on healthcare utilization as the unit of analysis so that the framework can be applied to empirical analyses across services such as healthcare, dental, and hospital visits (Andersen, 1968; Andersen & Newman, 1973; Andersen, 1995). The model explains the use of formal personal health services and provides a framework for indicating that individuals' use of health services is a function of their predisposition to health services use, factors which enable or impede use, and their need for care (Andersen, 1995; Babitsch et al., 2012). This model divides the major components (individual, societal, and contextual determinants of health service use) into three types of factors. These factors are: predisposing factors (age, marital status, ethnicity, or level of education), enabling factors (health insurance, language barriers, and accessibility to healthcare), and need factors (self-reported health status and own evaluation of health) (Andersen & Newman, 1973; Babitsch et al., 2012; Kerpershoek et al., 2020). The three components of the model examine the interrelationships between individuals and social factors that can interact with utilizing healthcare services, with each containing sub-components that allow for empirical measurement of selected variables (Please see **Figure 2)** (Andersen, 1968).

FIGURE 2: THE ANDERSEN MODEL OF HEALTHCARE SERVICES UTILIZATION (1995)(R. M. ANDERSEN, 1995)



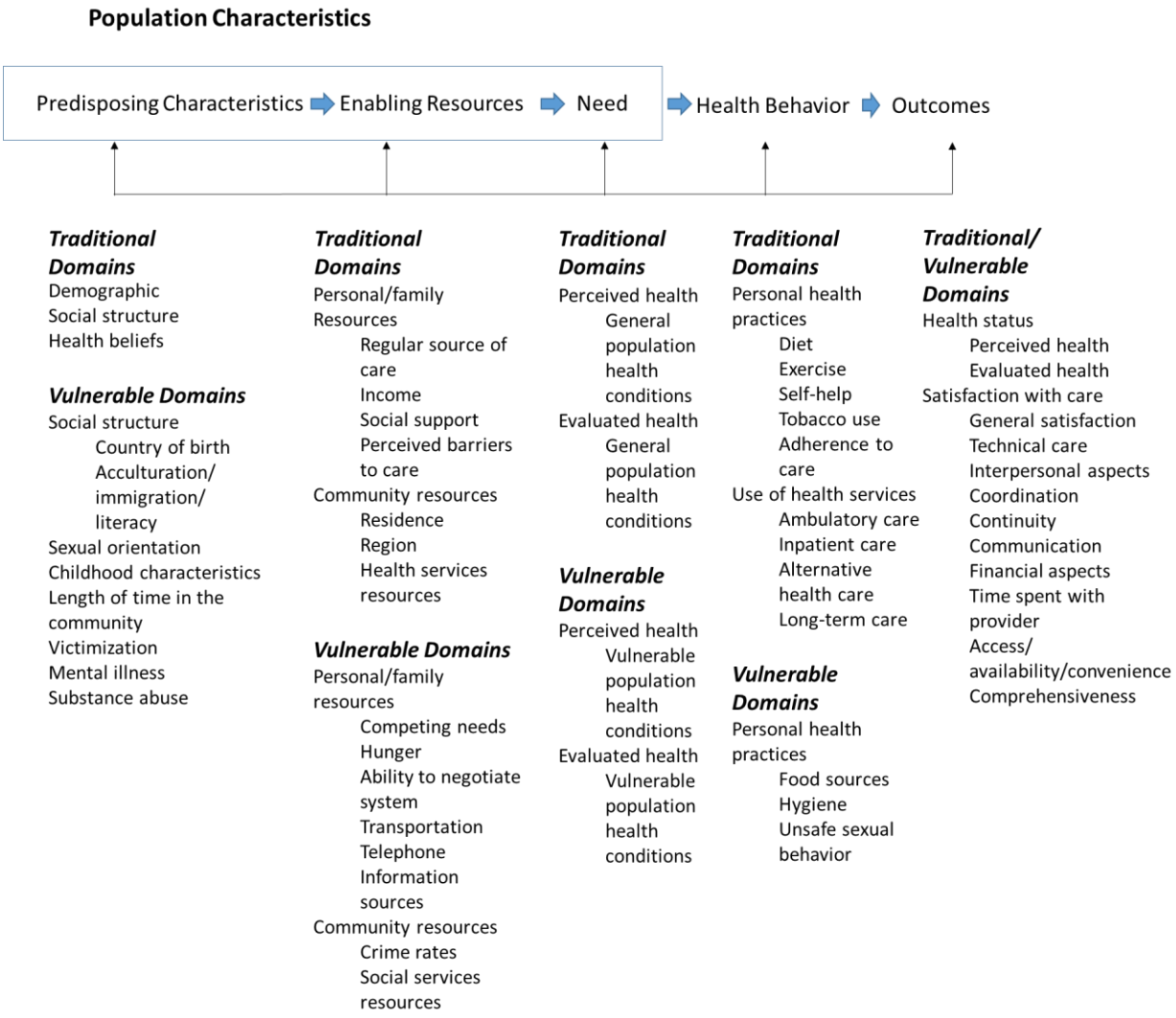
The Andersen model is applied in the U.S. and elsewhere as a theoretical and conceptual framework regarding social inquiry around different aspects of healthcare utilization. This framework assists in where to focus efforts, as well as within research methodology to provide a map for structuring variables within an analysis (Babitsch et al., 2012). Utilizing healthcare for beneficial primary care services such as cancer screenings is often a result of health-promoting resources such as access to care, medical insurance, social capital, and health-based knowledge. The different dynamics within this model all affect health service utilization in that interactions with health systems can vary based upon determinants that can either facilitate or hinder utilization (Alkhawaldeh et al., 2023; Phillips et al., 1998). These determinants of health include age or race (predisposing), access to health insurance (enabling), and/or self-perceived need for cancer screenings (needs) (Alkhawaldeh et al., 2023; Phillips et al., 1998; Shao et al., 2018). The Andersen model demonstrates an approach to inquiry around utilizing healthcare services and the different population characteristics that may impede utilization of healthcare.

Within the three major components of the model, various societal determinants may influence the opportunity to engage in health services utilization for an individual (Andersen & Newman, 1973; Andersen, 1995). Critiques of the model indicate that not enough attention is paid to cultural and social interaction, as well as an overemphasis of health needs at the expense of health beliefs and social structure (Bradley et al., 2002; Guendelman, 1991). Bradley et al. (2002) provides thoughtful critique of the Andersen model. The authors discuss that it can be enhanced by focusing more on psychosocial factors of "beliefs" (attitudes toward health services, knowledge about disease, and values) pertinent to racial/ethnic variations in long-term care across the continuum of care (Bradley et al., 2002). The authors demonstrate a need for indicating how the three factors as determinants of service use (predisposing, enabling, and need) are interrelated (Bradley et al., 2002). The Andersen model assists in understanding decisions to seek care by suggesting that being able to engage in healthcare are a function of these various factors. Furthermore, healthcare utilization is influenced by predispositions to barriers of health services for some, factors that enable or hinder use, and individuals' need for care (Andersen, 1995). All of which indicate areas for inequities to persist that can hinder healthcare usage as resources to promote utilization are not distributed evenly. A close examination of these various determinates provides avenues to direct efforts to address these inequities in access to healthcare (Andersen, 1995; Gelberg et al., 2000). However, more attention needs to be placed on social and cultural factors such as acculturation and social structures that may influence or hinder healthcare utilization. The expanded model may offer more powerful explanations of disparities in healthcare utilization among vulnerable racial/ethnic groups.

Expansion of the Andersen Model to Vulnerable Populations

Critiques to the Andersen model highlight a need to pay attention to vulnerable populations who often face inequitable opportunities to seek care and to meet their unique health needs. Gelberg and Andersen (2000) further extended the Andersen Model to refocus attention to vulnerable populations including minorities, undocumented immigrants, children, and chronically ill and disabled individuals to better understand their health service utilization (Gelberg et al., 2000; Stein et al., 2007). The Behavioral Model for Vulnerable Populations provides a theoretical framework expansion that highlights factors that might make a population vulnerable to health utilization and access (Victor et al., 2018). The model supplies insight into how these new vulnerability variables may affect the health status and healthcare utilization of the population (Victor et al., 2018). This model aids in the explanation of the use of health services within vulnerable populations by including domains such as acculturation, social support, community resources, unsafe sexual behaviors, etc., that are relevant to understanding the health and health-seeking behaviors of these populations (Please see **Figure 3**) (Gelberg et al., 2000; Stein et al., 2007). A revised model focusing on vulnerable populations is essential because factors that cause individuals to be vulnerable may also affect their use of health services and their health status. These factors may include childhood characteristics, ability to navigate the healthcare system, perceived health and health conditions, and acculturation (Gelberg et al., 2000; Stein et al., 2007; Victor et al., 2018). This extended theoretical framework and model incorporates these social factors when conducting inquiries around the use of health services and health outcomes, such as cancer screenings among vulnerable populations including NHPIs (Gelberg et al., 2000; Victor et al., 2018).

FIGURE 3: THE BEHAVIORAL MODEL FOR VULNERABLE POPULATIONS (2000)



This theoretical model servs as a conceptual framework for this dissertation, and will be discussed in detail within the Methodology chapter to follow. Those social factors falling within the vulnerable domain of the model demonstrate factors that may make these communities vulnerable in the first place (Gelberg et al., 2000). In addition, the model supplies influential factors to consider when studying healthcare utilization and outcomes within vulnerable communities (Gelberg et al., 2000; Lim et al., 2002). The model provides a more well-rounded emphasis on population characteristics when working with vulnerable populations: social

determinants or cultural norms of healthcare utilization, characteristics of the healthcare and other systems, and individual determinates of healthcare utilization (Small, 2010; Stein et al., 2012). The expanded model focuses on social structure and enabling resources that are relevant to vulnerable populations. The model also supplies variables to demonstrate that obtaining preventive services and monitoring health may be a lower priority for vulnerable populations because of various obligations and lived experiences (Gelberg et al., 2000; Lim et al., 2002; Small, 2010). Vulnerability itself influences individuals' ability or opportunity to seek care as they are often predisposed to factors that make them vulnerable and prevent them from receiving healthcare (Gelberg et al., 2000; Small, 2010). These factors may include country of birth, acculturation, language, and victimization (Small, 2010). These vulnerable enabling factors may also include the need for or hindrances to receiving public benefits and medical insurance, and vulnerable population characteristics like psychosocial risk factors such as social structures that limit the belief in a need for healthcare utilization (Small, 2010; Stein et al., 2012). These added categories provide a model for social inquiry concerning determinants of healthcare service utilization within vulnerable populations, such as cancer screenings within NHPI communities. Lastly, theoretical insight into individual-based thoughts concerning health decision predictions from a more public health perspective may help to offer an interdisciplinary examination of healthcare utilization and the thought process behind engaging in access to care.

Health Belief Model

Additional theoretical support for this dissertation and the focus on barriers to preventive healthcare draws from the Health Belief Model (HBM) and focus around health decisions. This model was developed during the 1950s as Public Health focus shifted towards prevention and not the treatment of a disease due to wide spread failure of the public in accepting disease

preventions or screening tests for the early detection of diseases (Rosenstock, 1974). This fostered a need for a theoretical framework to explain preventive health behavior with a focus on behaviors of individuals who were not currently suffering from diseases, and who needed to be oriented towards the avoidance of disease (Capik & Gozum, 2011; Rosenstock, 1974). The HBM provides a theoretical support for identifying specific attitudes or beliefs that influence people in choosing preventive healthcare and engaging in medical recommendations. Researchers use this model to theorize matters such as condom use, breast self-examinations, and disease screening behaviors (Austin et al., 2002; Capik & Gozum, 2011; Lau et al., 2020; Yarbrough & Braden, 2001). This exploratory model is used not only to assess why people do not use preventive health services, but also to understand why people use or fail to utilize health services (Austin et al., 2002; Janz & Becker, 1984).

The HBM has six fundamental constructs: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy, all of which are mainly used to develop health interventions (Capik & Gozum, 2011). These constructs are believed to influence individuals' decisions regarding whether or not to take a specific health action or doctor recommendation, while paying attention to the capability of performing the health recommendation (individual self-efficacy) (Janz & Becker, 1984; Oliver, 2007). This health motivation framework provides a context for cancer screening research, as well as the theoretical support for the relationships between individual choices to engage or not engage in screening practices (Lau et al., 2020; Yarbrough & Braden, 2001). Yarbrough & Braden (2001) found the use of the HBM to be inconsistent in predicting health behaviors for breast cancer screenings, but did demonstrate about 47% of the variance in screening being explained when taking into account SES (Yarbrough & Braden, 2001). The authors called for more insight into the social

meaning of breast cancer and breast cancer control for women, aspects that the vulnerable expansion model may assist in if incorporating various theoretical frameworks into an analysis (Yarbrough & Braden, 2001). Lau, Lim, Wong & Tan (2020) found that the HBM can be useful in understanding the barriers and facilitators to colorectal cancer screenings. The authors also found that the HBM can be useful in tailored interventions as this theoretical framework allows us to better understand how to improve adherence to screenings recommendations (Lau et al., 2020).

Taken together, these different theoretical and conceptual frameworks provide a basis of understanding individual decision making around healthcare utilization such as cancer screenings. There are various aspects of social life interacting to either facilitate or provide barriers to engaging in healthcare services and outcomes. The different theoretical frameworks discussed above demonstrate complex interrelated institutions and barriers that lead to inequities within healthcare for NHPIs. There are often conflicting priorities and barriers standing in the way to prioritize self-care. Understanding inequities within healthcare utilization allows us to hypothesize some of the social factors that may be unique to NHPIs and the disparate rates of cancer screening and increased mortality cancer rates they face (Bodnar et al., 2022; Leon Guerrero et al., 2020; Registry, 2022). As highlighted in the previous chapters, NHPIs are underrepresented in cancer control strategies, yet face increased rates of cancer incidence and mortality. More theoretical understanding of why these inequities persist despite advances in health sciences is needed. This dissertation aimed to do so by utilizing these beforementioned theoretical and conceptual frameworks as a foundation to understand disparities in cancer screenings and health outcomes among NHPIs.

After our 2017-2018 pilot study of 1,010 Native Hawaiian, Marshallese, and Chuukese adults in Hawai'i, it was evident that these communities do not engage in preventive cancer screenings and healthcare when comparing their rates to Hawai'i residents (Cassel et al., 2020). These are the only published findings from this dataset as of now (Cassel et al., 2020), we have one manuscript describing the respondent-driven sampling characteristics under review. As of February 2024, 9 studies have cited this article. We found that among participants aged 50 years and older, there were no significant differences across ethnic groups ($p < .30$) for those completing a colon cancer screening (37%) (Cassel et al., 2020). Additionally, only 27% were referred to screening by a physician (Cassel et al., 2020). These disparate rates uncovered from the original HINTS Hawai'i study are further alarming because early and regular screening for colorectal cancer for precancerous lesions can prevent nearly 90% of cancers of the colon (Lin et al., 2016). Our study also found that acculturation was found to be positively associated with cigarette and e-cigarette usage and PI communities were more likely to trust religious leaders rather than physicians (Cassel et al., 2020). These preliminary findings point to the importance of social factors in facilitating or hindering engagement in healthcare and affecting health outcomes. Additionally, this highlights the role of acculturation and social support in influencing healthcare utilization, which are factors from within the expanded Andersen model (Cassel et al., 2020; Gelberg et al., 2000). These findings supply a basis for my inquiry into the social factors that are creating barriers to cancer screenings within the existing dataset, as well as a need to further examine the population characteristics through interviews with community members that will be discussed within the next chapter.

Chapter 4 Methods

As discussed in the previous chapters, NHPIs face numerous obstacles in engaging in healthcare utilization, especially preventive care services such as cancer screenings. This dissertation strives to fill in a gap by exploring social factors and determinants facilitating and hindering preventive healthcare utilization among NHPIs in the State of Hawai‘i. The objective of this dissertation is to provide further insight into the previously documented health inequalities and higher rates of cancer incidence and mortality that NHPIs experience that go beyond traditionally explored demographic characteristics and lower SES of these racial/ethnic vulnerable populations. Specifically, this mixed-method dissertation aims to further explore variables uncovered from the Hawai‘i Health Information National Trends Study (HINTS) survey (N=1,010) conducted in 2017 and 2018. The intention of the HINTS Hawai‘i-based cross-sectional study was to determine factors that impact Native Hawaiian, Marshallese, and Chuukese participants engaging in cancer screening and understand individual cancer beliefs, informational sources, and behaviors. Participants were recruited from three public housing locations on the island of Oahu, and two PI community churches with the assistance of NHPI community organizations. After an initial analysis of the demographics of the study, it was uncovered that 85% of the sample reported incomes less than $35,000, 54% reported having medical insurance, and only 8.9% completed college (Cassel et al., 2020). Furthermore, what sparked this researchers’ interest in continuing analyses of this dataset and further insight into these groups and locations, was that among those 50 years and older, only 37% of the respondents completed any colon cancer screening and only 27% reported being ever referred to a colon cancer screening test by a doctor or physician (Cassel et al., 2020). During this same time, according to the 2018 Hawai‘i Behavioral Risk Factor Surveillance System, 75% of

Hawai‘i residents had a test for colon cancer (Warehouse, 2022). This immediately highlighted disparate rates of colon cancer screenings for NHPI community members in public housing that needed further inquiry.

This dissertation aims to provide further insight into these original HINTS survey findings by employing a mixed methods approach to understand more of the "whys" of self-reported lower-than-average Hawai‘i cancer screenings rates for NHPIs (Cassel et al., 2020). To complete this charge, this dissertation originally proposed to conduct 27 in-depth interviews (9 each for Native Hawaiians, Chuukese, and Marshallese individuals) with key stakeholders and leaders within the communities of focus (public housing on Oahu). Public housing was chosen as these sites were the locations for recruitment with the original HINTS study, and are known for diverse representation from underserved communities (Rita et al., 2020). These interviews aim to shed light on reasons why community members may or may not be engaging in doctor-recommended cancer screenings (preventive care). The three outcome variables for the quantitative secondary data analysis of the original HINTS Hawai‘i dataset include colorectal, cervical, and breast cancer screening history for those within the doctor-recommended screening age groups who completed the original Hawai`i study. Respondents were asked, "Ever had a test for colon cancer" (all adults over 50); "have you ever had a mammogram" (women over 45); and "how long ago did you have your most recent pap test to check for cervical cancer" (all women). Responses for these three questions were dichotomized as screened or not ever screened. For both the qualitative and quantitative methodologies of this dissertation, health comprehension, acculturation, and perceived racism and mistrust in healthcare served as guiding variables for the interview guide and analyses. As highlighted within Chapter 2, these variables have been shown to negatively affect preventive health and healthcare utilization for NHPIs, and provided a

foundation for the semi-structured interview questioning. The Health Belief Model and socioecological framework guided a theoretical understanding of the attitudes, beliefs, and external factors influencing individuals' choices in preventive healthcare. Additionally, the expanded Andersen model through the Behavioral Model for Vulnerable Populations further provides a conceptual model for the quantitative analysis and ordering of the variables available within the original HINTS Hawai‘i dataset and the makeup of the interview questions (Capik & Gozum, 2011; Gelberg et al., 2000; Halliday & Akee, 2020; Palafox & Hixon, 2011; Riklon et al., 2010).

These social factors of interest within this dissertation have been shown to influence health and cancer behaviors with different medically underserved populations. Health comprehension misunderstandings are often associated with poor health status, more hospital admissions, and increased high health costs for readmissions and may be improved by increased comprehension and readability of health-related materials and instructions by providers (Liu et al., 2009; Szabo et al., 2021). Acculturation refers to the social and psychological exchanges that take place when there is interaction between individuals from different cultures observed through domains such as behaviors or attitudes/beliefs while paying attention to social networks (Cabassa, 2003). Additionally, perceived racism/discrimination and unfair treatment are the experiences of racism based on ethnic differences as perceived and evaluated by a dominant culture (Western) and other minority groups measured in healthcare experiences, while paying attention to mistrust in healthcare affecting engagement with health services (Liang et al., 2007). Racial/ethnic discrimination is operationalized as the treatment of underrepresented communities negatively by majority ethnic communities causing unequal access to resources that promote positive healthcare and health-based knowledge. This exploratory pilot mixed method

dissertation aims to explore key factors uncovered from a logistic regression analysis of the HINTS survey data and triangulate findings from semi-structured interviews to inform future cancer screening prevention efforts for NHPIs in Hawai‘i.

The intention of the original HINTS Hawai‘i study (2017-2018) was to determine factors that impact Native Hawaiian, Marshallese, and Chuukese participants engaging in cancer screening and understand individual cancer beliefs, informational sources, and behaviors. From the uncovered lack of colorectal cancer screenings within NHPI communities, further insight into barriers to healthcare utilization and cancer screenings was needed and a motivation for this dissertation. Within the sample of those 50 years and older, only 37% of the respondents completed any colon cancer screening and 27% reported being ever referred to a screening test by a doctor/physician, whereas 75% of Hawai‘i residents reported having a test for colon cancer (Cassel et al., 2020; Warehouse, 2022). HINTS gathers a large amount of data regarding health behaviors for many populations. However, NHPIs represent a small sample of those respondents and are aggregated together. During the 2018 HINTS national Cycle, only 5 respondents were NHPI (National Institutes of Health, 2023). This dissertation will add to the lack of representation within the HINTS and national datasets regarding NHPI health behaviors and influences on cancer screenings by using the HINTS Hawai‘i dataset which focused solely on these underrepresented populations. Additionally, this dissertation further explores a comprehensive web of factors that might influence the use of health service guided by the socioecological framework, Health Belief Model, and the expanded Andersen model serving as a theoretical guide. Social factors of influence will be generated from the logistic regression analysis, while themes from the semi-structured interviews will add additional values to triangulate the survey findings and those factors that influence engagement in healthcare

utilization. By triangulating findings that are confirmed by both analyses or contradict one another, this dissertation aims to add value to the medical sociology field by highlighting facilitators and barriers to cancer screenings as uncovered from a quantitative analysis and interviews with NHPI community members. However, insight into the original Hawai‘i HINTS study, survey makeup, and evidence-based instrument design and sources must be addressed.

Original HINTS Study and Health Behaviors Survey Instrument

The University of Hawai‘i Cancer Center (UHCC) surveyed the health and cancer behaviors, knowledge, and health-based practices among Native Hawaiian, Chuukese, and Marshallese residents on Oahu in 2017-2018. The Health Information National Trends Survey (HINTS) (created and in use since 2003) collects nationally representative data about the usage of cancer-related information, access, and communication trends and patterns (*HINTS Fact Sheet* 2018). HINTS allows for monitoring changing patterns and communications trends regarding health practices of adults over 18 through a stratified sample of addresses, and selected participations are provided a web survey invitation (*HINTS Fact Sheet* 2018; Nelson et al., 2004). Health behaviors are actions taken by individuals that affect their health or mortality, intentionally or unintentionally (Short & Mollborn, 2015). The Hawai‘i HINTS study asked participants about health behaviors ranging from cancer screenings, last time visited a doctor, smoking, physical activity, and culturally-tailored questions such as betel nut usage and acculturation social networks (Cassel et al., 2020). These questions are traditionally asked at an individual level. However, there remains a further need to examine these constructs at a larger-group level by looking at culture and ethnic influences on health use and behaviors (Short & Mollborn, 2015). Further insight into the role of group-level effects of these constructs in influencing dynamic behaviors affecting health is needed (Short & Mollborn, 2015). The

Hawai‘i HINTS study and variables within the survey allows for a “healthy lifestyles” focus beyond a single behavior to include behaviors occurring in sets and influencing one another (Short & Mollborn, 2015). In this case, cancer screenings and multiple influencing factors such as acculturation, health comprehension, and perceived racism/mistrust can be examined (Short & Mollborn, 2015).

The traditional HINTS has gone through sixteen iterations since 2003 (each with 6 cycles of 4-year data collection years) utilizing a cross-sectional survey of a nationally-representative U.S. sample of Americans aged 18 and older through telephone interviews and now through stratified sampling of addresses (Institute, 2021; National Institutes of Health, 2022). Respondents are offered a paper survey or a web option to complete HINTS through a two-stage stratified sampling first utilizing residential addresses and then a selection of one adult per household selected (National Institutes of Health, 2022). However, as with many national datasets, the representation of medically underserved populations like NHPIs within HINTS remains low for these data collection sources. Specifically, for HINTS 6 collected in 2022, the estimated NHPI U.S. adult population was 405,476 (National Institutes of Health, 2023). However, only 0.3% (or 16 responses) were collected from this population (National Institutes of Health, 2023). Additionally, during HINTS 5 Cycle 1 collected in 2017, the time of our original Hawai‘i adaptation study, the NHPI U.S. adult population was 218,602; however, only 0.1% (or 3 responses) were collected from this population (National Institutes of Health, 2023). However, it should be noted that both cycles met the percentage of Non-Hispanic Native Hawaiian or other Pacific Islander responders relative to the U.S adult population. However the number of responses were small to meet that threshold with sampling. The limitation of HINTS in

generating responses from NHPI community members greatly hinders a better understanding of the populations and calls for future data collection over-sampling of NHPIs.

To address the needed representation of additional NHPIs within HINTS to facilitate meaningful national comparisons across racial/ethnic groups, the UHCC conducted the original Hawai‘i HINTS study between 2017 and 2018. The study had a goal of surveying a total of 500 Native Hawaiian, 250 Chuukese, and 250 Marshallese adults. After the year and a half of recruiting, 515 Native Hawaiian, 305 Chuukese, and 180 Marshallese were surveyed on topics concerning health-related behaviors including questions about cancer knowledge, attitudes, health communications, and cultural practices. Survey instruments of the Hawai‘i HINTS study were also adapted from the Behavioral Risk Factor Surveillance System (BRFSS). BRFSS was first established in 1984 in 15 states, and now is the nation’s premier system of telephone-based surveys on health behaviors collected in all 50 states with more than 400,000 adult interviews collected each year (Prevention, 2014). States utilize BRFSS to address urgent and timely health needs. In order to reach populations previously inaccessible, BRFSS began utilizing cell phones for survey administration in 2008 to produce a more representative sample (Prevention, 2014). BRFSS collects state-level data allowing for building health promotion activities targeted with state-specific communities. BRFSS is often used for providing empirical data about physical activity, nutrition, and smoking behaviors, as well as tracking cancer and health trends and patterns (Prevention, 2014; Richardson et al., 2022; Wills et al., 2019). The original Hawai‘i HINTS questionnaire utilized BRFSS questions regarding colorectal cancer screening, breast cancer screening, and barriers to care in order to compare findings to a national representative dataset for later analyses. This study was able to recruit from within NHPI communities.

For the Hawai‘i HINTS study, participants were recruited from three public housing communities, PI community events, two PI community churches, and through partnerships with community organizations to reach these often hard-to-locate communities. As with many vulnerable populations, there remains no sampling frame to recruit these individuals from. Public housing locations provided an ideal location for recruiting as NHPIs are often over represented in these communities. This original study aimed to fill in a knowledge and literature gap on the health behaviors of these medically underserved communities because of their unique health needs (Leon Guerrero et al., 2020; Palafox et al., 2018). Preventative health behaviors involving NHPIs are unique in that NHPIs living in Hawai'i may hold onto both Western and traditional cultural values (acculturation), and these may be at odds with one another. For example, PI community members may face language barriers or not agree with a medical providers recommendation or suggestions. They may feel a cultural expectation to agree with their doctor rather than ask questions when understanding is not met or if they do not agree with them. There may be internal conflicts between cultural informal norms of agreeing with those in advanced hierarchical positions and speaking up concerning misunderstandings which could be seen as a more American value. This dissertation serves as a continuation of the HINTS survey by exploring facilitators and barriers to healthcare utilization from the Hawai‘i HINTS findings. To achieve this charge, this dissertation utilizes the existing survey instrument discussed above and dataset for a secondary data analysis and triangulate these findings with semi-structured interviews. However, recruiting from these communities requires unique methodologies for hard-to-reach populations, which is often lacking from surveillance data. The Hawai'i HINTS study utilized Respondent Driven Sampling to recruit NHPIs, as this offset of snowball sampling provided an ideal recruitment strategy for vulnerable populations.

Non-Probability Sampling Methodologies

The Hawai'i HINTS study utilized Respondent Driven Sampling (RDS) to find and recruit Native Hawaiian, Marshallese, and Chuukese participants within three public housing communities and other sites where PI were known to be members such as local churches. Oftentimes, NHPIs are considered "hidden populations" because no sampling frame or strong privacy concerns exist making sampling these communities difficult, such as those living with HIV or drug injectors (Magnani et al., 2005). There remains little to no existing literature concerning disaggregated ethnic-based health concerns like mental health well-being, social stigmas, and cancer screening barriers for NHPI because it is often difficult to reach these populations (Sasa & Yellow Horse, 2022; Stotzer et al., 2022). Traditional probability sampling cannot always produce reliable samples where no sampling frame exists or traditional randomization is not possible, so nonprobability sampling measures are often necessary for hidden populations (Badowski et al., 2017; Heckathorn, 1997). Probability sampling utilizing the preferred random sampling in various minority populations is often difficult and ineffective because these groups are often vulnerable and hard-to-reach without community champions and networks within these communities (Badowski et al., 2017). Chain referral sampling practices offer promising measures for utilizing initial contacts (seeds) to refer and provide a fixed number of persons who fulfill the research criteria for sampling (Badowski et al., 2017; Heckathorn, 1997; Stotzer et al., 2022). These individuals, if they agree to participate, provide a fixed number of additional names, and this continues on in waves until equilibrium within hidden populations is reached (Heckathorn, 1997). RDS relies upon a predetermined sample size or oversampling targeted areas or populations and thereby capturing subjects with the full array of network sizes (Heckathorn, 1997; Johnston et al., 2013). RDS is unique from other nonprobability sampling

such as snowball sampling in that both are a means for studying hard-to-reach populations; however, RDS is a sampling method with good estimates for studying hard-to-reach populations (Heckathorn, 2011). RDS is a series of methods that aim to convert chain-referral sampling into a sampling method of reliable estimates of the samples' population (Heckathorn, 2011). This type of sampling methodology was vital to the successful recruitment of 1,000 participants for the HINTS study: 515 Native Hawaiian, 305 Chuukese, and 180 Marshallese adults, with less than 1% of the participants (10/1010) left out of the analysis for not meeting the ethnic criteria for inclusion (Cassel et al., 2020). This dissertation utilizes this dataset for the secondary data analysis.

In addition, for the qualitative methodology of this study, snowball sampling was utilized to recruit NHPI participants from two of the original public housing locations. Snowball sampling of interviewees provides the most efficient recruitment strategy as these groups are hard-to-reach without an initial contact in the community. Recruitment from vulnerable and medically underserved communities requires culturally-sensitive and tailored strategies that respect social networks and relationships (Sadler et al., 2010; Stotzer et al., 2022). Snowball sampling demonstrates a recruitment method that overcame challenges to reaching these communities and provides space to join health interventions and research (Sadler et al., 2010; Stotzer et al., 2022). This dissertation employs snowball sampling for the qualitative component of this study, beginning with one community champion in site 1. Respondent 1 (R1) at site 1 provided three names and contact information for potential recruits after her interview and this began the recruitment chain for that location. All three respondents completed the interview and provided contacts for possible involvement in the study. After reaching out to these contacts, an additional five interviews were conducted. For site 2, I was invited to attend two health-based

fairs within the public housing complex to distribute cancer-based resources for residents and recruit for different UHCC projects. During this time, I collected the names and contact information for those who were interested in taking part in the interview, and provided interested prospects with the IRB-approved recruitment flyer (see **Appendix D**). The first event supplied 20 names and contact information, of which I was able to successfully interview four participants. The second event supplied 10 contacts and three interviews were completed. I completed multiple contact attempts, left voice messages or emails, and committed to five calls of no contact before those potential participants were no longer reached out to and ceased potential recruitment. All but one interview was conducted over the phone and participants that were interviewed were provided recruitment flyers and asked for contact information for future recruits after the interview to continue the snowball chain. Phone interviews provide both advantages and disadvantages. In-person interviews are often viewed as the gold standard; however, phone interviews offer alternative qualitative formats with advantages such as time and cost savings, greater flexibility, and more options to ensure privacy (Lindsay, 2022). However, limitations include conflicting obligations while interviewing, distractions from family members, and not being able to view facial inflections when interviewing. **Table 1** demonstrates the final interviews conducted from each site utilizing snowball sampling.

TABLE 1: SITE-SPECIFIC INTERVIEWEE RECRUITMENT

	Site 1	Site 2
Interviewees	N=9	N=7

After recruitment, a total of n=16 interviews were completed from both sites and served as the qualitative component and analysis of this dissertation (recruitment decisions discussed below).

Gender and other demographic breakdowns of the interviewees are provided in Chapter 6 which discusses findings from the qualitative study.

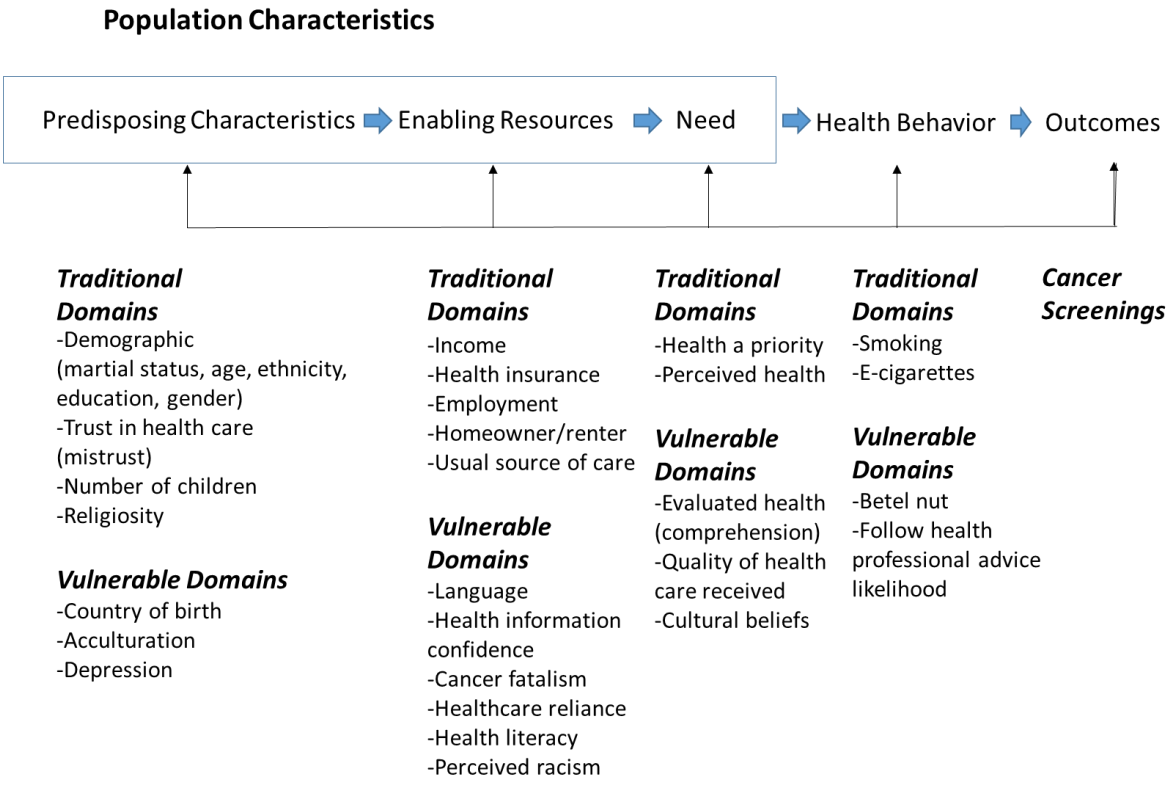
Recruitment Sites for these Hard-to-Reach Populations

With NHPIs, it is difficult to conduct traditional probability sampling strategies as these groups are often stigmatized, marginalized, or hard-to-reach because of historical mistreatment and trauma regarding colonization, Western healthcare mistreatment, or other social determinants driving inequities within these communities (Leon Guerrero et al., 2020; Pobutsky et al., 2009; Stotzer et al., 2022). Research and government agencies have established in the past that PI were residing at homeless shelters, beaches, and government-assisted public housing and residential areas within Hawai`i because of the high cost of living and racialized inequities tied to marginalized communities (Cassel et al., 2020; Pobutsky et al., 2009; Shek & Turlington, 2019). Shek and Turlington (2019) utilize public housing as a location for addressing social determinants of health for low-income Micronesian families regarding health-harming legal needs (Shek & Turlington, 2019). Yamada and Pobutsky (2009) mentioned that Hawai`i's high cost of living makes it difficult for many PI to survive economically, causing them to seek out housing assistance in public housing communities (Yamada & Pobutsky, 2009). Additionally, with multiple generations living under one roof, Micronesians often report low ratios of rooms per person in their residence causing overcrowded living situations within public housing (Laster Pirtle, 2020; Shek & Turlington, 2019; Yamada & Pobutsky, 2009). This dissertation utilizes two of the three original HINTS Hawai`i public housing communities as sites for recruiting for this project because of this researchers' established relationships with stakeholders within site 1, and also because of established relationships with community organizations within site 2.

Conceptual Framework for Secondary Data Analysis

Figure 4 demonstrates the conceptual model for this dissertation. This conceptual model was inspired by the Health Belief Model (Rosenstock, 1974) and the socioecological health perspective (Bronfenbrenner, 1977) in which individual health-related behaviors and self-efficacy for health changes are dependent upon interrelated institutions and social factors. The model's variables were organized according to the Andersen Model (Andersen, 1968) and the Behavioral Model for Vulnerable Populations (Gelberg et al., 2000) to advance our understanding of the role of social and cultural factors in the cancer screening outcomes (colorectal cancer, cervical cancer, and breast cancer) for NHPIs in Hawai`i. This model serves as the conceptual framework and a theoretical tool for this dissertation to help explain facilitators and barriers to adopting cancer prevention strategies. Additionally, the Andersen Model and the Behavioral Model for Vulnerable Populations provides an analysis map for categorizing and measuring individual and contextual determinants of health service use by placing the variables within predisposing, enabling, and need factor categories to help direct future efforts (Gelberg et al., 2000). Furthermore, **Figure 4** provides the variable categorization guide utilized within this dissertation from the Hawai‘i HINTS study for the logistic regression analysis. By utilizing the Behavioral Models guided by the HBM and the socioecological health perspective in explaining behaviors of health use, this dissertation demonstrates a need for further emphasis placed on NHPI cultural beliefs and social factors guiding behaviors. This in turn affects healthcare utilization and primary care for medically underserved communities.

FIGURE 4: DISSERTATION CONCEPTUAL FRAMEWORK



The vulnerable domains within the conceptual model indicate the role of acculturation and factors relating to self-identified ethnic communities in guiding behaviors relating to healthcare usage that go beyond the Andersen Model. Incorporating the expanded Andersen model into the framework for categorizing the variables for analysis will highlight influential social factors that is lacking within the limited NHPI cancer-based literature. Vulnerable domains within Figure 4 indicate possible factors guiding behaviors for vulnerable populations based upon the available variables from within the Hawai‘i HINTS dataset and social determinants influencing healthcare from within the literature for NHPIs (McElfish, Purvis, et al., 2019; Pobutsky et al., 2009; Rehuher et al., 2021). Some of the social interactions and cultural beliefs/practices from within the dataset that shape health and self-efficacy to seek out

healthcare include betel nut use, acculturation, quality of care received, and perceived racism. These social factors were selected and categorized into the three domains of the Gelberg Model because they provide potential areas for education and intervention within these overlooked and under-resourced communities (McElfish, Yeary, et al., 2019; Palafox & Hixon, 2011). Analyses for both the quantitative and qualitative components of this dissertation were conducted in tandem to triangulate those facilitators and barriers to cancer screenings within the NHPI communities.

Analyses

Logistic Regression for Quantitative Findings

For the secondary data analysis of the HINTS Hawai‘i dataset, this dissertation employs a logistic regression analysis as the statistical method to measure the associations between the independent variables (IVs) chosen within the conceptual framework (see **Figure 4**) and the outcomes, or dependent variables (DVs). Multivariate logistic regression served as the statistical test for this analysis to examine odds ratios (OR). Multivariable regression analyses evaluate the independent effects of each variable within a model on the outcomes while adjusting for the effect of other confounding variables included in the regression model, as well as quantifying the direction and strength of the associations (Castro & Ferreira, 2022; Fang, 2013; Stoltzfus, 2011). The decision behind this statistical analysis is that multivariable logistic regression involves an efficient technique to analyze the effects of multiple independent variables on a single binary outcome (in this case screened and not screened) by quantifying each IVs unique contribution and association with the DV (Stoltzfus, 2011).

The objective of this type of multivariable regression analysis is to utilize several IVs to predict values of the outcomes that a researcher wishes to know (Fang, 2013). This method

supplies an approach to inquire if the selected cancer screening outcomes are influenced by more than one IVs, and in this case based upon the available variables within the HINTS dataset, 40 variables, that made up the regression model and thought to be influential in NHPIs access to engaging in cancer screenings (Fang, 2013). For this analysis, HINTS asked questions around cancer types and screenings such as the most recent pap test for cervical cancer (dataset split and analyzed for all women), ever having a mammogram for breast cancer screening (dataset split and analyzed for women over 45), and ever having a test for colon cancer (dataset split for both genders over 50). These supplied the outcome variables for this dissertation and were then recoded into dichotomous outcome variables to contrast screened (1) or not screened (0) (N=Yes screened). Odds ratios for this regression analysis help identify the probabilities of detecting the cancer screening outcomes utilizing a bivariate approach for each specific variable within the conceptual model and a multivariable approach controlled for the adjusted variables. Adjusted variables included age, income, health insurance status, and occupational status. Analyses were ran using Statistical Package for the Social Sciences (SPSS).

Semi-Structured Interviews and Thematic Analysis for Qualitative Findings

For the qualitative component of this study, semi-structured interviews provide the best approach to engaging with NHPI community members utilizing snowball sampling to reach these often-hidden populations. This was achieved through my established community relationships with socially-connected community members and community organizations at two public housing locations, as discussed within the "Non-Probability Sampling Methodologies" section. Semi-structured interviews allowed me to engage in informal conversations with interviewees. In the interviews, themes and topics could emerge naturally and be interpreted as the interviewee had the freedom to veer off the interview guide based on what they wanted to

highlight (Small & Calarco, 2022). Questions were scripted on the interview guide (see **Appendix A**). However, as per the benefits of using semi-structured interviews, I encouraged interviewees to lead the conversation and expand on topics as they emerged naturally in the conversation (Berg & Lune, 2012). Semi-structured interviews allow for the development and expansion of questions within the interview guide that provide space for probing where appropriate for the research objectives as interviewing encourages explanatory rather than predictive analysis (Berg & Lune, 2012; Gerson & Damaske, 2020; Lofland & Lofland, 1995). Therefore, analysis emerge through an explanatory format as themes and patterns form from the narrative provided by those with that lived experience and can help develop theory in an inductive approach. This type of qualitative methodology allowed each participant's voice to be central and to remain at the heart of the research. Interviewees were able to tell their stories about their own health, family health, cancer screening history, and barriers to engaging in cancer screenings guided by the interview script but not held to those specific questions (Gerson & Damaske, 2020). Questions within the interview guide strive to inquire on the dynamic processes and tap into multiple dimensions of the human experience NHPIs may experience ranging from acculturation, health comprehension, language barriers to healthcare access, and mistrust/perceived racism experienced within healthcare that may affect their use of preventive services (Aflague et al., 2023; Esterberg, 2002; Gerson & Damaske, 2020). The use of these interviews allows for a more in-depth look into facilitators and barriers to cancer screenings for NHPIs by gathering more detailed and intimate knowledge than just an analysis of the HINTS variables in the regression analysis. Interviewing is established as a method for charting and explaining links between broad social structures/norms and individuals, thus providing a

methodology to further explore this pilot project (Gerson & Damaske, 2020; Lofland & Lofland, 1995; Small & Calarco, 2022).

The original dissertation plan called for N=27 interviews (9 Native Hawaiian, 9 Marshallese, and 9 Chuukese). However, several obstacles caused recruiting to end after one year and ended with N=16 interviews (59%). Sampling within site 2 was difficult to start off of the ground and I relied upon established community organizations that I partnered with in the past through health fairs where I could promote cancer resources and recruit. Site 2 did not benefit from snowball sampling as well as site 1, and both sites never went beyond one wave with referrals. It took several months to begin the process of recruiting in site 1 and 2 as permission to enter was needed. Additionally, I had to rely on my community champion to help begin recruitment at Site 1 and she experienced significant health setbacks. I often recruited in site 1 outside of her home and she was instrumental in my success of recruiting for this and previous projects by calling over friends and family. Thus, nearly a year passed and 16 interviews were completed. Fortunately, the 16 interviews provided sufficient insights to supplement the quantitative study. These interviews lasted between 30 minutes to an hour and a half and the interviewees' demographics can be found in Chapter 6. Site-specific information around recruitment can be found in the "Non-Probability Sampling Methodologies" section.

Interview studies rarely include enough people to satisfy tests of statistical significance and are often too labor-intensive, costly, and time-consuming to complete in-depth interviews with large samples (Gerson & Damaske, 2020). Additionally, interview transcripts can produce large amounts of data to analyze. Analyzing large amounts of text is often challenging and very labor intensive. As there is no agreed-upon sample size for qualitative methodology, the challenge lies in including enough data to have confidence in the findings to recognize

variations, patterns, and relationships to make comparisons among participants and claims of common themes and patterns (Gerson & Damaske, 2020; Rubin, 2021; Small & Calarco, 2022). Meeting saturation when interviewing must involve achieving the confidence you have discovered the reasons why patterns within the data exist and the ways in which they are connected to one another through themes (Gerson & Damaske, 2020; Rubin, 2021). Researchers can rely on reaching saturation and thick description when deciding to end recruitment and collecting new data when you feel enough data is collected to figure out what is happening and going on within your topics of interest (Rubin, 2021). One must be able to explain the significance within the social topics uncovered from the interviews, as well as how it is supported by theory or adds to a theoretical understanding of the social problem of interest (Rubin, 2021). After 16 interviews were finished, I felt that enough data was collected to generate results. I felt there were enough patterns to point us to new meanings to aid in explaining the processes between different social factors and influences to preventive cancer screenings. I began to hear the same common themes in each interview and observed the same connections between aspects of NHPIs experiences and Western healthcare. So I felt confident that I collected enough inquiry from these 16 interviews to generate patterns, themes, and develop meanings, which are summarized in Chapter 6 of this dissertation (Rubin, 2021).

The data were open coded for themes and sorted into coded classifications based on similarities, dissimilarities, and patterns within the interview data (Berg & Lune, 2012). A systematic indexing process helped me analyze and look for patterns within the data by indexing topics, themes and sub-themes that emerge from the analysis (Berg & Lune, 2012; Glaser et al., 1968; Lofland & Lofland, 1995). This open coding process followed Grounded Theory for qualitative research. Grounded theory allows one to generate and fill in the gaps of theory by

studying a phenomenon through an inductive approach where new insights are derived from the data (Chun Tie et al., 2019; Glaser & Strauss, 2017; Glaser et al., 1968). Triangulating influential social factors obtained from the regression analysis and by interviews will provide a basis of arriving at theory suited for this dissertation, and a way of filling in the gap in both the conceptual framework and theories of focus (Glaser & Strauss, 2017). Grounded theory allows for a flexible methodology with the aim of producing an explanatory theoretical understanding of this topic and generate theory that is grounded in the data (Chun Tie et al., 2019; Gerson & Damaske, 2020). The aim of this portion of the dissertation was to employ qualitative methodology through semi-structured in-depth interviews to explore and understand variables that may be missed or only partially measured utilizing quantitative measures as in HINTS (Berg & Lune, 2012; Savage & Burrows, 2007). Conversational exchanges/probing questions in semi-structured interview settings allow for narrative to be explored and expanded upon through the interviewees' reality (Bergman, 2010; Esterberg, 2002; Savage & Burrows, 2007; Small & Calarco, 2022). These settings are believed to be better measures of complex constructs such as ethnicity, cultural beliefs, mistrust in healthcare, acculturation, and perceived racism thus demonstrating a need to make use of this sampling strategy (Bergman, 2010; Esterberg, 2002; Savage & Burrows, 2007). Grounded theory guides the thematic analysis of this qualitative analysis to advance the understanding of NHPI community members health behaviors and influences on cancer screenings (Glaser & Strauss, 2017; Glaser et al., 1968). This approach allows for identifying patterns, meanings within the narrative, and commonalities from the data and provided a basis for sorting these into code classifications for analysis. For the analysis, I utilize NVivo version 14 software to categorize these data into parent and child nodes. These codes were analyzed for similarities and dissimilarities. This analysis provides a framework to

ensure the themes uncovered accurately represent what was extrapolated from the interviewees, following Grounded Theory and qualitative analysis approaches (Glaser et al., 1968; Rubin, 2021). The interviews were mainly conducted over the phone as this option was preferred by the majority of interviewees. Many interviewees had conflicting obligations and a phone interview allowed them the time to take part in the interview while being at home or running errands. Phone interviews offer both disadvantages and advantages such as greater flexibility and difficulty in traveling to interviews (Davies et al., 2020; Lindsay, 2022). Conducting the interviews over the phone was preferred by the interviewees versus an online Zoom format, therefore, this format was selected as the best interview format.

Confidentiality and Data Management and Storage

For the quantitative component of this dissertation, the HINTS Hawai‘i dataset was deidentified. No identifying variables or demographic information exists for the participants other than zip codes for some individuals. However, for the purpose of this dissertation, zip codes were not a part of the secondary data analysis. I was the only person present during the interviews for the qualitative arm of this dissertation besides the interviewee. Fifteen out of the sixteen interviews were conducted over the phone and one was conducted in-person at the participants home per their request. The over the phone format worked the best for interviewees as some did not understand the complexities of Zoom for video interviews and stated that they were comfortable with an oral exchange method. While the interviews took place, I took detailed notes to ensure I immediately highlighted data that emerged from the interviews (see **Appendix A**) to try and catch important pieces of narrative discussed. These articles of data were also a part of the analysis conducted before the NVivo thematic analysis to familiarize myself with and interpret the data and initial commonalities. These interviews took place in a private office at the

UHCC to protect the interviewees' privacy and were recorded utilizing an Olympus digital voice recorder, as well as an iPhone 7 as a backup device in case there were any problems with the video voice recorder. All interviewees were provided the IRB-approved consent form (**Appendix B**) verbally before the interview began and provided verbal consent. Interviewees were informed that their participation was completely voluntary, they could skip questions, start, stop, or pause at any time, and that they would be provided pseudonyms (R1-R16) rather than their names to protect their identity. Interviewees were compensated for their time in the form of a $25 gift card. Additionally, they were informed that the interview recordings would be transcribed, all names withdrawn, as well as the removal of any identifying information. After transcription, the recordings (both on the iPhone 7 and the Olympus voice recorder) were destroyed to protect interviewees' confidentiality. The recordings from the iPhone were immediately destroyed once the video voice recordings were uploaded to the secure network.

All of the quantitative and qualitative data for this dissertation were stored on a secure system at the UHCC and within the UHCC's internal secured network NDrive. These data were only accessible by myself while at the UHCC. This researcher had one undergraduate research assistant to transcribe three of the recordings as part of their training at the UHCC. The exchange of the transcription was conducted over the secure network. The remaining interviews were transcribed utilizing NVivo software provided by one of the dissertation committee members and these exchanges took place over a secure Dropbox file where myself and the researcher were the only ones who were able to access these documents. These transcriptions were then validated by myself and one graduate-level research assistant to ensure accuracy. This was also necessary because of the unique accents and dialects of these community members, in which the software was often unable to transcribe the narrative correctly. After each interview, the $25 gift card, a

copy of the consent form, a recruitment flyer, and a thank you card was mailed to all who completed the interviews. After the recording ceased, interviewees were informed that all of these documents would be mailed to them and they were asked to disclose any potential recruits to take part in the study. All of the participants were informed that the recruitment flyer would be mailed to them to pass out to any interested family members or friends to continue the snowball sampling chain.

Hypotheses, Research Questions, and Operationalization

Two overarching hypotheses and four research questions guide this dissertation and serve to test the relationships between the social variables of focus and the interaction they are expected to hold over the three cancer screenings for NHPI community members. This dissertation aims to answer the following research questions operating under the specific hypotheses (see **Table 2**) driving this study:

- RQ1: What do NHPI community members believe are the most impactful social factors influencing adherence/non-adherence to cancer-screening recommendations and barriers blocking screening?
- RQ2: Do key informants believe the following social factors play a role in their respective communities as factors affecting cancer screenings:
    - *Health comprehension,*
    - *Perceived racism (treated differently in a negative way within the health field because of their racial/ethnic identity)/mistrust in healthcare (lack of trust in Western medicine because of past experiences or negative experiences of others),*
    - *or Acculturation status*

- RQ3: Do the available social determinants (income, age group, occupation, health insurance status) within the dataset influence the cancer screening behaviors of NHPIs within public housing communities on Oahu (HINTS sample areas)?
    - *Do these social factors vary by cancer type (colorectal, cervical, and breast cancer)?*
- RQ4: How will the social factors of interest (health comprehension, perceived racism/mistrust in healthcare, and acculturation), or any social factors found to influence cancer screenings within the semi-structured interviews and logistic regression analysis inform areas of focus for these communities for the UHCC to focus cancer control strategies?
- **Hypothesis 1**: Evaluate whether and how three domains of the social factors (health comprehension, perceived racism/mistrust in healthcare, and acculturation) are related to cancer screenings for NHPIs.
    - *Null Hypothesis: Health comprehension, acculturation, and perceived racism or mistrust in healthcare will not be influential factors of engagement in colorectal, breast, and cervical cancer screenings uncovered from the secondary data analysis utilizing logistic regression.*
- **Hypothesis 2**: Assess if any important and influential social factors are missed from the quantitative analysis by conducting in-depth interviews regarding facilitators and barriers to cancer screenings for NHPIs.
    - *Null Hypothesis: Findings from the semi-structured interviews find no other influential barriers to cancer screenings for NHPIs.*

TABLE 2: HYPOTHESIS AND RESEARCH QUESTION STRUCTURE		
Component	Description	Research Questions
Hypothesis 1	Evaluate whether and how three categories of the social factors (health comprehension, perceived racism/mistrust in healthcare, and acculturation) are related to cancer screenings for NHPIs	(1) RQ1 (2) RQ3 (3) RQ4
Hypothesis 2	Assess if any important and influential social factors are missed from the quantitative analysis by conducting in-depth interviews regarding facilitators and barriers to cancer screenings for NHPIs	(1) RQ1 (2) RQ2 (3) RQ4

This dissertation aims to advance our knowledge using the Behavioral Model for Vulnerable Populations as a conceptual guide for variable categorization and the domains of focus for future prevention/intervention efforts. As well as themes uncovered from the semi-structured interviews to help conceptualize the role of interacting social influences driving cancer screening engagement for NHPIs. This dissertation values both quantitative and qualitative methodology in generating inferences and forming the basis of scientific sociology (Savage & Burrows, 2007). A mixed-method approach to investigating these research questions offers for a well-rounded means to conduct exploratory pilot analysis. Oftentimes in sociological research and theory, studies employ statistical measures to examine two or more variables and how they interact in their effects on some dependent variable (Allison, 1977). Multivariable logistic regression techniques are utilized for multiple IVs on dichotomized DVs for testing and examining direct and interaction effects (Allison, 1977). This analysis provides the technique for the quantitative portion of this dissertation. Health literacy, acculturation, and perceived racism/mistrust in healthcare are influential variables uncovered from a search of the existing literature and guiding the secondary data analysis and interview questions for RQ1 through RQ4. The use of a regression analysis of the existing HINTS data serves as an additional confirmation of facilitators and barriers to cancer screenings.

To help categorize the variables from within the HINTS survey that can facilitate or hinder access to formal healthcare, the Andersen Behavioral Model of Health Service Use and the expanded Behavioral Model for Vulnerable Populations provided an ideal framework. Gelberg and Andersen (2000) extended and expanded the Andersen Model to refocus attention to vulnerable populations who are at higher risk for disease, health inequalities and injury (Gelberg et al., 2000). This model aids in the explanation of the use of health services within these NHPI populations by including domains relevant to understanding the health and health-seeking behaviors of these populations by each ethnicity. This aim was supported by asking interviewees the role of cultural beliefs in their healthcare service usage, a noticeable gap within these conceptual models of focus (Gelberg et al., 2000; Stein et al., 2007). As discussed above, this dissertation utilizes this model to choose and categorize variables from the HINTS study into the three categories (see **Table 3**).

TABLE 3: HINTS SURVEY VARIABLES FOR THE LOGISTIC REGRESSION ANALYSIS UTILIZING THE BEHAVIORAL MODEL FOR VULNERABLE POPULATIONS FRAMEWORK FOR VARIABLE CATEGORIZATION

BMVP Domain	Variable	Variable Categories
Predisposing Factors	Religiosity - *Do you consider yourself as religious?*	Very religious
		Religious
		Not religious
	Marital Status - *What is your marital status?*	Married
		Living as Married
		Divorced
		Widowed
		Separated
		Single, Never Married
	# of Children - *How many children under the age of 18 live in your household?*	Fewer than 2
		2 to 3
		4 or more
	Age - *What is your age?*	Open ended
	Ethnicity - *What is your race?*	Native Hawaiian
		Marshallese

		Chuukese
	Education - *What is the highest grade or level of schooling you completed?*	Less than 8 years
		8 through 11 years
		12 years or completed high school
		Post high school training other than college (vocational or technical)
		Some college
		College graduate
		Postgraduate
	Acculturation* - *I often participate in my ethnic cultural traditions. I often participate in American cultural traditions.* - *I enjoy social activities with people from the same ethnic culture as myself.* - *I enjoy social activities with American people.* - *I enjoy entertainment from my ethnic culture.* - *I enjoy American entertainment.* - *I often behave in ways that are typical of my ethnic culture.* - *I often behave in ways that are typically American.* - *I believe in the values of my ethnic culture.* - *I believe in mainstream American values.* - *I am interested in having friends from my culture.* - *I am interested in having American friends.* *Measures of Ethnic and American identity from the acculturation construct will be conducted through a scale of 6 questions for each respective identity and measured as high, neutral, and low	Negative
		Neutral
		Positive
	Trust health care provider (mistrust) - *In general, how much do you trust information about health or medical topics from: A Doctor?*	Some
		A little
		Some
		A lot
	Depression -*Over the past two weeks, how often have you been bothered by little interest or pleasure in doing things.* -*Over the past two weeks, how often have you been bothered by feeling down, depressed or hopeless.* -*Over the past two weeks, how often have you been bothered by feeling nervous, anxious or on the edge.*	Nearly every day
		More than half the days
		Several days
		Not at all

	-Over the past two weeks, how often have you been bothered by not being able to sleep or control worrying.	
Enabling Factors	Income *- Thinking about members of your family living in this household, what is your combined annual income, meaning the total pre-tax income from all sources earned in the past year?*	Categories from $0-$200,000 or more
	Health Insurance *- Do you have any kind of health care coverage, including health insurance, prepaid plans such as Health Maintenance Organizations (HMO), or government plans such as Medicare, or Indian Health Service?*	Yes No
	Usual source of care *- What kind of place do you go most often?*	Clinic or health center Doctor's office or HMO Hospital emergency room Hospital outpatient department Some other place
	Employment *- What is your current occupational status?*	Employed Unemployed Homemaker Student Retired Disabled
	Language *- How well do you feel speaking English?*	Very well Well Not well Not at all
	Health-related information confidence *- Overall, how confident are you that you could get advice or information about health or medical topics if you needed it?*	Completely confident Very confident Somewhat confident A little confident Not confident at all
	Rely on healthcare provider *- In the past 12 months, how often did you feel you could rely on your doctors, nurses, or other healthcare provider to take care of your healthcare needs?*	Always Usually Sometimes Never
	Health comprehension	Strongly agree Agree Disagree

	-In the past year, I have had a hard time understanding the healthcare provider's instructions because of language. *-In the past year, I had a hard time following the healthcare provider's instructions due to logistical reasons like transportation or childcare.* *-In the past year, I had a hard time following the healthcare provider's instructions because of my work schedule.* *-In the past year, I delayed seeking care because I didn't have insurance or the co-payment was too expensive.* *- If a healthcare provider gives me advice that goes against my cultural beliefs, I wouldn't listen to them.* *- I feel that my healthcare provider understands my background and values.* *- I often feel as if my healthcare provider looks down on me and the way I live my life.*	Strongly disagree
	Perceived racism *- I think the health systems treat people unfairly based on their race or ethnic background.* *-I think racism/prejudice makes receiving good healthcare difficult.* *-I have personally experienced racism, racial discrimination, or racial prejudice at least once in the last 12 months.* *-If I experienced racism in the past 12 months, I would suffer from the stress that can affect my health.*	Strongly agree Agree Disagree Strongly disagree
	Cancer fatalism *-How much do you agree or disagree? It seems like everything causes cancer.* *-How much do you agree or disagree? There's not much you can do to lower your chances of getting cancer.* *-How much do you agree or disagree? There are so many recommendations about preventing cancer, it's hard to know which ones to follow.*	Strongly agree Somewhat agree Somewhat disagree Strongly disagree
Need Factors	Health a priority *- Is your health a priority for you?*	Yes No
	Perceived Health *- In general, what would you say your health is.*	Excellent Very good Good Fair Poor
	Smoke cigarettes	Everyday

	- *How often do you now smoke cigarettes?*	Some days
		Not at all
	Evaluated health (comprehension) - *Overall, how confident are you about your ability to take good care of your health?*	Completely confident
		Very confident
		Somewhat confident
		A little confident
		Not confident at all
	Quality of health care received - *Overall, how would you rate the quality of health care you received in the past 12 months?*	Excellent
		Very good
		Good
		Fair
		Poor

Significance

Medical Sociology and Cancer Research

Medical sociologists closely follow developments and conduct research in the areas of patient experience, cancer diagnostics, screening and treatment, and social as well as biomedical developments and their impact on patients and their families (Kerr et al., 2018; Link, 2008). This study aims to continue the role of medical sociology in cancer-based research and strives to fill in a gap in the literature of studies incorporating conceptual and theoretical frameworks examining factors impeding healthcare utilization. This study aims to uncover a deeper understanding of the social factors affecting cancer-screening practices found within NHPIs. This study utilizes the following existing frameworks and middle-range theories for explaining and categorizing social structural influences: Socio-Ecological Health Perspectives, social factors as a fundamental cause, the Behavioral Model of Health Service Use, the Behavioral Model for Vulnerable Populations, and the Health Belief Model. All of which aid in the theoretical support for the association between the found influential social factors and NHPI health disparities. As discussed in Chapter 2, these theories provide an overarching framework to aid in the explanation of social factors interacting to influence cancer screenings from the mixed method

analyses and how findings can be incorporated into future efforts addressing NHPI cancer control/prevention programs.

In summary, this dissertation aims to conduct interviews with NHPIs and supplement these findings by exploring new variables uncovered from both the logistic regression analysis of the Hawai'i HINTS survey data and social factors uncovered from the interviews to determine factors that influence NHPIs cancer screening behaviors. NHPIs often face numerous adverse health outcomes, increased racial discrimination, and disparate health equity for many reasons (Cassel et al., 2020; Leon Guerrero et al., 2020; Palafox et al., 2018). This study aims to explore reasons for not engaging in preventive healthcare utilization. This dissertation further explores this topic by utilizing a community-engaged approach by conducting semi-structured interviews with key stakeholders within the communities of focus. These interviews will aid in shedding light on reasons why community members may not be engaging in recommended cancer screening with health comprehension, acculturation, and perceived racism/mistrust in healthcare as the guiding areas of inquiry. These social factors were derived from literature searches regarding healthcare utilization barriers. These findings will then be disseminated back to these communities through outreach efforts, as well as future plans to conduct follow-up member-checks to validate these findings. This preliminary pilot study will help to inform small group education and how to focus awareness/prevention measures to members of these NHPI communities to ensure cultural sensitivity and relevance through testing the findings uncovered from this dissertation. Member-checking with NHPI focus groups will be a future goal to support a bidirectional approach to this dissertation and future work.

Chapter 5 Quantitative Results

As discussed in Chapter 4, logistic regression provides a statistical test for further inquiry into the Hawai'i HINTS dataset for this secondary data analysis to aid in testing Hypothesis 1 within this dissertation. Utilizing the expanded Andersen model (Behavioral Model for Vulnerable Populations) as a framework for organizing the social factors of interest, the outcome variables for cancer screenings (colorectal, breast, and cervical, questions adapted from HINTS and BRFSS) were dichotomized into screened and not screened for the regression. The analysis within the model highlights forty independent variables. Each variable category contains a reference response to compare the other responses to for the regression outcomes. The N^1 column provides the number of Yes screened responses for each category for the data output. LCL and UCL indicate the lower and upper confidence levels. **Tables 4-6** demonstrate the bivariate results for the individual response category and the cancer outcome to compare against the reference category. As previously mentioned, the n's varied within the model as the dataset was spilt for each cancer type by the gender and age-appropriate cancer screening recommendations at that time. Cervical cancer screening results were for all women, breast cancer screening results involved all women over 45. Colorectal cancer screening rates were tabulated for both genders over the age of 50. All of which were according to the U.S. Preventive Services Task Force (USPSTF) recommendations for screenings during that time; however, colorectal cancer screening age recommendation changed to age 45 as of 2021 (Force, 2023). Following this same model setup, **Tables 7-9** provides the multivariate results for each cancer screening type. The results controlled for age, income, having health insurance, and occupational status to determine if these social factors of interest affect screenings within these NHPI communities (RQ3). Within each table, the tables are split for those model domains including

predisposing factors (A), enabling factors (B), and needs factors (C). Each variable category contained multiple response categories; however, to save space, only 2 responses are shown for each variable. The decision to use a logistic regression through the category responses rather than creating scales stemmed from a belief that these data would not be normally distributed and would violate the model assumptions. Additionally, this approach allowed me to add a "No response" category to include missing data that may be significant that may be analyzed in a later study. The N^1 for the models' odd ratio represents those participants within the appropriate gender and age constraints who reported yes, having been screened for the specific cancer type.

TABLE 4: LOGISTIC REGRESSION BIVARIATE RESULTS FOR EVER HAVING A SCREENING FOR COLORECTAL CANCER

A. Predisposing Factors

	Categories	N	Col%	N^1	OR	LCL	UCL	*P*
Do you consider yourself as religious[a]	Mid (3-5)	300	42.1	43	0.50	0.29	0.86	**.01****
	High (6-7)	259	36.3	76	1.25	0.75	2.06	.39
What is your marital status[b]	Past Partner	150	21.0	48	1.53	0.99	2.36	**.05***
	Never Married	250	35.1	35	0.53	0.34	0.83	**.005****
How many children under the age of 18 live in your household[c]	One	102	14.3	16	0.37	0.20	0.66	**.0009*****
	Four or more	131	18.4	15	0.25	0.14	0.46	**<.0001*****
What is your age[d]	30-39	132	18.5	9	1.90	0.62	5.83	.26
	60-92	159	22.3	63	17.05	6.61	44.00	**<.0001*****
What is your Ethnicity[e]	Chuukese	190	26.6	33	0.69	0.44	1.07	.10
	Marshallese	127	17.8	29	0.97	0.60	1.55	.89
What is the highest grade or level of schooling you completed[f]	High School Graduate	339	47.5	55	0.75	0.47	1.21	.24
	College Graduate	64	9.0	20	1.76	0.92	3.38	.09
Ethnic Identity[g]	Neutral	176	24.7	50	1.77	0.85	3.67	.13
	High	440	61.7	88	1.11	0.56	2.23	.76
American Identity[h]	Neutral	204	28.6	43	1.05	0.53	2.06	.89
	High	402	56.4	91	1.15	0.61	2.16	.67
Acculturation[i]	Neutral	299	41.9	47	0.60	0.38	0.93	**.02***
	Positive	159	22.3	50	1.47	0.93	2.32	.10
In general, how much do you trust information about health or medical topics from: A Doctor[j]	A Little	139	19.5	21	0.99	0.45	2.18	.97
	A Lot	280	39.3	71	1.88	0.94	3.78	.07

Over the past two weeks, how often have you been bothered by little interest or pleasure in doing things[k]	Several Days	146	20.5	39	1.46	0.92	2.33	.11
	Nearly Every Day	104	14.6	22	1.08	0.62	1.87	.79
Over the past two weeks, how often have you been bothered by feeling down, depressed or hopeless[l]	Several Days	144	20.2	36	1.22	0.77	1.93	.40
	Nearly Every Day	75	10.5	17	1.07	0.59	1.96	.82
Over the past two weeks, how often have you been bothered by feeling nervous, anxious or on the edge[m]	Several Days	145	20.3	35	1.20	0.76	1.91	.44
	Nearly Every Day	73	10.2	16	1.06	0.57	1.96	.85
Over the past two weeks, how often have you been bothered by not being able to sleep or control worrying[n]	Several Days	142	19.9	39	1.54	0.98	2.44	.06
	Nearly Every Day	73	10.2	17	1.24	0.67	2.27	.49

*$p < .05$. **$p < .01$. ***$p < .001$

Reference categories are: [a]Low (1-2); [b]Married or Partner; [c]None; [d]18-29; [e]Native Hawaiian; [f]No high school degree; [g]Low; [h]Low; [i]Negative; [j]Not at all; [k]Not at all; [l]Not at all; [m]Not at all; [n]Not at all. [1]N= Yes to screening, used for analysis.

B. Enabling Factors

	Categories	N	Col%	N[1]	OR	LCL	UCL	*P*
What is your combined annual income[a]	$10,000 - $15,000	116	16.3	30	1.86	1.10	3.14	**.02***
	Over $35,000	80	11.2	28	2.87	1.64	5.02	**.0002*****
Do you have any kind of health care coverage[b]	Yes	394	55.3	114	1.00			
	No	309	43.3	39	0.35	0.24	0.53	**<.0001*****
Usual source of care[c]	Doctor Office or HMO	125	17.5	40	1.58	1.00	2.52	**.05***
	Emergency Room	77	10.8	13	0.68	0.36	1.32	.26
What is your current occupational status[d]	Retired	77	10.8	31	2.44	1.41	4.22	**.001*****
	Unemployed	211	29.6	34	0.69	0.43	1.12	.14
How well do you feel speaking English[e]	Well	176	24.7	43	1.20	0.78	1.83	.41
	Not Well	134	18.8	29	1.02	0.63	1.65	.93
How confident are you that you could get advice or information about health or medical topics if you needed it[f]	Very Confident	210	29.5	55	1.23	0.77	1.97	.38
	Not Confident At All	47	6.6	6	0.51	0.20	1.28	.15
How often did you feel you could rely on your doctors, nurses, or other healthcare	Usually	143	20.1	38	0.92	0.57	1.48	.72

provider to take care of your healthcare needs[g]								
	Never	56	7.9	1	0.05	0.01	0.34	**.003****
I have had a hard time understanding the healthcare provider's instructions because of language[h]	Agree	224	31.4	35	0.63	0.35	1.15	.13
	Strongly Disagree	154	21.6	42	1.28	0.71	2.31	.42
I had a hard time following the healthcare provider's instructions due to logistical reasons like transportation or childcare[i]	Agree	229	32.1	35	0.54	0.29	1.01	**.05***
	Strongly Disagree	146	20.5	42	1.21	0.65	2.25	.54
I had a hard time following the healthcare provider's instructions because of my work schedule[j]	Agree	227	31.8	39	0.74	0.39	1.41	.36
	Strongly Disagree	145	20.3	42	1.46	0.77	2.79	.25
I delayed seeking care because I didn't have insurance or the co-payment was too expensive[k]	Agree	245	34.4	42	0.67	0.39	1.15	.14
	Strongly Disagree	135	18.9	32	1.00	0.56	1.80	1.00
If a healthcare provider gives me advice that goes against my cultural beliefs, I wouldn't listen to them[l]	Agree	230	32.3	38	0.53	0.31	0.91	**.02***
	Strongly Disagree	119	16.7	27	0.79	0.43	1.42	.43
I feel that my healthcare provider understands my background and values[m]	Agree	327	45.9	67	0.64	0.41	1.00	**.05***
	Strongly Disagree	65	9.1	16	0.81	0.42	1.58	.54
I often feel as if my healthcare provider looks down on me and the way I live my life[n]	Agree	197	27.6	30	0.79	0.41	1.50	.47
	Strongly Disagree	139	19.5	45	2.10	1.13	3.92	**.02***
I think the health systems treat people unfairly based on their race or ethnic background[o]	Agree	255	35.8	47	0.90	0.52	1.58	.72
	Strongly Disagree	112	15.7	28	1.33	0.71	2.49	.37
I think racism/prejudice makes receiving good healthcare difficult[p]	Agree	288	40.4	56	0.97	0.56	1.67	.90
	Strongly Disagree	93	13.0	23	1.31	0.68	2.55	.42
I have personally experienced racism, racial discrimination, or racial	Agree	228	32.0	44	0.95	0.53	1.68	.85

prejudice at least once in the last 12 months[q]	Strongly Disagree	127	17.8	38	1.69	0.92	3.08	.09
If I experienced racism in the past 12 months, I would suffer from the stress that can affect my health[r]	Agree	247	34.6	49	0.75	0.45	1.25	.27
	Strongly Disagree	110	15.4	29	1.09	0.60	1.95	.78
It seems like everything causes cancer[s]	Agree	281	39.4	56	0.77	0.50	1.18	.23
	Strongly Disagree	82	11.5	15	0.69	0.36	1.31	.26
There's not much you can do to lower your chances of getting cancer[t]	Agree	276	38.7	54	0.91	0.55	1.52	.72
	Strongly Disagree	97	13.6	23	1.17	0.62	2.18	.63
There are so many recommendations about preventing cancer, it's hard to know which ones to follow[u]	Agree	313	43.9	69	0.85	0.56	1.31	.47
	Strongly Disagree	65	9.1	10	0.55	0.26	1.17	.12

*$p < .05$. **$p < .01$. ***$p < .001$

Reference categories are: [a]Less that $10,000; [b]Yes; [c]Clinic of health center; [d]Employed; [e]Very well; [f]Completely confident; [g]Always; [h]Strongly agree; [i]Strongly agree; [j]Strongly agree; [k]Strongly agree; [l]Strongly agree; [m]Strongly agree; [n]Strongly agree; [o]Strongly agree; [p]Strongly agree; [q]Strongly agree; [r]Strongly agree; [s]Strongly agree; [t]Strongly agree; [u]Strongly agree. [1]N= Yes to screening, used for analysis.

C. Needs Factor

	Categories	**N**	**Col%**	**N[1]**	**OR**	**LCL**	**UCL**	***P***
Is your health a priority for you[a]	Yes	604	84.7	140	1.00			
	No	85	11.9	9	0.39	0.19	0.80	**.01****
In general, what would you say your health is[b]	Very Good	151	21.2	38	1.56	0.85	2.87	.15
	Poor	44	6.2	9	1.20	0.50	2.88	.69
How often do you now smoke cigarettes[c]	Some Days	51	7.2	13	1.47	0.70	3.10	.31
	Not at All	211	29.6	48	1.27	0.76	2.11	.37
Overall, how confident are you about your ability to take good care of your health[d]	Very Confident	216	30.3	56	1.39	0.86	2.25	.18
	Not Confident At All	37	5.2	1	0.11	0.01	0.83	**.03***
Overall, how would you rate the quality of health care you received in the past 12 months[e]	Very Good	165	23.1	55	1.47	0.91	2.40	.12
	Poor	23	3.2	2	0.28	0.06	1.25	.10

*$p < .05$. **$p < .01$. ***$p < .001$*

Reference categories are: [a]Yes; [b]Excellent; [c]Everyday; [d]Completely confident; [e]Excellent. [1]N= Yes to screening, used for analysis.

TABLE 5: LOGISTIC REGRESSION BIVARIATE RESULTS FOR EVER HAVING A SCREENING FOR BREAST CANCER, MAMMOGRAM

A. Predisposing Factors

	Categories	N	Col%	N[1]	OR	LCL	UCL	*P*
Do you consider yourself as religious[a]	Mid (3-5)	257	41.5	97	1.79	1.05	3.06	**.03***
	High (6-7)	232	37.4	108	2.58	1.50	4.41	**.0006*****
What is your marital status[b]	Past Partner	121	19.5	66	1.39	0.90	2.13	.14
	Never Married	227	36.6	54	0.36	0.24	0.53	**<.0001*****
How many children under the age of 18 live in your household[c]	One	96	15.5	39	0.55	0.33	0.90	**.02***
	Four or more	114	18.4	28	0.26	0.16	0.44	**<.0001*****
What is your age[d]	30-39	132	21.3	25	4.67	1.85	11.82	**.001*****
	60-92	112	18.1	74	38.95	15.70	96.61	**<.0001*****
What is your Ethnicity[e]	Chuukese	186	30.0	62	0.61	0.42	0.89	**.01****
	Marshallese	126	20.3	43	0.63	0.41	0.97	**.04***
What is the highest grade or level of schooling you completed[f]	High School Graduate	277	44.7	92	0.92	0.60	1.42	.71
	College Graduate	65	10.5	40	2.97	1.61	5.46	**.0005*****
Ethnic Identity[g]	Neutral	142	22.9	78	4.10	1.94	8.68	**.0002*****
	High	399	64.4	145	1.92	0.95	3.88	.07
American Identity[h]	Neutral	170	27.4	78	1.53	0.83	2.83	.17
	High	358	57.7	133	1.07	0.60	1.90	.82
Acculturation[i]	Neutral	259	41.8	90	0.80	0.55	1.16	.23
	Positive	114	18.4	57	1.49	0.94	2.36	.09
In general, how much do you trust information about health or medical topics from: A Doctor[j]	A Little	101	16.3	29	0.77	0.38	1.53	.45
	A Lot	277	44.7	119	1.43	0.79	2.59	.23
Over the past two weeks, how often have you been bothered by little interest or pleasure in doing things[k]	Several Days	134	21.6	65	1.70	1.12	2.60	**.01****
	Nearly Every Day	89	14.4	38	1.35	0.83	2.20	.23
Over the past two weeks, how often have you been bothered by feeling down, depressed or hopeless[l]	Several Days	131	21.1	67	1.91	1.25	2.90	**.003****
	Nearly Every Day	62	10.0	33	2.07	1.19	3.61	**.01****
Over the past two weeks, how often have you been bothered by feeling nervous, anxious or on the edge[m]	Several Days	130	21.0	69	2.18	1.43	3.33	**.0003*****
	Nearly Every Day	71	11.5	32	1.58	0.93	2.68	.09
Over the past two weeks, how often have you been	Several Days	129	20.8	68	2.15	1.41	3.28	**.0004*****

bothered by not being able to sleep or control worrying[n]	Nearly Every Day	74	11.9	37	1.93	1.15	3.24	**.01****

*$p < .05$. **$p < .01$. ***$p < .001$

Reference categories are: [a]Low (1-2); [b]Married or Partner; [c]None; [d]18-29; [e]Native Hawaiian; [f]No high school degree; [g]Low; [h]Low; [i]Negative; [j]Not at all; [k]Not at all; [l]Not at all; [m]Not at all; [n]Not at all. [1]N= Yes to screening, used for analysis.

B. Enabling Factors

	Categories	N	Col%	N[1]	OR	LCL	UCL	*P*
What is your combined annual income[a]	$10,000 - $15,000	90	14.5	32	1.02	0.62	1.69	.92
	Over $35,000	81	13.1	46	2.44	1.47	4.06	**.0006****
Do you have any kind of health care coverage[b]	Yes	348	56.1	181	1.00			
	No	268	43.2	62	0.28	0.20	0.40	**<.0001****
Usual source of care[c]	Doctor Office or HMO	115	18.5	62	1.33	0.86	2.07	.20
	Emergency Room	60	9.7	17	0.45	0.24	0.83	**.01****
What is your current occupational status[d]	Retired	43	6.9	25	1.92	0.99	3.72	**.05***
	Unemployed	181	29.2	51	0.54	0.36	0.82	**.004****
How well do you feel speaking English[e]	Well	148	23.9	67	1.28	0.86	1.89	.22
	Not Well	124	20.0	39	0.71	0.46	1.10	.13
How confident are you that you could get advice or information about health or medical topics if you needed it[f]	Very Confident	176	28.4	73	0.96	0.62	1.47	.85
	Not Confident At All	38	6.1	8	0.36	0.16	0.83	**.02***
How often did you feel you could rely on your doctors, nurses, or other healthcare provider to take care of your healthcare needs[g]	Usually	138	22.3	65	0.80	0.51	1.24	.31
	Never	35	5.6	5	0.15	0.06	0.40	**.0002****
I have had a hard time understanding the healthcare provider's instructions because of language[h]	Agree	161	26.0	52	1.07	0.62	1.87	.80
	Strongly Disagree	153	24.7	71	1.95	1.13	3.37	**.02***
I had a hard time following the healthcare provider's instructions due to logistical reasons like transportation or childcare[i]	Agree	184	29.7	56	0.68	0.39	1.19	.18
	Strongly Disagree	145	23.4	72	1.53	0.87	2.70	.14
I had a hard time following the healthcare provider's	Agree	183	29.5	57	1.16	0.64	2.10	.62

instructions because of my work schedule[j]	Strongly Disagree	150	24.2	79	2.86	1.57	5.20	**.0006*** **
I delayed seeking care because I didn't have insurance or the co-payment was too expensive[k]	Agree	192	31.0	67	1.07	0.65	1.77	.79
	Strongly Disagree	141	22.7	72	2.09	1.24	3.52	**.006** **
If a healthcare provider gives me advice that goes against my cultural beliefs, I wouldn't listen to them[l]	Agree	180	29.0	66	1.06	0.64	1.76	.82
	Strongly Disagree	119	19.2	55	1.58	0.92	2.71	.10
I feel that my healthcare provider understands my background and values[m]	Agree	282	45.5	117	1.21	0.79	1.86	.38
	Strongly Disagree	57	9.2	32	2.19	1.16	4.12	**.02***
I often feel as if my healthcare provider looks down on me and the way I live my life[n]	Agree	158	25.5	47	1.14	0.63	2.06	.68
	Strongly Disagree	141	22.7	77	3.23	1.79	5.83	**.0001*** **
I think the health systems treat people unfairly based on their race or ethnic background[o]	Agree	190	30.6	73	1.50	0.89	2.51	.13
	Strongly Disagree	110	17.7	48	1.86	1.05	3.28	**.03***
I think racism/prejudice makes receiving good healthcare difficult[p]	Agree	226	36.5	91	1.50	0.91	2.45	.11
	Strongly Disagree	89	14.4	38	1.65	0.91	2.99	.10
I have personally experienced racism, racial discrimination, or racial prejudice at least once in the last 12 months[q]	Agree	180	29.0	63	1.00	0.59	1.68	.99
	Strongly Disagree	123	19.8	60	1.76	1.01	3.06	**.04***
If I experienced racism in the past 12 months, I would suffer from the stress that can affect my health[r]	Agree	196	31.6	78	0.94	0.59	1.51	.80
	Strongly Disagree	110	17.7	42	0.88	0.52	1.50	.64
It seems like everything causes cancer[s]	Agree	228	36.8	91	1.04	0.70	1.53	.85
	Strongly Disagree	67	10.8	25	0.93	0.53	1.65	.81
There's not much you can do to lower your chances of getting cancer[t]	Agree	226	36.5	90	1.22	0.77	1.92	.40
	Strongly Disagree	86	13.9	33	1.14	0.65	2.03	.64

There are so many recommendations about preventing cancer, it's hard to know which ones to follow[u]	Agree	268	43.2	111	0.99	0.67	1.46	.96
	Strongly Disagree	53	8.5	15	0.55	0.28	1.08	.08

*$p < .05$. **$p < .01$. ***$p < .001$

Reference categories are: [a]Less that $10,000; [b]Yes; [c]Clinic of health center; [d]Employed; [e]Very well; [f]Completely confident; [g]Always; [h]Strongly agree; [i]Strongly agree; [j]Strongly agree; [k]Strongly agree; [l]Strongly agree; [m]Strongly agree; [n]Strongly agree; [o]Strongly agree; [p]Strongly agree; [q]Strongly agree; [r]Strongly agree; [s]Strongly agree; [t]Strongly agree; [u]Strongly agree. [1]N= Yes to screening, used for analysis.

C. Needs Factors

	Categories	N	Col%	N[1]	OR	LCL	UCL	*P*
Is your health a priority for you[a]	Yes	535	86.3	220	1.00			
	No	69	11.1	16	0.43	0.24	0.78	**.005****
In general, what would you say your health is[b]	Very Good	142	22.9	54	1.56	0.87	2.79	.13
	Poor	43	6.9	21	2.43	1.13	5.20	**.02***
How often do you now smoke cigarettes[c]	Some Days	40	6.5	12	0.57	0.26	1.22	.15
	Not at All	181	29.2	75	0.93	0.58	1.50	.78
Overall, how confident are you about your ability to take good care of your health[d]	Very Confident	204	32.9	78	0.93	0.61	1.44	.76
	Not Confident At All	28	4.5	5	0.33	0.12	0.91	**.03***
Overall, how would you rate the quality of health care you received in the past 12 months[e]	Very Good	136	21.9	68	1.04	0.65	1.68	.86
	Poor	16	2.6	2	0.15	0.03	0.68	**.01****

*$p < .05$. **$p < .01$. ***$p < .001$*

Reference categories are: [a]Yes; [b]Excellent; [c]Everyday; [d]Completely confident; [e]Excellent. [1]N= Yes to screening, used for analysis.

TABLE 6: LOGISTIC REGRESSION BIVARIATE RESULTS FOR EVER HAVING A SCREENING FOR CERVICAL CANCER, PAP TEST

A. Predisposing Factors

	Categories	N	Col%	N[1]	OR	LCL	UCL	*P*
Do you consider yourself as religious[a]	Mid (3-5)	251	40.2	184	1.72	1.05	2.83	**.03***
	High (6-7)	236	37.8	180	2.02	1.21	3.35	**.007****
What is your marital status[b]	Past Partner	119	19.1	101	1.44	0.80	2.57	.22
	Never Married	228	36.5	135	0.37	0.25	0.55	**<.0001*****
How many children under the age of 18 live in your household[c]	One	98	15.7	71	0.81	0.46	1.40	.44
	Four or more	114	18.3	78	0.66	0.40	1.11	.12
What is your age[d]	30-39	139	22.3	113	5.61	3.23	9.75	**<.0001*****
	60-92	111	17.8	90	5.53	3.06	9.99	**<.0001*****
What is your Ethnicity[e]	Chuukese	191	30.6	131	0.77	0.51	1.14	.19
	Marshallese	119	19.1	90	1.09	0.67	1.78	.73

What is the highest grade or level of schooling you completed[f]	High School Graduate	284	45.5	206	1.94	1.26	2.97	**.002****
	College Graduate	62	9.9	48	2.52	1.27	4.99	**.008****
Ethnic Identity[g]	Neutral	145	23.2	115	3.83	1.93	7.60	**.0001*****
	High	399	63.9	293	2.76	1.52	5.02	**.0008*****
American Identity[h]	Neutral	171	27.4	129	2.78	1.51	5.13	**.001*****
	High	361	57.9	270	2.69	1.54	4.69	**.0005*****
Acculturation[i]	Neutral	265	42.5	173	0.52	0.34	0.79	**.002****
	Positive	118	18.9	94	1.08	0.62	1.89	.78
In general, how much do you trust information about health or medical topics from: A Doctor[j]	A Little	103	16.5	69	0.74	0.36	1.49	.40
	A Lot	281	45.0	216	1.21	0.64	2.28	.56
Over the past two weeks, how often have you been bothered by little interest or pleasure in doing things[k]	Several Days	142	22.8	110	1.35	0.84	2.18	.22
	Nearly Every Day	89	14.3	63	0.95	0.56	1.62	.85
Over the past two weeks, how often have you been bothered by feeling down, depressed or hopeless[l]	Several Days	137	22.0	106	1.24	0.77	2.01	.38
	Nearly Every Day	62	9.9	44	0.89	0.48	1.63	.70
Over the past two weeks, how often have you been bothered by feeling nervous, anxious or on the edge[m]	Several Days	136	21.8	101	1.07	0.67	1.71	.77
	Nearly Every Day	72	11.5	51	0.90	0.51	1.60	.73
Over the past two weeks, how often have you been bothered by not being able to sleep or control worrying[n]	Several Days	131	21.0	101	1.30	0.80	2.10	.29
	Nearly Every Day	73	11.7	51	0.89	0.51	1.57	.69

*$p < .05$. **$p < .01$. ***$p < .001$

Reference categories are: [a]Low (1-2); [b]Married or Partner; [c]None; [d]18-29; [e]Native Hawaiian; [f]No high school degree; [g]Low; [h]Low; [i]Negative; [j]Not at all; [k]Not at all; [l]Not at all; [m]Not at all; [n]Not at all. [1]N= Yes to screening, used for analysis.

B. Enabling Factors

	Categories	N	Col%	N[1]	OR	LCL	UCL	*P*
What is your combined annual income[a]	$10,000 - $15,000	85	13.6	65	1.63	0.93	2.85	.09
	Over $35,000	81	13.0	68	2.62	1.37	4.99	**.004****
	Yes	347	55.6	283	1.00			

Do you have any kind of health care coverage[b]	No	271	43.4	164	0.35	0.24	0.50	**<.0001*** **
Usual source of care[c]	Doctor Office or HMO	116	18.6	91	1.17	0.69	1.98	.55
	Emergency Room	62	9.9	37	0.48	0.27	0.85	**.01** **
What is your current occupational status[d]	Retired	43	6.9	37	2.03	0.81	5.07	.13
	Unemployed	183	29.3	116	0.57	0.37	0.87	**.01** **
How well do you feel speaking English[e]	Well	145	23.2	105	0.85	0.55	1.32	.47
	Not Well	126	20.2	82	0.60	0.39	0.94	**.03***
How confident are you that you could get advice or information about health or medical topics if you needed it[f]	Very Confident	176	28.2	128	0.92	0.57	1.49	.74
	Not Confident At All	37	5.9	24	0.64	0.30	1.36	.25
How often did you feel you could rely on your doctors, nurses, or other healthcare provider to take care of your healthcare needs[g]	Usually	141	22.6	108	0.76	0.44	1.31	.32
	Never	36	5.8	13	0.13	0.06	0.29	**<.0001*** **
I have had a hard time understanding the healthcare provider's instructions because of language[h]	Agree	165	26.4	108	0.57	0.31	1.02	.06
	Strongly Disagree	154	24.7	119	1.01	0.54	1.90	.96
I had a hard time following the healthcare provider's instructions due to logistical reasons like transportation or childcare[i]	Agree	188	30.1	128	0.81	0.44	1.47	.48
	Strongly Disagree	147	23.6	112	1.21	0.64	2.29	.56
I had a hard time following the healthcare provider's instructions because of my work schedule[j]	Agree	182	29.2	125	0.58	0.31	1.08	.09
	Strongly Disagree	149	23.9	116	0.92	0.47	1.81	.81
I delayed seeking care because I didn't have insurance or the co-payment was too expensive[k]	Agree	195	31.3	136	0.69	0.40	1.20	.19
	Strongly Disagree	142	22.8	109	0.99	0.54	1.81	.98
If a healthcare provider gives me advice that goes against my cultural beliefs, I wouldn't listen to them[l]	Agree	180	28.8	127	0.69	0.40	1.21	.20
	Strongly Disagree	122	19.6	92	0.89	0.48	1.64	.70
	Agree	284	45.5	218	1.11	0.69	1.79	.66

I feel that my healthcare provider understands my background and values[m]	Strongly Disagree	56	9.0	40	0.84	0.42	1.69	.63
I often feel as if my healthcare provider looks down on me and the way I live my life[n]	Agree	156	25.0	98	0.63	0.35	1.12	.11
	Strongly Disagree	142	22.8	114	1.51	0.80	2.84	.20
I think the health systems treat people unfairly based on their race or ethnic background[o]	Agree	196	31.4	146	1.04	0.60	1.79	.89
	Strongly Disagree	112	17.9	74	0.69	0.38	1.25	.22
I think racism/prejudice makes receiving good healthcare difficult[p]	Agree	233	37.3	175	1.07	0.63	1.82	.80
	Strongly Disagree	89	14.3	59	0.70	0.38	1.30	.26
I have personally experienced racism, racial discrimination, or racial prejudice at least once in the last 12 months[q]	Agree	187	30.0	130	0.74	0.42	1.30	.29
	Strongly Disagree	128	20.5	93	0.86	0.47	1.58	.63
If I experienced racism in the past 12 months, I would suffer from the stress that can affect my health[r]	Agree	199	31.9	149	0.98	0.58	1.67	.95
	Strongly Disagree	114	18.3	80	0.78	0.43	1.39	.39
It seems like everything causes cancer[s]	Agree	230	36.9	176	0.94	0.60	1.48	.79
	Strongly Disagree	69	11.1	35	0.30	0.17	0.53	**<.0001*** **
There's not much you can do to lower your chances of getting cancer[t]	Agree	228	36.5	172	1.30	0.79	2.13	.30
	Strongly Disagree	88	14.1	56	0.74	0.41	1.33	.31
There are so many recommendations about preventing cancer, it's hard to know which ones to follow[u]	Agree	271	43.4	212	1.30	0.83	2.04	.24
	Strongly Disagree	54	8.7	29	0.42	0.22	0.79	**.007****

*$p < .05$. **$p < .01$. ***$p < .001$

Reference categories are: [a]Less that $10,000; [b]Yes; [c]Clinic of health center; [d]Employed; [e]Very well; [f]Completely confident; [g]Always; [h]Strongly agree; [i]Strongly agree; [j]Strongly agree; [k]Strongly agree; [l]Strongly agree; [m]Strongly agree; [n]Strongly agree; [o]Strongly agree; [p]Strongly agree; [q]Strongly agree; [r]Strongly agree; [s]Strongly agree; [t]Strongly agree; [u]Strongly agree. [1]N= Yes to screening, used for analysis.

C. Needs Factors

	Categories	N	Col%	N[1]	OR	LCL	UCL	*P*
Is your health a priority for you[a]	Yes	538	86.2	406	1.00			
	No	72	11.5	38	0.36	0.22	0.60	**<.0001*** **
	Very Good	146	23.4	109	2.00	1.13	3.55	**.02***

In general, what would you say your health is[b]	Poor	40	6.4	30	2.04	0.88	4.72	.10
How often do you now smoke cigarettes[c]	Some Days	40	6.4	27	0.61	0.28	1.34	.22
	Not at All	184	29.5	118	0.52	0.31	0.89	**.02***
Overall, how confident are you about your ability to take good care of your health[d]	Very Confident	209	33.5	148	0.97	0.60	1.54	.88
	Not Confident At All	27	4.3	12	0.32	0.14	0.74	**.008****
Overall, how would you rate the quality of health care you received in the past 12 months[e]	Very Good	139	22.3	101	0.84	0.49	1.45	.54
	Poor	14	2.2	5	0.18	0.06	0.56	**.003***

**p < .05. **p < .01. ***p < .001*

Reference categories are: [a]Yes; [b]Excellent; [c]Everyday; [d]Completely confident; [e]Excellent. [1]N= Yes to screening, used for analysis.

TABLE 7: LOGISTIC REGRESSION MULTIVARIABLE RESULTS FOR EVER HAVING A SCREENING FOR COLORECTAL CANCER (CONTROLLED FOR AGE, INCOME, HEALTH INSURANCE, & OCCUPATION)

A. Predisposing Factors

	Categories	N	Col%	N[1]	OR	LCL	UCL	*P*
Do you consider yourself as religious[a]	Mid (3-5)	300	42.1	43	0.29	0.16	0.55	**.0001*****
	High (6-7)	259	36.3	76	0.62	0.34	1.12	.11
What is your marital status[b]	Past Partner	150	21.0	48	1.00	0.62	1.62	.99
	Never Married	250	35.1	35	0.93	0.56	1.55	.78
How many children under the age of 18 live in your household[c]	One	102	14.3	16	0.66	0.34	1.28	.22
	Four or more	131	18.4	15	0.52	0.27	1.00	**.05***
What is your age[d]	30-39	132	18.5	9	1.63	0.52	5.07	.40
	60-92	159	22.3	63	16.63	6.08	45.52	**<.0001*****
What is your Ethnicity[e]	Chuukese	190	26.6	33	1.02	0.61	1.69	.95
	Marshallese	127	17.8	29	1.44	0.83	2.51	.19
What is the highest grade or level of schooling you completed[f]	High School Graduate	339	47.5	55	0.78	0.46	1.33	.36
	College Graduate	64	9.0	20	1.11	0.52	2.36	.79
Ethnic Identity[g]	Neutral	176	24.7	50	1.27	0.56	2.88	.57
	High	440	61.7	88	1.10	0.51	2.37	.82
American Identity[h]	Neutral	204	28.6	43	0.82	0.38	1.75	.60
	High	402	56.4	91	1.16	0.57	2.37	.69
Acculturation[i]	Neutral	299	41.9	47	0.61	0.37	1.01	**.05***
	Positive	159	22.3	50	1.17	0.69	1.98	.57
In general, how much do you trust information about	A Little	139	19.5	21	0.95	0.40	2.27	.90

health or medical topics from: A Doctor[j]	A Lot	280	39.3	71	1.30	0.59	2.85	.51
Over the past two weeks, how often have you been bothered by little interest or pleasure in doing things[k]	Several Days	146	20.5	39	1.38	0.82	2.34	.23
	Nearly Every Day	104	14.6	22	1.48	0.79	2.76	.22
Over the past two weeks, how often have you been bothered by feeling down, depressed or hopeless[l]	Several Days	144	20.2	36	0.96	0.58	1.61	.89
	Nearly Every Day	75	10.5	17	1.31	0.66	2.61	.44
Over the past two weeks, how often have you been bothered by feeling nervous, anxious or on the edge[m]	Several Days	145	20.3	35	0.90	0.54	1.50	.69
	Nearly Every Day	73	10.2	16	1.36	0.68	2.75	.39
Over the past two weeks, how often have you been bothered by not being able to sleep or control worrying[n]	Several Days	142	19.9	39	1.32	0.79	2.22	.29
	Nearly Every Day	73	10.2	17	1.39	0.70	2.78	.35

*$p < .05$. **$p < .01$. ***$p < .001$

Reference categories are: [a]Low (1-2); [b]Married or Partner; [c]None; [d]18-29; [e]Native Hawaiian; [f]No high school degree; [g]Low; [h]Low; [i]Negative; [j]Not at all; [k]Not at all; [l]Not at all; [m]Not at all; [n]Not at all. [1]N= Yes to screening, used for analysis.

B. Enabling Factors

	Categories	N	Col%	N[1]	OR	LCL	UCL	*P*
What is your combined annual income[a]	$10,000 - $15,000	116	16.3	30	2.03	1.13	3.65	**.02***
	Over $35,000	80	11.2	28	2.04	1.06	3.90	**.03***
Do you have any kind of health care coverage[b]	Yes	394	55.3	114	1.00			
	No	309	43.3	39	0.52	0.33	0.82	**.005****
Usual source of care[c]	Doctor Office or HMO	125	17.5	40	1.24	0.73	2.09	.43
	Emergency Room	77	10.8	13	0.82	0.40	1.70	.60
What is your current occupational status[d]	Retired	77	10.8	31	0.83	0.42	1.64	.60
	Unemployed	211	29.6	34	0.63	0.36	1.11	.11
How well do you feel speaking English[e]	Well	176	24.7	43	0.96	0.59	1.56	.87
	Not Well	134	18.8	29	0.92	0.52	1.61	.76
How confident are you that you could get advice or information about health or	Very Confident	210	29.5	55	1.20	0.70	2.05	.50

medical topics if you needed it[f]	Not Confident At All	47	6.6	6	0.55	0.20	1.50	.24
How often did you feel you could rely on your doctors, nurses, or other healthcare provider to take care of your healthcare needs[g]	Usually	143	20.1	38	1.08	0.64	1.83	.78
	Never	56	7.9	1	0.09	0.01	0.73	**.02***
I have had a hard time understanding the healthcare provider's instructions because of language[h]	Agree	224	31.4	35	0.71	0.36	1.39	.32
	Strongly Disagree	154	21.6	42	1.03	0.52	2.03	.93
I had a hard time following the healthcare provider's instructions due to logistical reasons like transportation or childcare[i]	Agree	229	32.1	35	0.82	0.41	1.65	.57
	Strongly Disagree	146	20.5	42	1.10	0.54	2.22	.79
I had a hard time following the healthcare provider's instructions because of my work schedule[j]	Agree	227	31.8	39	0.88	0.43	1.81	.73
	Strongly Disagree	145	20.3	42	1.11	0.53	2.31	.79
I delayed seeking care because I didn't have insurance or the co-payment was too expensive[k]	Agree	245	34.4	42	0.79	0.43	1.45	.44
	Strongly Disagree	135	18.9	32	0.83	0.43	1.61	.58
If a healthcare provider gives me advice that goes against my cultural beliefs, I wouldn't listen to them[l]	Agree	230	32.3	38	0.66	0.36	1.20	.17
	Strongly Disagree	119	16.7	27	0.81	0.41	1.59	.55
I feel that my healthcare provider understands my background and values[m]	Agree	327	45.9	67	0.66	0.40	1.09	.10
	Strongly Disagree	65	9.1	16	0.83	0.39	1.77	.64
I often feel as if my healthcare provider looks down on me and the way I live my life[n]	Agree	197	27.6	30	1.14	0.56	2.32	.73
	Strongly Disagree	139	19.5	45	1.84	0.91	3.72	.09
I think the health systems treat people unfairly based on their race or ethnic background[o]	Agree	255	35.8	47	1.16	0.62	2.15	.65
	Strongly Disagree	112	15.7	28	1.16	0.58	2.33	.67

I think racism/prejudice makes receiving good healthcare difficult[p]	Agree	288	40.4	56	1.02	0.55	1.89	.94
	Strongly Disagree	93	13.0	23	1.13	0.54	2.37	.75
I have personally experienced racism, racial discrimination, or racial prejudice at least once in the last 12 months[q]	Agree	228	32.0	44	1.31	0.69	2.50	.41
	Strongly Disagree	127	17.8	38	1.22	0.62	2.42	.56
If I experienced racism in the past 12 months, I would suffer from the stress that can affect my health[r]	Agree	247	34.6	49	0.83	0.46	1.48	.52
	Strongly Disagree	110	15.4	29	0.94	0.48	1.84	.86
It seems like everything causes cancer[s]	Agree	281	39.4	56	0.75	0.46	1.21	.24
	Strongly Disagree	82	11.5	15	0.61	0.30	1.25	.18
There's not much you can do to lower your chances of getting cancer[t]	Agree	276	38.7	54	0.89	0.51	1.58	.70
	Strongly Disagree	97	13.6	23	1.01	0.50	2.05	.97
There are so many recommendations about preventing cancer, it's hard to know which ones to follow[u]	Agree	313	43.9	69	0.85	0.52	1.38	.51
	Strongly Disagree	65	9.1	10	0.64	0.28	1.47	.30

*$p < .05$. **$p < .01$. ***$p < .001$

Reference categories are: [a]Less that $10,000; [b]Yes; [c]Clinic of health center; [d]Employed; [e]Very well; [f]Completely confident; [g]Always; [h]Strongly agree; [i]Strongly agree; [j]Strongly agree; [k]Strongly agree; [l]Strongly agree; [m]Strongly agree; [n]Strongly agree; [o]Strongly agree; [p]Strongly agree; [q]Strongly agree; [r]Strongly agree; [s]Strongly agree; [t]Strongly agree; [u]Strongly agree. [1]N= Yes to screening, used for analysis.

C. Needs Factors

	Categories	**N**	**Col%**	**N[1]**	**OR**	**LCL**	**UCL**	***P***
Is your health a priority for you[a]	Yes	604	84.7	140	1.00			
	No	85	11.9	9	0.62	0.28	1.37	.23
In general, what would you say your health is[b]	Very Good	151	21.2	38	1.45	0.73	2.85	.29
	Poor	44	6.2	9	1.21	0.45	3.29	.70
How often do you now smoke cigarettes[c]	Some Days	51	7.2	13	1.34	0.58	3.11	.50
	Not at All	211	29.6	48	1.12	0.63	2.01	.69
Overall, how confident are you about your ability to take good care of your health[d]	Very Confident	216	30.3	56	1.37	0.80	2.36	.25
	Not Confident At All	37	5.2	1	0.13	0.02	1.01	**.05***
Overall, how would you rate the quality of health care	Very Good	165	23.1	55	1.62	0.94	2.82	.08

you received in the past 12 months[e]	Poor	23	3.2	2	0.39	0.08	2.01	.26

**p < .05. **p < .01. ***p < .001*

Reference categories are: [a]Yes; [b]Excellent; [c]Everyday; [d]Completely confident; [e]Excellent. [1]N= Yes to screening, used for analysis.

TABLE 8: LOGISTIC REGRESSION MULTIVARIABLE RESULTS FOR EVER HAVING A SCREENING FOR BREAST CANCER, MAMMOGRAM (CONTROLLED FOR AGE, INCOME, HEALTH INSURANCE, & OCCUPATION)

A. Predisposing Factors

	Categories	N	Col%	N[1]	OR	LCL	UCL	*P*
Do you consider yourself as religious[a]	Mid (3-5)	257	41.5	97	1.67	0.88	3.18	.12
	High (6-7)	232	37.4	108	1.69	0.89	3.22	.11
What is your marital status[b]	Past Partner	121	19.5	66	0.69	0.41	1.16	.16
	Never Married	227	36.6	54	0.60	0.37	0.97	**.04***
How many children under the age of 18 live in your household[c]	One	96	15.5	39	0.94	0.50	1.75	.83
	Four or more	114	18.4	28	0.43	0.23	0.80	**.007****
What is your age[d]	30-39	132	21.3	25	3.84	1.48	9.96	**.006****
	60-92	112	18.1	74	48.75	18.07	131.54	**<.0001*****
What is your Ethnicity[e]	Chuukese	186	30.0	62	1.05	0.65	1.71	.83
	Marshallese	126	20.3	43	0.87	0.51	1.50	.62
What is the highest grade or level of schooling you completed[f]	High School Graduate	277	44.7	92	1.07	0.63	1.82	.80
	College Graduate	65	10.5	40	2.67	1.21	5.87	**.01****
Ethnic Identity[g]	Neutral	142	22.9	78	4.01	1.63	9.86	**.002****
	High	399	64.4	145	2.38	1.03	5.48	**.04***
American Identity[h]	Neutral	170	27.4	78	1.62	0.76	3.47	.21
	High	358	57.7	133	1.32	0.64	2.72	.45
Acculturation[i]	Neutral	259	41.8	90	0.80	0.50	1.27	.34
	Positive	114	18.4	57	0.99	0.56	1.75	.96
In general, how much do you trust information about health or medical topics from: A Doctor[j]	A Little	101	16.3	29	0.50	0.21	1.18	.11
	A Lot	277	44.7	119	0.77	0.36	1.64	.50
Over the past two weeks, how often have you been bothered by little interest or pleasure in doing things[k]	Several Days	134	21.6	65	2.11	1.23	3.62	**.007****
	Nearly Every Day	89	14.4	38	1.61	0.88	2.95	.12
Over the past two weeks, how often have you been bothered by feeling down, depressed or hopeless[l]	Several Days	131	21.1	67	1.83	1.08	3.10	**.02***
	Nearly Every Day	62	10.0	33	2.02	1.04	3.94	**.04***

Over the past two weeks, how often have you been bothered by feeling nervous, anxious or on the edge[m]	Several Days	130	21.0	69	1.94	1.16	3.26	**.01****
	Nearly Every Day	71	11.5	32	2.08	1.08	4.01	**.03***
Over the past two weeks, how often have you been bothered by not being able to sleep or control worrying[n]	Several Days	129	20.8	68	2.04	1.20	3.48	**.009****
	Nearly Every Day	74	11.9	37	1.70	0.91	3.17	.09

**p* < .05. ***p* < .01. ****p* < .001

Reference categories are: [a]Low (1-2); [b]Married or Partner; [c]None; [d]18-29; [e]Native Hawaiian; [f]No high school degree; [g]Low; [h]Low; [i]Negative; [j]Not at all; [k]Not at all; [l]Not at all; [m]Not at all; [n]Not at all. [1]N= Yes to screening, used for analysis.

B. Enabling Factors

	Categories	N	Col%	N[1]	OR	LCL	UCL	*P*
What is your combined annual income[a]	$10,000 - $15,000	90	14.5	32	0.82	0.45	1.50	.53
	Over $35,000	81	13.1	46	2.15	1.12	4.11	**.02***
Do you have any kind of health care coverage[b]	Yes	348	56.1	181	1.00			
	No	268	43.2	62	0.39	0.26	0.60	**<.0001*****
Usual source of care[c]	Doctor Office or HMO	115	18.5	62	0.83	0.48	1.45	.52
	Emergency Room	60	9.7	17	0.52	0.25	1.10	.09
What is your current occupational status[d]	Retired	43	6.9	25	0.43	0.19	1.01	**.05***
	Unemployed	181	29.2	51	0.49	0.28	0.84	**.009****
How well do you feel speaking English[e]	Well	148	23.9	67	1.44	0.86	2.40	.16
	Not Well	124	20.0	39	0.55	0.31	0.96	**.04***
How confident are you that you could get advice or information about health or medical topics if you needed it[f]	Very Confident	176	28.4	73	1.15	0.67	1.95	.62
	Not Confident At All	38	6.1	8	0.31	0.12	0.81	**.02***
How often did you feel you could rely on your doctors, nurses, or other healthcare provider to take care of your healthcare needs[g]	Usually	138	22.3	65	0.79	0.46	1.36	.39
	Never	35	5.6	5	0.24	0.08	0.76	**.01****
I have had a hard time understanding the healthcare provider's instructions because of language[h]	Agree	161	26.0	52	1.52	0.78	2.96	.22
	Strongly Disagree	153	24.7	71	2.03	1.03	4.01	**.04***

I had a hard time following the healthcare provider's instructions due to logistical reasons like transportation or childcare[i]	Agree	184	29.7	56	0.89	0.45	1.78	.75
	Strongly Disagree	145	23.4	72	1.46	0.72	2.98	.30
I had a hard time following the healthcare provider's instructions because of my work schedule[j]	Agree	183	29.5	57	1.44	0.70	2.96	.33
	Strongly Disagree	150	24.2	79	2.86	1.37	5.94	**.005****
I delayed seeking care because I didn't have insurance or the co-payment was too expensive[k]	Agree	192	31.0	67	1.27	0.69	2.34	.45
	Strongly Disagree	141	22.7	72	2.00	1.05	3.82	**.04***
If a healthcare provider gives me advice that goes against my cultural beliefs, I wouldn't listen to them[l]	Agree	180	29.0	66	1.25	0.67	2.33	.47
	Strongly Disagree	119	19.2	55	1.86	0.94	3.68	.07
I feel that my healthcare provider understands my background and values[m]	Agree	282	45.5	117	1.41	0.83	2.39	.20
	Strongly Disagree	57	9.2	32	2.78	1.25	6.20	**.01****
I often feel as if my healthcare provider looks down on me and the way I live my life[n]	Agree	158	25.5	47	1.45	0.70	3.00	.32
	Strongly Disagree	141	22.7	77	3.38	1.60	7.10	**.001*****
I think the health systems treat people unfairly based on their race or ethnic background[o]	Agree	190	30.6	73	1.57	0.84	2.92	.16
	Strongly Disagree	110	17.7	48	1.96	0.97	3.93	.06
I think racism/prejudice makes receiving good healthcare difficult[p]	Agree	226	36.5	91	1.65	0.91	3.00	.10
	Strongly Disagree	89	14.4	38	1.47	0.72	2.99	.29
I have personally experienced racism, racial discrimination, or racial prejudice at least once in the last 12 months[q]	Agree	180	29.0	63	1.22	0.65	2.29	.53
	Strongly Disagree	123	19.8	60	1.55	0.79	3.03	.20
If I experienced racism in the past 12 months, I would suffer from the stress that can affect my health[r]	Agree	196	31.6	78	0.90	0.50	1.61	.71
	Strongly Disagree	110	17.7	42	0.91	0.47	1.79	.80

It seems like everything causes cancer[s]	Agree	228	36.8	91	1.02	0.63	1.67	.93
	Strongly Disagree	67	10.8	25	0.75	0.37	1.51	.42
There's not much you can do to lower your chances of getting cancer[t]	Agree	226	36.5	90	1.25	0.71	2.20	.43
	Strongly Disagree	86	13.9	33	1.09	0.53	2.22	.81
There are so many recommendations about preventing cancer, it's hard to know which ones to follow[u]	Agree	268	43.2	111	0.93	0.57	1.51	.76
	Strongly Disagree	53	8.5	15	0.49	0.22	1.09	.08

*$p < .05$. **$p < .01$. ***$p < .001$

Reference categories are: [a]Less that $10,000; [b]Yes; [c]Clinic of health center; [d]Employed; [e]Very well; [f]Completely confident; [g]Always; [h]Strongly agree; [i]Strongly agree; [j]Strongly agree; [k]Strongly agree; [l]Strongly agree; [m]Strongly agree; [n]Strongly agree; [o]Strongly agree; [p]Strongly agree; [q]Strongly agree; [r]Strongly agree; [s]Strongly agree; [t]Strongly agree; [u]Strongly agree. [1]N= Yes to screening, used for analysis.

C. Needs Factors

Needs Factor	Categories	N	Col%	N[1]	OR	LCL	UCL	*P*
Is your health a priority for you[a]	Yes	535	86.3	220	1.00			
	No	69	11.1	16	0.64	0.31	1.31	.23
In general, what would you say your health is[b]	Very Good	142	22.9	54	1.61	0.79	3.29	.19
	Poor	43	6.9	21	3.82	1.43	10.20	**.008****
How often do you now smoke cigarettes[c]	Some Days	40	6.5	12	0.45	0.18	1.15	.10
	Not at All	181	29.2	75	1.03	0.57	1.86	.93
Overall, how confident are you about your ability to take good care of your health[d]	Very Confident	204	32.9	78	0.95	0.55	1.64	.87
	Not Confident At All	28	4.5	5	0.46	0.14	1.51	.20
Overall, how would you rate the quality of health care you received in the past 12 months[e]	Very Good	136	21.9	68	0.77	0.43	1.38	.38
	Poor	16	2.6	2	0.21	0.03	1.32	.10

*$p < .05$. **$p < .01$. ***$p < .001$

Reference categories are: [a]Yes; [b]Excellent; [c]Everyday; [d]Completely confident; [e]Excellent. [1]N= Yes to screening, used for analysis.

TABLE 9: LOGISTIC REGRESSION MULTIVARIABLE RESULTS FOR EVER HAVING A SCREENING FOR CERVICAL CANCER, PAP TEST (CONTROLLED FOR AGE, INCOME, HEALTH INSURANCE, & OCCUPATION)

A. Predisposing Factors

	Categories	N	Col%	N[1]	OR	LCL	UCL	*P*
Do you consider yourself as religious[a]	Mid (3-5)	251	40.2	184	1.73	0.99	3.03	**.05***
	High (6-7)	236	37.8	180	1.54	0.87	2.71	.13
What is your marital status[b]	Past Partner	119	19.1	101	1.17	0.63	2.19	.61
	Never Married	228	36.5	135	0.51	0.32	0.81	**.004****

How many children under the age of 18 live in your household[c]	One	98	15.7	71	1.04	0.56	1.92	.91
	Four or more	114	18.3	78	0.75	0.42	1.36	.35
What is your age[d]	30-39	139	22.3	113	4.94	2.78	8.79	**<.0001*** **
	60-92	111	17.8	90	3.77	1.90	7.46	**.0001*** **
What is your Ethnicity[e]	Chuukese	191	30.6	131	0.96	0.60	1.52	.85
	Marshallese	119	19.1	90	1.14	0.67	1.97	.63
What is the highest grade or level of schooling you completed[f]	High School Graduate	284	45.5	206	1.95	1.20	3.16	**.007** **
	College Graduate	62	9.9	48	1.72	0.79	3.75	.17
Ethnic Identity[g]	Neutral	145	23.2	115	3.65	1.72	7.74	**.0007*** **
	High	399	63.9	293	3.01	1.56	5.80	**.001*** **
American Identity[h]	Neutral	171	27.4	129	2.63	1.34	5.15	**.005** **
	High	361	57.9	270	2.87	1.54	5.34	**.0009*** **
Acculturation[i]	Neutral	265	42.5	173	0.45	0.28	0.71	**.0007*** **
	Positive	118	18.9	94	0.89	0.48	1.64	.71
In general, how much do you trust information about health or medical topics from: A Doctor[j]	A Little	103	16.5	69	0.63	0.29	1.38	.25
	A Lot	281	45.0	216	0.92	0.45	1.90	.82
Over the past two weeks, how often have you been bothered by little interest or pleasure in doing things[k]	Several Days	142	22.8	110	1.42	0.84	2.38	.19
	Nearly Every Day	89	14.3	63	1.12	0.62	2.02	.70
Over the past two weeks, how often have you been bothered by feeling down, depressed or hopeless[l]	Several Days	137	22.0	106	1.19	0.70	2.03	.51
	Nearly Every Day	62	9.9	44	0.76	0.39	1.47	.41
Over the past two weeks, how often have you been bothered by feeling nervous, anxious or on the edge[m]	Several Days	136	21.8	101	0.87	0.52	1.46	.60
	Nearly Every Day	72	11.5	51	0.88	0.46	1.65	.68
Over the past two weeks, how often have you been bothered by not being able to sleep or control worrying[n]	Several Days	131	21.0	101	1.23	0.72	2.10	.46
	Nearly Every Day	73	11.7	51	0.72	0.39	1.34	.30

*$p < .05$. **$p < .01$. ***$p < .001$

Reference categories are: [a]Low (1-2); [b]Married or Partner; [c]None; [d]18-29; [e]Native Hawaiian; [f]No high school degree; [g]Low; [h]Low; [i]Negative; [j]Not at all; [k]Not at all; [l]Not at all; [m]Not at all; [n]Not at all. [1]N= Yes to screening, used for analysis.

B. Enabling Factors

	Categories	N	Col%	N[1]	OR	LCL	UCL	*P*
What is your combined annual income[a]	$10,000 - $15,000	85	13.6	65	1.31	0.71	2.40	.39
	Over $35,000	81	13.0	68	1.99	0.97	4.06	.06
Do you have any kind of health care coverage[b]	Yes	347	55.6	283	1.00			
	No	271	43.4	164	0.43	0.29	0.64	**<.0001*** **
Usual source of care[c]	Doctor Office or HMO	116	18.6	91	0.91	0.51	1.62	.74
	Emergency Room	62	9.9	37	0.58	0.31	1.10	.10
What is your current occupational status[d]	Retired	43	6.9	37	1.61	0.56	4.61	.37
	Unemployed	183	29.3	116	0.80	0.49	1.30	.36
How well do you feel speaking English[e]	Well	145	23.2	105	0.79	0.48	1.31	.37
	Not Well	126	20.2	82	0.45	0.26	0.77	**.003** **
How confident are you that you could get advice or information about health or medical topics if you needed it[f]	Very Confident	176	28.2	128	0.95	0.56	1.61	.85
	Not Confident At All	37	5.9	24	0.72	0.32	1.66	.44
How often did you feel you could rely on your doctors, nurses, or other healthcare provider to take care of your healthcare needs[g]	Usually	141	22.6	108	0.73	0.41	1.31	.29
	Never	36	5.8	13	0.22	0.09	0.52	**.0006*** **
I have had a hard time understanding the healthcare provider's instructions because of language[h]	Agree	165	26.4	108	0.49	0.25	0.95	**.04***
	Strongly Disagree	154	24.7	119	0.87	0.43	1.76	.70
I had a hard time following the healthcare provider's instructions due to logistical reasons like transportation or childcare[i]	Agree	188	30.1	128	0.84	0.43	1.64	.61
	Strongly Disagree	147	23.6	112	1.01	0.49	2.08	.97
I had a hard time following the healthcare provider's instructions because of my work schedule[j]	Agree	182	29.2	125	0.48	0.24	0.98	**.04***
	Strongly Disagree	149	23.9	116	0.67	0.32	1.42	.30
I delayed seeking care because I didn't have insurance or the co-payment was too expensive[k]	Agree	195	31.3	136	0.62	0.34	1.14	.12
	Strongly Disagree	142	22.8	109	0.76	0.39	1.49	.42

If a healthcare provider gives me advice that goes against my cultural beliefs, I wouldn't listen to them[l]	Agree	180	28.8	127	0.61	0.33	1.14	.12
	Strongly Disagree	122	19.6	92	0.80	0.40	1.59	.52
I feel that my healthcare provider understands my background and values[m]	Agree	284	45.5	218	1.01	0.60	1.70	.97
	Strongly Disagree	56	9.0	40	0.80	0.37	1.74	.58
I often feel as if my healthcare provider looks down on me and the way I live my life[n]	Agree	156	25.0	98	0.64	0.34	1.22	.17
	Strongly Disagree	142	22.8	114	1.36	0.67	2.77	.39
I think the health systems treat people unfairly based on their race or ethnic background[o]	Agree	196	31.4	146	0.82	0.45	1.51	.53
	Strongly Disagree	112	17.9	74	0.57	0.29	1.11	.10
I think racism/prejudice makes receiving good healthcare difficult[p]	Agree	233	37.3	175	1.10	0.61	1.99	.74
	Strongly Disagree	89	14.3	59	0.61	0.31	1.23	.17
I have personally experienced racism, racial discrimination, or racial prejudice at least once in the last 12 months[q]	Agree	187	30.0	130	0.74	0.40	1.38	.35
	Strongly Disagree	128	20.5	93	0.70	0.35	1.38	.30
If I experienced racism in the past 12 months, I would suffer from the stress that can affect my health[r]	Agree	199	31.9	149	0.94	0.52	1.69	.84
	Strongly Disagree	114	18.3	80	0.82	0.43	1.58	.56
It seems like everything causes cancer[s]	Agree	230	36.9	176	0.90	0.54	1.48	.67
	Strongly Disagree	69	11.1	35	0.24	0.13	0.47	**<.0001*** **
There's not much you can do to lower your chances of getting cancer[t]	Agree	228	36.5	172	1.35	0.78	2.33	.28
	Strongly Disagree	88	14.1	56	0.72	0.37	1.38	.32
There are so many recommendations about preventing cancer, it's hard to know which ones to follow[u]	Agree	271	43.4	212	1.33	0.82	2.17	.25
	Strongly Disagree	54	8.7	29	0.46	0.23	0.92	**.03***

*$p < .05$. **$p < .01$. ***$p < .001$

Reference categories are: [a]Less that $10,000; [b]Yes; [c]Clinic of health center; [d]Employed; [e]Very well; [f]Completely confident; [g]Always; [h]Strongly agree; [i]Strongly agree; [j]Strongly agree; [k]Strongly agree; [l]Strongly agree; [m]Strongly

agree; [n]Strongly agree; [o]Strongly agree; [p]Strongly agree; [q]Strongly agree; [r]Strongly agree; [s]Strongly agree; [t]Strongly agree; [u]Strongly agree. [1]N= Yes to screening, used for analysis.

C. Needs Factors

	Categories	N	Col%	N[1]	OR	LCL	UCL	*P*
Is your health a priority for you[a]	Yes	538	86.2	406	1.00			
	No	72	11.5	38	0.47	0.26	0.83	**.009****
In general, what would you say your health is[b]	Very Good	146	23.4	109	1.78	0.95	3.34	.07
	Poor	40	6.4	30	2.57	1.02	6.52	**.05***
How often do you now smoke cigarettes[c]	Some Days	40	6.4	27	0.52	0.22	1.24	.14
	Not at All	184	29.5	118	0.46	0.26	0.82	**.008****
Overall, how confident are you about your ability to take good care of your health[d]	Very Confident	209	33.5	148	0.88	0.53	1.47	.63
	Not Confident At All	27	4.3	12	0.33	0.13	0.85	**.02***
Overall, how would you rate the quality of health care you received in the past 12 months[e]	Very Good	139	22.3	101	0.75	0.42	1.36	.35
	Poor	14	2.2	5	0.25	0.07	0.94	**.04***

**p < .05. **p < .01. ***p < .001*
Reference categories are: [a]Yes; [b]Excellent; [c]Everyday; [d]Completely confident; [e]Excellent. [1]N= Yes to screening, used for analysis.

Health Comprehension

Health comprehension (enabling domain) was measured through a matrix-style question block with seven questions ranging from strongly agree to strongly disagree to the following activities regarding following healthcare providers instructions: I have had a hard time understanding the healthcare provider's instructions because of language; I had a hard time following the healthcare provider's instructions due to logistical reasons like transportation or childcare; I had a hard time following the healthcare provider's instructions because of my work schedule; I delayed seeking care because I didn't have insurance or the co-payment was too expensive; If a healthcare provider gives me advice that goes against my cultural beliefs, I wouldn't listen to them; I feel that my healthcare provider understands my background and values; and I often feel as if my healthcare provider looks down on me and the way I live my

life. Strongly agree serves as the reference category (comparison) for all of the Health Comprehension categorical measures.

For cervical cancer (all women), those who agreed that they had a hard time understanding a provider's instructions because of language were 51% less likely to self-report engaging in this cancer screening that those who strongly agreed and this was significant (p = .04) when controlling for age, income, health insurance, and occupation (see **Table 9.B**). For logistical reasons like transportation or childcare affecting following provider instructions, no significant findings were uncovered from the model. There were no significant findings within the model for the delayed seeking care because of no insurance or the co-payment was too expensive question. Those who agreed they had a hard time following their providers instructions because of work were 52% less likely to be screened (p = .04) when controlling for those same variables (see **Table 9.B**). Those who disagreed that their provider understands their background and values were 44% less likely to be screened than those who strongly agreed (p = .04) (see **Table 6.B**). Cultural beliefs also had no significant effect on this cancer screening probability. Additionally, there were no significant findings for the healthcare provider looking down on the respondent and the way they live their life.

For breast cancer screening (women 45+), findings were unique when compared to pap test. Those who disagreed that they have had a hard time understanding the healthcare provider's instructions because of language were 1.76 times more likely than those who strongly agreed to have had a mammography test and this was significant (p = .04) (see **Table 5.B**). Statistically significant findings were found for those who strongly disagreed with this same statement (1.95 times more likely, p = .02) (see **Table 5.B**) and at the multivariable level (2.03 times more likely, p = .04) when controlling for age, income, health insurance, and occupation (see **Table 8.B**). For

logistical reasons like transportation or childcare affecting following provider instructions, no significant findings were uncovered. Those who strongly disagreed that work caused them to not be able to follow their provider's instructions were 2.86 times more likely to be screened than those who strongly agreed (p = .0006) (see **Table 5.B**). Those who answered they strongly disagreed that they delayed seeking care because of no insurance or the co-payment was too expensive were 2.09 times more likely to have had this cancer test than those who strongly agreed (p = .006) (see **Table 5.B**). Cultural beliefs had no significant effect on this cancer screening probability. Respondents who strongly disagreed that their healthcare providers understood their background and cultures were 2.19 times more likely than those who strongly agreed to have had a mammogram (p = .02) (see **Table 5.B**). Lastly, those who strongly disagreed that they have a hard time following a healthcare provider's instructions when they look down on the respondent and the way they live their life were 3.23 times more likely to have had this test than those who strongly agreed (p = .0001) (see **Table 5.B**).

For colorectal cancer screening (all 50+), there were less statistically significant findings than the other two cancer screenings and no significant findings within the multivariable model. There were no significant findings for having a hard time understanding the healthcare provider's instructions because of language. For logistical reasons like transportation or childcare affecting following provider instructions, those who agreed were 46% less likely than those who strongly agreed to have had this screening test (p = .05) (see **Table 4.B**). No significant findings were uncovered for work causing them to not be able to follow their provider's instructions, as well as delaying seeking care because of no insurance or the co-payment was too expensive. For those who agreed that they would not listen to a healthcare providers' instructions if they give them advice that goes against their cultural beliefs, they were 47% less likely to have had this

screening (p = .02) (see **Table 4.B**). Respondents who agreed that their healthcare provider understood their background and cultures were 36% less likely to have had this test (p = .05), and 60% less likely for those who disagreed in comparison to those who strongly agreed with the statement (p = .003) (see **Table 4.B**). Lastly, those who strongly disagreed that they have a hard time following a healthcare provider's instructions when they look down on them and the way they live their life were 2.10 times more likely to have had a test for colon cancer than those who strongly agreed (p = .02) (see **Table 4.B**).

Acculturation

Acculturation modification questions (predisposing domain) within the original HINTS Hawai‘i database were adapted from the Vancouver Index of Acculturation. This index is a 20-item instrument that measures self-reported orientations towards an individuals' heritage and mainstream cultural groups and the adoption and adjustment that takes place, and this instrument has been used in several cultural contexts and communities (Testa et al., 2019). This index is a bidimensional acculturation instrument that measures the orientation towards both identities that does not assess language as language can be assessed separately because of its importance in the acculturation process (Testa et al., 2019). Respondents are asked about the endorsement rather than frequencies of the questions because of 'conceptual independence', which demonstrates that an answer to one question in the pair does not necessarily constrain a response to its counterpart (Kang, 2006; Testa et al., 2019). This index has shown good reliability and validity in the past, Kang (2006) found support for this index with successful Spearman's rank correlation coefficients and reliability generalization within research (Huynh et al., 2009; Kang, 2006). The index measures each cultural orientation as respondents participate and identify with each culture through values, social relationships, and adherence to traditions (Huynh et al., 2009). HINTS

used 12 of these questions, 6 questions for their ethnic culture, and 6 from American culture with responses ranging from strongly disagree, disagree, agree, and strongly agree (48 total score). I created an index for this analysis consisting of negative, neutral and positive acculturation as one variable. Acculturation was reverse coded, positive acculturation indicates greater American identification and negative acculturation implies greater Ethnic identity. This by no means has any reflection on cultural identity as being negative in comparison to an American identity, this just represents a consistent coding identification for this analysis. Negative acculturation is the reference category for this measure. Respondents were not asked about their immigration status, so the immigration status and time within the U.S. may vary for responses. This scale examines the bivariate associations between each acculturation variable and the screening outcomes. From this measure, a scale for both Ethnic and American identities were created with scores ranging from high, low, and a neutral affiliation to the respective identities. For both measures, low identity serves as the reference category.

For pap test, those whose responses fell in a neutral category were 48% less likely than those with a higher ethnic identity to have had this cancer screening (p = .002) (see **Table 6.A**), and 55% less likely to have had this screening test (p = .0007) when controlled for age, income, health insurance, and occupation (see **Table 9.A**). Those with a high Ethnic identity were 2.76 times more likely (p = .0008) and those with a high American identity were 2.69 more likely to have this screening when compared to those with low identities (p = .0005) (see **Table 6.A**). A neutral Ethnic identity was associated with 4.10 times more likelihood than those with a low Ethnic identity to have had a mammography (p = .0002) (see **Table 5.A**). For colorectal cancer screening, a neutral acculturation demonstrated 40% less likelihood of having this cancer screening test than those with a higher ethnic identity (p = .02) (see **Table 4.A**). Additionally,

those with a neutral acculturation had a 39% less likelihood of having had this screening than those with a higher Ethnic identity (p = .05) when controlling for age, income, occupation, and health (see **Table 7.A**). As previously stated, immigration status was not measured in relation to or compared with acculturation for this regression. Immigration status may affect acculturation and the level of adaption to either identity (Huynh et al., 2009).

Perceived Racism

Perceived racism (enabling domain) from within the original HINTS study consisted of four questions: I think the health systems treat people unfairly based on their race or ethnic background; I think racism/prejudice makes receiving good healthcare difficult; I have personally experienced racism, racial discrimination, or racial prejudice at least once in the last 12 months; and If I experienced racism in the past 12 months, I would suffer from the stress that can affect my health. Respondents could select from strongly agree, agree, disagree, and strongly disagree for each question. Strongly agree served as the reference category for these questions.

There were no statistically significant findings with cervical cancer screening involving ever had a pap test for women other than within the "No Response" category. For those who did not respond to the personally experiencing racism/racial discrimination question, they were 62% less likely than those who strongly agreed to be screened (p = .03) (see **Table 6.B**). For breast cancer screening, those who responded they disagreed that the health systems treat people unfairly based on their race/ethnicity were 1.72 times more likely to have had this test (p = .04) and 1.86 times more likely (p = .03) for those who strongly disagreed in comparison to those who strongly agreed (see **Table 5.B**). Respondents who indicated they strongly disagreed they have personally experienced racism were 1.76 times more likely than those who strongly agreed to have had this screening (p = .04) (see **Table 5.B**). Ever having a test for colorectal cancer was

reserved for those over the age of 50 and there were no statistically significant findings within the models.

Mistrust in Healthcare

Mistrust in healthcare (predisposing domain) within HINTS was measured by one question asking "In general, how much would you trust information about health or medical topics from a healthcare provider [physician, etc.]?". This was measured from not at all, a little, some, and a lot. "Not at all" served as the reference category for this question within the model. There were no significant findings for the three cancer-type screenings within the models. For colon cancer screening, those who indicated a lot of trust with their provider were 1.88 times more likely than those with not trust all to be screened and this was approaching significance (p =.07) (see **Table 4.A**).

Other Noteworthy Social Factors from Within the Models

Predisposing Domain

Some other social factors from within the model stood out as far as facilitators or hindrances to cancer screenings for NHPIs. Respondents provided their level of religiosity (very religious, religious, and not religious). For cervical cancer, those who indicated they were very religious (or high religiosity) were 2.02 times more likely to have had a pap test than those with low religiosity (p = .007) (see **Table 6.A**). Similarly, those who indicated high religiosity were 2.58 times more likely to have had a screening for breast cancer compared to those with low religiosity (p = .0006) (see **Table 5.A**). Respondents with a mid-religiosity were 71% less likely than those with a low religiosity to have had a test for colon cancer (p = .0001) when controlled for age, income, health insurance, and occupation at the multivariable level (see **Table 7.A**).

Marital status seemed to also influence cancer screening participation. Never married was significantly associated with less likelihood to engage in all three cancer screenings. 63% less likelihood for pap test ($p < .0001$) (see **Table 6.A**), 64% less likelihood for having a mammography ($p < .0001$) (see **Table 5.A**), and 47% less likelihood for ever having a test for colon cancer ($p = .005$) (see **Table 4.A**) when compared to those who indicated they were married or living with a partner. Education also influenced cancer screening utilization. Respondents who graduated college were more likely than those with no high school degree to have had all three cancer screenings. 2.52 times more likelihood for pap test ($p = .008$) (see **Table 6.A**), and 2.97 times more likelihood for having a mammography ($p = .0005$) (see **Table 5.A**). Respondents who started but did not graduate college were 1.90 times more likely than those with no high school degree to be screened for colon cancer ($p = .02$) (see **Table 4.A**). Those who were never married and ended their education after high school were less likely to have engaged in cancer screenings.

Enabling Domain

Income and health insurance stood out within the models as influencing engagement with cancer screenings for NHPIs. Respondents who indicated income over $35,000 were statistically more likely than those with income under $10,000 to have had a test for the three cancer types. 2.62 times more likely for cervical cancer ($p = .004$) (see **Table 6.B**), 2.44 times more likely for a mammogram ($p = .0006$) (see **Table 5.B**), and 2.87 times more likely for a test for colon cancer ($p = .0002$) (see **Table 4.B**). Those who responded that they do not have health insurance were significantly less likely than those with health insurance to have engaged in all three cancer screenings. 65% less likely to have had a pap test ($p < .0001$) (see **Table 6.B**), 72% less likely to

have had a test for breast cancer ($p < .0001$) (see **Table 5.B**), and 65% less likely to have had a test for colon cancer ($p < .0001$) (see **Table 4.B**).

Being unemployed and not speaking English well were also associated with less engagement with cancer screenings. Respondents who indicated an unemployment occupational status were less likely than those who are employed to ever have had a cancer screening. 43% less likelihood to have had a pap test ($p = .01$) (see **Table 6.B**) and 46% less likelihood for having a mammogram ($p = .004$) (see **Table 5.B**). When asked how well they feel speaking English, respondents who indicated they do not feel well speaking English were less likely than those who felt very well speaking English to engage in screenings. 40% less likelihood for a screening for cervical cancer ($p = .03$) (see **Table 6.B**) and OR=0.45 ($p = .003$) when controlling for age, income, health insurance, and occupation (see **Table 9.B**). 45% less likely to have had a screening for breast cancer when controlled for those same variables ($p = .04$) (see **Table 8.B**).

When asked if respondents could rely on doctors to take care of their health needs, respondents who indicated never to this question were significantly less likely than those who replied always to have had a cancer screening. For cervical cancer, 87% less likely ($p < .0001$) (see **Table 6.B**), 76% less likelihood for mammography ($p = .01$) when controlling for those variables (see **Table 8.B**), and 91% less likely to have had a test for colon cancer ($p = .02$) when controlling for those variables (see **Table 7.B**). Thus, being unemployed, not speaking English well (ESL for PI within this dataset), and feeling like they could not rely on a doctor to take care of their health needs indicated a less likelihood of engagement with cancer screenings.

Needs Domain

Respondents provided a yes or no response to a question about health importance, is health a priority for them. Those who indicated that no, health was not a priority for them were

significantly less likely than those who indicated health was a priority for them to engage in the three cancer screenings. 53% less likely to have had a pap test (p = .009) when controlling for age, income, health insurance, and occupational status (see **Table 9.C**). 57% less likely to have had a mammogram (p = .005) (see **Table 5.C**) and 61% less likely to have had a test for colon cancer (p = .01) than those who felt health was a priority for them (see **Table 4.C**). Perceived health for pap test demonstrated more likelihood to have had cancer screening regardless of response type from very good to poor (ex. Very good [OR=2.00, p = .02] and fair [OR=2.87, p = .001]) (see **Table 6.C**). It is possible respondents did not understand this question or were feeling survey fatigue, or just a result of small sample sizes.

Additionally, respondents who demonstrated that they were not confident at all in their ability to take good care of their health were significantly less likely to have each cancer screening compared to those who were completely confident. 67% less likely for ever having a pap test (p = .02) when controlling for those variables (see **Table 9.C**), 67% less likely to have had a mammogram (p = .03) (see **Table 5.C**), and 87% less likely to have had a test for colon cancer (p = .05) when controlling for those variables (see **Table 7.C**). Lastly, those who reported that the quality of care they have received in the past 12 months has been poor were less likely to have engaged in cancer screenings than those who felt the care they received was excellent. This included cervical cancer screening (OR=0.25, p = .04) when controlling for those variables (see **Table 9.C**) and breast cancer screening (OR=0.15, p = .01) (see **Table 5.C**). Furthermore, those who did not view their health as a priority, were not confident at all in their ability to take good care of their health, and who reported that the quality of care they have received in the past 12 months has been poor were less likely to have engaged in cancer screenings.

Discussion

Hypothesis Testing with the Model Results

Hypothesis 1, Evaluate whether and how three domains of the social factors (health comprehension, perceived racism/mistrust in healthcare, and acculturation) are related to cancer screenings for NHPIs

Utilizing the Behavioral Model for Vulnerable Populations proved successful in categorizing variables for the regression model and also where to focus efforts going forward. Thus rejecting the null hypothesis that posits employing this framework would uncover no statistically significant social factors affecting colorectal, cervical, and breast cancer screening practices. For health comprehension, those who had a hard time understanding the healthcare provider's instructions because of language and logistical reasons like transportation or childcare affecting following instructions are less likely to have had cancer screenings than those who did not have a hard time understanding or following provider instructions (see **Tables 4.B, 9.B**) (Islam et al., 2017; Pobutsky et al., 2009). These may indicate areas where respondents had trouble in past or heard stories from others where they were not able to comprehend healthcare providers because of language barriers or other life obligations that caused them to not engage in preventive healthcare in the past (McElfish, Yeary, et al., 2019). Furthermore, those who responded that work caused them to not be able to follow their provider's instructions, they delayed seeking care because of no insurance or the co-payment was too expensive, did not feel that providers understood their background and cultures, and they have a hard time following a provider's instructions when they feel looked down upon and the way they live their life, had decreased likelihood of engaging in cancer screenings (see **Tables 4B, 5B, 6B, 8B, 9B**). Health comprehension such as language barriers, logistical reasons, and differences in ethnic and

cultural identities has been linked to barriers to engagement in healthcare utilization (Hu et al., 2016; Liss & Baker, 2014; Liu et al., 2009; Terui, 2017). Future interventions or cancer screening programs must pay attention to barriers found from this analysis such as language barriers, logistical constraints (transportation or childcare), work schedules, no insurance, costly health expenses, as well as ensuring cultural sensitivity and respecting diversity when working with NHPI community members.

A neutral acculturation demonstrated less likelihood of ever having a screening for all three cancer types than those with more Ethnic affiliation (see **Tables 4A, 6A, 9A**). Individuals who may not feel a strong tie to both their ethnic culture and American culture within public housing demonstrate a unique underserved population. Those with a neutral score may indicate individuals who do not feel a strong connection to their ethnic or American cultures, they may have provided some stronger agreement or disagreement with aspects of the scale (values, traditions, or relationships); however, their scores fell in a mid-range. It is clear that a neutral affiliation to both cultures is associated with health behaviors as these individuals did not engage in cancer screenings. Their location in public housing may provide a barrier to cultural and social networks that could serve to facilitate health knowledge and behaviors like cancer screening awareness (Shek & Turlington, 2019). This assumption stems from a neutral connection to both ethnic and American cultures where health-based knowledge from familial, social, and health networks may take place that these individuals are missing out (Mouttapa et al., 2016; Palafox et al., 2018). These individuals may not feel a strong connection to either identity, or did not indicate a strong inclination to engage in activities typically associated with culture (traditions, music, entertainment, etc.). A mid to medium acculturation status has been linked to more likelihood of intimate partner violence, as well as the level of acculturation linking health

outcomes within underrepresented populations (Burnam et al., 1987; Caetano et al., 2000; Sparks et al., 2024). Future efforts should be placed on networks for health-based awareness and information sharing, as not having a strong connection to both cultures demonstrated a lack of engagement with life-saving screenings.

Perceived racism provided mixed, conflicting, and many non-significant results. Personal experience with racism demonstrated a hindrance to cancer screenings for all cancer types; however, mainly not significant. Those who disagreed that they have experienced racism were more likely to have had cancer screenings than those who had experienced racism (see **Table 5.B**). Mixed results from the findings may reflect the questions and misunderstandings resulting from the question wording and Likert scale. Non-significant findings may be a result of not personally experiencing racism, as well as limited exposure to social networks where these stories of racism or healthcare inequalities might have spread. Perceived racism within vulnerable populations is often a driver of health inequities, and racism is associated with difference in medical treatment for many vulnerable populations (Ahmed et al., 2017; Elias & Paradies, 2021; Laster Pirtle, 2020; Phelan & Link, 2015). I expected perceived racism to be an influencer of cancer screenings; however, the findings were mainly not significant and often conflicting. Phelan & Link (2015) describe racism as a fundamental cause of racial differences in SES and health inequalities, as well as racism demonstrating a fundamental association with health independent of SES. Racism or perceived racism was expected to be a barrier to cancer screenings as evident in previous research (Ahmed et al., 2017; Phelan & Link, 2015; Rhee et al., 2019), and surprisingly there were few associations, mainly not significant. Perceived racism was found to not be influential within this dataset and should be investigated further by using

other variables from the regression to determine if there might be more mediator or moderator associations with the health outcomes.

Those who had a lot of trust in doctors concerning information about health or medical topics were more likely to have had each cancer screening. However, trust results were all non-significant. For colon cancer screening, those who indicated a lot of trust with their provider were 1.88 times more likely than those with not trust all to be screened and this was approaching significance (p =.07) (see **Table 4.A**). These findings were mainly not significant; however, still highlight that trust in Western healthcare is essential as NHPIs have experienced historical trauma and a history of mistrust with Western health causing limited to no engagement with preventive care (Godinet et al., 2019; Leon Guerrero et al., 2020; Palafox & Hixon, 2011). These insignificant findings may be a result of one question to measure this construct, when many other studies utilize multi-itemed scales to measure trust with underserved populations (Ferreira et al., 2021; Hong et al., 2018; Paul et al., 2022; Schwei et al., 2014). Other noteworthy social factors within the Behavioral Model for Vulnerable Populations framework for this regression also indicted areas for further insight. Predisposing domains of influence included high religiosity, those who indicated that they were very religious were more likely than those with low religiosity to have a history of each cancer screening (see **Tables 6.A, 5.A**). Similar links between religion or religious service attendance and healthcare utilization has been found with other populations (Ferreira et al., 2021; Kretzler et al., 2020; Van Ness et al., 2002). Additionally, those who were never married, ended their education after high school, and less religious were less likely to have engaged in all cancer screenings within HINTS. Marriage is often associated with better health outcomes as selecting for healthier people and directly and

indirectly causing better health, as is the case for more education (Alkhawaldeh et al., 2023; Huntington et al., 2022; Lee & Schafer, 2021).

With enabling domains, income over $35,000 was associated with increased likelihood of engaging in the three cancer screenings (see **Tables 4B, 5B, 6B, 7B, 8B**). Having no health insurance, being unemployed, not speaking English well, and feeling like you could not rely on a doctor to take care of your health needs were all associated with less engagement with cancer screenings (see **Tables 4B, 5B, 6B, 7B, 8B, 9B**). In regards to needs domains, respondents who indicated that health was not a priority for them, demonstrated that they were not confident at all in their ability to take good care of their health, and reported that the quality of care they have received in the past 12 months has been poor were less likely to engage in the three cancer screenings (see **Tables 4C, 5C, 6C, 7C, 9C**). These social factors indicate income, health insurance, English proficiency, employment, self-confidence in the ability to take care of health, and the quality of healthcare received influence engagement with cancer screenings, which is found in previous studies (Aitaoto et al., 2012; Akinyemiju et al., 2022; Dela Cruz et al., 2022; Islam et al., 2017; McElfish, Yeary, et al., 2019). These and other social factors indicate opportunities for inequalities to manifest and drive unequal access to preventive care for medically underserved populations (Burrage et al., 2023; Palafox et al., 2018). As indicated by the findings, these social factors can be predisposing or social structures an individual is born into, enabling as in constructed social characteristics of different institutions by an individual, and self-perceptions of health needs. All of which can influence the engagement with healthcare such as cancer screenings for NHPI populations.

Limitations

These findings represent a non-probability sample, thus making inferences about the larger populations difficult to concretely demonstrate. The bivariate and multivariable models represent 1,010 Native Hawaiian, Marshallese, and Chuukese adults. However, the sample sizes within the models and for each variable diminish as the criteria expands. These findings are specific to three public housing communities and one general location of recruitment within Oahu, so may not be representative of other rural or urban NHPIs communities. Meaning the models suffer from small sample sizes from a non-random sample of NHPIs within a small geographic location on Oahu. Additionally, this was a lengthy survey (21 pages). Response bias might be a factor as participants could feel survey fatigue and answered questions in a quick manner towards the end or felt a sense of burnout with answering health-based questions. Nonresponse bias must be considered as many studies find participation is lacking from those individuals who might be more at risk or suffer from greater inequities and their participation is frequently missing from research (de Winter et al., 2005). However, the RDS methodology of constrained sampling offered a wider range of recruitment and participation as people often felt excited for the opportunity to be rewarded for recruiting more referrals and referred friends and family (Badowski et al., 2017; Heckathorn, 1997; Heckathorn, 2011). Social desirability and interviewer bias could have been a factor as many respondents were friends and family of their seeds and doing them a favor. Many participants got to know me as the "Cancer Center Guy", this might alter their responses as they want to provide responses that make them or their communities seem healthier or more adherent to healthcare recommendations. Reading and writing in English was a requirement to take part in HINTS. However, some may have had a hard time with the survey questions and some of the reverse responses (negative and positive)

throughout the survey. Linguistic misunderstandings might have led to answering in a way without truly understanding the questions and a response that misrepresented their behaviors or thoughts (Liss & Baker, 2014; McElfish et al., 2018). Additionally, this regression was dependent upon the existing variables from within the HINTS dataset. Not all relevant social factors for measuring health inequities and barriers to cancer screenings were included and might be missing that could aid in intervention and prevention efforts for NHPIs.

This dissertation demonstrates pilot efforts for further inquiry into associations within this dataset and social factors that influence cancer screenings for NHPIs, while considering health comprehension, acculturation, perceived racism, and mistrust in healthcare. These and other constructs within the framework prove successful in providing insight into influences of healthcare access and utilization. The Andersen and Behavioral Model for Vulnerable Populations was used as a framework for organizing the social factors of interest (Kerpershoek et al., 2020; Lee et al., 2019; Stein et al., 2012). This allows for an examination into areas within the context of NHPIs lives where intervention or prevention measures may be best suited. However, caution must be advised when interpreting these results as many were a result of small sample sizes as each of the variables within the model domains varied. Many of these demographic and social factors found to influence cancer screening highlight the preexisting health inequity barriers that underserved communities face (Aitaoto et al., 2009; Pineda et al., 2023; Rehuher et al., 2021). However, this dissertation utilizes mixed methods to help indicate how these and other social factors uncovered from community interviews highlight preventive care facilitators and barriers and where these may overlap.

Chapter 6 Qualitative Results

The qualitative arm of this dissertation began shortly after the logistic regression models were completed but not analyzed to not influence the interview questioning. The results from the regression did not alter the questioning route used for the semi-structured interviews. The snowball sampling was already in place and the questionnaire was approved by the University of Hawai‘i IRB. Furthermore, the mixed method approach was chosen to triangulate findings from each of the analyses with the existing medical sociology and public health literature. After the nearly year of recruiting, sixteen interviews were completed with nine from site 1 and seven from site 2. **Table 10** supplies the ethnicity, age groups, Hawai‘i birthplace, site location, and if the participant remembered taking part in the HINTS Hawai‘i study.

TABLE 10: INTERVIEWEE DEMOGRAPHICS

N=16

ID	Ethnicity	Age Group	From Hawai'i	HINTS Participant?	HINTS Site Location
R1	Native Hawaiian	70-80	Yes	Yes	1
R2	Native Hawaiian	50-60	Yes	Yes	1
R3	Native Hawaiian	40-50	Yes	Yes	1
R4	Native Hawaiian	60-70	No	Yes	1
R5	Native Hawaiian	60-70	No	No	1
R6	Native Hawaiian	30-40	Yes	No	2
R7	Native Hawaiian	70-80	Yes	Yes	1
R8	Native Hawaiian	50-60	No	No	2
R9	Marshallese	40-50	No	No	1
R10	Marshallese	30-40	Yes	Yes	1
R11	Marshallese	40-50	No	No	2
R12	Chuukese	70-80	No	No	1

R13	Chuukese	20-30	No	No	2
R14	Chuukese	40-50	No	Yes	2
R15	Chuukese	30-40	No	Yes	2
R16	Chuukese	30-40	No	No	2

Demographics

For self-reported ethnicity, there were 8 Native Hawaiian, 3 Marshallese, and 5 Chuukese adults who took part in the semi-structured interviews. Even with the limited set of respondents, major themes emerged from the interviews to inform questions for the qualitative analysis. The majority of the interviewees identified as female (n=13 or 81%). The mean age of the interviewees was 50 years old. I created age groups for the interviewees and did not link the gender or birth location (if outside of Hawai‘i) because of the small sample size in order to protect the confidentiality of the interviewees. All of the interviewees had to reside within one of the two public housing communities within Oahu, be over the age of 18, speak English, and identify as NHPI to meet the recruitment criteria for the interviews. All but one of the PI (Chuukese and Marshallese) interviewees was born outside of Hawai‘i and the U.S., and therefore the majority of PI were migrants to the U.S. The interviewees were asked about: their background, the overall health of their ethnic/racial community in housing, insurance practices, community cancer beliefs and screening practices, personal cancer screening practices and knowledge, and facilitators or barriers to screenings (health comprehension, acculturation/cultural practices, mistrust in Western health/perceived racism, and other social factors). Grounded theory provided a framework for pulling the major themes, patterns and commonalities uncovered from these interviews for this analysis.

Those who moved to Hawai‘i indicated the reasons behind their migration included education, their parents moved here, to be closer to family, there are more financial opportunities here, and the need to move because someone within their immediate family was sick and needed

medical care. Six of the interviewees discussed the need to either move to or return back to Hawai‘i to be closer to their family. R9 (Marshallese woman born in the Marshall Islands) stated that her mother decided to more here because, “My uncle and them, they have property here, they own some property here”. Not surprising, many PI interviewees migrated to Hawai‘i because they had some established familial connection to Hawai‘i or had family with a place to live to help with their transition. All but two of the interviewees had health insurance. Twelve participants indicated they have Med-QUEST (MQD), Hawai‘i’s Medicaid program, with various health plans. The remaining two interviewees currently have insurance through their or their spouse’s employment. In regards to the two that did not have insurance, one person indicated they do not have it now, while the other interviewee stated they plan to get insurance through MQD. Interview questions were asked concerning the health of the interviewee, their family, and their ethnic community within public housing.

Health of the Community

Of those interviewed, 50% described their health as bad, negative, or seen as ‘not that good’. Bad diets, unhealthy behaviors, lack of exercise, high blood pressure, and other NCDs were brought up in regards to individuals’ negative view of their health. R8 described her health as bad and wanted better health as she knows people who are older than her and thinks they look younger. “My age looks like my age, it's like older, but the way I feel is like going to the old age, I need to be healthy. I need to get better, how can I take care of myself to get stronger at the age of 55 or a little younger because some people, they are 55 and they're feeling strong or strength. Like they are not 55, they’re still are 40 something like that “. Those who described their health as good did not provide much context around the notion of good health. Many of those interviewed just indicated they felt ‘healthy’ or ‘just okay’ health. A few described their health in

a positive light because they had no pain or sicknesses that they knew of, so the absence of any observed diseases. R15 described her health as, “Maybe good, yeah because I don’t have any disease”. After describing their health, participants of the interviews were asked about the health of their family members or ethnic community members within their housing.

Common themes regarding the health of their community or immediate families for NHPIs included bad diets and lifestyles, obesity, physical inactivity, a lot of sick people, mental health problems, smoking and drinking, too much sleep, and not enough education around healthy lifestyles. Interestingly, 8 of those interviewed (1 Marshallese, 2 Chuukese, and 5 NH) contributed bad health of the community to ethnic identities or practices. R1 (NH woman) attributed smoking behaviors within public housing to mainly Chuukese, “They smoke, they roll their cigarettes, they smoke more than anyone else”. R7 (NH woman) also contributed bad health to Micronesian community members who were “on welfare and MQD”. “But really, most the guys here on welfare that lives here. The majority on welfare. If you’re Micronesian, you know the insurance, you got to go to the welfare and get them”. Surprisingly, there was an overarching theme of outer-PI group affiliations when it came to attributing unhealthy lifestyles or engaging in deviant or bad behavior with ethnic identities. All but one of the NH adults interviewed attributed unhealthy lifestyles, deviant behaviors, or a reliance on MQD with being Micronesian or a PI identity. All of those interviewed who were Marshallese or Chuukese attributed bad health to their own ethnic community members and their identity as either Marshallese or Chuukese. R10 (Marshallese woman) stated, “A lot of other sick people that live here. Especially Marshallese people, from Marshall Islands, I think they are sick”. A common theme emerged regarding intra-group and outer-PI group blaming and ‘othering’ when discussing bad health and lifestyles within public housing linked to ethnic identities and reliance on MQD/federal benefits.

Additionally, many interviewees described not engaging with members of their family and ethnic communities enough to make assumptions about their health. “I don’t know, I’m really not sure, nobody really talks about those things”, according to R5 when asked about the health of her family. Participants brought up a lack of social ties to ethnic communities within housing and more of a focus on their own family. However, as indicated by R5, many participants revealed that their family does not talk enough about health, or does not discuss it at all. This important and unforeseen theme uncovered from the interviews will be discussed in the proceeding sections. Common themes were uncovered regarding healthcare engagement and a lack of proactive health behaviors within NHPI communities.

Healthcare Interaction and Engagement

As far as the quality of care received when engaging with the healthcare system, four of the interviewees discussed a negative interaction or view of Western healthcare. The remaining twelve (75%) provided positive previous interactions or feedback regarding their health insurance, providers, and the quality of care received in the past. R5 discussed her and her daughter’s interaction with a local oncologist. “The doctor is really good for her, she likes the doctor, she's really nice because she explains everything to my daughter”. Reasons behind trust in healthcare included being happy with local clinics such as Kōkua Kalihi Valley Comprehensive Family Services, doctors are nice and listen to them, resources like gym memberships and food allowances, and feeling confident that their provider will take care of their health. Remarkably, the majority of the interviewees provided positive feedback of their health insurance and the type of care they have received in the past. However, only five of those interviewed addressed proactive health behaviors. The remaining participants discussed that they and their community only engage in healthcare when sick or feeling pain (reactive).

Questions centering on engaging with healthcare were viewed through a reactive or proactive approach to health-seeking behaviors. R1, R4 and R7 (Native Hawaiians), supplied insight into trusting their healthcare provider and engaging in proactive health behaviors. “Me and my sister are definitely proactive…check to test blood, get the results, go to doctor’s appointments…and my doctor is really on it, all that harm reduction stuff”, R4 stated. R1 discussed how she is on top of preventive health and her doctor normally reminds her of her appointments but she reached out this year. “I have to go; I haven’t gone for screenings for the whole year already. So, I called their office and asked”. The other two interviewees who talked about proactive health behaviors discussed how only some of their community members engage in preventive services and see the doctor before they are sick. However, both brought up excuses and barriers that do get in the way of proactive healthcare in addition to practicing reactive care. Lack of transportation, work schedules, and language barriers were some of the excuses and barriers brought up regarding hindrances to proactive care. 11 out of 12 of those interviewed discussed negative or adverse health conditions of their ethnic communities. A major theme was uncovered regarding a lack of NHPI proactive health practices, with some providing insight into proactive health practices.

Not surprising, all of those interviewed supplied insight into an observed NHPI community norm of not engaging in proactive health behaviors and being more reactive. Themes uncovered from these questions ranged from why go in if you are not feeling sick, health not being a priority/not caring, no time to go see a doctor or appointments, a sense of denial of sickness without symptoms, and some community members ignore advice. R5 revealed insight into reactive behaviors in the Chuukese community when asked if community members visit doctors even when they are reminded to engage in proactive behaviors. “Oh no, hardly no. In

fact, no, my insurance always tries to get me to go in and no [laughs], they good at like telling me you know, you're due for this or you're due for that but I always refuse". R2 discussed the same theme within the Native Hawaiian community. "I think maybe that being proactive, being aware of what their health is, maybe they don't care…because maybe they prefer not to take care themselves. Maybe they prefer just to drink soda for the rest of their lives. And just know that their soda is just eating their insides up". Many provided some sort of observation that NHPIs seem to not care or prioritize their own health by ignoring health concerns and preventive behaviors. In regards to the Marshallese community practicing preventive healthcare, R9 stated, "I don't think they have that. Well, some of the younger generations today kind of get the idea but not as…understanding of what like you're saying the Westernized mindset to, wait, I got to prioritize my life because without a doctor, you know, I might be really sick". 50% of the interviewees described generational differences in healthcare practices and behaviors. They brought up views that younger generations may be adopting a Western mindset of taking care of health and prioritizing the self, which will be discussed within 'acculturation'. The themes around not engaging in proactive healthcare did not vary by ethnicity and were discussed by Native Hawaiian, Chuukese, and Marshallese interviewees. Interviewees seem to believe that NHPIs do not have a mindset centered on prioritizing their own health and engaging in proactive health behaviors. As was also the case when discussing cancer screenings.

Cancer screenings

Interviewees were asked about their own experiences and thoughts about cancer screenings, as well as the cancer screening practices of their ethnic communities. Interviewees were split when it came to their own engagement with cancer screenings. Interviewees described engaging in some sort of cancer screening in the past. Many had trouble remembering the exact

time frame of their last screening, but 6 were able to name a cancer screening that they had in the past. Four participants recalled having a test for colon cancer (including one couple who were screened together as part of one UHCC study). Moreover, 4 of the interviewees recalled having a test for breast cancer. R3 (NH woman) attributed cancer screenings to advanced age and awareness supplied by her health provider. “I’m at that age where I have regular checkups with mammograms and colonoscopy. I think you’re more aware when your doctor does schedule it, and it’s just a preventive”. Recalled cancer screening tests included screenings of the colon, breasts, lungs, brain, liver, skin, and stomach. Those who could recall any type of cancer screening felt strongly about cancer screenings and the need to engage in preventive care. R1 expressed, “I go mammogram every year. It’s good to be educated, it’s good to have once-a-year checkup”. Of those 6 interviewees who could recall a cancer screening test, 4 were NH, 1 was Chuukese and 1 was Marshallese. However, 12 interviewees could not recall engaging in any cancer screening practices in the past.

There were major themes uncovered in relation to a lack of engagement with cancer screenings or a lack of doctor-recommended routine screenings. Of those interviewed, three individuals could only recall engaging in a cancer screening test once or twice. R15 (Chuukese woman) had one test for skin cancer and never followed-up. R5 (NH woman) and R11 (Marshallese woman) indicated that they have had a mammography either once or twice in the past. Both of these women described the test as painful and uncomfortable, so they never went back for routine tests because of this past experience. R5 explained the screening for breast cancer as negative, “I did mammograms twice, and after that I said never again. Because the machine is just terrible, mean”. R16 could not recall her doctor ever recommending any cancer screening tests in the past.

Additionally, nine of the interviewees revealed that they have not had a test for cancer in the past. Besides not knowing any specific tests for cancer screenings, themes uncovered included conflicting messages about screenings, they forgot to go in for the screening, life got in the way/busy, pain or discomfort, no rapport with their doctor who recommended a screening, and a desire for screening education. R16 (Chuukese woman) recalled her doctor making a recommendation about a cancer screening and ceasing substances without any context or respectful rapport. "I remember I have my appointment at KKV and there is this paper. They ask me about chewing the betel nut and if I'm smoking, and I put I'm chewing betel nut. So, the doctor saw my paper and he's asking me to quit chewing betel nut because it causes cancer". She did not engage in the recommended screening nor did she see a need to quit betel nut. She felt no connection to her doctor and felt no desire to stop a culturally-important practice because there was no context besides a response to a questionnaire she completed about her health behaviors. This highlights the need for trust and rapport to be established in order to encourage behavioral changes or recommend health practices because betel nut chewing is tied to important cultural practices and behaviors for many NHPI communities (Dalisay et al., 2022; Kawabata, 2023). Nonadherence to medical recommendations can be tied to a lack of cultural competency/compassion within healthcare. R5 expressed discomfort with the idea of tests for cancer, "I guess I'm not comfortable", because of stories of painful testing. R13 indicated that she does not get screenings but would like to get screened. However, she did not know where to go for that information or how to ask for cancer recommendations. Lastly, some of the interviewees did describe encouraging others to get screened without a history of screening. R2 stated, "Making sure, polyps and all that stuff, inside is all good. I think that's very important—very important. I would tell them the same thing too; I would share that news with them. It's the

right thing for you to do, whether it's he or she, and just tell it like it is". Even without an engagement in cancer screenings, individuals see the benefit of routine cancer screenings.

Barriers to Cancer Screenings

Interviewees were first asked about their views of cancer screenings. Most of the interviewees viewed cancer screenings as beneficial even though the majority of them did not engage in screenings. Cancer screenings seem to be held in favorable light with NHPIs; however, many barriers are in place that influence non-engagement in cancer screenings. Some of the participants disclosed that they would encourage their family and friends, as well as their children to get screened for cancer. However, many did not hold screenings for cancer as something that was important in their life because of other obligations, financial constraints, or a fear of finding out they might be sick. The social factors that influenced the regression analysis of this dissertation (health comprehension, acculturation, and perceived racism/mistrust which were found to be influential within sociological and public health literature) were also topics within the interview guide (see **Appendix A**). This approach supplied a framework to triangulate these findings. Many barriers to care and cancer screenings were uncovered from the interviews through social factors that serve as hindrances to proactive healthcare.

Health Comprehension

Interviewees were asked questions around the leading reasons why their family and community members may not be taking part in cancer screenings. For health comprehension, participants disclosed that misunderstandings within healthcare interactions and the need for more education were the driving hindrances to engaging in cancer screenings for NHPIs. Some form of misunderstanding with their doctor was brought up by 50% of those interviewed. Misunderstandings ranged from language barriers, over and under explaining medical terms and

conditions, and the lack of time spent with their doctor. Many participants discussed doctors or healthcare workers and how they often explain things to them or their family either not fully or overburden them with information. R9 stated, “Ever since I started working with the patients at the Queen’s, a lot of them, they don’t really explain that. The second imaging is gonna cost this much or whatever. So, there’s not that much explanation”. Many feel that providers disclose too much information or not enough information and they leave their visit or interaction without really knowing what was explained to them. Participants did state that their NHPI identity can also increase misunderstandings as they are taught to agree with those in higher positions than themselves, such as doctors, and find it rude to ask questions or disagree. Doctors discuss health conditions, recommendations, and instructions for medications and many NHPIs walk away from these interactions without a full comprehension. R1 discussed a cancer scare in which her doctor said the word cancer and how she may have it and never provided any further context before scheduling a later test. “The doctors, they don’t explain to you what’s happening. They say you have this spot in your lungs. They say Lung cancer and they left me hanging. So—what’s these tests for? Why you putting me through all these things? They don’t say nothing. I have to ask”. She had to advocate for herself and her doctor had no sense of empathy or provided her any resources for this difficult time before she could get further tests for cancer. Misunderstandings as a major theme were uncovered even when not mentioned by the interviewee. Many of the interviewees have experienced health scares within their family. R11 provided memories from when she lost her mother to a disease that she could not name. She told the story of the hospital advising her to take her mother home without giving a diagnosis or advising her and her family about what is best for her mother while she was sick.

“ But the emergency, they never really gave the reason she was dying, they told me to, take to the Tripler, they told me I need some doctor, some expert to explain to me my mom her health. They told me, can you release your mom, they told me. Can you release your mom, I said what happened, does she have like, she was okay but when she got like operated, the stomach was , she got like, after the maybe two days she kind of lost her memory. Yeah, she just, I don’t know”.

R11 is a Marshallese woman and relied upon her family to help her make decisions about her mother’s health. However, language barriers caused a huge burden and barrier to care for her and her family. This was an obstacle within many stories from those who were interviewed.

Expectedly, language proved to be a major impediment to comprehending doctor instructions, recommendations, and understanding how to navigate health insurance. The majority of interviewees brought up language barriers throughout their interviews. Language barriers seem to be a recurring barrier to access to care, cancer screenings, and engaging with health insurance. When discussing why Marshallese community members may not be going in for cancer screenings, R10 disclosed that they need the information in their language to know the importance of screening. “Probably because they're not in their language, it probably wouldn’t speak to them, so they didn’t know what was going to happen and why they should take the screenings, needed in their own language so that they're more aware about it”. Language barriers hindered filling out insurance and healthcare forms, and many felt they could not ask clarifying questions without an interpreter. Some interviewees discussed that they bring along interpreters (mainly family members) to help them during healthcare interactions. Interpreters were viewed as crucial to help increase NHPI cancer screenings. However, not everyone felt that PI know they can ask for an interpreter. R13 believed that many people do not know they can ask for and

are entitled to an interpreter when seeing their doctor. “It's like some doesn't really understand English and they probably have no idea that they can”, when talking about why PI may not go in for screenings or ask for language assistance. It is clear from the interview findings that language provides a major barrier to engaging with healthcare and cancer screenings. Many interviewees brought up cancer awareness needs.

A large number of the interviewees discussed the need for education around cancer and the importance of screenings. A majority of the participants did not know where to go to get information regarding cancer and cancer screenings. Sources such as the UHCC, their PCP, health fairs, KKV, pamphlets from community organizations, and the internet were discussed as sources. When discussing cancer knowledge sources, R10 discussed the role of the UHCC. “I think when the people like you and other people that come into the community or whatever, so I think you get a lot of people, a lot of people come to see you because it is helpful to them, you know”. Others agreed that a continued presence of the UHCC as a source for cancer information was vital to NHPIs within public housing because they are devoid of cancer-based resources. Interviewees seemed to agree that their family and ethnic communities do not know where to get cancer information. Notably, there was a common pattern of ‘up to the individual’ that was brought up when it came to getting resources, information, and getting screened. According to R2, “I know that everybody would have access to that, I mean—on the internet, you can find anything nowadays. But I think it’s up to the individual themselves, he or she, you know—to get more educated on these issues and stuff. It’s not a game”. This was a common response to how other people should obtain cancer information, knowledge, and informational sources. Most agreed that an individual must want this information and know how to seek it out, a self-responsibility to value your own care and seek resources. Overarching themes emerged regarding

misunderstandings within healthcare interactions, language barriers, and the need for more education as the driving hindrances to obtaining cancer screening knowledge and constructed themes to barriers of comprehension for NHPIs. Participants were asked about the role of their ethnic culture and Western influences to their health practices and behaviors.

Acculturation and Cultural Influences

The role of culture and mindsets regarding generational differences influenced decision making within healthcare and engaging in cancer screenings for NHPIs. Most NH interviewees felt that Hawai‘i provided a melting pot of ethnic and cultural influences that lead to better understandings between different populations. A sense of ‘one culture, one people’ was brought up by NH interviewees when discussing influences brought by PI communities within Hawai‘i’s public housing. R3 discussed Hawai‘i as a melting pot of cultural influences within public housing. “If I have a Portuguese neighbor and that’s all they’re cooking is Portuguese bread, of course I’m gonna give them some of my poi because I have a taro patch in my backyard. You know, it’s just that melting pot of the neighbor bringing home a fish and you give them some taro”. R3 and others demonstrated that public housing provides a space for multiple ethnic and cultural influences and social processes. These social processes and influences are interpreted by other populations through meaning-making of these behaviors/interactions (Mohr et al., 2020). So different groups make meaning out of the behaviors they see other populations engage in and associate that with their identity for that population. This view of a diverse ethnic and cultural community within public housing was seen as leading to better understandings of other populations. However, this was in stark contrast to outer-group views of PI public housing members as engaging in deviant behaviors and not caring about or prioritizing their own health. This was especially true when NH discussed PI youth and adults who utilize MQD and public

benefits. A sense of 'othering' or competing for resources emerged between NH and PI living within the same communities, which was quite perplexing. R9 stated when discussing PI youth and parents, "I do not know if this is about the culture but 10 or 11 o'clock at night you have little kids out there running around and acting crazy running around, the parents just let them and stuff like that. So, I think maybe because the parents are sick or the parents don't care or something about their kids". Mixed themes emerged concerning the multi-ethnic makeup of public housing and the role of these influences on health decision-making and the interpretation of the behaviors of others.

A majority of the interviewees discussed the role of their ethnic culture and the need to return to traditional practices and processes that construct NHPIs social realities. Themes emerged regarding the need to return to ethnic/cultural values and mindsets for both NH and PI community members. These were seen as instrumental to improve the health of these communities and the need to connect back to ancestorial practices that are lost due to Western influence. Many participants discussed that this is especially true in the younger generations. NH felt more confidence that their youth are returning to NH cultural practices and staples such as food, Hula, and ʻŌlelo Hawaiʻi. According to R3 in regards to cultural practices influencing health engagement, "Our Naʻ Opio today, our children of Hawaiʻi, they're gaining that knowledge, to actually bring it back to their homes". He and others felt that a return to traditional practices benefit NH community health as traditional medicine/practices can work with Western medicine to improve the health of the people of Hawaiʻi. Many felt this was a product of younger generations and their desire to connect to NH ancestry. However, most interviewees often stated that efforts should be placed on the youth. They felt stuck in their ways and do not engage in preventive healthcare because they feel like they do not want to know about any adverse possible

health outcomes. As was expected, many interviewees feel like they do not need to prioritize themselves and efforts should be placed on others. Similar themes were found with PI interviewees.

PI interviewees also discussed the role of their ethnic and Western cultures as they influence their engagement with healthcare. PI interviewees often spoke positively of Western healthcare and their interactions, even when limited. Cultural influences on behaviors and engagement with healthcare were noticeably discussed more by NH than PI participants. PI interviewees communicated that they do not engage with many PI community members in housing, and interact more with just their family. So cultural influences were not discussed within the interviews as much as with NH interviewees. This might be a product of living within public housing as they have limited social interactions with other community members. PI often revealed that language barriers and prioritizing other familial relationships and obligations hindered engagement with cancer screenings. Acculturation was not a major driver of hindrances to healthcare. However, aspects of PI collectivist social realities seemed to cause conflict with Western views of prioritizing the self, preventive care, and healthcare appointments. According to R9 (Marshallese woman), “I would say that it’s also challenging because a lot of people don’t know about the lifestyles here. Oh, the time management and all that kind of stuff. I think, with the cultures, it’s also affecting how they live their lives here”. PI migrants do not have a mindset of prioritizing themselves and their health needs. However, prioritizing family and social obligations are also a facilitator for positive experiences such as social interactions and mental health wellbeing. So, these traits serve as both facilitators and hindrances to healthcare engagement.

Themes emerged regarding prioritizing their family and their social obligations, which often caused missed appointments or putting off healthcare. Social obligations and networks emerged as crucial to PI communities such as funerals, birth events, major birthdays, and church. These often came at the expense of taking care of the self and putting off their health for many PI interviewees. Furthermore, generational differences seem to be a theme for PI as well as NH communities. R9 discussed the generational mindsets in the younger PI generations. She disclosed that they have adopted a Western mindset to take care of themselves and know that they should prioritize their health. According to her, the UHCC should focus efforts on the younger generations to make sure they know about the benefits of preventive care. "Our younger generations today kind of get the idea but not as really understanding of what, like you're saying the Westernized mindset to, wait, I gotta prioritize my life because without a doctor, you know, I might be really sick". Themes were raised regarding cultural barriers related to language misunderstandings because of a need for an interpreter, placing others before themselves, and internal norms of not speaking up or challenging authority. When discussing engagement with healthcare and doctors, R9 stated, "They'd rather have someone to take them because they wouldn't know how to handle themselves like going to the hospital, or it would affect somehow with their language barrier like they cannot understand what that person's saying and then they don't want to go or don't want to speak, or they're shy or they're very scared to go alone". This was also discussed by other PI interviewees; many feel afraid to ask questions or afraid of potential language misunderstandings when engaging in healthcare. This may cause some to not speak up during their interaction with their provider, or simply not go in for the appointment. Interestingly, a need to not 'rock the boat' when engaging in healthcare may be tied to a fear of losing health benefits or being treated differently according to some of the interviewees.

It is clear that culture shapes lived experiences and realties for NHPIs and can influence cancer screenings and the overall engagement with healthcare. Interviewees provided insight into public housing's unique melting pot of cultures and how some may interpret the behaviors of others. Mixed themes emerged concerning the melting pot, as some interviewees see this as beneficial to public housing and getting to know more about other peoples lived experiences and cultures. However, this also provided avenues for biased views of PI community members.

> *"99% of the people here at this community is this—Micronesian, they run the whole community over here. And I think because of their situation with the U.S. so long ago, they got paid millions of dollars. But I still—I work here every day, and I see… there's some good ones. But there's some that don't do nothing at all. All they do Is eat, stay on welfare, they get all that food stamps and stuff, they get funds, and they get kids"* (R2)

NHPIs shared views of generational differences of beliefs and priorities. It seems as though the youth are adopting Western norms of prioritizing the self and this can be leveraged with preventive care according to interviewees. However, participants often do not feel the same responsibility to their own health, as older generations do not want to find out anything bad regarding their health. They feel set in their ways and do not see a need to change their mindset around preventive care practices like cancer screenings. Many were insured and had providers who reminded them about screenings, yet did not engage for various reasons. There remains a clear need of intervention regarding the need to prioritize self-care and preventive health through family-based methods. This can allow all members of the family throughout the life course to be engaged in healthcare discussions due to the fact that older generations do not seem to value resources wasted on them even though preventive health can prolong their lives and time with

their family. Interviewees were asked about the role of trust and racism within Western healthcare.

Perceived Racism/Mistrust in Healthcare

Surprisingly, the role of racism or perceived racism was not a common theme amongst the interviewees except for Chuukese interviewees. Participants were asked if they ever felt like they were treated differently within healthcare interactions or stories from others regarding being treated differently. Chuukese women, briefly discussed being treated differently but not in any major way. R15 had heard some Chuukese individuals have felt like they were treated differently or talked down to when they went to the hospital. However, she said she is grateful for her provider and they treat her well. “I heard because some of the Chuukese, yeah, that's what they think. They were like treating, when they go to like the hospital and they don’t care. They say they don’t because they’re Chuukese or Micronesian so they don't know anything so. Me, myself, I'm grateful for the one I always go to. They treat me well”. R16 stated that she once felt like her doctor was talking down to her because she smokes but that was more about the substance and not her identity. “I told them about my cigarettes, you know, and maybe I am overthinking because sometimes I explained to them and they just blah, blah, blah [laughs]”. Chuukese individuals may feel like they are treated differently than other NHPI populations based on these interviews. However, they still spoke positively of their healthcare providers but it is not clear from these interviews if that is based solely on the positive interactions or a fear of speaking negatively about their health insurance or fear of losing this benefit. PI women discussed hearing some stories of being treated differently by family and community members but did not describe it as being a major concern. A couple of interviewees did state that this is

possibly a reason why they do not engage in cancer screenings. The area of perceived racism demonstrates a social factor that seems to vary based on ethnic identity within these populations.

Other factors emerged as influencing healthcare engagement due to being treated differently. R1 discussed how she thinks she was treated differently because of her age, over 70 years old. She felt it was more about age rather than being NH. This view was shared by a few other interviewees when discussing their interactions with healthcare providers. Other age differences involved an acceptance of their fate and not wanting to find out any major health concerns, as discussed previously. Additionally, some felt like they were treated differently because they had MQD or were given less medical attention than others because of being on 'welfare'. This difference was more about SES rather than ethnic or racial identity. R7 brought up the difference in treatment for those who pay for insurance and those who have MQD. "You know, it's true, if you are on welfare, you get less treatment. If you are paying for your health, better treated. I told that to my doctor and I was so mad. If you have you have welfare, they don't really check on you that good but if you have paid insurance, it's like damn, they are going to treat you better and better service". R10 also brought this point up when speaking to the differences in care for those with MQD and other forms of health insurance. "I think so, I think so. Because I, take for instance the doctor that does, that surveyed me on the cancer, I didn't have a certain medical that I had before and they didn't have it, so the doctor was not going to see me anymore". From these themes, it appears Hawai'i's diverse population may be a protective factor against racial/ethnic differential treatment but this claim would require more inquiry. Interviewees discussed being treated differently based on welfare or being on MQD, as well as age differential treatment versus ethnicity. This was true for all except for Chuukese women, so perceived racism may be a factor for this population.

The remaining interviewees had not personally experienced perceived racism or had not heard others speak about being treated differently. Themes emerged of being treated the same as other underrepresented groups, mutual respect between them and their providers, and Hawai‘i’s melting pot of diversity creating a mixture of cultures which is a protective factor. According to R3, “I think every individual that came into a doctor’s office, they were treated the same as every person that walked into that office…we’re in a melting pot here”. “We have Hawaiian, Filipino, Chinese, Japanese, you know Portuguese, and the African-American, Indian. So, you have all these—Koreans, all these ethnicities, thank you Jesus that we have those. But it’s because it’s all these cultures”. R10 supplied similar insight when discussing how he thinks we are all treated evenly when interacting with healthcare providers and they do not treat different people differently based on ethnicity. “I think that they don’t focus as much in Hawai‘i, especially”. Interviewees felt respected by their provider and that mutual respect was shared. This was also seen within healthcare interactions and trust.

Interviewees discussed both a negative view and a positive view of their providers and feeling respected. The majority of interviewees do trust their provider and Western healthcare. Mistrust was mainly brought up by NH interviewees. Mistrust was a result of personal experiences, the experiences of family or friends, misunderstandings, or a death of a loved one, which have been seen as barriers from within previous literature (Bajos et al., 2022; Schnittker, 2004; Smith et al., 2022). R4 discussed their personal mistrust of some aspects of Western medicine. “I question some of it. Because some medicines, you have to read the fine print right, the side effects. And some of them, the same shit you are taking to make you better, makes you worse, even death. You know, so I do question a lot of pills, and do I feel safe a lot? Some of them, no”. R1 provided insight into mistrust based on a missed diagnosis. “I don’t trust them. I

don’t believe in them. They don’t do their job. I came in with my cellulitis. If my doctor did her job, I wouldn’t be like this today”. Similar stories were shared by participants, as negative interactions, missed diagnoses, or feeling like their opinion did not matter influenced mistrust and a negative view of Western healthcare.

There were also mentions of word-of-mouth discussions that led to their mistrust within healthcare for interviewees. R15 stated, “You know, when I heard somebody dying when they go to hospital, uh, it’s kind of worry me. That's why I don't go to other hospital”. Similarly, R7 brought up a recent conversation she had with friends in which she discussed a negative interaction she had with her provider. “Mostly stories, like me and my friends had past experiences and we were talking about it last week. I told them what is happening to me, they said oh that is f**ked up, and I said yeah, I thought I was going to die after that, you know what I mean. But mostly past experiences and hearsay”. Stories from others were a common pattern when discussing mistrust in healthcare, indicating that social networks play an important role for NHPIs. R8 told a story of her mother’s passing as a reason behind her mistrust in healthcare. “Just like my mom. The doctor never tell her to do the chest X-ray earlier, to get that. And then by the time we went to the emergency, that's when they knew she got pneumonia. And that's a last minute or last part already because then we went to ICU until she passed away”. As expected, lived experiences matter when it comes to interactions with healthcare, experiences of others can also shape views of healthcare and influence engagement with preventive practices like cancer screenings.

Many participants felt that they trusted their provider and felt respected when interacting with Western healthcare. Interviewees discussed positive interactions with healthcare, liking their health insurance or provider, and were happy with the care they received. These all

contributed to a constructed theme of trust in healthcare. When supplying reasons why R2 trusts his provider and Western healthcare, he felt they cared about him and offered many resources. “They give me a food allowance. They give me a booklet where I can order good food, good medicine, vitamins, everything. So yes, I have all that good stuff”. One interviewee (ID number not used to ensure confidentiality) also felt they could trust their provider and healthcare center. “They have everything there you know and they’re on it, you feel confident going to the doctor there, they are on it, competent”. This was important to them, as they have faced discrimination in the past as an Intersex NHPI with health problems. “And my doctor is really on it, and the harm reduction center. Everything that comes up, he asks to check up on it”. Additionally, “I have history with them, Dr. X especially because he has been my doctor for so long. I can say Doc and we can understand because of the relationship. Yeah, he is really cool”. Many other stories regarding positive interactions with providers and their insurance seemed to influence trust in Western medicine for the interviewees. According to R8, “Oh, yes because they help us a lot with my needs. Like, if I'm going to the doctor, my medicine, they help me to pay all everything for my doctor. I no pay yet from my own money. And so, they covered everything and also the benefits, it helps out”. A positive view of health insurance was shared by many and helped to solidify a trust in healthcare, which is instrumental to facilitate engagement with healthcare for underrepresented populations (Bajos et al., 2022; Somera et al., 2016). However, it remains clear that the majority of those interviewed do not engage in healthcare even when they feel respected or a hold a positive view of Western healthcare. All of the interviewees brought up fear in some capacity when talking about their or engaging in healthcare and preventive screening services.

Fear as a Driving Factor

Strikingly, fear was a major theme emerging from all of the interviews. Participants brought up 'fear' in many aspects within the interviews such as reasons why their family or community do not take care of their health, as well as why they do not take part in cancer screenings. Fear as a hindrance to healthcare engagement is a major theme from the interviews and serves as a major barrier to engagement in proactive health. NHPI community members provided an emotion response when discussing cancer and fear was the emotion that emerged most frequently. R16 demonstrated that she has witnessed cancer within a family member and that shaped her reality of the word. "You know, I feel scared because I have a lot in my country [Chuuk], they have that kind of sickness. And some I saw in my eyes what cancer is". R10 also provide insight into the emotions that coincide with the word cancer. "Cancer is a very sensitive thing that as soon as you hear that, you get worried, you get scared. You get a lot of emotions that come with cancer". R4 brought up their cancer diagnosis and how the first mention of the word cancer scared them and they put off going back in for follow-up tests. "Definitely scared of the truth because when I was told that I, when they scoped me to take out the polyps from me, that's how I found out. And then they told me I have to go back because they see a spot on my kidneys and they think it could be cancer. And I didn't go back". Every interviewee knew of someone who had cancer either directly or indirectly, and these interactions created a reality of fear of the word. This fear provides a major barrier to taking part in cancer screenings for NHPI populations.

Emotional responses concerning fear involved a fear of finding out that you might be sick or have a disease from a screening or test. Fear also included a fear of others looking down on you and a fear of unintended/hidden costs and pain that may come along with screening and

tests. R5 felt that NH adults do not engage in preventive health services because they have a fear of looking weak or if they find out something is wrong, other people might treat them differently. “The way other people look at them, I guess there's a fear. Looked down on or differently. That's an important thing I'm gathering more and more that not all people talk about it, some people fear talking about it because they look down upon or look differently”. People may not go in for cancer screenings before they feel any sicknesses or pains because of a fear of looking weak or sick. Interviewees also brought up a fear of finding out you might be sick, so many would rather not know and continue living their life. This was brought up by a majority of the interviewees as to why NHPI to do engage with their health insurance, see the doctor before they are sick, or get cancer screenings. R9 brought up a story of one PI family who did not want to get screened for cancer because they would rather not know if they are sick. “What I heard from her is kind of saying I don’t want to know. I don’t wanna know if I’m sick or not. I’d rather just live my life and not get screened and not know what’s going on”. R4 summed up a majority of the fears that NHPIs may face that cause them not to prioritize their health or take part in preventive health behaviors. “They are scared what is their result is. Or the other one is they would like to know what is their result, is there something wrong or not. What's happening with their results? What is the outcome of their results? Or the other reason is um, if they don't have insurance, I know they have to pay their own packet to pay for it”.

Mechanisms of fear emerged from the interviews ranging from a fear of finding out that you might be sick or have a major disease like cancer, fear you will be viewed as ‘weak’, a fear of the associated costs, and fear of the pain from testing. R9 provided a story of her family being charged extra for a mammogram and this hurt them financially. This also put a fear of unintended costs that might be associated with cancer screenings into her head, as well as the

pain that can result from the screening. “Couple of them said, I went to the doctor and the mammogram, one of the mammogram machines was really, they had a lot of compression and I had a bruise. Others say, the first time I went, I know it wasn’t supposed to be charged, but somehow, I was charged up to one hundred some dollars. And that is why—that’s another reason why, unexpected expenditures”. R10 felt that NHPIs need to normalize talking about health and taking part in proactive health behaviors. “ I think very important that people talk about their problems and medical so people are aware of what’s going on because a lot of people just don’t want to talk about it because they don’t want people to feel sorry for them”. Many felt that fear can be corrected by education and normalizing the discussion of health within the family and prioritizing the self for NHPI populations. Fear as a barrier to healthcare utilization and cancer screenings can be seen within many underserved and vulnerable populations (Austin et al., 2002; Ferreira et al., 2021; Masson, 2021). Along with fear, a response of ‘In God’s hands’ seemed to highlight a factor that lead to NHPI community members not taking part in seeing their providers or engaging in preventive health.

In God’s Hands

Interviewees discussed God being in control when discussing their own health, their life course, the health of their family, and cancer. Nearly all of the participants brought up God or faith in some capacity as it relates to control over their life or health. God or faith was also thanked for positive aspects of life like healing from a sickness, or God as the reason why they do not fear cancer or death. These beliefs were interpreted as it is “up to God’ , ‘in God’s hands’, or ‘I give it to God’. Interviewees gave thanks to God for recent or past health problems and feeling better/healing. R11 had blood pressure problems and issues walking. She feels much better now and gave the credit to God. “Thank God, all I know I just like read the Bible and

that's the way it really helping, I said God please help me to make my body better. I always pick up my Bible and say God please help me. Finally, I can walk but only the thing I just fighting for myself. But thank God I just, I'm okay now". R7 also thanked God more than her doctors for her recent bad health where she could not walk because of cellulitis and a bad fall. "That's the highest and best thing you will ever get [faith]. Yeah, I tell my doctors and everybody's family, they don't see how I walk because there was no way for me. I said only God covered it. So, I tell the doctors, I got this, I got this". Some gave credit to their doctors or Western healthcare and their own desire to get better. However, the majority of the interviewees gave God the credit for their health improvements.

A notable belief emerged that interviewees attribute to God or faith that they do not have any sicknesses (absence of disease) and this is why they do not engage in preventive practices like cancer screenings. R6 discussed how she does not have any pressing health concerns or major sicknesses. She acknowledged that she is overweight and needs to eat better and exercise more. However, she felt God was in control and that is why she is not sick and did not need to go in to see her doctor. "Thank God I don't have like any health issues like, you know, asthma or diabetes, I don't have any of those. So, that's a good thing for me". R9 provided insight into how she has witnessed many PI community members excuse engaging in preventive health because their path and health is within God's plan/hands. "They say that, I believe in God so I cannot go to the hospital, I'll just give God everything for him to heal me. All that kind of stuff with their health. Overall, I'd say there's a lot of misunderstanding or misinterpretation on how they believe, or what the Bible is really saying on what their culture should be". Themes emerged that God is in control of NHPI community members and their health. This important topic of discussion surfaced within the interviews as to why they are not engaging with their insurance,

preventive healthcare, and cancer screenings. According to R7, “The best medicine in the world, faith. Only God can take care of you, so believe in him”. This provides insight into the importance of faith and a higher power with NHPI community members. Religion or religious affiliation can be linked to healthcare and cancer screening as impediments in that underrepresented minority groups may attribute health and life circumstances to a higher power and delay seeking preventive care if they feel some other force has their health covered (Gutusa & Roets, 2023). Any cancer control programs or interventions must acknowledge the importance of faith within NHPI populations and work with faith-based leaders and institutions. Along with faith, a clear theme surfaced concerning a lack of conversations within NHPI families about health and family history regarding diseases and cancers.

Not Discussing Health within the Family

A striking pattern emerged in that interviewees could not name specific diseases and cancers within their families, indicating a lack of conversations concerning health within the family institution. Interviewees knew of people who had cancer, passed away from cancer, or passed away from NCDs within their family or friends but could not name the specific cancer or disease. A great deal of intervening efforts could be placed on health and preventive tests and screening if individuals know what diseases may run in their family. This is especially true with cancer and catching polyps early with screenings, which can be life-saving (Domingo et al., 2018; Stark et al., 2020). A clear absence of these conversations within NHPI populations and their families generated from the interviews. This is especially alarming because the interviewees all seemed to highlight the importance of the family structure. This was the primary focus of their life and where they place their priorities, as well as the social structure where informational exchanges to take place (McElfish, Purvis, et al., 2019). However, a theme surfaced concerning

the lack of information sharing within families regarding histories of diseases and adverse health conditions. All of the interviewees knew of someone either directly or indirectly who had cancer but could not often name the cancer. Interviewees were split when it came to naming cancers and screening guidelines were mainly unknown. There was often a lack of specifics regarding their family history of cancer even when a family member had cancer. R5 mentioned that many of her family members had been diagnosed with cancer. Yet the only cancer location or type she could name was that her daughter had cancer in her private area. She mentioned that no one in her family talks about these things.

> *" Nobody really talks about things. Well, I know cancer runs in the family. All I know is my grandparents, my grandmother passed from cancer. Um who else, well my daughter has cancer. And my dad had cancer but he didn't pass from that, he passed from something else. No, I'm not sure of the types, well only my daughter. My daughter is, um, what is it called, the private area".*

This type of informational gap emerged as common within NHPI communities. The topic of health and disease emerged as a sort of taboo topic within NHPI communities that is not talked about within family and community structures.

Many of the interviewees brought up the fact that NHPI community members are not talking enough about health and health histories within the family. This may be tied to fear, as discussed above, if people worry about being viewed as weak or too embarrassed to bring up health-related matters. R10 brought up that people within family structures may be too embarrassed to talk about health problems or do not want others to look down on them. Other interviewees made this connection as well, fear of being treated differently or seen as weak may be a driving factor for not discussing health problems. R12 brought up how she does not really

talk to anyone within housing and only associates with her family. However, she did not know much about her family's history of diseases or sicknesses. She stated that they, "do not talk about health or the importance of going to the doctor". R15 discussed that cancer did not run in her family but she did know friends that had cancer. But once again, she could not name the cancer or specifics about the disease or their cancer journey. "I only know that they have, that they died from cancer". This type of information within family or social networks can help spread the importance of cancer screenings and risk factors or early signs to monitor (McElfish et al., 2015; Saraiya et al., 2004). However, NHPI populations within public housing do not seem to be using their most valued institution, the family, to discuss these matters and spread life-saving information for future generations. The need to raise awareness of the importance of cancer within families was prevalent within the interviews. R2 talked about the need for cancer knowledge and where the UHCC can help intervene. He indicated that these efforts should come from medical providers and discussed within the family structure. "Family members should be talking about it, because if there's people dying in the family, people should be talking about it. Maybe it's a wake-up call for the people, for start changing their way of life and the way they eat and do things". Some of the interviewees did say they would start to talk about cancer more within their family and requested more education about cancer screenings. The lack of information sharing regarding familial health seems to be a constructed cultural norm for NHPI populations from the interviews. These constructed cultural behaviors hinder opportunities for information sharing that can improve the health of these communities. This lack of health-based informational sharing within social networks can be linked to a lack of strong social ties within public housing that surfaced from the interviews.

No Strong Community or Cultural Support System or Network

A majority of the interviewees brought up their family as the most important aspect of their life; however, very surprising, there seemed to be a clear disconnection from other social networks within public housing. Interviewees were asked about their social networks and how networks may influence their health behaviors like cancer screenings. Many of the participants brought up that they only socialize with their family and no one else or very few people within their housing community. This was perplexing, as many NHPI community members have strong ties to social and ethnic networks (McElfish, Yeary, et al., 2019; Mouttapa et al., 2016). Close circles emerged as the networks where informational sharing takes place. However, this was associated with the family or those living within the interviewees home. R14 brought up that her close circle was restricted to immediate family who live within her home. When asked about social networks or sources to talk about health, she stated, "I have my cousin over here and just stay with myself, with my son and my boyfriend". This type of response surfaced throughout the interviews, a small social circle of family in public housing seems to be common immediate networks for exchanges. R5 discussed sharing information about cancer screening and health. She brought up that she would share this information within her family but she does not talk with others in public housing. "I mean I'll talk about it with my family and other than that, people don't you, you know, I don't want to share news, anything with anybody". It is not clear if this is tied to a fear of being seen as sick or treated differently, or more about interviewees keeping to themselves. Small close circles emerged as networks to direct information-sharing and resources for the community going forward.

Some of the interviewees did feel supported from the community, but this was tied more to the housing location versus their ethnic community. Additionally, this was reserved for those

who embrace a more community leader role or provide social connections for resources sharing within public housing. R11 felt that she had health resources available to her as a Marshallese woman in the public housing community she lived in (Site 2) and had community organizations nearby. “The health for the Marshallese community? We just use the [Site 2]. And then we have community for like Marshallese and different languages there. If we need help with like, you know, health or school or something like whatever. And then we have like Consulate over here, even the We Are Oceania, like whatever you need, you lost your passport, your I94 or whatever”. Site 2 offered more health-based resources, education, and organizations to assist PI communities than Site 1. Two participants from Site 1 who felt they had some networks for health assistance and information sharing are involved in community outreach like Foodbank and Toys for Tots for their housing community. R1 has a neighbor who serves as her caregiver and she can rely on her for help and assistance with doctor’s appointments and grocery shopping. “I think today the community is more about togetherness. You see people separating—oh, Samoans and all that, we all together now”. However, she also brought up deviant behaviors within Micronesian youth and criticized PI community members for utilizing welfare. What became visible was there were conflicting messages about positive community networks in housing for assistance and information sharing, and outer-group experiences of fighting for resources. Site 1 did not offer residents as many health resources and services as Site 2. A feeling of social ties may be a result of a housing location that provides resources to bring residents together and provides more opportunities to create community. Interviewees discussed how they do not associate with many people in their housing, and stay within their small social circles. These circles were reserved for family and these circles demonstrate an area to focus efforts to spread cancer awareness. Many of the interviewees acknowledged this and felt that spreading cancer

information is needed in their families and communities. Family materialized as crucial to NHPIs lives and this often coincided with a need to prioritize family needs and ignore their own needs.

Family Priorities/Not Prioritizing the Self

Throughout the interviews, family priorities and obligations were prioritized over the interviewees' needs or health. A sense of prioritizing the needs of others and family was brought up throughout the interviews and a major mechanism for not engaging in self-care and preventive health. NHPI populations often feel a strong need to take care of their family and put their families' needs above their own needs. This social and cultural norm is often associated with ignoring their own needs and health concerns (Esquivel et al., 2023; Gelberg et al., 2000; McLaughlin & Braun, 1998). Prioritizing family needs over the self may then coincide with missed doctors' appointments, ignoring health concerns, and postponing preventive appointments like cancer screenings because other things are seen as more important (Lee et al., 2009). According to R9, "It's also our cultures. People tend to spend most of their time at home or with their kids and husbands instead of, you know, just thinking about the way that we should be living, rather than just thinking about work and making money to survive". She felt this desire to take care of her family and more pressing aspects of life, such as work and finances, trumped the need to think about her own health. She acknowledged this was a common theme in the PI communities but also felt like a shift needs to occur to take care of the self. "Not even going to the doctor. And some part of it I'd say, they have different priorities. They would say, oh I'll just stay with the kids and we'll see how we're gonna survive with food or whatever we need. But, then you know it is kind of affecting their mindsets to kind of prioritize, go to the doctor so I can get better". Family, work, and trying to survive financially materialized as more important than the self for interviewees.

Women worried about how their health problems could affect their family. They knew they were the family caregiver and often worked long hours and multiple jobs. Many of the interviewees were afraid to find out if they were sick and how it could hurt the family. R15 stated NHPIs may not go in for preventive health because, “They scare and they don’t want to like hurt their family or make their family worry”. Taking care of yourself was not a priority for many of the interviewees. Other aspects of life were seen as more important and vital to surviving in Hawai‘i. Family, work, school, household chores, and childcare were seen as more important than doctor visits for checkups or screenings. Participants acknowledged they need to take better care of themselves. However, life often gets in the way and they have to focus priorities elsewhere because of the high cost of living in Hawai‘i. R9 stated, “ I try the best to work things out for myself first, and it’s also challenging because I have to think about my work, my studies, when it comes to the kids. When I’m tired, I don’t have things for my own self, like exercising or even controlling all those things like diets and all that stuff”. There seems to be a cultural norm or taboo that community members do not feel their priorities should be focused on the self and their own health needs. Interviewees often spoke of the high cost of living in Hawai‘i and they were afraid of finding out if they were sick. Finding out about sickness could mean missed work and unintended costs associated with diseases like cancer. Other life priorities like the family, work, and finances constructed themes relating to barriers to healthcare utilization. NHPI community members feel a strong sense to prioritize their family over themselves (McElfish, Yeary, et al., 2019; McLaughlin & Braun, 1998; Mouttapa et al., 2016). Therefore, factors like work, money, and family obligations take precedent over the need for personal health. Prevention efforts must not ignore family obligations. They should promote the idea that NHPI populations need to take care of themselves to see their families grow and set good

examples, as well as take the family institution into consideration for any prevention measures or interventions.

Discussion

Hypothesis Testing with the Interview Findings

- ***Hypothesis 2****: To assess if any important and influential social factors are missed from the quantitative analysis by conducting in-depth interviews regarding facilitators and barriers to cancer screenings for NHPIs.*

As expected, the qualitative arm of this dissertation provided fruitful insight into influences of cancer screenings for NHPI populations. These social factors went beyond the variables of focus within the expanded Andersen Model (health comprehension, acculturation, perceived racism, and mistrust in healthcare) derived as influential from sociological and public health literature. Major themes that emerged from the interviews that stood out the most to me included the constructs around fear in relation to the aspects of cancer, not prioritizing the self, limited social interactions beyond the institution of the family, and not discussing health and family histories of disease within family circles. These interviews provided new insight, meanings, and important questions around social factors that influence the engagement in healthcare and preventive cancer screenings for NHPI community members.

Most of the interviewees were female (81%), 88% had health insurance, and half of the interviewees described their health as bad or not that good. All of those who were interviewed resided within two public housing communities. All but one of the PI interviewees were born outside of Hawai‘i and the U.S. Therefore, the majority of the PI interviewees were migrants to the U.S. and provide bicultural views between their ethnic/racial cultures and American constructed identities. Many of the participants moved to Hawai‘i because of their or a family

members' health concern. A majority had some established familial connections to Hawai‘i and this meant a place to live when moving to Hawai‘i. Most of the interviewees described the health of their ethnic community as unhealthy or bad. Those who did describe their own health or the health of their community as good did not provide much context beyond 'just okay'. Many NHPIs described their communities as having a 'bad lifestyle'. This was conceptualized as having bad diets, overweight, not enough exercise, lazy, and too much smoking and drinking alcohol. This was further expressed as 'up to the individual' to get better and take care of their health regardless of life influences, which is tied to individual-level factors as influenced by social and physical environments and their association with health (Brown et al., 2019; Gehlert et al., 2008). These comments were surprising as most of the interviewees who described their own health as bad acknowledged their behaviors but did not seem motivated to make healthy changes. Respondents did state they would like more resources and education about healthier lifestyles and preventive cancer screenings because they felt these and other health-based resources were lacking within public housing and medically underserved populations (Agbemenu, 2016; Aitaoto et al., 2012; Yeary et al., 2017). Intra-group and outer-group blaming and differences emerged. Unforeseen patterns surfaced with NH interviewees describing PI community members as an 'other PI-group' and this was met with a view of deviant youth behaviors, misconduct, and bad parenting. They also attributed bad lifestyles of PI populations to being lazy and taking advantage of welfare. A major theme arose of limited state-sponsored resources and fighting for these resources within NHPI populations in public housing that raised future questions of inquiry around why this view of fighting for resources exists within NHPIs? This sense of blaming bad lifestyles on the individual and it being an individual choice to live better was seen within groups. All of the PI interviewees ascribed bad health and habits to their ethnic community.

Inter-group and intra-group conflicts surfaced between Pacific Islander populations in public housing through viewing resources as limited and others taking advantage of the system. Barriers to the engagement in healthcare and cancer screenings were discussed throughout the interviews.

Interviewees discussed positive interactions or feedback regarding the healthcare they have received and their healthcare providers. Many of the interviewees were happy with health clinics, felt their doctors respect them/are nice to them, and they receive beneficial MQD resources. Most of the interviewees agreed that their family and community only engage with the healthcare system when they are sick or something happens. Not surprising, it is clear that NHPI community members are reactive to health concerns and are not engaging in proactive healthcare like cancer screenings (Moy et al., 2010; Rehuher et al., 2021). Themes uncovered regarding barriers to proactive healthcare ranged from why go in if you are not feeling sick, health not being a priority/not caring, no time to go see a doctor or appointments, and a sense of denial of sickness without symptoms. These themes did not vary by ethnicity. Only a portion of the interviewees could name a cancer screening test that they have taken part in and six could name the screening and cancer type. Cancer screening tests recalled included screenings of the colon, breasts, lungs, brain, liver, skin, and stomach; however, brain, liver, and stomach screening seemed to be tied to other illnesses beyond cancer. These interviewees strongly supported cancer screenings and felt other NHPI community members need to take part in preventive health. Barriers emerged from those who had not been screened or could not remember any specific cancer screenings or cancer types. These included conflicting messages about screenings, life got in the way/busy, pain or discomfort of screenings, no rapport with their doctor who recommended a screening, and a lack of screening education. It is not clear if NHPI communities are not paying attention to preventive healthcare screening recommendations, or if their

providers are not disclosing these important preventive services and appointments, as seen as system/institutional barriers (Fletcher et al., 2014; Rehuher et al., 2021). These barriers arose as mechanisms that influence the engagement with healthcare but not independent of one another, as they were often discussed as multiple factors in place impeding NHPI communities. Interviewees were asked about the social factors that influenced the regression model of this dissertation.

Health comprehension barriers surfaced through different forms of misunderstandings NHPI communities experience within healthcare. Participants disclosed that misunderstandings with healthcare providers and a need for more cancer screening resources were hindrances to preventive health (Szabo et al., 2021). Misunderstandings were brought up as NHPI interviewees felt healthcare providers do not explain important details about their health to these communities. Additionally, participants brought up experiences of too much information and medical jargon thrown their way. PI populations hold onto a cultural norm of being uncomfortable asking questions or not questioning those in higher positions like doctors. To do so could be seen as rude, so they often agree without fully understanding or nod their head in agreeance when understanding is not met. They may fear speaking up or being seen as less intelligent if they do not understand their doctor's instructions, recommendations, or suggestions for future appointments. These patterns appeared from the interviews around a construction of health comprehension because PI who do engage with healthcare services often leave appointments without a full understanding of the interaction because cultural and linguistic misunderstandings (Reppas-Rindlisbacher & Rawal, 2024; Singleton & Krause, 2010).

Interviewees also brought up language when it comes to healthcare comprehension. Language barriers exist for many PI community members. Some of the interviewees were not

aware they are entitled to an interpreter during their medical visit and often rely on family members. This can cause problems if family members are uncomfortable explaining sensitive topics or asking sensitive questions about pain or body parts. Therefore, hidden pains or suggestions for follow-up appointments may not be passed on during the patient/doctor interaction. Many NHPI community members walk away from these interactions without a full comprehension and are afraid to advocate for themselves. More focus needs to be given to ensuring PI have interpreters present during visits, medical offices provide translated materials (health literacy focus), and understanding is met during healthcare interactions. Interviewees asked for education and cancer-based resources to spread the importance of preventive cancer screenings. The role of culture and generational differences provided insight into influences of cancer screenings.

NH interviewees spoke of the melting pot of Hawai‘i and the diversity of public housing that provides opportunities for cross-cultural exchanges. However, at the same time, they brought up negative views of PI community members and their actions. Oftentimes, an outer group reaction to PI residents' reliance on MQD/federal benefits, parenting habits, lack of employment, and deviant youth behavior was expressed. There were conflicting messages regarding the role of culture and different NHPI groups within housing. Many participants did believe that they see generational differences in behaviors. The youth are adopting more of a Western mindset of prioritizing themselves and taking care of their heath. Most of the interviewees stated that efforts should be placed on the youth and improving their health for future generations. However, this was associated with their own bad health and a sense of being too old to change their ways and they would rather not know. These mindsets created barriers to engaging in cancer screenings. Furthermore, many participants knew they had bad health and

would rather any intervening efforts be placed on the youth since they do not want to know if they are sick. A majority of the interviewees discussed the role of their ethnic culture and the need to return to traditional practices and processes that construct NHPIs social realities. Many felt this could improve the health of the community. This could be accomplished by a return to their ancestral language, practices, behaviors, and constructed identity as a Pacific Islander. Acculturation was discussed in these factors as many felt some conflict in accepting and identifying with aspects of multiple identities. A majority of the interviewees do not engage with a lot of their ethnic community members. So, influences to healthcare were mainly based on life circumstances and the institution of the family. Perceptions of mistrust and racism were analyzed from the interview findings.

Racism or the perception of racism did not surface as a major theme within all of the interviewees except for with Chuukese participants. Chuukese women did bring up being treated differently but did not provide a great deal of context around the situations or any lasting behavior changes because of the mistreatment. These were manifested in stories from others who said they were treated differently. These individuals felt they were treated differently than others because of their PI identity. Some felt this might be a reason why Chuukese community members do not go in for preventive health but many were happy with their healthcare. Other interviewees brought up the role of ageism and having MQD/welfare as facilitators of mistreatment. These were not tied to any ethnic indemnity, but rather to being older and having a state-sponsored health insurance or federal resources. Some people felt they receive lesser care or are treated not as well as those with private insurance. The majority of the interviewees had not personally experienced perceived racism or had not heard others speak about being treated differently. Themes emerged of mutual respect from providers and being treated evenly. The

melting pot of diversity within Hawai‘i may be a protective factor against increased opportunities for mistreatment based on race and ethnicity. These positive interactions with healthcare provided avenues for trust with Western healthcare. Mistrust of Western health was mainly brought up by NH interviewees. Mistrust resulted from stories of negative interactions, missed diagnoses, and a feeling of being ignored by their provider. Mistrust may also be a result to historical trauma, mistreatment, and the colonization of NH communities. It remains clear that positive and negative interactions with healthcare are carried though social networks within NHPI populations. Furthermore, even when insured and happy with their healthcare, NHPI community members are not engaging in preventive health services. Major themes surfaced regarding barriers to care and cancer screenings for these populations from the interviews.

Interviewees discussed barriers to healthcare engagement and cancer screenings throughout the interviews. Many themes emerged as influential to healthcare and areas for future prevention efforts. Fear emerged as an instrumental barrier from all of the interviewees. Fear was expressed through a fear of finding out something is wrong, fear of unintended costs if you are sick, fear of being treated differently, and a fear of being seen as weak or a burden on the family. The word cancer was associated with fear. Every interviewee knew of someone who had cancer either directly or indirectly. These interactions created a reality of a fear of cancer. Interviewees had a clear emotional response to cancer and why they, their families, or their community members do not go in for cancer screenings. Fear is a driving influence to access to care and can be seen within other underserved populations as influencing access to care (Ferreira et al., 2021). Furthermore, the response of ‘up to God’, ‘in God’s hands’, or ‘I give it to God’ was brought up in nearly all of the interviews. These responses were a result of discussing a higher power being in control of their health, life, sicknesses, and healing. The majority of the interviewees gave

God or faith credit for any of their health improvements, as well as an explanation of why they do not get cancer screening. They feel like God will take care of them and do not see the need to be screened without the proper awareness of screening practices and benefits. The implied absence of disease or sickness is why they do not take part in any preventive health practices. Faith is instrumental to the lives of NHPI community members, as most attributed the path of their lives and health to God as found in other research with vulnerable populations indicating a potential impediment to preventive health (Gutusa & Roets, 2023).

Interviewees brought up a lack of engagement with proactive health services, and also a lack of discussions within family structures regarding health. A clear absence of conversations around health and family histories of diseases/cancers surfaced from the interviews. All of the interviewees knew of someone who had cancer, and cancer was common within many of their families. However, very few could name a specific cancer type their family member had or the disease that a family member passed away from. This type of family knowledge is critical to early detection and screenings. However, many NHPI communities are not engaging in these conversations. A fear of being seen as weak or treated differently might be a contributing factor to the lack of these conversations in the most valued NHPI institution, the family. Additionally, a majority of the interviewees brought up their close circle as the network for informational exchanges. These circles were often restricted to their immediate family members or those they lived with in housing. Themes emerged of no strong social ties to larger ethnic and cultural communities within public housing. Many of the interviewees stated they only talk to their family when it came to social networks for information sharing. Small family-based close circles emerged as networks to direct information-sharing and resources for the community for future efforts. A sense of community support was restricted mainly to Site 2 as it offers health-based

organizations, educational resources, and language assistance programs. Furthermore, all of the interviewees brought up the need to take care of their family and other social obligations before their own health. Self-care is not seen as a priority as many NHPIs feel a strong cultural responsibility to prioritize their family. Other factors are seen as more important than taking care of their own health such as work schedules, family obligations, and finances because of the high cost of living in Hawai‘i . A clear message surfaced that family-based interventions are needed to correct fears and raise the awareness of cancer prevention measures, normalizing conversations of diseases, and prioritizing self-care.

Limitations

As with the quantitative portion of this dissertation, these findings should be taken into consideration with important limitations. These findings represent themes emerging from 16 interviewees. Therefore, the sample size for this dissertation is small, and smaller than originally scheduled. NH voices were more represented than Marshallese and Chuukese public housing residents. However, any major distinctions by ethnicity were discussed in the findings. There is no agreed upon sample frame for qualitative research but once saturation has been met and a thick description of a social setting has emerged, interviews can cease (Rubin, 2021). For this work, I felt enough processes and new meanings were generated from the 16 interviews to end recruitment as the themes emerging reflected NHPI communities within public housing. One major noteworthy limitation within the qualitative arm of this dissertation involves gender representation. Only 2 out of the 16 interviewees were male. Therefore, these findings might reflect more of a maternal insight as many of the respondents were mothers and spoke about the importance of their family needs above their own. However, one intersex participant was recruited for the interviews and provided their insight with the major findings. Further studies

should aim for a more balanced gender representation to ensure themes uncovered reflect wider NHPI populations, which may be achieved through quota sampling. Quota sampling is a non-probability sampling technique where a population is divided into strata 'quota controls' as chosen by their relevancy to the study topic (Yang & Banamah, 2014). The number of controls are usually determined by census or population data to establish a predetermined size, and the interviewers select from the population the calculated number of participants in each stratum (Lopez & Whitehead, 2013; Yang & Banamah, 2014). This allows the researcher to determine the number of participants, as well as the characteristics or controls they need to possess to better represent the population they are trying to reach (Lopez & Whitehead, 2013).

Self-selection bias might be a factor from snowball sampling. Interviewees who were recruited from their friends might represent a group of individuals who value their health more than those who might have refused to take part in the interviews. This could be a contributing factor to a more positive appreciation for healthcare providers, trust in Western medicine, and a lack of perceived racism found from the interviews. Recruiting a larger number of participants may aid in a more representative sample from these communities and provide more conflicting views of healthcare and preventive health importance. Social desirability may also have affected interview responses. Often, interviewees may want to reflect a more positive and healthier lifestyle when being interviewed. Underserved communities may want to portray a more positive light for their community and this could influence more favorable responses to interview questions. A larger more diverse sample could help reduce the potential for this bias.

These findings may also reflect interview questions more than the themes emerging from the interviews. Surprising findings such as a lack of perceptions of racism and a large amount of trust in healthcare for these underserved communities might be a result of the interview guide.

Interviewees were only asked a few questions for each of the social factors of the quantitative arm of this work (health comprehension, acculturation, perceived racism/mistrust). Therefore, these findings may be a result of a minimal amount of questioning around these social factors or a misunderstanding of their meaning. Many of the Chuukese participants provided minimal narrative around these questions so it could be that they did not fully understand the questions. Many of the interviewees did ask clarifying questions or asked for the question to be repeated to help reduce the opportunities for misunderstandings. The use of semi-structured interviews allowed for a variance from the interview guide to address these concerns. Follow-up questions were asked to try and dig deeper into their responses and provide more context around their responses. Future studies should utilize more interview questions around these abstract social topics, or engage in separate studies to allow for a deeper understanding of these barriers to care. Additionally, future studies should offer interviews with PI communities in their preferred language through translators to ensure understanding is met. This study was unable to offer the interviews in Marshallese, Chuukese, or ʻŌlelo Hawaiʻi because of time and cost constraints. Future studies should try and match ethnicities and gender between interviewers and interviewees. This might create a space for more comfortable informational exchanges to take place. Additionally, this will allow for relationships to be created and for later member checking of the data that emerges from these studies to ensure they accurately represent the communities. These findings were analyzed by one researcher, so the reliability of the themes and findings may be limited to one person's interpretation of the data. Future analyses of these data should involve multiple researchers to ensure agreeance on the interpretation of the data and themes.

This chapter demonstrates pilot efforts for further inquiry into social factors that influence cancer screenings for NHPI community members within public housing. Health

comprehension and acculturation proved successful in providing insight into influences of healthcare utilization. Perceived racism and mistrust in healthcare varied by ethnicity and were not brought up in the majority of the interviews. However, these ethnic differences should be further explored as they highlight barriers to accessing care and preventive services for specific populations. Utilizing semi-structured interviews with 16 NHPI community members provided instrumental insight into influential social factors like fear, not prioritizing the self, family-based close circles, and a lack of conversations within social networks concerning health and family histories of disease. These important themes were not found within the quantitative analysis and were a product of the interviews. These and other influential social factors will be discussed in the proceeding chapter in how the mixed methods complimented one another while also highlighting influences uncovered from each analysis. The use of the interviews allowed for a free-forming exchange between the interviewer and interviewee to dive deeper into social and cultural contexts brought up during the interviews. This chapter highlight areas within the context of NHPI lives where intervention or prevention measures may be best suited while paying attention to the study limitations.

Chapter 7 Discussion

This dissertation strives to contribute to a methodological gap within the literature regarding NHPI populations health inequities and observed disparate rates of cancer incidence and mortality (Leon Guerrero et al., 2020; Registry, 2022). This study incorporates interdisciplinary approaches to social inquiry regarding medical sociological and public health-based theoretical foundations by exploring social factors influencing preventive healthcare utilization among NHPIs in the State of Hawai‘i. The research questions guiding this dissertation are grounded in the results of the disparate cancer screening rates found within our original HINTS Hawai‘i study, as well as continued NHPI health and cancer inequities despite advances in cancer screening options, technologies, and cancer care (Cassel et al., 2020; Pineda et al., 2023; Registry, 2022). The objective of this dissertation is to provide further insight into previously documented cancer inequalities that go beyond traditionally explored demographic characteristics and lower SES of these medically underserved groups. This work dives deeper into the facilitators and barriers of cancer screenings for NHPI community members within two public housing sites. A mixed methods approach into this social inquiry allows for these pilot findings to be triangulated with two different methodological approaches and the respective sociological and public health literature. A secondary data analysis utilizing a logistic regression of the original dataset was conducted while triangulating the model findings with 16 semi-structured interviews. The social factors from within existing literature driving this dissertation's regression categorization of variables and questions within the semi-structure interviews include health comprehension, acculturation, and perceived racism and mistrust in healthcare. These social factors are known contributing factors to healthcare inequities within medically

underserved populations (Agbemenu, 2016; Elias & Paradies, 2021; McElfish, Yeary, et al., 2019; Szabo et al., 2021).

Both of the analyses prove successful in rejecting the null hypotheses of no association between the social factors of interest and cancer screenings for NHPI populations. Both of the analyses uncover both facilitators and hindrances to cancer screenings for NHOPI communities that were supported by existing literature and also went against known influential barriers to healthcare (perceived racism) (Hall et al., 2015; Phelan & Link, 2015). By utilizing the Behavioral Model for Vulnerable Populations, this pilot study proves successful in categorizing variables for the regression model. The findings indicate where to focus efforts going forward. Respondents were asked about colon, breast, and cervical cancer screenings within the original survey and these cancer screenings served as the outcome variables for the secondary data analysis. Enabling factors within the model setup provide the greatest amount of insight into influences over cancer screenings for NHPI community members. The enabling domain includes modifiable personal/family characteristics and resources, as well as community resources that are often a result of constructed social characteristics of different institutions by an individual (Gelberg et al., 2000; Kosteniuk et al., 2022). Predisposing domains also supply a great deal if insight into non-modifiable cancer barriers for these communities. These factors like education, religiousness, ethnicity, and acculturation are often demographic characteristics and social structures into which an individual is born (Gelberg et al., 2000; Kosteniuk et al., 2022). The needs domain provides some insight into self-perceptions of health needs like general health, health priority, and quality of care. Few studies have focused the Gelberg model on NHPI communities specifically, with many previous studies comparing these aggregated groups to larger racial/ethnic groups (Eisenman et al., 2006; Heslin et al., 2003; Pacheco et al., 2022). The

interviews provide support for these quantitative findings, while also demonstrating other crucial influences to cancer screenings. Major themes that emerged from the interviews that stood out the most to me included the constructs around fear and cancer, the lack of prioritizing the self, limited social interactions beyond the institution of the family, and a norm of not discussing health and family histories of disease within family circles. These interviews provided influential insight into social factors that influence the engagement in preventive cancer screenings for NHPI community members that were missed in the regression analysis. The social factors of focus for both analyses are used to answer Research Questions 1-3:

- RQ1: What do NHPI community members believe are the most impactful social factors influencing adherence/non-adherence to cancer-screening recommendations and barriers blocking screening?
- RQ2: Do key informants believe the following social factors play a role in their respective communities as factors affecting cancer screenings:
    - *Health comprehension,*
    - *Perceived racism/mistrust in healthcare,*
    - *or Acculturation status*
- RQ3: Do the available social determinants (income, age group, occupation, health insurance status) within the dataset influence the cancer screening behaviors of NHPIs within public housing communities on Oahu (HINTS sample areas)?
    - *Do these social factors vary by cancer type (colorectal, cervical, and breast cancer)?*

Health Comprehension

For health comprehension, those who have a hard time understanding the healthcare provider's instructions because of language and cultural barriers affecting following provider instructions are less likely to have had cancer screenings. This was confirmed within the interviews as major themes emerged concerning forms of misunderstandings NHPI populations experience within healthcare. Misunderstandings hindering health comprehension from the interviews, also confirmed from existing literature, include not explaining important details of their health-based interactions, over and under-explaining information, medical jargon, and language barriers (Islam et al., 2017; Liss & Baker, 2014; Singleton & Krause, 2010). When controlling for age, income, health insurance, and occupation, 51% of participants are less likely within the regression analysis to self-report engaging in cervical cancer screenings ($p = .04$). Respondents who disagree that their healthcare provider understood their background and cultures are 60% less likely to have had a colon cancer test ($p = .003$). Interviewees brought up language as the major barrier to health-based comprehension and misunderstandings; moreover, language barriers and health literacy remain a barrier to care for medically underserved communities (Jacobs et al., 2004; Rasi, 2020; Singleton & Krause, 2010). This is a major concern because many also brought up that they do not want to seem discourteous or unintelligent by asking follow-up questions or for second opinions. Many PI populations hold onto a cultural norm of being uncomfortable asking questions or not questioning those in higher positions like doctors. Furthermore, many of the interviewees are not aware that they are entitled to have an interpreter within healthcare interactions, which is seen as a financially viable and ethical method for improving healthcare for patients with limited English proficiency (Ali & Watson, 2018; Jacobs et al., 2004).

Acculturation and Cultural Identity Conflict

Surprisingly, acculturation varies within the regression analysis, and the cultural views of others within housing and internally-shaped cultural identities of the interviewees. Within the regression, acculturation was indexed to consist of negative, neutral, and positive acculturation for both the respondents' ethnic culture and American identity. Acculturation was reverse coded, positive acculturation indicates greater American identification and negative acculturation implies greater Ethnic identity. A neutral acculturation is associated with a 48% less likelihood of having a pap test (p = .002), and a 40% less likelihood of having a colorectal cancer screening test (p = .02). Individuals who may not feel a strong tie to both their ethnic culture and American culture within public housing demonstrate a unique underserved population where to focus future efforts because they may be missing out on important networks for health-based information sharing (Huynh et al., 2009; Mouttapa et al., 2016; Weaver et al., 2017). Many of the interviewees speak of a lack of social ties to others within their ethnic communities within public housing. A strong social network of support and information sharing is vital to collectivist populations (Badowski et al., 2017; Mouttapa et al., 2016; Weaver et al., 2017).

NH interviewees speak of the melting pot of Hawai‘i and the diversity of public housing as it provides opportunities for cross-cultural exchanges. However, they also bring up negative views of PI community members and their behaviors. These include PI residents' reliance on MQD/federal benefits, negative parenting habits, lack of employment, and deviant youth behavior. Intergroup conflict and racism emerge within public housing as some NHPI groups feel positively about PI populations, while also holding implicit biased views of PI community members. These findings were surprising because NHPIs, as groups, are often associated with inter-PI norms of cooperation, group cohesion, ethnocentrism, and collective action between

identities as PI (Giles et al., 2019; McElfish, Yeary, et al., 2019). The emergence of outer-group conflict and racially-motivated views of Micronesians as deviant and reliant on government resources was surprising; however, this conflict has been seen in other studies through explanations of migration and colonization as a driver but not as prevalent with NHPI-based research (Reynolds & Thompson, 2017; Rita et al., 2020). NHPI populations within public housing seem to feel a sense of intergroup competition for resources, housing, and social goods through racial/ethnic tensions expressed by NH interviewees, as seen in research concerning majority and minority groups and intergroup biases (De La Cruz et al., 2024; Griffiths & Nesdale, 2006). Acculturation comes through within the interviews as many participants feel a conflict in accepting and identifying with multiple identities. They feel a connection to their family and their ethnic identity but do not engage with others within their community. Furthermore, many of the interviewees know they have bad health and unhealthy habits but do not accept Western influences of the importance of self-care through cancer screenings. Many want to focus on helping the future generations and youth as they feel they were too set in their ways and do not want to uncover any adverse health conditions like cancer from screenings. A return to NHPI ancestral languages, practices, behaviors, and constructed identities as a Pacific Islander could help improve health according to the interviewees (Dela Cruz et al., 2022; Galy et al., 2021). This can also aid in the missing social networks where cancer-based resources and awareness campaigns could be utilized as increased connections can bring larger social networks and better health outcomes (Burgette et al., 2021; Laranjo et al., 2015). Perceived racism and mistrust demonstrate mixed findings from both the regression and interview data.

Perceived Racism/Mistrust in Healthcare

Results from the regression sheds light on the way being treated unfairly can negatively influence engaging in preventive care. Respondents from the regression who disagree that they have personally experienced racism are more likely to be screened for the three cancer types. Respondents who indicate they strongly disagree that they have personally experienced racism are 1.76 times more likely to have had a breast cancer screening (p = .04) (see **Table 5**). These respondents indicated they have not experienced racism in their lives and thus were more likely to be screened for this cancer than those who strongly agreed they have experienced racism (see **Table 5**). Lived experiences of racism or being treated differently because of a racial/ethnic identity is often associated with differences in treatment adherence, trust in providers, and the overall engagement with healthcare (Ahmed et al., 2017; Elias & Paradies, 2021; Hall et al., 2015; Laster Pirtle, 2020). Mixed results from the other questions of perceived racism that did not support the existing literature of the influence of racism on healthcare may be a result of double negative or confusing survey questions for participants (Elias & Paradies, 2021; Paul et al., 2022; Williams & Sternthal, 2010). This may be tied to limited social networks where these stories of racism or healthcare inequalities might have spread. Within the interviews, mixed themes emerge as well. Only Chuukese women feel they were treated differently because of their ethnic identity. However, these were tied more to stories from others rather than their own experiences, and these stories did not seem to lead to any behavior changes. Mistreatment as a theme within the interviews, centers more on the role of ageism and having MQD/welfare as facilitators of mistreatment versus ethnic identity. Ageism and the type of insurance supplier (state/federal versus private) is linked to mistreatment and negative stigma within the healthcare field (Martinez-Hume et al., 2017; Mouton et al., 2019; Pillemer et al., 2015). The majority of

the interviewees have not personally experienced perceived racism or have not heard others within their circles speak about being treated differently.

Mistrust was brought up in the interviews as positive interactions with providers and mutual respect leading to trust in healthcare; however, mistrust was not influential in the regression analysis. Unexpectedly, there were no significant findings for the three cancer-type screenings within the models. Trust is seen as influential within NHPI and other medically underserved communities as associated with healthcare interaction and engagement (Hong et al., 2018; Schnittker, 2004; Somera et al., 2016). Most of the interviewees feel respect from their healthcare providers. PI participants discuss positive interactions with their providers and enjoying the health clinics they interact with normally. Mistrust of Western health was mainly brought up by NH interviewees. Mistrust seems to result from stories of negative interactions, missed diagnoses, and a feeling of being ignored by their provider for NH community members (Smith et al., 2022; Somera et al., 2016). Once again, social networks are avenues to facilitate or hinder trust within healthcare for NHPI communities (Laranjo et al., 2015); however, networks for these populations can either increase trust in healthcare or disrupt trust with negative stories.

Within the interviews, the perceived racism and mistrust in healthcare limited findings might be a result of the interview questions. Only a few questions around each social factor were asked and PI interviewees did not provide a great deal of context around their limited responses even when asked follow-up questions. Inada et al. (2019) interviewed Chuukese women and providers and found that rarely did the interviewees discuss discrimination. Rather, they reported being treated differently because they often do not attribute differential treatment to racism because of mistrust of agencies or fear of repercussions (Inada et al., 2019). Members of medically underserved communities may feel grateful for Western healthcare and insurance, and

not want to speak negativity out of fear (D'Anna et al., 2018; Inada et al., 2019). However, it is clear from both of the analyses, that trust in healthcare is important within these populations and social networks can influence trust based on stories from others (McElfish, Yeary, et al., 2019; Palafox et al., 2018). Both of the methodologies provide influential social factors beyond the expanded Andersen Model that served as a framework for the regression and questions within the interviews.

Other Influential Social Factors on Cancer Screenings

The use of mixed methods allows for these findings to be triangulated with the existing literature to determine if they hold up true or if any additional social factors were missed in either analysis. The regression found that high religiosity is associated with the increased likelihood of engaging in cancer screenings. Faith is a major theme within the interviews. However, this was not associated with increases in cancer screenings as a majority of the interviewees could not recall engaging in cancer screenings. What was clear was that faith and a higher power are influential to the lives of NHPI populations (Neville et al., 2023; Nunn et al., 2016). The response of 'up to God', 'in God's hands', or 'I give it to God' was brought up in nearly all of the interviews. Furthermore, interviewees feel as if God is in control of their lives, health, healing, and whether or not they get sick. This is associated with cancer screenings in that faith is seen as a larger driver of engagement in preventive care than a need to prioritize the self and health. Many of the interviewees indicate that they do not want to know if they are sick by going in for screenings because they believe God is in control of their health. A majority of the interviewees credit God as the reason they do not have any major sicknesses or diseases, as indicated by previous work where religion/spirituality is tied to health decision-making and support (Kaholokula et al., 2008; Sabado et al., 2010). Religion and faith are crucial to the lives

of NHPI populations and can be a facilitator of cancer screenings through efforts with faith-based institutions.

The quantitative analysis indicates that those who were never married and ended their education after high school are less likely to have engaged in cancer screenings. Interviewees were asked about marital status and education and the majority were married parents and finished high school. Education attainment was confirmed as an association with cancer screenings. Many of the interview participants completed school after high school and could not recall any cancer screening, as is the case in the regression. Additionally, other demographic drivers of inequities stand out from the regression. Those who do not have health insurance are significantly less likely to engage in all three cancer screenings, 65% less likely to have had a pap test ($p < .0001$). Respondents who indicate income over $35,000 are statistically more likely to have had a test for the three cancer types, 2.87 times more likely for a test for colon cancer ($p = .0002$). All of the interviewees earn less than $35,000 and all but 2 of them have health insurance. Not surprising, respondents from the survey who had lower income and no health insurance were less likely to be screened for cancer, which is often associated with less engagement with cancer screenings within the literature (Domingo et al., 2018; Gopalani et al., 2023; Henry et al., 2014; Islam et al., 2017). Interviewees mainly had health insurance yet the majority do not engage in cancer screenings. The 2020 COFA expansion of health insurance may have contributed to PI community members' insurance obtainment. However, many NHPI populations are not engaging in preventive care like cancer screenings even when insured.

Being unemployed and not speaking English well is associated with less engagement with cancer screenings from the regression analysis and supported by existing findings from previous work (Aitaoto et al., 2009; Domingo et al., 2018; Moy et al., 2010). For breast cancer,

respondents who indicate an unemployment occupational status are 46% less likely to have a mammogram (p = .004). Furthermore, respondents are 45% less likely to have had a screening for breast cancer when controlled for demographic variables (p = .04) when they do not feel well speaking English. Language is a major theme from the interviews. Many of the interviewees disclose that language barriers are present in their communities and areas where healthcare needs to improve (McElfish, Yeary, et al., 2019; Rehuher et al., 2021). A majority of the interview participants are employed and some work multiple jobs. In this case, being employed is associated with less engagement with cancer screenings, unlike the regression. Which may be due to a fear of missing work for healthcare appointments when insured (Daley et al., 2011; Masson, 2021). Factors such as fear of costs, family obligations, worrying about finances, and not prioritizing the self all emerged from the interviews as barriers to engaging with cancer screenings for the interviewees.

Health importance and prioritizing the self are areas that influence cancer screening engagement. From the regression, those who indicate that health was not a priority for them are significantly less likely to engage in the three cancer screenings, 64% less likely to have had a pap test (p < .0001). Many of the interviewees describe their health, their family's health, and the health of their ethnic community as bad or unhealthy. Participants ascribe unhealthy habits to their family and ethnic communities such as being overweight, eating unhealthy foods, physical inactivity, and smoking and drinking alcohol (Hafoka, 2017; Rehuher et al., 2021). However, many of the interviewees do not engage in preventive health even when they describe their health as bad and in need for change, which I expected. All of the interviewees highlight the need to take care of their family and other social obligations before their own health, as seen in the literature (McElfish, Purvis, et al., 2019; McElfish, Yeary, et al., 2019). What I found to be a

crucial finding, was that self-care is not seen as a priority as many NHPIs feel a strong cultural responsibility to prioritize their family and their needs above their own needs (James et al., 2017; McLaughlin & Braun, 1998). Generational differences also emerge as many of the interviewees discuss that they are too old and set in their ways to change their health habits. They would rather efforts be placed on younger generations, as they see the younger generations adapting to American norms of prioritizing their health and mental health.

Lastly, small social circles, lack of health-based conversations, and a sense of fear also hinder cancer screenings for NHPI community members in housing. These findings provide new mechanisms for future prevention efforts and areas for inquiry for myself because of their significant influence over preventive health. Major themes emerge from the interviews involving social networks and informational exchanges. Within the original HINTS dataset, network size was used for an RDS analysis (submitted Willingham et al., 2024 manuscript) and the location within public housing mattered more in regards to referral network than racial/ethnic networks. Interviewees conceptualize their social network as their family and those who they live with. A clear theme began to surface involving a lack of engaging with members of their ethnic communities, and social isolation can have adverse effects on underserved community members (Morgan et al., 2020; Ormiston et al., 2024). A majority of the interviewees state they only talk to their family and that is where they could spread information about cancer screenings. These small social circles hinder cancer awareness because they are mainly constrained to the family (Laranjo et al., 2015; Mouttapa et al., 2016). Furthermore, within these circles, interviewees disclose that they are not talking about their health or their family history of diseases. This type of information is vital to cancer and other disease screening and early detection (Bostean et al., 2013). There is a lack of strong social ties to larger ethnic and cultural communities within

public housing, which is missing from the literature. Fear also surfaces as a major theme from the interviews. Fear is expressed through a fear of finding out something is wrong, fear of unintended costs if you are sick, fear of being treated differently, and a fear of being seen as weak or a burden on the family. Even the word cancer coneys emotional responses of fear from the interviewees. Participants asked for more information about cancer and cancer-based resources to help with these fears. All of these influential social factors must be taken into consideration with the limitations discussed within Chapters 5 and 6. The findings from this dissertation provide avenues to direct future efforts and answer Research Question 4:

- RQ4: How will the social factors of interest (health comprehension, perceived racism/mistrust in healthcare, and acculturation), or any social factors found to influence cancer screenings within the semi-structured interviews and logistic regression analysis inform areas of focus for these communities for the UHCC to focus cancer control strategies?

Future Research and Recommendations

By triangulating the findings from this mixed method dissertation, future efforts and recommendations to increase cancer screening awareness for NHPI community members in public housing can be provided. This dissertation serves as a pilot exploratory study to better understand influences to cancer screenings for these populations. Next steps will involve taking these findings back to Site 1 and Site 2. Dissemination efforts are already in the works for Site 1 to provide a cancer awareness day, efforts in part with the housing office staff. During this event, findings from this dissertation will be provided to the community, which is often lacking from studies involving NHPI populations (Chung-Do et al., 2016; McElfish, Yeary, et al., 2019). I hope to be able to garner feedback during the event as to their thoughts concerning the major

themes and findings. I also plan to apply for funding to hold focus groups at both sites to go over these findings to confirm these influences with the community members. Efforts will be made to have Marshallese and Chuukese interpreters or focus group leaders, as well as match genders of the community members and facilitators because of the importance of ethnic and gender matching within PI communities (Blake-Beard et al., 2011). The target audience will include NHPI community members within public housing, while also reaching back out to the interviewees (member checking) for their inclusion, if possible. I have conducted two member checks with these preliminary data from Site 1. They both felt the findings are accurate and representative of their communities (NH and Marshallese) and would like to take part in the focus groups. It is my goal to use these pilot findings to direct family-based intervention and cancer awareness campaigns within public housing aimed at normalizing health conversations, addressing fear-based cancer concerns, and increasing cancer screening awareness. It is clear that many community members rely on their small social circles and this is where we need to direct efforts. Pokhrel et al. (2016) found that NH with larger network sizes were strongly associated with higher perceived social support and lower self-reported recent cigarette smoking. However, it is clear that social support and social networks are associated with influences over health and NHPI often rely on family members for their social support (Pokhrel et al., 2016). Families are a system of interdependencies of units and family-based interventions may provide the opportunity to leverage family processes for behavioral changes that are broader and not just individual or narrow-based (Kitzmann & Beech, 2006; Skelton et al., 2012). Therefore, efforts can be placed on providing cancer awareness to families that include all members of the unit or household in addition to individual-focused efforts. This can allow for more accountability and support for family members because they will all have access to resources to engage in health-based

conversations within their close circle (Kitzmann & Beech, 2006). Directions for these efforts can benefit from existing family-based sociological literature. Ho et al., (2022) performed a scoping review of family-based interventions and found interventions were mainly driven by ecological systems and social cognitive theory to drive the intervention. Individuals are within multiple levels of contexts and institutions like the family where their actions and behaviors are influenced (Ho et al., 2022; Lee et al., 2017; Palafox et al., 2018). Therefore interventions targeting the family must address areas of influence within multiple domains such as through socioecological theory (Akinyemiju et al., 2022; Lee et al., 2017). Many interventions were found to mainly address family support and parental influence on children (Ho et al., 2022). However, few studies assessed elderly family members as the recipients or actor within the intervention. This will be crucial with NHPI communities because household dynamics are unique and older members of the family hold influence over their families (Galy et al., 2021; Rehuher et al., 2021). These findings demonstrate clear paths forward for myself as well as suggestions for future UHCC-based efforts for NHPI populations.

From these findings, efforts going forward need to be placed on ensuring NHPIs have interpreters present during medical office visits and these medical offices provide translated materials, documents, and signage to the populations they serve (Ali & Watson, 2018; Dang et al., 2010). We should ensure that community members know they have this right and that healthcare offices will work with them to schedule an interpreter when needed. Community health educators and Clinical Trials Office staff should prioritize the use of interpreters and translated materials within the UHCC (Dang et al., 2010). There remains a need for more culturally-tailored trainings for healthcare providers such as cultural competency/awareness to help ensure understanding is met during healthcare interactions (Vaughan et al., 2018; Yeary et

al., 2017). Trust is essential to NHPI communities and engaging with healthcare is crucial as many interviewees disclose unhealthy lifestyles and a lack of engagement with preventive health services. Trainings with providers can work to establish trust and reduce misunderstandings with NHPI populations (Vaughan et al., 2018). I have conducted two cultural competency trainings with 2 Federally Qualified Health Centers as part of my UHCC work. During these trainings, we reviewed the need for culturally and linguistically appropriate services for Micronesian communities (Singleton & Krause, 2010). I also provided feedback from these communities regarding their healthcare and stories from community members. These trainings should continue, as well as be offered by members from NHPI communities through virtual platforms if available. These efforts are underway, as well as targeted cultural sensitivity training with UHCC staff and faculty. Trainings and other intervening efforts must uplift NHPI community voices and perspectives (Aflague et al., 2023; Chung-Do et al., 2016). Including anonymized stories and quotes from community members can be a first step in bringing their voices to cancer prevention efforts. Underserved communities often benefit from seeing members of their own community and hearing their stories to influence positive behavioral changes (Blake-Beard et al., 2011).

UHCC efforts must continue utilizing Community Advisory Boards and Outreach Advisory Councils that consist of NHPI community members. These boards provide guidance and insight from NHPI community members and ensure they have influence over the direction of the research and outreach efforts within their own communities. Additionally, motivational interviewing offers approaches to facilitate lifestyle changes for individuals within healthcare (McKenzie et al., 2015; Oh & Lee, 2016). Ensuring UHCC staff and community champions who will be facilitating our efforts are trained in motivational interviewing is essential. This will

allow those working with NHPI community members to have resources and training aimed at mastering the dos and don'ts of successful implementation in diverse contexts.

Individuals who may not feel a strong tie to both their ethnic culture and Western culture within public housing demonstrate a unique underserved population where to focus future efforts (Agbemenu, 2016). Findings from this dissertation demonstrate that many of the interviewees and respondents either felt a neutral link to both ethnic and American culture and were removed from community networks. Efforts going forward should continue addressing individual behavioral change prevention measures as these efforts can spread within social networks and social ties (Lee et al., 2017; McLeroy et al., 1988). Important findings from the regression indicate that individuals who are not married with only a high school education and earning less than $35k are significantly less likely to be screened for cancer (Fletcher et al., 2014; Henry et al., 2014; Link et al., 1998). Individual efforts must continue with these community members as they may not be tied to larger networks often associated with family institutions. However, it is evident from these findings that these groups within public housing represent a unique group of NHPI community members. They may be missing important exchanges of health-based information and resources by being socially disconnected from organizations and communities (Burgette et al., 2021; Mouttapa et al., 2016). Efforts should be placed on reaching these community members as they are less likely to be engaging in cancer screenings. Awareness campaigns can focus on these members of the community by working with public housing to promote cancer screening flyers and resources in public areas.

Additionally, campaign/intervention efforts can work to address fear-based concerns of engaging in cancer screenings by highlight practicing self-care because fear is associated with non-engagement with health services ranging from preventive care to cancer survivorship

(Deuning-Smit et al., 2023; Prins et al., 2022). These efforts can work to address the raised concerns that prioritizing the self will take away from family priorities and care. Campaigns can indicate messages that 'Early detection of cancer can save your life' and 'Taking care of your health helps to make sure you can live longer to see your family grow up'. Future intervening efforts can also bring up the importance of knowing family histories of disease and cancer. Campaigns can indicate that early detection based on a family history of a cancer type can save lives and increase the likelihood of survival (Bostean et al., 2013; Richardson et al., 2022). These efforts must be culturally-sensitive and acknowledge that conversations may be difficult as many topics of health and disease are taboo within PI communities. Interventions within the family can work to normalize the idea of health and preventive health at the same time acknowledging the importance of talking about health (Ho et al., 2022; Kitzmann & Beech, 2006). Being sick is not a sign of weakness and fear-based corrections are needed around this socially constructed view of a fear of being treated differently. Parents and family members often feel embarrassed, poorly informed, or unaware of how to begin awkward health-conversations (Ladapo et al., 2013). Efforts can work in tandem to promote confidence in initiating health-based conversations while promoting self-care and preventive health .

Intervening efforts must address and acknowledge the role of faith within NHPI populations (Neuendorf et al., 2021; Sabado et al., 2010). Those within the survey who indicate a strong religiosity are more likely to be screened for cancer. Faith and God were brought up by nearly all of the interviewees. However, many of the participants could not recall or have not taken part in cancer screenings. Future efforts should look more into the role of faith and faith-based institutions separately (Benjamins et al., 2011; Webb et al., 2013). Those who were more likely to be screened for cancer might be more involved in a church or social networks where

information about health and cancer is spread. Individuals within public housing who were not socially tied to many networks might hold a strong faith commitment and belief in God but may not be involved in a church or faith institutions. Future efforts should look into the role of the institution of faith and church and the construction of faith that individuals hold that may not be tied to a physical institution (Benjamins et al., 2011). These individuals may represent populations from the findings from this dissertation. Disconnected community members are in need of cancer awareness and intervention efforts, as they are separated from institutions and social networks to spread health information (Morgan et al., 2020; Palafox & Hixon, 2011). Future efforts will also include further analyses of the original HINTS dataset to determine if any ethnic differences exist. A more in depth analysis will allow for a better understanding of ethnic differences in the likelihoods of cancer screenings within the found influential social factors. This can include a factor analysis or structural equation modeling for a more in-depth understanding of these effects. This can also serve as further quantitative trainings for myself.

These efforts and recommendations for future work within the UHCC and by myself highlight the need for more in-depth inquiry into NHPI populations within public housing. These community members demonstrate individuals who might hold onto conflicting norms of behavior from both their ethnic and American influences. Internal conflicts regarding engaging in preventive health and taking care of themselves surfaced from the interviews. Many NHPI fear cancer and finding out if they are sick, or worry that their own health will take away from their family priorities. Additionally, insight into these community members might benefit from a case study focus. This will allow us to shift the unit of analysis to the housing site location as an extended examination of this study to address the small sample size concerns of this work (Rubin, 2021). Furthermore, this will allow us to highlight the case study as providing inquiry

into this particular location with these particular populations of focus because from the analyses, context and built-environment matter (Rubin, 2021). These areas of focus provide me avenues to research further to address social factors and how to raise the awareness of preventive health within public housing for NHPI populations. More work is needed to understand and address the social factors uncovered from both analyses that highlight influential barriers and facilitators to cancer screenings.

Chapter 8 Conclusion

Taken together, this dissertation provides a pilot mixed method study to uncover new insights into influences of cancer screenings for NHPI community members within public housing. From this work, it is clear to me that context and built environments matter with these communities. Surprisingly, the constructs tied to location within public housing became a more central focus to me from the interviews that was not as evident from the regression analysis. I see the role of a built environment for NHPI populations as central to any sociological and public health efforts involving preventive health (Burgette et al., 2021; Hafoka, 2017; Smith et al., 2019). These environments bring about unique challenges to health prevention efforts from these data that was not expected. Many of the interviewees demonstrate a social disconnection from important social ties and networks. The regression analysis also indicates that a neutral connection to both ethnic and American cultural influences decreased the likelihood that individuals will have a cancer screening. It is clear that the environment of public housing brings about challenges to social networks for information sharing because the interviewees disclose that they mainly interact with only their family (McElfish, Purvis, et al., 2019; Rita et al., 2020). Family-based and home-based close circles are the networks that seem to matter to these communities and where we can direct future family-based interventions. These interventions need to address prioritizing self-care, addressing fears of cancer and preventive health, the role of God and faith in decision making, and normalizing conversations around health and family history of disease (Kitzmann & Beech, 2006; McElfish et al., 2015; Skelton et al., 2012). These major findings from this work highlight my contribution to medical sociology and public health-related work, as the generative findings highlight the intersectionality of social factors across multiple dimensions of NHPIs lives and where we can begin to direct cancer control efforts.

The melting pot of diversity within Hawai‘i may be a protective factor against increased opportunities for mistreatment based on race and ethnicity; however, internal racist views exist for NHPI populations (Levinson et al., 2015; Rita et al., 2020; Rohrer, 2008). Interviewees felt treated differently based on ageism and MQD/federal benefit engagement rather than ethnicity. Only Chuukese women disclosed stories of other community members being treated differently. A majority of the interviewees trust their medical providers and the regression found that no history of mistreatment mattered when it came to trust and perceived racism. However, there remains to be inter-group biases as many NH interviewees hold onto negative views of PI community members, which was an unexpected finding (Levinson et al., 2015; Rita et al., 2020). There is a sense of fighting for resources within public housing causing an ‘othering’ to occur based on an outer-PI group dynamic (Rita et al., 2020; Talmy, 2010). NHPI populations within public housing see distinctions between Pacific Island groups as the lines are often blurred through a PI identity.

From this dissertation, policy implications can be addressed towards the public housing location. Campaigns highlighting cancer screening recommendations and addressing misguided fears for NHPI community members within public housing can be initiated. I am already working with Site 1 and their office staff. This will serve as a pilot to address public housing as a location to direct policy implications. Translated campaign flyers and posters can support the importance of cancer screenings, while also providing stories of cancer screenings and cancer journeys from within the populations (Brown et al., 2019; McElfish et al., 2018; Terui, 2017). These efforts can help address concerns and fears relating to cancer. Translated cancer screening and awareness campaigns will need commitment from the housing location and Hawai‘i Public Housing Authority as they need to sign off on many programs and campaigns within the sites.

We have been successful in the past with working with the Hawai‘i Public Housing Authority on these and other efforts. However, additional efforts need to be addressed to include any actual policies to provide cancer resources and awareness to the communities. Site 2 offers a model of cultural and health-related resources for community members and a health center that could benefit Site 1. My future innovation efforts include addressing an increased focus on the built environments of public housing. I have worked to establish relationships with the Site 1 office staff. We have already been in conversations around the need for outside space for children to encourage increased activities and a safe environment for families (Burgette et al., 2021; Hafoka, 2017; Smith et al., 2019). This addresses some of the concerns raised in the interviews, as well as many individual risk factors associated with cancer such as physical inactivity (Albright et al., 2005; Bostean et al., 2013; Palafox et al., 2018; Pineda et al., 2023). This task is no small one, and will involve looking for funding sources and policy implications from the site, the State, and the Hawai‘i Public Housing Authority to begin these efforts.

This dissertation serves as a pilot and exploratory approach to learning more about the barriers NHPI populations within public housing face in relation to cancer screenings. This work exceeded my expectations as I found instrumental insight from the interviews that were confirmed from the regression but also missed from the original Hawai‘i HINTS survey. Many of these social factors like cultural ties, close family circles, faith in God, and prioritizing family over the self are not meant to be viewed as only barriers. These and other socially constructed aspects of NHPI populations demonstrate facilitators of positive and inspirational selflessness (Godinet et al., 2019; Vaughan et al., 2018). Many underrepresented communities provide examples of adapting to a culture outside of their own and strong ethics of working hard to provide a life for themselves and their families (Chung-Do et al., 2016; Esquivel et al., 2022;

Leon Guerrero et al., 2023; Rehuher et al., 2021). This is seen within many PI populations, as well as within NH populations even when facing a history of colonization and historical trauma within their own lands (Godinet et al., 2019; Kaholokula et al., 2019; Sasa & Yellow Horse, 2022). This work strives to make sense of some of the reasons why we found such disparate rates in cancer screenings with NHPI populations within three public housing locations (Cassel et al., 2020). I achieved this and have direction for future efforts to address these barriers going forward. My future work will involve more inquiry into these barriers such as lack of social networks, not prioritizing the self, and the fears associated with cancer and cancer screenings and confirming these findings with these same communities. Too often researchers drop in and out of communities without bringing their own data and findings back to the communities of focus to disseminate information and resources (Chung-Do et al., 2016; Hall et al., 2009). National attention is needed, as disparate incidence and mortality rates for NHPI populations should be more well-known (Leon Guerrero et al., 2020; Registry, 2022; Van Dyne et al., 2020). These efforts have already in place as I have conducted 39 community outreach events, conference presentations, and small talks cornering NHPI community health and cancer with thousands of attendees.

Barriers to care and cancer discussed within this work are known contributors to health inequalities (Islam et al., 2017; Miller et al., 2019; Mounga & Maughan, 2012). However, this dissertation strives to fill in a gap in the literature concerning these barriers because they are often sparce and differentiated by cancer type. Utilizing medical sociology and public health allows for a deeper insight into these barriers to healthcare utilization (Kerr et al., 2018; Timmermans & Haas, 2008). Understandings of the linkage and associations between the uncovered influential social factors and cancer screening outcomes are provided in this

dissertation through theoretical foundations that highlight the intersectionality and dimensions of institutions over the life course for individuals (Link & Phelan, 1995; Phelan & Link, 2015). Socio-Ecological Health Perspectives, social factors as a fundamental cause, the Behavioral Model of Health Service Use, the Behavioral Model for Vulnerable Populations, and the Health Belief Model served as theoretical and conceptual foundations for understanding how NHPI populations experience health inequities. The Gelberg model provides insight into the role of predisposing and enabling domains on creating barriers to cancer screenings for these groups, and this dissertation utilized this theoretical framework which has not been traditionally used with NHPI populations in the past.

In regards to theoretical guidance from this dissertation, the Gelberg model provides space for cultural and social variables within a model creation and framework (Gelberg et al., 2000). This theoretical tool is useful within studies involving underrepresented and vulnerable populations such as NHPI populations (Kosteniuk et al., 2022; Stein et al., 2012). The Andersen model misses influential social and cultural variables of explanation of behaviors that the Gelberg model attends. Factors from both analyses within this study highlight the role of socio-cultural influences of constructed behaviors and expectations of healthcare, as well as how they influence one another (Akinyemiju et al., 2022; Okamoto et al., 2008; Palafox et al., 2018). The expanded model highlights socio-cultural factors and offers useful insight for future studies. Suggestions for the model include a more nuanced needs domain beyond ‘Perceived Health’ and ‘Evaluated Health’. Individuals may evaluate their health expectations based on perceived health outcomes as a result of their family history (Palafox & Hixon, 2011; Rehuher et al., 2021). Including family history health needs variables may highlight a lack of information exchanges within vulnerable populations and where to direct efforts, as unexpectedly found in this

dissertation. Furthermore, enabling domains measure constructed perceived barriers to care and health services resources (Gelberg et al., 2000; Stein et al., 2007). Healthcare misunderstandings and barriers to comprehension might further illuminate barriers to negotiating the health system and informational exchanges. Predisposing domain provides space for social structures/networks and living conditions (Gelberg et al., 2000). However, this domain might benefit from variables measuring inter and intra group biases and conflicts within vulnerable populations as they are often housed in locations with similar populations. This invites space for conflict and fighting for resources that the model should consider measuring, which were generative results from the interviews. The social factors discussed within the findings influence each other through a Socio-Ecological perspective. NHPI community members' environmental, social, and political contexts affect their health and are influenced by one another to create internal barriers to seeking out preventive care (Akinyemiju et al., 2022; Daley et al., 2011; Lau et al., 2020). These social practices are not independent of one another, fear is tied to a lack of informational exchanges, not prioritizing the self is tied to cultural norms of putting the family first, etc. We cannot address specific barriers to cancer screenings without realizing how they fit into a larger model of inter-dependent influences over NHPI community members' lives (Leon Guerrero et al., 2020; Palafox et al., 2018).

This work is just a first step in learning more about the barriers to cancer screenings for NHPIs. This does not end here, but rather, this dissertation creates a foundation to focus inquiry on these factors that emerged from the regression analysis and interview findings. NHPIs deserve to be drivers of their own health and the policies and research that addresses their own health concerns. Future research and efforts should incorporate their voices and experiences in every conceivable capacity, as well as provide opportunities for NHPI health-based capacity building

within their built environments. Fear relating to cancer, intergroup racism, small close circles, social isolation within public housing, not prioritizing the self, a lack of health-related conversations within the family, and the built environment of public housing stood out as generative findings from this work to me. These social factors point us to new mechanisms and raise new questions concerning influences to cancer screenings for NHPI populations for my future work. NHPIs demonstrate collective persevering social, health, and cultural inequities through historic trauma and mistreatment, and more local and national attention should be placed on addressing some of the historical wrongs through improving health equity for these distinct groups.

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Appendix A: Semi-structured Interview Guide

Interview Guide

Before the interview begins, the student researcher will provide the participant with an informed consent form and review the consent with the participant. After the participant signs the informed consent and is provided with a copy, the participant will be asked to complete the short demographic survey. The PI will then utilize this semi-structured interview guide. Participants will be encouraged to speak freely. Probes in this guide will only be utilized as necessary.

Introductory information

Aloha, my name is XXXXX. Thank you for taking time to join us today to talk about your thoughts on cancer screenings in your community. Your participation in this study is completely voluntary. You may end your participation at any time without loss of benefits. There is very little risk for your involvement in our study today. I may ask you to share personal information but you may decline or share only what you are comfortable sharing. You can skip any questions, take a break, or stop this interview at any time without penalty. The interview should last about 30 to 60 minutes. I will be asking you questions and will give you time to respond. Please feel free to clarify or ask questions if there is something you do not understand. As you have given consent, we will be audio recorded for the interview to help ensure accuracy. Only our research team will have access to the recorded files. The audio recording will be transcribed to help us generate a report to be used by the University of Hawai'i Cancer Center and our partners to strengthen cancer screening education and intervention measures in Hawai'i. Your name or any other identifying information will not be used in the transcriptions and/or written report. This interview is meant to be informal. I encourage you to speak freely. There are no right or wrong answers. Thanks so much for taking the time to meet and share your thoughts with me. Let us start by finding out a little bit about you.

FOR IRB USE: The following are approximate questions that will be used in the interview. Not all questions will necessarily be asked as this is a semi-structured interview process. No additional questions will be included in the interview process.

1. How do you describe your gender identity?
    a. Please specify:_____
    b. I prefer not to answer

2. What is your age in years?
    a. Please specify:_____
    b. I prefer not to answer

3. Which categories describe you?
    a. American Indian or Alaskan Native
    b. Filipino
    c. Chinese/Taiwanese
    d. Korean
    e. Japanese
    f. Vietnamese
    g. Asian Indian
    h. Other Asian, Please specify:_____
    i. Black or African American
    j. Hispanic, Latino(a) or Spanish Origin
    k. Middle Eastern or North African
    l. Native Hawaiian
    m. Pacific Islander, Please specify:_____ (e.g., Chamorro, Chuukese, Kosraean, Marshallese, Micronesian, Palauan, Tongan, etc.)
    n. Samoan
    o. White/Caucasian
    p. Some other race, ethnicity, or origin, Please specify:_____
    q. I prefer not to answer

4. Were you born in Hawaii?
    a. Yes
    b. No *If not, where were you born? Please specify:_____
    c. I prefer not to answer

5. What is your marital status?
    a. Married
    b. Living as married
    c. Divorced
    d. Widowed
    e. Separated
    f. Single, never been married
6. What is your current occupational status? Mark only one.
    a. Employed
    b. Unemployed
    c. Homemaker
    d. Student
    e. Retired
    f. Disabled
    g. Other, Please specify:_____

7. Thinking about members of your family living in this household, what is your combined annual income, meaning the total pre-tax income from all sources earned in the past year?

I. Background

Thank you again for agreeing to participate. I want to start by talking about you and getting to know more about yourself.

1. Tell me about yourself? **Probes:**
    a. Where are you from?
    b. Family background [if they have siblings or living parents, where do they live]
    c. Major life events/turning points/difficulties/achievements/career/education, etc. Ethnicity, age moved to Hawai'i?

II. Immigration/Family History/Language

2. Were you born in Hawaii? **Probes:**
    a. (If not born in Hawaii) How did you (or your parents, grandparents, etc.) end up in Hawaii?
    b. What influenced your decision (or parents' decision) to move to Hawaii?
    c. How long have you lived in your neighborhood, public housing community?
    d. What about with language, do you have trouble communication, speaking, or understanding things here because of language barriers?

III. Community Health/Insurance Role

Now that I know a little more about you and how you ended up in Hawaii and this community housing, I want to discuss how you view the health and challenges to healthcare your (ethnicity) community faces.

Overall community health

3. Please describe some of the observations or views you have regarding the health of your (ethnicity) community? **Probes:**
    a. (Ethnic) community overall health, absent of major diseases, noticeable increase in diseases. NCDs, weight trends of the community, children's health
    b. How do you think that health varies by location for your community (rural versus urban, in Hawaii versus specific Pacific Island, different parts of the island, mainland versus Hawaii)? In what way?

Health Insurance/COFA Medicaid

4. What type of health insurance do you have and how long have you had this insurance (through work, Medicaid, Medicare)? **Probes:**
    a. How common do you think it is for most of your community members (ethnicity and housing) to have health insurance, for what services (screenings, prevention, reactive care, etc.) do they use insurance for in your opinion?
    b. Please tell me the role of insurance, of lack thereof, plays in the health of your community?

c. Are you aware that congress has restored Medicaid eligibility for citizens from COFA nations residing in the US? How known do you think this is within your community?
[Possible probes: How can this insurance better serve your community? How to spread awareness of this opportunity better? What do you think an increase of health insurance for your community members would do for the health of your community?]

IV. Community Cancer Beliefs

Now that we have talked about overall health, I also want to discuss how you believe your community views cancer and their cancer behaviors.

Cancer in your community

5. What are your thoughts on how your community views cancer? **Probes:**
    a. How common is cancer knowledge, figures, or stats on cancer specific to your community known throughout the community?
    b. How do you think we can make this information for accessible for your ethnic and community housing members?

6. Please describe some of the cancers that you know of that may affect your community? **Probes:**
    a. What are your thoughts on preventive cancer screenings? What about with community members?

7. How do you think your community members educate themselves about different cancers? **Probes:**
    a. What resources about cancer education do you know about? How do you access them? How accessible are they in your language of choice?
    b. Please describe to me where you would you go to get cancer information or guidance?

V. Participant Cancer Screening History

I also want to talk about cancer screening practices.

8. Please tell me about any tests/preventative screenings for cancer you have had in the past? **Probes?**
    a. If so, please tell me about when and what type of test it was?
    b. How was that experience?
    c. How long has it been since your last (specific test)?

9. WOMEN ONLY: Please tell me what you know about breast or cervical cancer and screenings?

VI. Ideas for Discrepancies in Screening Rates Found in HINTS Survey/Literature Review

Now I would like to talk more about areas relating to cancer screening, and specifically colorectal cancer screening, and how things may affect decisions to be screened and other screening behaviors.

10. Please describe some of the leading reason(s) you think are causing members within your (ethnic) community to not take part in doctor-recommended cancer screenings?

11. Please tell me about any instances where you heard anyone describe experiences relating to screening hindrances or positive experiences?

12. What other reasons do you feel may hinder community members from not engaging in CRC screening?

13. How well do you think doctors explain CRC screening practices to Native Hawaiian and PI community members?

Health Literacy/Mistrust

14. How much do you think unequal access to healthcare resources and information may be a possible driving factor behind your community members not engaging in this cancer screening or others? **Probes:**
    a. How much do you think community members trust Western medicine? Healthcare professionals/doctors?
    b. How major of a concern do you view mistrust in healthcare as interrupting screening?

Perceived racism

15. How much do you feel that racism or perceived racism/stereotyping may affect community members from seeking out or taking part in preventive health like cancer screenings? **Probes:**
    a. Please tell me about any stories of these types of things causing health-related problems and hindrances to CRC screenings?
    b. How much do you feel racism or perceived racism may be a possible driving factor behind not engaging in this cancer screening?

Acculturation/Social Networks

16. Please tell me about the role of (ethnic identity) and your cultural beliefs/customs in affecting cancer screenings or knowledge? **Probes:**
    a. How much do you (or you think others in your community) may feel a sense of confusion when it comes to dueling cultures and health behaviors?
    b. How could you describe your social relationships with people from your ethnic community, here in Hawaii and other parts of the world?

c. Do these social relationships influence your health decisions, such as cancer screening behaviors? What about screening beliefs?
d. Do you think there is a difference in how community members from your ethnic community and Americans view cancer screening, is it a taboo topic?

Do you have any further thoughts on cancer screening and your community members?

Thank you again for agreeing to take part in this interview regarding the health of your community. Your role and expertise in this community is of great value to us and we know we could not even being to work with this community without first learning more about their cancer needs from those in the community such as yourself. We aim to continue developing areas of cancer screening intervention and educational materials for your community and hope to be able to continue seeking out guidance from key community members such as yourself. Thank you again.

After the interview, the researcher will answer any questions the participant may have regarding the interview process or dissemination of results of the study. Participants will be thanked for their time and sharing their story.

Appendix B: Consent Form

Aloha! My name is Mark Willingham, MS and you are invited to take part in a research study. I am a graduate student at the University of Hawai'i at Mānoa in the Department of Sociology. As part of the requirements for earning my graduate degree, I am doing a research project along with Dr. Wei Zhang & Dr. Kevin Cassel. I would like to ask some questions on what you think about factors that may affect cancer screenings in your community.

What am I being asked to do?

If you participate in this project, I will meet with you using an online platform, such as Zoom of Facebook Messenger, for an interview at a time that is convenient for you. During that time, you will also be asked some basic demographic questions including your gender, age, ethnicity, Hawai'i born, marital status, occupation, and income; however, your name and identifying information will not be included.

Taking part in this study is your choice.

Your participation in this project is completely voluntary. You may stop participating at any time. If you stop being in the study, there will be no penalty or loss to you.

Why is this study being done?

The purpose of my project is to speak with community members throughout Oahu who identify as a member of a Pacific Island community to gauge their thoughts about cancer screenings. Information gathered and analyzed from these interviews will help inform and develop small group education efforts and future interventions in Hawai'i. I am asking you to participate because you identify as a member of either the Native Hawaiian, Chuukese, or Marshallese communities; and your expertise can help shed light on cancer screening barriers for your community, the purpose of this student-led research for my degree completion.

What will happen if I decide to take part in this study?

The interview will consist of about 20 questions and will take about 30 to 60 minutes. Questions asked include "*What are your thoughts on how your community views cancer?*", "*How do you think your community members educate themselves about different cancers*?" and "*Please tell me about any tests/preventative screenings for cancer you have had in the past?"* to name a few questions. Only you, Mark Willingham, and a member of the research staff will be present during the interview. With your permission, I will audio-record (to capture your interview since we are meeting remotely) the interview so that I can later transcribe the interview and analyze the responses. You will be one of about 30 people I will interview for this study.

What are the risks and benefits of taking part in this study?

I believe there is little risk to you for participating in this research project. The risks to your physical, emotional, social, professional, or financial well-being are considered to be 'less than minimal'. I will be asking you questions and will give you time to respond. Please feel free to

clarify or ask questions if there is something you do not understand. You may become stressed or uncomfortable answering any of the interview questions or discussing topics with me during the interview. If you do become stressed or uncomfortable, you can skip the question or take a break. You can also stop the interview, or you can withdraw from the project altogether.

There will be no direct benefit to you for participating in this interview. The results of this project may help improve Hawai'i's rural and Pacific Islander populations' knowledge, attitudes and participation in cancer screenings.

Privacy and Confidentiality:

I will keep all study data secure in a locked filing cabinet in a locked office/encrypted on a password protected computer. A fellow investigator and a student investigator helping conduct the study will have access to the information. Other agencies that have legal permission have the right to review research records. The University of Hawai'i Human Studies Program has the right to review research records for this study.

After a copy of the interviews is written, the audio recordings will be erased or destroyed. When the results of this research project are reported, I will not use your name and will not use any other personal identifying information that can identify you. I will use pseudonyms (fake names) and report my findings in a way that protects your privacy and confidentiality to the extent allowed by law.

Compensation:

You will receive up to $25 in compensation in the form of a gift card for your time and effort in participating in this research project.

Future Research Studies:

Identifiers will be removed from your identifiable private information and after removal of identifiers, the data may be used for future research studies or distributed to another investigator for future research studies and we will not seek further approval from you for these future studies.

Questions:

If you have any questions about this study, please call or email me at 808-956-7689 & weizhang@hawaii.edu or Mark Willingham at 808-441-8186 & mlw237@hawaii.edu. You may contact the UH Human Studies Program at 808.956.5007 or uhirb@hawaii.edu to discuss problems, concerns and questions; obtain information; or offer input with an informed individual who is unaffiliated with the specific research protocol. Please visit http://go.hawaii.edu/jRd for more information on your rights as a research participant.

If you agree to participate in this project, please sign and date this signature page and return it using UH File Drop (https://www.hawaii.edu/filedrop/) to: mlw237@hawaii.edu or mail it to:

Mark Willingham

University of Hawai'i Cancer Center

701 Ilalo Street, Suite 414

Honolulu, HI 96813.

Keep a copy of the informed consent for your records and reference.

Signature(s) for Consent:

I give permission to join the research project entitled, "*Exploring Factors Relating to Preventive Cancer Screenings for Native Hawaiian and Pacific Islander Adults"*

Please initial next to either "Yes" or "No" to the following:

_____ Yes _____ No I consent to be audio-recorded for the interview portion of this research.

Name of Participant (Print): _____

Participant's Signature: _____

Signature of the Person Obtaining Consent: _____

Date: _____

Mahalo!

Appendix C: HINTS Original Survey

University of Hawai'i Cancer Center

Health Information Needs and Trends in the Pacific

General Instructions

- Answer each question as honestly and as best as you can. There is no right or wrong answer.
- Mark ☒ or ☑ in the box next to your answer. When writing text, please write them in the text box or line.
- If you mark NO for a question, please follow any instructions that direct you to the next question.

You and Your Household

1. What is your age?

Years old

2. Are you male or female?

☐ Male
☐ Female
☐ Other → Specify: _____

3. What is your marital status?

☐ Married
☐ Living as married
☐ Divorced
☐ Widowed
☐ Separated
☐ Single, never been married

4. Ethnicity (**Please mark one.**)

☐ Chamorro
☐ Filipino
☐ Chuukese
☐ Marshallese
☐ Palauan
☐ Kosraean
☐ Yapese
☐ Pohnpeian
☐ Other Pacific Islander
☐ Chinese
☐ Korean
☐ Japanese

☐ Vietnamese
☐ Asian Indian
☐ Native Hawaiian
☐ American Indian or Alaska Native
☐ Other Asian
☐ White/Caucasian
☐ Samoan
☐ Black or African American

5. Are you Hispanic, Latino/a, or Spanish origin? Mark all that apply.

☐ Mexican, Mexican American, Chicano/a
☐ Puerto Rican
☐ Cuban
☐ Another Hispanic, Latino/a, or Spanish origin
☐ None of these

6. Have you ever served on active duty in the U.S. Armed Forces, military Reserves or National Guard? Active duty does not include training in the Reserves or National Guard, but DOES include activation, for example, for the Persian Gulf War.

☐ Yes, now on active duty
☐ Yes, on active duty in the last 12 months but not now
☐ Yes, on active duty in the past, but not in the last 12 months
☐ No, training for Reserves or National Guard only
☐ No, never served in the military

7. In the past 12 months, have you received some or all of your health care from a VA hospital or clinic?

☐ Yes, all my health care
☐ Yes, some of my health care
☐ No, no VA health care received

8. What is your current occupational status? **Mark only <u>one.</u>**

☐ Employed
☐ Unemployed
☐ Homemaker
☐ Student
☐ Retired
☐ Disabled
☐ Other → Specify: _____

9. Including yourself, how many people live in your household?

Number of people

10. How many children under the age of 18 live in your household?

f children

11. Thinking about members of your family living in this household, what is your combined annual income, meaning the total pre-tax income from all sources earned in the past year?

- ☐ $0 to $9,999
- ☐ $10,000 to $14,999
- ☐ $15,000 to $19,999
- ☐ $20,000 to $34,999
- ☐ $35,000 to $49,999
- ☐ $50,000 to $74,999
- ☐ $75,000 to $99,999
- ☐ $100,000 to $199,999
- ☐ $200,000 or more

12. Which one of these comes closest to your own feeling about your household's income these days?

- ☐ Living comfortably on present income
- ☐ Getting by on present income
- ☐ Finding it difficult on present income
- ☐ Finding it very difficult on present income

13. What is your current residential address? Please use the address where you live if different than where your mail is delivered ***(note: you can skip providing your address if you choose)***?

_____ Zip Code:

_____

14. Do you currently rent or own your home?

- ☐ Own
- ☐ Rent
- ☐ Occupied without paying monetary rent

15. Does anyone in your family have a working cell phone?

- ☐ Yes
- ☐ No

16. Is there at least one telephone inside your home that is currently working and is not a cell phone?

- ☐ Yes
- ☐ No

17. What is the highest grade or level of schooling you completed?

- ☐ Less than 8 years
- ☐ 8 through 11 years
- ☐ 12 years or completed high school
- ☐ Post high school training other than college (vocational or technical)
- ☐ Some college
- ☐ College graduate
- ☐ Postgraduate

18. Were you born in the United States (in any of the 50 states or in any of its territories, such as Guam, CNMI, Puerto Rico, and American Samoa)?

- ☐ Yes → **GO TO *21***

☐ No

19. In what year did you come to the United States (in any of the 50 states or in any of its territories, such as Guam, CNMI, Puerto Rico, and American Samoa)?

Year: | | | | | (example: 1985)

20. If you were not born in the United States, where were you born? _____

21. How well do you feel speaking English?

☐ Very well
☐ Well
☐ Not well
☐ Not at all

22. Do you speak any language(s) other than English?

☐ Yes
☐ No→ **GO TO *27***

23. If so, what language(s) do you speak fluently? _____

24. In general, what language(s) do you speak?

☐ Native language
☐ Native language more than English
☐ Both equally
☐ English more than native language
☐ English

25. In general, what language(s) do you read?

☐ Native language
☐ Native language more than English
☐ Both equally
☐ English more than native language
☐ English

26. What language(s) do you speak at home?

☐ Native language
☐ Native language more than English
☐ Both equally

☐ English more than native language
☐ English

27. Do you have a religion?

☐ Yes → *Please specify*_____
☐ No

28. Do you consider yourself as religious?

☐ 1 – Not religious
☐ 2
☐ 3
☐ 4 – Neutral
☐ 5
☐ 6
☐ 7 – Very religious

Looking for Health Information

29. Have you ever looked for information about health or medical topics from any source?

☐ Yes
☐ No → **GO TO *34***

30. The most recent time you looked for information about health or medical topics, where did you go first?

Mark only one from the following list:

☐ Books
☐ Brochures, pamphlets, etc.
☐ Cancer organization
☐ Family
☐ Friend/Co-Worker
☐ Doctor or health care provider
☐ Internet
☐ Library
☐ Magazines
☐ Newspapers
☐ Telephone information number
☐ Complementary, alternative, or unconventional practitioner
☐ Social media site, such as Facebook, PatientsLikeMe, Caring Bridge
☐ Other - Specify:_____

31. Did you look or go anywhere else that time?

☐ Yes
☐ No

32. The most recent time you looked for information about health or medical topics, who was it for?

☐ Myself
☐ Someone else

☐ Both myself and someone else

33. Based on the results of your most recent search for information about health or medical topics, how much do you agree or disagree with each of the following statements?

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
a. It took you a lot of effort to get the information you needed.	☐	☐	☐	☐
b. You felt frustrated during your search for the information.	☐	☐	☐	☐
c. You were concerned about the quality of the information	☐	☐	☐	☐
d. The information you found was hard to understand.	☐	☐	☐	☐

34. Overall, how confident are you that you could get advice or information about health or medical topics if you needed it?

☐ Completely confident
☐ Very confident
☐ Somewhat confident
☐ A little confident
☐ Not confident at all

35. In general, how much would you trust information about health or medical topics from each of the following?

	Not at all	A little	Some	A lot
a. A health care provider (physician, etc.)	☐	☐	☐	☐
b. Family or friends	☐	☐	☐	☐
c. Newspapers or magazines	☐	☐	☐	☐
d. Radio	☐	☐	☐	☐
e. Internet	☐	☐	☐	☐
f. Television	☐	☐	☐	☐
g. Government health agencies	☐	☐	☐	☐
h. Charitable organizations	☐	☐	☐	☐
i. Religious organizations and leaders.	☐	☐	☐	☐

36. Imagine that you had a strong need to get information about health or medical topics. Where would you go first? **Mark only <u>one</u>.**

☐ Books
☐ Brochures, pamphlets, etc.
☐ Cancer organization
☐ Family
☐ Friend/Co-Worker
☐ Doctor or health care provider
☐ Internet
☐ Library

☐ Magazines
☐ Newspapers
☐ Telephone information number
☐ Complementary, alternative, or unconventional practitioner
☐ Social media site, such as Facebook, PatientsLikeMe, Caring Bridge
☐ Other - Specify:_____

37. Have you ever looked for information about cancer from any source?

☐ Yes
☐ No

Using Internet to Find Information

38. Do you ever go on-line to access the Internet or World Wide Web, or to send and receive e-mail?

☐ Yes
☐ No → **GO TO *46***

39. When you use the Internet, do you access it through...

	Yes	No
a. A regular dial-up telephone line	☐	☐
b. Broadband such as DSL, cable, or FiOS	☐	☐
c. A cellular network (e.g. phone, 3G/4G)	☐	☐
d. A wireless network (Wi-Fi)	☐	☐

40. Do you access the Internet any other way?

☐ Yes → Specify _____
☐ No

41. In the past 12 months, have you used the Internet to look for health or medical information for yourself?

☐ Yes
☐ No

42. In the last 12 months, have you used the Internet for any of the following reasons?

	Yes	No
a. Looked for information about quitting smoking.	☐	☐

b. Bought medicine or vitamins on-line.	☐	☐
c. Participated in an on-line support group for people with similar health or medical issues	☐	☐
d. Used e-mail or the Internet to communicate with health provider or doctor's office.	☐	☐
e. Used a website to help with your diet, weight, or physical activity.	☐	☐
f. Looked for a health care provider	☐	☐
g. Downloaded health-related information to a mobile device, such as MP3 player, cell phone, tablet computer or electronic book device.	☐	☐
h. Visited a "social networking" site, such as "Facebook" or LinkedIn" to read and share about medical topics.	☐	☐
i. Wrote in an on-line diary or "blog" (i.e., Web log) about any type of health topic.	☐	☐
j. Kept track of personal health information such as care received, test results, or medical appointments.	☐	☐
k. Looked for health or medical information for someone else.	☐	☐

43. Have you done anything else health-related on the Internet?

☐ Yes → Specify _____
☐ No

44. On your cell phone, do you happen to have any software applications or 'apps' that help you track or manage your health, or not?

☐ Yes
☐ No → **GO TO *46***

45. What health issue or topic do your apps deal with (please specify)? _____

Your Health Care

46. Do you have any kind of health care coverage, including health insurance, prepaid plans such as Health Maintenance Organizations (HMO), or government plans such as Medicare, or Indian Health Service?

☐ Yes
☐ No→ **GO TO *49***

47. What is the primary source of your health care coverage?

☐ A plan purchased through an employer or union (including plans purchased through another person's employer)
☐ A plan that you or another family member buys on your own
☐ Medicare
☐ Medicaid or other state program
☐ TRICARE (formerly CHAMPUS), VA, or Military
☐ Alaska Native, Indian Health Service, Tribal Health Services
☐ Some other source

48. Do you have any other health care coverage plan for yourself (please do not include dental or vision plans)?

☐ Yes → Specify _____
☐ No

49. Is there a place that you USUALLY go to when you are sick or need advice about your health?

☐ Yes
☐ There is MORE THAN ONE place
☐ There is NO place → **GO TO *51***

50. What kind of place do you go most often?

☐ Clinic or health center
☐ Doctor's office or HMO
☐ Hospital emergency room
☐ Hospital outpatient department
☐ Some other place → Specify _____

51. In the past 12 months was there a time when you needed to see a doctor, but could not because of cost?

☐ Yes
☐ No

52. About how long has it been since you last visited a doctor for a routine checkup? A routine checkup is a general physical exam, not an exam for a specific injury, illness, or condition.

☐ Within past year (anytime less than 12 months ago)
☐ Within past 2 years (1 year but less than 2 years ago)
☐ Within past 5 years (2 years but less than 5 years ago)
☐ 5 or more years ago
☐ Don't know
☐ Never

53. In the past 12 months, not counting times you went to an emergency room, how many times did you go to a doctor, nurse, or other healthcare provider to get care for yourself?

☐ None → **GO TO *57***
☐ 1 time
☐ 2 times
☐ 3 times
☐ 4 times
☐ 5-9 times
☐ 10 or more times

54. The following questions are about your communication with all doctors, nurses, or other healthcare provider you saw and how satisfied you were with their service during the past 12 months...

How often did they do each of the following:

	Very Often	Usually	Sometimes	Rarely
a. Give you the chance to ask all the health-related questions you had?	☐	☐	☐	☐
b. Give the attention you needed to reflect your feelings and emotions?	☐	☐	☐	☐
c. Make sure you understood the things you needed to do to take care of your health?	☐	☐	☐	☐
d. Explain things in a way you could understand?	☐	☐	☐	☐
e. Help you deal with feelings of uncertainty about your health or health care?	☐	☐	☐	☐

55. In the past 12 months, how often did you feel you could rely on your doctors, nurses, or other healthcare provider to take care of your health care needs?

☐ Always
☐ Usually
☐ Sometimes
☐ Never

56. Overall, how would you rate the quality of health care you received in the past 12 months?

☐ Excellent
☐ Very good
☐ Good
☐ Fair
☐ Poor

57. In the past 12 months, have you talked to a doctor, nurse, or other healthcare provider about any kind of health information you have gotten from the Internet?

☐ Yes
☐ No → **GO TO *59***

58. In the past 12 months when you talked with a healthcare provider, how interested were they in hearing about the information you found on-line?

☐ Very interested
☐ Somewhat interested
☐ A little interested
☐ Not at all interested

59. **Comprehension**

	Strongly Agree	Agree	Disagree	Strongly Disagree
a. In the past year, I have had a hard time understanding the healthcare provider's instructions because of language.	☐	☐	☐	☐
b. In the past year, I had a hard time following the healthcare provider's instructions due to logistical reasons like transportation or childcare.	☐	☐	☐	☐
c. In the past year, I had a hard time following the healthcare provider's instructions because of my work schedule.	☐	☐	☐	☐
d. In the past year, I delayed seeking care because I didn't have insurance or the co-payment was too expensive.	☐	☐	☐	☐
e. If a healthcare provider gives me advice that goes against my cultural beliefs, I wouldn't listen to them.	☐	☐	☐	☐
f. I feel that my healthcare provider understands my background and values.	☐	☐	☐	☐
g. I often feel as if my healthcare provider looks down on me and the way I live my life.	☐	☐	☐	☐

60. Compliance to medical advice: How likely are you to follow the medical advice from:

	Least likely to Comply	2	3	4	Most likely to Obey
a. A health care provider	☐	☐	☐	☐	☐
b. A friend	☐	☐	☐	☐	☐
c. A relative	☐	☐	☐	☐	☐
d. A medical brochure	☐	☐	☐	☐	☐
e. A printed newspaper or magazine article	☐	☐	☐	☐	☐
f. An online source or website	☐	☐	☐	☐	☐

61. How much do you agree with the following statements:

	Strongly Agree	Agree	Disagree	Strongly Disagree
a. I think the health systems treat people unfairly based on their race or ethnic background.	☐	☐	☐	☐
b. I think racism/prejudice makes receiving good health care difficult.	☐	☐	☐	☐

c. I have personally experienced racism, racial discrimination, or racial prejudice at least once in the last 12 months.	☐	☐	☐	☐
d. If I experienced racism in the past 12 months, I would suffer from the stress that can affect my health.	☐	☐	☐	☐

Your Health, Nutrition, and Physical Activity

62. Is your health a priority for you?

- ☐ Yes
- ☐ No

63. In general, would you say your health is...

- ☐ Excellent
- ☐ Very good
- ☐ Good
- ☐ Fair
- ☐ Poor

64. Overall, how confident are you about your ability to take good care of your health?

- ☐ Completely confident
- ☐ Very confident
- ☐ Somewhat confident
- ☐ A little confident
- ☐ Not confident at all

65. Over the past 2 weeks, how often have you been bothered by any of the following problems?

	Nearly every day	**More than half the days**	**Several Days**	**Not at all**
a. Little interest or pleasure in doing things.	☐	☐	☐	☐
b. Feeling down, depressed or hopeless	☐	☐	☐	☐
c. Feeling nervous, anxious or on edge	☐	☐	☐	☐
d. Not being able to stop or control worrying	☐	☐	☐	☐

66. How often in the past 12 months would you say you were worried or stressed about having enough money to buy nutritious meals?

- ☐ Always
- ☐ Usually
- ☐ Sometimes

☐ Rarely
☐ Never

67. When available, how often do you use menu information on calories in deciding what to order?

☐ Always
☐ Usually
☐ Sometimes
☐ Rarely
☐ Never

68. About how tall are you without shoes?

☐ Feet ☐☐ Inches

69. About how much do you weigh, in pounds, without shoes?

☐☐☐ Pounds

70. When you are outside for more than one hour on a warm, sunny day, how often do you wear sunscreen?

☐ Always
☐ Often
☐ Sometimes
☐ Rarely
☐ Never
☐ I do not go out on sunny days

Tobacco Products

71. Have you ever smoked at least 100 cigarettes in your entire life?

☐ Yes
☐ No → **GO TO *73***

72. How often do you now smoke cigarettes?

☐ Everyday
☐ Some days
☐ Not at all

E-Cigarettes

Electronic cigarettes (e-cigarettes) and other electronic "vaping" products include electronic hookahs (e-hookahs), vape pens, e-cigars, and others. These products are battery-powered and usually contain nicotine and flavors such as fruit, mint, or candy.

73. Have you ever used an e-cigarette or other electronic "vaping" product, even just one time, in your entire life?

- ☐ Yes
- ☐ No
- ☐ Do not know

74. How often, if at all, do you currently use an e-cigarette or a similar vaping device?

- ☐ Daily
- ☐ Less than daily, but at least once a week
- ☐ Less than weekly, but at least once a month
- ☐ Less than monthly
- ☐ Not at all

75. Have you seen marketing for e-cigarettes:

	Often	Sometimes	Rarely	Never
a. In newspapers?	☐	☐	☐	☐
b. In magazines or other print media?	☐	☐	☐	☐
c. On television?	☐	☐	☐	☐
d. On the internet?	☐	☐	☐	☐
e. At sports and cultural events?	☐	☐	☐	☐
f. At convenient stores?	☐	☐	☐	☐
g. At gas stations?	☐	☐	☐	☐
h. At grocery stores	☐	☐	☐	☐
i. At malls?	☐	☐	☐	☐

Other (please specify)

Betel Nut Use

76. Have you ever chewed betel nut in your life?

- ☐ Yes

☐ No → **GO TO *79***

77. Do you now chew betel nut?

☐ Yes
☐ No

78. How often do you chew betel nut?

|___|___| Times per Day
|___|___| Times per Week
|___|___| Times per Month
|___| Only on Occasion

ATTENTION: ALL FEMALES COMPLETING THIS QUESTIONNAIRE CONTINUE TO QUESTION *79*.

ALL MALES SHOULD SKIP TO QUESTION *84*.

Women and Cancer

The next questions are about breast and cervical cancer.

79. How long ago did you have your most recent Pap test to check for cervical cancer?

☐ A year ago or less
☐ More than 1, up to 2 years ago
☐ More than 2, up to 3 years ago
☐ More than 3, up to 5 years ago
☐ More than 5 years ago
☐ I have never had a Pap test

80. At what age are most women supposed to start having mammograms?

Years Old

81. A mammogram is an x-ray of each breast to look for cancer. Have you ever had a mammogram?

☐ Yes
☐ No → **GO TO *83***

82. How long has it been since you had your last mammogram?

☐ Within the past year (anytime less than 12 months ago
☐ Within the past 2 years (1 year but less than 2 years ago)

☐ Within the past 3 years (2 years but less than 3 years ago)
☐ Within the past 5 years (3 years but less than 5 years ago)
☐ 5 or more years ago

83. A vaccine to prevent HPV infection is available and is called the HPV shot, cervical cancer vaccine, GARDASIL®, or Cervarix®.

Has a doctor or other health care professional ever talked with you about the HPV shot or vaccine?

☐ Yes
☐ No

ATTENTION: IF YOU ARE 50 YEARS OLD OR OLDER CONTINUE THE NEXT QUESTION.

IF YOU ARE 49 YEARS OLD OR YOUNGER SKIP TO QUESTION *92*.

Screening for Cancer

84. There are a few different tests to check for colon cancer. Has a doctor ever told you that you should have a test for colon cancer?

☐ Yes
☐ No

85. Have you ever had a test to check for colon cancer?

☐ Yes
☐ No

86. At what age are most people supposed to start doing <u>home</u> blood stool tests, having a sigmoidoscopy or having a colonoscopy?

Years Old

87. A blood stool test is a test that may use a special kit at home to determine whether the stool contains blood. Have you ever had this test using a home kit?

☐ Yes
☐ No→ **GO TO *89***

88. How long has it been since you had your last blood stool test using a home kit?

☐ Within the past year (anytime less than 12 months ago
☐ Within the past 2 years (1 year but less than 2 years ago)
☐ Within the past 3 years (2 years but less than 3 years ago)
☐ Within the past 5 years (3 years but less than 5 years ago)
☐ 5 or more years ago

89. Sigmoidoscopy and colonoscopy are exams in which a tube is inserted in the rectum to view the colon for any signs of cancer or other health problems. Have you ever had either of these exams?

- ☐ Yes
- ☐ No→ **GO TO *92***

90. For a SIGMOIDOSCOPY, a flexible tube is inserted into the rectum to look for problems. A COLONOSCOPY is similar, but uses a longer tube, and you are usually given medication through a needle in your arm to make you sleepy and told to have someone else drive you home after the test. Was your MOST RECENT exam a sigmoidoscopy or a colonoscopy?

- ☐ Sigmoidoscopy
- ☐ Colonoscopy

91. How long has it been since you had your last sigmoidoscopy or colonoscopy? **Mark only one.**

- ☐ Within the past year (anytime less than 12 months ago)
- ☐ Within the past 2 years (1 year but less than 2 years ago)
- ☐ Within the past 3 years (2 years but less than 3 years ago)
- ☐ Within the past 5 years (3 years but less than 5 years ago)
- ☐ Within the past 10 years (5 years but less than 10 years ago)
- ☐ 10 or more years ago

Beliefs about Cancer

Think about cancer in general when answering the questions in this section.

92. How likely are you to get cancer in your lifetime?

- ☐ Very likely
- ☐ Likely
- ☐ Neither unlikely nor likely
- ☐ Unlikely
- ☐ Very unlikely

93. Compared to other people your age, how likely are you to get cancer in your lifetime?

- ☐ Much less likely
- ☐ Less likely
- ☐ About the same
- ☐ More likely
- ☐ Much more likely

94. How worried are you about getting cancer?

- ☐ Not at all
- ☐ Slightly
- ☐ Somewhat
- ☐ Moderately
- ☐ Extremely

95. How much do you agree or disagree with each of the following statements?

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
a. It seems like everything causes cancer	☐	☐	☐	☐
b. There's not much you can do to lower your chances of getting cancer	☐	☐	☐	☐
c. There are so many recommendations about preventing cancer, it's hard to know which ones to follow.	☐	☐	☐	☐

96. Can you think of anything people can do to reduce their chances of getting cancer? **Mark <u>all</u> that apply**.

☐ Eat Better/Better Nutrition
☐ Get screened for cancer/Get Tested
☐ Don't Smoke/Quit Smoking
☐ Exercise/Exercise More
☐ Stay out of the Sun/Wear Sunscreen
☐ Get Vaccination
☐ Other → Please Specify _____

97. Each item below is a belief statement about your health with which you may agree or disagree.

	Strongly Agree	Agree	Disagree	Strongly Disagree
a. If I get sick, it is my own behavior which determines how soon I get well again.	☐	☐	☐	☐
b. No matter what I do, if I am going to get sick I will get sick.	☐	☐	☐	☐
c. Most things that affect my health happen to me by accident.	☐	☐	☐	☐
d. I am in control of my health.	☐	☐	☐	☐
e. When I get sick, I am to blame.	☐	☐	☐	☐
f. Luck plays a big part in determining how soon I will recover from an illness.	☐	☐	☐	☐
g. My good health is largely a matter of good fortune.	☐	☐	☐	☐
h. The main thing which affects my health is what I myself do.	☐	☐	☐	☐
i. If I can take care of myself, I can avoid illness.	☐	☐	☐	☐
j. No matter what I do, I'm likely to get sick.	☐	☐	☐	☐
k. If it's meant to be, I will stay healthy.	☐	☐	☐	☐
l. If I take right actions, I can stay healthy.	☐	☐	☐	☐

Your Cancer History

98. Have you ever been diagnosed as having cancer?

- ☐ Yes
- ☐ No→ **GO TO *102***

99. What type of cancer did you have? **Mark <u>all</u> that apply.**

- ☐ Bladder cancer
- ☐ Bone cancer
- ☐ Breast cancer
- ☐ Cervical cancer (cancer of the cervix)
- ☐ Colon cancer
- ☐ Endometrial cancer (cancer of the uterus)
- ☐ Head and neck cancer
- ☐ Hodgkin's lymphoma
- ☐ Leukemia/Blood cancer
- ☐ Liver cancer
- ☐ Lung cancer
- ☐ Melanoma
- ☐ Non-Hodgkin lymphoma
- ☐ Oral cancer
- ☐ Ovarian cancer
- ☐ Pancreatic cancer
- ☐ Pharyngeal (throat) cancer
- ☐ Prostate cancer
- ☐ Rectal cancer
- ☐ Renal (kidney) cancer
- ☐ Skin cancer, non-melanoma
- ☐ Stomach cancer
- ☐ Other-Specify_____

100. At what age were you first told that you had cancer?

Age

101. Have any of your family members ever had cancer?

- ☐ Yes
- ☐ No
- ☐ Not sure

Social Interaction

Please circle one of the numbers to the right of each question to indicate your degree of agreement or disagreement.

102. Many of these questions will refer to your ethnic culture, meaning the original culture of your family (other than American). It may be the culture of your birth, the culture in which you have been raised, or any culture in your family background. If there are several, pick the one that has influenced you most (e.g. Filipino, Chuukese, Palauan, Japanese). If you do not feel that you have been influenced by any other culture, please name a culture that influenced previous generations of your family. Your ethnic culture (other than American) is:

_____

	Strongly Agree	**Agree**	**Disagree**	**Strongly Disagree**
a. I often participate in my ethnic cultural traditions. [SEP]	☐	☐	☐	☐
b. I often participate in American cultural traditions.	☐	☐	☐	☐
c. I enjoy social activities with people from the same ethnic culture as myself. [SEP]	☐	☐	☐	☐
d. I enjoy social activities with American people. [SEP][SEP]	☐	☐	☐	☐
e. I enjoy entertainment (e.g., movies, music) from my ethnic culture.	☐	☐	☐	☐
f. I enjoy American entertainment (e.g., movies, music).	☐	☐	☐	☐

g. I often behave in ways that are typical of my ethnic culture	☐	☐	☐	☐
h. I often behave in ways that are typically American.	☐	☐	☐	☐
i. I believe in the values of my ethnic culture.	☐	☐	☐	☐
j. I believe in mainstream American values.	☐	☐	☐	☐
k. I am interested in having friends from my ethnic culture.	☐	☐	☐	☐
l. I am interested in having American friends	☐	☐	☐	☐

Network Questions

The following questions require you to number how many people from Hawaii that you know fit the following description. Do not leave questions blank or put zero. Answer as best as you can.

103. How many Hawaii residents between ages 18 and 75 do you know personally, i.e. you know them and they know you by name? _____

104. With the number of people you counted from question 103, how many have you interacted with via phone, email, or social media during the past 2 weeks? _____

105. With the number of people you counted from question 104, how many did you meet in person during the past 2 weeks? _____

106. How many people do you discuss personal matters with? _____

107. What is the number of people in Hawaii that you think you could potentially recruit for the study? _____

108. How would you best describe the relationship with the person who recruited you to this study (the person who gave you this coupon)?

- ☐ A relative
- ☐ A close Friend
- ☐ A friend
- ☐ An acquaintance
- ☐ A stranger

109. How often do you see your recruiter?

☐ Always
☐ Often
☐ Sometimes
☐ Never

110. About how long have you known your recruiter?

☐ Less than Six months
☐ Six months to a year
☐ Over a year

111. Does your recruiter live in the same neighborhood as you?

☐ Yes
☐ No

Thank You for Completing This Survey

Appendix D: IRB-Approved Recruitment Flyer

The University of Hawai`i is conducting a study:

Exploring Factors Relating to Preventive Cancer Screenings for Native Hawaiian and Pacific Islander Adults

Are you 45 years or older and Native Hawaiian, Chuukese, or Marshallese?

If the answer is **YES**…

Dr. Wei Zhang and Mark Willingham would like to invite you to participate in a research study.

The purpose of this study is to explore social factors uncovered from interviews to determine drivers affecting cancer screenings for Native Hawaiian, Marshallese, and Chuukese individuals aged 45 and above. Pacific Island Populations often face numerous adverse health outcomes, increased racial discrimination, and disparate health equity for many reasons, and this study aims to explore these and other determinants for not engaging in preventive care utilization.

- Study will involve one 30-60 minute interview, audio recorded over Zoom or Messenger.
- Study volunteers will be compensated for their time.
- A summary of the study themes and results will be available to study volunteers.

To learn more about the study,

Please call Mark Willingham, MS at 808.441.8186 or email mlw237@hawaii.edu