

# Oral Health Data Report

Family Health Services Division  
Hawaii Department of Health  
State of Hawaii  
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Family Health  
Services Division



## Executive Summary

Oral health is critical to our general health and well-being. Unlike other states, Hawaii does not have an ongoing and routine system for assessing the oral health of its residents and does not currently have a robust dental public health program within the Hawaii State Department of Health. This report is an initial effort by the Department of Health to review existing sources of data and their ability to accurately portray the oral health status and access to dental care experienced by Hawaii's residents. National resources, such as Healthy People 2020 Oral Health Objectives and several reports from the Pew Charitable Trusts, are provided to demonstrate national objectives and where Hawaii stands by comparison. This report serves to inform planning and policy discussions regarding the oral health of Hawaii residents.

In reviewing the various data sets, various characteristics were demonstrated to be associated with a poor self-reported oral health status or lack of utilization of dental services. These characteristics included:

1. Low socio-economic status and/or use of public health insurance
2. Race/ethnicity
3. Age
4. Educational status
5. County/Geography

In addition to associations among sociodemographic characteristics, the utilization of the hospital emergency departments for preventable oral health visits was compared between 2006 and 2012. A relative increase by 58% was documented, demonstrating the significant costs associated with episodic dental care and lack of access to dental services, either due to location or lack of dental coverage. This represents a considerable cost to hospitals and State Medicaid.

The good news is that not all the data demonstrated negative outcomes. There were improvements demonstrated among children served by the Early Periodic Screening, Diagnosis, and Treatment (EPSDT) program. More of these high-risk children received protective sealants on permanent teeth, preventive dental services in general, dental treatment related services, and there was an overall decline in children being referred for corrective treatment throughout Hawaii. The improvement in these measures for the overall EPSDT population is encouraging and continued support to sustain these improvements will help improve the oral health for these children. Likewise, improvement in the oral health of children will likely lead to reductions in adult related conditions as they grow and likely yield reductions in costs over the long term.

This compilation of data from existing systems demonstrates the limited knowledge available and the need for more complete oral health surveillance data, with an inclusion of actual objective clinical data to compare populations throughout the state.

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# Background

## Importance of Oral Health Surveillance

Surveillance of oral health data is critical to ensure that the population in the State of Hawaii is able to access appropriate oral health care. Oral health is an essential and integral component of health throughout life. Poor oral health can result in significant illness, disease, and even death. Poor oral health is associated with increased health care costs, increased absenteeism, and decreased productivity. People who do not receive regular professional care can develop oral disease that requires complex restorative treatment, leads to tooth loss, and contributes to health problems. Routine dental visits provide an opportunity for early diagnosis, prevention, and treatment of oral disease. Dental caries is the most common chronic health problem in children 5 to 17 years of age. If left untreated, dental decay can cause unnecessary pain and infection that can compromise a child's ability to eat well. This can result in absence from and inability to concentrate in school, early tooth loss that impairs speech development, failure to thrive, reduced self-esteem, and increased risk for future caries development with age. Early dental disease is reversible and treatment can prevent progression to more destructive disease that will promote better health in both children and adults. The last population based direct oral health assessment data collected on children in third grade in the state was in 2007. The elimination of the capacity of the Department of Health to conduct oral health assessments in school children highlights the importance of a systematic report to document the current surveillance efforts and capacity on oral health data in the state for all populations.

## Goals of this Report

It is important to track oral health data in order to understand trends and improve oral health standards. In addition, data tracking is one of the PEW children's dental health benchmarks. The last oral health data report for Hawaii was completed in 2004. This report outlines the current sources available for tracking oral health in Hawaii and the needs for improved data tracking. The objective of this report is to highlight current surveillance capacity in Hawaii to include, but not limited to:

- Overall State Level Data on population groups (children, adults, pregnant women)
- Data on differences based on social determinants of health within the population groups (age, race, gender, education, geography, etc... depending on data source)
- Recommendations for additional analyses and continued surveillance efforts.

## Healthy People 2020 Summary of Oral Health Objectives<sup>1</sup>

<b>Oral Health of Children and Adolescents</b>
OH-1 Reduce the proportion of children and adolescents who have dental caries experience in their primary or permanent teeth
OH-2 Reduce the proportion of children and adolescents with untreated dental decay
<b>Oral Health of Adults</b>
OH-3 Reduce the proportion of adults with untreated dental decay
OH-4 Reduce the proportion of adults who have ever had a permanent tooth extracted because of dental caries or periodontal disease
OH-5 Reduce the proportion of adults aged 45 to 74 years with moderate or severe periodontitis
OH-6 Increase the proportion of oral and pharyngeal cancers detected at the earliest stage
<b>Access to Preventive Services</b>
OH-7 (Leading Health Indicator) Increase the proportion of children, adolescents, and adults who used the oral health care system in the past year
OH-8 Increase the proportion of low-income children and adolescents who received any preventive dental service during the past year
OH-9 Increase the proportion of school-based health centers with an oral health component
OH-10 Increase the proportion of local health departments and Federally Qualified Health Centers (FQHCs) that have an oral health program
OH-11 Increase the proportion of patients who receive oral health services at Federally Qualified Health Centers (FQHCs) each year
<b>Oral Health Interventions</b>
OH-12 Increase the proportion of children and adolescents who have received dental sealants on their molar teeth
OH-13 Increase the proportion of the US population served by community water systems with optimally fluoridated water
OH-14 (Developmental) Increase the proportion of adults who receive preventive interventions in dental offices
<b>Monitoring and Surveillance Systems</b>
OH-15 (Developmental) Increase the number of States and the District of Columbia that have a system for recording and referring infants and children with cleft lips and cleft palates to craniofacial anomaly rehabilitative teams
OH-16 Increase the number of States and the District of Columbia that have an oral and craniofacial health surveillance system
<b>Public Health Infrastructure</b>
OH-17 Increase health agencies that have a dental public health program directed by a dental professional with public health training
<b>Other Related Objectives</b>
C-6 Reduce the oropharyngeal cancer death rate
D-8 Increase the proportion of persons with diagnosed diabetes who have at least an annual dental examination
AHS-1.2 (Developmental) Increase the proportion of persons with dental insurance
AHS-6.3 Reduce the proportion of persons who are unable to obtain or delay in obtaining necessary dental care

The Department of Health and Human Services leads the development and evaluation of Healthy People 2020, which identified nearly 600 objectives and 1200 measures (including 17 objectives covering 32 measures related to Oral Health—appendix 1) to improve the health of all Americans. This initiative provides science-based, 10-year national objectives for improving the health of all Americans. For three decades, Healthy People has established benchmarks and monitored progress over time in order to: 1) Encourage collaborations across communities

<sup>1</sup> US Department of Health and Human Services. Healthy People 2020 Objectives. Specific detail available at: <http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=32>.

and sectors; 2) Empower individuals toward making informed health decisions; and 3) Measure the impact of prevention activities.

## PEW Report<sup>2</sup>

The PEW Charitable Trusts is a non-profit organization that works to develop policy solutions to critical state issues through collaboration of policy makers and comprehensive research across the US. The PEW Children’s Dental Campaign is a national effort to increase dental care access among children. A part of this program is the development of dental report cards for each state including the 2010 “Cost of Delay Report”, the 2011 “State of Children’s Dental Health: Making Coverage Matter” report, and the 2013 “Falling Short: Dental Sealants” report.

The 2010 and 2011 reports graded states on child dental health based on eight key evidence-based policy benchmarks. The grading standards are: “A” for meeting 6 or more benchmarks, “B” for meeting 5 benchmarks, “C” for meeting 4 benchmarks, “D” for meeting 3 benchmarks, and “F” for meeting 2 or fewer benchmarks. The eight indicators and Hawaii’s status in 2010 and 2011 are presented in the table below.

Indicator	Hawaii 2010 Report	Hawaii 2011 Report	Meets Standards
Having sealant programs in at least 25% of high-risk schools	0%	0%	
Allowing a hygienist to place sealants in school-based programs without a dentists exam	No	No	
Providing fluoridated public drinking water to at least 75% of residents served by community water systems	8.4%	10.8%	
Meeting or exceeding the national 2007 (38.1%) average of children enrolled in Medicaid receiving dental services	39.9%	45.8%	✓
Paying dentists who serve Medicaid-enrolled children at least the 2008 national average (60.5) of dentists’ median retail fees	36.8%	37.7%	
Reimbursing medical care providers through the state Medicaid program for providing dental services	No	No	
Authorizing new primary-care dental providers	No	No	
Submitting basic screening data to the national database that tracks oral health status	No	No	

The State of Hawaii received a failing “F” grade in both the 2010 and 2011 reports, meeting only one of the eight standards. In the 2013 “Dental Sealant” report, Hawaii also received a failing “F” grade and did not meet any of the four indicators which include: 1) access to sealants for low income children; 2) hygienists allowed to place sealants in school programs without a dentist exam; 3) collection of data data on children and participation in national oral health data base, and 4) progress toward Healthy People objective for proportion of students receiving sealants across the state.

<sup>2</sup> Pew’s Children Dental Campaign. Oral Health Reports. Available online at: <http://www.pewstates.org/projects/childrens-dental-campaign-328060>.

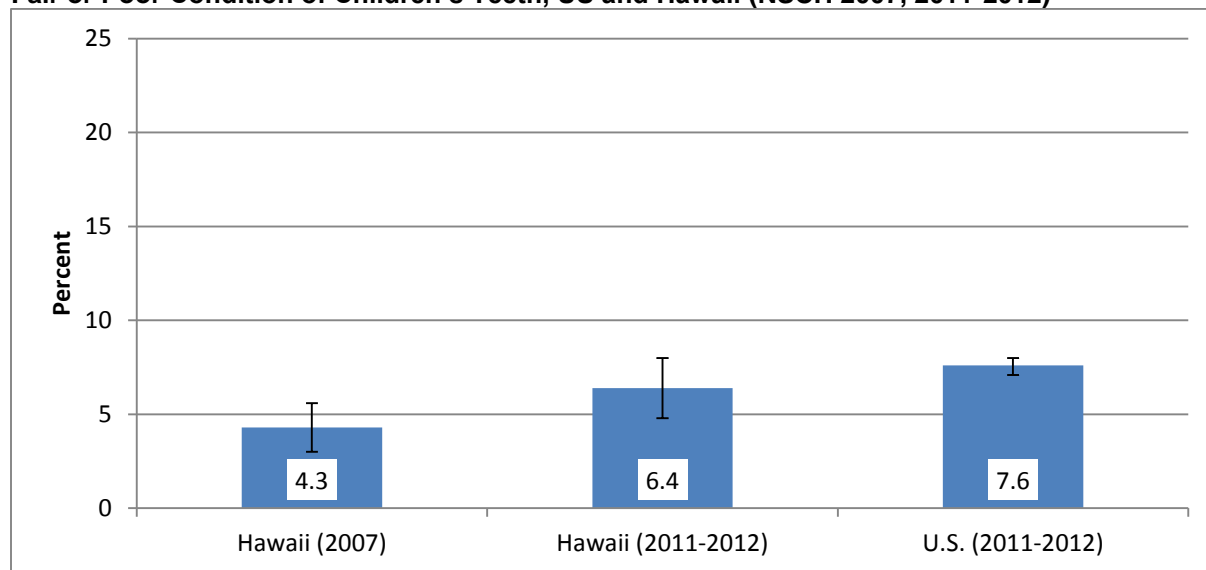
## Surveillance Data

### NATIONAL SURVEY OF CHILDREN'S HEALTH (NSCH)<sup>3</sup>

The NSCH is a nationwide telephone survey, which collects information on a variety of behavioral, physical, and emotional health indicators among children aged 0 to 17 years. Oral health information collected includes the general condition of children's teeth and the prevalence of general and specific oral health problems. The data below from the 2011-2012 NSCH survey represents information weighted to reflect the 304,000 children 0-17 years of age (with about 100,000 each in the 0-5, 6-11, and 12-17 years of age) living in the State of Hawaii. Statewide, there were 104,333 residents 0-5 years of age, 99,103 6-11 years of age, and 100,382 12-17 years of age based on 2010 census data. Just as access to medical care results in better general health, access to dental care results in improved oral health. Regular dental visits allow for the provision of preventive services and the detection of oral disease at an early stage.

### Fair or Poor Oral Health

**Fair or Poor Condition of Children's Teeth, US and Hawaii (NSCH 2007, 2011-2012)**

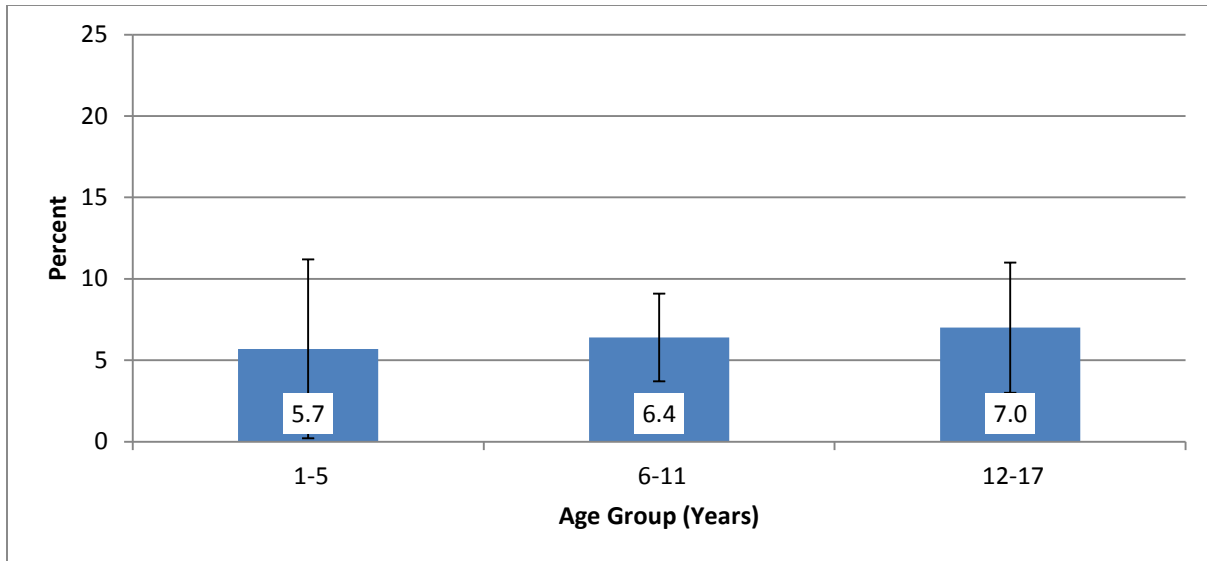


*The percent of children with teeth reported in fair or poor condition in 2011-2012 is lower in Hawaii compared to the US (6.4% vs. 7.6%, respectively). The percent of children with fair or poor condition teeth was higher in 2011-2012 in Hawaii than in 2007 (4.3%).*

### Fair or Poor Condition of Children's Teeth by Age, Hawaii (NSCH 2011-2012)

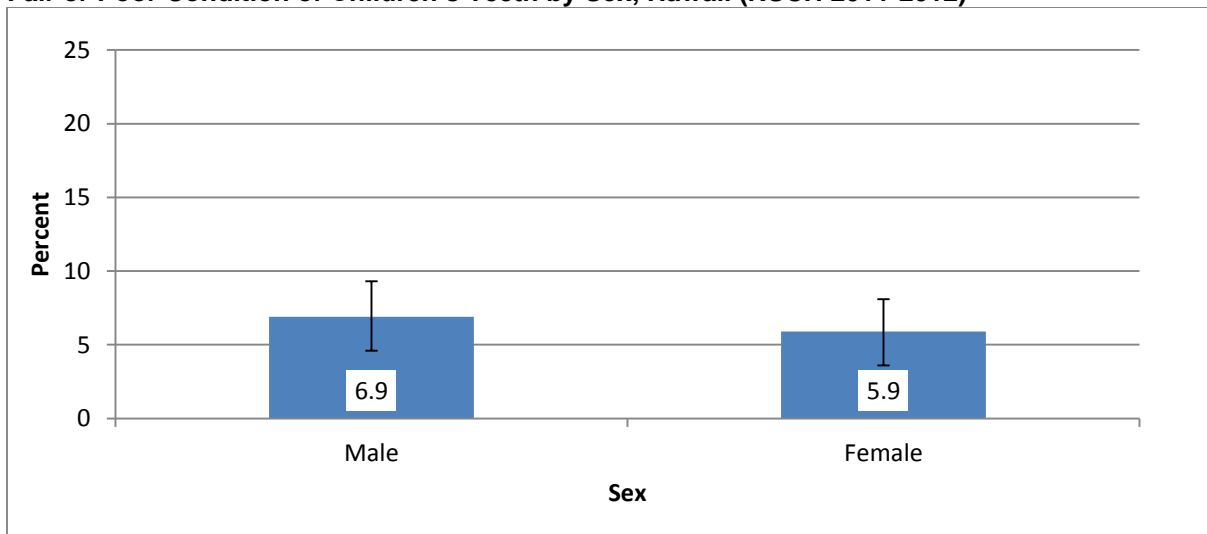
<sup>3</sup> NSCH Data obtained online from Child and Adolescent Health Measurement Initiative, Data Resource Center on Child and Adolescent Health website. Available online at: <http://www.childhealthdata.org>.





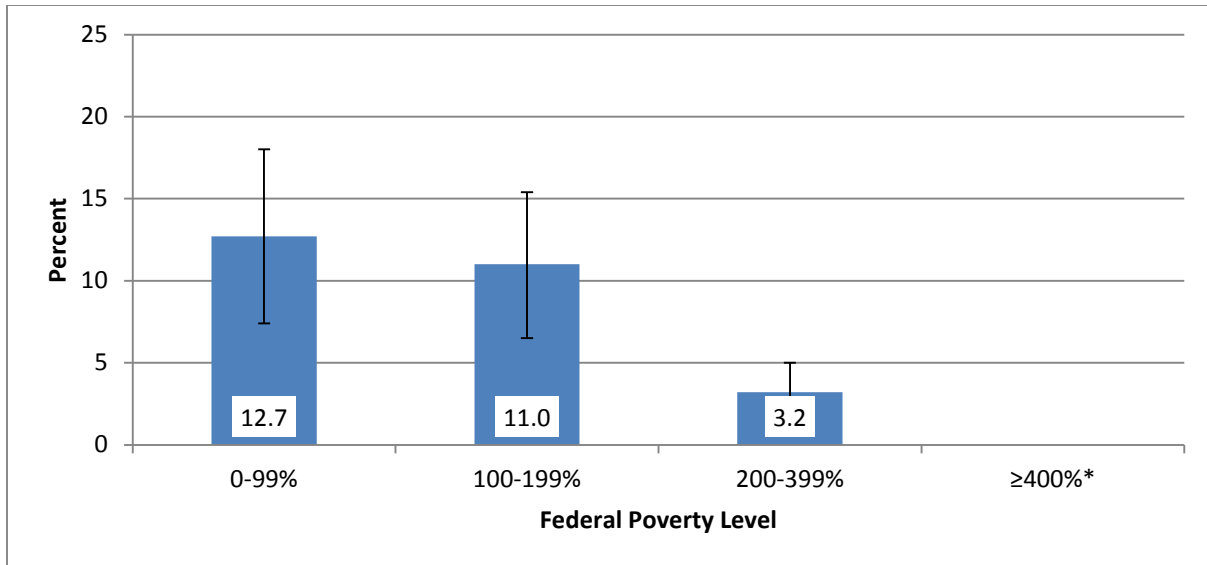
*The percent of children with fair or poor condition teeth in Hawaii slightly increases with age group from 1-5 years to 12-17 years (5.7% and 7.0%, respectively).*

**Fair or Poor Condition of Children's Teeth by Sex, Hawaii (NSCH 2011-2012)**



*Males have a slightly higher prevalence of fair or poor condition teeth compared to females in Hawaii (6.9% and 5.9%, respectively).*

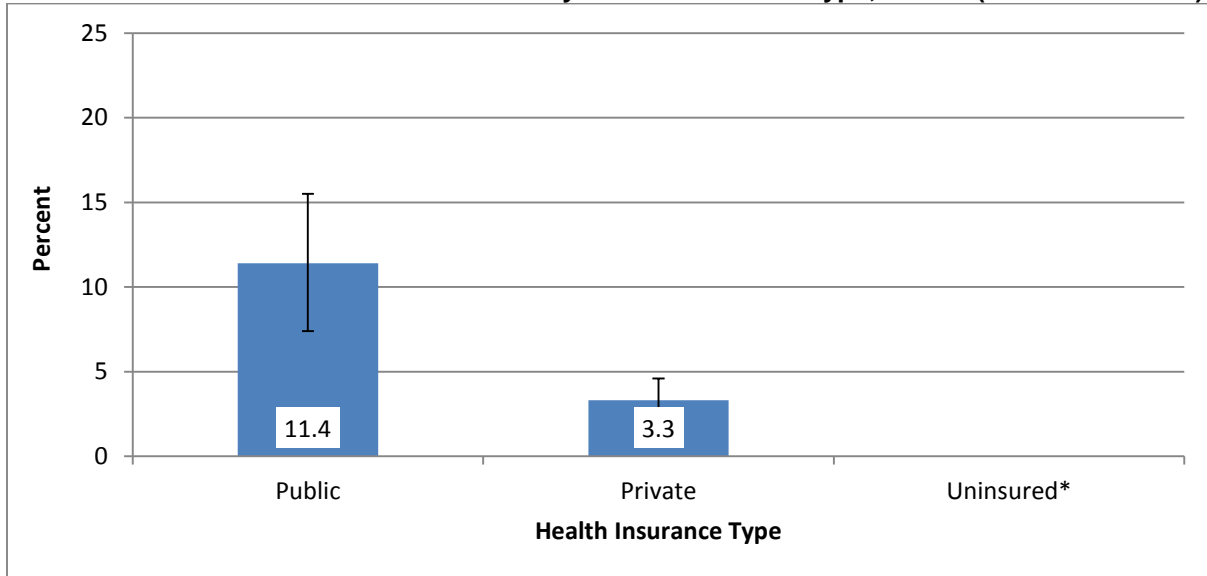
**Fair or Poor Condition of Children's Teeth by Federal Poverty Level, Hawaii (NSCH 2011-2012)**



\*Not reportable due to small cell size

*Children with household incomes 0-99% and 100-199% of the federal poverty level have a higher prevalence of fair or poor teeth compared to children with a household income 200-399% of the federal poverty level (12.7% and 11.0% vs. 3.2%, respectively).*

#### Fair or Poor Condition of Children's Teeth by Health Insurance Type, Hawaii (NSCH 2011-2012)

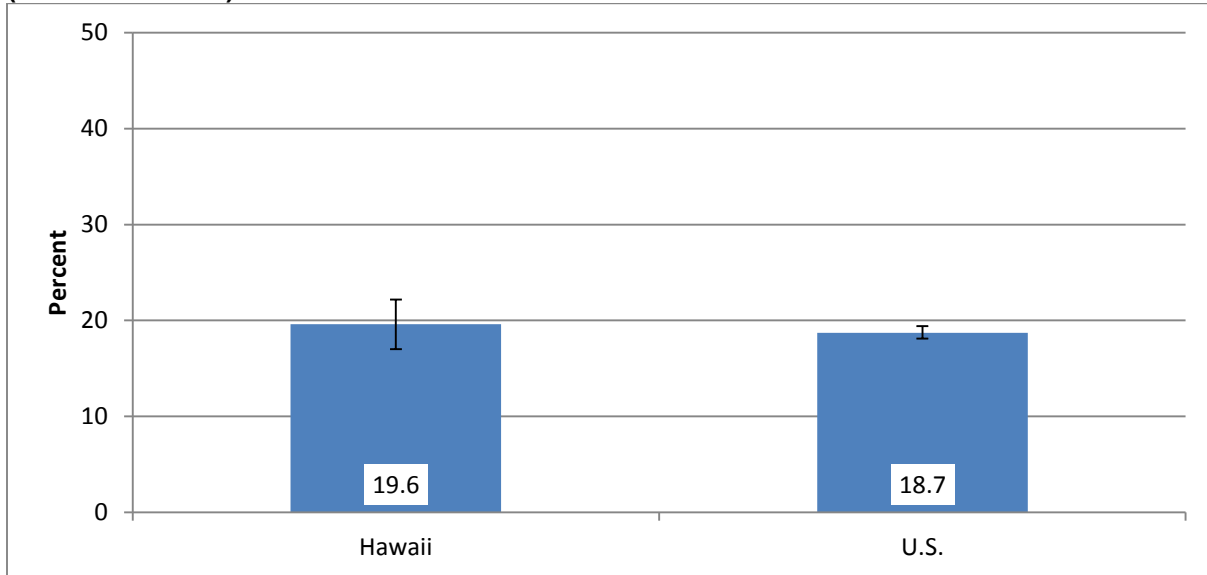


\*Not reportable due to small cell size

*The prevalence of fair or poor condition teeth among children in Hawaii differs by health insurance type. Among children with public insurance, the prevalence of fair or poor condition teeth is higher than among children with private insurance (11.4% vs. 3.3%, respectively).*

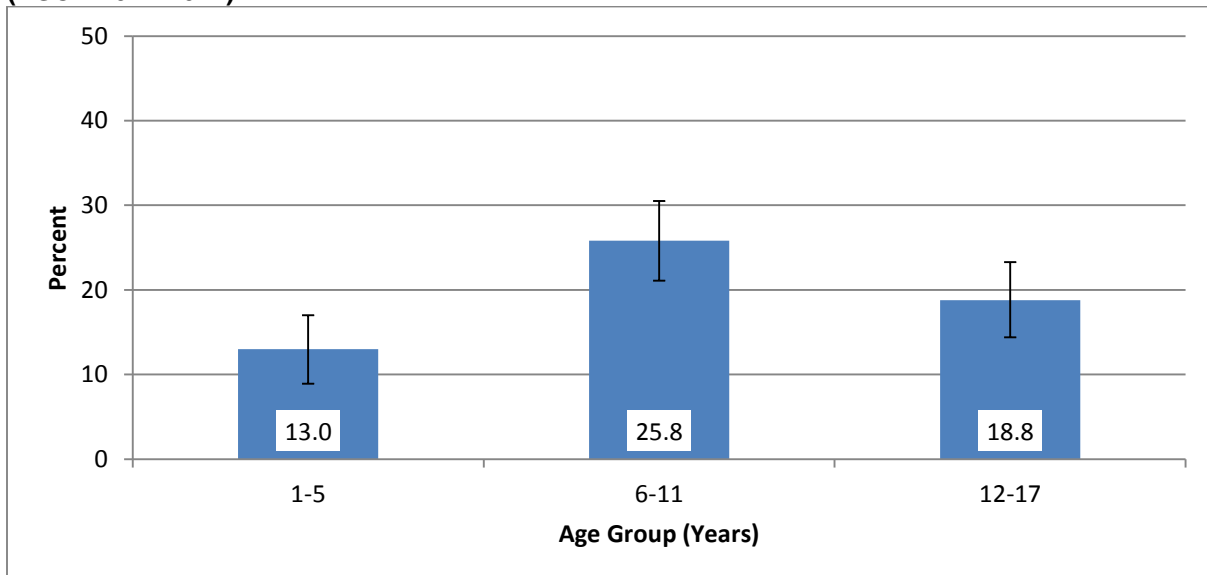
## One or More Oral Health Problems

**Percent of Children With One or More Oral Health Problems in the Past Six Months, US and Hawaii (NSCH 2011-2012)**



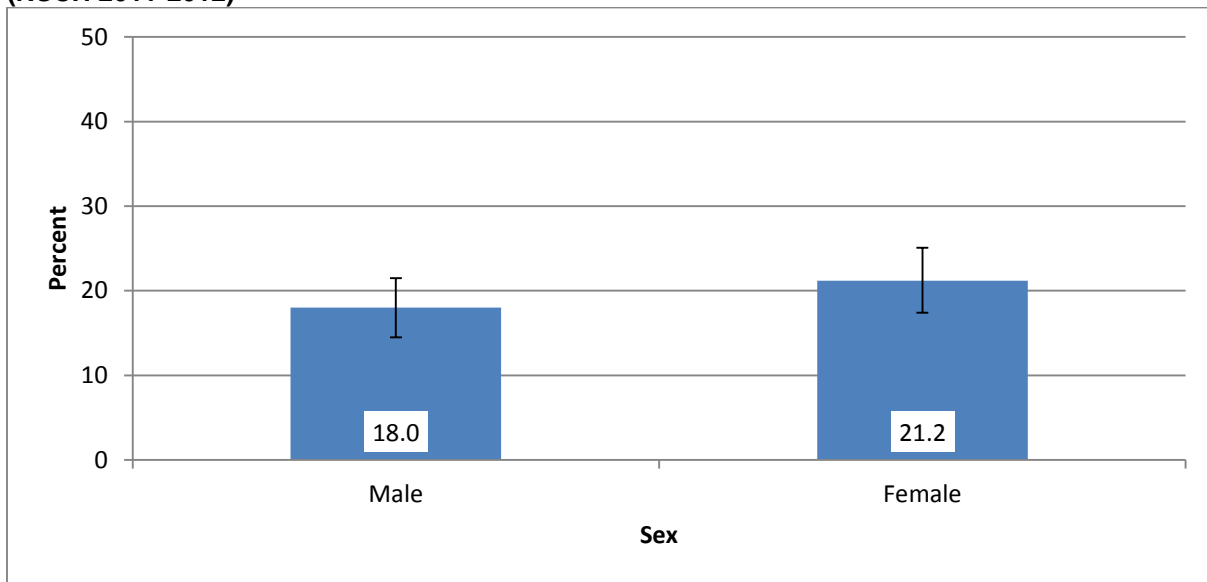
*The prevalence of one or more health problems among children is comparable between Hawaii and the US (19.6% and 18.7%, respectively).*

**Percent of Children With One or More Oral Health Problems in the Past Six Months by Age, Hawaii (NSCH 2011-2012)**



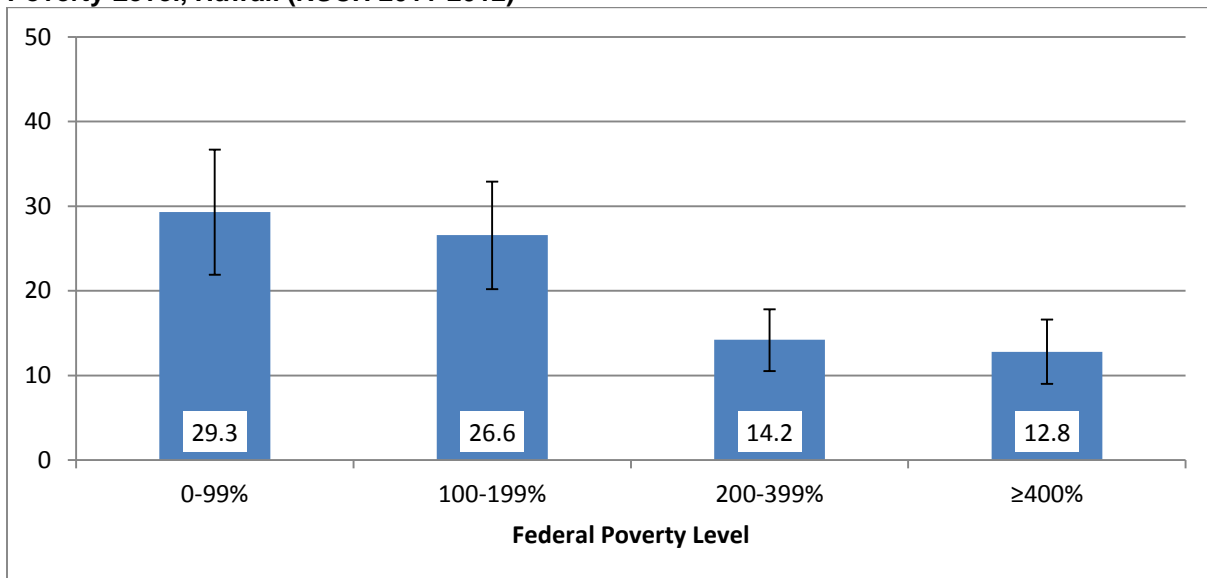
*The percent of children with one or more oral health problems is highest among 6-11 year olds (25.8%) and is lowest among 1-5 year olds (13.0%).*

**Percent of Children With One or More Oral Health Problems in the Past Six Months by Sex, Hawaii (NSCH 2011-2012)**



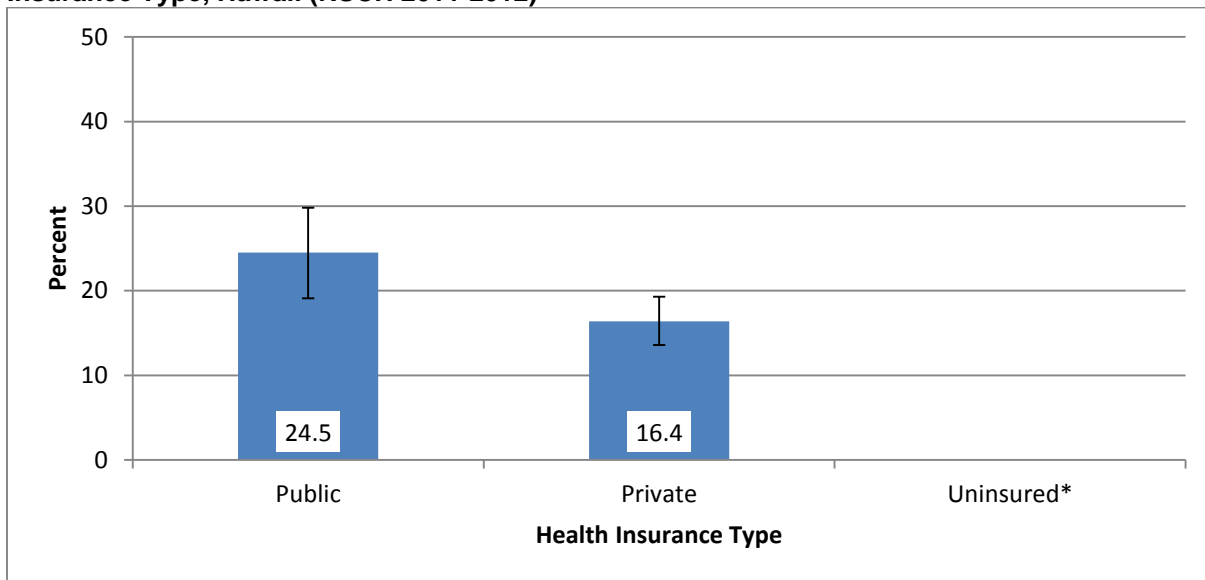
*The percent of children with one or more oral health problems in the past six months is fairly similar among males and females (18.0% and 21.2%, respectively).*

**Percent of Children with One or More Oral Health Problems in the Past Six Months by Federal Poverty Level, Hawaii (NSCH 2011-2012)**



*The percent of children with one or more oral health problems in the past six months varies by percentage of the federal poverty level. The prevalence of one or more oral health problems among children in Hawaii ranges from 29.3% among children with household income levels 0-99% of the federal poverty level to 12.8% among children with household income levels greater than or equal to 400% of the federal poverty level.*

**Percent of Children with One or More Oral Health Problems in the Past Six Months by Health Insurance Type, Hawaii (NSCH 2011-2012)**

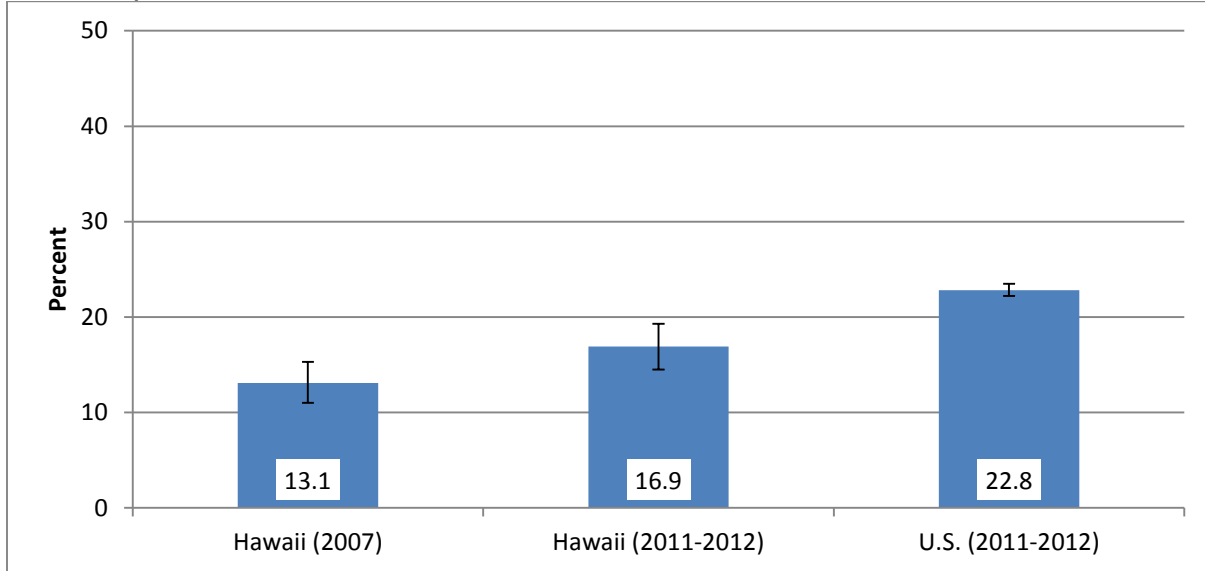


\*Not reportable due to small cell size

*The percent of children with one or more oral health problems differs by health insurance type among children in Hawaii. Children with public health insurance have a higher prevalence of one or more health problems in the last six months than those with private insurance (24.5% vs. 16.4%, respectively).*

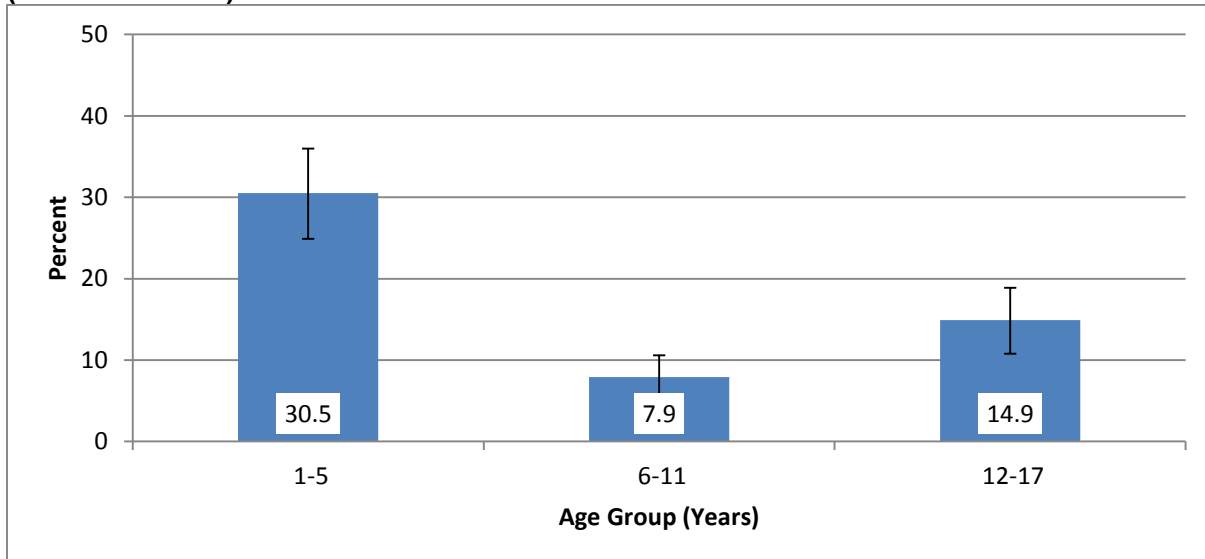
## No Preventive Dental Care Visit

Percent of Children With No Preventive Dental Care Visit in Past Year, US and Hawaii (NSCH 2007, 2011-2012)



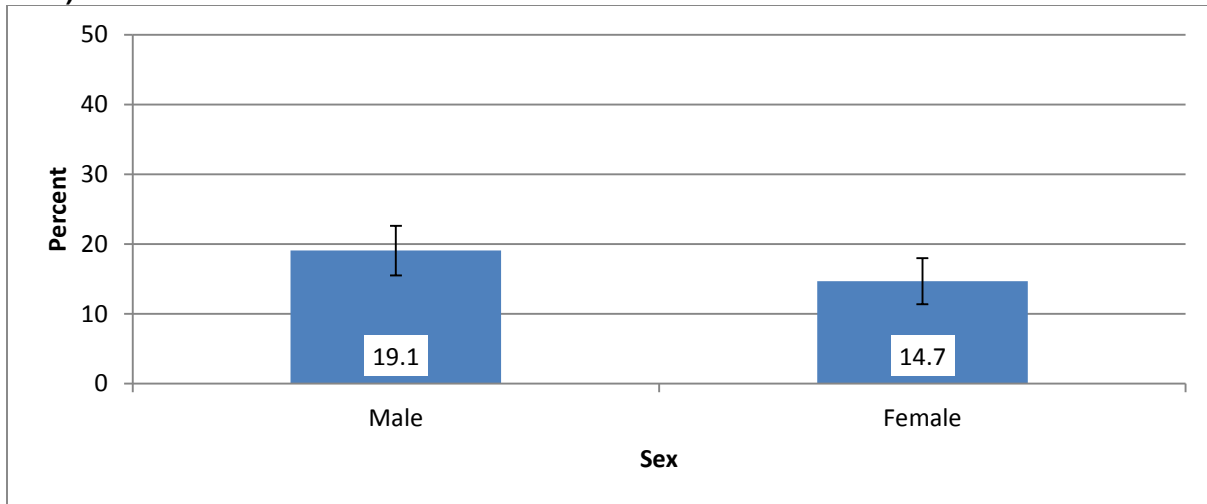
*The percent of children with no preventive dental care visit in the past year is lower in Hawaii than in the US in 2011-2012 (16.9% vs. 22.8%, respectively). In Hawaii, the percent of children with no preventive dental care visit was higher in 2011-2012 than 2007 (13.1%).*

Percent of Children With No Preventive Dental Care Visit in Past Year by Age Group, Hawaii (NSCH 2011-2012)



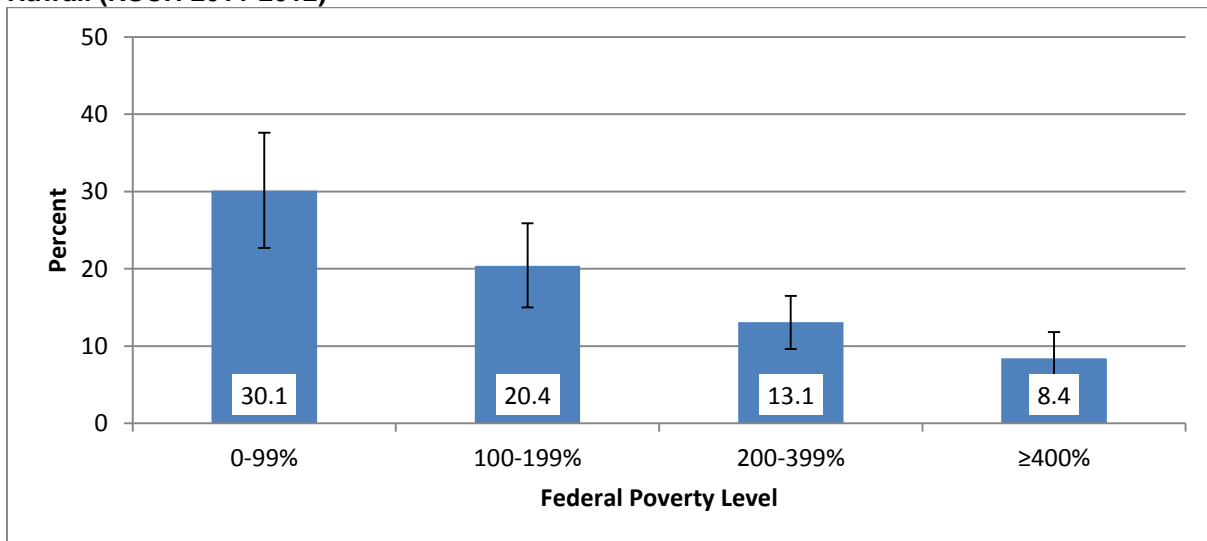
*Children aged 1 to 5 years have the highest prevalence of no preventive dental visit (30.5%) while children aged 6 to 11 years have the lowest prevalence of no preventive dental visit (7.9%).*

**Percent of Children With No Preventive Dental Care Visit in Past Year by Sex, Hawaii (NSCH 2011-2012)**



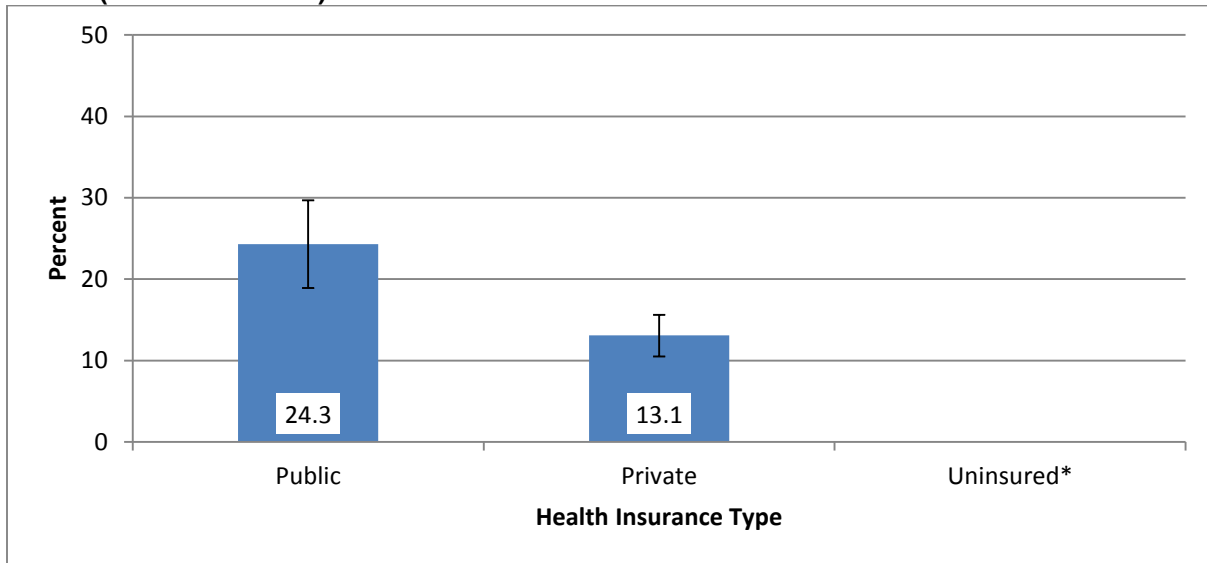
*Males and females have similar prevalence estimates of no preventive dental visit in the past year with 19.1% of males and 14.7% of females having no visit.*

**Percent of Children With No Preventive Dental Care Visit in Past Year by Federal Poverty Level, Hawaii (NSCH 2011-2012)**



*Children with household income level of 0-99% of the federal poverty level have the highest prevalence of no dental visit (30.1%) while children with household income level of greater than or equal to 400% of the federal poverty level have the lowest prevalence of no preventive dental visit (8.4%).*

**Percent of Children With No Preventive Dental Care Visit in Past Year by Health Insurance Type, Hawaii (NSCH 2011-2012)**



\*Not reportable due to small cell size

*Children with public insurance have a higher prevalence of no preventive dental visit (24.3%) compared to children with private insurance (13.1%).*

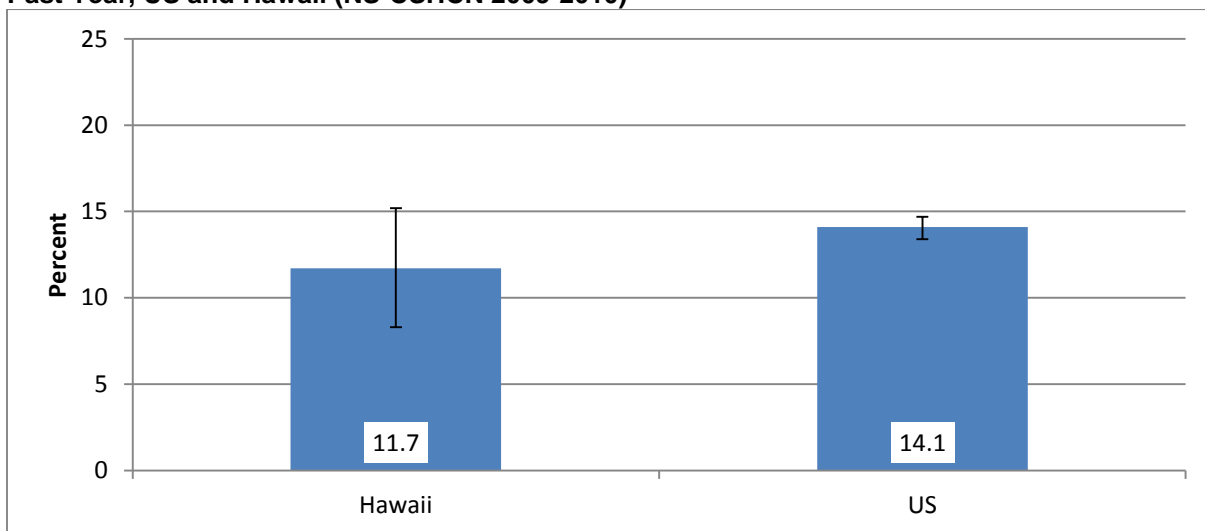


## NATIONAL SURVEY OF CHILDREN WITH SPECIAL HEALTH CARE NEEDS (NS-CSHCN)<sup>4</sup>

The data below comes from the 2009/2010 NS-CSHCN survey. The NS-CSHCN is a nationwide telephone survey which collects a range of health information on children with special health care needs. Indicators on behavioral, physical, and emotional health are collected on children aged 0 to 17 years who are classified as having one or more special health care needs. The survey data is weighted to reflect the estimated 35,022 children with special health care needs in the state. Oral health information collected from this survey includes the prevalence of no dental care visits and the prevalence of unmet needs for dental services.

### No Preventive Dental Care Visit

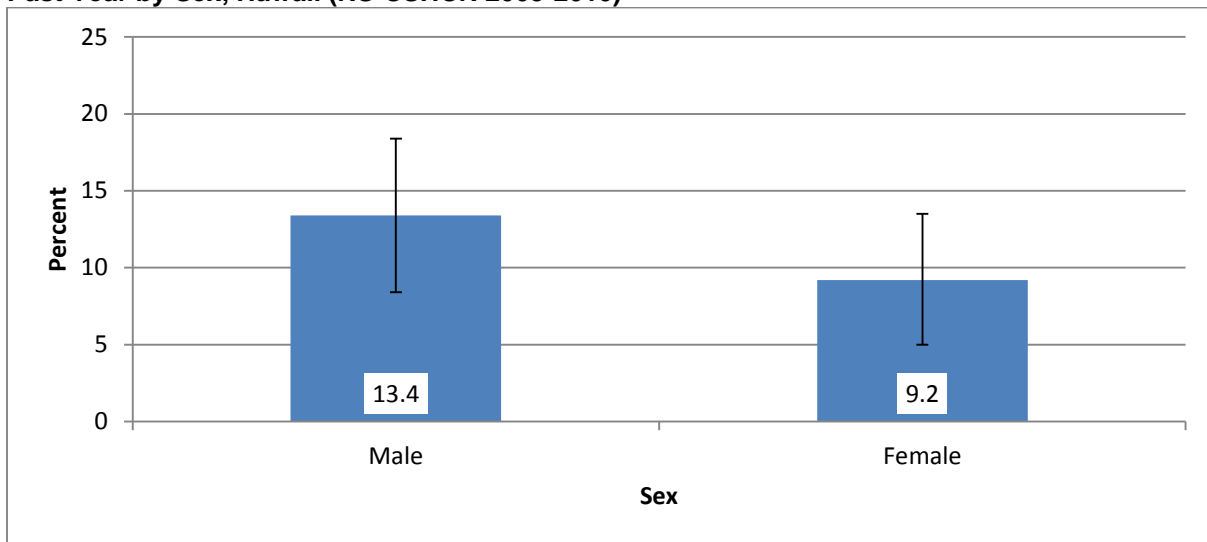
**Percentage of Children With Special Health Care Needs With No Preventive Dental Care Visits in Past Year, US and Hawaii (NS-CSHCN 2009-2010)**



*The prevalence of no dental visit in the past year among children with special health care needs is fairly similar in the US and in Hawaii (14.1% and 11.7%, respectively).*

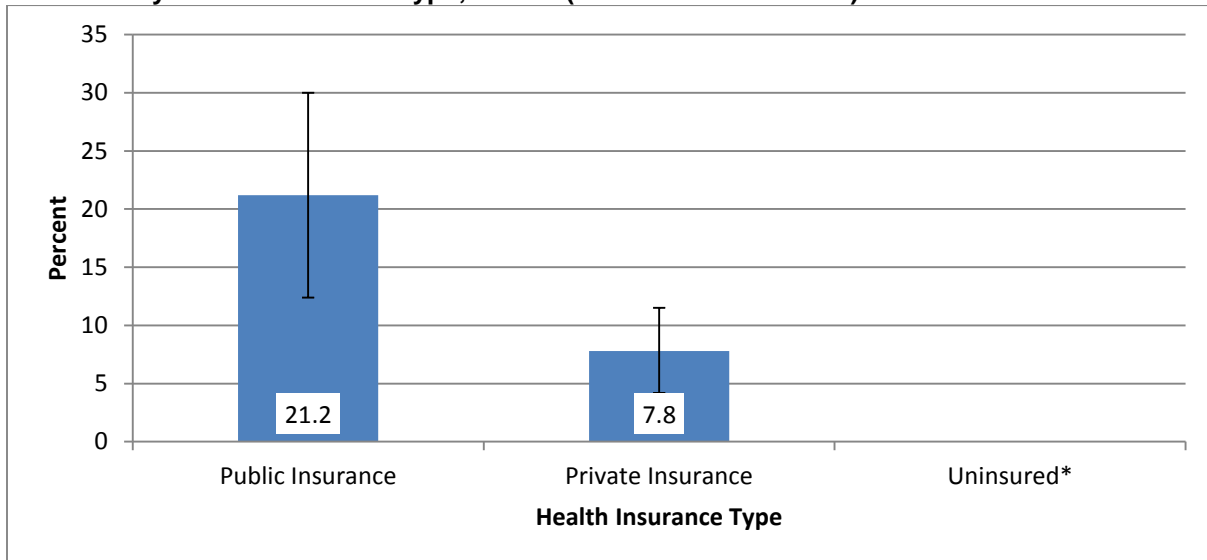
<sup>4</sup> NS-CSHCN Data obtained online from Child and Adolescent Health Measurement Initiative, Data Resource Center on Child, and Adolescent Health website. Available online at: <http://www.childhealthdata.org>.

**Percentage of Children With Special Health Care Needs With No Preventive Dental Care Visits in Past Year by Sex, Hawaii (NS-CSHCN 2009-2010)**



*The prevalence of no preventive dental visit among children with special health care needs in Hawaii is comparable between males and females (13.4% and 9.2%, respectively).*

**Percentage of Children With Special Health Care Needs With No Preventive Dental Care Visits in Past Year by Health Insurance Type, Hawaii (NS-CSHCN 2009-2010)**

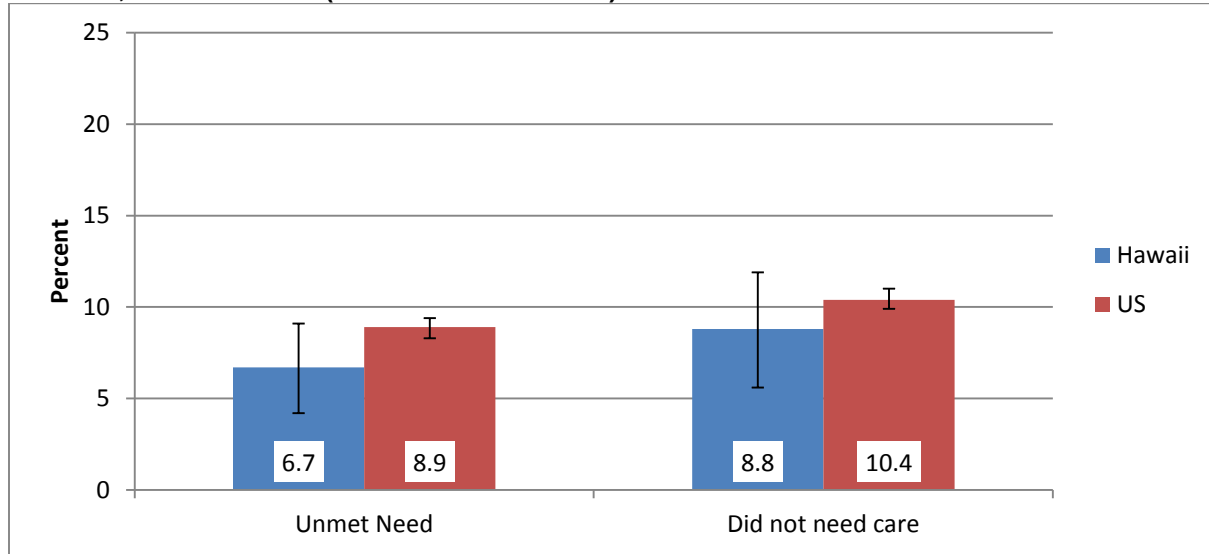


\*Not reportable due to small cell size

*The prevalence of no preventive dental visit among children with special health care needs varies by insurance type. Among children with public insurance, the prevalence of no dental visit is higher than among children with private insurance (21.2% vs. 7.8%, respectively).*

## Unmet Needs for Preventive Dental Services

Percent of Children With Special Health Care Needs with Unmet Need for Preventive Dental Services, US and Hawaii (NS-CSHCN 2009-2010)



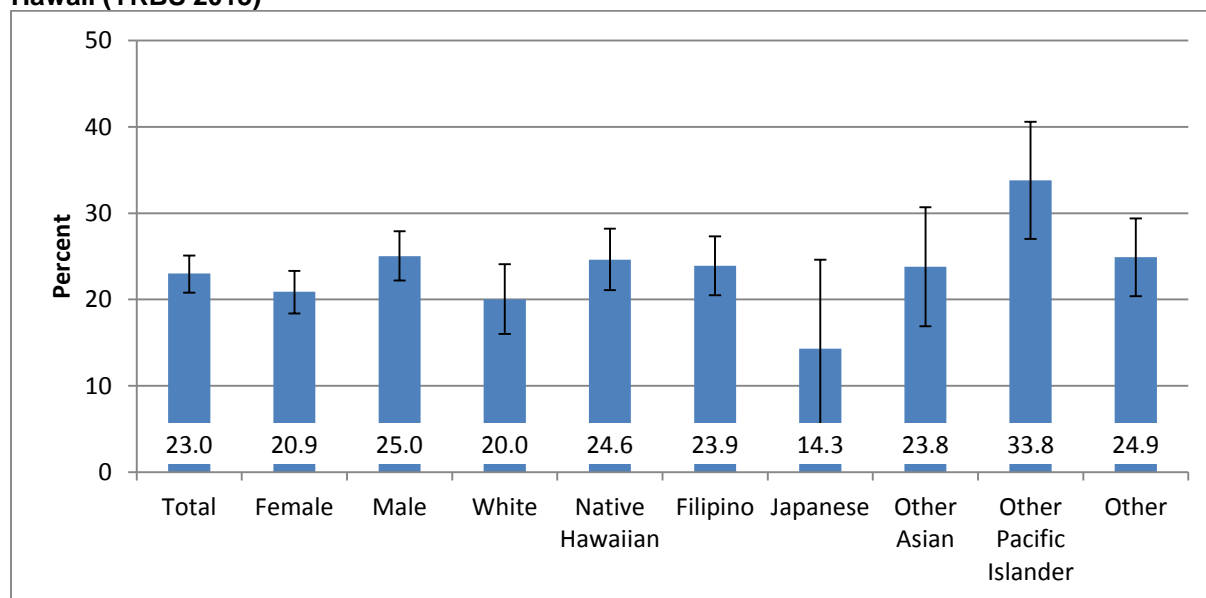
*The percent of children with an unmet need for preventive dental services is similar between the US and Hawaii (8.9% and 6.7%, respectively).*

## YOUTH RISK BEHAVIOR SURVEY (YRBS)<sup>5</sup>

The YRBS is a nationwide surveillance program conducted in states, which monitors health conditions and behaviors among youth. The survey is conducted every odd year and includes youth risk behaviors in six priority areas including unintentional injuries and violence, sexual behaviors, tobacco use, alcohol and other drug use, unhealthy dietary behaviors, and physical activity. Individual states have the flexibility to choose from a core questionnaire, add optional modules, and include their own state developed questions. In Hawaii the survey is only administered in public middle and high schools resulting in a lack of data from both private and charter schools. Additionally, parental consent to complete the survey was required. The survey provides information weighted to reflect about 27,000 public middle (typically, 11-13 years of age) and 43,000 public high school students (typically, 14-17 years of age) in the State of Hawaii. Statewide, there were 48,563 residents 11-13 years of age and 68,112 that are 14-17 years of age based on 2010 census data.

### No Dental Visit among Students

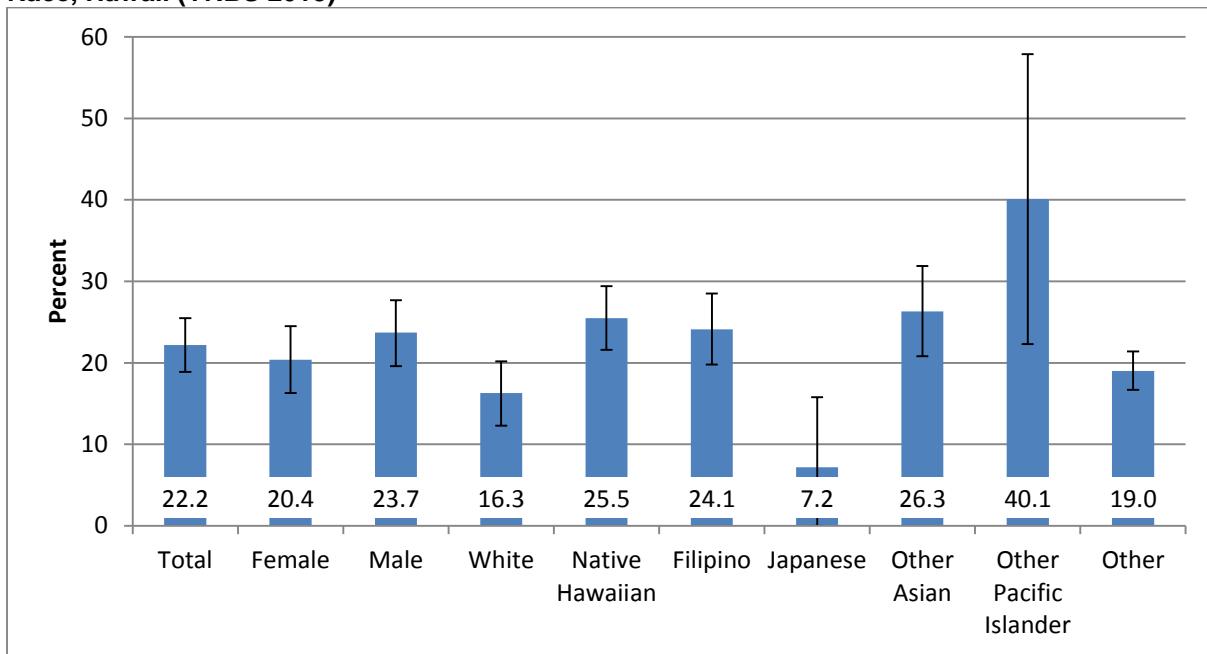
**Percent of Public High School Students With No Dental Visit in Past 12 Months by Sex and Race, Hawaii (YRBS 2013)**



*The overall percent of Hawaii high school students with no dental visit in the past 12 months is 23.0%. The prevalence of no dental visit among high school students varies by sex with males less likely to have had a dental visit (25.0%) compared to females (20.9%). Similarly, there is variation by race, with “Other Pacific Islander” (33.8%) students having the highest prevalence of no dental visit while Japanese students had the lowest prevalence (14.3%) of no dental visit in the past year.*

<sup>5</sup> Youth Risk Behavior Survey data obtained from data request from Hawaii Health Data Warehouse. Sept 2014. Data Available online at <http://www.hhdw.org>.

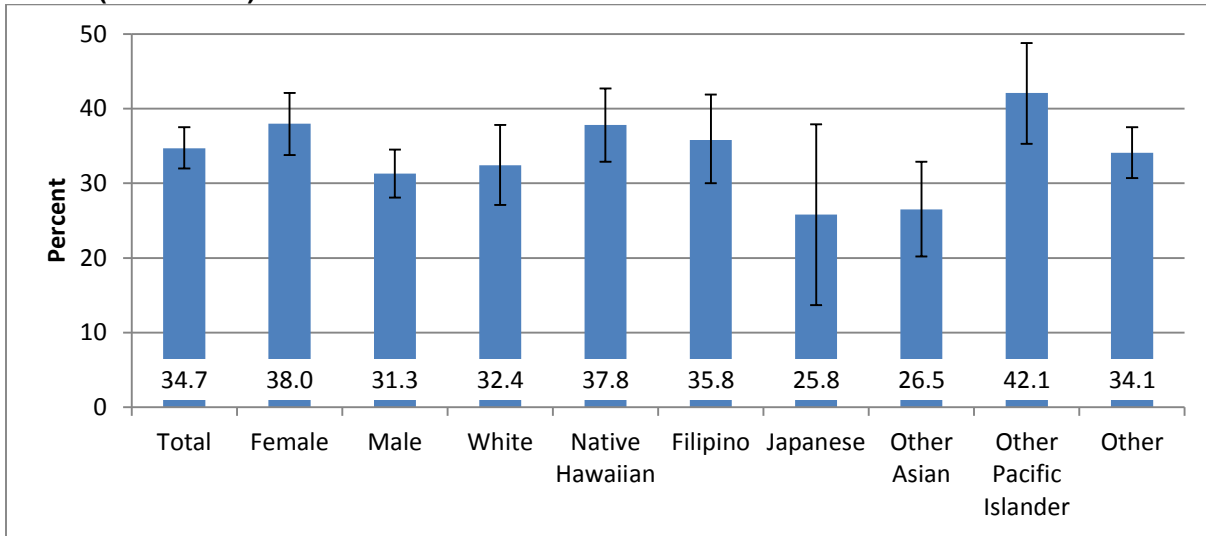
**Percent of Public Middle School Students With No Dental Visit in Past 12 Months by Sex and Race, Hawaii (YRBS 2013)**



*The overall percent of Hawaii middle school students with no dental visit in the past 12 months is 22.2%. The prevalence of no dental visit among middle school students does not vary by sex. The prevalence does vary by race with 40.1% of “Other Pacific Islander” middle school students not having seen a dentist in the past year. Intermediate estimates were found in Native Hawaiian (25.5%), Filipino (24.1%), and “Other Asian” (26.3%) students. Japanese middle school students have the lowest prevalence of no dental visit (7.2%).*

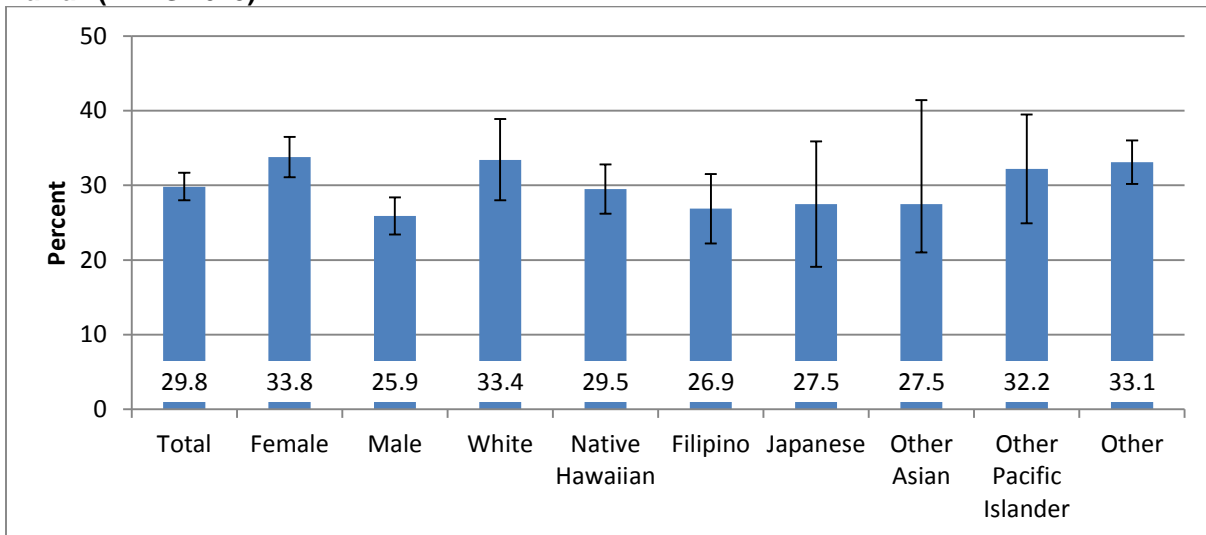
## Toothache among Students

**Percent of Public High School Students With a Toothache in Past 12 Months by Sex and Race, Hawaii (YRBS 2013)**



The overall percent of Hawaii high school students with a toothache in the past 12 months is 34.7%. The prevalence of toothache among high school students varies by sex with males less likely to have had a toothache (31.3%) compared to females (38.0%). Similarly, there is variation by race, with “Other Pacific Islander” (42.1%), Native Hawaiian (37.8%), and Filipino (35.8%) students having the highest prevalence of toothache while Japanese (25.8%) and “Other Asian” (26.5%) had the lowest prevalence toothache in the past year.

**Percent of Public Middle School Students With a Toothache in Past 12 Months by Sex and Race, Hawaii (YRBS 2013)**



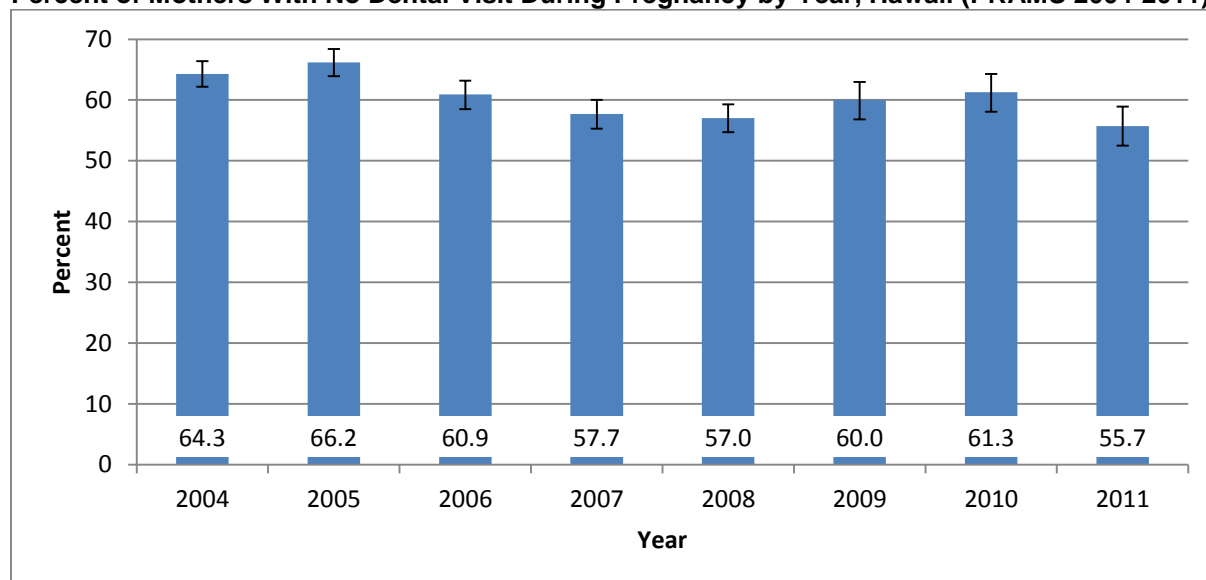
The overall percent of Hawaii middle school students with a toothache in the past 12 months is 29.8%. The prevalence of toothache among high school students varies by sex with males less likely to have had a toothache (25.9%) compared to females (33.8%). There is minimal variation by race groups.

## PREGNANCY RISK ASSESSMENT MONITORING SYSTEM (PRAMS)<sup>6</sup>

Maintaining a woman's oral health during pregnancy can be done safely and effectively at all stages of pregnancy, and makes good sense for both the woman and her baby. Research shows that if a woman does not have good oral health during pregnancy, the health of the developing baby may suffer. Infections in the mouth increase the risk for preterm labor, births and may worsen a woman's existing medical conditions such as diabetes, which can also result in complications during pregnancy.<sup>7</sup> A mother's untreated tooth decay can lead to infection of the child, thus putting the baby at risk for future tooth decay. PRAMS is a surveillance system which collects information on preconception, pregnancy and post-pregnancy behaviors and experiences of mothers and infants including oral health data on visits to the dentist visits and teeth cleaning before, during and after pregnancy. The survey data is weighted to reflect the approximately 19,000 births that occur annually to Hawaii residents. The time periods are approximate with before pregnancy specified as the 12 months before getting pregnant, during pregnancy dependent on duration of the pregnancy (range 7-10 months), and after pregnancy when the survey was completed (range 2-6 months). Therefore, the composite measure combining all three of the time periods represents a median time period of 2 years with a range from 1.6 to 2.5 years.

### Mothers With No Dental Visit During Pregnancy

Percent of Mothers With No Dental Visit During Pregnancy by Year, Hawaii (PRAMS 2004-2011)

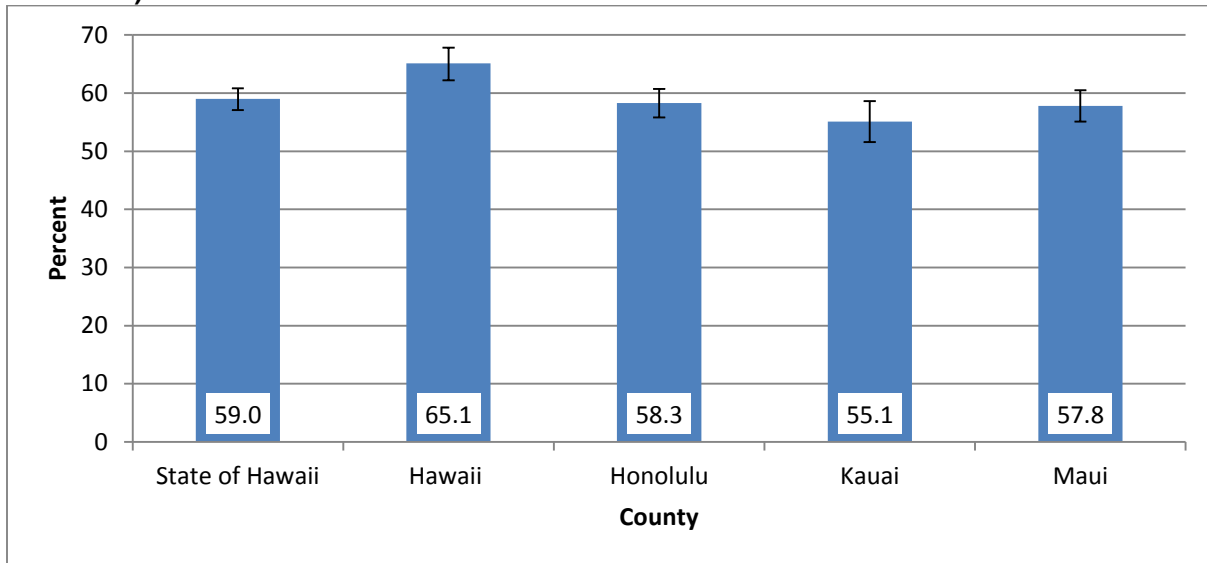


*The percent of mothers with no dental visit during pregnancy is fairly similar for all years from 2004 to 2011 in Hawaii. There was a decrease in the prevalence of no dental visit from 2005 to 2006 (66.2% to 60.9%, respectively). The prevalence of no dental visit during pregnancy ranges from 55.7% (2011) to 66.2% (2005).*

<sup>6</sup> Hawaii PRAMS data obtained via data request from Hawaii PRAMS Program. April 2013.

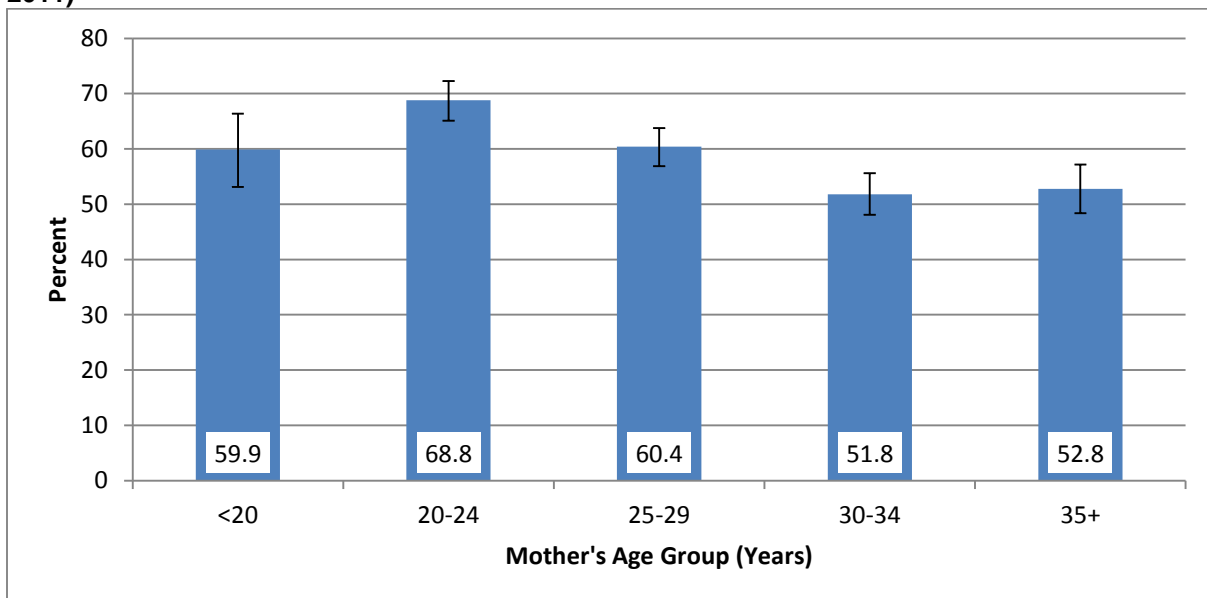
<sup>7</sup> *Oral Health Care During Pregnancy and Early Childhood*. New York State Department of Health. August 2006. Available at: [www.nyhealth.gov/publications/0824.pdf](http://www.nyhealth.gov/publications/0824.pdf). Accessed 10/17/2013

**Percent of Mothers With No Dental Visit During Pregnancy by State and County, Hawaii (PRAMS 2009-2011)**



*The highest prevalence of no dental visit is among mothers in Hawaii County (65.1%) and the lowest prevalence of no dental visit is among mothers in Kauai County (55.1%). The estimate for Hawaii County is significantly higher than the overall State estimate of 59.0%.*

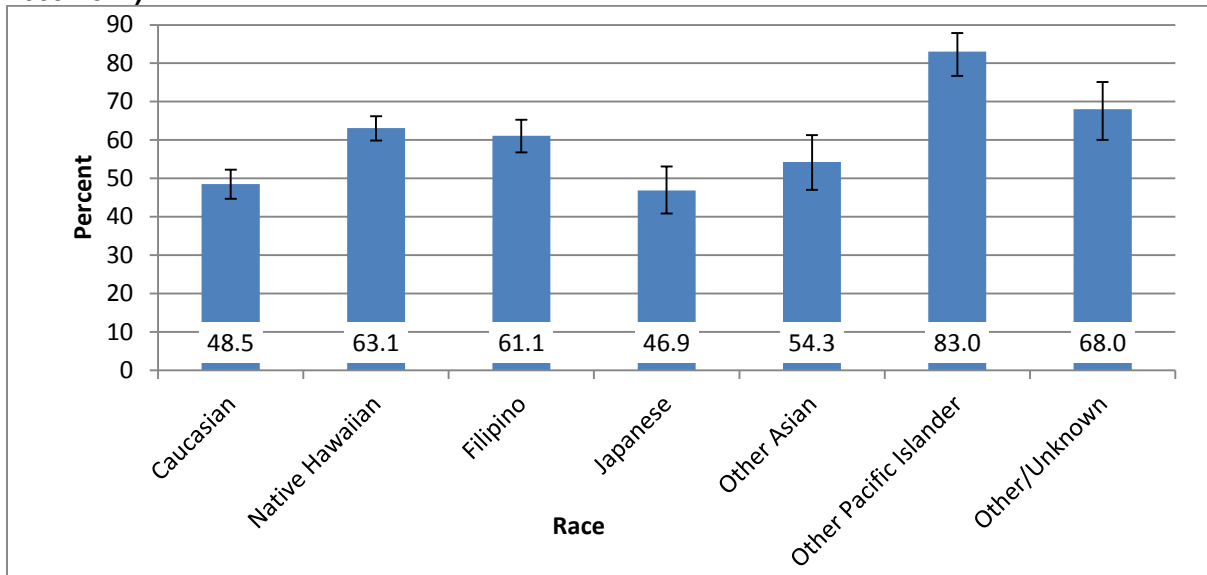
**Percent of Mothers With No Dental Visit During Pregnancy by Mother's Age, Hawaii (PRAMS 2009-2011)**



*The highest prevalence is among mothers that were 20-24 year olds (68.8%) and the lowest prevalence is among mothers aged 30-34 years (51.8%) and 35 years and older (52.8%).*

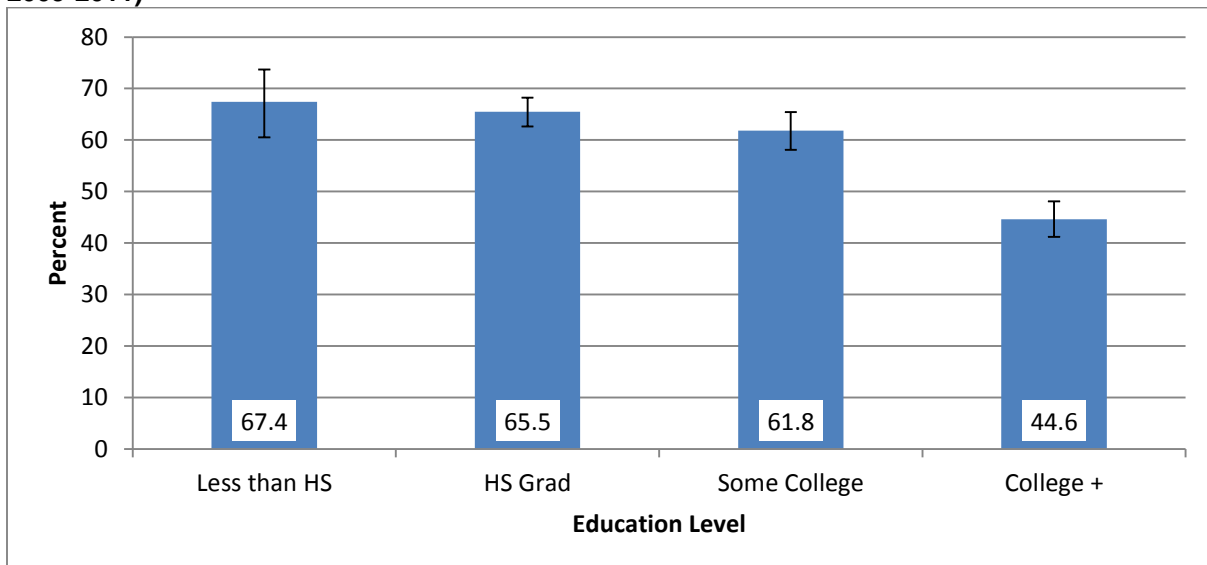


**Percent of Mothers With No Dental Visit During Pregnancy by Maternal Race, Hawaii (PRAMS 2009-2011)**



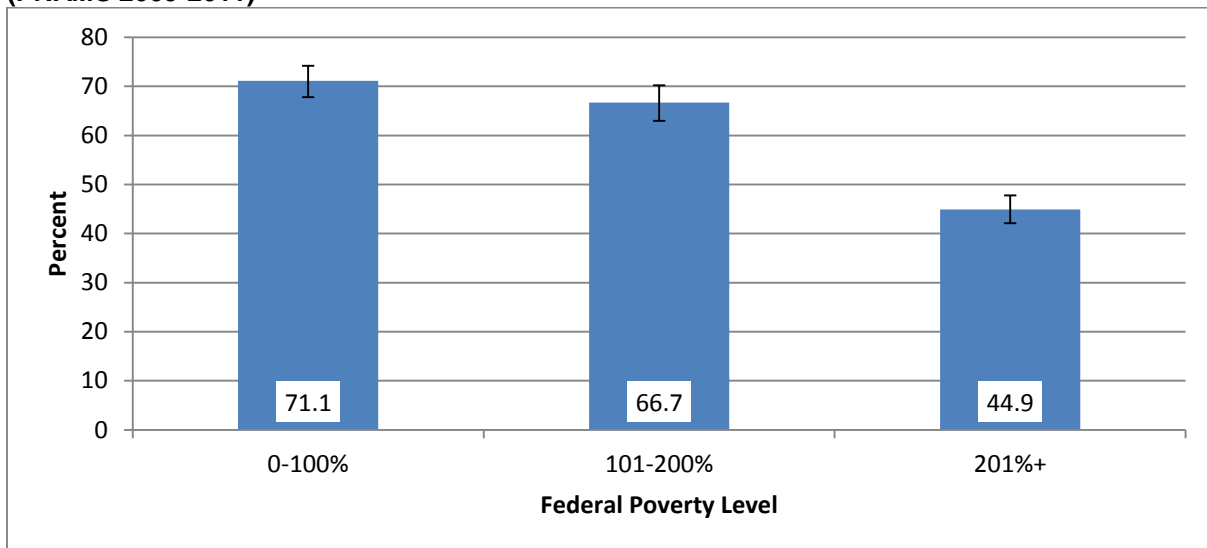
*The highest prevalence of no dental visit during pregnancy is among “Other Pacific Islander” mothers (83.0%) and the lowest prevalence of no dental visit during pregnancy is among Japanese mothers (46.9%).*

**Percent of Mothers With No Dental Visit During Pregnancy by Education Level, Hawaii (PRAMS 2009-2011)**



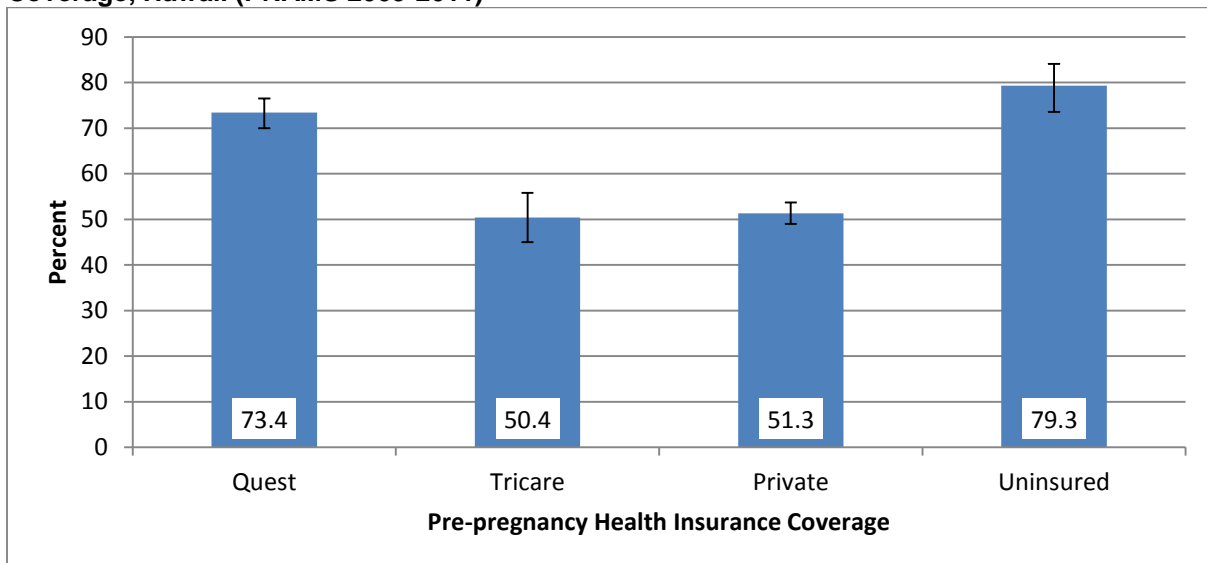
*Mothers with a less than high school education have the highest prevalence of no dental visit (67.4%) and mothers with a college and beyond education level have the lowest prevalence of no dental visit (44.6%).*

**Percent of Mothers With No Dental Visit During Pregnancy by Federal Poverty Level, Hawaii (PRAMS 2009-2011)**



*Mothers who are 0-100% of the federal poverty level have the highest prevalence of no dental visit during pregnancy (71.1%) while mothers who are 201% and greater of the federal poverty level have the lowest prevalence of no dental visit during pregnancy (44.9%).*

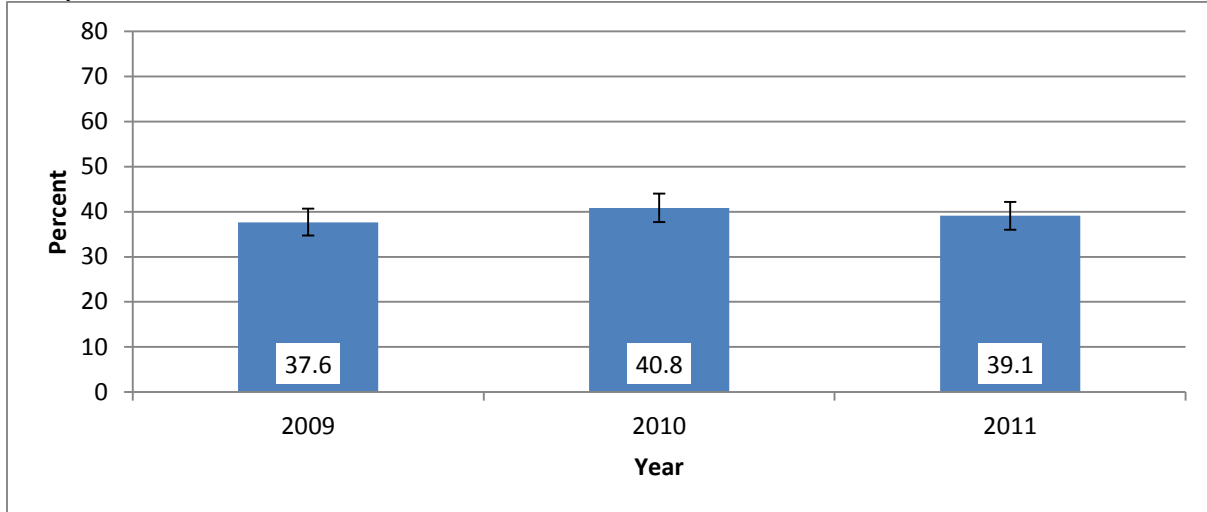
**Percent of Mothers With No Dental Visit During Pregnancy by Pre-Pregnancy Health Insurance Coverage, Hawaii (PRAMS 2009-2011)**



*Mothers who are uninsured or have Quest/Medicaid health insurance pre-pregnancy have the highest prevalence of no dental visit during pregnancy (79.3% and 73.4%, respectively) while mothers on Tricare military insurance or private insurance have the lowest prevalence of no dental visit during pregnancy (50.4% and 51.3%, respectively).*

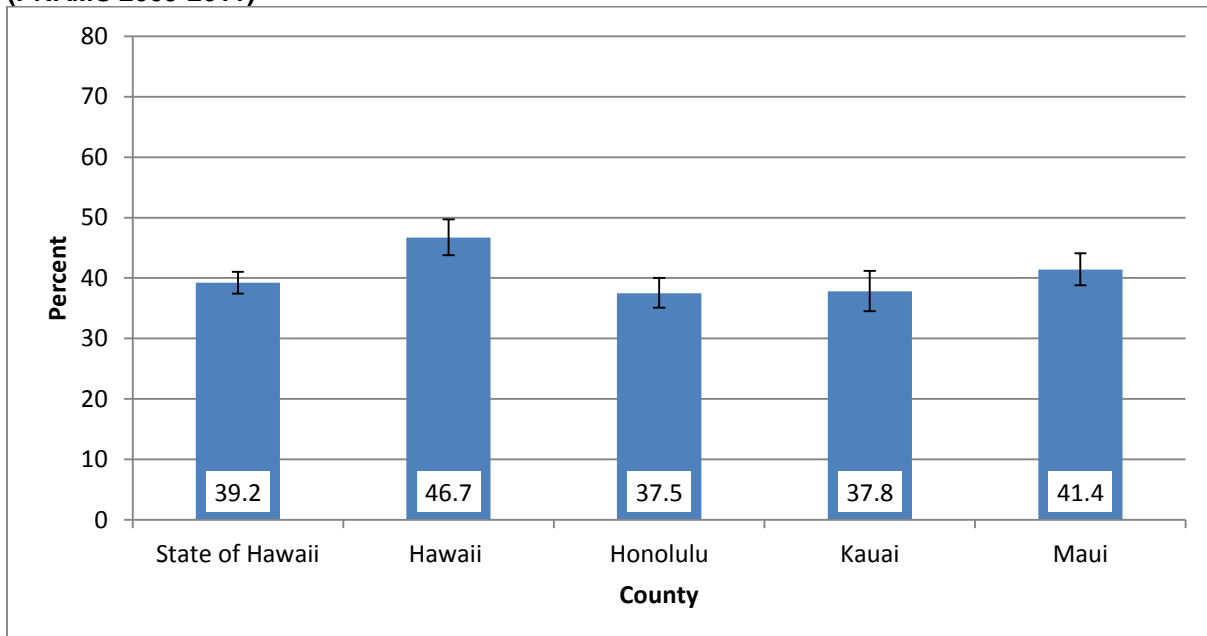
## Composite Measure of No Teeth Cleaning Before, During, and After Pregnancy

**Composite Measure: Percent of Mothers With No Teeth Cleaning by Year, Hawaii (PRAMS 2009-2011)**



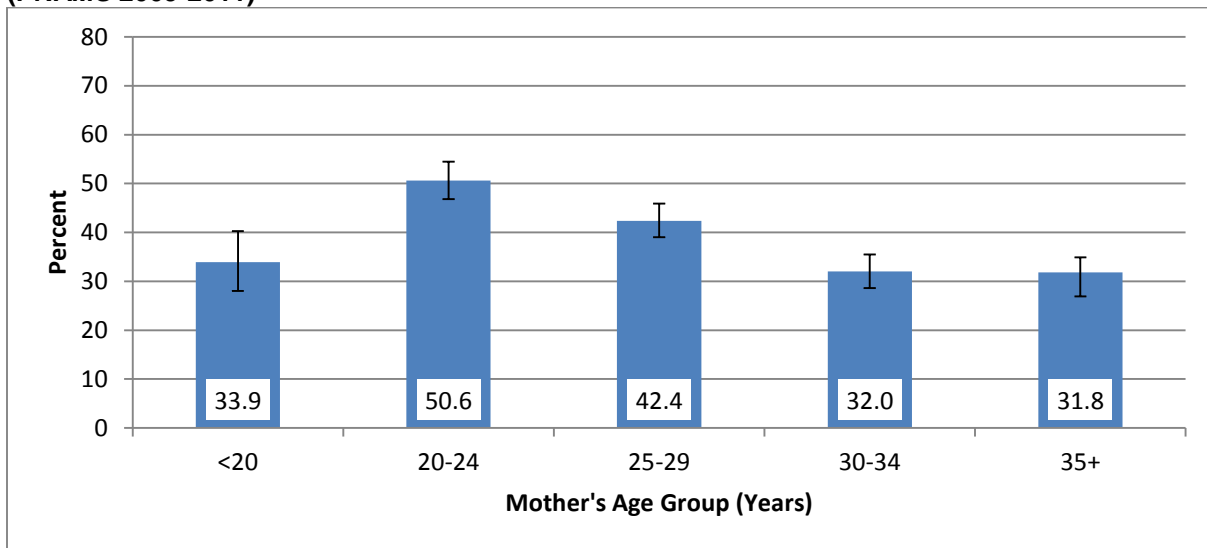
*The prevalence of no teeth cleaning during the entire period before, during, and after pregnancy is fairly similar across the years from 2009 to 2011, ranging from 37.6% in 2009 to 40.8% in 2010.*

**Composite Measure: Percent of Mothers With No Teeth Cleaning by State and County, Hawaii (PRAMS 2009-2011)**



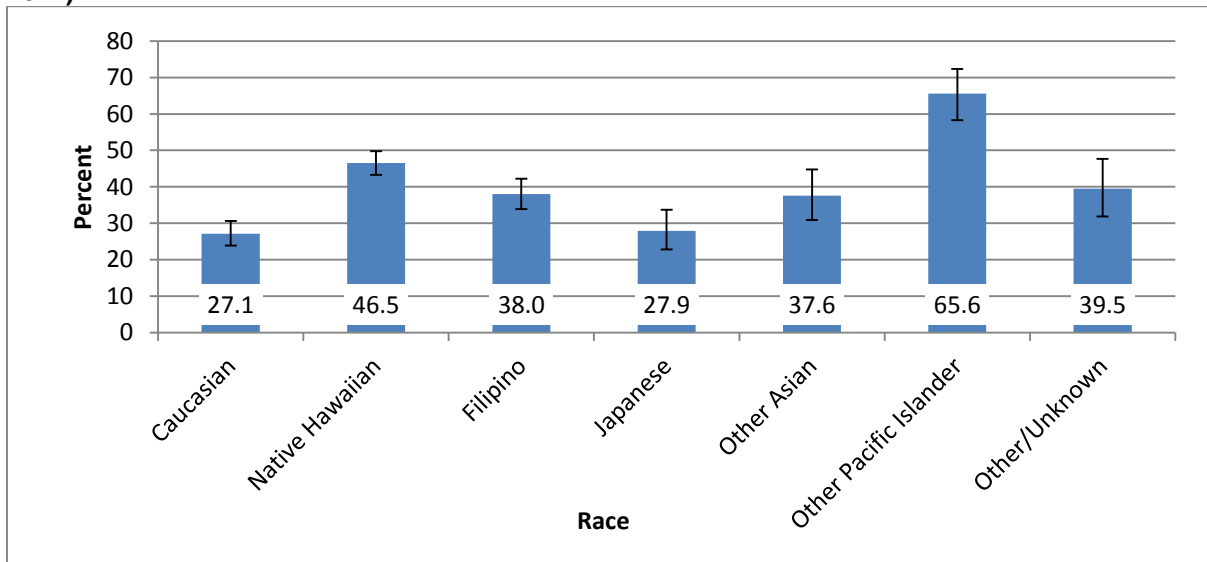
*The prevalence of no teeth cleaning before, during, and after pregnancy varies by county ranging from 46.7% in Hawaii County to 37.5% in Honolulu County. The estimate for Hawaii County is significantly higher than the overall State estimate of 39.2%.*

**Composite Measure: Percent of Mothers With No Teeth Cleaning by Mother's Age Group, Hawaii (PRAMS 2009-2011)**



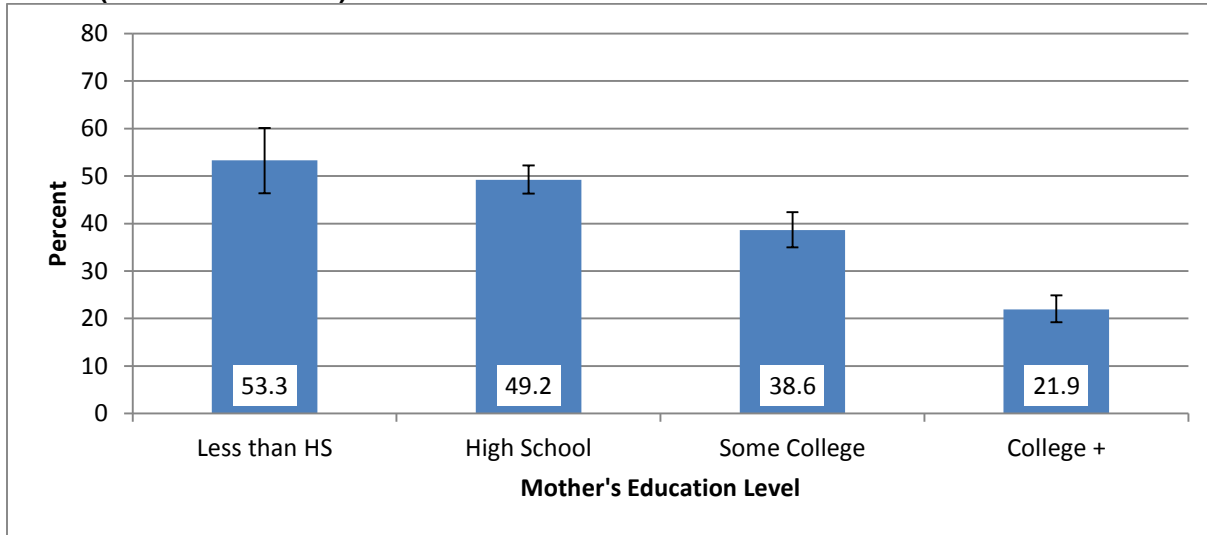
*The highest prevalence of no teeth cleaning is among mothers 20-24 years of age (50.6%), and the lowest prevalence is among mothers 35 years and older (31.8%).*

**Composite Measure: Percent of Mothers With No Teeth Cleaning by Race, Hawaii (PRAMS 2009-2011)**



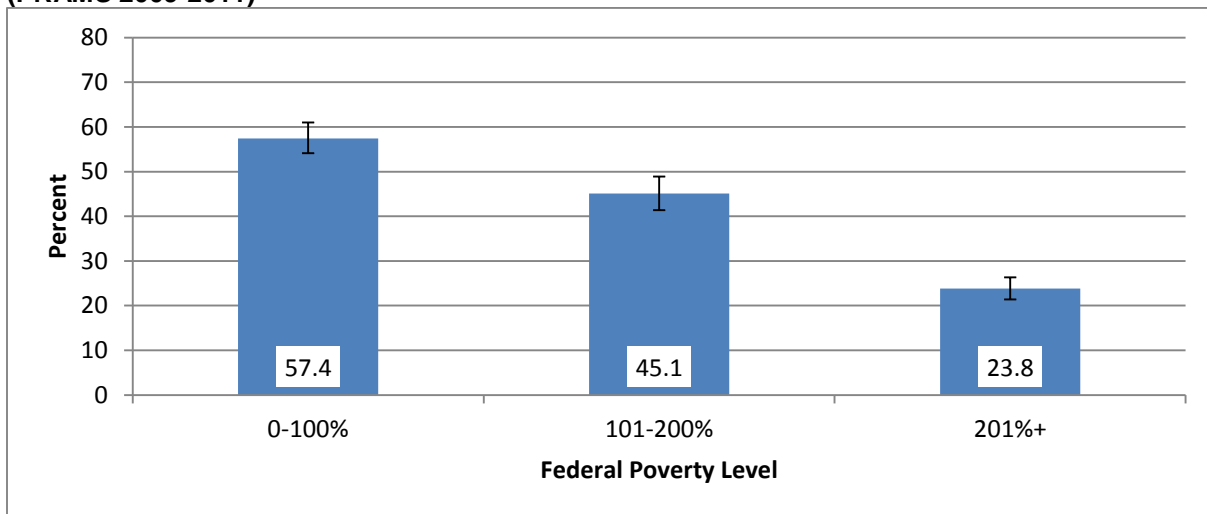
*The prevalence of no teeth cleaning before, during or after pregnancy varies by race with “Other Pacific Islander” mothers having the highest prevalence of no teeth cleaning (65.6%) and Caucasian and Japanese mothers having the lowest prevalence of no teeth cleaning (27.1% and 27.9%, respectively).*

**Composite Measure: Percent of Mothers With No Teeth Cleaning by Mother's Education Level, Hawaii (PRAMS 2009-2011)**



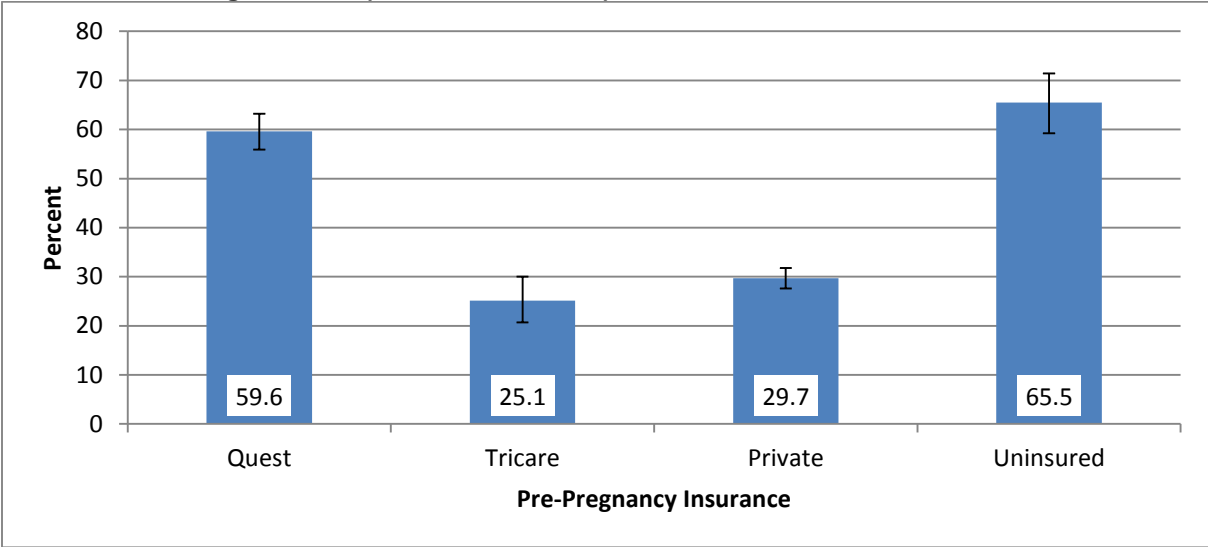
*Mothers with less than a high school education have a prevalence of no teeth cleaning of 53.3% while mothers with a college and beyond education have a prevalence of no teeth cleaning of 21.9%.*

**Composite Measure: Percent of Mothers With No Teeth Cleaning by Federal Poverty Level, Hawaii (PRAMS 2009-2011)**



*Mothers with a household income of 0-100% of the federal poverty level have the highest prevalence of no teeth cleaning while mothers with a household income of 201+% of the federal poverty level have the lowest prevalence of no teeth cleaning (57.4% and 23.8%, respectively).*

**Composite Measure: Percent of Mothers With No Teeth Cleaning by Pre-Pregnancy Health Insurance Coverage, Hawaii (PRAMS 2009-2011)**



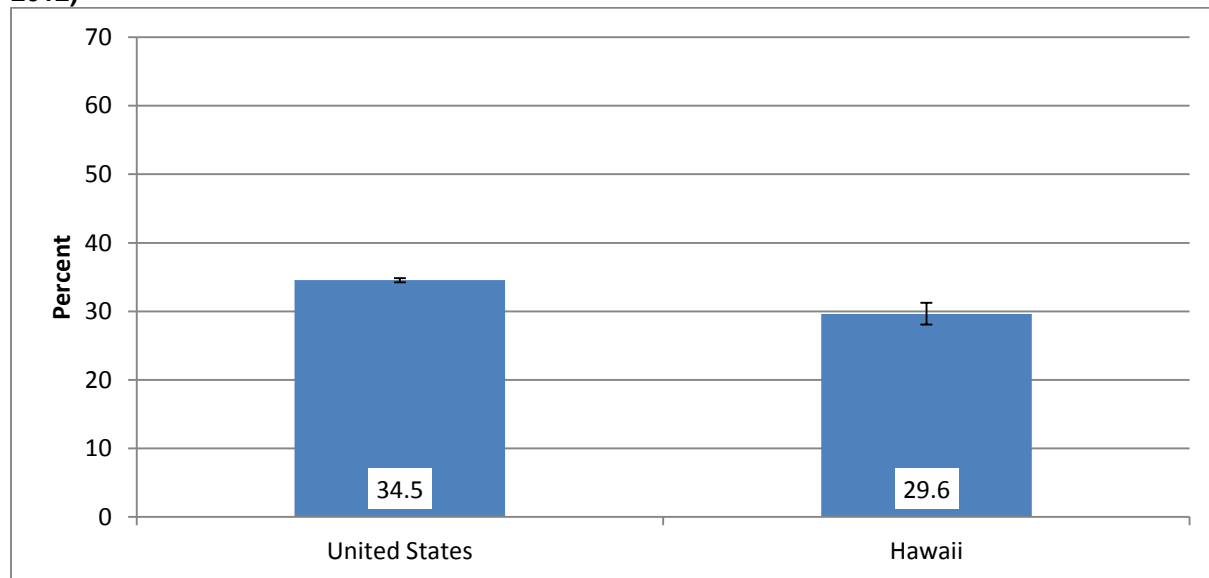
*Mothers who were uninsured or had Quest/Medicaid insurance before pregnancy have the highest prevalence of no teeth cleaning (65.5% and 59.6%, respectively) while mothers who had Tricare military insurance or private insurance before pregnancy have the lowest prevalence of no teeth cleaning (25.1% and 29.7%, respectively).*

## BEHAVIORAL RISK FACTOR SURVEILLANCE SYSTEM (BRFSS)

The BRFSS is a nationwide telephone survey which tracks health conditions and behaviors among adults aged 18 and older in the United States. The survey data is weighted to reflect 1,080,000 adults living in the state. Statewide, there were 1,084,567 residents 18 years of age or older living in the state based on 2010 census data. Oral health data is available from BRFSS on how often adults visit the dentist and receive teeth cleanings as well as the prevalence of adults who have had permanent teeth removed.<sup>8,9</sup> See appendix 2 for specific questions used in BRFSS related to oral health.

### No Dental Visit in Past Year

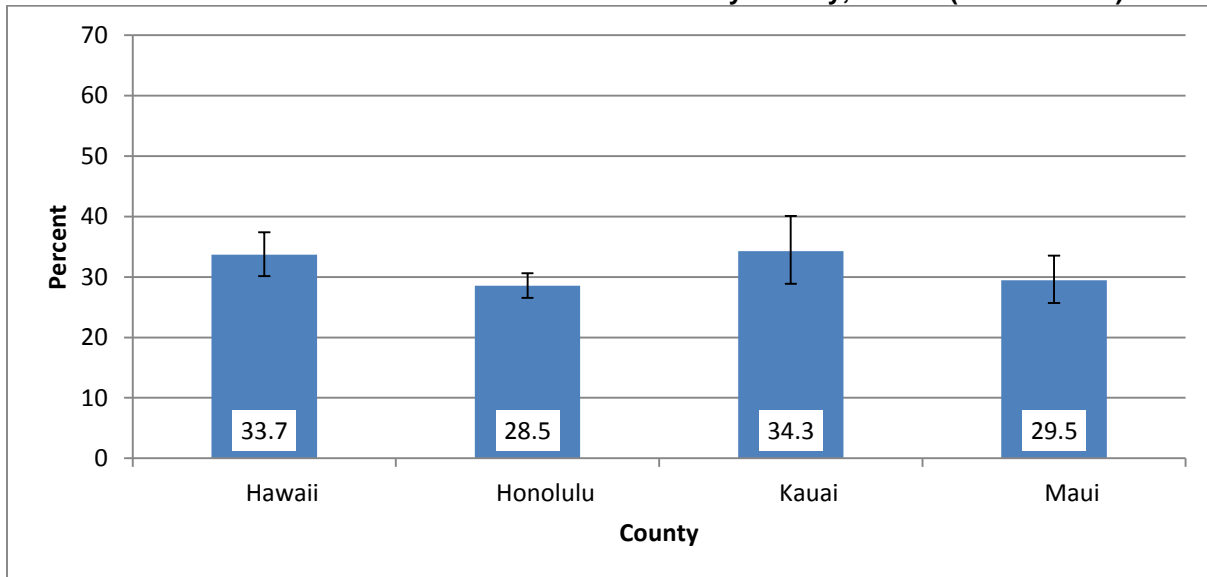
**Percent of Adults With No Dentist Visit in the Past Year, in the United States and Hawaii (BRFSS 2012)**



*The prevalence of adults with no dental visit in the past year is similar in the US and the State of Hawaii (34.5% and 29.6%, respectively).*

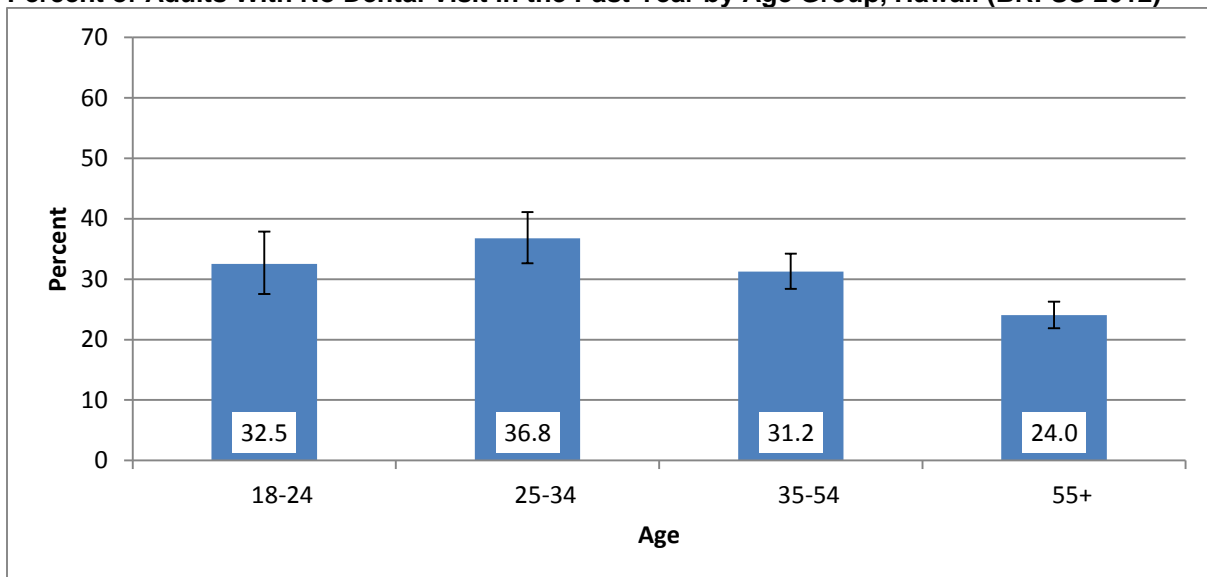
<sup>8</sup> State and National BRFSS Data measures calculated by Family Health Services Division. September 2014.

**Percent of Adults With No Dentist Visit in the Past Year by County, Hawaii (BRFSS 2012)**



*In Hawaii, the prevalence of no dental visit varied somewhat by county with Kauai County having the highest prevalence (34.3%).*

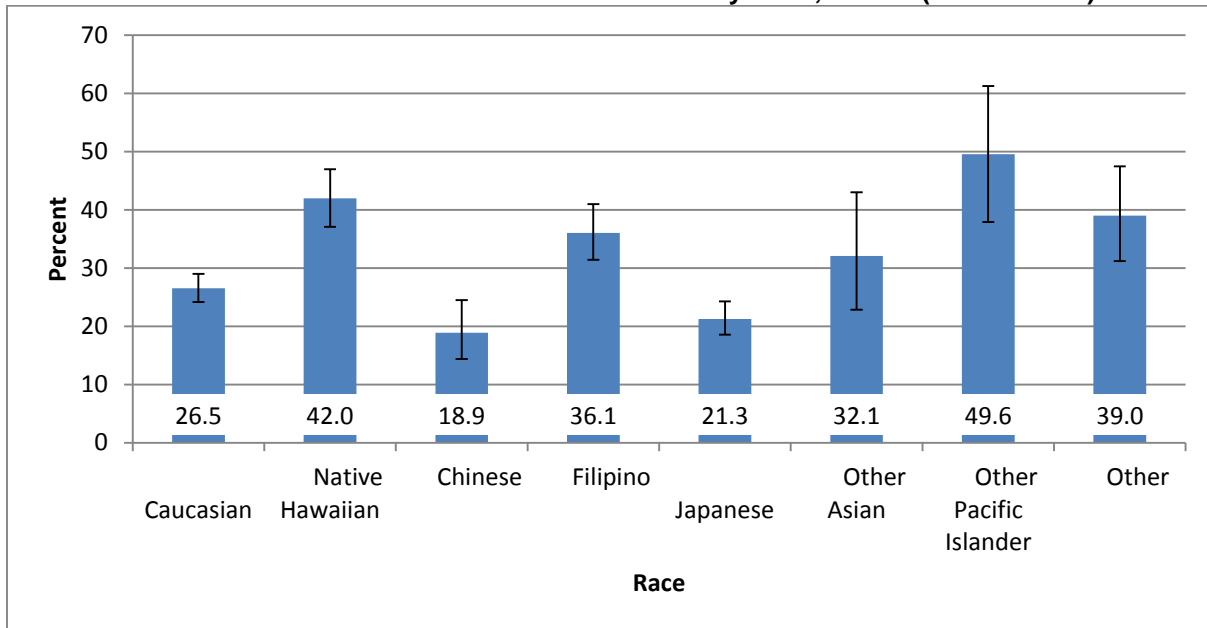
**Percent of Adults With No Dental Visit in the Past Year by Age Group, Hawaii (BRFSS 2012)**



*The highest prevalence of no dental visit in the past year was among 25-34 year olds (36.8%) and the lowest prevalence estimates were among those 55 and older (24.0%).*

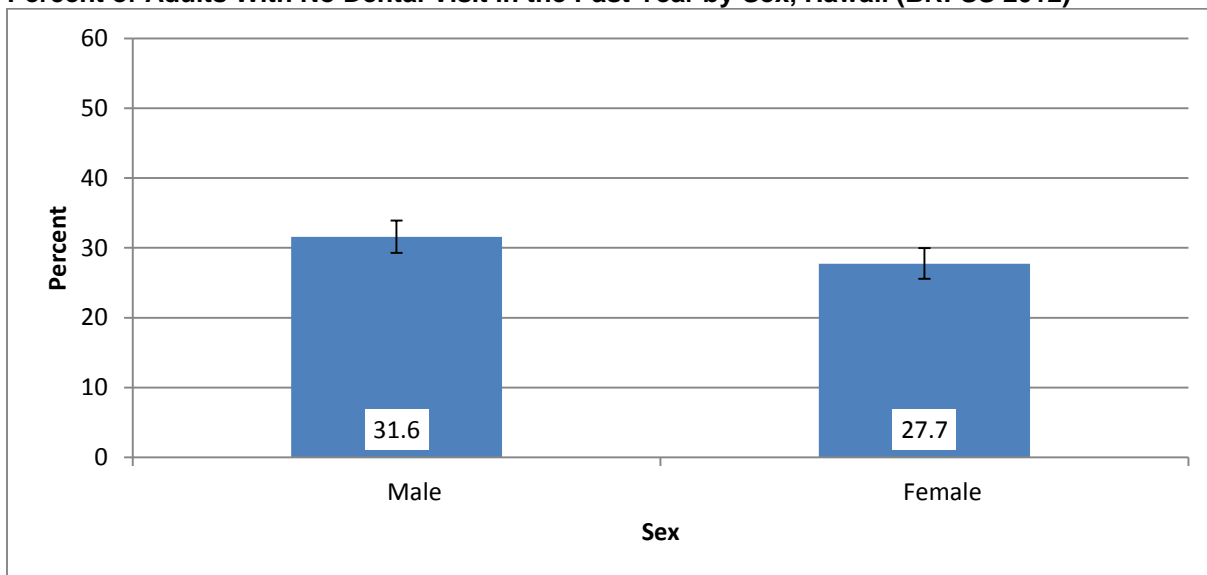


**Percent of Adults With No Dentist Visit in the Past Year by Race, Hawaii (BRFSS 2012)**



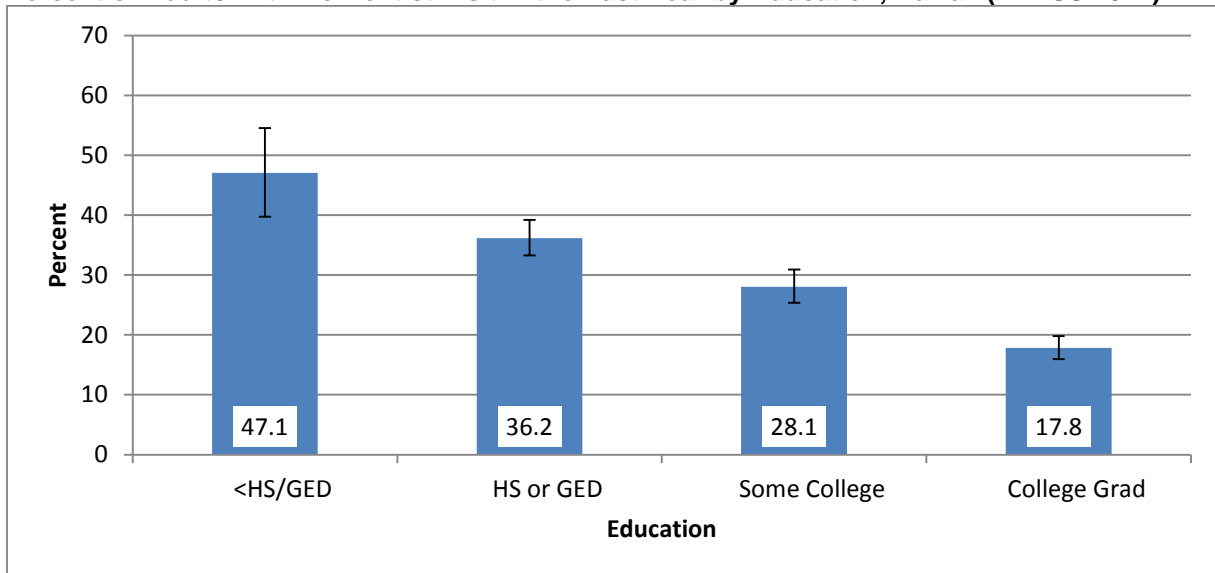
*The prevalence of no dental visits in the past year was highest among “Other Pacific Islander”, and Native Hawaiian adults (49.6% and 42.0%, respectively). The prevalence of no dental visits was lowest among Chinese adults (18.9%).*

**Percent of Adults With No Dental Visit in the Past Year by Sex, Hawaii (BRFSS 2012)**



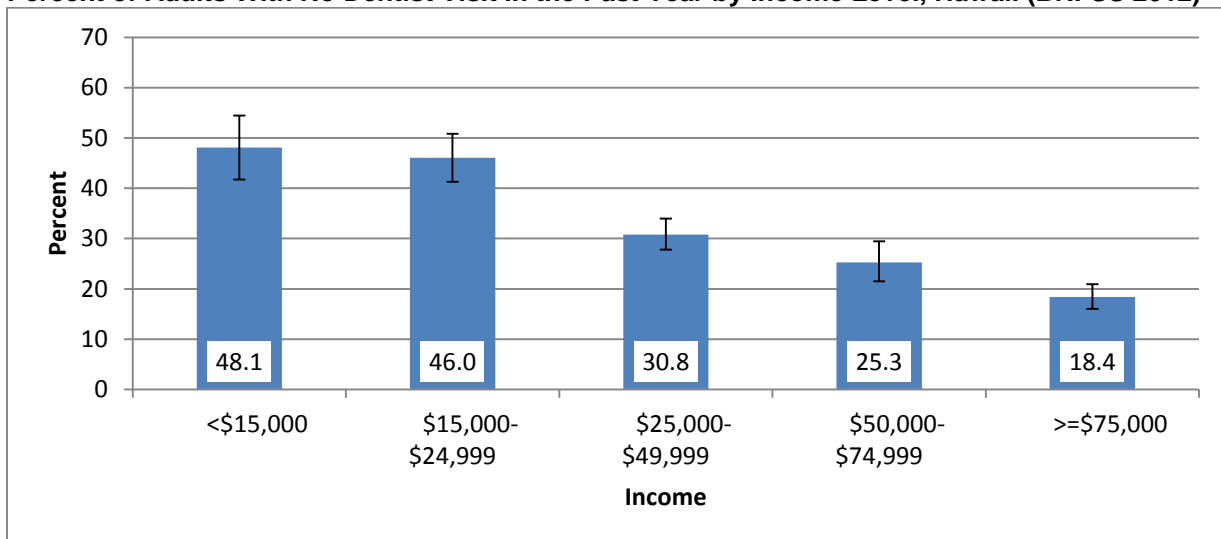
*Males have a higher prevalence of no dental visits in the past year compared to females (31.6% vs. 27.7%, respectively).*

**Percent of Adults With No Dentist Visit in the Past Year by Education, Hawaii (BRFSS 2012)**



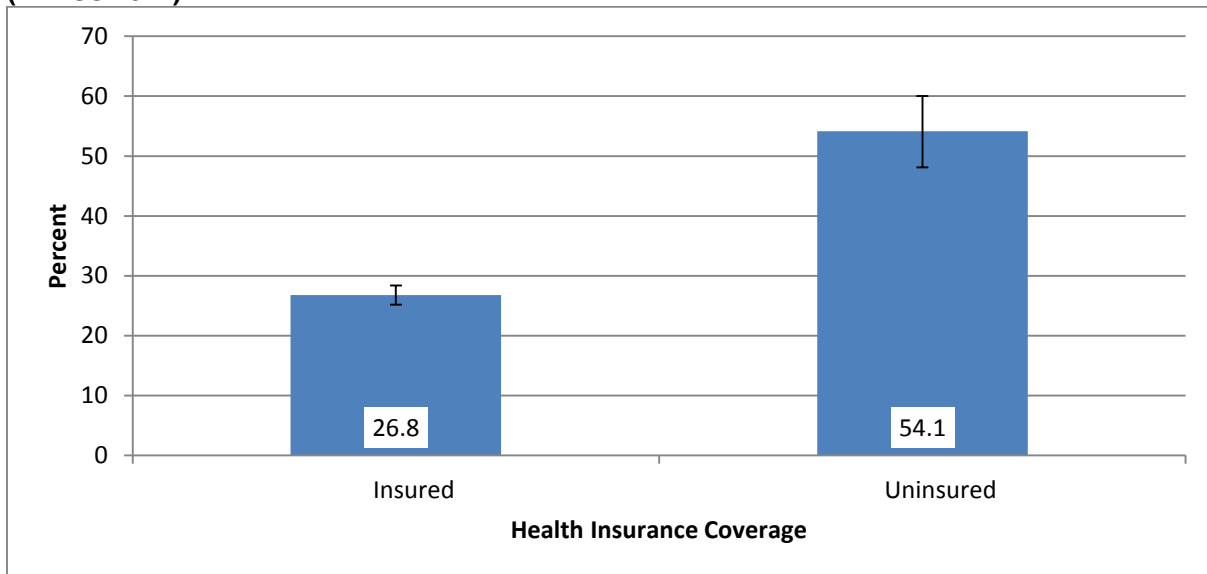
*Adults with less than high school or GED have the highest prevalence of no dental visit in the past year (47.1%) and those with a college education level have the lowest prevalence of no dental visit in the past year (17.8%).*

**Percent of Adults With No Dentist Visit in the Past Year by Income Level, Hawaii (BRFSS 2012)**



*Adults with income less than \$15,000 or between \$15,000 and \$24,999 per year have the highest prevalence of no dental visit in the past year (46.3 % and 49.0%, respectively). Adults with income greater than \$75,000 per year have the lowest prevalence of no dental visits in the past year (20.6%)*

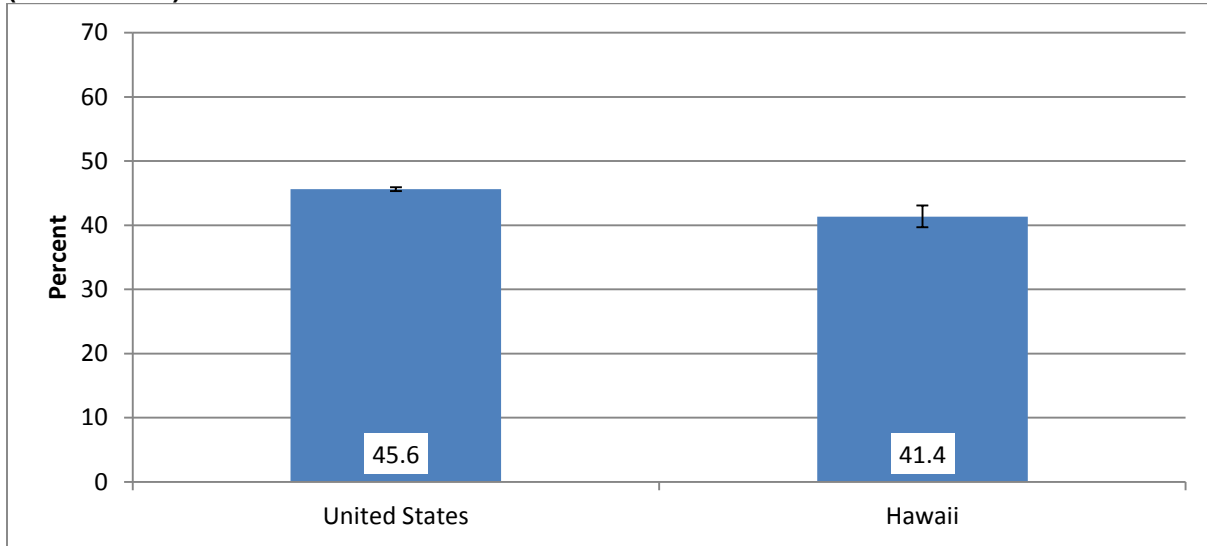
**Percent of Adults With No Dentist Visit in the Past Year by Health Insurance Coverage, Hawaii (BRFSS 2012)**



*Adults who have health insurance coverage have a lower prevalence of no dental visits than those that are uninsured (26.8% vs. 54.1%, respectively).*

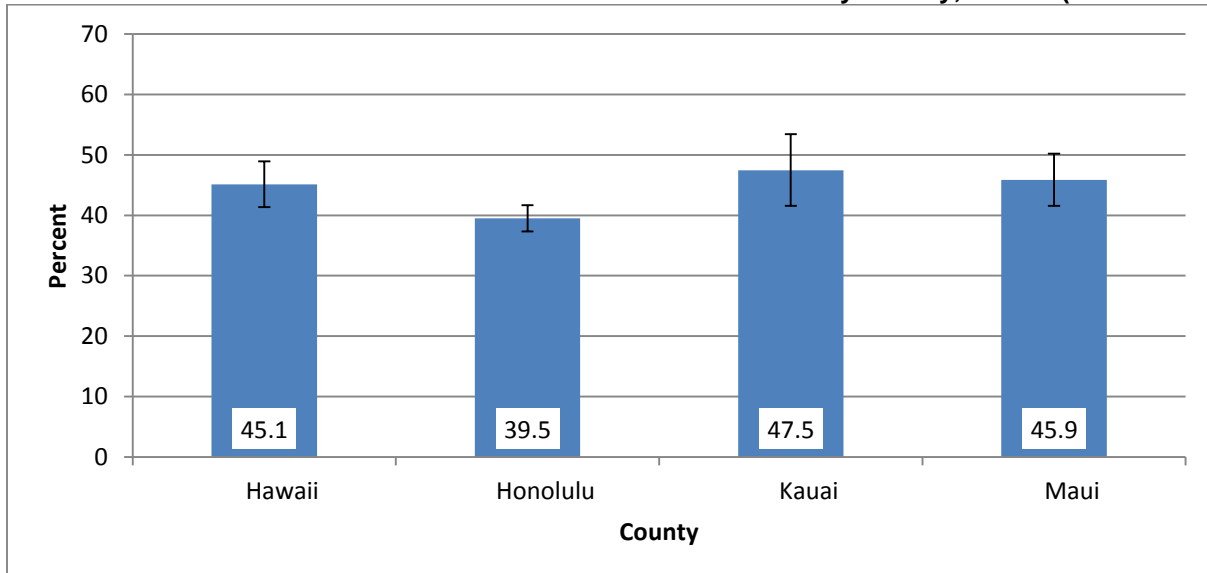
## At Least One Permanent Tooth Removed in Adults

**Percent of Adults With At Least One Permanent Tooth Extracted, in the United States and Hawaii (BRFSS 2012)**



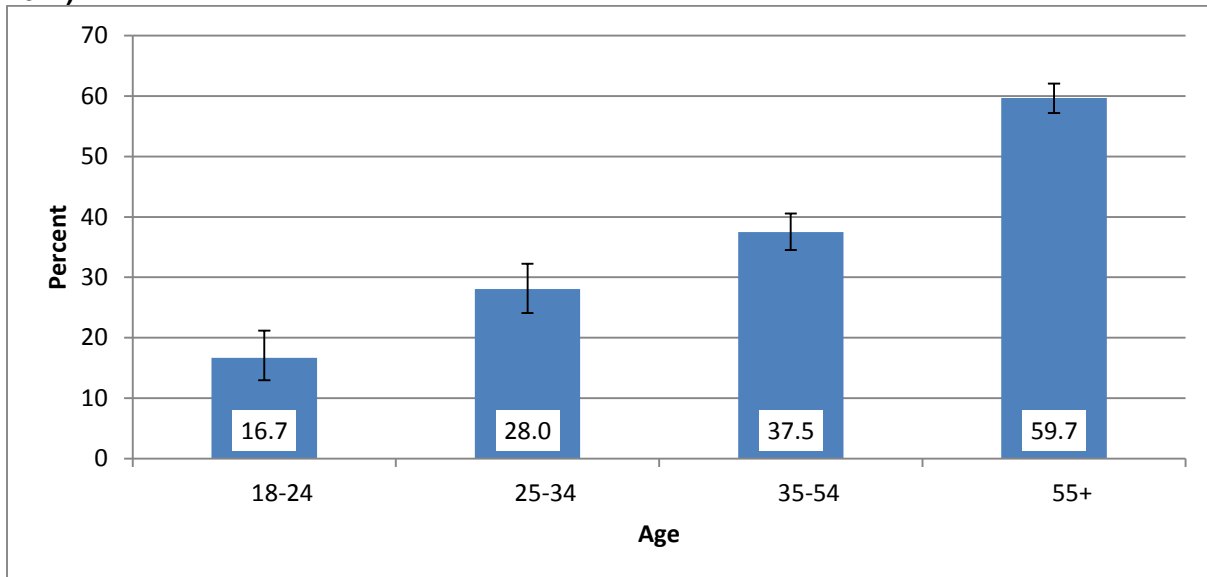
*The prevalence of permanent tooth extraction is similar in the US and the State of Hawaii (45.6% and 41.4%, respectively).*

**Percent of Adults With at Least One Permanent Tooth Extracted by County, Hawaii (BRFSS 2012)**



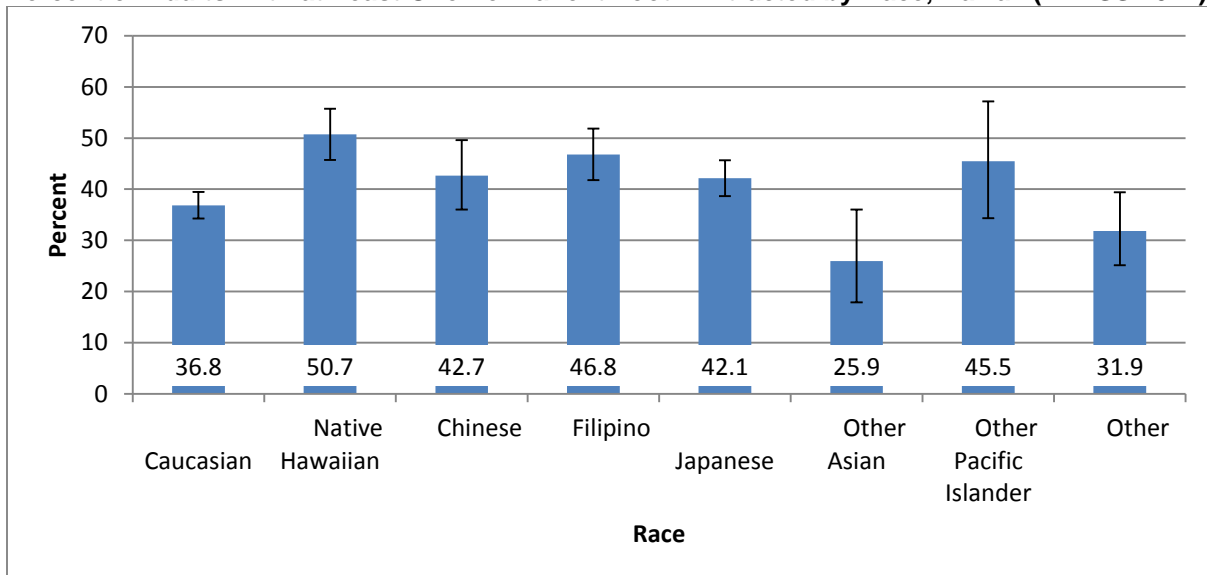
*The percent of adults with any teeth removed is fairly similar among the counties in Hawaii ranging from 39.5% in Honolulu County to 47.5% in Kauai County.*

**Percent of Adults With at Least One Permanent Tooth Extracted by Age Group, Hawaii (BRFSS 2012)**



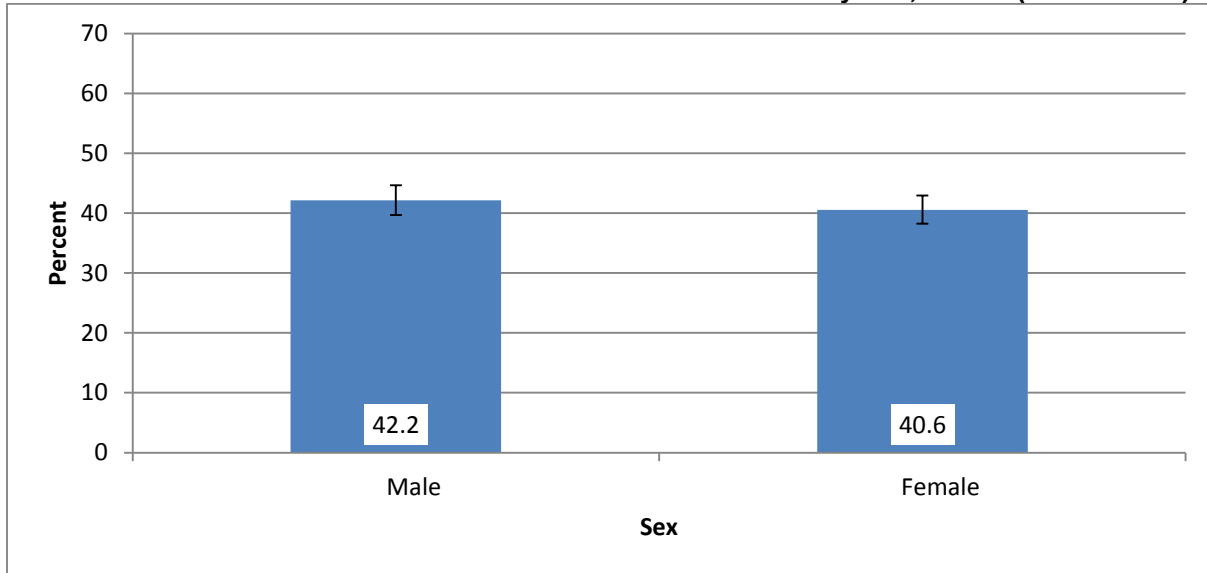
*The percent of adults with any teeth removed increases with age with the highest prevalence among adults aged 55 and older (59.7%).*

**Percent of Adults With at Least One Permanent Tooth Extracted by Race, Hawaii (BRFSS 2012)**



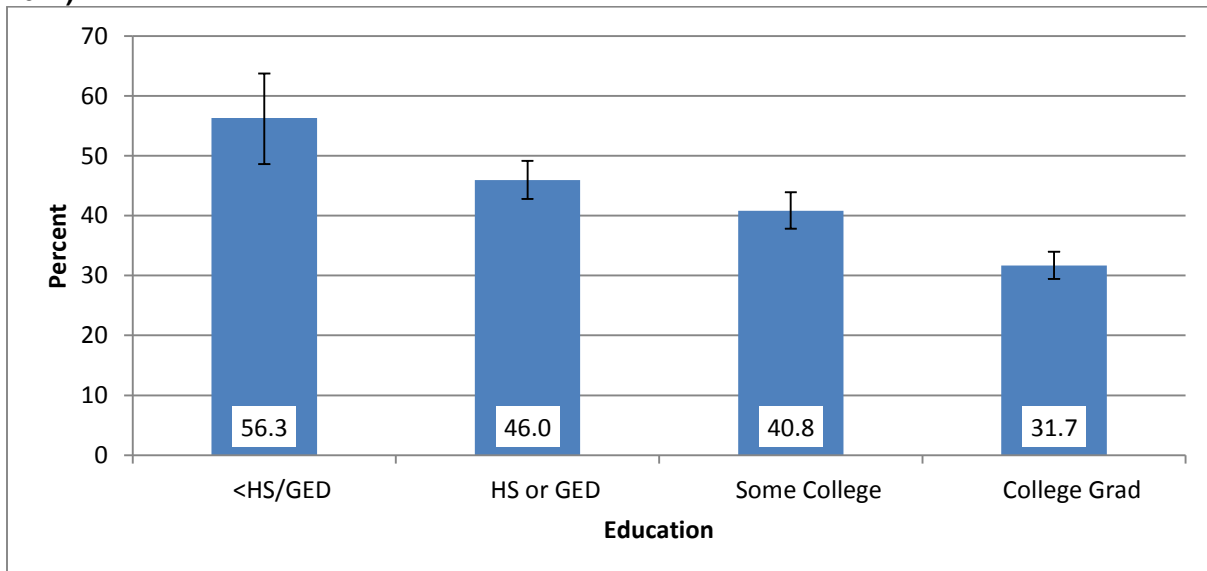
*The highest prevalence of any teeth removed is among Native Hawaiian, “Other Pacific Islander”, and Filipino adults (50.7%, 45.5%, and 46.8%, respectively). The lowest prevalence of any teeth removed in adults was among “Other Asian” and “Other” adults (25.9% and 31.9%, respectively).*

**Percent of Adults With at Least One Permanent Tooth Extracted by Sex, Hawaii (BRFSS 2012)**



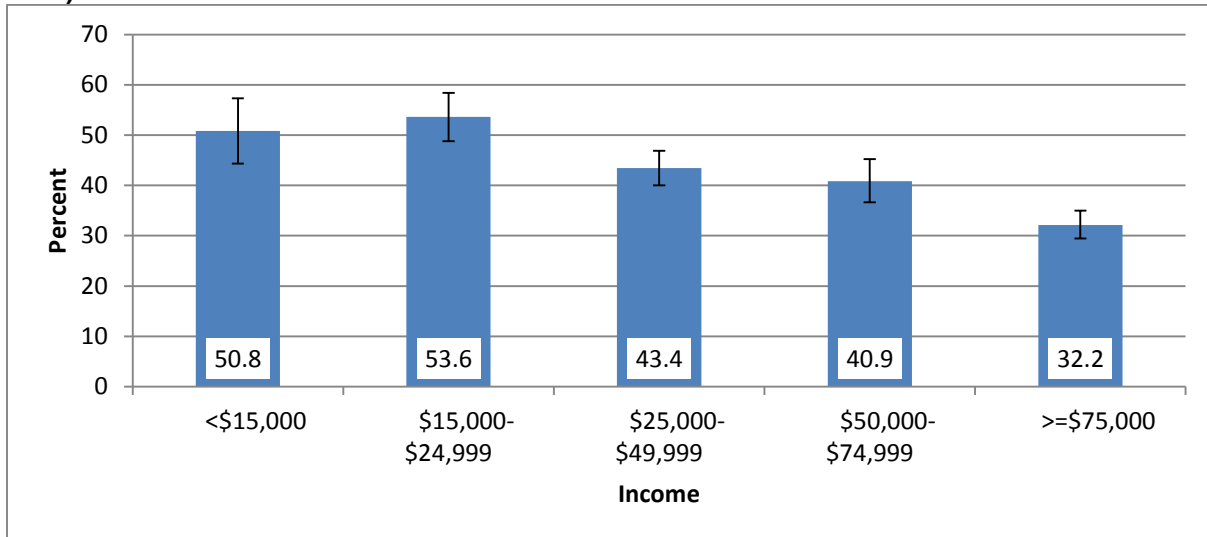
*Males have a higher prevalence of any teeth removed than females (42.2% vs. 40.6%, respectively).*

**Percent of Adults With at Least One Permanent Tooth Extracted by Education, Hawaii (BRFSS 2012)**



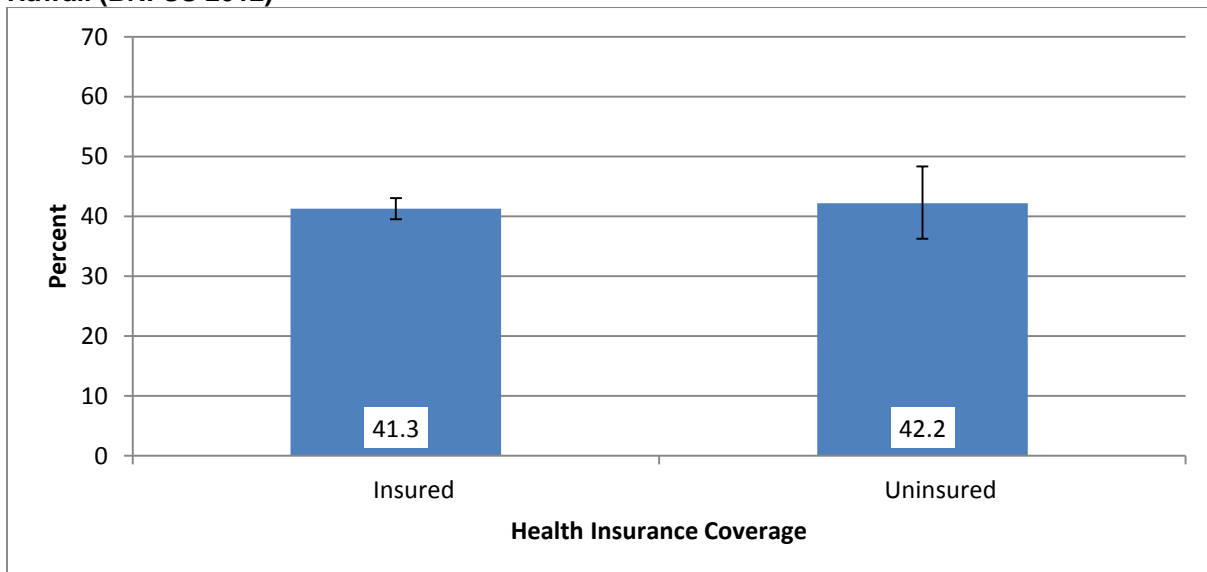
*Adults with less than a high school education have the highest prevalence of any teeth removed (56.3%) and adults who are college graduates have the lowest prevalence of any teeth removed (31.7%).*

**Percent of Adults With at Least One Permanent Tooth Extracted by Income Level, Hawaii (BRFSS 2012)**



*Adults with income between \$15,000 and \$24,999 have the highest prevalence of any teeth removed (54.4%) and adults with incomes greater than \$75,000 have the lowest prevalence of any teeth removed (35.0%).*

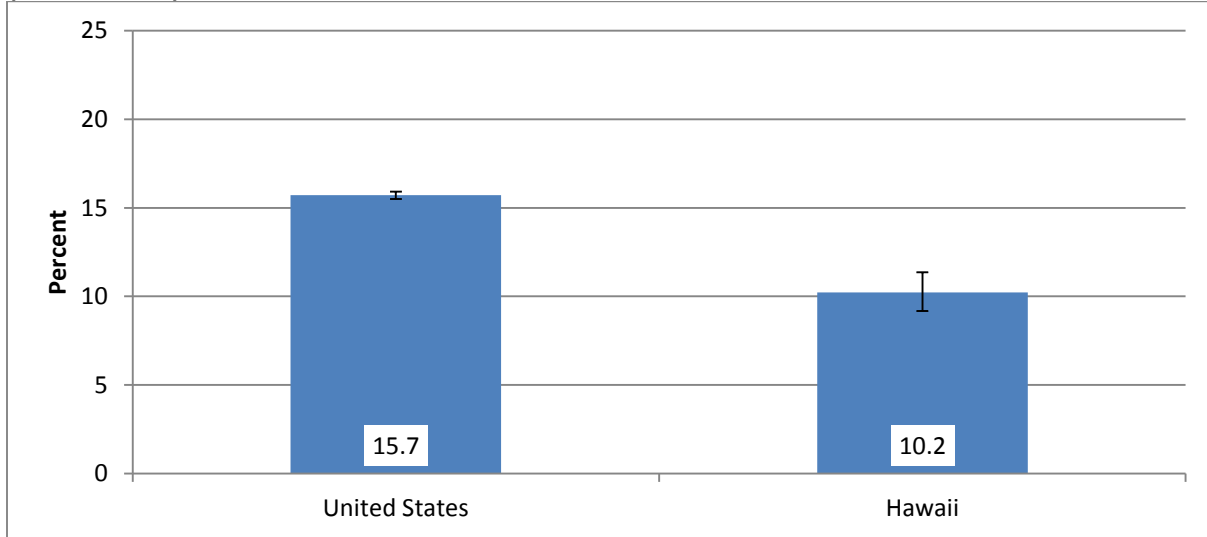
**Percent of Adults With at Least One Permanent Tooth Extracted by Health Insurance Coverage, Hawaii (BRFSS 2012)**



*Those who are uninsured have a prevalence of tooth extraction of 42.2%, which is similar to those who are insured (41.3%).*

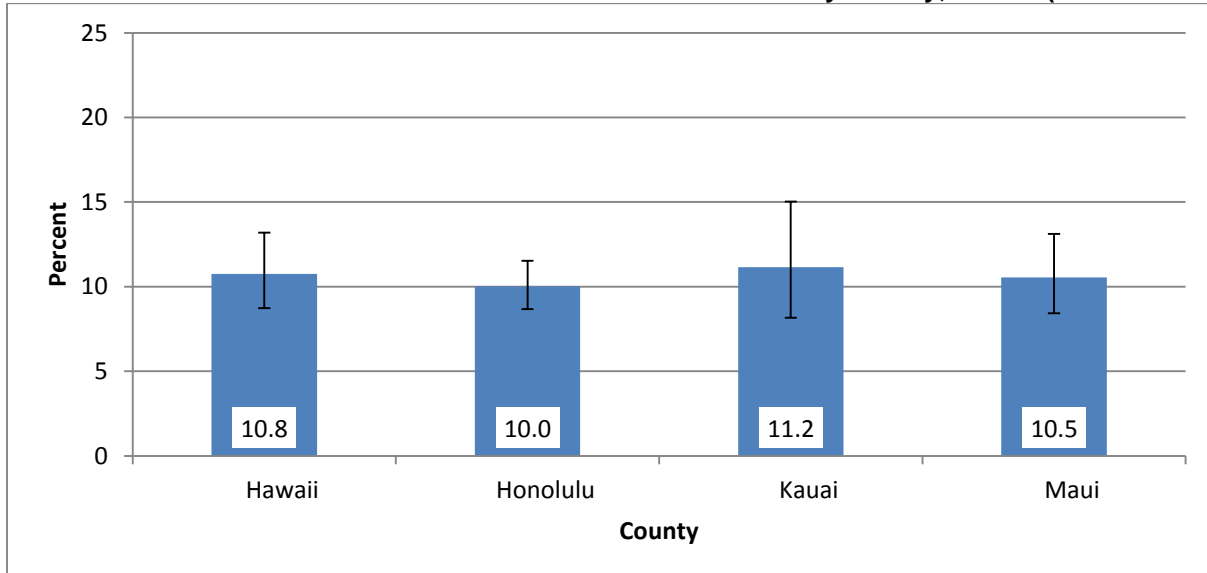
## Substantial Tooth Loss in Adults

**Percent of Adults With at Least Six Permanent Teeth Extracted, in the United States and Hawaii (BRFSS 2012)**



*The prevalence of substantial tooth loss among adults is lower in Hawaii than in the US (10.2% and 15.7%, respectively).*

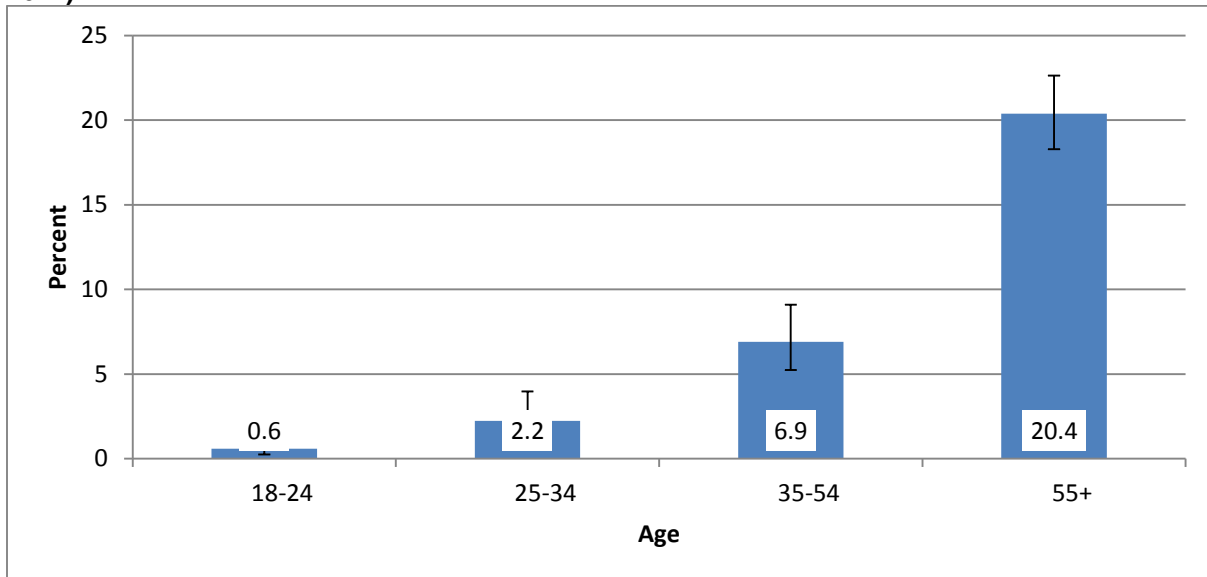
**Percent of Adults With at Least Six Permanent Teeth Extracted by County, Hawaii (BRFSS 2012)**



*The prevalence of substantial tooth loss among adults is fairly similar among the smaller counties in Hawaii ranging from 10.0% in Honolulu County to 11.2% in Kauai County.*

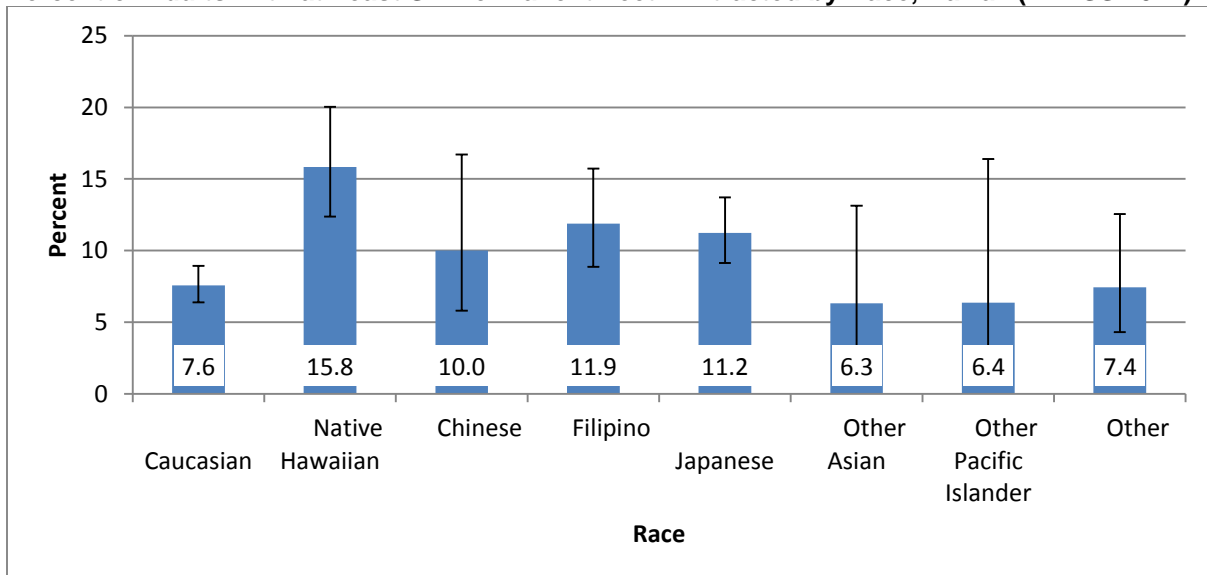


**Percent of Adults With at Least Six Permanent Teeth Extracted by Age Group, Hawaii (BRFSS 2012)**



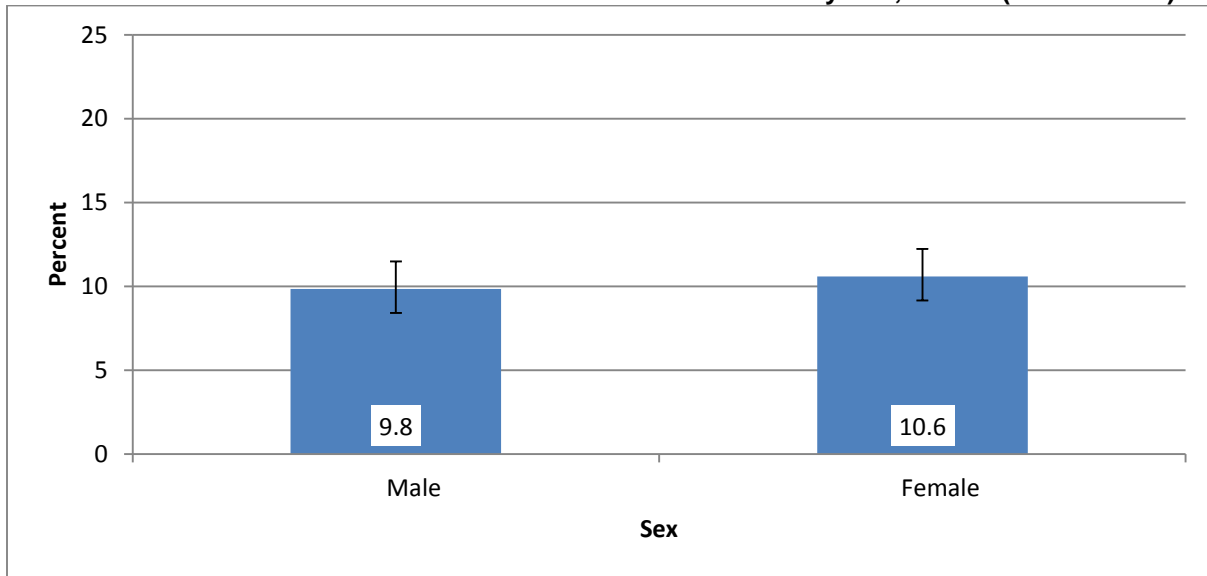
*The prevalence of substantial tooth loss among adults increases with age with the highest estimates among adults age 55 and older (20.4%).*

**Percent of Adults With at Least Six Permanent Teeth Extracted by Race, Hawaii (BRFSS 2012)**



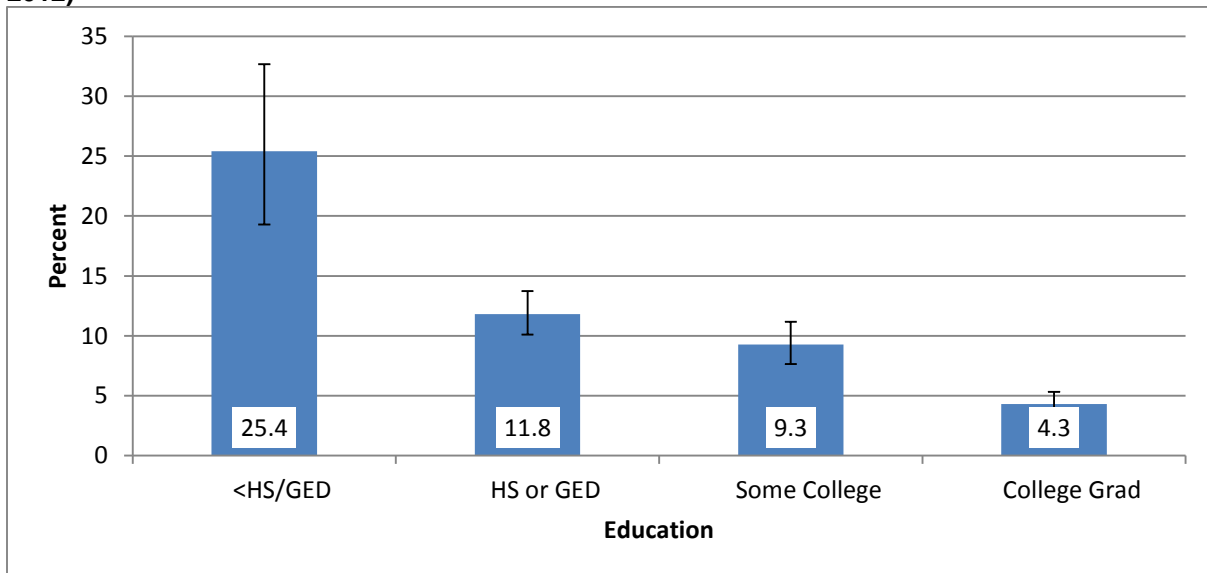
*The highest prevalence of substantial tooth loss occurs among Native Hawaiian, Filipino, and Japanese adults (15.8%, 11.9%, and 11.2%, respectively). The prevalence of substantial tooth loss is lowest among “Other Asian” and “Other Pacific Islander” adults (6.3% and 6.4%, respectively).*

**Percent of Adults With at Least Six Permanent Teeth Extracted by Sex, Hawaii (BRFSS 2012)**



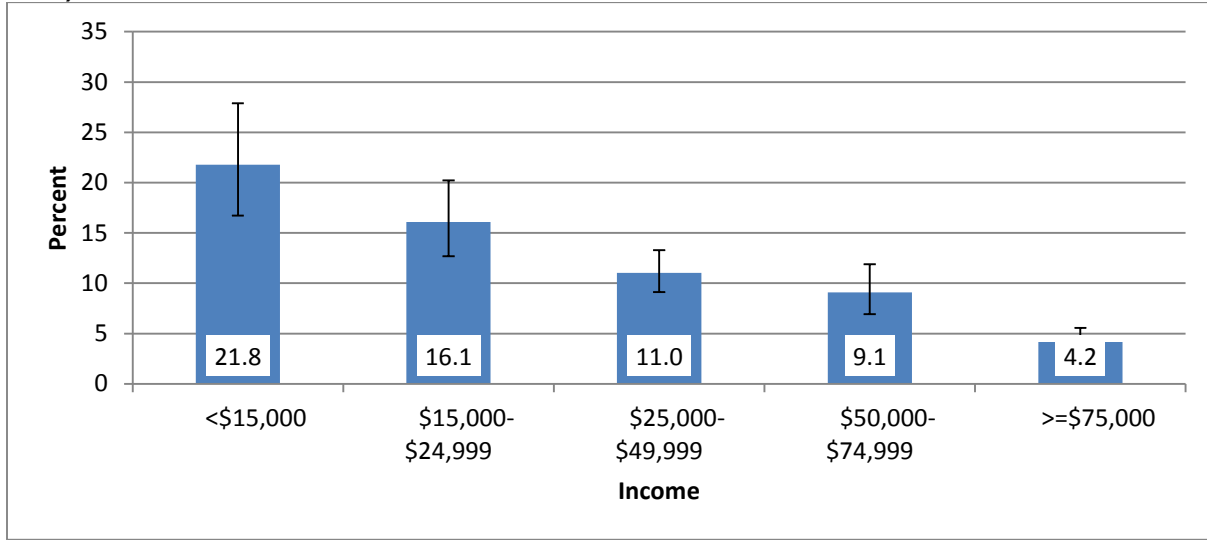
*Females have a higher prevalence of substantial tooth loss than males (10.6% vs. 9.8%, respectively).*

**Percent of Adults With at Least Six Permanent Teeth Extracted by Education, Hawaii (BRFSS 2012)**



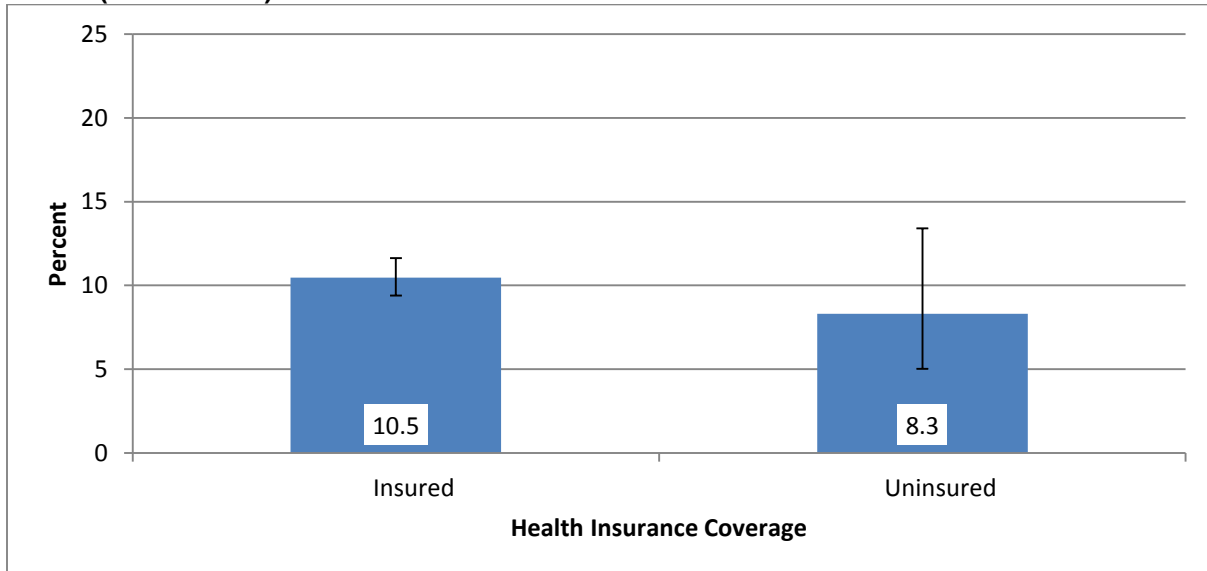
*Adults with less than a high school education have the highest prevalence of substantial tooth loss (25.4%) and adults who are college graduates have the lowest prevalence of substantial tooth loss (4.3%).*

**Percent of Adults With at Least Six Permanent Teeth Extracted by Income Level, Hawaii (BRFSS 2012)**



*Adults with incomes between \$15,000 and \$24,999 have the highest prevalence of substantial tooth loss (20.2%). Adults with incomes greater than \$75,000 have the lowest prevalence of substantial tooth loss (5.8%).*

**Percent of Adults With at Least Six Permanent Teeth Extracted by Health Insurance Coverage, Hawaii (BRFSS 2012)**



*Adults who are uninsured have a similar estimate of substantial tooth loss (8.3%) compared to those who are insured (10.5%).*

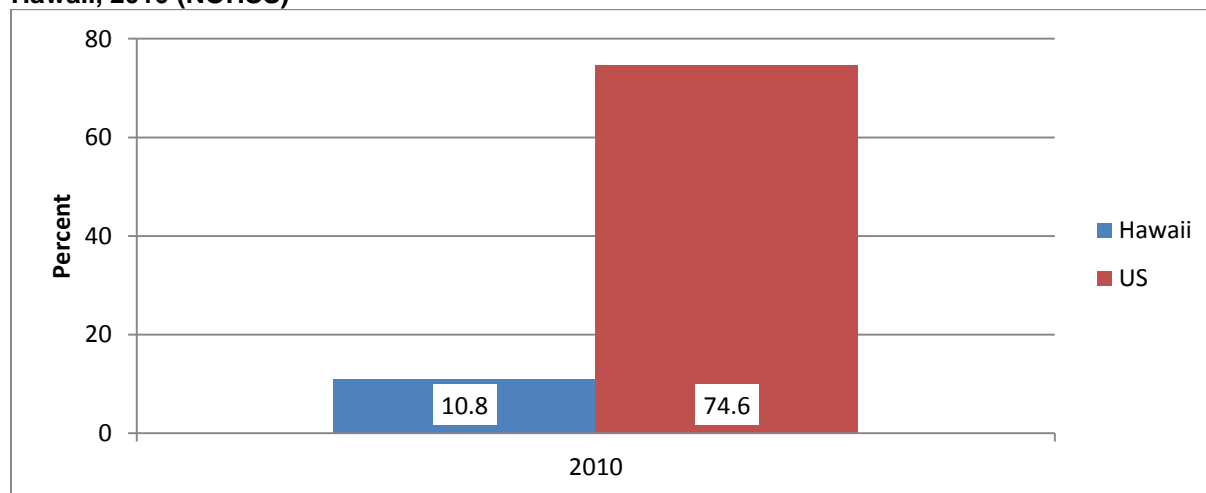
## NATIONAL ORAL HEALTH SURVEILLANCE SYSTEM (NOHSS)

The NOHSS is a system managed by the CDC's Division of Oral Health and the Association of State and Territorial Dental Directors.<sup>10</sup> The purpose of the NOHSS is to monitor oral health indicators nationally and at the state level. Water fluoridation and cancer data is tracked as well as oral health indicators from BRFSS and population based exam data in children. In this section, only water fluoridation and cancer data are shown.

### Community Water Fluoridation

Fluoride added to community drinking water sources at levels recommended by the federal government has repeatedly been shown to be a safe, inexpensive, and extremely effective method of preventing tooth decay in all age groups.<sup>11</sup> Other somewhat less effective ways to achieve the benefits of fluoride include use of toothpaste, mouth rinses, prescribed tablets or professionally applied varnish, gels or foams.<sup>12</sup> Some of these products can be used at home while others are prescribed or performed by health or dental professionals. These are the only options for families who are not on public water systems or whose systems are not fluoridated.

#### Percent of Population on Public Water Supply Systems Receiving Fluoridated Water, US and Hawaii, 2010 (NOHSS)



Note: 95% Confidence Intervals not available

*The percent of the population in Hawaii that are on public water systems with fluoride is much lower than reported for the entire US*

<sup>10</sup> Water Fluoridation data available online at: <http://www.cdc.gov/nohss>. Cancer Incidence and Mortality data from the National Program of Cancer Registries and is available online at: <http://www.cdc.gov/cancer/npcr/>

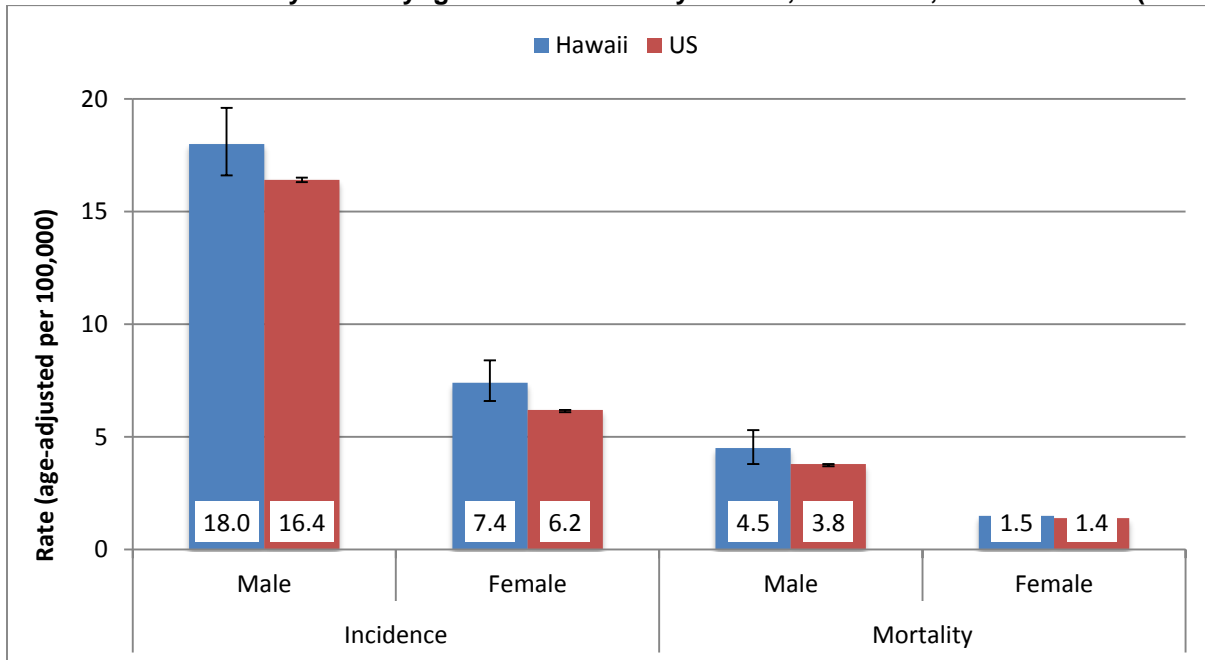
<sup>11</sup> From the Centers for Disease Control and Prevention. Achievements in public health, 1900-1999: fluoridation of drinking water to prevent dental caries. JAMA 2000;283:1283-6.

<sup>12</sup> Marinho VC, Higgins JP, Sheiham A, Logan S. One topical fluoride (toothpastes, or mouth rinses, or gels, or varnishes) versus another for preventing dental caries in children and adolescents. Cochrane Database Syst Rev 2004;(1):CD002780.

## Pharyngeal and Oral Cavity Cancer

Each year, more than 30,000 new cases of oral and pharyngeal cancer are diagnosed and over 8,000 deaths due to oral cancer occur.<sup>13</sup> The 5-year survival rate for these cancers is only about 50 percent. Mortality from oral cancer is nearly twice as high in African-American males as it is in whites. Methods used to treat oral cancers (surgery, radiation, and chemotherapy) are disfiguring and costly. Avoiding high-risk behaviors, that include cigarette, cigar or pipe smoking, use of smokeless tobacco, and excessive use of alcohol are critical in preventing oral cancers. Early detection is key to increasing the survival rate for these cancers. Most early signs of oral cancer are painless and are difficult to detect without a thorough head and neck examination by a dental or medical professional.

**Incidence and Mortality of Pharyngeal and Oral Cavity Cancer, 2005-2009, US and Hawaii (NOHSS)**



*Hawaii is fairly similar to the US in incidence of and mortality from pharyngeal and oral cavity cancer. Males (n=615) have a higher incidence of pharyngeal and oral cavity cancer compared to females (n=281) (18.0 per 100,000 vs. 7.4 per 100,000, respectively).*

<sup>13</sup> Division of Oral Health. National Oral Health Surveillance System: Cancer of the Oral Cavity and Pharynx. Available online at: <http://www.cdc.gov/nohss/guideCP.htm>.

## EMERGENCY ROOM DATA

An individual in Hawaii who experiences a toothache or mouth injury and can't afford dental care or can't get an appointment at a dentist's office or dental clinic, must resort to going to a hospital emergency room (ER). Emergency rooms do not provide dental care and little can be done with the exception of providing antibiotics and pain medication until the patient can be seen by a dental professional. Surveillance of claims data from the emergency room can provide estimates for visits related to oral health conditions, some of which can be potentially preventable. All emergency rooms in the State of Hawaii provide data to the Hawaii Health Information Corporation.<sup>14</sup> Specific codes, based on consensus of national experts, of 521 (Diseases of hard tissues of teeth) and 522 (Diseases of pulp and periapical tissues) are often used to assess visits that could have been prevented through access to outpatient dental care.<sup>15</sup> The ER data does not include the patients that were initially seen in the ER, but required an admission to the hospital, number that this represents and the associated hospital charges are noted in the narrative that follows.

ICD Codes with first level specification:

521 Diseases of Hard Tissues of Teeth

521.0 Dental Caries

521.1 Excessive Dental Attrition

521.2 Abrasion of Teeth

521.3 Erosion of Teeth

521.4 Pathological Tooth Resorption

521.5 Hypercementosis

521.6 Ankylosis of Teeth

521.7 Intrinsic Posteruptive Color Changes

521.8 Other Specific Diseases of Hard Tissues of Teeth

521.9 Unspecified Disease of Hard Tissues of Teeth

522 Diseases of Pulp and Periapical Tissues

522.0 Pulpitis

522.1 Necrosis of the Pulp

522.2 Pulp Degeneration

522.3 Abnormal Hard Tissue Formation in Pulp

522.4 Acute Apical Periodontitis of Pupal Origin

522.5 Periapical Abscess without Sinus

522.6 Chronic Apical Periodontitis

522.7 Periapical Abscess with Sinus

522.8 Radicular Cyst

522.9 Other and Unspecified Diseases of Pulp and Periapical Tissues

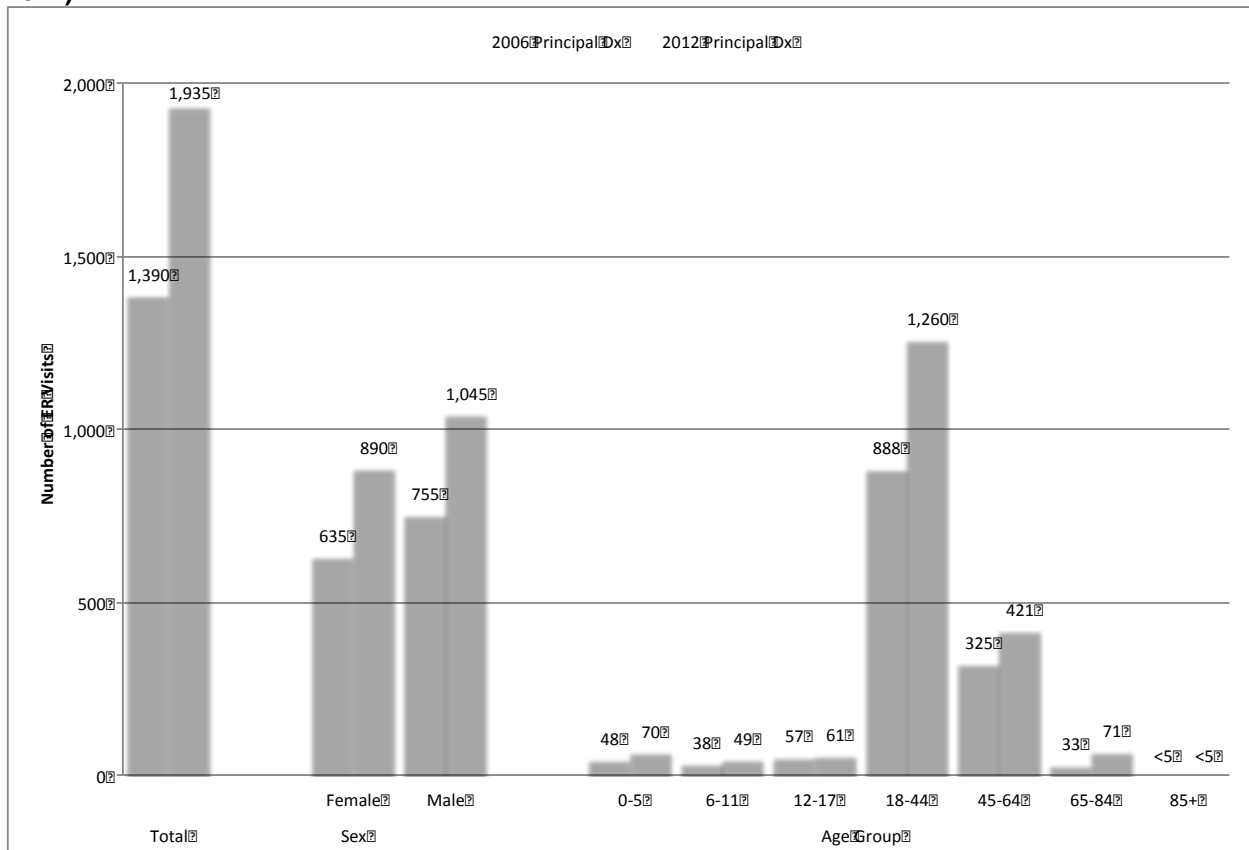
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<sup>14</sup> State statistics from Hawaii Health Information Corporation data request. Family Health Services Division. January 2014. Data does not include Tripler Medical Center.

<sup>15</sup> Pew Children's Dental Campaign. A costly dental destination: Hospital Care Means States Pay Dearly. Pew Center on the States. Issue Brief. February 2012. Available online at [www.pewcenteronthestates.org/dental](http://www.pewcenteronthestates.org/dental).

In Hawaii, there were nearly 2,000 Emergency Room Visits due to oral health (ICD9-CM principal diagnosis of 521-522) conditions in 2012 that were likely preventable. This represented an increase of 39% from 2006 when there were 1,390 ER visits, which is much higher than the 16% increase seen nationally from 2006-2009.<sup>15</sup> This represented over 2 million dollars (\$2,046,484) in hospital charges in 2012 compared to \$845,848 in 2006 (a 142% relative increase). In 2012, this represented a mean charge of \$1,057 per emergency room visit, which represented a 74% relative increase in the mean charge from 2006. Additionally, there were 39 admissions to the hospital from the ER in 2012 compared to 11 in 2006 with a principal diagnosis. This represented an increase of 255% over the time period and accounted for \$476,356 in total charges in 2012 (an increase of 391% from 2006). There were an additional 7 and 6 admissions in 2012 and 2006 respectively that didn't go through the ER with additional charges of \$70,738 in 2012 (an increase of 229% from 2006). The total charges for ER visits, inpatient admissions both through the ER and not through the ER represented \$2.6 million dollars in 2012 (an increase of 169% from 2006 when it accounted for \$965 thousand dollars).

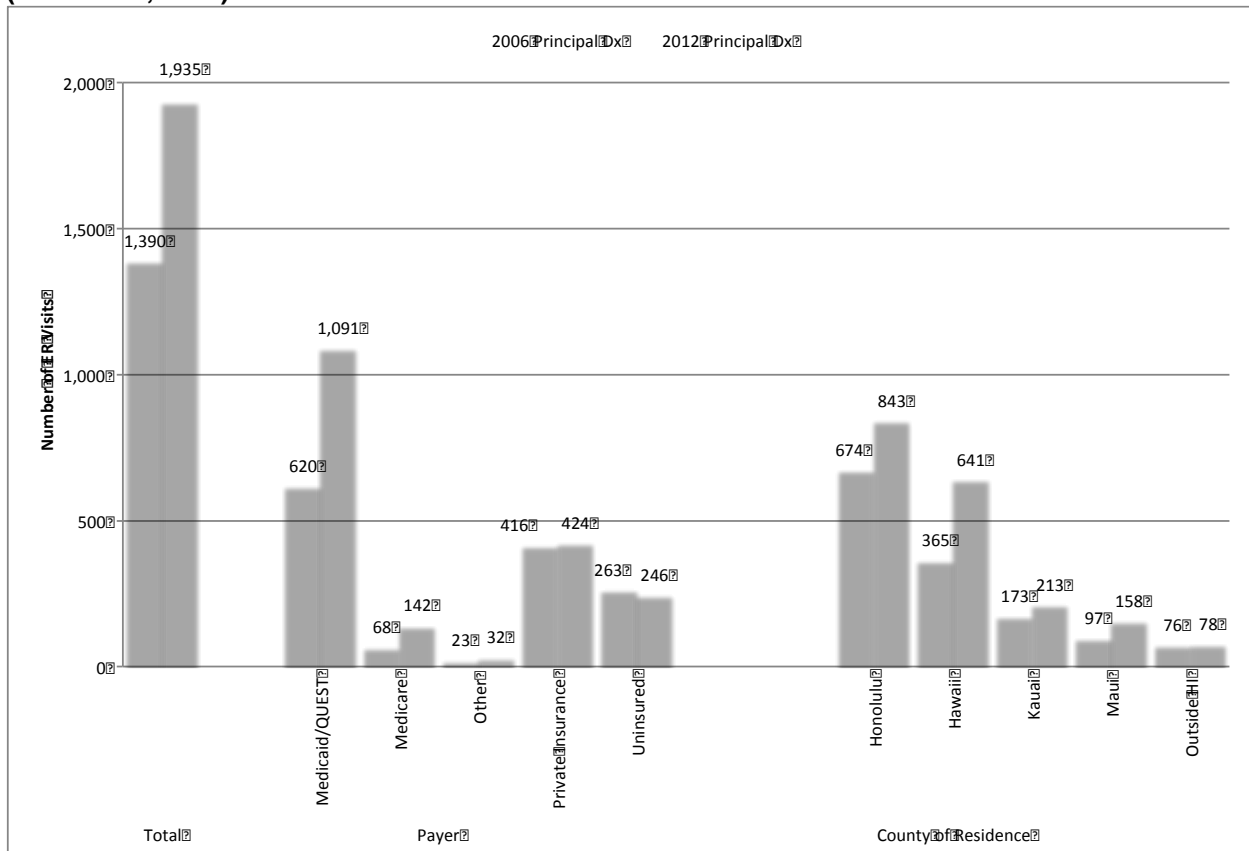
**Preventable Oral Health ER Visits (Principal Diagnosis) by Sex and Age Group, Hawaii, (HHIC 2006, 2012)**



Note: 95% Confidence Intervals not available  
Data does not include Tripler Medical Center.

Among the various population subgroups, there were more males than females, which had similar increases over the time period. A large proportion of these visits occur in those 18-44 years of age, followed by those 45-64 years of age with similar relative increases over the time period. The largest relative increase was among those 65-84 years of age (68.3%).

**Preventable Oral Health ER Visits (Principal Diagnosis) by Payer and County of Residence, Hawaii (HHIC 2006, 2012)**



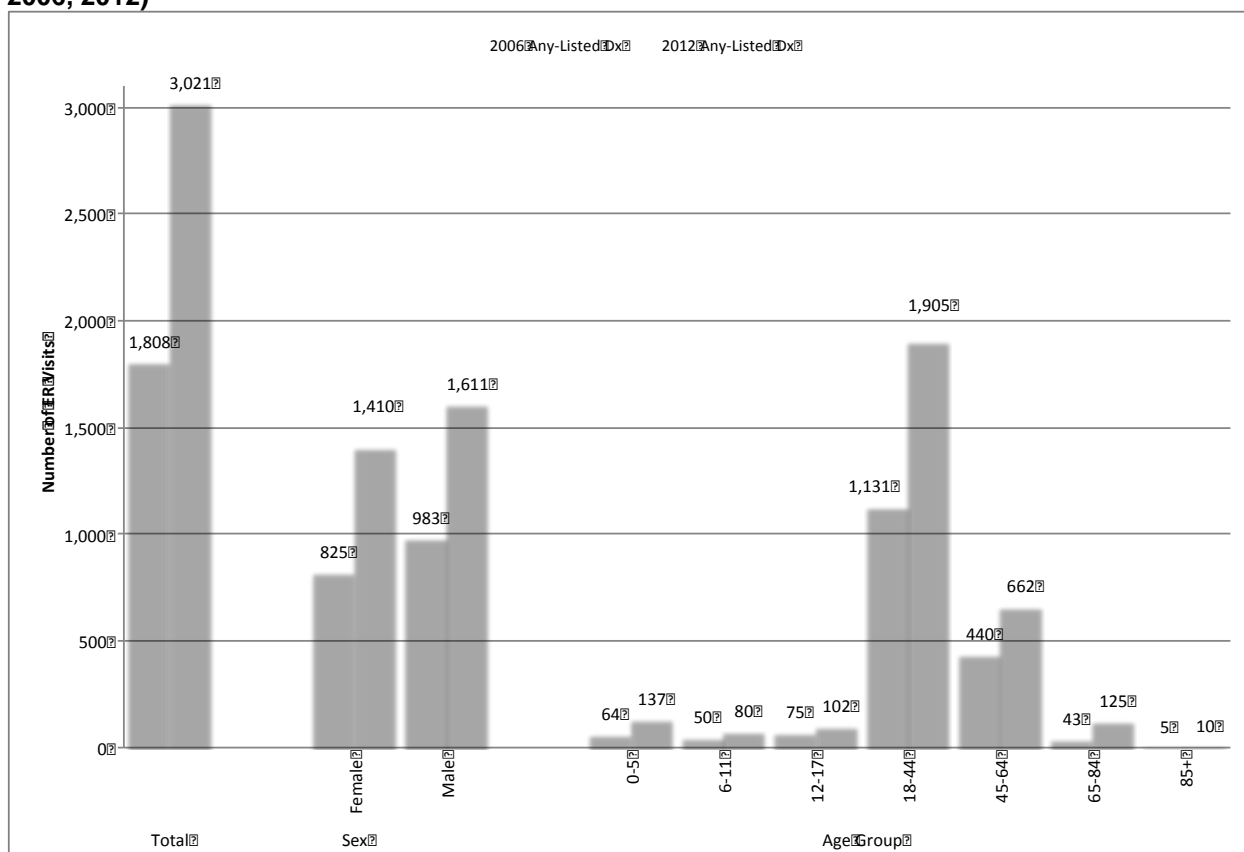
Note: 95% Confidence Intervals not available  
Data does not include Tripler Medical Center.

*Those on Quest/Medicaid as a payer accounted for more than half of the visits and saw a larger relative increase (63.8%) while those on Medicare also saw a substantial increase (67.6%) compared to those with private insurance (50.5%) and those that were uninsured (48.3%). The relative change was highest among residents of Hawaii (63.7%) and Maui (62.0%) compared to Honolulu (55.6%) and Kauai (55.2%) counties.*



In Hawaii, there were just over 3,000 Emergency Room Visits due to oral health (ICD9-CM any-listed diagnosis of 521-522) conditions in 2012 that were likely preventable. This represented an increase of 62.6% from 2006 when there were 1,808 ER visits, which is much higher than the 21.6% increase seen nationally from 2006-2009.<sup>15</sup> This also represented over 8.5 million dollars (\$8,622,212) in hospital charges in 2012 compared to \$4,116,683 in 2006 (a 67.1% relative increase). In 2012, this represented a mean charge of \$2,854 per emergency room visit, which represented a 25% relative increase in the mean charge from 2006. Additionally, there were 176 admissions to the hospital from the ER in 2012 compared to 85 in 2006 with any-listed diagnosis. This represented an increase of 107% over the time period and accounted for \$6.1 million dollars in total charges in 2012 (an increase of 82% from 2006). There were an additional 43 and 85 admissions in 2012 and 2006, respectively, that didn't go through the ER with additional charges of \$2.4 million dollars in 2012 (an increase of 11% from 2006). The total charges for ER visits, inpatient admissions both through the ER and not through the ER represented \$17.1 million dollars in 2012 (an increase of 82% from 2006 when it accounted for \$9.4 million dollars).

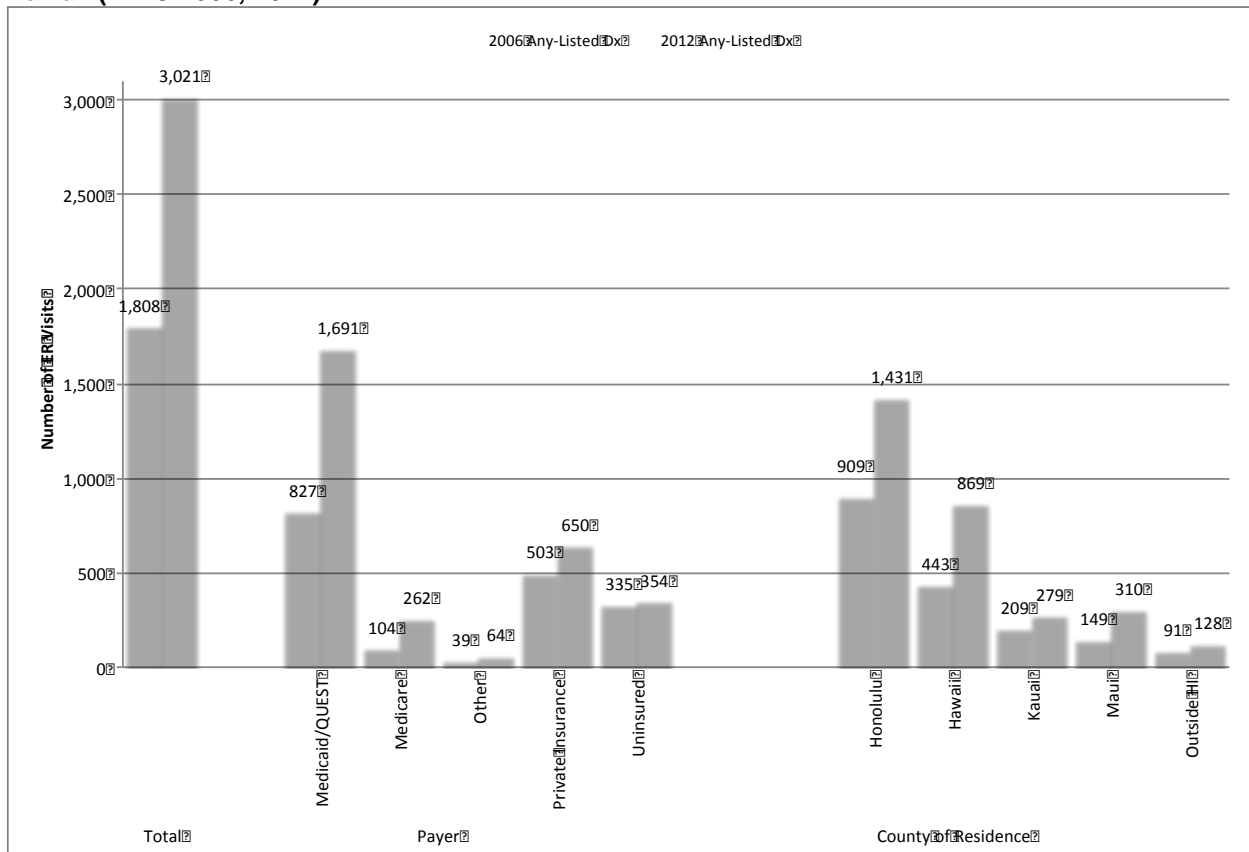
### Preventable Oral Health ER Visits (Any-Listed Diagnosis) by Sex and Age Group, Hawaii (HHIC 2006, 2012)



Note: 95% Confidence Intervals not available  
Data does not include Tripler Medical Center.

Among the various population subgroups, there were more males than females which had similar increases over the time period. A large proportion of these visits occur in those 18-44 years of age, followed by those 45-64 years of age with similar relative increases over the time period. The largest relative increase was among those 65-84 years of age (74.4%).

**Preventable Oral Health ER Visits (Any-Listed Diagnosis) by Payer and County of Residence, Hawaii (HHIC 2006, 2012)**



Note: 95% Confidence Intervals not available  
Data does not include Tripler Medical Center.

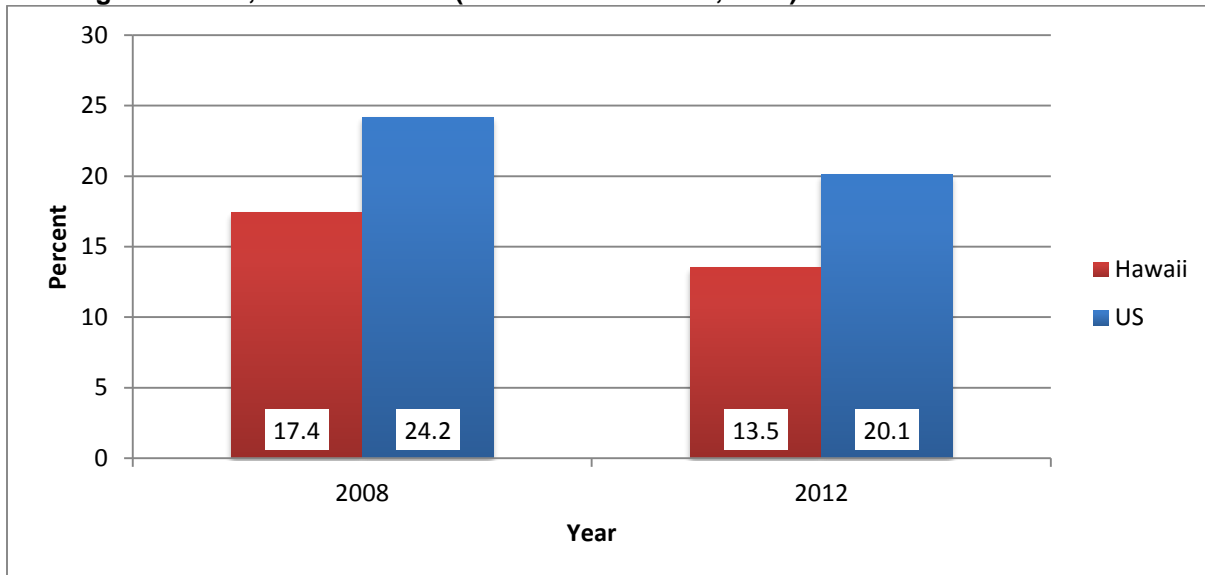
*Those with Quest/Medicaid as a payer accounted for more than half of the visits and saw a larger relative increase (67.2%) while those on Medicare also saw a substantial increase (71.6%) compared to those with private insurance (56.4%) and those that were uninsured (51.4%). The relative increase was highest among residents of Maui (67.5%) and Hawaii (66.2%) compared to Honolulu (61.2%) and Kauai (57.2%) counties.*

## Program Data

### HEAD START PROGRAM INFORMATION REPORT

Head Start is a federal program that promotes the school readiness of children ages birth to five from low-income families by enhancing their cognitive, social, and emotional development. Head Start serves preschool-age children and their families. Many Head Start programs also provide Early Head Start, which serves infants, toddlers, pregnant women, and their families who have incomes below the federal poverty level. Data is reported annually on a number of characteristics including receipt of and need for dental services in the program information report.<sup>16</sup>

**Percent of Preschool Children Enrolled in Head Start Receiving Oral Health Examination and Needing Treatment, Hawaii and US (Head Start PIR 2008, 2012)**



Note: 95% Confidence Intervals not available

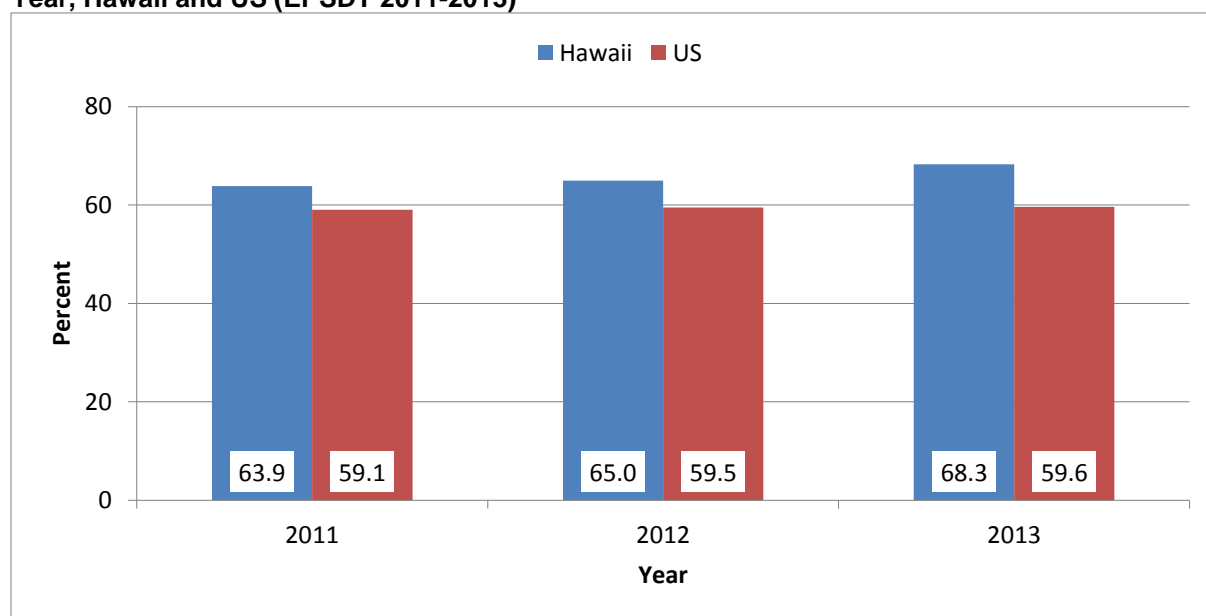
*Preschool children enrolled in Head Start in Hawaii and receiving oral health examination have a lower percent of treatment needed compared to that for the rest of the US. Additionally, there has been improvement in the proportion needing treatment in 2012 compared to 2008 both in Hawaii and in the US.*

<sup>16</sup> Head Start data available from Program Information Reports. Available online at: <http://eclkc.ohs.acf.hhs.gov/hslc/mr/pir>.

## EARLY PERIODIC SCREENING, DIAGNOSIS, AND TREATMENT (EPSDT) PROGRAM

Medicaid is a joint federal-state program that provides health insurance to low-income individuals. Dental services are a covered benefit for most Medicaid enrolled children from birth through age 20. Dentists in private practice in Hawaii are enrolled as Medicaid providers, but community dental clinics are more likely to provide dental care to people covered by Medicaid, and they may offer sliding-fee schedules, reduced fees or free care to those who cannot afford to pay. The number of people seeking services at these clinics often exceed their capacity to provide comprehensive care. Waiting lists may be weeks or months long. Since 2009, adults on Quest/Medicaid in Hawaii, only emergency dental services are covered, not routine care. The EPSDT program is a component of Medicaid for child health.<sup>17</sup> This program is required in every state and provides financing for pediatric health services with the goal of improving the health of low-income children.

**Percent of EPSDT Children Aged 6-9 Years Old, Receiving Dental Services in the Past Year by Year, Hawaii and US (EPSDT 2011-2013)**

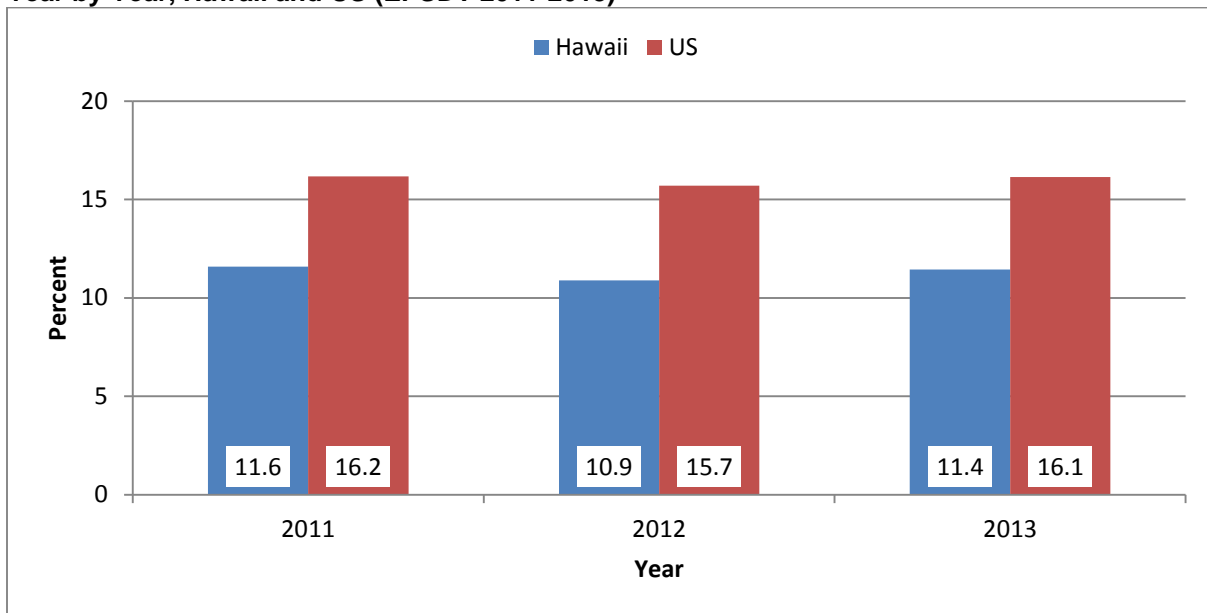


Note: 95% Confidence Intervals not available

*The percent of EPSDT eligible children aged 6-9 years receiving dental services in the past year increased from 63.9% in 2011 to 68.3% in Hawaii in 2013. Nationally, the estimate for EPSDT children aged 6-9 years has been lower than Hawaii with an estimate of 59.6% in 2013.*

<sup>17</sup> EPSDT data obtained from Annual CMS-416 Forms.

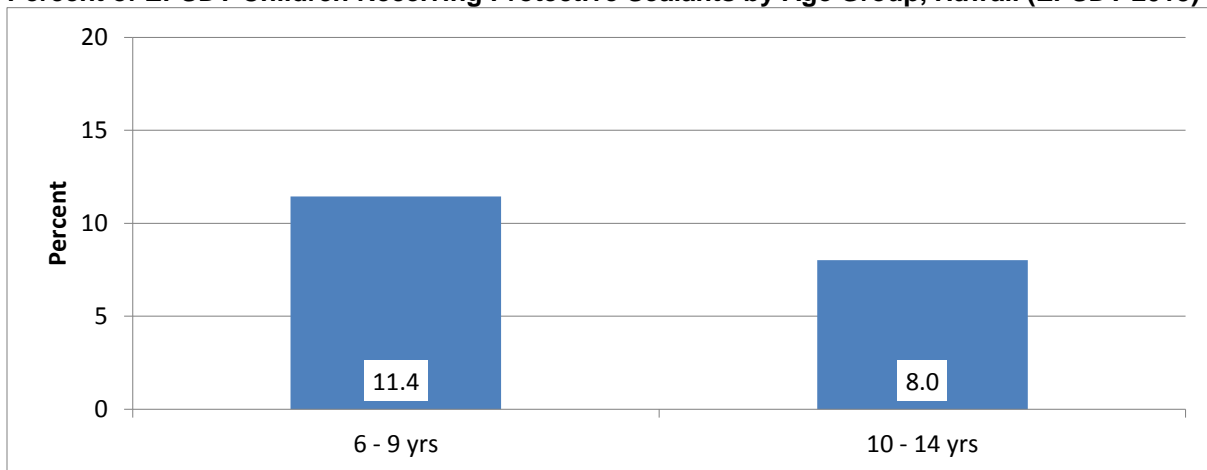
**Percent of Hawaii EPSDT Children Aged 6-9 Years Old, Receiving Protective Sealants, in the Past Year by Year, Hawaii and US (EPSDT 2011-2013)**



Note: 95% Confidence Intervals not available

*The percent of EPSDT children aged 6-9 years receiving protective sealants remained fairly constant from 2011 to 2013, ranging from 10.9% in 2012 to 11.6% in 2011. Nationally, the estimate for EPSDT children aged 6-9 years is consistently higher than Hawaii with an estimated 16.1% in 2013.*

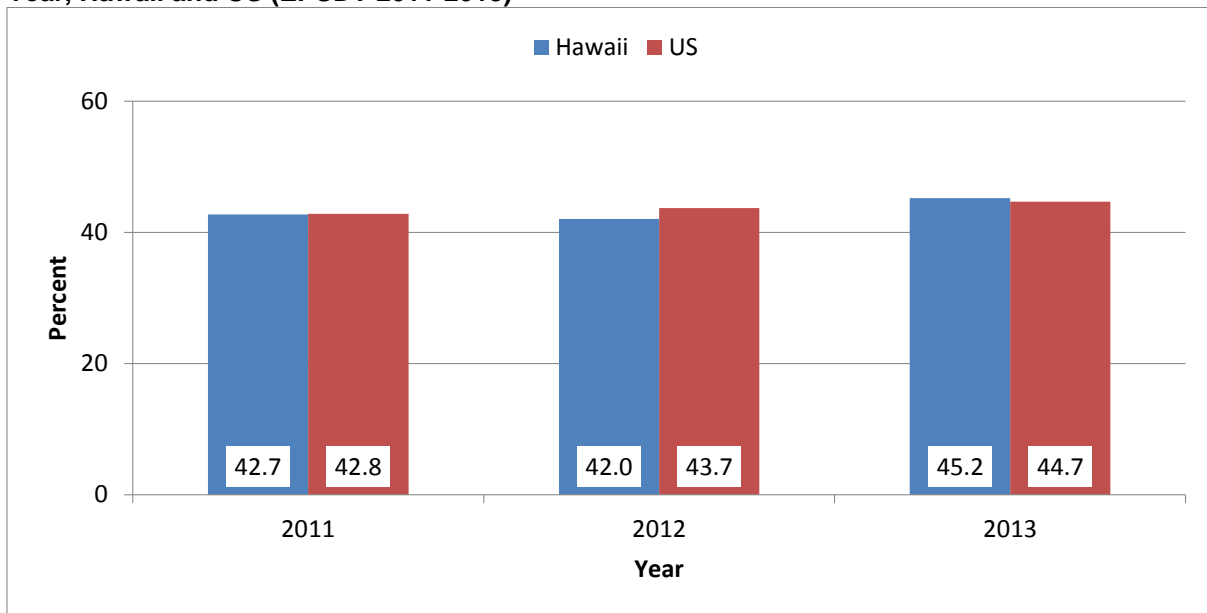
**Percent of EPSDT Children Receiving Protective Sealants by Age Group, Hawaii (EPSDT 2013)**



Note: 95% Confidence Intervals not available

*The proportion of children in Hawaii receiving protective sealants varies by age group with the highest proportion among 6-9 year olds at 11.4% followed by 8.0% of children 10-14 years old.*

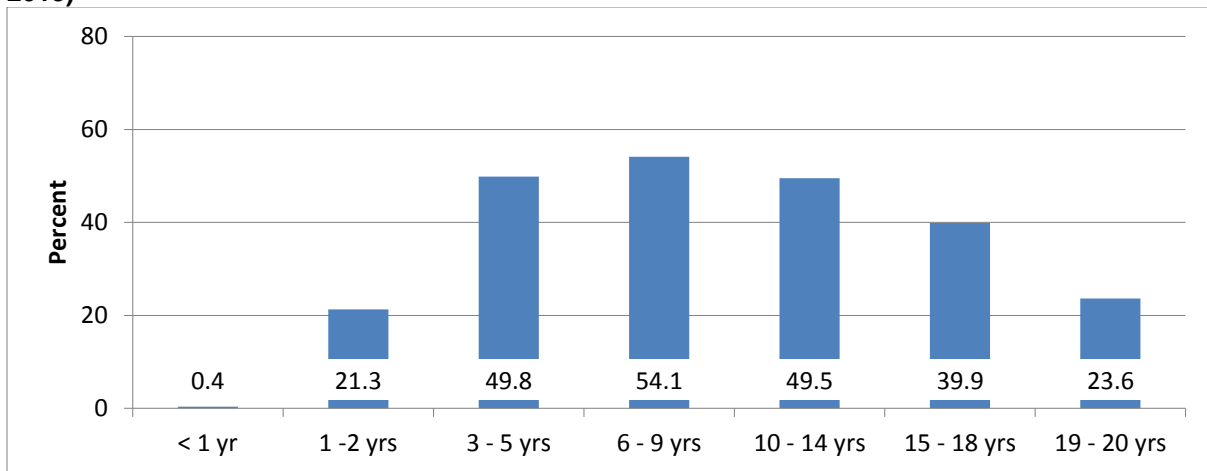
**Percent of Hawaii EPSDT Children 1-18 Years of Age Receiving Preventive Dental Services by Year, Hawaii and US (EPSDT 2011-2013)**



Note: 95% Confidence Intervals not available

*The percent of children receiving preventive dental services increased slightly over time in both the US and Hawaii. The estimate in Hawaii in 2013 was 45.2%, similar to the 44.7% for the US.*

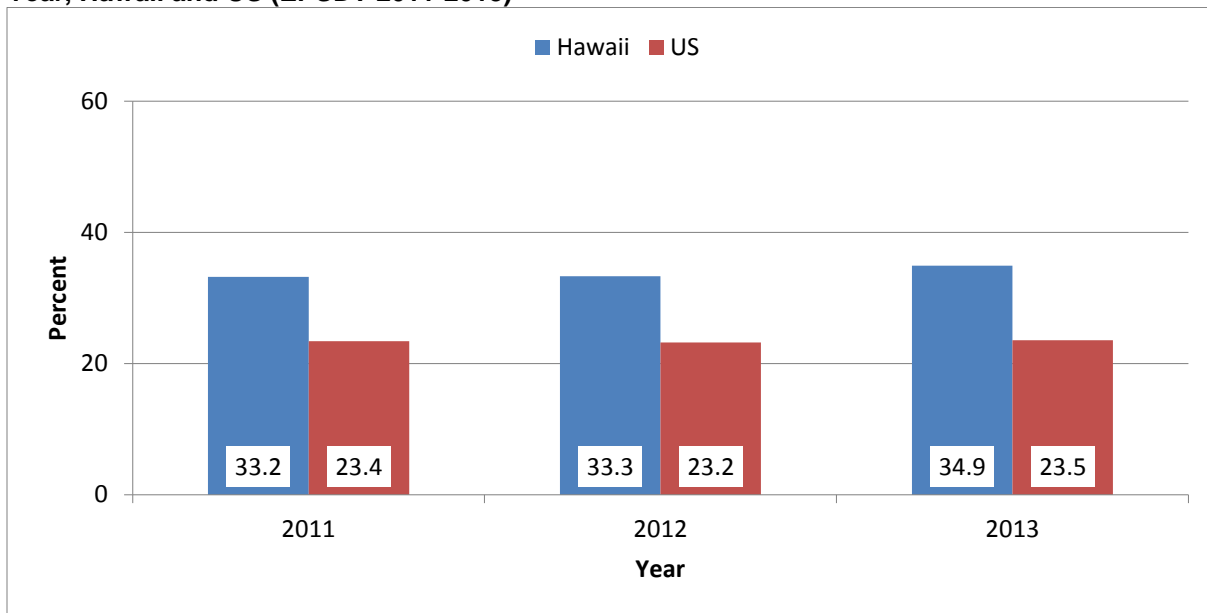
**Percent of EPSDT Children Receiving Preventive Dental Services by Age Group, Hawaii (EPSDT 2013)**



Note: 95% Confidence Intervals not available

*The proportion of children in Hawaii receiving preventive dental services varied by age group with 6-9 year olds (54.1%) having the highest percent, followed by 3-5 year olds (49.8%) and 10-14 year olds (49.5%).*

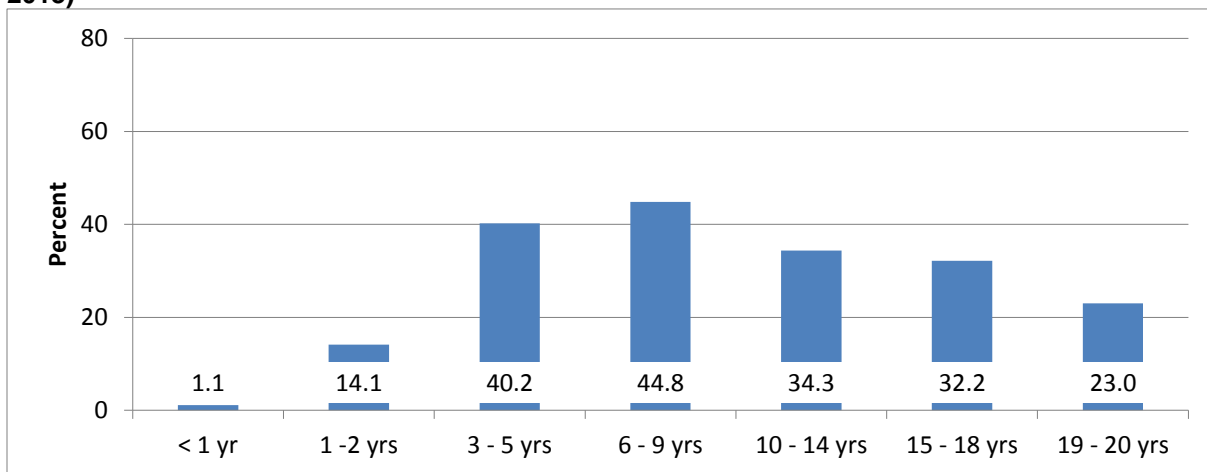
**Percent of Hawaii EPSDT Children 1-18 Years of Age Receiving Dental Treatment Services by Year, Hawaii and US (EPSDT 2011-2013)**



Note: 95% Confidence Intervals not available

*The percent of children receiving dental treatment services was higher in Hawaii than the US with about the same proportions over the time period.*

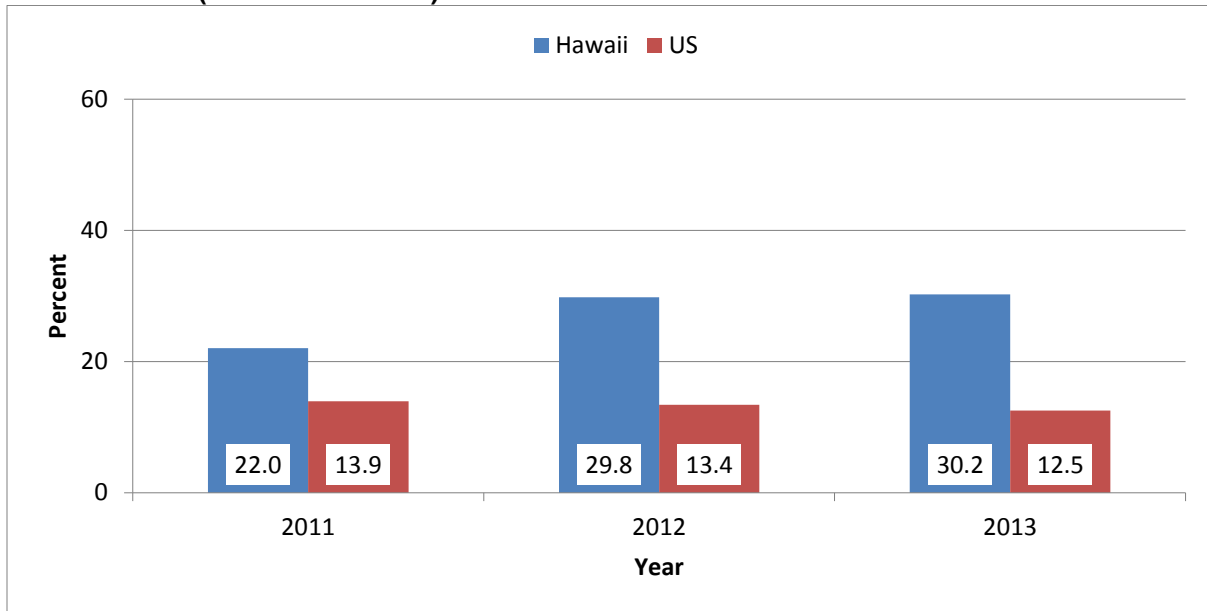
**Percent of EPSDT Children Receiving Dental Treatment Services by Age Group, Hawaii (EPSDT 2013)**



Note: 95% Confidence Intervals not available

*The percent of children receiving dental treatment services varies by age group with the highest proportion among 6-9 year olds (44.8%), followed by 3-5 year olds (40.2%), and 10-14 year olds (34.3%).*

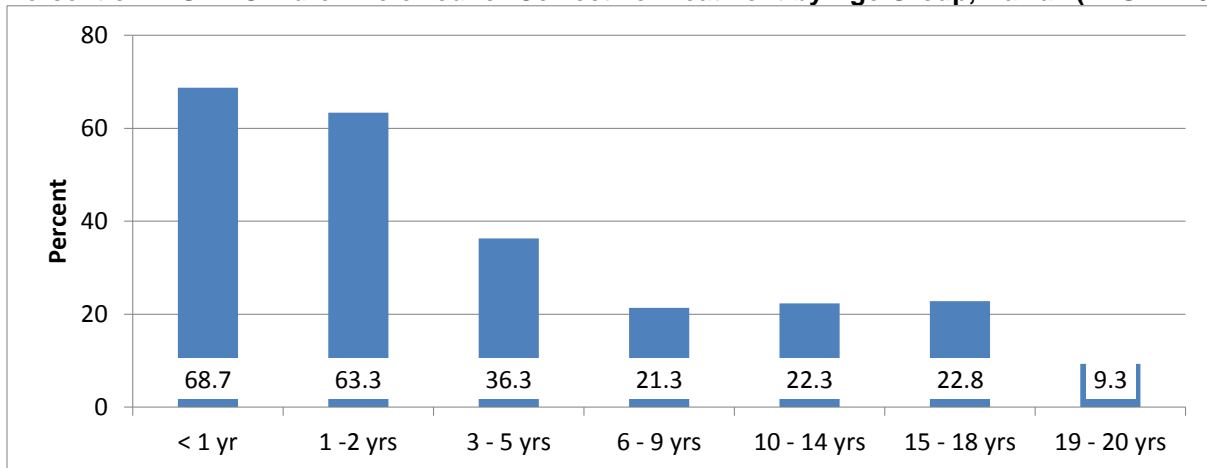
**Percent of Hawaii EPSDT Children 1-18 Years of Age Referred for Corrective Treatment by Year, Hawaii and US (EPSDT 2011-2013)**



Note: 95% Confidence Intervals not available

*The percentage of children referred for corrective treatment was higher in Hawaii than the US with some increase in the proportions in Hawaii over the time period.*

**Percent of EPSDT Children Referred for Corrective Treatment by Age Group, Hawaii (EPSDT 2013)**



Note: 95% Confidence Intervals not available

*The percent of children referred for corrective treatment varies by age group with a high of 68.7% among infants and 63.3% among 1-2 year olds to a low of 9.3% among 19-20 year olds.*



## DENTAL WORKFORCE IN HAWAII

An assessment of the dental workforce is critical to understand the distribution of providers and the ability for individuals to access these services. However, data on access other than obtained through surveys is limited. The Department of Commerce and Consumer Affairs Professional and Vocational Licensing Division administers the Dentists and Dental Hygienists licensing in the State of Hawaii and provides detail on the number of current licenses in the state.<sup>18</sup> The data provided does not include information that allows an assessment of individuals that actually practiced dentistry in the state so individuals that have retired or live outside of the state are included in the overall total numbers. For example, of the 1,473 current licenses reported in the State of Hawaii in FY 2014, 396 had “Mainland” addresses and 17 had “Foreign” addresses. These were excluded from the following graphs, in addition to 5 who had an Oahu address and 15 with a “Mainland” address but were noted to have a temporary dental license which was introduced starting in FY 2014. Additionally, a dentist may provide services on more than one island and only that listed as the primary practice address for the license is reflected in the available data. Notwithstanding, this data does show some general increases in the dental workforce over time in the State of Hawaii and highlights growth. A more complete assessment should look at type of dental specialist, volume of practice, age of dentists, insurance claims, and other factors that may contribute to the patterns of dental care access in the state currently or in the near future. To help place information into context, ratios of the general population to number of dental providers was calculated based on estimates for the US from the Bureau of Labor Statistics,<sup>19</sup> the State of Hawaii, Department of Commerce and Consumer Affairs, and the general population from the US Census Bureau for US, State of Hawaii, and Counties.<sup>20</sup>

Information on Medicaid/QUEST providers was obtained through a data-sharing request for calendar year 2013 which included information on total number of providers and the number that had paid claims in the past year.<sup>21</sup> The data shared in this report consolidated all dental providers to the county level based on practice address and does not differentiate between practice specialties or those that provide services outside of their primary practice. It is important to consider variation in specialty care on individual neighbor islands and counties. The same provider could be counted in more than one county if they provide services in more than one county. Therefore, the overall proportion may be an over-estimate of the proportion of all providers serving Medicaid/QUEST clients.

Estimated calculations reflecting the proportion of providers in each county were done based on these two data sources and will have its limitations for interpretation. For example, there is no information from DCCA about the actual number of dentists that are actively practicing in the time frame in Hawaii. Whereas, the Medicaid/QUEST data will have the same provider listed on multiple islands if they saw patients on more than one island and thus be included twice in the

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<sup>18</sup> State of Hawaii, Department of Commerce and Consumer Affairs, Professional and Vocational Licensing Division. Geographic Report (Current Licenses). Available at: <http://hawaii.gov/dcca/pvl/boards/dentist/>.

<sup>19</sup> Bureau of Labor Statistics, US Department of Labor, Occupational Outlook Handbook, 2014-15 Edition, Dentists. Available at: <http://www.bls.gov/ooh/healthcare/dentists.html>. (visited October 31, 2014).

<sup>20</sup> US Census Bureau. 2010 Census Data. Available at: <http://www.census.gov>. (visited October 31, 2014).

<sup>21</sup> State of Hawaii, Department of Human Services. Medicaid/QUEST claims data request. Family Health Services Division, March 2014.

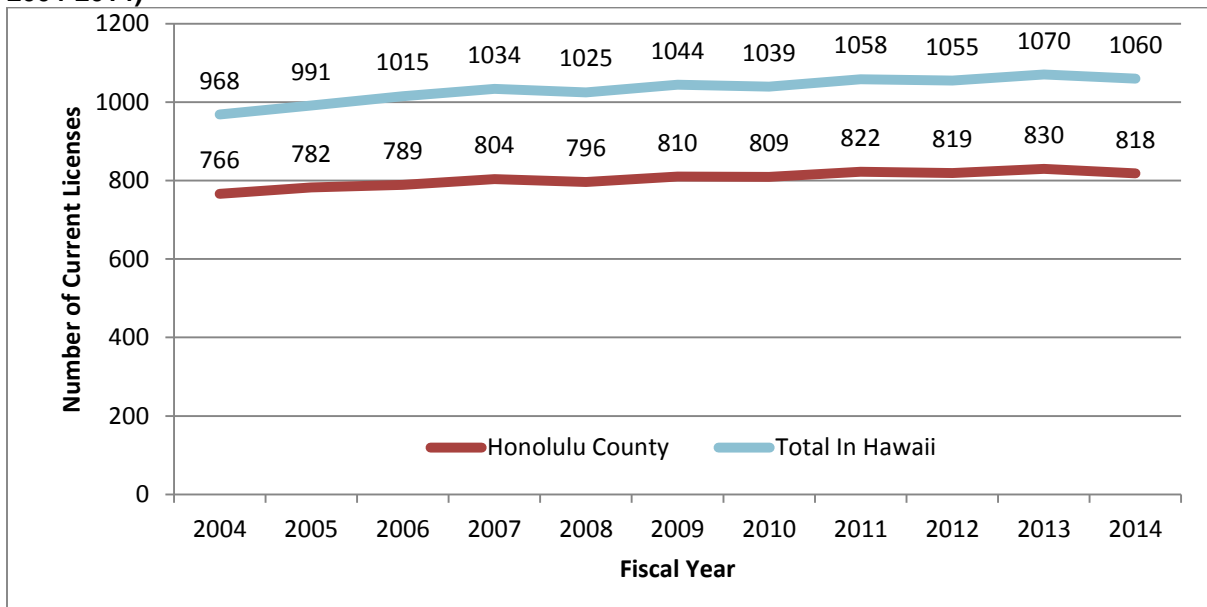
numerator depending on the county. Both of these factors can lead to under- or over-estimates of the actual proportion of providers accepting Medicaid/QUEST but does give an approximation. There is not a comparable national or other unit data, but it is interesting that there are such differences in the proportion of providers accepting Medicaid/QUEST by geographic county.

Costs to transport clients from neighbor island counties to Honolulu for services is one measure to start to quantify the impact of low access. This information was obtained from Community Case Management (CCM).<sup>22</sup> There could be many reasons why transport was required and the costs listed reflect transport for one minor child and one attendant or just the client if 18 years and older. The most common referrals are made for the purpose of treatment by a “specialist” (i.e., pedodontist, endodontist, oral surgeon, etc...). The specific procedures vary from simple fillings, to complicated extractions, pulpotomies, root canals, supernumeraries, treatment under general anesthesia, frenectomies, etc... Under EPSDT any necessary procedure is covered with the exception of “orthodontia” which is not covered for cosmetic reasons. Orthodontia is covered for trauma, cleft lip/palate treatment plans and by prior authorization. Adult benefits are restricted to “emergency” and “palliative care” so travel for adults are typically not covered as they can usually receive treatment in a dentist’s office or the ER on their island of residence. We don’t typically fly adults. Exceptions include considerations for medical complications that can’t be handled in an office, or even in the community hospital.

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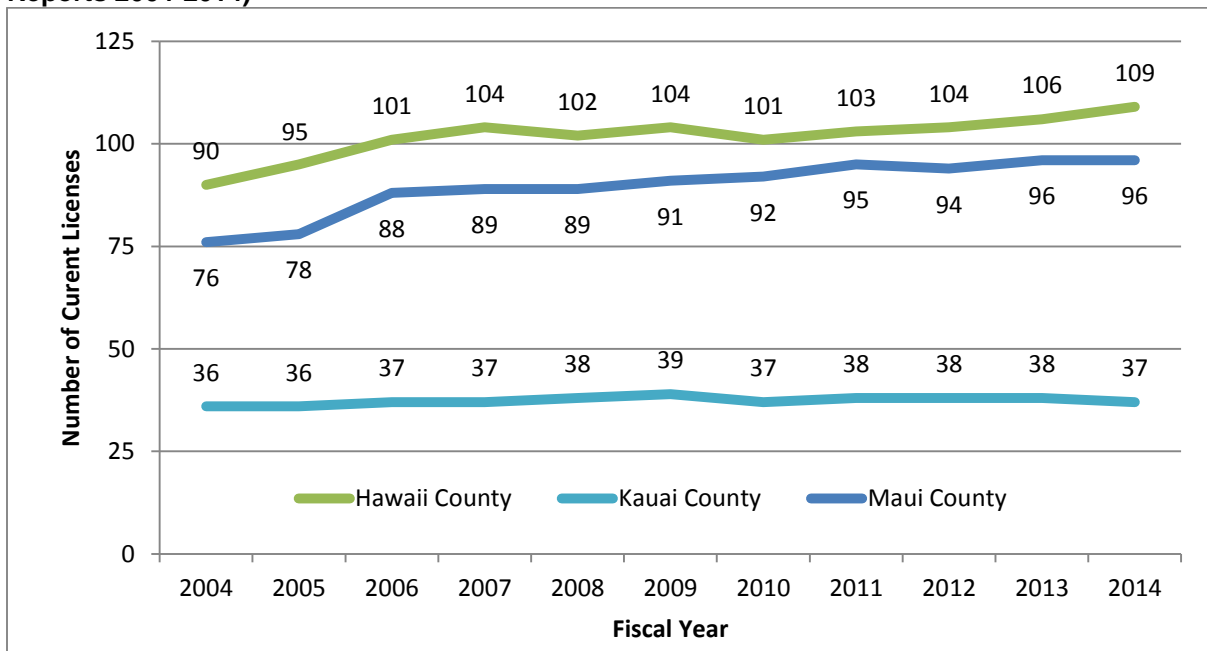
<sup>22</sup> Community Case Management. Air Transport Costs for Children and Adults due to Dental Services, Hawaii 2006-2013. Family Health Services Division, Hawaii Department of Health Data Request.

**Number of Current Dental Licenses State and Honolulu County by Year, Hawaii (DCCA Reports 2004-2014)**



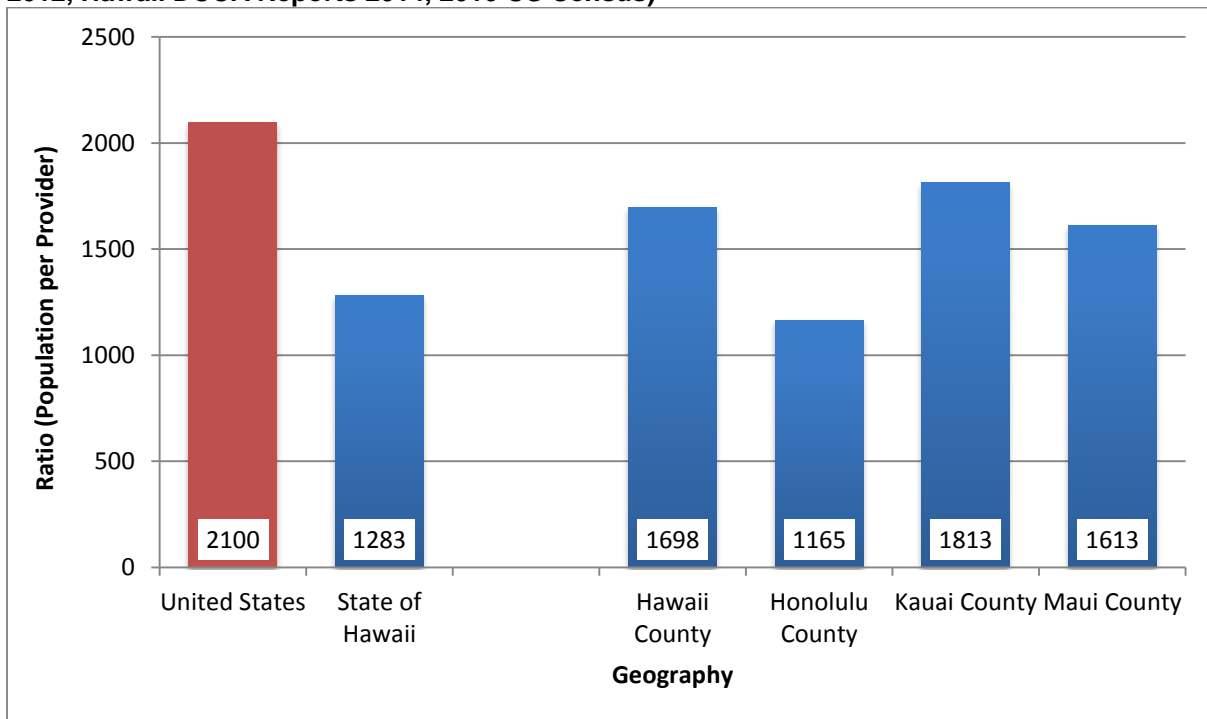
Overall, there has been about a 10% increase in the total number of dentists with current licenses that list an address within the State of Hawaii. The growth was 7% in Honolulu County where the vast majority of the population lives.

**Number of Current Dental Licenses Hawaii, Maui, and Kauai Counties by Year, Hawaii (DCCA Reports 2004-2014)**



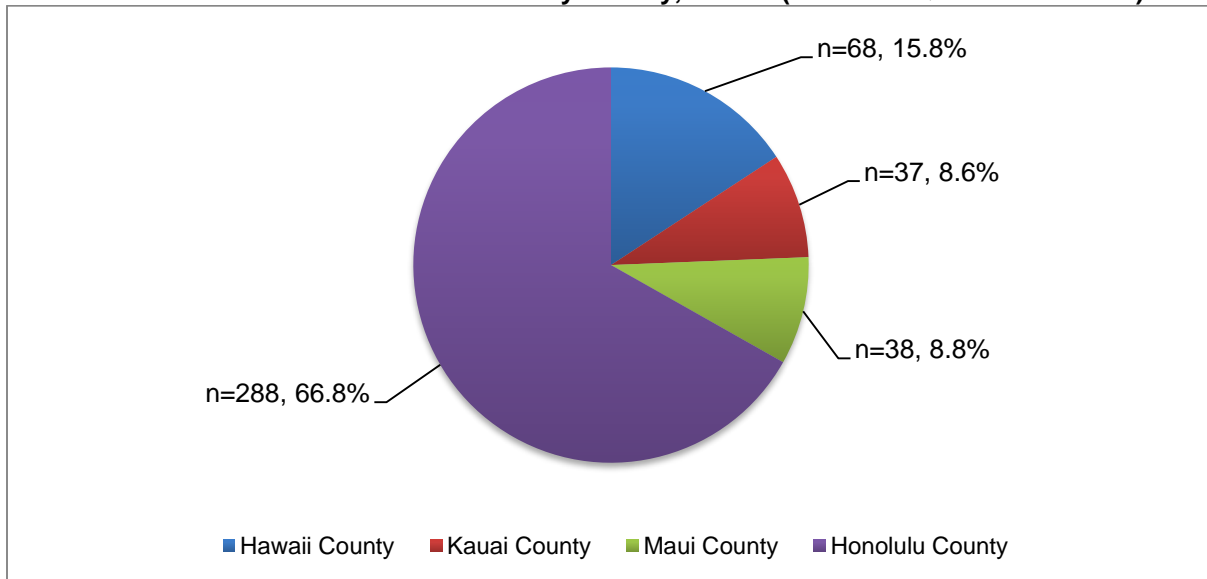
Overall, there has been 26% increase in dentists in Maui County since 2004 and a 21% increase in Hawaii County. This represents an additional 20 and 19 providers in 2014 in Maui and Hawaii Counties, respectively.

**Population Ratio per Current Dental Licenses State and Counties, Hawaii (Bureau Labor Statistics 2012, Hawaii DCCA Reports 2014, 2010 US Census)**



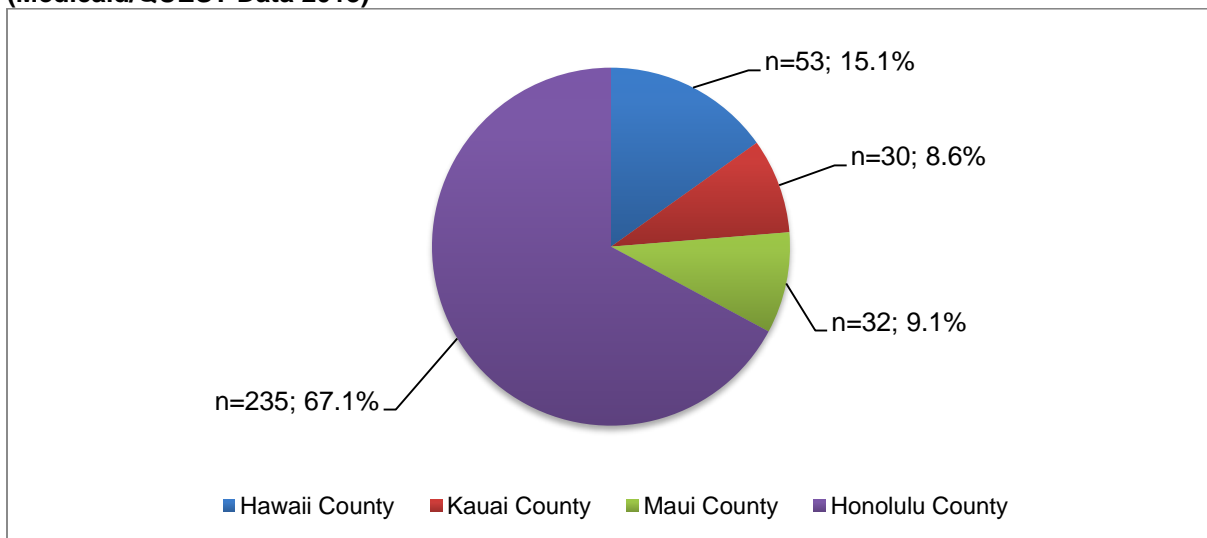
*Overall, it is estimated that there were 147,000 dentists in practice in 2012 in the United States, which corresponds to a ratio of 2,100 persons for every dentist. Overall for the State of Hawaii the estimated ratio is 1283:1 with some variation by county. Honolulu County where the vast majority of the population lives has a ratio of 1165:1, which was significantly lower than seen in other Counties in the state. The highest ratio was found in Kauai County (1813:1), followed by Hawaii County (1698:1), and Maui County (1613:1).*

**Distribution of Medicaid Enrolled Dentists by County, Hawaii (Medicaid/QUEST Data 2013)**



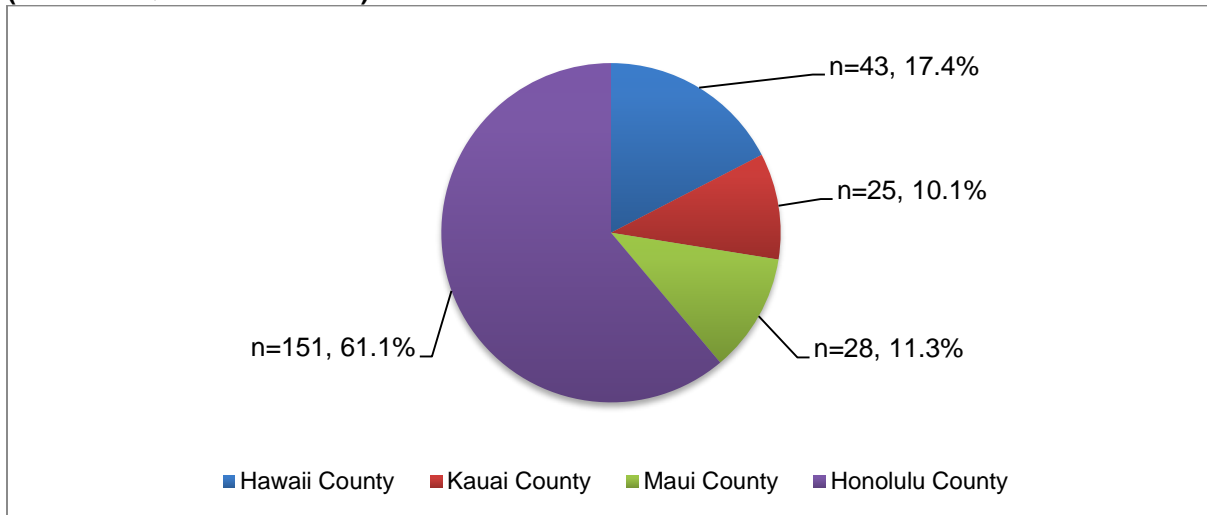
Overall, there are 431 dentists that participated in Medicaid in 2013 with 67% of them located in Honolulu County where about 70% of the state population lived. About 16% of them are located in Hawaii County where 14% of the state population lived, and just under 9% of them each are located in Maui (11% of the population) and Kauai (5% of the population).

**Distribution of Medicaid Dentists With at Least One Paid Claim by County, Hawaii (Medicaid/QUEST Data 2013)**



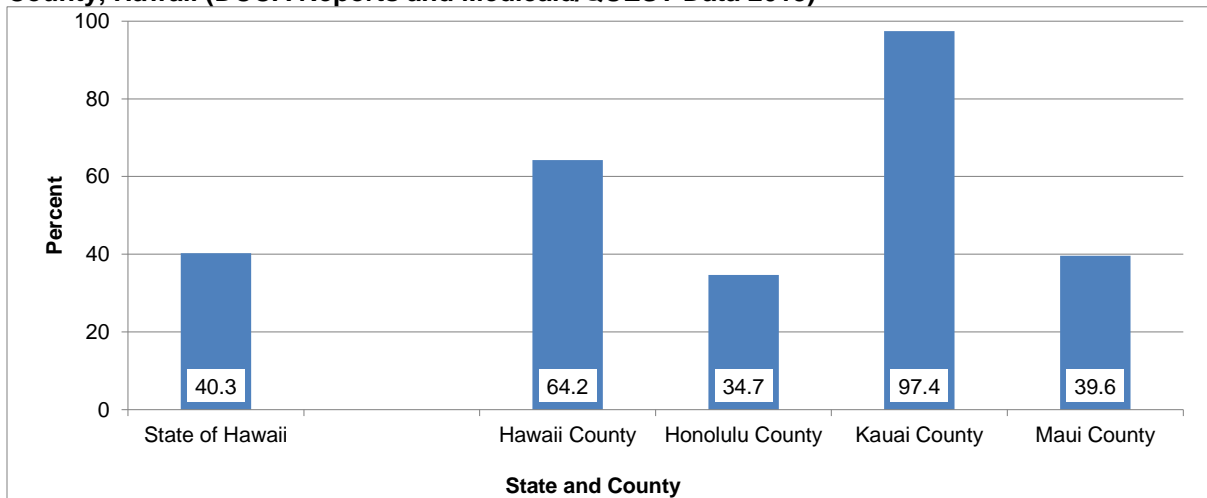
Overall, there are 350 dentists with at least one paid claim from Medicaid/QUEST in 2013 with 67% of them located in Honolulu County where about 70% of the state population lived. About 15% of them are located in Hawaii County where 14% of the state population lived, and about 9% of them each are located in Maui (11% of the population) and Kauai (5% of the population).

**Distribution of Medicaid Dentists With at Least Fifty Paid Claims by County, Hawaii (Medicaid/QUEST Data 2013)**



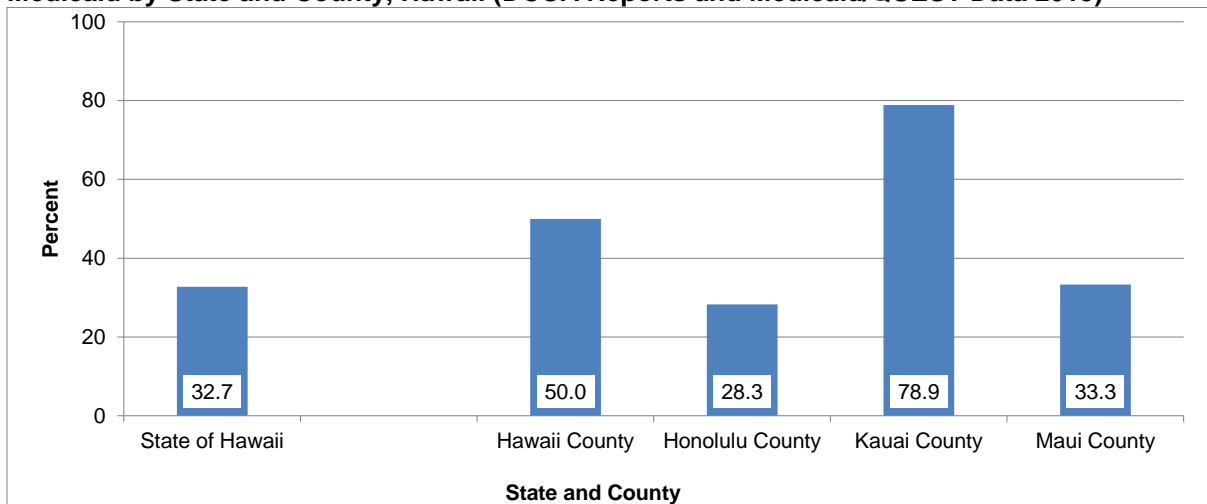
Overall, there are 247 dentists with at least fifty paid claims from Medicaid/QUEST in 2013 with 61% of them located in Honolulu County where about 70% of the state population lived. About 17% of them are located in Hawaii County where 14% of the state population lived, and about 11% of them each are located in Maui (11% of the population) and 10% in Kauai (5% of the population).

**Estimated Proportion of All Dentists With Current License Participating in Medicaid by State and County, Hawaii (DCCA Reports and Medicaid/QUEST Data 2013)**



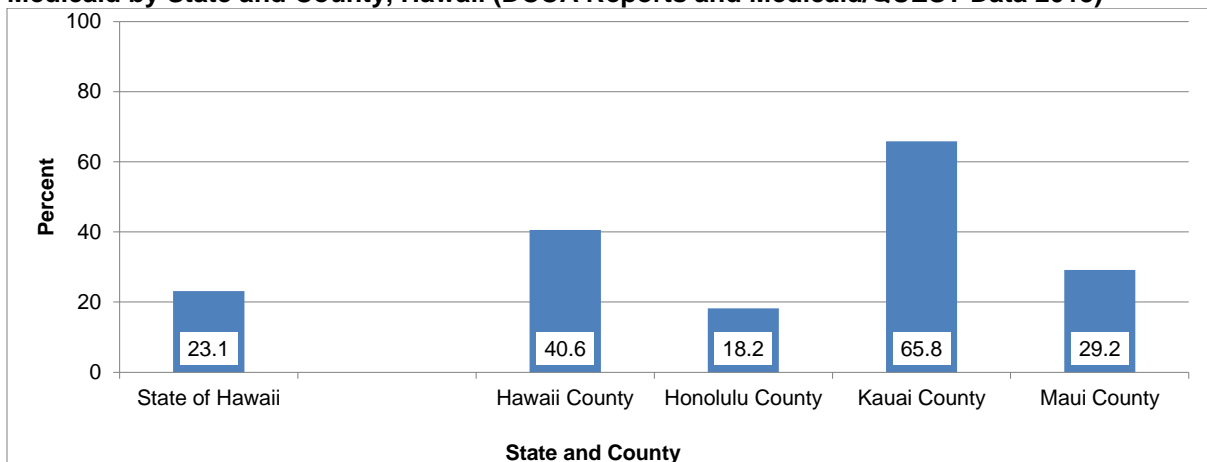
Overall an estimated 40% of dentists with current licensures in 2013 participated in Medicaid/QUEST based on dividing the number of Medicaid/QUEST dentists by the number with current licenses based on DCCA data. There was substantial variation by county with nearly all dentists in Kauai County counted as a Medicaid provider, nearly 2/3 of those in Hawaii County, 40% of those in Maui County, and 35% of those in Honolulu County.

**Estimated Proportion of All Dentists With Current License With at Least One Paid Claim by Medicaid by State and County, Hawaii (DCCA Reports and Medicaid/QUEST Data 2013)**



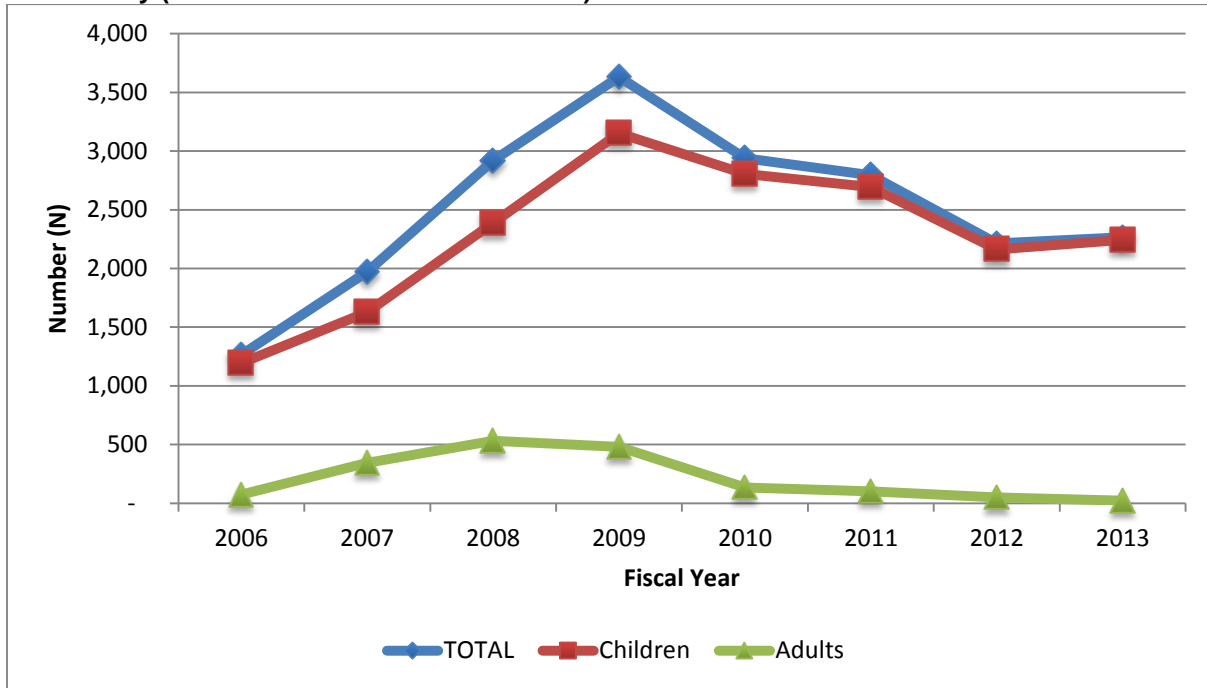
Overall an estimated 33% of dentists with current licensures in 2013 had at least one paid Medicaid/QUEST claim based on dividing the number of Medicaid/QUEST dentists with at least one paid claim by the number with current licenses based on DCCA data. There was substantial variation by county with nearly 80% of dentists in Kauai County with at least one paid claim to Medicaid/QUEST, 50% of those in Hawaii County, 33% of those in Maui County, and 28% of those in Honolulu County.

**Estimated Proportion of All Dentists with Current License With at Least Fifty Paid Claims by Medicaid by State and County, Hawaii (DCCA Reports and Medicaid/QUEST Data 2013)**



Overall an estimated 23% of dentists with current licensures in 2013 with at least fifty paid Medicaid/QUEST claims based on dividing the number of Medicaid/QUEST dentists that submitted at least fifty claims by the number with current licenses based on DCCA data. There was substantial variation by county with 65% of dentists in Kauai County with at least fifty claims to Medicaid/QUEST, 41% in Hawaii County, 29% in Maui County, and 18% of those in Honolulu County.

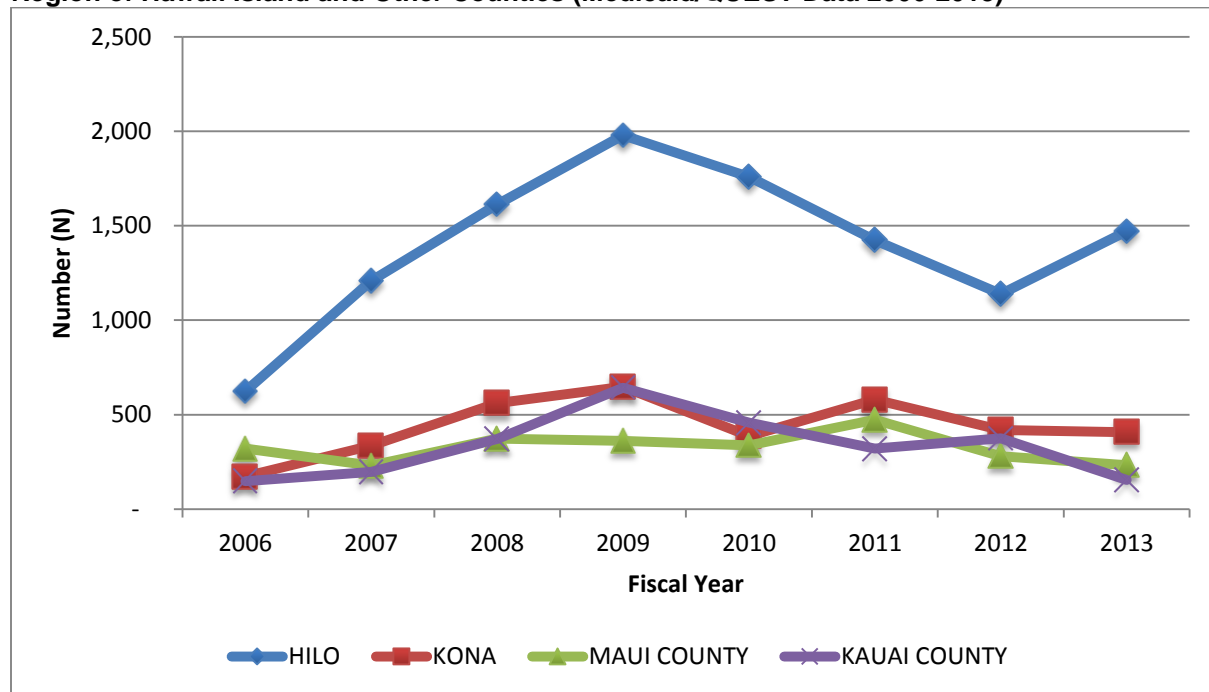
**Estimated Number of Children and Adults Transported off Island by Air for Dental Services, State and County (Medicaid/QUEST Data 2006-2013)**



Over the past eight years there has been significant changes in the number of Medicaid/QUEST clients that were transported by air to receive dental services. In FY 2009, 3,633 clients were transported off their home island with the vast majority being children under the age of 21 (3,153). Over the past five years, this number has steadily declined with 2,266 clients (2,244 children and 22 adults) being transported in FY 2013. Without accounting for changes in the value of the dollar over the time period, these transports accounted for a peak cost of \$1.2 million in FY 2009, a low of \$401 thousand in FY 2006, and amounted to \$848 thousand in FY 2013.



**Estimated Number of Children and Adults Transported off Island by Air for Dental Services, Region of Hawaii Island and Other Counties (Medicaid/QUEST Data 2006-2013)**



Over the past eight years there has been significant changes in the number of Medicaid/QUEST clients that were transported by air to receive dental services. The vast majority of the clients transported lives in East Hawaii and has made up more than all the other areas combined since 2007. For example in FY 2009, 1,980 of the statewide total of 3,633 clients transported were from East Hawaii (55%). In FY 2013, 1,471 of the statewide total of 2,266 were from East Hawaii (65%). In FY 2013, 1,878 were from Hawaii County (Hilo and Kona combined), which made up 83% of those requiring air transports for dental services. Over the past five years, there has been an overall reduction across all counties and areas compared to FY 2009. Although making up a smaller number of clients transported, Maui and Kauai Counties have generally seen declines since the peak in FY 2009, but still accounted for 233 clients (Maui County) and 155 clients (Kauai County) in FY 2013.

## Gaps in the Data

There are several areas in Hawaii's oral health surveillance that currently lack adequate data for tracking trends and informing dental health programs. Among adults, the BRFSS does not currently have any recent data on dental insurance or information on any barriers to accessing care for oral health. Hawaii has not previously fully reported to the NOHSS, which is a gap for oral health reporting. However, Hawaii is currently working with the Association of State and Territorial Dental Directors and other organizations to improve oral health reporting from the state. There is work to develop data collection on a representative population of third grade students in the state to meet some of the requirements of NOHSS. This data will help in establishing oral health baseline data for third grade children using a brief clinical assessment of children by trained health professionals. Other efforts have included identifying current programs in the state providing dental sealants and other activities to children. Among youth, there is currently limited data available for oral health indicators. In 2013, the YRBS included indicators on oral health for both public middle school and high school students in the state. This has helped to increase oral health surveillance among adolescents in the State of Hawaii to look at utilization of dental services and burden of disease as reflected by a question on toothaches. This YRBS data is only representative of middle and high school students attending public schools in the state and received consent from the parents to participate in the survey. These questions will provide surveillance data on oral health in children as well as help inform planning efforts. There have been some efforts by various organizations including community health centers to outreach to populations in the state including children. It will be important to ensure that these efforts are done in a systematic and coordinated manner so that surveillance of activities are documented. Additional analyses could include surveillance of claims data at both the inpatient and outpatient level, which could provide information on dental utilization across all populations. Although this report presents data across the life span, only cross sectional data is available, so there is no actual record level linkage between early childhood oral health and its' potential impact on oral health later in the life. If appropriate longitudinal data systems could be established, this could represent an active area of research and accountability to look at the costs and other impacts of early childhood dental health on adult disease including oral health.

## Recommended Strategies to Improve Oral Health

Given the extent of the problems, the disparities observed and the large number of people affected, oral diseases in Hawaii are a major public health problem. Their impact on individuals and communities include pain, suffering, impairment in function, and reduced quality of life. Several key strategies have been identified that, if implemented, could improve the oral health of Hawaii's residents.

- Support the State of Hawaii Department of Health's ability to fulfill its public health responsibility for achieving optimal oral health for all Hawaii residents.
- Develop and implement an oral health surveillance plan to improve data collection, analysis, and use of data for program planning, evaluation and policies.
- Develop effective, evidence-based community- and school-based dental disease prevention programs for all age groups, particularly those who are experiencing oral health disparities. These should include age appropriate fluoride and dental sealant programs.
- Continue to support and expand affordable dental care to the low-income population in Hawaii.
- Expand Medicaid dental services for adults beyond the current coverage for emergencies only to include preventive and treatment services.
- Develop strategies to reduce barriers to finding and receiving dental care for children enrolled in the Medicaid program. Encourage education of providers to improve outreach and service to children.
- Use or adapt existing educational programs for pregnant women, and for health and dental professionals regarding the safety and importance of dental care and preventive counseling during pregnancy and in the neonatal period.

## Appendix 1: Detailed Data Tables

Children with Fair/Poor Condition Teeth, One or More Oral Health Problems, and No Preventive Dental Care, by Year and Subgroups, 2007, 2011-2012, National Survey of Children's Health (NSCH)

	Children with Fair/Poor Condition Teeth		One or More Oral Health Problems in the Past Six Months		No Preventive Dental Care Visit in Past Year	
	%	95% CI	%	95% CI	%	95% CI
<b>Year</b>						
2007	4.3	(3.0-5.6)			13.1	(11.0-15.3)
2011-2012	6.4	(4.8-8.0)	19.6	(17.0-22.2)	16.9	(14.5-19.3)
US (2011-2012)	7.6	(7.2-8.1)	18.7	(18.1-19.4)	22.8	(22.2-23.5)
<b>Subgroups (2011-2012)</b>						
<b>Age Group (Years)*</b>						
1-5	5.7	(2.9-8.6)	13.0	(8.9-17.0)	30.5	(24.9-36.0)
6-11	6.4	(3.9-8.8)	25.8	(21.1-30.5)	7.9	(5.2-10.6)
12-17	7.0	(3.9-10.0)	18.8	(14.4-23.3)	14.9	(10.8-18.9)
<b>Sex</b>						
Male	6.9	(4.5-9.2)	18.0	(14.5-21.5)	19.1	(15.6-22.7)
Female	5.9	(3.7-8.2)	21.2	(17.4-25.1)	14.7	(11.4-18.0)
<b>Federal Poverty Level</b>						
0-99%	12.7	(7.4-18.0)	29.3	(21.9-36.7)	30.1	(22.6-37.5)
100-199%	11.0	(6.6-15.5)	26.6	(20.2-32.9)	20.4	(14.9-25.8)
200-399%	3.2	(1.4-5.1)	14.2	(10.5-17.8)	13.1	(9.7-16.6)
400+%	NR	NR	12.8	(9.0-16.6)	8.4	(5.0-11.8)
<b>Type of Health Insurance</b>						
Public	11.4	(7.4-15.5)	24.5	(19.1-29.8)	24.3	(18.9-29.7)
Private	3.3	(2.0-4.6)	16.4	(13.6-19.3)	13.1	(10.5-15.6)
Uninsured	NR	NR	NR	NR	NR	NR

\*NR: Not reportable due to small cell size

Percentage of Children With No Preventive Dental Care Visits in Past Year (NS-CSHCN 2009-2010)

	%	95% CI
US	14.1	(13.5-14.8)
Hawaii	11.7	(8.2-15.1)
<b>Sex</b>		
Male	13.4	(8.4-18.4)
Female	9.2	(4.9-13.4)
<b>Type of Health Insurance</b>		
Public	21.2	(12.4-30.0)
Private	7.8	(4.2-11.5)
Uninsured	NR	

Percentage of Children With Unmet Need for Preventive Dental Care in Past Year (NS-CSHCN 2009-2010)

	Unmet Need		Did Not Need Care	
	%	95% CI	%	95% CI
US	8.9	(8.4-9.5)	10.4	(9.8-10.9)
Hawaii	6.7	(4.2-9.1)	8.8	(5.6-11.9)

Students With No Dental Visit and Toothache in the Past 12 Months, by Sex and Race, Hawaii (YRBS 2013)

	No Dental Visit				Toothache			
	Middle School		High School		Middle School		High School	
	%	95% CI	%	95% CI	%	95% CI	%	95%CI
<b>Total</b>	22.2	(18.9-25.5)	23.0	(20.8-25.1)	29.8	(28.0-31.7)	34.7	(32.0-37.5)
<b>Sex</b>								
Female	20.4	(16.3-24.5)	20.9	(18.4-23.3)	33.8	(31.1-36.5)	38.0	(33.8-42.1)
Male	23.7	(19.6-27.7)	25.0	(22.2-27.9)	25.9	(23.4-28.4)	31.3	(28.1-34.5)
<b>Race</b>								
White	16.3	(12.3-20.2)	20.0	(16.0- 24.1)	33.4	(28.0-38.9)	32.4	(27.1-37.8)
Native Hawaiian	25.5	(21.6-29.4)	24.6	(21.1-28.2)	29.5	(26.2-32.8)	37.8	(32.9-42.7)
Filipino	24.1	(19.8-28.5)	23.9	(20.5-27.3)	26.9	(22.2-31.5)	35.8	(30.0-41.9)
Japanese	7.2	(0.0-15.8)	14.3	(4.0-24.6)	27.5	(19.1-35.9)	25.8	(13.7-37.9)
Other Asian	26.3	(20.8-31.9)	23.8	(16.9-30.7)	27.5	(21.0-41.4)	26.5	(20.2-32.9)
Other Pacific Islander	40.1	(22.3-57.9)	33.8	(27.0-40.6)	32.2	(24.9-39.5)	42.1	(35.3-48.8)
Other	19.0	(16.7-21.4)	24.9	(21.4-29.4)	33.1	(30.2-36.0)	34.1	(30.7-37.5)

Women With No Dental Visit During Pregnancy, by Year, Hawaii (PRAMS 2004-2011)

<b>Year</b>	<b>%</b>	<b>95% CI</b>
2004	64.3	(62.2-66.4)
2005	66.2	(63.9-68.4)
2006	60.9	(58.5-63.2)
2007	57.7	(55.3-60.0)
2008	57.0	(54.7-59.3)
2009	60.0	(56.8-63.0)
2010	61.3	(58.1-64.3)
2011	55.7	(52.5-58.9)

Women With No Dental Visit During Pregnancy, No Teeth Cleaning Before, During, and After Pregnancy, and Composite Variable for Teeth Cleaning by Year and Population Subgroups in Hawaii (PRAMS 2009-2011)

Year	No Cleaning Before Pregnancy % (95% CI)	No Cleaning During Pregnancy % (95% CI)	No Cleaning After Pregnancy % (95% CI)	No Teeth Cleaning Composite % (95% CI)	No Dental Visit During Pregnancy % (95% CI)
2009	47.7 (44.6-50.8)	66.5 (63.4-69.4)	72.1 (69.2-74.9)	37.6 (34.7-40.7)	60.0 (56.8-63.0)
2010	49.5 (46.3-52.7)	66.2 (63.1-69.2)	73.9 (71.0-76.7)	40.8 (37.7-44.0)	61.3 (58.1-64.3)
2011	47.2 (44.0-50.4)	63.1 (59.9-66.1)	72.1 (69.1-74.8)	39.1 (36.0-42.2)	55.7 (52.5-58.9)
<b>Subgroups (2009-2011)</b>					
State of Hawaii	48.1 (46.3-50.0)	65.2 (63.5-67.0)	72.7 (71.0-74.3)	39.2 (37.4-41.0)	59.0 (57.1-60.8)
<b>County</b>					
Hawaii	56.0 (53.1-58.9)	73.3 (70.7-75.8)	78.0 (75.5-80.4)	46.7 (43.8-49.7)	65.1 (62.2-67.8)
Honolulu	46.4 (43.9-48.8)	64.1 (61.7-66.5)	71.6 (69.3-73.8)	37.5 (35.1-40.0)	58.3 (55.8-60.7)
Kauai	47.3 (43.8-50.8)	62.3 (58.9-65.8)	75.2 (72.0-78.1)	37.8 (34.5-41.2)	55.1 (51.6-58.6)
Maui	50.6 (47.9-53.3)	64.4 (61.8-66.9)	72.7 (70.2-75.1)	41.4 (38.8-44.1)	57.8 (55.1-60.5)
<b>Age</b>					
<20	48.0 (41.4-54.6)	70.6 (64.0-76.5)	69.6 (62.9-75.5)	33.9 (28.0-40.3)	59.9 (53.1-66.4)
20-24	60.4 (56.5-64.1)	76.6 (73.2-79.8)	78.4 (74.9-81.4)	50.6 (46.8-54.5)	68.8 (65.1-72.3)
24-29	50.6 (47.1-54.1)	67.4 (64.0-70.7)	75.5 (72.3-78.4)	42.4 (39.0-45.9)	60.4 (56.9-63.8)
30-34	40.0 (36.4-43.6)	55.8 (52.1-59.5)	67.4 (63.8-70.8)	32.0 (28.6-35.5)	51.8 (48.4-57.2)
35+	39.0 (34.9-43.4)	57.3 (52.9-61.5)	69.1 (65.1-73.3)	31.8 (26.9-34.9)	52.8 (48.4-57.2)
<b>Race</b>					
Caucasian	35.9 (32.4-39.6)	55.3 (51.5-59.1)	64.2 (60.4-67.9)	27.1 (23.9-30.6)	48.5 (44.7-52.3)
Hawaiian/Part-Hawaiian	56.1 (52.9-59.4)	71.3 (68.2-74.2)	77.7 (74.8-80.3)	46.5 (43.3-49.8)	63.1 (59.9-66.2)
Filipino	46.9 (42.6-51.2)	67.3 (63.2-71.2)	71.8 (67.7-75.6)	38.0 (33.9-42.2)	61.1 (56.8-65.3)
Japanese	36.0 (30.4-42.0)	50.7 (44.6-56.8)	65.5 (59.5-71.1)	27.9 (22.8-33.7)	46.9 (40.9-53.1)
Other Asian	45.6 (38.6-52.7)	56.9 (49.1-63.8)	74.0 (67.1-79.9)	37.6 (30.9-44.8)	54.3 (47.0-61.3)
Other Pacific Islander	75.0 (67.9-81.0)	88.6 (86.1-92.5)	85.6 (79.5-90.2)	65.6 (58.3-72.3)	83.0 (76.7-87.9)
Other/Unknown	47.2 (39.3-55.4)	71.9 (63.9-78.8)	77.1 (69.5-83.3)	39.5 (31.9-47.7)	68.0 (60.0-75.1)
<b>Education</b>					
< High School	61.8 (54.8-68.4)	79.0 (72.6-84.2)	80.3 (74.4-85.1)	53.3 (46.4-60.1)	67.4 (60.5-73.7)
High School Grad	58.7 (55.8-61.5)	73.7 (71.1-76.3)	78.1 (75.5-80.4)	49.2 (46.3-52.2)	65.5 (62.6-68.2)
Some College	47.2 (43.4-51.0)	68.0 (64.4-71.4)	73.5 (69.9-76.7)	38.6 (35.0-42.4)	61.8 (58.1-65.4)
College+	30.3 (27.3-33.6)	47.2 (43.8-50.7)	62.6 (59.2-65.9)	21.9 (19.2-24.9)	44.6 (41.2-48.1)
<b>Federal Poverty Level</b>					
0-100%	67.1 (63.7-70.3)	79.2 (76.2-82.0)	83.0 (80.1-85.5)	57.4 (54.1-61.0)	71.1 (67.8-74.2)
100-200%	54.4 (50.6-58.1)	72.9 (69.4-76.2)	76.6 (73.1-79.8)	45.1 (41.1-48.9)	66.7 (63.0-70.2)
201+%	31.3 (28.7-34.0)	50.4 (47.5-53.2)	63.5 (60.7-66.2)	23.8 (21.4-26.3)	44.9 (42.1-47.8)
<b>Insurance Status</b>					
Quest/Medicaid	68.7 (65.2-72.0)	81.6 (78.6-84.3)	83.2 (80.2-85.8)	59.6 (55.9-63.2)	73.4 (70.0-76.5)
Tricare	33.9 (29.0-39.2)	57.4 (52.0-62.7)	63.1 (57.7-68.1)	25.1 (20.7-30.0)	50.4 (45.0-55.8)
Private	38.0 (35.8-40.3)	57.2 (54.8-59.5)	67.9 (65.6-70.1)	29.7 (27.6-31.8)	51.3 (49.0-53.7)
Uninsured	75.2 (69.5-80.2)	86.4 (81.3-90.2)	90.7 (86.2-93.8)	65.5 (59.2-71.4)	79.3 (73.6-84.1)

Adults With No Dental Visit and Teeth Extraction by Selected Characteristics, Hawaii (BRFSS 2012)

	Visited Dentist Past Year		Adults with at least one tooth extracted		Adults with at least six teeth extracted	
	No	95% CI	Yes	95% CI	Yes	95% CI
<b>United States</b>	34.5	(34.3 - 34.8)	45.6	(45.3 - 45.9)	15.7	(15.5 - 15.9)
<b>Hawaii</b>	29.6	(28.1 - 31.2)	41.4	(39.7 - 43.1)	10.2	(9.2 - 11.4)
<b>COUNTY</b>						
Hawaii	33.7	(30.2 - 37.4)	45.1	(41.4 - 48.9)	10.8	(8.7 - 13.2)
Honolulu	28.5	(26.6 - 30.6)	39.5	(37.3 - 41.7)	10.0	(8.7 - 11.5)
Kauai	34.3	(28.9 - 40.1)	47.5	(41.6 - 53.4)	11.2	(8.2 - 15.0)
Maui	29.5	(25.7 - 33.5)	45.9	(41.6 - 50.2)	10.5	(8.4 - 13.1)
<b>AGE</b>						
18-24	32.5	(27.6 - 37.9)	16.7	(13.0 - 21.2)	0.6	(0.3 - 1.4)
25-34	36.8	(32.7 - 41.1)	28.0	(24.1 - 32.2)	2.2	(1.3 - 4.0)
35-54	31.2	(28.4 - 34.2)	37.5	(34.5 - 40.6)	6.9	(5.2 - 9.1)
55+	24.0	(21.9 - 26.3)	59.7	(57.2 - 62.1)	20.4	(18.3 - 22.6)
<b>RACE</b>						
Caucasian	26.5	(24.2 - 29.0)	36.8	(34.3 - 39.4)	7.6	(6.4 - 8.9)
Native Hawaiian	42.0	(37.1 - 47.0)	50.7	(45.7 - 55.7)	15.8	(12.4 - 20.0)
Chinese	18.9	(14.4 - 24.5)	42.7	(36.0 - 49.6)	10.0	(5.8 - 16.7)
Filipino	36.1	(31.4 - 41.0)	46.8	(41.8 - 51.8)	11.9	(8.9 - 15.7)
Japanese	21.3	(18.6 - 24.3)	42.1	(38.6 - 45.7)	11.2	(9.1 - 13.7)
Other Asian	32.1	(22.8 - 43.0)	25.9	(17.9 - 36.0)	6.3	(2.9 - 13.1)
Other Pacific Islander	49.6	(37.9 - 61.3)	45.5	(34.3 - 57.1)	6.4	(2.3 - 16.4)
Other	39.0	(31.2 - 47.5)	31.9	(25.1 - 39.4)	7.4	(4.3 - 12.5)
<b>GENDER</b>						
Male	31.6	(29.3 - 33.9)	42.2	(39.7 - 44.7)	9.8	(8.4 - 11.5)
Female	27.7	(25.6 - 30.0)	40.6	(38.3 - 42.9)	10.6	(9.2 - 12.2)
<b>EDUCATION</b>						
<HS/GED	47.1	(39.7 - 54.6)	56.3	(48.6 - 63.8)	25.4	(19.3 - 32.7)
HS or GED	36.2	(33.3 - 39.2)	46.0	(42.8 - 49.2)	11.8	(10.1 - 13.7)
Some College	28.1	(25.4 - 30.9)	40.8	(37.8 - 43.9)	9.3	(7.7 - 11.2)
College Grad	17.8	(16.0 - 19.8)	31.7	(29.4 - 34.0)	4.3	(3.5 - 5.3)
<b>INCOME</b>						
<\$15,000	48.1	(41.7 - 54.5)	50.8	(44.3 - 57.3)	21.8	(16.7 - 27.9)
\$15,000-\$24,999	46.0	(41.3 - 50.8)	53.6	(48.8 - 58.4)	16.1	(12.7 - 20.2)
\$25,000-\$49,999	30.8	(27.8 - 33.9)	43.4	(40.0 - 46.9)	11.0	(9.1 - 13.3)
\$50,000-\$74,999	25.3	(21.5 - 29.4)	40.9	(36.6 - 45.2)	9.1	(6.9 - 11.9)
>=\$75,000	18.4	(16.0 - 20.9)	32.2	(29.4 - 35.0)	4.2	(3.1 - 5.6)
<b>INSURANCE</b>						
Insured	26.8	(25.2 - 28.4)	41.3	(39.5 - 43.1)	10.5	(9.4 - 11.6)
Uninsured	54.1	(48.1 - 60.0)	42.2	(36.3 - 48.4)	8.3	(5.0 - 13.4)

Incidence and Mortality of Pharyngeal and Oral Cavity Cancer, 2005-2009, US and Hawaii (NOHSS)

	Hawaii		US	
	Rate/100,000	95% CI	Rate/100,000	95% CI
<b>Incidence</b>				
Males	18.0	(16.6-19.6)	16.4	(16.3-16.5)
Females	7.4	(6.6-8.4)	6.2	(6.1-6.2)
<b>Mortality</b>				
Males	4.5	(3.8-5.3)	3.8	(3.7-3.8)

Females 1.5 (1.2-1.9) 1.4 (1.4-1.4)

Emergency Room Data First-Listed, Any-Listed diagnosis (ICD-9 CM Codes 521-522), and Relative Change, Hawaii 2006, 2012

	Principal Dx			Any-Listed Dx		
	2006 Principal Dx	2012 Principal Dx	Relative Change	2006 Any-Listed Dx	2012 Any-Listed Dx	Relative Change
<b>Total</b>	<b>1,390</b>	<b>1,935</b>	<b>39.2%</b>	<b>1,808</b>	<b>3,021</b>	<b>67.1%</b>
<b>Sex</b>						
Female	635	890	40.2%	825	1,410	70.9%
Male	755	1,045	38.4%	983	1,611	63.9%
<b>Age Group</b>						
0-5	48	70	45.8%	64	137	114.1%
6-11	38	49	28.9%	50	80	60.0%
12-17	57	61	7.0%	75	102	36.0%
18-44	888	1,260	41.9%	1,131	1,905	68.4%
45-64	325	421	29.5%	440	662	50.5%
65-84	33	71	115.2%	43	125	190.7%
85+	<5	<5		5	10	100.0%
<b>Payer</b>						
Medicaid/QUEST	620	1,091	76.0%	827	1,691	104.5%
Medicare	68	142	108.8%	104	262	151.9%
Other	23	32	39.1%	39	64	64.1%
Private Insurance	416	424	1.9%	503	650	29.2%
Uninsured	263	246	-6.5%	335	354	5.7%
<b>County of Residence</b>						
Honolulu	674	843	25.1%	909	1,431	57.4%
Hawaii	365	641	75.6%	443	869	96.2%
Kauai	173	213	23.1%	209	279	33.5%
Maui	97	158	62.9%	149	310	108.1%
Outside HI	76	78	2.6%	91	128	40.7%
Total Charges	<b>\$845,848</b>	<b>\$2,046,484</b>	<b>141.9%</b>	<b>\$4,116,683</b>	<b>\$8,622,212</b>	<b>109.4%</b>
Mean Charge	\$608.52	\$1,057.61	73.8%	\$2,276.93	\$2,854.09	25.3%

Notes: Dx refers to diagnosis. <5 Denotes numbers not reportable. Data does not include Tripler Medical Center.



Inpatient Hospitalization Data First-Listed, Any-Listed Diagnosis (ICD-9 CM Codes 521-522), and Relative Change, Hawaii 2006, 2012

	Principal Dx			Any-Listed Dx		
	2006	2012	Relative Change	2006	2012	Relative Change
<b>Total</b>						
Visits	18	45	150.0%	170	219	28.8%
Charges	\$118,601	\$547,094	361.3%	\$5,275,485	\$8,469,273	60.5%
<b>Inpatient from ER</b>						
Visits	11	39	254.5%	85	176	107.1%
Charges	\$97,102	\$476,356	390.6%	\$3,101,340	\$6,066,267	95.6%
<b>Inpatient Not from ER</b>						
Visits	7	6	-14.3%	85	43	-49.4%
Total Charges	\$21,499	\$70,738	229.0%	\$2,174,145	\$2,403,006	10.5%

Notes: Dx refers to diagnosis. Data does not include Tripler Medical Center.

Number of Head Start Enrolled Preschool Children Receiving an Oral Health Exam, and the Percent Needing Dental Treatment, US and Hawaii, 2008, 2012

	Year	Hawaii		US	
		2008	2012	2008	2012
Completed Oral Health Examination (N)		2,915	2,720	849,729	840,453
Diagnosed as Needing Dental Treatment (n)		508	368	205,553	169,154
Proportion Needing Dental Treatment (%)		17.4	13.5	24.2	20.1

Percent of Children Aged 6-9, Receiving Any Dental Services and Protective Sealants in Past Year, Hawaii and US (EPSDT 2011-2013)

	Year	Hawaii			US		
		2011	2012	2013	2011	2012	2013
Total Number of Clients (N)		29,852	32,204	32,491	6,908,115	7,170,452	7,515,417
Receiving Any Dental Services (%)		63.9	65.0	68.3	59.1	59.5	59.6
Receiving Protective Sealants (%)		11.6	10.9	11.4	16.2	15.7	16.1

Percent of Children Receiving Preventive Dental Services, Dental Treatment, and Referred for Corrective Treatment by Overall and by Age Group in Hawaii (EPSDT 2013)

	Total Number of Clients (N)	Receiving Dental Services (%)	Receiving Protective Sealants (%)	Receiving Preventive Dental Services (%)	Receiving Dental Treatment Services (%)	Referred for Corrective Treatment (%)
<b>Age Group</b>						
<1	6,271	1.7	0.0	0.4	1.1	68.7
1-2	17,902	35.2	0.0	21.3	14.1	63.3
3-5	26,566	66.3	0.0	49.8	40.2	36.3
6-9	32,491	68.3	11.4	54.1	44.8	21.3
10-14	35,247	60.9	8.0	49.5	34.3	22.3
15-18	25,090	51.6	0.0	39.9	32.2	22.8
19-20	8,860	34.2	0.0	23.6	23.0	9.3

Percent of Children 1-18 Years of Age Receiving Any Dental Service, Preventive Dental Services, Treatment Services, and Referred for Corrective Treatment by Year in Hawaii and US (EPSDT 2011-2013)

Year	Hawaii			US		
	2011	2012	2013	2011	2012	2013
Total Number of Clients (N)	129,68	138,72	137,29	30,309,86	30,794,33	31,427,07
Receiving Any Dental Services (%)	6	5	6	2	1	8
Receiving Preventive Dental Services (%)	54.6	55.0	58.6	48.3	49.2	49.8
Receiving Dental Treatment Services (%)	42.7	42.0	45.2	42.8	43.7	44.7
Referred for Corrective Treatment (%)	33.2	33.3	34.9	23.4	23.2	23.5
	22.0	29.8	30.2	13.9	13.4	12.5

Percent of Population of Public Water Supply Systems Receiving Fluoridated Water, US and Hawaii, 2012

Year	Hawaii (%)	US (%)
2012	10.8	74.6

Trends in Current Dental Licensure Island, County, and State of Hawaii (DCCA Reports, 2004-2014)

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Relative Change (2004-2014)
Total	1288	1315	1424	1473	1457	1499	1473	1510	1482	1520	1473	14.4%
Hawaii County	90	95	101	104	102	104	101	103	104	106	109	21.1%
Honolulu County	766	782	789	804	796	810	809	822	819	830	818	6.8%
Kauai County	36	36	37	37	38	39	37	38	38	38	37	2.8%
Maui County	76	78	88	89	89	91	92	95	94	96	96	26.3%
Maui Island	73	75	84	85	85	87	89	92	89	91	91	24.7%
Molokai Island	3	3	3	3	3	3	3	3	4	4	4	33.3%
Lanai Island	0	0	1	1	1	1	0	0	1	1	1	100.0%
Mainland	301	306	390	417	409	433	416	434	407	431	396	31.6%
Foreign	19	18	19	22	23	22	18	18	20	19	17	-10.5%
Total In Hawaii	968	991	1015	1034	1025	1044	1039	1058	1055	1070	1060	9.5%

Note: Maui County includes those listed as Maui Island, Molokai Island, and Lanai Island. Total in Hawaii excludes those listed as Mainland or Foreign.

Number of Medicaid/QUEST Providers and Number With at Least One and Fifty Paid Claims in the Past Year by County and State of Hawaii (Medicaid/QUEST Data 2013)

	Number Of Providers	Proportion of Providers (%)	Number with at Least One Paid Claim	Proportion of Providers (%)	Number with at Least Fifty Paid Claims	Proportion of Providers (%)
State of Hawaii	431	100	350	100	247	100
Hawaii County	68	15.8	53	15.1	43	17.4
Honolulu County	288	66.8	235	67.1	151	61.1
Kauai County	37	8.6	30	8.6	25	10.1
Maui County	38	8.8	32	9.1	28	11.3

Number of Medicaid/QUEST Clients Transported by Air for Oral Health, State, Region of Hawaii, and County, 2006-2013 (Data Request CCM, 2006-2013)

Year	2006	2007	2008	2009	2010	2011	2012	2013
Total	1266	1970	2919	3633	2940	2796	2213	2266
Children	1193	1627	2388	3153	2806	2694	2163	2244
Adults	73	343	531	480	134	102	50	22
Hilo	624	1209	1614	1980	1759	1424	1139	1471
Kona	173	335	561	648	386	579	419	407
Kauai County	148	196	371	643	457	320	375	155
Maui County	321	230	373	362	338	473	280	233
Total Dollars	\$401,507	\$606,504	\$893,917	\$1,202,507	\$884,194	\$900,877	\$736,798	\$848,675

## Appendix 2: Detailed Survey Questions

### NSCH (2011-2012 only)

- [During the past 12 months/Since [his/her] birth], did [S.C.] have a toothache, decayed teeth, or unfilled cavities?
  - (1) YES
  - (2) NO
  - (77) DON'T KNOW
  - (99) REFUSED

### NSCH (2007 & 2011-2012)

- How would you describe the condition of [S.C.]'s teeth: excellent, very good, good, fair, or poor?
- [During the past 12 months/Since [his/her] birth], how many times did [S.C.] see a dentist for preventive dental care, such as check-ups and dental cleanings?

### NS-CSHCN (2009-2010)

- [During the past 12 months/Since [his/her] birth], how many times did [S.C.] see a dentist for preventive dental care, such as check-ups and dental cleanings?
- What type of care was delayed or not received? Was it medical care, dental care, mental health services, or something else? [MARK ALL THAT APPLY]
  - (1) MEDICAL CARE
  - (2) DENTAL CARE**
  - (3) MENTAL HEALTH SERVICES
  - (4) SOMETHING ELSE
  - (6) DON'T KNOW
  - (7) REFUSED

### YRBS (2013)—questions asked in public middle and high schools

- When was the last time you saw a dentist for a check-up, exam, teeth cleaning, or other dental work?
  - A. During the past 12 months
  - B. Between 12 and 24 months ago
  - C. More than 24 months ago
  - D. Never
  - E. Not sure
- During the past 12 months, did you have a toothache?
  - A. Yes
  - B. No
  - C. Not sure

### PRAMS Phase 5 Survey (2004-2008)

- This question is about the care of your teeth during your most recent pregnancy. For each item, circle **Y** (Yes) if it is true or circle **N** (No) if it is not true.
  - a. I needed to see a dentist for a problem . . . . . N Y
  - b. I went to a dentist or dental clinic. . . . . N Y
  - c. A dental or other health care worker talked with me about how to care for my teeth and gums. . . . . N Y

## PRAMS Phase 6 Survey (2009-2011)

- At any time during the *12 months before* you got pregnant with your new baby, did you do any of the following things?  
For each item, circle **Y** (Yes) if you did it or circle **N** (No) if you did not.
  - a. I was dieting (changing my eating habits) to lose weight . . . . . N Y
  - b. I was exercising 3 or more days of the week . . . . . N Y
  - c. I was regularly taking prescription medicines other than birth control . . . N Y
  - d. I visited a health care worker to be checked or treated for diabetes. . . . N Y
  - e. I visited a health care worker to be checked or treated for high blood pressure. . . . . N Y
  - f. I visited a health care worker to be checked or treated for depression or anxiety . . . . . N Y
  - g. I talked to a health care worker about my family medical history . . . . N Y
  - h. I had my teeth cleaned by a dentist or dental hygienist. . . . . N Y**
- This question is about the care of your teeth during *your most recent* pregnancy.  
For each item, circle **Y** (Yes) if it is true or circle **N** (No) if it is not true.
  - a. I needed to see a dentist for a problem . . . . . N Y
  - b. I went to a dentist or dental clinic. . . . N Y
  - c. A dental or other health care worker talked with me about how to care for my teeth and gums . . . . . N Y
- Did you have your teeth cleaned by a dentist or dental hygienist during the time periods listed below?  
For each time period, circle **Y** (Yes) if you had your teeth cleaned then or circle **N** (No) if you did not have your teeth cleaned then.
  - a. During my most recent pregnancy . . . N Y
  - b. After my most recent pregnancy . . . . N Y

## BRFSS 20102

- How long has it been since you last visited a dentist or a dental clinic for any reason? Include visits to dental specialists, such as orthodontists.  
Read only if necessary:
  - 1) Within the past year (anytime less than 12 months ago)
  - 2) Within the past 2 years (1 year but less than 2 years ago)
  - 3) Within the past 5 years (2 years but less than 5 years ago)
  - 4) 5 or more years ago
  - 7) Don't know / Not sure
  - 8) Never
  - 9) Refused
- How many of your permanent teeth have been removed because of tooth decay or gum disease? Include teeth lost to infection, but do not include teeth lost for other reasons, such as injury or orthodontics.  
NOTE: If wisdom teeth are removed because of tooth decay or gum disease, they should be included in the count for lost teeth.
  - 1) 1 to 5
  - 2) 6 or more but not all
  - 3) All
  - 7) Don't know / Not sure
  - 8) None
  - 9) Refused

## Head Start program Information Report

- Number of children, including those enrolled in Medicaid or State CHIP, who have completed a professional dental examination during the operating period or within the last 12 months?

- Of the children examined, the number diagnosed as needing dental treatment?

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## Some Oral Health Resources

The 2011 Children’s Oral Health Summit identified some oral health resources for children in the State of Hawaii.

### **Hawaii State Department of Health**

#### **Family Health Services Division**

- Developing planning on oral health across populations in the State through the work with partners and communities.

#### **Primary Care Office**

- Updates dental health shortage areas and provides subsidies for dental services

#### **Women, Infants and Children (WIC) Services Branch**

- Provides education on infant and child oral health

### **Hawaii State Department of Human Services**

#### **Med-Quest Division**

- Provides dental services for low-income families

#### **Community Case Management Corporation**

- Facilitates statewide access to Medicaid dental programs

#### **Hawaii Medical Services Association**

- Offers low-cost dental insurance plans for children

### **Community Providers**

#### **Aloha Medical Mission**

- Non-profit, operates free dental clinic

#### **Community Health Centers**

- Non-profit, offer dental services in low-access, low-income areas

#### **Hawaii Head Start and Early Head Start Dental Home Initiative**

- Ensures head start and early head start enrollees have access to dental services

#### **Lutheran Medical Center Pediatric Dental Residency Program and Advanced Education in General Dentistry Program**

- Provides education for dentists to serve in underserved communities

#### **Queen’s Medical Center General Practice Residency Program**

- Provides dental education and services and QMC dental clinic

#### **Hawaii Primary Care Association**

- Provides health services through community health centers

### **Community Organizations**

#### **Hawaii Island Oral Health Coalition**

- Coalition of community partners expanding dental services, prevention and education

#### **Hawaiian Islands Oral Health Task Force**

- Identifies strategies to increase oral health access and policy initiatives

#### **Kauai Dental Health Task Force**

- Identifies oral health problems and strategies for county

#### **Maui Oral Health Center**

- Provides dental services to low-income, underserved, uninsured communities

#### **Maui Oral Health Task Force**

- Identifies and supports initiatives to increase oral health services on Maui

#### **Tri-County Dental Health Task Force**

- Hawaii, Kauai, and Maui collaboration meeting to increase dental services in rural island communities



Family Health  
Services Division



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