

Papa Ola Lōkahi

E OLA MAU A MAU

THE NEXT GENERATION OF NATIVE HAWAIIAN HEALTH

ORAL HEALTH REPORT

E OLA MAU A MAU – THE NEXT GENERATION OF NATIVE HAWAIIAN HEALTH

Copyright © 2019. Papa Ola Lōkahi. All Rights Reserved.

No part of this report may be reproduced or transmitted in whole or in part in any form without the express written permission of Papa Ola Lōkahi.

Suggested Citation:
Papa Ola Lōkahi. (2019). E Ola Mau A Mau – The Next Generation of Native Hawaiian Health. Honolulu, HI: Papa Ola Lōkahi.

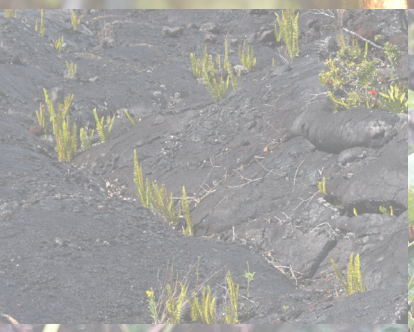
For the electronic version and additional resources on Hawaiian health and well-being please visit: www.papaolalokahi.org





















Chapter Five:
Oral Health

ORAL HEALTH

Mikako Deguchi, Emi Eno Orikasa
Nancy Partika, Ciera Pagud, Kim Puente, Malia Tector-Agustin

Executive Summary

Increased Understanding

There has been increased research over the last 30 years, with more scholarly publications and increased interest in and understanding of oral health needs.

- Oral health affects the ability to eat and enjoy a full range of dietary choices. It also affects speech, communication, socializing, general health (diabetes and cardiovascular diseases), sleep, general well-being, learning, and employment.
- Vulnerabilities and risks for oral health diseases have changed over time. Oral health inequity persistently affects Native Hawaiian adults and children.
- Financial barriers are one of the primary reasons that patients are not able to see a dentist. Medicaid currently does not offer comprehensive dental care benefits for adults.
- To provide culturally competent oral health care to Native Hawaiians, there is a need for a dental workforce that represents the population.
- Fluoride occurs naturally in groundwater, and community water fluoridation can be one of the most cost-effective ways to deliver fluoride to the people of Hawai‘i.

Effective and Promising Approaches

- A full array of dental services is provided statewide by the Federally Qualified Health Centers and the Native Hawaiian Health Care Systems at two clinic locations, one on Kaua‘i and the other on Maui.
- Bringing preventive care to children instead of waiting for children to come to care is proven to be highly effective. School-based sealant and fluoride mouth rinse programs increase access to preventive care for children who otherwise do not access care.
- Linkage to dental case management promotes oral health for children needing specialized care.
- Linking patients to prevention and treatment through school-based oral health education, screening and referral programs, dental case management, and pediatricians’ offices is effective.

Gaps

- There is a lack of funding for capital expansion for Native Hawaiian Health Care Systems and Federally Qualified Health Centers to enhance access to services (dental care, screening, referrals, education, etc.) for all, including children, adults, kūpuna,[1] and low-income families.
- School-based sealant and fluoride mouth rinse programs need to be expanded to more schools, especially schools with high needs.
- Funding for school-based programs is lacking. Medicaid/MedQUEST needs policies and a billing system that are amenable to school-based programs.
- Medicaid adult dental benefits, which include prevention and treatment, have been discontinued.
- There are inadequate funding and programs to increase the number of Native Hawaiian dental professionals, especially in Native Hawaiian communities.
- Few programs and educational resources address oral health in terms of Native Hawaiian health concepts and values.
- Water fluoridation is proven to be cost-effective and reaches many but has not been implemented.

[1] elders

- There is a lack of oral health data across the lifespan, especially clinical data and information specific to Native Hawaiians.

Recommendations for Impact

- **Address oral health in connection with overall health.**
  - Require continuing education on oral health for medical professionals, and on overall health (diabetes, coronary artery disease, HIV, pregnancy, stress) for dental professionals.
- **Increase oral health literacy and awareness.**
  - Create awareness through media about the importance of good dental hygiene.
  - Develop and implement oral health educational programs for health care providers, families, schools, and communities.
- **Develop a diversified oral health workforce, including rural areas.**
  - Create and implement workforce development programs and higher education programs to increase the number of Native Hawaiian dental professionals in Hawai‘i.
  - Provide funding for workforce development for Native Hawaiians.
  - Develop and establish policies at the state and organizational levels to support Native Hawaiian dental professionals.
  - Foster the development of a collaborative system among families, schools, universities, and workplaces.
- **Invest in prevention.**
  - Provide low-income families with dental supplies (toothbrush, toothpaste, dental floss) through public and private means.
  - Develop policies and programs to promote prevention in the community.
  - Develop policies and practices to increase preventive care in dental clinics.
- **Increase access to care (decrease oral health care disparities).**
  - Restore Medicaid adult comprehensive dental benefits including prevention and treatment.
  - Develop school health policies that address and improve children’s oral health status.
  - Develop sustainable school-based sealant and fluoride mouth rinse programs.
  - Develop and implement community-based programs that improve the oral health of keiki, adults, and kūpuna, especially those who are from low-income families.
  - Provide funding for capital expansion to start up school-based and community-based programs and establish Medicaid policy to make programs sustainable.
  - Strengthen collaboration among State of Hawai‘i Department of Human Services Medicaid program, Native Hawaiian Health Care Systems, Federally Qualified Health Centers, schools, and communities to enact a policy that supports school-based and community-based programs; secure funding for these programs.
- **Implement culturally-adapted programs and practices.**
  - Foster collaboration between Native Hawaiian health experts and dental professionals to develop educational materials.
  - Develop educational programs for dental and medical health care professionals to increase understanding of oral health in the context of Native Hawaiian health concepts and values, and how to adapt practices accordingly.
  - Revisit traditional practices and revitalize them to fit contemporary lifestyles.
- **Systematically improve data collection relevant to Native Hawaiian oral health.**
  - Establish policies and systems to collect data on Native Hawaiian representation in the dental workforce.
  - Improve data collection across the lifespan, especially with respect to clinical data and information delineating Native Hawaiians.
  - Analyze data to improve oral health programs and to support increased representation of Native Hawaiians in the dental workforce.
  - Establish policies to ensure open and responsible data sharing among agencies.

Introduction

The 1985 *E Ola Mau* report highlighted the change in tooth decay from virtually non-existent prior to 1778 to endemic in 1930. Early research identified dental caries as a major public health problem, with the highest rates of decayed, missing, and filled teeth among Native Hawaiian children. Research also showed a changing diet from a high starch, low refined sugar diet to a high sugar, low starch diet, in the context of negligible fluoride content in Hawaii's civilian water supply. At the time of the 1985 report, programs in the community had demonstrated minimal impact on improving dental health either through education or treatment on an individual or statewide basis. Four primary strategies were recommended, including enhanced fluoridation; dental educational programs for families and school children; regular surveys of the dental status of Hawaii's population, especially of children, followed by immediate and appropriate treatment at sites demonstrating need, at little or no cost to those without dental insurance; and dental protection in competitive sports.

The current report is based on a review of the literature and interviews conducted with Native Hawaiian and non-Native Hawaiian professionals who serve the Native Hawaiian community. It also includes responses from Native Hawaiian patients, patient advocates, and public health organizations. The interview questions focused on obtaining information to improve oral health among those who are currently underserved, particularly within Native Hawaiian communities. This report updates our understanding of the needs, gaps, and effective and promising programs for Native Hawaiian oral health. It emphasizes areas with the greatest disparities in oral health and makes recommendations to ensure impact.

Increased Understanding

- **Oral health affects the ability to eat and enjoy a full range of dietary choices. It also affects speech, communication, socializing, general health (diabetes and cardiovascular diseases), sleep, general well-being, learning, and employment.**

There has been increased research over the last 30 years, with more than 900 scholarly publications on Native Hawaiian oral health, and increased interest in and understanding of oral health needs. Studies have shown that oral health status affects our overall well-being and functioning in a variety of ways. Studies also have shown that oral health inequity exists and is associated with income, education, race and ethnicity, place (rural vs. urban), and disability status.

Untreated dental decay compromises a child's well-being at home and at school; over time, chronic untreated oral disease adversely impacts an individual's systemic health, quality of life, and economic productivity (The California Society of Pediatric Dentistry, 2017; Hyde, Satariano, & Weintraub, 2006). Oral health status can affect people physically and psychologically, affecting their enjoyment of life; their ability to chew, taste, and savor food; how they look, speak, and socialize; and their self-esteem, self-image, and feelings of social well-being (Sheiham et al., 2001). In recent years, studies have found a two-way association between periodontitis and diabetes, and a relationship between periodontitis and cardiovascular disease (Nazir, 2017; Preshaw et al., 2012). Native Hawaiians are one of the highest-risk populations for cardiometabolic diseases in the United States. Many studies have found increased prevalence of diabetes, obesity, and cardiovascular risk factors among Native Hawaiians and other Pacific Islanders (Mau, Sinclair, Saito, Bauhofer, & Kaholokula, 2009).

The teeth and your mouth are an expression of yourself. Just like any other part of your body, but teeth are what you smile with…and that self-image is what's going to impact how you take care of yourself and your health status.

Dan Fujii, DDS, MPH
Dental Director
Wai'anae Coast Comprehensive Health Center

- **Vulnerabilities and risks for oral health diseases have changed over time. Oral health inequity persistently affects Native Hawaiian adults and children.**

Clinical and behavioral information related to oral health throughout the lifespan is limited. Moreover, studies on Native Hawaiian perspectives on oral health are limited. Before European contact, Native Hawaiians had excellent oral health. Examination of skeletal remains revealed that the prevalence of caries was 9.6% among children 6-11 years old, and 1.9% among children 12-17 years (Keene, 1986). A study of surveys conducted in 1989 and 1999 found that among Native Hawaiian children 6-8 years old, those with actively carious teeth in need of treatment were 46.1 % in 1989 and 39.6% in 1999, compared to Caucasian children at 25.6% and 22.2%, respectively (Greer, Tengan, Hu, & Takata, 2003). A survey conducted in 2015 found that the untreated decay rate in Native Hawaiian children was 28.5%, compared to 13.2% in Caucasian children (State of Hawai'i, 2016).

A study conducted in 2017 found that Native Hawaiians had the largest proportion of excess tooth loss (Deguchi, Mau, Davis, & Niederman, 2017).

Table 1
Oral Health Disparities

Oral Health Over Time	Pre-European Contact	1989	1999	2014 2015
Keiki: Decay	9.6%*[b] 1.9%*[d]	46.1%*[a] 25.6%**[a]	39.6%*[a] 22.2%**[a]	28.5%*[c] 13.2%**[c]
Adults: Removal	NA	NA	NA	48.8%* 36.9%**
*Native Hawaiian; **Caucasian; [a]Ages 6-8; [b]Ages 6-11; [c]Ages 8-9; [d]Ages 12-17				

Several federal reports have called attention to the disproportionate impact of oral disease on vulnerable populations. In each report, lack of information about the complex issues involved in meeting the needs of the vulnerable population was identified as a significant barrier to efforts to understand and improve their oral health (Morgan et al., 2015).

Poor oral health and dental hygiene are particularly prevalent among vulnerable populations. Oral health status has been found to be associated with socioeconomics, race and ethnicity, and rurality (Arcury, Preisser, Gesler, & Powers, 2005; Doescher & Keppel, 2015; Huang & Park, 2015; Kumar, Kroon, & Lalloo, 2014; Makhija et al., 2006; Rural Health Information Hub, 2014; Vargas, Dye, & Hayes, 2003; Vargas, Ronzio, & Hayes, 2003). Oral health inequity persistently affects Native Hawaiian adults and children (Greer et al., 2003; State of Hawai‘i, 2015, 2016). Native Hawaiian adults have higher rates of tooth loss than Caucasians and Japanese, and Native Hawaiian children have higher rates of dental decay than their Caucasian and Japanese peers (State of Hawai‘i, 2015, 2016). Native Hawaiians are overrepresented in the lower socioeconomic strata, under-represented in higher education, and more likely to be marginalized from the larger society (Mau et al., 2009).

Health disparities in oral health and dental care utilization have been found in minority groups, in rural areas, among those of low socioeconomic status, and in people with disabilities (Armour, Swanson, Waldman, & Perlman, 2008; Doescher & Keppel, 2015; Edelstein, 2002; Pourat & Finocchio, 2010). According to the Hawai‘i Behavior Risk Factor Surveillance System 2015 report, nearly twice as many Native Hawaiians as Caucasians had not visited a dentist for more than five years (14.2% vs. 7.5%; State of Hawai‘i, 2015). Emergency usage data shows that the rate of preventable emergency oral health visits for Native Hawaiians was more than 1.55 times greater than for non-Hawaiians (27.3 per 10,000 for Native Hawaiians vs. 17.6 for non-Hawaiians; Hayes, 2018). These data suggest that Native Hawaiians lack access to preventive and treatment visits, and that the need for prevention and treatment is great. This is not surprising, given Native Hawaiians are over-represented in other risk groups such as those with low socioeconomic status and rural residence.

In the 2015 report *Needs and Assets Assessment of Oral Health Services in Hawai‘i: Results and Recommendations* (Sugimoto-Matsuda & Stridiron, 2017), only 30% of adults (>18 years of age) reported seeing a dentist in the past year, and more than 3,000 emergency room visits occurred annually due to preventable dental problems. Importantly, persistent dental health disparities were identified in groups with greater proportions of Native Hawaiians, such as those with low socioeconomic status, rural residence, pregnancy, and disability. For example, low-income residents were more likely to have dental problems and less likely to see a dentist each year, with 51% of low-income adults having lost teeth from dental disease, compared to 32% of higher-income adults. Likewise, 29% of low-income children reported dental problems in the past six months, compared to 13% of high-income children. 82% of high-income adults saw a dentist each year, compared to 52% of those categorized as low-income. Among children enrolled in Hawai‘i’s Medicaid/QUEST program, 59% saw a dentist in 2013, which was higher than national Medicaid statistics (50%); however, it is important to note that children in Hawai‘i’s Medicaid program were receiving more treatment services, rather than preventive care, compared to national trends. These

disparities were greatest for Native Hawaiians (see the section on Gaps later in this chapter).

Overall, the state's estimated ratio of residents per dentist was 1,283 to 1 (Sugimoto-Matsuda & Stridiron, 2017). However, the gap widened on the more rural neighbor islands, with the highest ratios in Kauaʻi County (1,813:1), followed by Hawaiʻi County (1,698:1) and Maui County (1,613:1). Of note, Native Hawaiians reside more often in rural communities.

Furthermore, only 41% of pregnant women in Hawaiʻi reported seeing a dentist during their pregnancy (Sugimoto-Matsuda & Stridiron, 2017). Pregnant women living in Hawaiʻi County, those with less than a high school education, younger mothers (20-29 years old), and women who were low-income and on Medicaid/QUEST had the lowest rates of visits to a dentist during pregnancy.

Nationally, people with disabilities are more likely than people without disabilities to have poor oral health. Native Hawaiians experience higher age-specific levels of disability when compared with their Japanese and White counterparts (Pobutsky, Hirokawa, & Reyes-Salvail, 2003). People with disabilities are less likely to have visited a dentist or dental clinic in the past year and more likely to suffer edentulism (toothlessness) compared with those without disabilities (Armour et al., 2008). Individuals with intellectual and developmental disabilities are more likely to have poorer oral hygiene, increased decay, and increased periodontal (gum) disease than the general population (Binkley et al., 2014).

Low health literacy is associated with poorer health outcomes and use of health care services (Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011). Although culturally adapted health education programs for Native Hawaiians have been developed and made systematically available in regard to diabetes and cardiovascular disease, there are as yet no such programs related to oral health (The Center for Native and Pacific Health Disparities Research, 2017; The Queen's Medical Center, 2017). Medical education programs to increase cultural competency have been shown to be effective and have been integrated at the University of Hawaiʻi John A. Burns School of Medicine (Beach et al., 2005; Native Hawaiian Center of Excellence, 2015). However, the State of Hawaiʻi lacks a dental school; dentists are trained outside of Hawaiʻi and have limited education in cultural competency to treat Native Hawaiian patients.

And so, for health care, it's so important because people are passing away way sooner than they should be [and losing their teeth before they should]. Dealing with health disparities, we want to hear the stories so that it can impact our children, you know, and we can start to turn around – those children can start to turn around and help the kūpuna…and in this quest that we have, we're trying to ask questions about what, you know, what our kūpuna [are] recommending us to do, and so, can you talk about your community and what their values are, and if there was something that we could do to help the culture become something greater and people to instill that more so within their children.

Dental patient interview

Referral services, case management, and medical-dental integration are pathways to increase access to oral health care for Native Hawaiian communities. Place-based screening seems to increase awareness of the importance of oral health and the need for professional oral health care. However, screening itself does not directly translate to access to care. Referral services, case management, and medical-dental integration must be thoroughly planned and implemented to ensure that patients receive care (Nelson, Rashid, Galvin, Essien, & Levine, 1999). A shared vision among potential collaborators facilitates communication regarding strategies to achieve common goals.

- **Financial barriers are one of the primary reasons that patients are not able to see a dentist. Medicaid currently does not offer comprehensive dental care benefits for adults.**

The Affordable Care Act mandates that states must provide dental benefits to children covered by Medicaid and the Children's Health Insurance Program (CHIP), but states are allowed to choose whether to provide dental benefits for adults (Center for Medicaid and CHIP Services, n.d.). Hawaii's Medicaid currently does not offer comprehensive dental care benefits for adults and only covers emergency visits with limited services (tooth extraction and pain medication; Fink, 2009). The negative public health effects and increased economic impact of eliminating basic dental care demonstrate the importance of affordable and accessible preventive oral health care (Salomon, Heidel, Kolokythas, Miloro, & Schlieve, 2017).

In one study, the need for dental services was found to be high among the dentate elderly (those with teeth), with nearly three-quarters reporting having visited a dentist within the past year (Warren, Cowen, Watkins, & Hand, 2000). However, Medicare does not cover most dental care, including dental procedures such as cleanings, fillings, and tooth extractions, or supplies such as dentures, dental plates, and other dental devices. Coverage under Medicare Part A (Hospital Insurance) is limited to certain dental

services during hospitalization (U.S. Centers for Medicare & Medicaid Services, 2013). The lack of public health policy to support access to regular dental care among the elderly seems to conflict with Native Hawaiian culture which values its kūpuna.[2]

❖ **To provide culturally competent oral health care to Native Hawaiians, there is a need for a dental workforce that represents the population.**

Ambrose et al. (2012) reported that having a Native Hawaiian physician caring for a Native Hawaiian patient improved patient-physician interactions and several patient-related outcomes such as satisfaction, provider preference, and quality of care. Several other studies have found similar effects of ethnic concordance between patient and physician (Saha, Arbelaez, & Cooper, 2003). There is a need to investigate whether cultivating a proportionate representation of Native Hawaiians in the dental workforce might promote better oral health among Native Hawaiians. Further discussion related to this issue may be found in Chapter 7: Workforce Development.

Data on Native Hawaiian representation within the dental workforce are not readily available. The Professional & Vocational Licensing Division of the State Department of Commerce and Consumer Affairs, which licenses dentists and dental hygienists, does not collect data on the ethnicity and race of applicants. Also, the Hawai'i Dental Association – a statewide professional association of approximately 1,000 members representing over 92% of all dentists practicing in Hawai'i in general dentistry and the eight dental specialties recognized by the American Dental Association – does not collect nor provide race or ethnicity information regarding their membership (Hawai'i Dental Association, 2017).

❖ **Fluoride occurs naturally in groundwater, and community water fluoridation can be one of the most cost-effective ways to deliver fluoride to the people of Hawai'i.**

Most common oral diseases, such as tooth decay and periodontitis (gum disease), can be prevented through a combination of community, professional, and individual strategies. Such strategies include disease prevention and health promotion interventions to create a healthy environment, reduce risk factors, inform target groups, and improve knowledge and behaviors. These can be implemented community-wide through the efforts of health professionals and policy-makers, or through the exercise of individual responsibility (National Institute of Dental and Craniofacial Research, 2014).

More than 70 years of scientific research has consistently shown that an optimal level of fluoride in community water is safe and effective in preventing tooth decay, reducing the incidence of cavities by at least 25% in both children and adults (American Dental Association, 2017). A systematic review published in 2000 cautioned that the evidence of a beneficial reduction in caries should be considered together with the increased prevalence of dental fluorosis. There has been no clear evidence of other potential adverse effects (McDonagh et al., 2000). A 2015 systematic review published found that water fluoridation is effective at reducing levels of tooth decay among children (Iheozor-Ejiofor et al., 2015). Legislative bills regarding water fluoridation have been heard in the past, meeting with much opposition. However, it is unclear to what extent the opponents represented Native Hawaiian communities or values.

Tooth decay (dental caries) is damage to a tooth that can occur when decay-causing bacteria in the mouth come into contact with sugars and starches from foods and drinks, forming an acid which destroys the tooth's enamel by causing it to lose minerals. This can lead to a small hole in the tooth, called a cavity. If tooth decay is not treated, it can cause pain, infection, and even tooth loss (National Institute of Dental and Craniofacial Research, 2018). Making dietary choices that limit foods high in sugars and starches, eating nutritious and balanced meals, helps lessens the chance of developing tooth decay. A study found that child/adolescent exposure to food-related ads, particularly for sugar-sweetened beverages and fast-food restaurants, was significantly higher in areas with higher proportions of black children/adolescents and lower-income households (Powell, Wada, & Kumanyika, 2014). Further, a study found that despite overwhelming consensus on the causal role of sugars in tooth decay and recommendations by expert committees, quantitative targets restricting the intake of sugars to control dental caries have not been widely implemented (Kearns, Glantz, & Schmidt, 2015).

Along with water fluoridation, a greater diffusion of other preventive interventions could reduce the incidence of caries at an affordable cost. Topical application of fluoride (through fluoride gel, toothpaste, and mouth rinses) and fluoride supplements would be convenient and inexpensive tools to reduce dental caries. In addition, pit and fissure sealants and fluoride varnishes appear likely to effectively reduce the risk of caries. To prevent the progression of tooth decay, 38% silver diamine

[2] elders

fluoride (SDF) arrests active caries at 81% success rate (Gao et al., 2016). Apart from staining the arrested lesion black, no significant complication of SDF use among children is reported. SDF treatment is noninvasive and easily implemented. It can be a promising strategy to manage dental caries in young children or those who have special needs (Gao et al., 2016).

Further, natural preventive care that can be integrated in clinical and home care is gaining interest. Though limited, some studies have suggested the effectiveness of natural products, such as baking soda to reduce plaque. Plaque is a sticky, colorless film of bacteria that continually forms on our teeth and along the gum line. Plaque contains bacteria that cause cavities and gum disease (Ghassemi, Vorwerk, Hooper, Putt, & Milleman, 2008; Putt et al., 2008). A study compared the effectiveness of coconut oil vs. chlorhexidine (a prescription mouthwash with antibacterial properties) and found no statistically significant difference between them in the reduction of S. mutants, a bacterium commonly found in the human oral cavity and a significant contributor to tooth decay (Peedikayil et al., 2016).

According to the Pew Charitable Trust's report on children's dental health, Hawai'i meets only one of the eight policy benchmarks aimed at improving children's dental health, making it the worst overall performer among the 50 states and the District of Columbia. Hawai'i does not fully use proven preventive strategies. It lacks a school sealant program and has the lowest rate of fluoridation of any state. Residents living on military bases are the only ones who receive fluoridated water (The Pew Charitable Trust, 2011).

There are growing interest in and need for mobile dentistry and place-based care and referral (based in schools, community centers, churches, Head Start programs, WIC programs, senior centers, home care services, etc.) (Branson, 2014; Rural Health Information Hub, 2017; Sugimoto-Matsuda & Stridiron, 2017). Place-based care is defined as providing direct access where people live, work, go to school, worship, or receive social services. A systematic review of preventive dental visits indicated that a focus on making care a positive experience is likely to be particularly beneficial (Harris, Pennington, & Whitehead, 2017). Interviews conducted for this report revealed interest in and need for place- and community-based care. Native Hawaiians appeared to prefer care close to their community, delivered through outreach programs. However, the interview results indicated that funding and billing policies do not seem to support outreach programs such as school-based and other place-based care. Increased interest in teledentistry may help overcome this barrier in the future.

Sometimes organizations and individuals step up beyond their comfort zones and take on new responsibilities to address health issues. When we expand our roles, and take action to ease the suffering of others, we immediately improve our lives and others'. Our community needs more people stepping up and taking action to prevent individual disease and improve community health.

Gavin Uchida, DDS, MBA
Dental Director
Family Health Services Division
Hawai'i State Department of Health

Effective and Promising Approaches

Since 1988, great strides have been made in improving the oral health status of Native Hawaiians. Cooperative efforts of the Native Hawaiian Health Centers, Federally Qualified Health Centers, and various community entities have resulted in projects with the potential for far-reaching effects in enhancing the oral health of Native Hawaiians. These endeavors not only improve access to care, but more importantly, provide oral health education that can help break the cycle of poor oral health through the generations.

- **A full array of dental services is provided statewide by the Federally Qualified Health Centers and the Native Hawaiian Health Care Systems at two clinic locations, one on Kaua'i and the other on Maui.**

Federally Qualified Health Centers and Native Hawaiian Health Care Systems located near Native Hawaiian communities are currently providing dental care integrated within a larger comprehensive health center. Both patients and providers cite this centralized health care system as a successful way of reducing barriers to care. Health care is conveniently centered in one clinic, providing patients access to a wide range of resources, including medical, dental, vision, behavioral health, and traditional healing services. Some centers also include services to transport their clients to and from appointments.

Federally Qualified Health Centers and Native Hawaiian Health Care Systems also allow providers to focus on health care outcomes rather than the financial pressures with which many in the private sector may be burdened. Appointment times can be lengthened so providers can include oral health education tailored to a patient's cultural influences. In view of the holistic

Native Hawaiian conception of health, it is vitally important to form a strong patient-provider relationship and address oral health in the context of overall health. The Native Hawaiian Health Care System was designed from a holistic perspective, and many interviewees expressed that they are more comfortable obtaining care in such an environment. The Federally Qualified Health Care System and Native Hawaiian Health Care Centers allow providers the time to design and implement programs that result in a broader, community-wide reduction in disease. These programs include oral health education in schools and other community organizations and events, and school-based sealant and fluoride programs.

- **Bringing preventive care to children instead of waiting for children to come to care is proven to be highly effective. School-based sealant and fluoride mouth rinse programs increase access to preventive care for children who otherwise do not access care.**

Some of the Federally Qualified Health Centers and Native Hawaiian Health Care Systems have implemented mobile dentistry and place-based dental services outside the traditional office setting, providing greater accessibility and convenience for patients and their families. Services include education, screenings, fluoride varnish, prophylaxis, and sealants. These services are currently being offered at Head Start, preschools, elementary schools, after-school programs, and community health fairs.

More comprehensive care has also been offered through establishing a virtual dental home for patients, with a pilot project currently underway on Hawai‘i island at Head Start and WIC locations, and a project pending on Maui in partnership with Head Start, WIC, and a long-term care facility. Virtual dental homes provide onsite education and preventive oral health services two to three days a week at the above locations. Their continual presence serves as a reminder for students and staff of the importance of regular oral hygiene care, providing reinforcement that serves to develop healthy lifelong habits.

- **Linkage to dental case management promotes oral health for children needing specialized care.**

Oral health programs through Federally Qualified Health Centers and Native Hawaiian Health Care Systems have helped parents and children establish a dental home. On Maui, student participants who have indicated they do not have a dentist, those who have not seen a dentist in over a year, or those who have rampant, active decay are provided with information about how to receive services at the Native Hawaiian Health Care System. Health care workers from the Native Hawaiian Health Care System also follow up with phone calls and letters to aid parents in obtaining an appointment. This approach has been marginally successful in helping to establish care for participants in need of a dental home.

- **Linking patients to prevention and treatment through school-based oral health education, screening and referral programs, dental case management, and pediatricians’ offices is effective.**

A key component in improving oral health is education. Oral health directors at Federally Qualified Health Centers and Native Hawaiian Health Care Systems, dental hygienists, and dentists in private practice all agree that education is the prevailing force that can ultimately lead to better long-term oral health outcomes. Improving oral health literacy in the dental office is a key component in this education. To this end, providers are focusing on effective communication with patients. Techniques including open-ended questions, the use of patient-friendly visual materials, and the teach-back method serve to empower patients to become their own health advocates.

Efforts are also being made to provide oral health education outside the dental office, such as at Head Start and Early Head Start programs, preschools, elementary schools, after-school programs, and long-term care facilities across the state. Students, teachers, school administrators, health aides, parents or guardians, and caregivers have been able to benefit from such outreach programs provided primarily by the Federally Qualified Health Centers and Native Hawaiian Health Centers.

Interdisciplinary education is also an important component in improving oral health outcomes, especially in children, pregnant mothers, and those with diabetes. Short informational briefings at monthly meetings have been successful in providing updates and recommendations to pediatricians, OB/GYNs, and nurses. The Native Hawaiian holistic approach to health may benefit both Native Hawaiians and non-Hawaiians, leading to positive correlations among oral health, overall health, and general well-being.

As my kumu, my Aloha says, Hawaiians didn’t have the Western afflictions because we were an isolated island chain and we didn’t have visitors. For instance, dental caries, we didn’t have dental caries, we didn’t have the same kind that we have today. La‘au

lapa'au[3] *evolved over hundreds of years to treat the afflictions that we had at the time. But now we get exposed to all of this stuff, so we have these diseases and symptoms and maladies that came from the Western world. So that is what Western medicine has evolved to treat. It's almost that the two of them are two different worlds, because they came out of two different worlds…but they are very complementary because of that. So, in the Western world, TMJ, temporal mandibular joint dysfunction syndrome, it's pain in your jaw joint that causes headaches. It's a stress-related thing…In the '80s and '90s it was a big thing in the dental world for very hands-on treatment with these very intricate ways of treatment and they had different schools of thought…But it boiled down to what research has told us is that it has nothing to do with the mechanics of the bite and that it is mostly a stress-related thing. And so, of course, Hawaiians, with the cultural baggage that we have, there's a lot of stress-related problems and it becomes a pattern, and now, you look at it now, in lapa'au you look at the whole person, you look at not only the whole person but their spirituality and their ancestors, okay, and it gives you a great understanding for…these stress-related afflictions. The voids in one are filled by the attributes of the other. That's why I think it's the most effective way to heal people. So…although there's times we are with certain patients I can't tell them, oh this, you don't tell them, people. It's how you present things…if you tell a Hawaiian person that you are bringing in lapa'au principles, it's immediately accepted, and they prefer that, especially the older ones.*

Randal Kam, DDS, FAGD, FICD
Dental Director
Lana'i Community Health Center

Native Hawaiian health care was learned through the mo'olelo[4] passed down from generation to generation. The practice of la'au lapa'au by kahuna[5] includes gathering, preparing, and administering plant, animal, and mineral remedies from the land and sea with prayer to heal mind, body, and spirit (Hilgenkamp & Pescaia, 2003). The following story illustrates the importance of learning and teaching the protocols of health to the Native Hawaiian people, and the relevance of these to oral health.

One by one the coals in the fire-pit died down as the cold-bite of predawn spread through the small grass house. But neither the shaggy-haired old man nor the beardless youth sitting by his side moved as they waited…to start the trip up the valley back of their home to gather medical herbs. Through the chants and riddles, prayers, allegories, and stories, the boy had learned about the plants and their uses. From the shoreline to the peaks of the mountains the gods gave the plants that could be used to repair mana-drained bodies. And it was the kahuna-trained la'au lapa'au who was the keeper of the secrets (huna) of the plants, who knew their compounding uses. The kahuna la'au lapa'au combined the knowledge of the agriculturalist with that of the medical scientist. Few plants escaped his attention, and most were used in some form of treatment.

Before beginning his formal apprenticeship the young la'au lapa'au trainee knew how to identify many of the basic plants, their growth patterns, and popular uses. As his training began, this basic knowledge was put in order. He learned the families of plants that assigned relationships on the basis of sex, leaf structure, appearance of flowers, and other growth characteristics. While learning the names of the plants, the trainee also learned all the variations that a plant name might have so that his choice of plants for medical use might utilize the power of the words used for the plant name.

(Gutmanis, 1976, pg. 44)

With the knowledge of the 'āina[6] passed down for generations, Native Hawaiians were able to find cures for a multitude of illnesses. Some examples of la'au lapa'au to treat oral health issues include inserting a plug from the root of the puakala into the cavity; or rubbing the watery sap from a green kukui nut picked from a tree in the morning sun, or the sap from a banana flower, to cure bad breath or a coated tongue (Gutmanis, 1976).

Combining traditional Native Hawaiian approaches to health with Western methods may provide an optimal way to prevent and treat oral health problems. Indeed, "Western" studies are now finding what Native Hawaiians have known for generations: that oral health, overall health, and general well-being are inextricable from one another.

Community Meetings

Community meetings are an important way of gathering information about an area's perceived oral health needs and developing customized solutions to meet those needs. These meetings help build relationships with the community, provide an

[3] healing remedies
[4] stories
[5] priest, minister, shaman, expert in medicine
[6] land

opportunity to educate and promote oral health, and develop activities that will best assist the local population in receiving dental care. Bright Smiles Hawai‘i (2017) held a series of focus groups around the state to ask communities how oral health could be improved. Four community initiatives were implemented as a result of these meetings. Among these initiatives include Bright Smiles Ka‘u, in which organizers have offered oral health education and distributed oral health kits to various community groups and events; and Brightest Smiles Maui, in which organizers have held several talk-story sessions on Maui and Moloka‘i with various small groups affected by oral health disparities.

Ka ‘ike a ka mākua he hei na ke keiki.

The knowledge of the parent is absorbed by the child.

‘Ōlelo No‘eau #1397
(Pukui, 1983, p. 155)

Private Grants

Private foundation grants have been instrumental in supplementing federal dollars to support Native Hawaiian oral health initiatives. Although Federally Qualified Health Centers and Native Hawaiian Health Care Systems apply a sliding fee schedule based on patients’ ability to pay, some services, including dentures, crowns, and bridges, still accrue charges that are unaffordable to many. Private foundation grants have allowed these patients to obtain treatment that they otherwise could not afford. Private foundation grants have also allowed for the expansion of services to remote areas, and the implementation of outreach programs.

Gaps

- **There is a lack of funding for capital expansion of Native Hawaiian Health Care Systems and Federally Qualified Health Centers to increase access to services (dental care, screening, referrals, education, etc.) for all, including children, adults, kūpuna, and low-income families.**

Gaps in access to oral health care are a universal issue in the United States but are particularly prevalent in minority and low-income populations that lack health equity. These groups receive fewer preventive services and lower quality health care in general. Language barriers and the lack of cross-cultural medical education negatively affect clinical decision-making in their care. Dental health has been largely disconnected from overall health, and, as a result, is even more susceptible to these inequities. Communities statewide need to be directly engaged as active partners with the oral health system to address these disparities and improve oral health outcomes for Native Hawaiians. Federal funding for capital expansion for Native Hawaiian Health Care Systems and Federally Qualified Health Centers would permit greater access to dental care, screening, referrals, education, and other related services to children, adults, and kūpuna, particularly those from low-income families.

Outreach Programs

The tele-dentistry model is spreading across the country, and a pilot project was initiated on the island of Hawai‘i; however, insurance plans, including Medicaid, are slow to change their reimbursement policies, making it difficult to sustain these programs. Mobile dentistry and place-based care, which eliminate barriers such as transportation and the challenges of navigating through a health care system, are grossly underutilized.

Health Policy

Water fluoridation is widely considered one of the most effective public health measures available to help prevent dental decay in a community. Despite repeated attempts to institute water fluoridation over several years at the state and county policy levels, Hawai‘i currently has fluoridated water only within federally-controlled military communities, which constitute about 11% of the statewide population. Other current mechanisms for delivering fluoride to children include treatment programs in selected DOE elementary schools.

- **School-based sealant and fluoride mouth rinse programs need to be expanded to all schools, especially schools with high needs.**
  - **Funding for school-based programs is lacking. Medicaid/MedQUEST needs policies and a billing system that are amenable to school-based programs.**

Prevention

School-based sealant and fluoride treatment programs are an effective primary prevention measure and need to be expanded into more Hawai‘i schools, especially schools with greater numbers of Native Hawaiians students and higher oral health needs. This would require more sustainable funding for school-based oral health programs. Preventive measures are

proven to be cost-effective and far-reaching in their impact.

Local diet in Hawai‘i is a key factor in poor oral health, often reflecting limited access to healthy foods that are affordable. It is cheaper to eat unhealthy foods from fast-food establishments, which are more accessible. High-sugar foods and beverages are a pervasive presence in society. Other unhealthy eating habits, from an oral health perspective, include chewing on food before feeding infants, which promotes exchange of bacteria that can cause tooth decay. Also, “bottle mouth” occurs when babies drink milk or juice while resting or sleeping.

Exposure to food-related television advertising is associated with children’s purchase requests, consumption patterns, and adiposity. Nutritional content studies show that despite industry pledges to promote only healthy products, relatively little progress has been made; the vast majority of television advertisements seen by or directed at children consist of unhealthy foods and beverages that are high in saturated fat, sugar, or sodium (Powell et al., 2014).

Interviewees for our task force report shared a motivation to address oral health in a holistic way with their ‘ohana and the community. Several interviewees spoke of links among oral health, diet, and stress. Revisiting and revitalizing traditional practices, and reducing the consumption of a high-sugar, high-carbohydrate Western diet, may be a strong interest and need for many Native Hawaiians. Inhibitors and enablers of the consumption of a traditional Native Hawaiian diet need to be investigated from a public health perspective, and policies implemented to increase access to traditional foods.

Education Programs

In the past, elementary schools often created interactive visual methods of teaching children good oral health, along with offering routine visits by dental hygienists from the State of Hawai‘i Department of Health to carry out primary dental hygiene activities. These services have largely been discontinued. It appears that educating the younger generations about oral health is not a priority in schools, although schools might be the best venue for disseminating information to Native Hawaiian children and youth.

More programs and educational resources are required statewide to address oral health in relation to Native Hawaiian health concepts and values. Lack of access to Native Hawaiian Home Lands and loss of land contributes to a loss of cultural traditional living practices that affect oral health.

Disparities in Health Outcome

- **Medicaid adult dental benefits, which include prevention and treatment, have been discontinued.**

Socioeconomic status is a major contributor to oral health disparities. Native Hawaiians on Medicaid are covered only through age 20 for complete preventive and restorative services. Beyond age 20, adults on Medicaid receive only emergency services, which are often defined as pulling badly decayed teeth. Many dental providers are unwilling to accept adult patients on Medicaid because the reimbursement for services is low in comparison to other coverage. There are widely-known differences in oral health access for children and adults in Hawai‘i due to broader Medicaid oral health coverage for children, encompassing a greater variety of preventive and treatment services.

Medicare does not offer a dental plan; thus, dental plan coverage must come out-of-pocket (Medicare.gov, n.d.). As persons on Medicare – aged 65 or over, blind, or disabled – are usually on fixed incomes, these out-of-pocket costs for dental coverage or co-payments are often prohibitive. Even for those Native Hawaiians with some form of medical and dental health coverage, co-payments are increasingly costly, particularly with advanced restorative oral health services such as dentures, partial dentures, and crowns. Many cite their need to make regular payments for rent, transportation, food, utilities, and other basic household needs as outweighing their oral health needs. Hence, the largest gaps are financial; many people feel that they cannot afford dental health services. More funding for programs that effectively reach Native Hawaiians communities to promote oral health are needed, as well as more funding for existing oral health programs that are proven to work well.

With Native Hawaiian Health Care Systems and Federally Qualified Health Centers at over-capacity, with shortages of dentists and hygienists, Native Hawaiians tend to go instead to the private dental care sector if they can afford it or avoid seeking care altogether until it becomes an urgent issue. The consequences of dental disease often make it challenging for Native Hawaiians to complete their schooling and maintain steady employment. Higher dropout rates, increased unemployment, and lost tax revenues diminish economic stability at the local, state, regional, and national levels. There are disproportionate and serious effects of provider shortages on low-income and rural community members as well as on people with disabilities. These groups struggle to find providers who accept public dental insurance, serve patients in rural areas, or serve persons with disabilities or other special needs.

Disparities in Utilization of Care

We do have those who fall through the cracks and those are the ones we care about; those are the ones we want to help.

Tasha Kama
Patient Advocate/Community Member
Maui's Brightest Smilers

Transportation to oral health services is an issue for many in rural locations. There is a need for enhanced access for residents of these locations through such innovative programs as mobile dental service vans. There are areas of the state where a single provider is currently the sole source of oral health care in the community. In many areas, there is a need for after-hour and weekend services for people who work Monday through Friday and cannot take time off work to be seen for oral health care. There have been 4,000 emergency room visits by Native Hawaiians for oral health-related problems in 2011-2014 statewide – i.e., 1,000 visits per year. Native Hawaiians have the highest rate of emergency room use for oral health problems in Hawai‘i – 8 times higher than all other populations combined (Hayes, 2018). More data and analyses are needed to determine why this is occurring since emergency rooms are not effective at serving as a dental home and are more expensive than other oral health service options. Moreover, dental services are generally not available there. Emergency room personnel are typically ill-equipped to address oral health problems. Frequent use of emergency rooms to address non-traumatic oral health needs is a clear indication that the existing oral health system is failing Native Hawaiians.

Medical-Dental Integration

Hawai‘i lacks an integrated oral health system of services, particularly for those with minimal if any oral health coverage. This problem is more severe in rural areas such as the neighbor islands, where the delivery system depends on a few dental businesses that may not have the capacity to provide access for all in the community who need it or who might not accept persons without more comprehensive oral health coverage.

Better collaboration between the medical and dental professions would also improve the oral health status of community members across entire socioeconomic lines. There are many who regularly seek care from a physician for specific conditions, such as pregnancy, diabetes, or heart conditions, but never set foot in a dental office. Obstetricians/gynecologists and pediatricians need to emphasize the importance of prenatal and infant dental care, reinforcing the recommendation set forth by the American Academy of Pediatric Dentistry that all children see a dentist by age one. Similarly, primary care physicians, endocrinologists, and cardiologists can counsel their patients on the importance of seeking regular dental care. Other screening and preventive procedures, such as fluoride varnish, can also be done in a physician’s office.

Oral Health and Overall Health

There is a wide gap between medical and dental knowledge and practice, and a great need for integrated services delivery. On many levels, health care providers and consumers alike do not consistently act upon the knowledge that the mouth is an important part of the body, and its health has significant effects on overall health and well-being. A multifaceted approach oriented toward public health is needed to improve oral health status and provide a range of services from prevention to repair, restoration, and stabilization. Widespread community education is needed to link oral health conditions to overall health, and to prioritize oral health promotion to prevent adverse effects to overall health. We need to make clear the connection of oral health to diabetes and cardiac status. We need to emphasize that poor oral health can increase stress, and thereby give rise to a host of other problems in the body. In addition, there is social and personal stigma attached to having visibly bad teeth, which can detract from self-esteem and thus affect success in life, including work and relationships.

Culture

The Western approach to oral health has tended to localize treatment to body parts (tooth, gums, jaw, etc.). By contrast, the traditional Hawaiian approach to health is to view and treat the patient holistically. Indeed, many interviewees expressed their interest in approaching oral health holistically. However, not all oral health care providers are trained in holistic approaches, nor do they possess the cultural competency to adapt their practice to meet the patient’s health culture.

...Segments of sugar cane were peeled with the teeth and chewed, and chunks of dried squid were given the growing youngster to chew on to develop good jaw muscles and strong teeth. Wood ash or charcoal was rubbed on and between the teeth for cleansing, after which the mouth was rinsed with fresh or sea water.

(Handy & Pukui, 1950, pp. 89-90)

This account shows that Native Hawaiians knew the importance of oral health and prevention. It indicates their recognition that good habits start early in life and are transmitted across generations. Revisiting traditional wisdom and practices and revitalizing them to fit the "modern" lifestyle may greatly benefit oral health among Native Hawaiians.

Workforce Development

- **There are inadequate funding and programs to increase the number of Native Hawaiian dental professionals, especially in Native Hawaiian communities.**

There is a need for increased representation of Native Hawaiians within the local workforce of oral health care providers at both professional and para-professional levels. Hawai'i lacks a dental school, and a report by the Hawai'i Dental Service indicates that only 11% of the survey participants' academic institutions have programs that are culturally based or culturally adapted (Sugimoto-Matsuda & Stridiron, 2017). Increased efforts to recruit, educate, and retain Native Hawaiians in Hawai'i will help build a culturally competent workforce from whom Native Hawaiians feel comfortable seeking care. Programs and educational resources to address oral health in relation to Native Hawaiian health concepts and values are also currently lacking. Finally, data collection and dissemination regarding Native Hawaiians' oral health status and related disparities are required to shape policies and strategies.

Data Availability and Research

- **There is a lack of data across the lifespan, especially clinical data and information specific to Native Hawaiians.**

There is a need for improved collection, analysis, and dissemination of data related to oral health disparities affecting Native Hawaiians, including access and barriers to oral health care, and other community-voiced oral health needs. There are approximately 68,000 Native Hawaiians on Medicaid in Hawai'i. Low reimbursement rates and lack of providers willing to treat Medicaid recipients are issues on which data and analysis are required to develop and implement improved care options for this population.

Recommendations for Impact

'A'ohe mea nana e ho'opuhili,
he moho no ka lā makani.

There is no one to interfere,
for he is a messenger of a windy day.

Said in admiration of a person
who lets nothing stop him from
carrying out the task entrusted to him.

'Ōlelo No'eau #189
(Pukui, 1983, p. 23)

Interview results yielded recommendations for policy, systems, and environmental (program) changes to improve oral health status among Native Hawaiians. Recommended policy changes include policies at the legislative and organizational levels. Systems change involves the rules within an organization. Systems change and policy change often work hand-in-hand. Often, systems change focuses on changing infrastructure within a school, park, worksite, or health setting, or instituting processes or procedures at the system level that ensure a healthier workplace. Environmental change may include physical (programs, structures, or services), social (attitudes or behaviors with respect to policies that promote health), and economic (financial incentives or disincentives) factors that influence people's practices (The Food Trust, 2012). We focus on describing program changes as an environmental component in the following section. Policy, system, and program changes need to work in synergy for greater impact and sustainability. Further, both state-wide systemic change and autonomy in community-level decision-making may be critical in leveraging resources to create impact.

- **Address oral health in connection with overall health.**
  - **Require continuing education on oral health for medical professionals, and on overall health (diabetes, coronary artery disease, HIV, pregnancy, stress) for dental professionals.**

The interconnections between physical and emotional health, which have been the subject of much contemporary research in Western medicine, have long been known to Native Hawaiians. As Native Hawaiians have traditionally addressed oral health from a holistic perspective, we recommend modifying current practices to understand patients' overall health and to address oral health within the context of overall health, including patients' lifestyles. We recommend establishing policies to promote inter-professional continuing education on oral health for medical professionals and on overall health conditions such as diabetes, coronary artery disease, HIV, pregnancy, and

stress for dental professionals; systems to deliver inter-professional health trainings; and programs that address holistic approaches to oral health.

- **Increase oral health literacy and awareness.**
  - **Create awareness through media about the importance of good dental hygiene.**
  - **Develop and implement oral health educational programs for health care providers, families, schools, and communities.**

We recommend developing and providing culturally tailored education programs for patients, families, schools, communities, and providers. Education programs for patients, families, schools, and communities need to create awareness about the importance of good hygiene, good food and drink choices, and utilization of check-ups, preventive care, and early treatment. Education programs for providers need to create understanding of Native Hawaiian health concepts and to enhance provider-patient communications. Education programs need to be delivered through various media to reach a wide audience. We recommend establishing policies to allocate adequate funding to develop and sustain a system that delivers culturally tailored oral health education programs systematically through the Native Hawaiian community.

- **Develop a diversified oral health workforce, including rural areas.**
  - **Create and implement workforce development programs and higher education programs to increase the number of Native Hawaiian dental professionals in Hawai‘i.**
  - **Provide funding for workforce development for Native Hawaiians.**
  - **Develop and establish policies at the state and organizational level to support Native Hawaiian dental professionals.**
  - **Foster the development of a collaborative system among families, schools, universities, and workplaces.**

Currently, Native Hawaiians are not proportionately represented in the oral health workforce. We recommend assessing the current dental workforce in the State and developing policies to increase Native Hawaiian representation in the dental workforce. The development of a collaborative committee among secondary education, post-secondary education, licensing agencies, professional associations, and residency programs is recommended to increase the numbers of Native Hawaiian students and professionals. Funding and programs to support the practice of Native Hawaiian dental professionals, especially in Native Hawaiian communities, are strongly recommended.

Referral/Case Management/Medical-Dental Integration

We recommend policies to build a collaborative system among families, early-childhood programs, schools, universities, workplaces, senior care programs, medical care providers, and dental health care providers in the Native Hawaiian community. We recommend developing a referral program among organizations and implementing it system-wide, with adequate funding to develop and sustain the system.

- **Invest in prevention.**
  - **Provide low income families with dental supplies (toothbrush, toothpaste, dental floss) through public and private means.**
  - **Develop policies and programs to promote prevention in the community.**
  - **Develop policies and practices that increase preventive care in dental clinics.**

There are multiple ways to prevent tooth decay: delivery of fluoride through fluoride varnish, fluoride gel, fluoride foam, fluoridated toothpaste, and fluoridated water; dental sealants; silver diamine fluoride; brushing and flossing; and avoiding acid-causing food and beverages. We recommend developing policies and systems that promote preventive care at home, in the community, and at the clinic. For example, providing economically challenged families and individuals with dental supplies (toothbrush, toothpaste, and dental floss) is one way to promote preventive care at home. Funding school-based preventive care programs is one way to promote prevention in the community. Providing patient-centered, evidence-based, and culturally adapted dental care is one way to promote prevention in clinics.

- **Increase access to care (decrease oral health care disparities).**
  - **Restore Medicaid adult comprehensive dental benefits including prevention and treatment.**
  - **Develop school health policies that address and improve children’s oral health status.**
  - **Develop sustainable school-based sealant and fluoride mouth rinse programs.**
  - **Develop and implement community-based programs that improve the oral health of**

keiki, adults, and kūpuna, especially those who are from low-income families.

- **Provide funding for capital expansion to start up school-based and community-based programs and establish Medicaid policy to make programs sustainable.**
- **Strengthen collaboration among State of Hawai'i Department of Human Services Medicaid program, Native Hawaiian Health Care Systems, Federally Qualified Health Centers, schools, and communities to enact a policy that supports school-based and community-based programs; secure funding for these programs.**

To decrease disparities in care utilization we recommend policies, systems, and programs that increase access to care for all. Policies that promote regular check-ups, preventive care, and early treatment are critical, as avoiding or not being able to utilize dental care at an early stage can lead to progression of tooth decay and gum diseases that require more painful and costly procedures. Painful experiences increase fear and anxiety, and these negative feelings lead patients to avoid regular and timely dental care utilization. Currently, MedQUEST does not offer comprehensive dental care coverage for adults. All, regardless of income or employment status, should have equal rights and opportunities to access care. Further, the current Medicaid policy that excludes comprehensive dental care for adults teaches communities and families that oral health is not an important aspect of overall health. This notion conflicts with the Hawaiian value to achieve health holistically within the 'ohana[7] and community. We strongly recommend restoring adult comprehensive dental services to Medicaid participants, including prevention and treatment.

We also recommend establishing health policies that promote and sustain outreach programs (care provided on portable units and on vans/buses); systems that connect care with keiki,[8] adults, and kūpuna,[9] especially the economically challenged (Title I schools, homeless shelters, etc.); and programs that are affordable, evidence-based, and culturally adapted. Medicaid policies need to increase the number of Medicaid participating providers; support community-based (school-based, WIC-based, etc.) services; and promote regular, preventive, and early treatment dental care utilization. This would include restoration of Medicaid adult dental benefits.

- **Implement culturally adapted programs and practices.**
  - **Foster collaboration between Native Hawaiian health experts and dental professionals to develop educational materials.**
  - **Develop educational programs for dental and medical health care professionals to increase understanding of oral health in the context of Native Hawaiian health concepts and values, and how to adapt practices accordingly.**
  - **Revisit traditional practices and revitalize them to fit contemporary lifestyles.**

We recommend developing policies aligned with and reflective of Native Hawaiian culture. Native Hawaiians are highly interconnected with family and community, value relationships, and view health holistically. As Native Hawaiians appear to have had good oral health during the pre-European contact period, we recommend establishing health policies and systems that support Native Hawaiians in revisiting and revitalizing traditional cultural health practices that can be incorporated into their current lifestyles.

We recommend collaboration among Native Hawaiian dental health care professionals to develop culturally tailored oral health education programs for patients, families, communities, and non-Native Hawaiian providers. We also recommend that Native Hawaiian dental health professionals, as a hui,[10] promote oral health in Native Hawaiian communities, and collaborate with Native Hawaiian physicians and other medical professionals.

The following prayer given by Mary Kawena Pukui was used when 'awa[11] was not obtainable and a pōpolo[12] plant was substituted, called 'awa pōpolo, which could be used to treat a toothache. It was chanted while gathering the plants.

[7] family
[8] children
[9] elders
[10] organization
[11] kava
[12] black nightshade

E ka ʻawa a Kane
I ulu i Kahiki
I aʻa i Kahiki
I kumu i Kahiki
I lala i Kahiki
I lau i Kahiki
I mole i Kahiki

I pua i Kahiki
I kiʻi mai nei au i ko kino
I laʻau no
E Kane e, ho mai i ola

O ʻawa of Kane,
That grew in Kahiki
Rooted in Kahiki,
Bore rootlets in Kahiki,
Grew a stalk in Kahiki
Branched in Kahiki,
Leafed in Kahiki,
Bore leaf buds in Kahiki,
Blossomed in Kahiki,
I have come to take your body
To be used for medicine for [patient's name],
O Kane, grant him health.

(Pukui, n.d.)

- **Systematically improve data collection relevant to Native Hawaiian oral health.**
  - **Establish policies and systems to collect data on Native Hawaiian representation in the dental work force.**
  - **Improve data collection across the lifespan, especially with respect to clinical data and information delineating Native Hawaiians.**
    - **Analyze data to improve oral health programs and to support increased representation of Native Hawaiians in the dental work force.**
    - **Establish policies to ensure open and responsible data sharing among agencies.**

We recommend establishing policies to collect data on oral health outcomes (clinical data) and dental workforce development outcome on a regular basis; develop integrated data collection systems among organizations (for example, a system linking community health centers and schools); and establish survey protocol that ensures that data collected are reliable, comparable, and available across the lifespan. Additionally, we recommend policies to enable responsible, open, convenient, and non-bureaucratic data sharing to analyze and improve program operations. (See Chapter 6: Data Governance.)

Conclusion

In the past 30 years, Papa Ola Lōkahi has been at the forefront of advocating for Native Hawaiian health. The five Native Hawaiian Health Care Systems have been at the forefront of providing services in the Native Hawaiian community. To improve oral health among Native Hawaiians, systematic changes beyond the Native Hawaiian community are required. Restoration of Medicaid comprehensive dental coverage that includes prevention and treatment is one of the critical systematic changes that need to occur and that will benefit not only Native Hawaiians but all populations statewide. The revitalization of Native Hawaiian holistic approaches to oral health is another important change that will benefit all.

Today, oral health disparities persist among Native Hawaiians and other groups. Without change, many will continue to suffer from oral health diseases and overall health conditions that are associated with poor oral health. Over the next 30 years, we must remain in the forefront to advocate, serve, and collaborate for systematic change that will improve oral health for Native Hawaiians and all.

References

Ambrose, A. J., Arakawa, R. Y., Greidanus, B. D., Macdonald, P. R., Racsa, C. P., Shibuya, K. T., …Yamada, S. (2012). Geographical maldistribution of Native Hawaiian and other Pacific Islander physicians in Hawai'i. *Hawai'i Journal of Medicine & Public Health: A Journal of Asia Pacific Medicine & Public Health, 71*(4 Suppl 1), 13-20. Retrieved from https://www.ncbi.nlm.nih.gov/

American Dental Association. (2017). *Fluoride in water*. Retrieved from http://www.ada.org/ en/public-programs/advocating-for-the-public/fluoride-and-fluoridation

Arcury, T. A., Preisser, J. S., Gesler, W. M., & Powers, J. M. (2005). Access to transportation and health care utilization in a rural region. *The Journal of Rural Health, 21*(1), 31-8. Retrieved from https://www.ncbi.nlm.nih.gov/

Armour, B. S., Swanson, M., Waldman, H. B., & Perlman, S. P. (2008). A profile of state-level differences in the oral health of people with and without disabilities, in the U.S., in 2004. *Public Health Reports, 123*(1), 67-75. doi: 10.1177/003335490812300110

Beach, M. C., Price, E. G., Gary, T. L., Robinson, K. A., Gozu, A., Palacio, A., …Cooper, L. A. (2005). Cultural competence: A systematic review of health care provider educational interventions. *Medical Care, 43*(4), 356-73. Retrieved from https://www.ncbi.nlm.nih.gov/

Berkman, N. D., Sheridan, S. L., Donahue, K. E., Halpern, D. J., & Crotty, K. (2011). Low health literacy and health outcome: An updated systematic review. *Annals of Internal Medicine, 155*(2), 97-107. doi: 10.7326/0003-4819-155-2-201107190-00005

Binkley, C. J., Johnson, K. W., Abadi, M., Thompson, K., Shamblen, S. R., Young, L., & Zaksek, B. (2014). Improving the oral health of residents with intellectual and developmental disabilities: An oral health strategy and pilot study. *Evaluation and Program Planning, 27*, 54-63. doi: 10.1016/j.evalprogplan.2014.07.003

Branson, B. G. (2014, November). Place-based model of care. *Perspectives on Dental Hygiene* (a supplement to *Dimensions of Dental Hygiene*), *12*(11), 38-39.

Bright Smiles Hawai'i. (2017). *Community initiatives*. Retrieved online on April 10, 218 from: http://brightsmileshawaii.org/community-initiatives/

The California Society of Pediatric Dentistry. (2017). *The consequences of untreated dental disease in children.* California Dental Association. Retrieved from https://www.cda.org/Portals/0/pdfs/untreated_disease.pdf

Center for Medicaid and CHIP Services. (n.d.). Dental care. *Medicaid.gov*. Retrieved from https://www.medicaid.gov/medicaid/benefits/dental/index.html

The Center for Native and Pacific Health Disparities Research. (2017). *Ulu training.* Retrieved from www2.jabsom.hawaii.edu/

Deguchi, M., Mau, M. M., Davis, J., & Niederman, R. (2017). Preventable tooth loss in Hawai'i: The role of socioeconomic status, diabetes, and dental visits. *Preventing Chronic Disease, 14*, 170214. DOI: http://dx.doi.org/10.5888/pcd14.170214

Doescher, M., & Keppel, G. (2015). *Dentist supply, dental care utilization, and oral health among rural and urban U.S. residents.* WWAMI Rural Health Research Center, University of Washington. Retrieved from http://depts.washington.edu/uwrhrc/uploads/RHRC_FR135_Doescher.pdf

Edelstein, B. L. (2002). Disparities in oral health and access to care: Findings of national surveys. *Ambulatory Pediatrics: The Official Journal of the Ambulatory Pediatric Association, 2*(2 Suppl), 141-147. Retrieved from https://www.ncbi.nlm.nih.gov/

Fink, K. S. (2009). *Changes to adult dental benefits effective August 10, 2009.* State of Hawai'i Department of Human Services. Retrieved from http://www.med-quest.us/PDFs/Provider%20Memos/ACSMEMO2009/DENTAL%20M09-03.pdf

The Food Trust (2012). *What Is Policy, Systems and Environmental (PSE) change?* Retrieved online on April 10, 2018 from: http://healthtrust.org/wp-content/uploads/2013/11/2012-12-28-Policy_Systems_and_Environmental_Change.pdf

Gao, S. S., Zhao, I. S., Hiraishi, N., Duangthip, D., Mei, M. L., Lo, E. C. M., & Chu, C. H. (2016). Clinical trials of silver diamine fluoride in arresting caries among children: A systematic review. *JDR Clinical & Translational Research*, *1*(3), 201-210.

Ghassemi, A., Vorwerk, L. M., Hooper, W. J., Putt, M. S., & Milleman, K. R. (2008). A four-week clinical study to evaluate and compare the effectiveness of a baking soda dentifrice and an antimicrobial dentifrice in reducing plaque. *The Journal of Clinical Dentistry, 19*(4), 120-126.

Greer, M. H., Tengan, S. L., Hu, K. I., & Takata, J. T. (2003). Early childhood caries among Hawai'i public school children, 1989 vs. 1999. *Pacific Health Dialogue, 10*(1), 17-22. Retrieved from https://www.ncbi.nlm.nih.gov/

Gutmanis, J. (1976). *Kahuna la'au lapa'au.* Honolulu, HI: Island Heritage Books.

Handy, E. C., & Pukui, M. K. (1950). The Polynesian family system in Ka-'u, Hawai'i. *The Journal of the Polynesian Society*, *59*(3), 232-240.

Harris, R. V., Pennington, A., & Whitehead, M. (2017). Preventive dental visiting: A critical interpretive synthesis of theory explaining how inequalities arise. *Community Dentistry and Oral Epidemiology, 45(*2), 120-134. doi: 10.1111/cdoe.12268

Hawai'i Dental Association. (2017). *About.* Retrieved from www.hawaiidentalassociation.net/about

Hayes, D. (2018). *Preventable oral health ER visits: Native Hawaiian*. Family Health Services Division, State of Hawai'i Department of Health. Retrieved from http://histategis.maps.arcgis.com/apps/MapSeries/index.html?appid=520acc5b615d4b60b8ea7e409a0a49de

Hilgenkamp, K., & Pescaia, C. (2003). Traditional Hawaiian healing and Western influence. *Californian Journal of Health Promotion*, *1*, 34-39.

Huang, D. L., & Park, M. (2015). Socioeconomic and racial/ethnic oral health disparities among US older adults: Oral health quality of life and dentition. *Journal of Public Health Dentistry, 75*(2), 85-92. doi: 10.1111/jphd.12072

Hyde, S., Satariano, W. A., & Weintraub, J. A. (2006). Welfare dental intervention improves employment and quality of life. *Journal of Dental Research, 85*(1), 79-84. doi: 10.1177/154405910608500114

Iheozor-Ejiofor, Z., Worthington, H. V., Walsh, T., O'Malley, L., Clarkson, J. E., Macey, R., …Glenny, A. (2015). Water fluoridation to prevent tooth decay. *The Cochrane Database of Systematic Reviews, 6,* CD010856. doi: 10.1002/14651858

Kearns, C. E., Glantz, S. A., & Schmidt, L. A. (2015). Sugar industry influence on the scientific agenda of the National Institute of Dental Research's 1971 National Caries Program: A historical analysis of internal documents. *PLoS Medicine*, *12*(3), e1001798.

Keene, H. J. (1986). Dental caries prevalence in early Polynesians from the Hawaiian Islands. *Journal of Dental Research, 65*(6), 935-938. doi: 10.1177/00220345860540051601

Kumar, S., Kroon, J., & Lalloo, R. (2014). A systematic review of the impact of parental socio-economic status and home environment characteristics on children's oral health related quality of life. *Health and Quality of Life Outcomes, 12,* 41. doi: 10.1186/1477-7525-12-41

Makhija, S. K., Gilbert G. H., Boykin, M. J., Litaker, M. S., Allman, R. M., Baker, P. S., …Ritchie, C. S. (2006). The relationship between sociodemographic factors and oral health-related quality of life in dentate and edentulous community-dwelling older adults. *Journal of the American Geriatrics Society, 54*(11), 1701-1712. doi: 10.1111/j.1532-5415.2006.00923.x

Mau, M. K., Sinclair, K., Saito, E. P., Bauhofer, K. N., & Kaholokula, J. K. (2009). Cardiometabolic health disparities in Native Hawaiians and other Pacific Islanders. *Epidemiologic Reviews, 31*, 113-129. doi: 10.1093/ajerev/mxp004

McDonagh, M. S., Whiting, P. F., Wilson, P. M., Sutton, A. J., Chestnutt, I., Cooper, J., …Kleijnen, J. (2000). Systematic review of water fluoridation. *BMJ, 321*, 855. doi: 10.1136/bmj.321.7265.855

Medicare.gov. (n.d.). Your Medicare coverage. *Medicare.gov*. Retrieved from https://www.medicare.gov/coverage/your-medicare-coverage.html

Morgan, J. P., Minihan, P. M., Stark, P. C., Finkelman, M. D., Yantsides, K. E., Park, A., …Must, A. (2015). The oral health status of 4,732 adults with intellectual and developmental disabilities. *Journal of the American Dental Association, 143*(8), 838-846. Retrieved from https://www.ncbi.nlm.nih.gov/

National Institute of Dental and Craniofacial Research. (2014). Chapter 7: Community and other approaches to promote oral health and prevent oral disease. *National Institute of Dental and Craniofacial Research.* Retrieved from https://www.nidcr.nih.gov/

National Institute of Dental and Craniofacial Research. (2018). *Tooth decay.* Retrieved online April 10, 2018 from: https://www.nidcr.nih.gov/health-info/tooth-decay

Native Hawaiian Center of Excellence. (2015). *Cultural competency development training.* Retrieved from http://www.hawaii.edu/nhcoe/information-dissemination/

Nazir, M. A. (2017). Prevalence of periodontal disease, its association with systemic diseases and prevention. *International Journal of Health Sciences, 11*(2), 72-80. Retrieved from https://www.ncbi.nilm.nih.gov/

Nelson, J. C., Rashid, H., Galvin, V. G., Essien, J. D., & Levine, L. M. (1999). Public/private partners: Key factors in creating a strategic alliance for community health. *American Journal of Preventive Medicine, 16*(3 Suppl), 94-102. Retrieved from https://www.ncbi.nlm.nih.gov/

Peedikayil, F. C., Remy, V., John, S., Chandru, T. P., Sreenivasan, P., & Bijapur, G. A. (2016). Comparison of antibacterial efficacy of coconut oil and chlorhexidine on Streptococcus mutans: An in vivo study. *Journal of International Society of Preventive & Community Dentistry, 6*(5), 447.

The Pew Charitable Trust. (2011). *The state of children's dental health: Making coverage matter.* Retrieved from http://www.pewtrusts.org/~/media/legacy/uploadedfiles/pcs_assets/2011/hawaii_052311_web.pdf

Pobutsky, A. M., Hirokawa, R., & Reyes-Salvail, F. (2003). Estimates of disability among ethnic groups in Hawai'i. *Californian Journal of Health Promotion, 1*[Special issue: Hawaii], 65-82. doi: 10.1.1.174.3878

Pourat, N., & Finocchio, L. (2010). Racial and ethnic disparities in dental care for publicly insured children. *Health Affairs (Project Hope), 29*(7), 1356-1363. doi: 10.1377/hlthaff.2009.0089

Powell, L. M., Wada, R., & Kumanyika, S. K. (2014). Racial/ethnic and income disparities in child and adolescent exposure to food and beverage television ads across the U.S. media markets. *Health & Place*, *29*, 124-131.

Preshaw, P. M., Alba, A. L., Herrera, D., Jepsen, S., Konstantinidis, A., Makrilakis, K., & Taylor, R. (2012). Periodontitis and diabetes: A two-way relationship. *Diabetologia, 55*(1), 21-31. doi: 10.1007/s00125-011-2342-y

Pukui, M. K. (n.d.). *Offerings.* Unpublished manuscript in the Gutmanis family private archive.

Pukui, M. K. (1983). *'Ōlelo no'eau: Hawaiian proverbs & poetical sayings.* Honolulu, HI: Bishop Museum Press.

Putt, M. S., Milleman, K. R., Ghassemi, A., Vorwerk, L. M., Hooper, W. J., Soparkar, P. M., …Proskin, H. M. (2008). Enhancement of plaque removal efficacy by tooth brushing with baking soda dentifrices: Results of five clinical studies. *The Journal of Clinical Dentistry, 19*(4), 111-119.

The Queen's Medical Center. (2017). *Native Hawaiian health program.* Retrieved from http://queensmedicalcenter.org/native-hawaiian-health-program

Rural Health Information Hub. (2014). *Oral health in rural communities.* Retrieved from https://www.ruralhealthinfo.org/topics/oral-health

Rural Health Information Hub. (2017). *Mobile dental services model.* Retrieved from https://www.ruralhealthinfo.org/community-health/oral-health/2/mobile-dental-services-model

Saha, S., Arbelaez, J. J., & Cooper, L. A. (2003). Patient-physician relationships and racial disparities in the quality of health care. *American Journal of Public Health*, *93*(10), 1713–1719. doi:10.2105/AJPH.93.10.1713

Salomon, D., Heidel, R. E., Kolokythas, A., Miloro, M., & Schlieve, T. (2017). Does restriction of public health care dental benefits affect the volume, severity, or cost of dental-related hospital visits? *Journal of Oral and Maxillofacial Surgery, 75*(3), 467-474. doi: 10.1016/j.joms.2016.10.019

Sheiham, A., Steele, J. G., Marcenes, W., Tsakos, G., Finch, S., & Walls, A. W. (2001). Prevalence of impacts of dental and oral disorders and their effects on eating among older people; a national survey in Great Britain. *Community Dentistry and Oral Epidemiology, 29*(3), 195-203. Retrieved from https://www.ncbi.nlm.nih.gov/

State of Hawai‘i. (2015). *The Hawai‘i Behavioral Factor Surveillance System 2014 results.* Department of Health, Honolulu. Retrieved from http://health.hawaii.gov/brfss/files/2015/08/salvail_ye_fall_prevent2011.pdf

State of Hawai‘i. (2016). *Hawai‘i Smiles 2015.* Retrieved from https://health.hawaii.gov/about/files/2013/06/Hawaii-Smiles-Report.pdf

Sugimoto-Matsuda, J., & Stridiron, A. K. (2017). *Needs and assets assessment of oral health services in Hawai‘i: Results and recommendations.* Honolulu, HI: Hawai‘i Dental Service. Retrieved online April 4, 2018 from https://www.hawaiidentalservice.com/ddpahi/HDS_Full_Report_Needs_And_Assets_Assessment_of_Oral_Health_Services_In_Hawaii.pdf

U.S. Centers for Medicare & Medicaid Services. (2013). *Medicare dental coverage.* Retrieved online April 10, 2018 from https://www.cms.gov/Medicare/Coverage/MedicareDentalCoverage/index.html

Vargas, C. M., Dye, B. A., & Hayes, K. (2003). Oral health care utilization by U.S. rural residents: National Health Interview Survey 1999. *Journal of Public Health Dentistry, 63*(3), 150-157. Retrieved from https://www.ncbi.nlm.nih.gov/

Vargas, C. M., Ronzio, C. R., & Hayes, K. L. (2003). Oral health status of children and adolescents by rural residence, United States. *Journal of Rural Health, 19*(3), 260-268. Retrieved from https://www.ncbi.nlm.nih.gov/

Warren, J. J., Cowen, H. J., Watkins, C. M., & Hand, J. S. (2000). Dental caries prevalence and dental care utilization among the very old. *Journal of the American Dental Association, 131*(11), 1571-1579. Retrieved from https://www.ncbi.nlm.nih.gov/



Papa Ola Lōkahi

894 Queen Street | Honolulu, HI 96813 • (808) 597-6550 • www.papaolalokahi.org