



VOLUME 3

Social Determinants of Health

INTRODUCTION



Office of Hawaiian Affairs

The Office of Hawaiian Affairs (OHA) was established during the 1978 Constitutional Convention, Hawai'i State Constitution (Article XII). Chapter 10 of the Hawai'i Revised Statutes (HRS) defines OHA's roles and responsibilities: to support the betterment of the conditions of Native Hawaiians; to be the public agency responsible for the performance, development, and coordination of programs relating to Native Hawaiians; to assess policies and practices; and to conduct advocacy.

In 2009, OHA's Board of Trustees adopted a new Strategic Plan focusing on six strategic priorities: *mo'omeheu* (culture), *'āina* (land & water), *ea* (governance), *ho'ona'auao* (education), *ho'okahua waiwai* (economic self-sufficiency), and *mauli ola* (health).

For *mauli ola*, OHA seeks to improve the quality and longevity of life so Native Hawaiians will enjoy healthy lifestyles and experience reduced onset of chronic diseases. This fact sheet reports on the social determinants of health related to OHA's strategic plan.

Overview of Native Hawaiian Health

There was a time in Hawai'i's past when Native Hawaiians had a holistic view of *mauli ola* (health) incorporating *mana* (sacred life force), *pono* (harmony, balance), and *lōkahi* (unity) for physical, mental, spiritual, and emotional well-being. A strong oral tradition facilitated the passing of knowledge from one generation to the next. The *mauka to makai* (mountain to ocean) *ahupua'a* (land division) provided an active and thriving subsistence living. Traditional cultural and medical art forms promoted care and healing. The *kapu* (sacred restrictions) system provided a framework of rules regulating behavior and conduct, and *'ohana* (family) values nurtured wellness and illness prevention.^{1, 2}

Then the Native Hawaiians experienced changes in political power, the loss of many ancient customs and practices, the introduction of diseases, and the decline of *mauli ola*. Devastating communicable disease epidemics characterized Native Hawaiian health in the eighteenth and nineteenth centuries. High rates of chronic diseases in the Native Hawaiian population are the hallmark of *mauli ola* in contemporary times.

***Mai ka piko o ke po'o a ka poli o ka wāwae,
a la'a ma nā kihi 'eha o ke kino.***

From the crown of the head to the soles of the feet, and the four corners of the body.

An expression used in the prayers of healing. The four corners are the shoulders and hips; between them are the vital organs of the body.

(Pukui, 1983, #2066)



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SOCIAL DETERMINANTS OF HEALTH

The traditional *ahupua'a* system ensured environmental, economic, and social well-being in ancient Native Hawaiian society. The needs of the Native Hawaiian people were met through diligent environmental management and controlled resource use.² Over the course of the nineteenth and twentieth centuries, Native Hawaiians quickly lost the ability to continue their practice of sustainability. A growing cash-based economy, rapidly developing western style education system, and constitutional government replaced traditional ways. Native Hawaiians underwent sweeping cultural and lifestyle transformation.⁴

Native Hawaiians are perhaps the one racial group with the highest health risk in Hawai'i. This risk stems from high economic and cultural stress, lifestyle and risk behaviors, and late or lack of access to health care. Accordingly, it is not surprising to find among Native Hawaiians a high incidence of diseases, ailments, early disability, and premature death.⁴

Background

Everyone has the right to good health. However, not everyone has the same opportunities to make health-promoting choices. Even with great motivation, the barriers to health may be too great for individuals to overcome. Health behaviors, quality and affordable medical care, genetic makeup, and physical and social environments are critical determinants of health. The physical and social environments are better known as the social determinants of health.^{5, 6}

Social determinants of health are the complex and interconnected structures, circumstances, environments, institutions, and systems that contribute to or harm the health of individuals and communities. Social determinants of health are shaped by cultural, political, environmental, social, and economic conditions. Childhood experiences, educational attainment, employment, income, housing, culture, public policy, social and familial support networks, built and physical environments, and access to health care and social services are some of the most commonly cited social determinants of health. Leading national and international organizations recognize the social determinants of health as the single most important factor in individual and population health outcomes.⁷⁻⁹

Ka lā i ka Mauiola.

The sun at the source of life.

Maui-ola (Breath-of-life) is the god of health.

(Pukui, 1983, #1422)

Social Determinants of Health and the Life Course

Health begins before birth during *ho'okauhua* (gestation) with the social determinants affecting health resources for the *hāpai* (pregnant) *makuahine* (mother). The early years of life can be conceptualized as three phases: infancy, childhood, and adolescence. *Keiki li'ilī'i* (early childhood) is a critical developmental phase that influences health and social outcomes throughout the life course. The financial and social resources at a family's disposal can enhance or inhibit their ability to provide *keiki* (children) with nurturing and stimulating environments conducive to cognitive and behavioral development. The effects of education and income impact health at all stages of life, but are most profound during childhood. *Ōpio* (adolescents) are generally a healthy group. When *Ōpio* experience adverse health outcomes, the causes are often preventable. Some common health issues among *Ōpio* include engaging in risky sexual behaviors, using tobacco, alcohol, or other illicit drugs, becoming a teen mother, or sustaining injuries from accidents or violence.¹⁰⁻¹²

The later years in life can also be viewed as two phases, adulthood and elderhood. *Mākua* (adults) and *kūpuna* (older adults) are vulnerable to chronic diseases and stressors. Some stressors common among *mākua* include working long or irregular hours, dealing with daily parental responsibilities, or caring for older family members. Long-term exposure to these stressors can put *mākua* at higher risk for injuries, digestive problems, hypertension, obesity, or heart disease. For *kūpuna*, mobility, or the ability to effectively and safely move in the environment is essential to health and well-being. Impaired mobility can cause mental distress from the inability to independently perform daily activities, access goods and services, and interact with *ʻohana*. The physical problems associated from limitations in mobility include depression, cardiovascular (heart) disease, cancer, and injuries. The social determinants of health impact individuals in similar ways, but manifest themselves differently at each stage of life.^{10, 13}

The social determinants of health are the circumstances in which people are born, grow up, live, work and age, and the systems put in place to deal with illness.⁹

SOCIAL DETERMINANTS OF HEALTH (CONTINUED)

Key Concepts

Health Disparities

Health disparities are the differences in incidence, prevalence, mortality, and burden of health conditions among population groups. The absence of favorable cultural, political, social, and economic conditions can inhibit an individual's ability to achieve good health. Health disparities adversely affect population groups based on: gender, age, race/ethnicity, socio-economic status, geography, sexual orientation, disability, historical trauma, social disadvantage, or a combination of these factors.^{7, 14}

Socio-Economic Status

Socio-economic status measures an individual's economic or social position in relation to others based on education, occupation, and income. Some of the established health conditions linked with low socio-economic status include low birth weight, infant and maternal mortality, cardiovascular (heart) disease, hypertension, arthritis, diabetes, and certain cancers. Obesity is an exception because of its prevalence is similar across income levels.^{7, 15, 16}

Health Literacy

Health literacy refers to the ability to access, process, and comprehend health information. Proficiency in health literacy is required to make decisions needed to prevent or treat illness. Low educational attainment and limited English proficiency (LEP) affect a person's ability to navigate the intricacies of the health care system. Individuals with limited health literacy skills are more likely to enter the health care system at a later stage of illness, have a greater risk for preventable hospital admissions, and utilize fewer preventive services. High use of services designed to treat disease complications translates into higher health care costs. As the population becomes more diverse with respect to age, culture, and language, having adequate health literacy skills has the potential to reduce health disparities.¹⁷

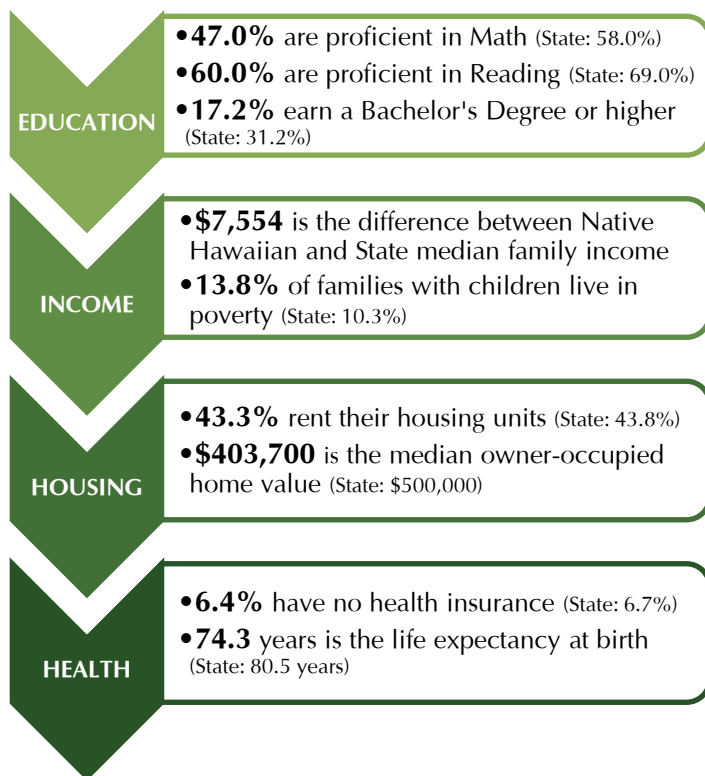
Health Literacy Skills¹⁷

- Having general health knowledge
- Filling out complex forms
- Seeking timely medical care
- Utilizing preventive services
- Providing consent
- Understanding instructions on medications
- Calculating premiums, copays, and deductibles to select health insurance plans

Cultural Integration in Health Services

Cultural integration in health services refers to health care that meets the social, cultural, and linguistic needs of patients. Successful cultural integration in health services requires incorporating traditional and contemporary knowledge and practices into patient care. Perception of health and illness are shaped by cultural factors such as methods of communication, expression of symptoms, coping styles, and willingness to seek treatment. In western cultures, illness is conceived as a pathological imbalance in the body, whereas Native Hawaiians view *ma'i* (illness) as a disruption in *lōkahi*. Native Hawaiians reference illness categories such as, *ma'i i kino* (body sickness), *ma'i i waho* (sickness from outside influences), or *ma'i ma loko* (sickness from within caused by quarrels in the family). Each sickness type warrants a different treatment regimen. It is important for providers to investigate the etiology of health issues Native Hawaiian patients may present to ensure proper diagnosis of symptoms. Providers who understand and respect these spheres of influence are better equipped to provide care that is respectful and responsive to patients' beliefs and values. Cultural integration in health services has the potential to reduce health disparities and produce favorable health outcomes.¹⁸⁻²⁰

Figure 1. Selected Native Hawaiian versus State Social Determinants of Health Indicators



Sources. Hawai'i Common Core Standards (HCCS), 2015. U.S. Census Bureau, 2014. Hawai'i Department of Business, Economic Development & Tourism, 2005.

MO'OMEHEU- CULTURE

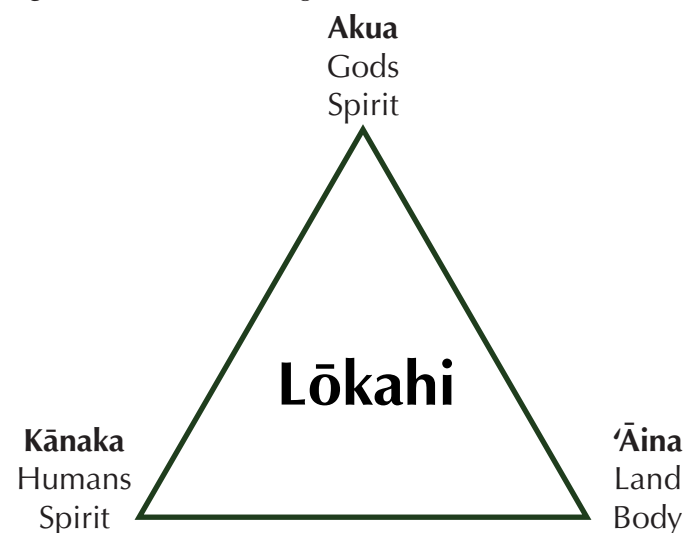


Native Hawaiian Health Philosophies

Native Hawaiian health encompasses *lōkahi*, *pono*, and *mana*. *Lōkahi* describes the unity between *akua* (gods), *kānaka* (humans), and *ʻāina*. *Pono*, or harmony, is maintained through proper thoughts, feelings, and emotions. *Ma'i* occurs when there is a disruption in *lōkahi* or *pono*, resulting in loss of *mana*. *Mana* refers to the life force found in all things animate and inanimate in the universe that connects *akua*, *kānaka*, and *ʻāina*.²⁴

Critical to Native Hawaiian health is *lōkahi*, or harmony with self and others. The three corners of the *lōkahi* triangle represent mind, body, and spirit. The connection between these three apices exists within the *na'au* (mind, heart, and affections), or the emotional center of the person.²⁵ Native Hawaiians understand the interconnectedness of *lōkahi* and thus treat the mind, body, and spirit as one. The presence of problems, conflicts, illness, or disease suggests dissonance in one or more corners of the *lōkahi* triangle. Restoring balance requires holistically healing all three corners.^{26, 27} **Figure 2** depicts the *lōkahi* triangle.

Figure 2. The *Lōkahi* Triangle



Adapted from Rezentes, 1996.

***Ua lehulehu a manomano ka
ʻikenā a ka Hawaiʻi.***

Great and numerous is the knowledge of the Hawaiians.
(Pukui, 1983, #2814)

Kāhuna (Native Hawaiian Health Practitioners)

Kāhuna (experts) served as medical providers for Native Hawaiians before the introduction of western medicine. *Kāhuna* specialize in various areas of healing practices.^{27, 28} Some of these healing practices are listed in **Figure 3**. Similar to contemporary medical doctors, *kāhuna lāʻau* (medical practitioners) spend a minimum of fifteen years studying and training in their specialty area, but often times train their whole lives. Sustaining these health practices will be difficult as there are an estimated 60–80 *kāhuna* in Hawaiʻi with an average age of 75.^{29–31}

Figure 3. Selected Hawaiian Health Specialties

Hawaiian Health Specialist	Definition
ʻAi Pono	Nutrition
Haʻihaʻi iwi	Chiropractor
Hāhā	Diagnostician
Hoʻohānau	Obstetrician
Lāʻau lapaʻau	Herbal medicine
Lomi lomi	Massage
Hoʻoponopono	Conflict resolution
Pahu	Surgeon
Pāʻaoʻao	Pediatrician

Sources: Handy, E. S. C., Pukui, M. K., & Livermore, K, 1993. Judd, 1998.
Note. This list is not exhaustive.

Hoʻoponopono

Lāʻau lapaʻau, *lomi lomi*, and *hoʻoponopono* are the predominant traditional healing modalities practiced today. *Hoʻoponopono*, or “to make right”, is a traditional healing practice that seeks to rectify imbalances within the family and spiritual world. *Hoʻoponopono* is a method of counseling and mediation used to resolve conflicts and maintain harmonious relationships. Proceedings are traditionally a family matter, unless a non-relative is involved in the *pilikia* (trouble). Either a *kāhuna lāʻau* or *kūpuna* is called upon to serve as the *haku* (mediation leader). A successful *hoʻoponopono* session requires participants to speak truthfully for healing to occur. During the period of discussion, family members air grievances and confess their transgressions. The process continues until there is repentance, restitution, and mutual forgiveness.^{27, 29, 31, 32}

Native Hawaiians understand health and wellness as balance between akua, kānaka, and ʻāina. Kāhuna train in various healing specialties and are responsible for restoring health.

‘ĀINA- LAND & WATER



Native Hawaiian Health and the Land

Native Hawaiian identity is rooted in the land and sea as expressed in the proverb, “*Ka mauli o ka ‘āina a he mauli kānaka*,” the life of the land is the life of the people.³³ From this, the land serves as a critical component in Native Hawaiian health, spirituality, and well-being. The land provides sustenance, spiritual strength, and political empowerment. Tending to the land signifies the physical relationship between people and earth, or *mālama ‘āina* (caring for the land). Like a family bond, the land reciprocates by caring for the people.³⁴

Physical Environment

The physical environment includes the earth’s natural features like air, water, natural vegetation, landform, and climate. The clearest connection between the physical environment and health is the use of natural elements for food and medicine. Native Hawaiians were skilled agriculturalists who developed irrigation systems for their wetland *kalo* (taro), engineered *loko i‘a* (fishponds), and understood how to enrich the soil to maximize production value. Native Hawaiians once exclusively survived off the resources of the physical environment and produced enough food to nourish a population estimated between 100,000 and 1,000,000.⁴ The introduction of foreign diseases reversed this notion. Subsequently, a surge in economic growth and development from trade and commerce marked not only the epidemiological transition from infectious to chronic diseases, but also to a heavy reliance on imported products. The once self-sufficient society now relies on an estimated 85–90% imported food products.³⁵

Organic agriculture produces products using methods that preserve the environment and avoids most synthetic materials like pesticides and antibiotics.³⁶ The principles of organic agriculture are closely aligned with traditional Hawaiian farming practices of sustainable food production. Organic agriculture seeks to enhance the physical environment and natural resources to produce foods of high nutritional value; reduce dependence on non-renewable resources; minimize adverse impacts on food safety, water quality, and wildlife; increase food security; and restore economic self-sufficiency.³⁷

Built Environment

The built environment is the part of the physical environment constructed by human activity. The built environment consists of urban design, land use, zoning patterns, and transportation systems. Some examples of the built environment include homes, buildings, streets and highways, public transportation, parks, and open spaces. The design of the places where we live, play, and work affect patterns of living that can facilitate or hinder the adoption of healthy behaviors.^{38, 39}

After thirty years of building westward on O‘ahu, development trends are shifting back east towards urban Honolulu. **Figure 4** depicts the Kaka‘ako skyline, the epicenter of urban development on O‘ahu. There is growing recognition that land use planning and health are linked. However, planning authorities have traditionally prioritized economic development and environmental stewardship over health promotion in urban design. Likewise, public health officials concentrate on providing direct health care services and prevention services rather than constructing healthy environments. Lack of coordination between planning and health authorities can create structural limitations that work against health.⁴⁰

Figure 4. Kaka‘ako Skyline



Source. Demography, 2015.

‘Ewa, O‘ahu; Wailuku, Maui; and Hakalau, Hawai‘i are examples of places with urban sprawl, or expansion of an urban area into surrounding regions. Urban sprawl is characterized by segregated land use areas, low density land use, architectural homogeneity, and heavy reliance on automobiles. Sprawling communities limit the opportunity for active modes of transportation like biking or walking. The propensity for active travel decreases when neighborhood facilities are in inconvenient locations or separated by great distances. Beyond accessibility, connectivity of routes, quality of sidewalks, and safety are other important components of the pedestrian and cycling environment.^{40, 41}

The social, service, and economic characteristics of a neighborhood can also affect health. Close proximity to parks, schools and after-school programs, retailers, employment, as well as medical facilities provides convenient access to frequented destinations. In contrast, residents living in neighborhoods with busy streets, high crime rates, polluted beaches, and numerous convenience stores and fast food establishments face greater obstacles to make health-promoting choices. Exposure to neighborhood disadvantage in early childhood has profound effects that can continue into adolescence and adulthood. Differences in the quality and availability of resources across neighborhoods can create or exacerbate health disparities along the socio-economic gradient.^{42, 43}

The land is central to Native Hawaiian health, spirituality, and well-being because the land provides sustenance, spiritual strength, and political empowerment. The physical constructs of the land, or built environment can also affect health.

EA- GOVERNANCE



Maintaining good health requires utilization of not only medical resources, but also social, financial, and personal resources. Thus, a diversity of stakeholders from areas outside of health care should be involved in cross-collaborative efforts to prevent, address, and resolve the concerns that contribute to poor health in the communities they serve. An overlapping intervention point for improving health promotion is at the government level.^{44–46}

Government policy establishes standards and regulations to ensure that the environments in which people, live, play, and work are conducive to good health. In 2015, the State of Hawai‘i took a stand against tobacco use by adding electronic cigarettes as restricted items to locations where smoking is illegal and became the first State in the country to outlaw smoking for anyone under twenty-one years old.^{47, 48} These new laws have the potential to decrease smoking rates among Native Hawaiian *keiki* and *‘ōpio*, who had the highest current tobacco use among the other four major race/ethnicities (Caucasian, Chinese, Filipino, and Japanese) in 2013.⁴⁹ Increasing the legal smoking age creates healthy conditions to decrease exposure, access, and vulnerability to tobacco products.⁵⁰ This is especially significant because tobacco use is the leading preventable cause of disease, disability, and death in the United States.⁸ Policy change is a difficult but effective method of improving population health because it renders change at the broader societal level. In the following scenario, Moani deals with several institutional barriers impacting her and her baby’s health.⁵⁰

Moani’s Experience with the Social Determinants of Health

Baby Kaleo was born eight weeks early, weighing two pounds. Kaleo’s eighteen-year-old mother, Moani grew up in an *‘ohana* where high-fat meals and smoking were the norm. Moani decided to forego college in order to make ends meet and lives with her *makuahine* and *tūtū* (grandmother) in Anahola, Kaua‘i. Moani works at a local fast-food establishment that pays minimum wage and provides free meals to employees at the end of their shifts. While pregnant she consumed more high-fat, high-salt foods to nourish her fetus and developed pre-eclampsia. Getting regular exercise was difficult because her workplace was located in a high crime neighborhood, inaccessible by public transportation, and lacked sidewalks. When Moani became pregnant she quit smoking, but was still exposed to second-hand smoke at home. The recently enacted law banning smoking for people under twenty-one years old provided further impetus for change in Moani’s personal behaviors.

Moani had health insurance coverage from her *makuahine* because she is under twenty-six years old. Despite having health insurance, accessing health care was difficult. There was no obstetrical care available in Anahola able to accommodate her complex pregnancy. The closest facility was located a thirty minute car drive away in Līhu‘e. Since Moani was dependent on *tūtū* for rides, she missed several prenatal care appointments that conflicted with her and *tūtū*’s work schedules. Unable to control her blood pressure, baby Kaleo was born prematurely with cognitive deficits. The educational system could not provide Kaleo with the individual educational support he needed to thrive and he eventually dropped out of school at sixteen.

Advocacy and Public Policy

As part of its mandate to advocate for Native Hawaiians, OHA assesses the policies and practices of other agencies impacting Native Hawaiians by providing legal and policy compliance review, assessment, and corrective action services to OHA’s top leadership, allowing the organization to take proactive steps when organizations interpret or implement laws in ways that may harm the Hawaiian community or may not be in its best interest. Each year OHA submits a package of proposed bills to the Hawai‘i State Legislature. OHA’s Board of Trustees also votes to take positions on a variety of legislation impacting the Hawaiian community.⁵¹

Social Determinants of Health Planning (Act 155)

In 2014, the Hawai‘i State Legislature amended the State Health-Planning Statute for the first time in nearly 30 years, modernizing the existing law so that it is aligned with best practices in health planning. The amendment seeks to accomplish three things including:

- Allow state agencies to plan and invest resources to eliminate health disparities by addressing the social determinants of health;
- Align state policy with federal policy codifying the federal government’s commitment to improve Native Hawaiian health; and
- Specifically address the health disparities of Native Hawaiians, other Pacific Islanders, and Filipinos.⁵²

Nā Limahana o Lonopūhā

Nā Limahana o Lonopūhā, the Native Hawaiian Health Consortium, is an integrated network of leading senior executives and health care providers committed to addressing the status of Native Hawaiian health throughout the State of Hawai‘i. This consortium proposes progressive models of culture and research-based methods in implementing prevention and treatment programs focused on systemic outcomes among the various levels of Native Hawaiian health and wellness. The consortium comprises private, non-profit, state, academic, community health centers and community-based providers with direct and indirect services throughout Native Hawaiian communities. This collaborative network is established to exemplify a multi-level approach to improving Native Hawaiian health outcomes in the 21st century, specifically as those outcomes relate to chronic diseases.⁵³

HO'ONA'AUAO- EDUCATION

Traditional Native Hawaiian education is regarded as a highly spiritual process designed to train *haumāna* (students) in occupation-specific roles. *Haumāna* acquire mana as they progress in their training. *Mana* is a power bestowed from the gods that can be inherited, enhanced, or lost. Hawaiian scholar Mary Kawena Pukui refers to *mana* as the ultimate personal possession that carries an obligation to improve upon talents. For example, the *kāhuna lā'au lapa'au* can transmit *mana* from healing plants to ill patients, but would lose this ability if they neglect their patients.^{32, 54} This example describes practical learning opportunities as a hallmark of traditional Native Hawaiian education.

Educational Attainment and Health

In contemporary times, education shifted from occupation-specific knowledge to education on a breadth of topics. The health benefits of early childhood education extend from the first years of life to adulthood. As of the 2014–2015 school year, children in Hawai'i who are 5 years old must attend kindergarten. Besides the home, schools are the ideal place to promote health because they reach most children for an extended period. In the short-term, early education improves health because children are more likely to have an ongoing source of health care. All public and private school students in Hawai'i must meet health examination and immunization requirements.^{11, 55, 56}

The long-term effects of education on adult health include improved cognitive development, improved social-emotional development, and general health knowledge. Improved cognitive development is associated with greater academic achievement, which translates into better employment opportunities and higher earning potential.^{57, 58} Improved social-emotional development is associated with decreased propensity for risk-taking, stress, absenteeism from school, and self-regulation. General health knowledge informs students of health promoting and risky behaviors. High educational attainment predisposes the recipient to a higher health trajectory. These individuals report lower chronic and acute disease burden, independent of basic demographic and employment indicators.⁵⁹



16.2%

Percent of resident Native Hawaiian mothers in Hawai'i who had live births in 2013 were college graduates.⁶⁰

The lowest percentage of all race/ethnicities.

Parents' Educational Attainment

Parents' educational attainment can influence their children's health status and development beginning early in life. This is seen in the correlation between maternal post-secondary education completion and infant mortality.⁶¹ In 2013, 16.2% of resident Native Hawaiian mothers in Hawai'i who had

live births were college graduates, the lowest percentage in comparison to other race/ethnicities. In the same year, the infant mortality rate was 5.8 (per 1,000 live births).⁶⁰ Native Hawaiians had the second-highest infant mortality rate after Caucasians. Parents with lower educational attainment often face greater obstacles in providing healthy home environments for their children due to limited time, money, and resources. This can affect children's educational prospects through the quality of schools in lower-income neighborhoods. Children growing up in these environments are more likely to follow similar pathways as their parents, perpetuating an intergenerational cycle of low educational attainment and health disparities.^{55, 62}

Health Sciences Degree Attainment

With more people expected to seek regular health care from expanded health insurance coverage across the United States, there is a corresponding demand for personnel to provide those services. In 2014, Hawai'i had a shortage of 889 physicians.⁶³ Primary care was the specialty with the greatest shortage, especially on the neighbor islands. This problem is further exacerbated with a maldistribution of physicians practicing in urban O'ahu, forcing residents to commute from rural areas or the neighbor islands to obtain care. This difficulty in accessing care is reflected in the higher rates of Native Hawaiian emergency hospitalizations on the neighbor islands for both acute and chronic conditions.⁶⁴ Educating future health care professionals in the communities they plan to serve has the potential to improve access to high quality care as providers may be able to better tailor interventions in accordance with the patient's beliefs.^{65, 66} Figure 5 depicts selected 2013–2014 post-secondary health sciences degree attainment in the University of Hawai'i System (Hilo, Mānoa, and West O'ahu) for Native Hawaiians and overall student population. Only 13.1% of students earning health sciences degrees were Native Hawaiian.⁶⁷

3.4%

Percent of 2,860 FTE physicians in Hawai'i who were Native Hawaiian in 2010.⁶⁶

Figure 5. 2013–2014 University of Hawai'i Post-Secondary Degree Attainment in the Health Sciences

Degree	Native Hawaiian	All
Medicine (MD)	3	62
Nursing (BS, MS, DNP, PhD)	49	381
Pharmacy (BS, MS, Pharm.D)	10	164
Psychology (BA/BS, MS, DNP, PhD)	40	345
Public Health (MPH, MS, DrPH, PhD)	6	31
Social Work (BS, MSW, PhD)	39	139

Source. UH IRO, 2015.

Education impacts health through: improved cognitive and social-emotional development, greater general health knowledge and employment opportunities, and higher income potential.

HO'OKAHUA WAIWAI- ECONOMIC SELF-SUFFICIENCY

Native Hawaiians were once economically self-sufficient and survived off the land's natural resources. Persons with access to *wai* (fresh water) were regarded as wealthy because of *wai*'s centrality to agriculture and aquaculture. The Hawaiian word for wealth, *waiwai*, is derived from the word *wai* for water. Water symbolized bounty for the Hawaiian planter because crops such as *kalo* depended on water for productivity. In modern times, ownership of *wai*'s scarce counterpart, *'āina*, signifies wealth.^{32, 68}

Living in Hawai'i poses a great challenge for not only Native Hawaiians, but all residents because of the high cost of living. With the nation's highest food and electricity costs, householders make difficult choices of having to select which bills get paid every month.⁶⁹ Homes without electricity cannot keep refrigerated medicines or fresh produce. Parents working long hours may be exhausted from working a long shift to cook nutritious meals and instead rely on cheap high-calorie meals. Individuals without health insurance cannot receive preventive services or seek care when they fall ill. Families unable to pay monthly mortgages or rent are left to move in with other family members or seek other shelter, creating crowded living spaces. The closest primary care physician may be an hour bus ride away, making the visit costly and time-consuming. With barely enough financial resources for daily living expenses, planning for the future becomes nearly impossible, leaving people with the ability to only respond to urgent needs.



20.5%

Percent of Native Hawaiian households that received Supplemental Nutrition Assistance Program (SNAP) benefits in 2013 as compared to 11.3% of households in the State.²²

Income

Income represents a person's material resources. Components of income can include a combination of the following: employment, government assistance, dividends or interest from investments, child support, alimony, deferred compensation, and pensions. Over a person's lifetime, income can fluctuate with notable decreases in significant life events such as job loss, disability, retirement, or economic downturns. Therefore, income relates to health through expenditures on material resources necessary for health and well-being. The mechanisms in which income can influence health include purchasing shelter, nutritious food, safe transportation, leisure activities conducive to health, and educational expenses.^{70, 71}

Income acts as an enabler or barrier to the other social determinants of health. Generally, people with higher incomes experience better health outcomes than those with lower incomes. A decent and secure income allows families to access health promoting resources.



87.8%

Percent Native Hawaiian women earned in comparison to their male counterparts in 2013.²²

Figure 6 shows selected income indicators from the 2013 American Community Survey. Native Hawaiian women earned 87.8% of Native Hawaiian male earnings, 4.5% higher than the State's ratio of 83.3%.²² Equal pay is not a women's issue, but a family issue. Nearly a quarter of Native Hawaiian mothers are solely responsible for financially supporting their families. Narrowing the pay gap requires active participation in society, control over household and financial resources, high educational attainment, and executive and managerial opportunities. These pathways can improve the health of women as they are more likely to have fewer and healthier children, more likely to access health care services, and less likely to suffer domestic violence.^{70, 72}

Figure 6. Income Indicators

Indicator	Native Hawaiians	State
Median Household Income	\$65,688	\$68,020
Median Family Income	\$72,762	\$80,316
Per Capita Income	\$20,472	\$29,577
Median Male Earnings	\$41,821	\$48,440
Median Female Earnings	\$36,707	\$40,370

Source: American Community Survey, 2013.

Poverty

Poverty is characterized by the chronic deprivation of resources, capabilities, choices, security, and power necessary for an adequate standard of living.⁷³ Persons with lower socio-economic status tend to experience poorer health in comparison to those in favorable circumstances. Poverty diminishes the opportunity to obtain healthy foods, safe housing, sanitation, education, employment, and medical care.



13.8%

Percent of Native Hawaiian families with related children less than 18 years who lived in poverty in 2013 in comparison to 10.3% of the State.²²

HO'OKAHUA WAIWAI- ECONOMIC SELF-SUFFICIENCY (CONTINUED)

Employment

For many, employment provides the main source of income and avenue in which people get health insurance. In Hawai'i, employees working more than twenty hours a week for four consecutive weeks and earning a monthly wage greater than \$628.36 are eligible for health insurance benefits. Health insurance provides protection from financial risks in the event of illness or injury. Depending on the employer, employees may also be entitled to work-related resources such as paid sick and personal leave, workplace health promotion programs, and retirement benefits.^{74, 75}

The most common occupation among Native Hawaiian men was in construction while office and administrative jobs were the most common occupation among Native Hawaiian women. **Figure 7** shows the top five occupations among Native Hawaiians by gender from 2006–2010. Four of five occupations for men are physically demanding and can put workers at higher risk for injuries. In contrast, women worked in sedentary jobs, allowing for limited opportunities for movement or exercise.⁷⁶

Figure 7. Native Hawaiian Occupations by Gender

Native Hawaiian Males		Native Hawaiian Females	
Occupation	Est.	Occupation	Est.
Construction	10,760	Office & Administrative	15,406
Transportation	4,928	Sales	8,053
Office & Administrative	4,046	Education	5,393
Grounds Cleaning & Maintenance	3,978	Food	4,758
Installation, Maintenance, & Repair	3,711	Management	4,337

Source. 2006–2010 American Community Survey Selected Population Tables. C24010: Sex by Occupation for the Civilian Employed Population 16 Years and Over.


4,124
Women

**Number of
Native Hawaiians
in healthcare
occupations from
2006–2010.⁷⁶**


1,094
Men

Note. Includes health diagnosing and treating practitioners and technical occupations, health technologists and technicians, and healthcare support occupations.

2013 Native Hawaiian Median Monthly Housing Costs in Hawai'i⁷²



\$1,960

The median monthly mortgage.

\$1,274

The median monthly gross rent.

In addition to having the nation's highest food and electricity costs, Hawai'i also has high housing costs. Hawai'i has the nation's second-highest median monthly mortgage of \$1,960 and highest median gross rent of \$1,414. The Department of Housing and Urban Development (HUD) defines affordable housing as paying no more than 30% of income on gross housing and utility costs. Households spending over the 30% threshold often have insufficient funds for other living expenses. In 2013, 39.5% of Native Hawaiian home owners and 51.2% of renters paid over 30% of their gross income on housing.^{72, 76, 77}

Affordable housing has the potential to improve health by freeing up family resources to satisfy other essential needs. High housing costs force too many families to choose between eating nutritious food, making bill payments, or postponing needed health care. A period of unemployment or unexpected expense like an emergency room bill can threaten housing stability and lead to eviction or homelessness. Housing availability and affordability force many Native Hawaiian families to double-up with others to live in crowded living spaces. While living with extended family can provide social support, crowding has been linked with stress and respiratory and infectious diseases. Inhalation or exposure to toxins such as pesticides, mold, asbestos, lead, radon, and carbon monoxide can put residents at risk for injury, asthma, and poisoning. Unstable housing can jeopardize children's performance in school because they lack a stable home environment. A stable home provides families with a sense of privacy, stability, and control, which can improve health outcomes.^{77–80}

The physical design of homes can also affect health. Stairs, slippery floors, and lack of grab bars increase the risk for unintentional injuries. Falls at home are the leading cause of fatal and non-fatal injuries among *kūpuna*. Aging in place is usually the most affordable option for *kūpuna* on fixed incomes, but their homes may not be designed for their needs. In 2013, 40.5% of non-institutionalized civilian Native Hawaiian adults age 65 years and older had a disability and 5.7% lived in poverty.²² Alternative housing options such as nursing homes, long-term care facilities, and assisted living homes are not only costly, but also reduce independence.^{78, 80, 81}

Affordable housing has the potential to improve health by freeing up family resources to satisfy other needs.

MAULI OLA- HEALTH



Healing Places

Native Hawaiians recognize specific places and natural resources as having special healing powers. *Wahi pana* (legendary place) are visited during significant events of the life cycle, from conception to birth, times of celebration and difficulty, and death. Kūkaniloko is a sacred *wahi pana* on the island of O‘ahu that served as a place of chiefly births during ancient times. Kūkaniloko contains birthing *pōhaku* (stone) credited with having special healing powers to absorb pain. Following the child’s birth, the *piko* (umbilical cord) may have been left at Kūkaniloko. The practice of returning the *piko* to the land signified the child’s connection to their ancestral homeland. Native Hawaiians believed the *piko* absorbed the *mana* from the *pōhaku*. This *mana* provided the child with good health and spiritual strength.^{82–84}

Nā Piko ‘Ekolu

Nā piko ‘ekolu literally translates into “three umbilical cords.” Metaphors are prominently featured in the Hawaiian language, thus *nā piko ‘ekolu* (three body points) expresses multiple meanings. *Nā piko ‘ekolu* symbolizes a person’s spiritual connection to their past, present, and future. These relationships are inseparable and essential to good psychological health.^{32, 54, 83–85} Other symbolic, figurative, physical, spiritual, and metaphorical meanings of *nā piko ‘ekolu* are shown in **Figure 8**.

Figure 8. Nā Piko ‘Ekolu

Meaning Type and Description	Nā Piko ‘Ekolu (Three body points)		
	Piko ‘Aumākua (Ancestors or heritage)	Piko ‘Iewe (Immediate family)	Piko ‘Iwi Kuamo‘o (Descendants)
Symbolic The spiritual and emotional bonds between family members.	‘Aumākua (ancestors), Kūpuna (grandparents)	Mākua (parents)	‘Ōpio (youth), Keiki (children)
Figurative The connection that spans generations.	Wā mamua (past)	Kēia ao (present)	Ka wā mahope (future)
Physical The physical representation on the human body.	Po‘o (head)	‘Iewe (placenta)	‘Iwi kuamo‘o (reproductive organs)
Spiritual The actions required to maintain good psychological health.	Mālama ‘āina (caring for the land) by honoring sense of place and relationships with ‘aumākua	Maintain familial relationships and bonds	Transmit Hawaiian culture, language, values, and knowledge to future generations
Metaphorical The parts of the kalo plant illustrate the contexts that contribute to the social determinants of health.	Huluhulu (roots)	Hā (stalk)	‘Ohā (shoots)

Sources. Blaisdell, 1997. Pukui, Haertig, & Lee, Vols. I & II, 1972. Becker & Vanclay, 2003.

Kalo

Kalo (*Colocasia esculenta* (L) Schott) is a canoe plant that was introduced by Polynesians to Hawai‘i. Native Hawaiians expertly cultivated *kalo* as a dietary staple. *Kalo* was the central crop of Hawaiian agricultural society because of its cultural, economic, political, and spiritual significance. At the peak of *kalo* production, over 300 varieties were planted across 20,000 acres (31 square miles).^{86, 87} Today, there are less than a hundred Hawaiian *kalo* varieties in existence. In 2011, approximately 450 acres or 0.04% of all farm acreage in Hawai‘i was used for *kalo* production.⁸⁷



450 Acres

Acres used for *kalo* production in Hawai‘i in 2011. This is equivalent to the acreage in the Kaka‘ako Mauka region, bordered by Ala Moana, Punchbowl, South King, and Pi‘ikoi streets.^{87, 88}

MAULI OLA- HEALTH (CONTINUED)

Kalo (Continued)

The origin of *kalo* is rooted in the genealogies of Papahānaumoku (Earth Mother) and Wākea (Sky Father). Hāloa (everlasting breath) was the first human descendant of Papahānaumoku and Wākea and younger brother of Hāloanaka (quivering long stalk). Hāloanaka was born prematurely and died but Hawaiians recognize him as Hāloa's elder brother. The first *kalo* plant grew in the spot where Hāloa's elder brother was buried. Hāloa ate from the *kalo* plant. Thus, *kalo* is regarded as not only a staple food, but also as progenitor of the Hawaiian people.⁸⁹

Kalo is used as a metaphor to describe the connection to family and represents a common ancestral bond to Hāloa. Pukui writes, "Members of the 'ohana, like the taro are all from the same root."²⁰ The word 'ohana comes from the root word 'ohā (shoots). The 'ohā derives its strength and stability from the *huluhulu* (roots), just as a person traces their roots to their 'aumākua and kūpuna. *Hā* (stalk) comes from Hāloa and represents the connection between generations, or *mākua*. *Hā* carries another metaphorical definition, meaning the breath of life. Replanting the *hā* marks the renewal of life into 'ohā or *keiki*. The place where the stem and leaf meet is called the *piko*, or connection to the past, present, and future.^{32, 90}

Nā Piko 'Ekolu Conceptual Model

Figure 9 depicts the conceptual model for the social determinants of health using the *kalo* plant to illustrate *nā piko 'ekolu* concept. The model represents the interplay of individual, relational, and structural variables that contribute to the social determinants of health for Native Hawaiians. The purpose of the conceptual model is to: identify social determinants of health; identify sources of health disparities; explore direct and indirect mechanisms that impact health; illustrate relationships between determinants; incorporate Native Hawaiian ideologies of health and wellness; and map potential entry points for targeted interventions and policy. The factors listed are neither deterministic nor claiming that the factors listed are the only factors relevant to the social determinants of health. The model

rather highlights the critical components most relevant to Native Hawaiians.^{32, 54, 84, 91–93} When discussing the social determinants of health for Native Hawaiians, it is important to integrate *nā piko 'ekolu* to sustain the essence of Native Hawaiian well-being.

- The *huluhulu*, or *piko 'aumākua*, lies deep in the ground drawing nutrients from the environment. Beneath superficial layers, *huluhulu* span great lengths providing an anchor to the earth and 'aumākua. Although *huluhulu* remains unseen, it is the source of enduring strength and foundation for healthy growth just as culture and history provide a sense of identity. *Kalo* can grow upwards only when connection to *piko 'aumākua* is maintained.
- The *hā*, or *piko 'iwe* stands above ground providing stability for the plant. The *hā* serves as a buffer, protecting the plant from harsh conditions just as parents do for their children. Differential exposure to water, soil, and sun can positively or negatively impact the *kalo's* health. Similarly, differences in political or socio-economic structures can generate social stratification in society, engendering health damaging or promoting conditions. Social stratification describes how society is stratified based on level of education, occupation, income, and fixed social conditions.
- The presence of 'ohā, or *piko 'iwi kuamo'o*, signifies the plant's overall vitality. 'Ohā cannot grow unless both *huluhulu* and *hā* are firmly planted in the ground just as *keiki* need guidance from *mākua* and *kūpuna*. Thus, the 'ohā represents the personal and interpersonal circumstances that individuals have direct control over.
- The *piko*, or *nā piko 'ekolu* resides in the center of the *pu'uwai* (heart) shaped leaf. The *piko* connects all members and generations of the 'ohana through deeply rooted spiritual, emotional, mental, and physical bonds. The strength of these bonds in turn determines overall health and wellness.

SUMMARY

Social determinants of health are the complex and interconnected structures, circumstances, environments, institutions, and systems that contribute to or harm health. Incorporating a holistic approach to health and well-being via the social determinants is consistent with both the Native Hawaiian view of *mauli ola* and leading health organizations. Addressing the social determinants of health has the potential to not only improve health, but also provide equal opportunity to lead a healthy, fulfilling, and productive life.

Mana is our legacy. Maui ola is our destiny.

Impacts of the Social Determinants of Health on:

MO'OMEHEU- strong Hawaiian identity among Native Hawaiians that balances economic, environmental, social, and cultural wellness;
'ĀINA- environmental stewardship of natural resources and community infrastructure that facilitates active lifestyles;
EA- advocating for policy that affects health directly or indirectly by enacting structural change;
HO'ONA'UAO- increase knowledge and skills to facilitate healthier behaviors and better employment opportunities;
HO'OKAHUA WAIWAI- employment that provides fair wages, benefits, and opportunities for advancement; and housing that is safe, affordable, and secure; and
MAULI OLA- physical, spiritual, mental, and emotional balance of the individual, family, and community.

MAULI OLA- HEALTH (CONTINUED)

Figure 9. Nā Piko 'Ekolu

NĀ PIKO 'EKOLU

Piko

Health

Physical
Emotional
Spiritual
Mental

Dimensions

Mortality
Morbidity
Physical Functioning
Well-being

PIKO 'IWI KUAMO'O

'Ohā

Personal/ Interpersonal

Family Structure
• Composition, size,
generation, marital status

Material Circumstances
• Housing, neighborhoods,
physical & built environments

Modifiable Behaviors
• Diet, exercise, smoking, drinking,
drug use, sexual activity

Psychosocial Circumstances
• Life events, stress

Community Network
• Religious affiliations, social
institutions & support

Acculturation

PIKO 'AUMĀKUA

Huluhulu

Cultural

Values

Mo'olelo (stories & traditions)

Language

'Āina (land)

Wai (fresh water)

Historical

Ali'i (chiefs)

Introduction of

Foreign Diseases

Land Privatization

Statehood

PIKO 'IEWE

Hā

Political

Governance

Social/Public Policy

• Civil institutions

Social Justice

• Human rights, racism

Power & Prestige

Health System

• Access & quality of care

Socio-Economic

Education

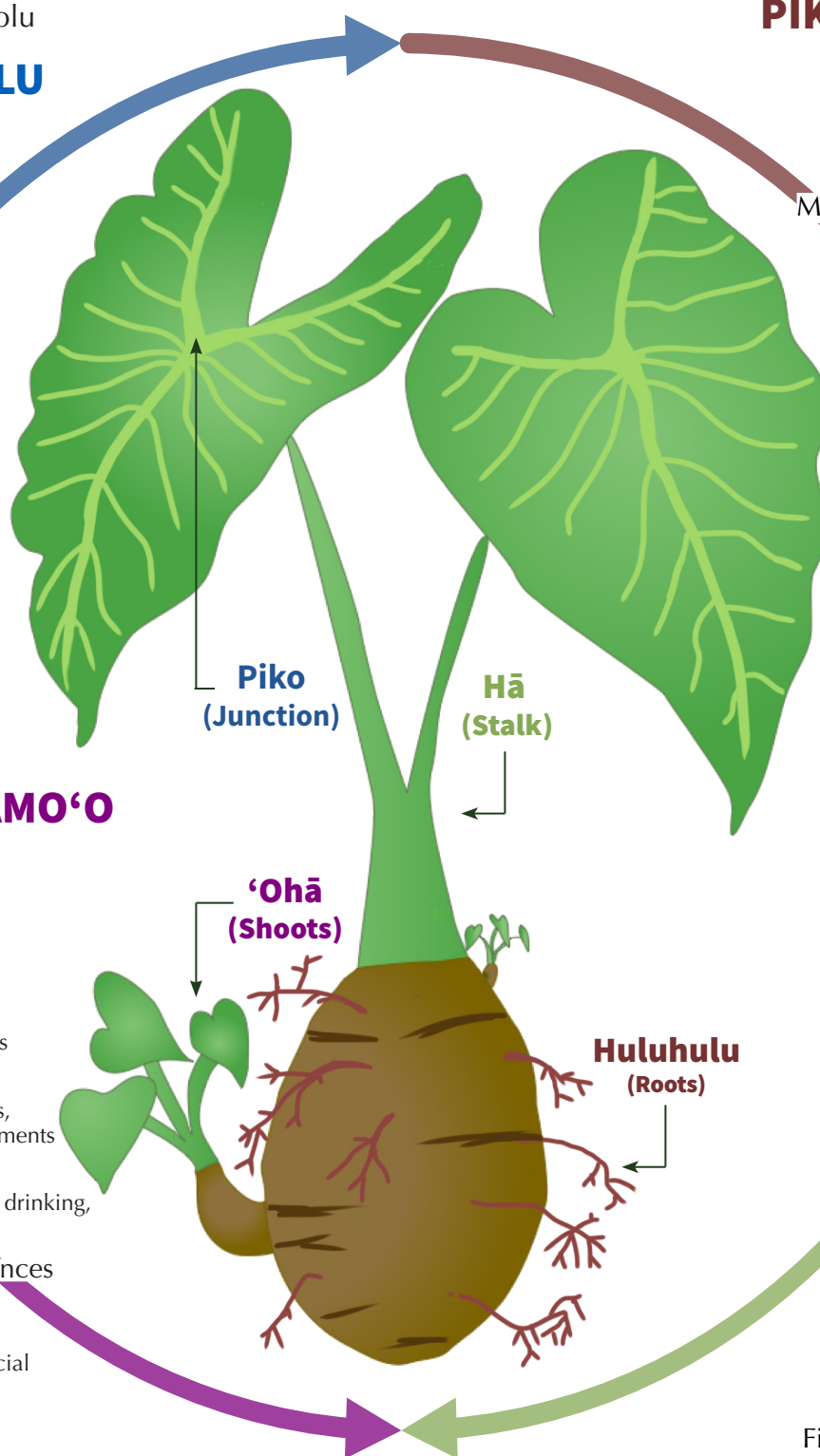
Occupation

Income

• Poverty, wealth

Fixed Social Conditions

• Age, race/ethnicity, sex, disability,
sexual orientation



Adapted from OHA, 2011. Commission on the Social Determinants of Health, 2008.
McGovern, Miller, & Hughes-Cromwick, 2014.

TERMS



Active Travel: Method of transportation that focuses on physical activity (walking or cycling) as opposed to sedentary forms (driving or riding the bus).

Affordable Housing: Housing for which occupants pay no more than 30% of their income on gross housing costs and utilities (HUD).

Built Environment: The part of the physical environment constructed by human activity.

Chronic Disease: Noncommunicable disease of long duration, slow progression, and rarely cured completely.

Cultural Integration in Health Services: The ability of health care providers to deliver care that meets the social, cultural, and linguistic needs of patients (CDC).

Educational Attainment: The level or number of years of schooling a person has completed.

Family: A family consists of a householder and one or more other persons living in the same household who are related to the householder by birth, marriage, or adoption. All persons in a household who are related to the householder are regarded as members of his or her family. A household can contain only one family for purposes of census tabulations. Not all households contain families since a household may comprise a group of unrelated persons or one person living alone (U.S. Census Bureau).

Family Income: In compiling statistics on family income, the incomes of all members 15 years old and over in each family are summed and treated as a single amount (U.S. Census Bureau).

Health Disparities: The difference in the incidence, prevalence, mortality, and the burden of health conditions between population groups.

Health Literacy: The ability to access, process, and comprehend health information (HHS).

Household: A household includes all the persons who occupy a housing unit. A housing unit is a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. The occupants may be a single family, one person living alone, two or more families living together, or any other group of related or unrelated persons who share living arrangements (U.S. Census Bureau).

Household Income: Includes the income of the householder and all other persons 15 years old and over in the household, whether related to the householder or not. Because many households consist of only one person, average household income is usually less than average family income (U.S. Census Bureau).

Infant Mortality Rate: The number of infant deaths per 1,000 live births.

Land Use: The functional dimension of land for different purposes and

activities. Land use categories include: residential, industrial, recreational, and environmental protection (Barton, 2009).

Live Birth: The complete expulsion or extraction from its mother of a product of conception that did, after the complete expulsion or extraction from its mother, breathe or show any other evidence of life such as beating of the heart, pulsation of the umbilical cord, or movement of voluntary muscle, whether or not the umbilical cord was cut or the placenta attached (§338-1, HRS).

Native Hawaiian: “any individual who is a descendant of the aboriginal people who, prior to 1778, occupied and exercised sovereignty in the area that now constitutes the State of Hawai‘i” (U.S. Public Law 103–150).

Organic Agriculture: Produces products using methods that preserve the environment and avoids most synthetic materials like pesticides and antibiotics (USDA).

Pre-eclampsia: A condition presented by dangerous hypertension, weight gain, etc. in late pregnancy that may develop into convulsive eclampsia if untreated.

Primary Care: Basic health care services that includes health promotion, disease prevention, health maintenance, patient education and counseling, referrals to specialty providers, and diagnosis and treatment of acute and chronic illnesses (Public Health Service Act).

Social Determinants of Health: The complex structures, circumstances, environments, institutions, and systems that contribute to or harm the health of individuals and communities. Social determinants of health are shaped by cultural, political, environmental, social, and economic conditions (Commission on Social Determinants of Health).

Social Stratification: Describes how society is stratified based on level of education, occupation, income, and fixed social conditions.

Per Capita Income: Per capita income is the mean income computed for every man, woman, and child in a particular group. It is derived by dividing the total income of a particular group by the total population in that group (excluding patients or inmates in institutional quarters) (U.S. Census Bureau).

Physical Environment: The part of the environment that includes natural elements such as air, water, natural vegetation, landform, and climate.

Socio-Economic Status: Measures an individual’s economic or social position in relation to others based on education, occupation, and income (CDC).

Urban Sprawl: The expansion of an urban area into surrounding regions.

Vital Statistics: The collection of vital statistics data including births, deaths, and marriages is coordinated by the Office of Health Status Monitoring in the State of Hawai‘i Department of Health.

Hawaiian Terms⁹⁴

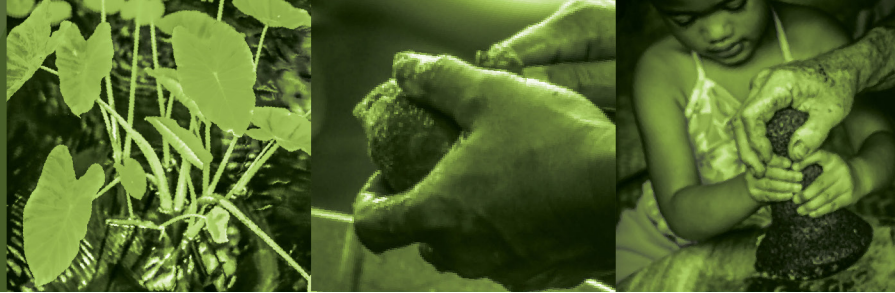
ahupua‘a: land division
‘āina: land
akua: gods
ali‘i: chief
‘aumākua: deified ancestors
ea: governance
hā: stalk
haku: mediation leader
hāpai: pregnant
haumāna: students
ho‘okauhua: gestation
ho‘okahua waiwai: economic self-sufficiency
ho‘ona‘auao: education
ho‘oponopono: conflict resolution
huluhulu: roots
‘iewe: placenta

‘iwi kuamo‘o: reproductive organs
kāhuna: experts
kāhuna lā‘au: medical practitioners
kalo: taro
kānaka: humans
kapu: sacred restrictions
ka wā mahope: future
kēia ao: present
keiki: children
keiki li‘ili‘i: early childhood
kūpuna: older adults, grandparents
lā‘au lapa‘au: herbal medicine
lōkahi: unity
loko ‘ia: fishponds
lomi lomi: massage
ma‘i: illness
ma‘i i kino: body sickness

ma‘i i waho: sickness from outside influences
ma‘i ma loko: sickness caused by quarrels in the family
makai: towards the ocean
mākua: adults, parents
makuahine: mother
mālama ‘āina: caring for the land
mana: sacred life force
mauka: towards the mountain
mauli ola: health
mo‘olelo: story, tradition
mo‘omeheu: culture
na‘au: mind, heart, and affections
nā piko ‘ekolu: three body points
‘ohā: shoots
‘ohana: family

‘ōpio: youth
piko: umbilical cord
piko ‘aumākua: ancestors or heritage
piko ‘iewe: immediate family
piko ‘iwi kuamo‘o: descendants
pilikia: trouble
pōhaku: stone
pono: harmony, balance
po‘o: head
pu‘uwai: heart
tūtū: grandmother
wā mamua: past
wahi pana: legendary place
wai: fresh water
waiwai: wealth

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