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Oral Health Care Disparities in the Redwood Coast Region

CCRP
California Center for Rural Policy

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It is well established that oral health is integral to the overall health of the individual.[1,2,3] Research has shown an association between poor oral health and numerous adverse health outcomes including diabetes,[4,5] cancer,[6,7,8] cardiovascular disease,[9-13] and pregnancy complications.[2,14,15] Oral health diseases are preventable and treatable with good personal oral hygiene and routine professional care.

Results from the Rural Health Information Survey, 2006 indicate that there are disparities in access to oral health care in the Redwood Coast Region:

- Respondents living in poverty* were the least likely to have their teeth professionally cleaned in the past year and 6.8 times more likely to have gone 5 or more years without professional teeth cleaning compared to respondents living at or above 300% poverty.
- Adult respondents living in households with children were less likely than adult respondents living in households without children to have their teeth professionally cleaned.
- Respondents of color were less likely to have their teeth professionally cleaned than white respondents.
- Younger adult respondents (18-29 years) were the least likely to have their teeth professionally cleaned in the past year compared to older adults.
- Male respondents were less likely than female respondents to have their teeth professionally cleaned.
- Respondents who were uninsured or with Medi-Cal insurance were significantly less likely to have their teeth cleaned in the past year and significantly more likely to have never received or to have gone 5 or more years without professional teeth cleaning than those with private insurance.
- 11 out of 43 sampled communities had over 40% of the respondents report not having their teeth cleaned in the past year and in some communities this reached nearly 60%.
- Oral health care is a commonly reported reason for regularly leaving the county of residence for health services.

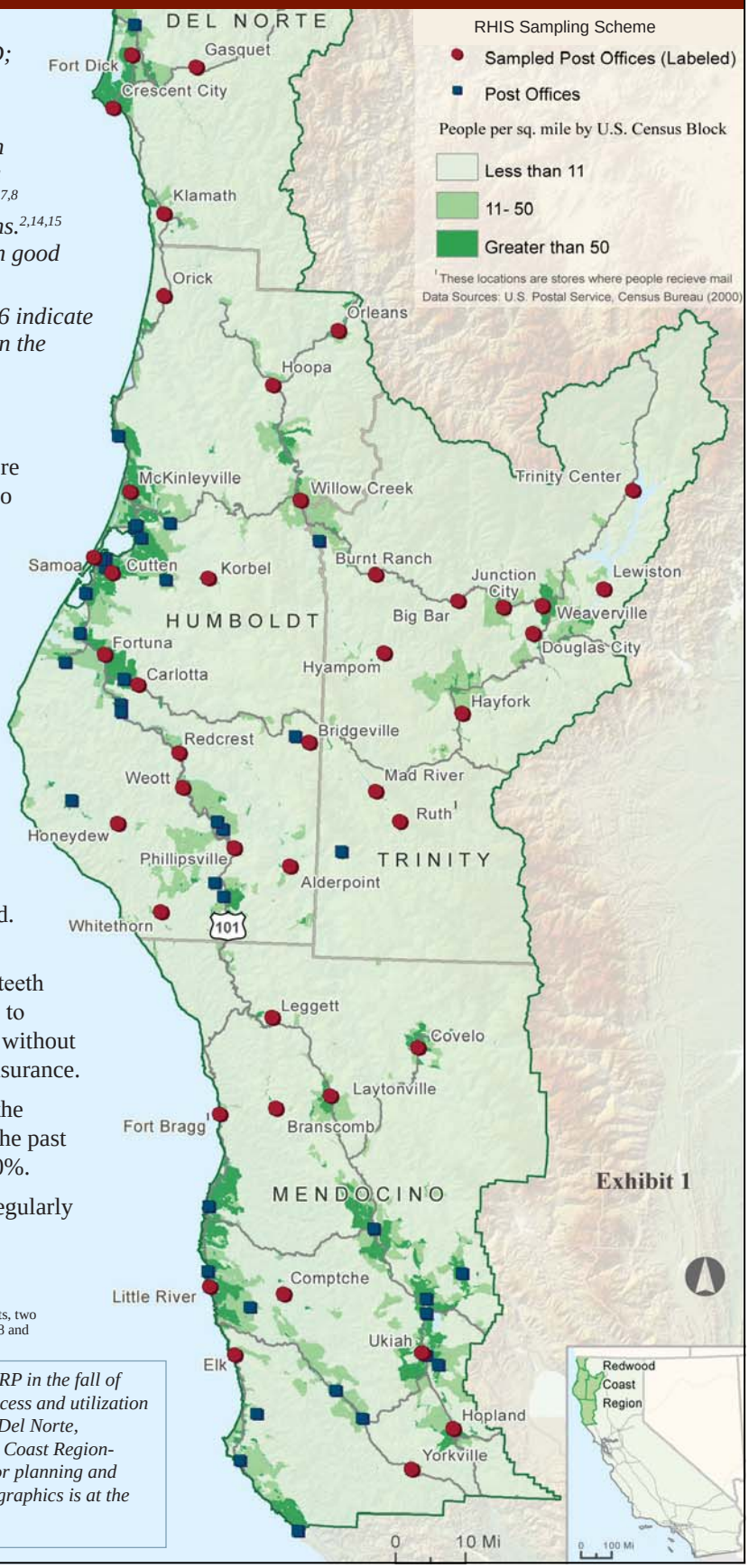


Exhibit 1

* The Federal Poverty Level (FPL) varies by household size. For a family of four (two adults, two children) the 2006 Federal Poverty Level (100% FPL) was $20,444, 200% FPL was $40,888 and 300% FPL was $61,332.

The Rural Health Information Survey (RHIS) was conducted by CCRP in the fall of 2006. The purpose of the survey was to assess health disparities, access and utilization of healthcare, and other determinants of health among residents in Del Norte, Humboldt, Trinity and Mendocino counties (known as the Redwood Coast Region- Exhibit 1). The goal of the survey is to provide useful information for planning and policy development. A description of the methods and sample demographics is at the end of this report (Exhibits 11 & 12).

Why Study Oral Health?

There is a growing body of literature showing that oral health is integral to the overall health of the individual.[1,2,3] Dental diseases are common and widespread making them a major public health problem worldwide.[2,3] Dental caries (tooth decay) is the single most common chronic childhood disease— 5 times more common than asthma.[1]

The social impact of oral diseases is substantial. Untreated dental diseases can cause significant pain and suffering and interfere with essential functions such as eating, swallowing, speaking and other activities of daily living such as work, school, and family interactions. In the U.S. each year, children lose more than 51 million school hours and employed adults lose more than 164 million hours of work due to dental-related illness.[1]

Periodontal disease is a chronic bacterial infection in the mouth causing inflammation of the gums (gingivitis), which can lead to the gradual destruction of the surrounding tissue and bones (periodontitis).[2,7] It is estimated that about 22% of US adults have mild disease and 13% have moderate or severe disease.[16] The disease tends to have a higher prevalence in the elderly, as well as black and Mexican-American populations. Additional risk factors for developing periodontal disease include male gender, high body mass index (BMI), tobacco use, diabetes, poor nutrition, low socioeconomic status and limited access to dental care.[2,7]

Research has shown an association between periodontal disease and numerous adverse health outcomes including diabetes,[4,5] cancer,[6,7,8] cardiovascular disease (coronary heart disease and stroke),[9-13] and pregnancy complications (preterm birth, low birthweight, pre-eclampsia and gestational diabetes).[2,14,15] Furthermore, animal studies suggest that maternal periodontal infections may lead to adverse long-term effects on the infant's growth and development.[14] The mechanism is thought to be due to chronic infection and inflammation that is present in the body. Studies have shown that infection located in one organ or tissue may lead to harmful effects to other parts of the body.[2,6,7,14] These findings underscore the importance of including oral health as an integral aspect of overall health, rather than as an isolated component.

"My children need to see a dentist + are not able."
– Del Norte respondent ,≤99% FPL

"No insurance; income not supporting doctor/dental bills/glasses."
– Trinity respondent, 100-99% FPL

"It's been 3 months since one dentist found a cavity, but it will be another 3 months before my appointment to fill it. I have Blue Cross dental insurance."
– Humboldt respondent, FPL unknown

"Can't afford dental."
– Mendocino respondent, 200-299% FPL

Periodontal disease is a preventable and treatable condition. Indeed, treatment of peridontal disease may lead to other health benefits.There is some evidence that treating periodontal disease may improve glycemic control in people with diabetes,[17] improve vascular endothelial function[18] and decrease atherosclerosis[19] as well as reduce the rate of preterm delivery and increase birth weight.[2,14]

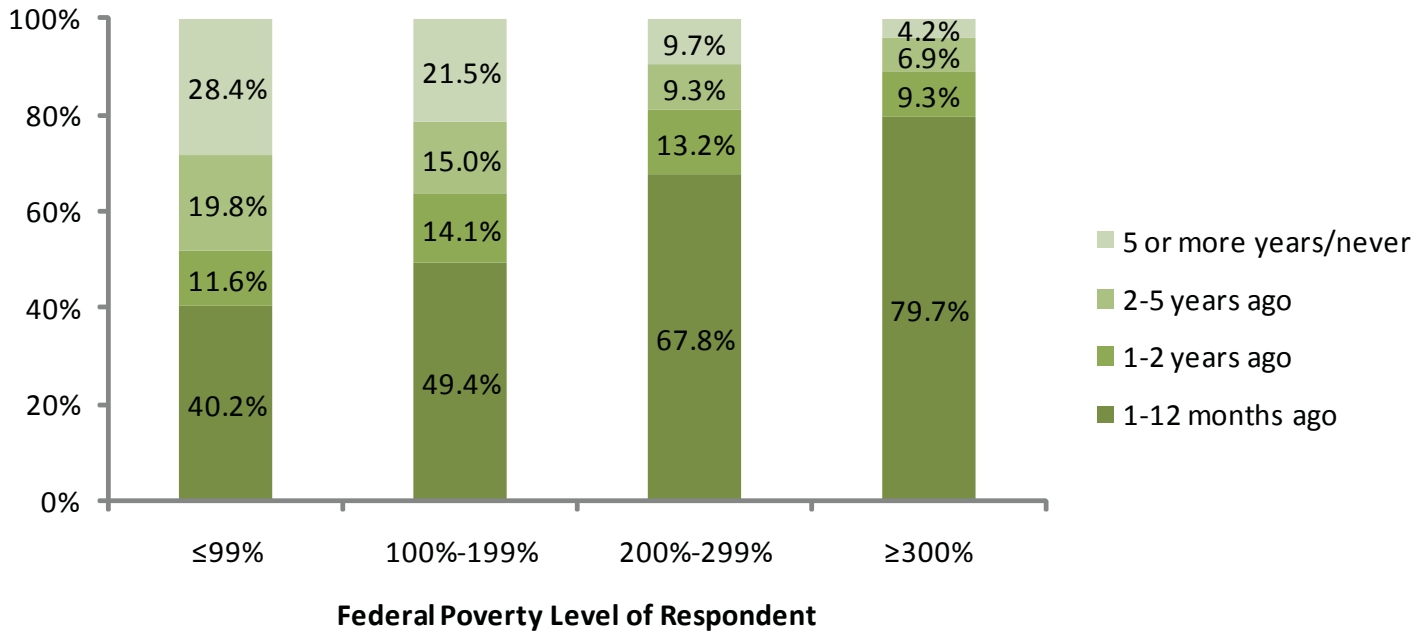
Experts recommend that individuals have a professional dental check-up at least every year starting as young as age 1 year.[20,21] Good personal oral hygiene (brushing and flossing) and routine professional care are necessary to maintain optimal oral health and prevent periodontal disease. Regular dental check-ups are important as they provide opportunities for the early diagnosis, prevention, and treatment of oral diseases.

Access to Oral Health Care: The Impact of Poverty

Respondents living in poverty were 6.8 times more likely to have gone 5 years or more without professional teeth cleaning compared to respondents living at or above 300% poverty.

Of all respondents, 64% reported having their teeth professionally cleaned in the past year. However, respondents living in the poorest households (≤99% FPL) were the least likely to have their teeth professionally cleaned in the past year (40.2%). As the socioeconomic status of the respondent improves so does the likelihood of their teeth being professionally cleaned within the past year, with nearly 80% of those living at or above 300% poverty having received professional oral health care in the past year. The lower the socioeconomic status (or the greater the poverty level), the more likely the respondent was to have never received professional teeth cleaning or to have gone long periods of time without professional teeth cleaning. These differences are statistically significant (Exhibit 2). The same pattern is seen when comparing low-income (<200% FPL) to non low-income (≥ 200% FPL) respondents (Exhibit 3).

Exhibit 2: Time since Last Professional Teeth Cleaning by Federal Poverty Level of Respondents (*n* =2,350)



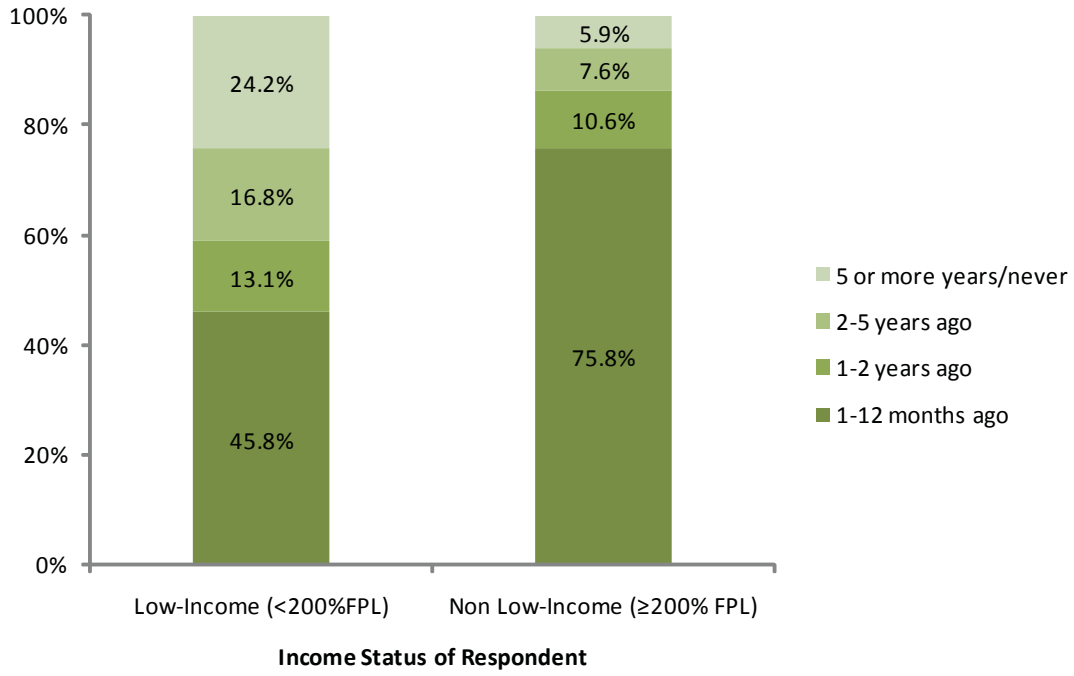
Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the question, "To the best of your knowledge, when did you last have your teeth cleaned at a Dentist's office?" Analysis was restricted to respondents who answered the question and provided information necessary for determining poverty level. Respondents who answered "don't know" or "not applicable" were excluded from the analysis.

Who is living in poverty in our rural communities?

The Rural Health Information Survey and U.S. Census data show that certain populations in the Redwood Coast Region have a high prevalence of poverty. For example, households with children, especially when headed by single women, have a high likelihood of living in poverty. People of color also have a higher likelihood of living in poverty compared to whites. Additionally, the younger you are, the more likely you are to live in poverty.[22] Indeed, analysis of RHIS shows that these populations are less likely to receive preventive oral health care compared to their counterparts who are not living in poverty.

Access to Oral Health Care: The Impact of Poverty *continued*

Exhibit 3: Time since Last Professional Teeth Cleaning by Income Status of Respondents (*n* =2,350)



Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the question, "To the best of your knowledge, when did you last have your teeth cleaned at a Dentist's office?" Analysis was restricted to respondents who answered the question and provided information necessary for determining income status. Respondents who answered "don't know" or "not applicable" were excluded from the analysis.

"[unable to get] dental work because cost of transportation and appts."
– Del Norte respondent, ≤99% FPL

"No policy for teeth. Too expensive."
– Trinity respondent, 100-99% FPL

"Often can't afford doctor or dentists visits."
– Humboldt respondent, 100-199% FPL

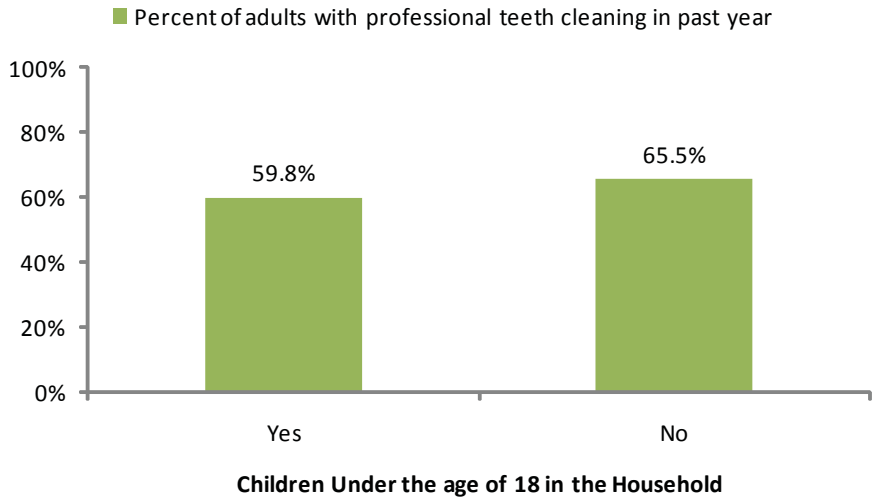
"Couldn't pay for all the dental work I should get."
– Mendocino respondent, ≤99% FPL

Access to Oral Health Care: The Impact of Children in the Household

Adult respondents with children in the household were significantly less likely to have their teeth professionally cleaned in the past year compared to adult respondents without children in the household.

Of the adult respondents with children under the age of 18 in the household, 59.8% reported professional teeth cleaning in the past year, which is significantly lower than adult respondents without children in the household (65.5%) (Exhibit 4). Further analysis revealed that poverty accounts these differences. Households with children are more likely to live in poverty and therefore adults in these households are less likely to receive preventive oral health care.

Exhibit 4: Professional Teeth Cleaning in Past Year among Respondents with and without Children in the Household (*n* =2,670)



Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the questions, "To the best of your knowledge, when did you last have your teeth cleaned at a Dentist's office?" and "In the past 6 months how many children age 0-5 years have lived in your household" and "In the past 6 months how many children age 6-17 years have lived in your household" Analysis was restricted to respondents who answered the questions. Respondents who answered "don't know" or "not applicable" were excluded from the analysis.

What does it mean to be statistically significant?

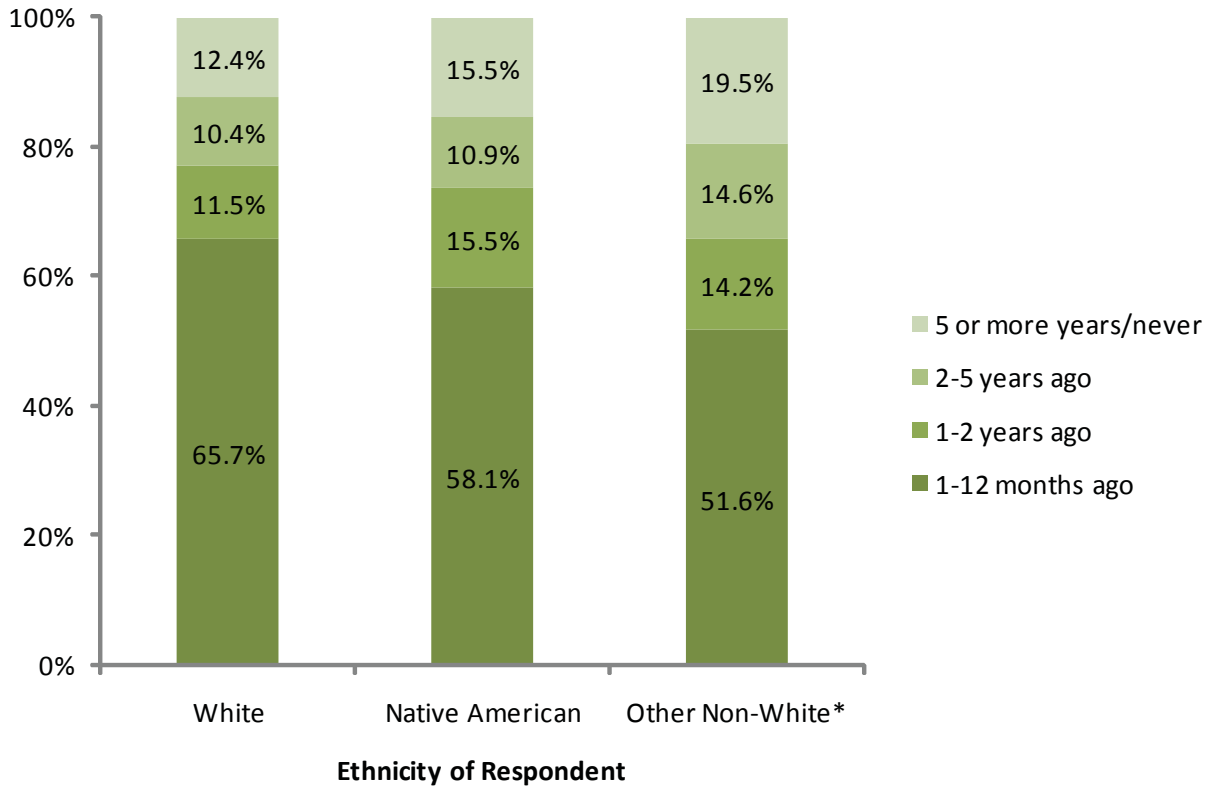
Whenever comparisons are made between groups there is always the possibility of finding a difference simply by chance. In research we like to find "true" differences and not differences that have occurred by chance. By convention, most researchers use a *P*-value of <.05 to determine if a difference is significant. This means there is less than a 5% probability that the difference observed has occurred by chance alone.

Access to Oral Health Care: The Impact of Race/Ethnicity

Respondents of color were less likely to have their teeth professionally cleaned than white respondents.

Of the white respondents, 65.7% reported having their teeth professionally cleaned in the past year and 12.4% reported never receiving or going 5 or more years without professional teeth cleaning. This is significantly different from the other non-white respondents, of which 51.6% reported having their teeth professionally cleaned in the past year and 19.5% reported never receiving or going 5 or more years without professional teeth cleaning. Of the Native American respondents, 58.1% reported receiving professional teeth cleaning in the past year and 15.5% reported never receiving or going 5 or more years without professional teeth cleaning. The Native American respondents did not differ significantly from the white and other non-white respondents (Exhibit 5).Further analysis revealed that poverty accounts for much of the differences in access to oral health care between ethnic groups.

Exhibit 5: Time since Last Professional Teeth Cleaning by Race/Ethnicity* (*n* = 2,654)



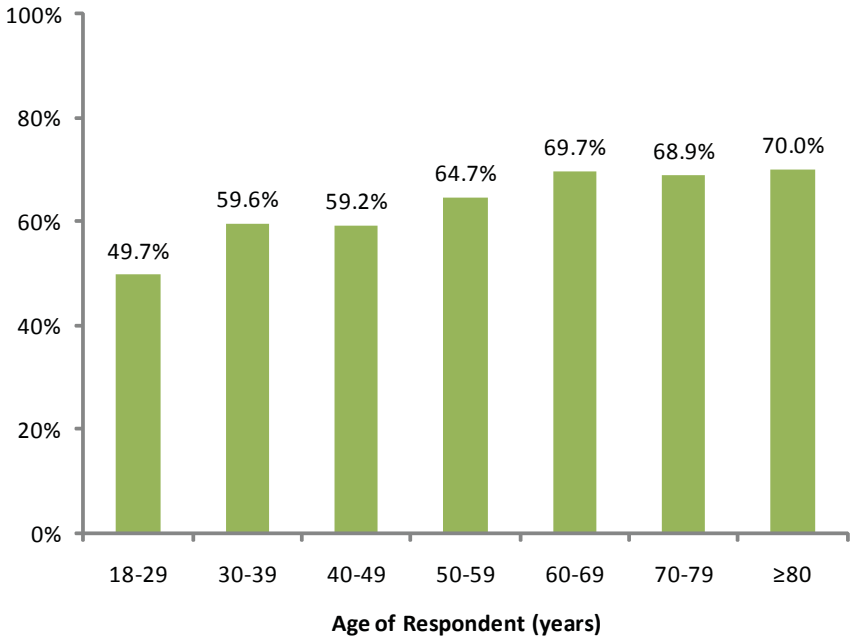
Source: Rural Health Information Survey, 2006, California Center for Rural Policy
*Respondents were able to classify their ethnicity as White, African American, Latino/a, Asian, Native American, Multi-racial, or Other. Due to a small number of respondents in several of the categories, comparisons were made between White, Native American, and Other Non-White respondents (includes African American, Latino/a, Asian, Multi-racial and other).

Access to Oral Health Care: The Impact of Age and Gender

Younger adult respondents were the least likely to have their teeth professionally cleaned in the past year.

There was a clear trend between age and professional teeth cleaning. Of the younger respondents (18-29 years old), 49.7% had received professional teeth cleaning in the past year. As the age of the respondent increases so does the likelihood of having received professional teeth cleaning in the past year (Exhibit 6). As with ethnicity and households with children, poverty accounts for much of the differences in access to oral health care between age groups.

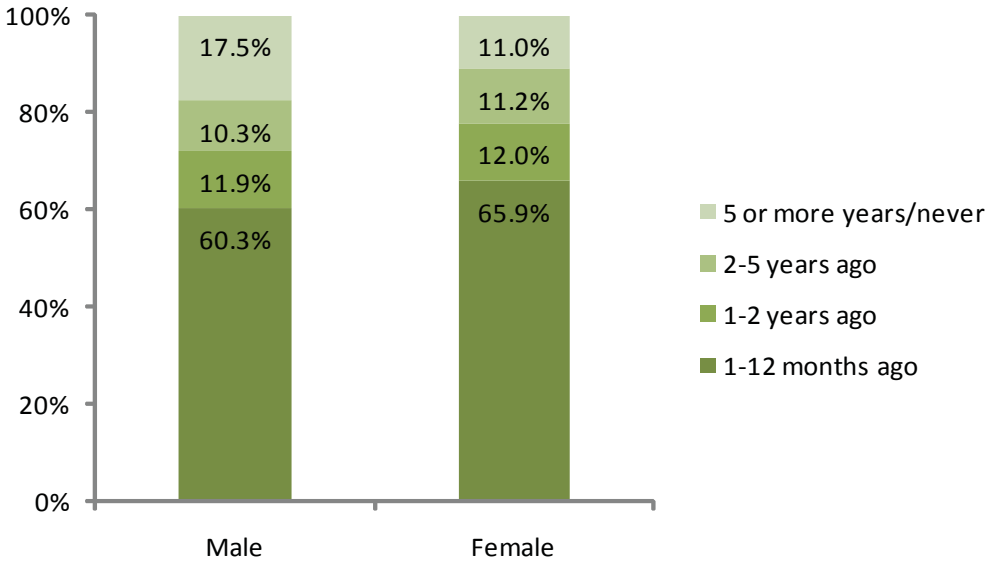
Exhibit 6: Professional Teeth Cleaning in Past Year by Age of Respondent (*n* =2,626)



Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the question, "To the best of your knowledge, when did you last have your teeth cleaned at a Dentist's office?" and "In what year were you born?". Analysis was restricted to respondents who answered both questions. Respondents who answered "don't know" or "not applicable" were excluded from the analysis.

Male respondents were significantly less likely to have their teeth professionally cleaned in the past year and significantly more likely to have never received or gone 5 or more years without professional teeth cleaning than female respondents (Exhibit 7).

Exhibit 7: Time since Last Professional Teeth Cleaning by Gender (*n* = 2,664)



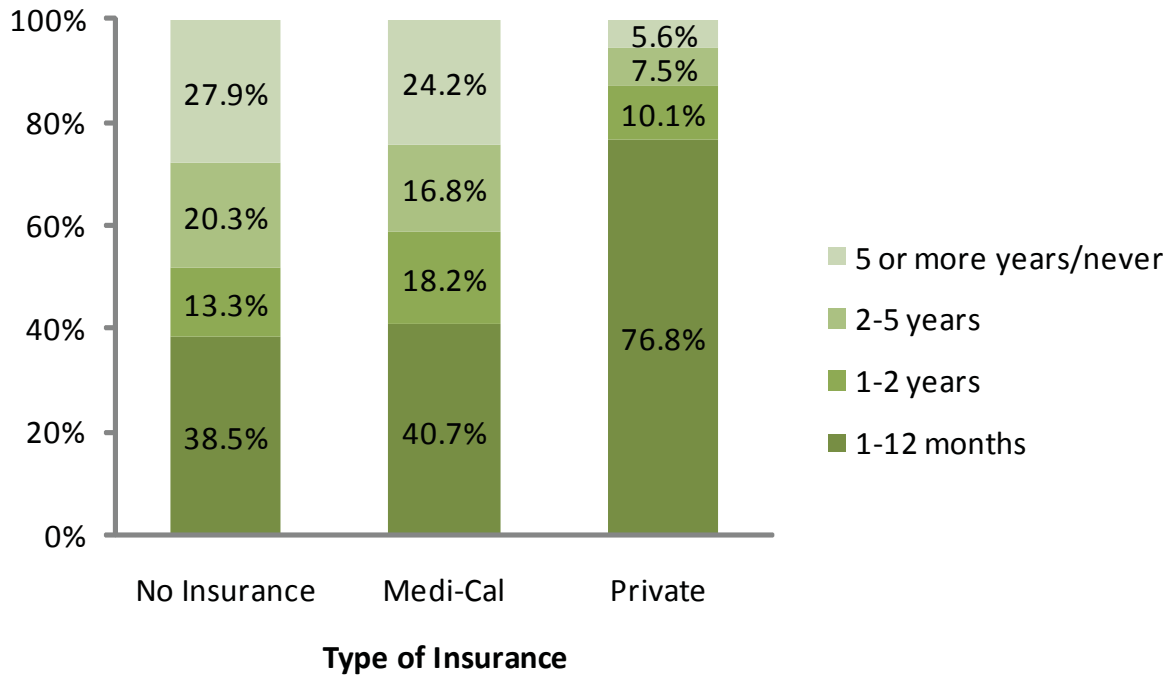
Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the question, "To the best of your knowledge, when did you last have your teeth cleaned at a Dentist's office?" and "What is your gender?". Analysis was restricted to respondents who answered both questions. Respondents who answered "don't know" or "not applicable" were excluded from the analysis.

Access to Oral Health Care: Insurance Coverage Matters

Respondents who were uninsured or with Medi-Cal insurance were significantly less likely to have their teeth cleaned in the past year and significantly more likely to have never received or gone 5 or more years without professional teeth cleaning than those with private insurance.

Of the uninsured respondents, 38.5% reported having their teeth cleaned in the year prior to the survey. This does not differ significantly from respondents with Medi-Cal insurance (40.7%), but does differ significantly from those with private insurance (76.8%). Compared to private insurance, being without insurance or with Medi-Cal insurance is significantly associated with never receiving or having a long interval (5 or more years) since last professional teeth cleaning (Exhibit 8).

Exhibit 8: Time since Last Professional Teeth Cleaning by Type of Insurance (*n* =2,247)



Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the questions, "To the best of your knowledge, when did you last have your teeth cleaned at a Dentist's office?" and "What type(s) of health insurance do you have?". Analysis was restricted to respondents who answered both questions and reported their insurance status as "None", " Medi-Cal", or "Private". Respondents who answered "don't know" or "not applicable" were excluded from the analysis.

"No doctors or dentists available for new patients in Del Norte or take CMSP."
– Del Norte respondent, ≤99% FPL

"Couldn't find dentist in Trinity or Humboldt County that would accept Denta-Cal."
– Trinity respondent, ≤99% FPL

"Have been trying for more than a year to find dentist who will take Medi-Cal for new patient."
– Humboldt respondent , ≤99% FPL

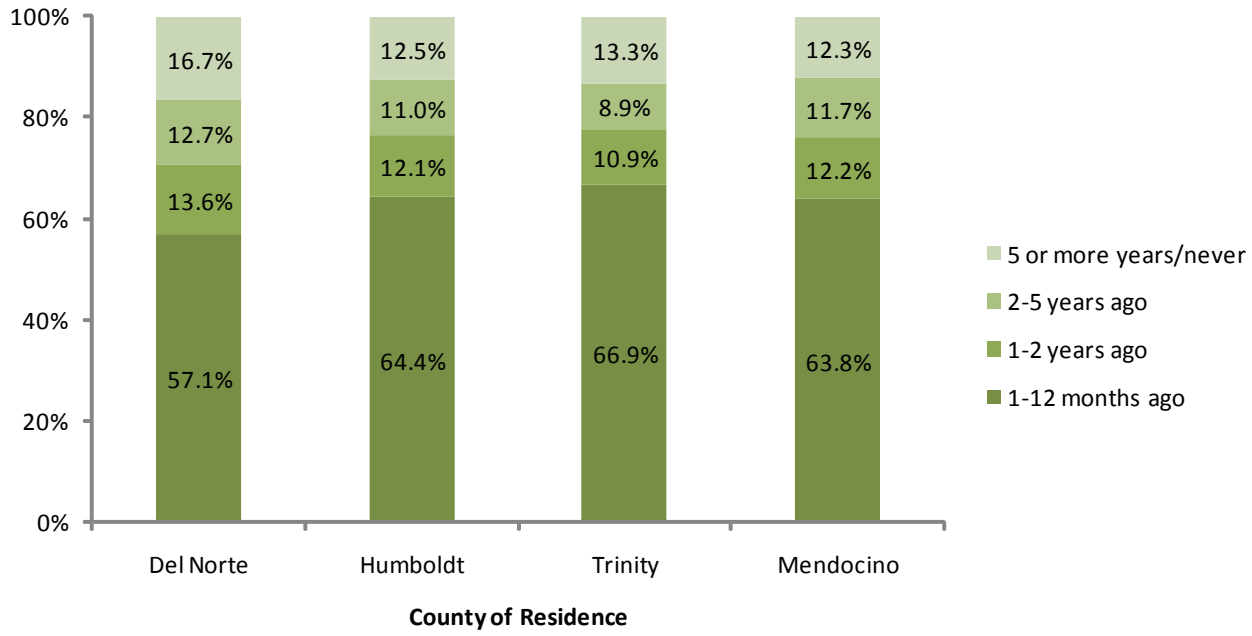
"No insurance and no money for dentist."
– Mendocino respondent, 100-199% FPL

Access to Oral Health Care: The Impact of Place

There was not a significant difference between counties with respect to respondents receiving a professional teeth cleaning in the past year or at longer intervals (Exhibit 9). Analysis on a sub-county level revealed significant variability by sampled community with respect to respondents receiving professional teeth cleaning. Within each county, several sampled communities had over 40% of the respondents report going without professional teeth cleaning in the past year: Klamath (57.8%), Crescent City (41.8%), Fort Dick (40.5%), Orleans (51.8%), Orick (41.7%), Hoopa (40.5%), Alderpoint (45.8%), Lewiston (47.2%), Hayfork (42.1%), Covelo (57.6%), and Leggett (57.1%) (Exhibit 10).

By population density there was not a significant difference between respondents from areas with low population density (≤50 people per square mile) and those from areas with higher population density (>50 people per square mile) with respect to having teeth cleaned in the past year.

Exhibit 9: Time since Last Professional Teeth Cleaning by County of Residence (*n* =2,674)



Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the question, "To the best of your knowledge, when did you last have your teeth cleaned at a Dentist's office?" Analysis was restricted to respondents who answered the question and provided their county of residence. Respondents who answered "don't know" or "not applicable" were excluded from the analysis.

Lack of oral health services was a commonly reported reason for regularly leaving county of residence to receive health care. Respondents from Trinity (58.4%) and Del Norte (44%) were the most likely to regularly leave the county for health services, followed by respondents from Mendocino (30.8%) and Humboldt (13.1%).

The primary reason for regularly leaving the county among Trinity and Del Norte respondents was needed services were not available, whereas the primary reason among Humboldt and Mendocino respondents was quality was better elsewhere, followed by needed services not available. Lack of oral health services was the second most commonly reported reason for regularly leaving the county (lack of medical specialists was #1).

"No adequate dental care in our area."
Trinity respondent, ≥300% FPL

"Lack of dental services, lack of optometry services."
Humboldt respondent , ≤99% FPL

Exhibit 10

CCRP Rural Health Information Survey:

Percent of Respondents Without Professional Teeth Cleaning in Past Year[1], 2006

Study methods: The Rural Health Information Survey (RHIS) was conducted by the California Center for Rural Policy in the fall of 2006. A total of 23,606 surveys were mailed to a random sample of post office box holders in the four counties of Del Norte, Humboldt, Trinity, and Mendocino. The total number of returned surveys was 3,003 for an overall response rate of 12.7%

Percent of Respondents Without Professional Teeth Cleaning in the Past Year

- 47.1-60%
- 37.1-47%
- 28.1-37%
- 17.1-28%
- 0-17%
- Low Sample Size[2]

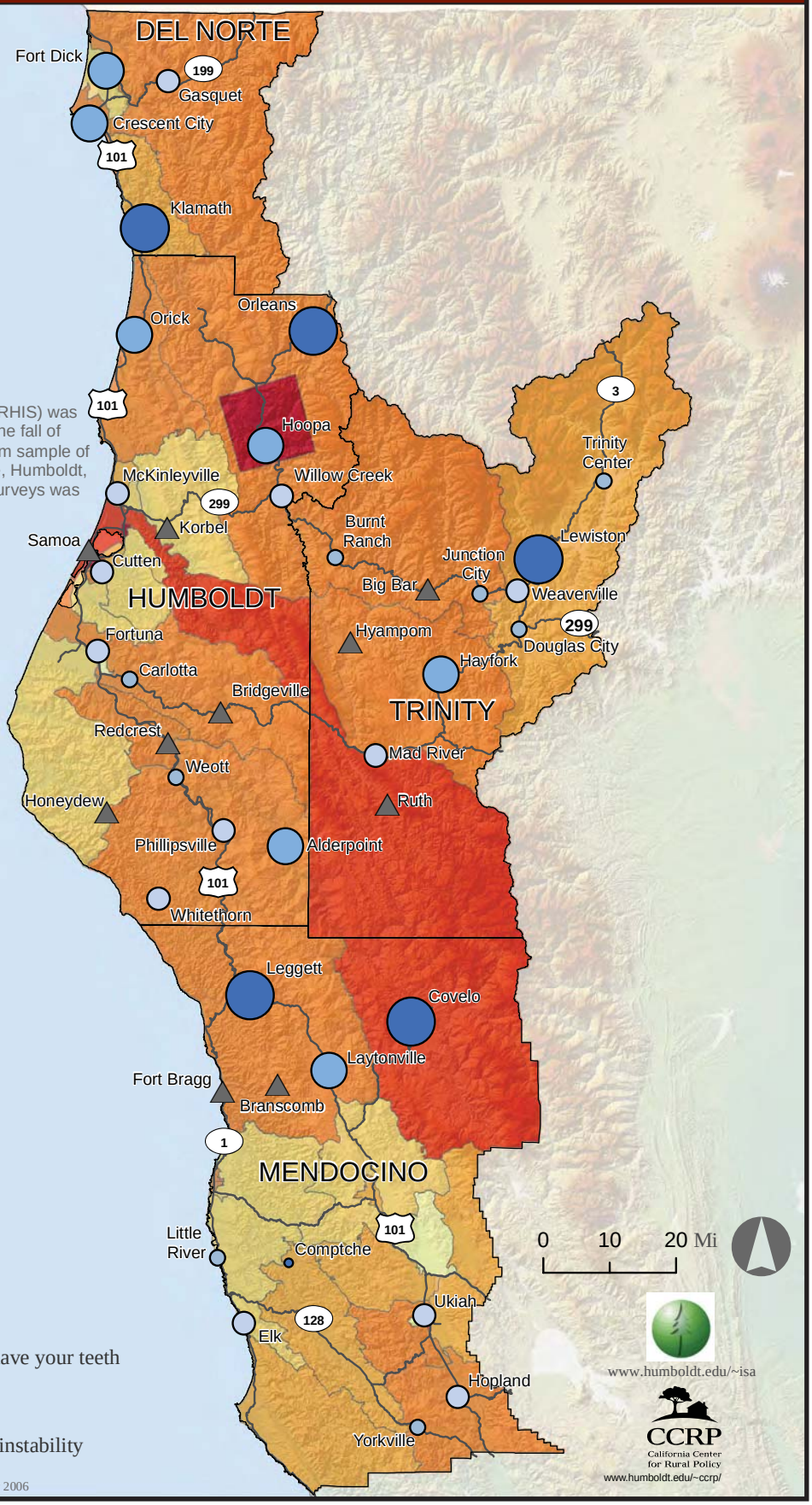
Total Population Below Poverty Level Percent by Census Tract

- 5 - 8
- 9 - 13
- 14 - 16
- 17 - 23
- 24 - 28
- 29 - 44

Data Source: U.S. Census Bureau 2000

[1] Data derived from RHIS survey question (14): To the best of your knowledge, when did you have your teeth cleaned at the Dentist's office?

[2] Post offices with less than 20 survey responses were not included in analysis due to statistical instability



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GIS and Cartography: S. Miller and R. Degagne
Data Sources: ESRI; U.S. Postal Service; CCRP Rural Health Information Survey 2006

Implications for Programs, Policy & Research

Results from the Rural Health Information Survey clearly show that there are oral health disparities in the Redwood Coast Region. Oral health disparities refers to differences in the incidence, prevalence, mortality and burden of oral health disease as well as the use of oral health care services,[23] which was the focus of the research described herein.

This survey identified particular groups that are at risk for not receiving recommended preventive oral health care. Being poor or low income, of color, male, between the ages of 18 to 29 years, uninsured or Medi-Cal insured,living in a household with children or living in certain communities all decrease the chance of receiving recommended preventive oral health care compared to individuals without these factors. These findings are consistent with findings from national studies, however, the proportion of the adult population reporting professional teeth cleaning in the previous year is lower in the Redwood Coast Region (64%) than it was for California (67.9%) and the Nation in 2004 (69%).[23]

By far, the factors that appear to be the strongest determinants of whether or not an individual receives preventive oral health care is poverty level and insurance status with individuals living in poverty and without health insurance or with Medi-Cal insurance being the least likely to access preventive oral health care services. This is concerning as it is well established that adults and children from poor households have the most oral health disease.[23]

It is known that there are geographic oral health disparities among U.S. adults with adults living in rural areas being more likely to report unmet dental care needs and less likely to have a dental visit in the prior year compared to their urban counterparts.[23] The current research shows that even within areas that are predominately rural, oral health disparities still exist.

A major barrier to accessing oral health care for the low-income population in California has been the low reimbursement rates for Medicaid dental services- some of the lowest reimbursement rates in the country. While California has more dentists per capita than the national average, only 40% accept Medi-Cal patients.[24] Unfortunately, since most adult Medi-Cal dental benefits were eliminated in July, 2009, the situation is likely to get worse.

Lack of available oral health services results in higher use of the emergency department for preventable oral health conditions. Indeed, rural counties in Northern California have the highest rate of emergency department visits for preventable dental conditions compared to the rest of the state (Humboldt county topped all other counties).[25] Twenty six California counties (including Humboldt, Del Norte, Trinity and Mendocino) report higher rates of emergency department visits for preventable dental conditions than those for both asthma and diabetes.[25]

All of these findings point to the need for improved access to preventive oral health services in our rural communities. Increasing access to oral health care in our rural communities not only improves the health of community members, it also has an economic benefit by preventing loss of money out of the area for oral health services and decreasing costly visits to the emergency department and urgent care for preventable conditions.

This study has some limitations. It provides information about the respondents of the survey and does not necessarily describe the population in general. However, this is the largest and most comprehensive study ever conducted in this rural region of California. This study also relies on self report of when individuals last received professional teeth cleaning. This survey focused on adults and did not specifically ask questions about children's access to dental care. Prior studies in Humboldt County have identified a high percentage of children

Implications for Programs, Policy & Research *continued*

in the county with untreated dental caries and clearly this is a population in which routine preventive dental care is critical.[26]

Another study in Humboldt County assessed access to dental health care among pregnant women and found that only about half attempted to access dental health services during their pregnancy. Medi-Cal insurance was a significant barrier to accessing dental care for pregnant women, despite the fact that Medi-Cal did and still does cover dental visits for pregnant women.[27]

Improving adult access to oral health care can improve children's oral health in several ways. The bacteria that cause dental disease are often passed from parents and other caretakers to their children. Studies have shown that when parents do not have at least one dental visit per year, their children are 13 times less likely to visit a dentist that same year.[28]

Limited access to dental care is a known risk factor for periodontal disease.[2,7] Reducing disparities requires approaches that target populations at high risk for oral diseases and improve access to care. Future research and policies should focus on increasing access to preventive oral health care and early intervention services for vulnerable populations, including economically disadvantaged populations, pregnant women, and individuals with chronic diseases such as diabetes and heart disease.

"No dentists here accept Medi-Cal except "A" St. Clinic - I can't meet their hours."
– Del Norte respondent, ≤99% FPL

"Can't afford blood tests-health care, dentist."
– Trinity respondent, ≤99% FPL

"No dental in county that take Medi-Cal."
– Trinity respondent, 100-99% FPL

"Don't get to go to the dentist often enough."
– Humboldt respondent, FPL unknown

"Dental needs not met."
– Humboldt respondent , ≤99% FPL

"Dental is hard to come by for Medi-Cal."
– Humboldt respondent , ≤99% FPL

"Dental is like 3 months waiting list to get in."
– Humboldt respondent, 100-199% FPL

"Couldn't get referral for pediatric dental services."
– Humboldt respondent , ≤99% FPL

"No doctors in our region will not take my children's insurance. To see the dentist, it is a 6-12 month wait."
– Del Norte respondent , 100-199% FPL

"Needs dental care that is more in touch with special needs children."
– Humboldt respondent, 100-199% FPL

Policy Directions

Reinstate Adult Denti-Cal Coverage in California

On July 1, 2009, due to the budget crisis, California passed a state law (Welfare and Institutions Code section 14131.10) which eliminated most adult dental services as a Medi-Cal benefit. As a result, three million poor, disabled, and elderly California adults no longer have access to services such as cleanings, exams, fillings, gum treatments, crowns, root canals and dentures. This law has had a devastating effect on the Redwood Coast Region— the health of residents of the Redwood Coast Region are disproportionately impacted because of the number of adults in the region that rely on public support for their dental health coverage. In addition, the loss of revenue from the Adult dental program has jeopardized all low income community care. Dental programs at several community clinics have been forced to close, eliminating services in those communities for children who still remain covered. This law must be reversed and Adult dental services must be reinstated.

Increase Dental Coverage

To help improve health outcomes it is not enough to just reinstate adult dental services. We must increase insurance reimbursements for basic dental care. Throughout rural California there is a shortage of private dental providers willing to accept Medi-Cal patients because of the low reimbursement rate.

Integrate Oral Health and General Health in Insurance Plans and Provision of Care

Historically, physicians and dentists have operated in completely separate realms. Insurance coverage is separate for general health care and oral health care. Since oral health and general health are integral to one another it seems prudent to include oral health in general insurance plans and to provide oral health care and general health care in the same location when feasible.

Decrease "Dental Homelessness", Especially among Children

The oral health needs of all children are best met through ongoing, comprehensive dental care. Similar to a "Medical Home", a "Dental Home" provides a regular source of continuous and comprehensive care, which is associated with better health outcomes and lower costs. Starting as early as 1 year of age, children should have their first dental visit and should be seen regularly to optimize prevention and early intervention. Ideally, a "Dental Home" also provides emergency services for children as this allows for continuity of care.

In 2006, California passed landmark legislation AB 1433 (Emmerson/Laird) that requires all children entering public schools for the first time to undergo dental screenings. This legislation lays the groundwork for getting every child a "Dental Home" in rural communities. Head Start Programs in the Redwood Coast Region are required to ensure that every child gets treatment by eliminating barriers to care. Designated as a payer of last resort, Head Start must provide financial support in cases where a family is financially unable to seek oral treatment or when insurance coverage is inadequate. Since no pediatric dentists in the Redwood Coast Region accept Medi-Cal, Head Start's job to ensure oral care for every child enrolled in their program has become more challenging. Head Start funding is limited and the need is great. Continued support and expansion of funding of programs that provide school children dental treatment is essential and paramount to general health. Decreasing "dental homelessness" among rural children will require a concerted effort to increase the oral health workforce, Medi-Cal reimbursement and other funding to ensure all children have a "Dental Home".

Emphasize Prevention, Especially Among Children

Programs that emphasize prevention of oral problems prior to the manifestation of tooth decay are integral to oral health and a much more cost effective alternative than emergency oral care. In Humboldt County, there is a school based preventive program known as TOOTH (Teaching Oral Optimism Throughout Humboldt). The Program was originally created by the local California Conservation Corps but now is funded by First 5 Humboldt and administered by the Redwood Coast Community Action. The TOOTH program is implemented in preschool and 6th grade classes and the curriculum includes activities such as in-class teeth brushing exercises as well as instruction on teeth brushing, nutrition, and safety. An evaluation by the California Conservation Corp

Policy Directions *continued*

found that the TOOTH program was effective at increasing knowledge related to oral health, increasing the quality of teeth brushing, and decreasing plaque levels among school aged children.[29] Given the success of the TOOTH program, similar programs should be supported and sustained in rural communities.

When it Comes to Fluoride, Give People Information and Options

The topic of fluoride often leads to heated discussions in our rural communities. There are many different ways in which fluoride can be used to prevent tooth decay and individuals should be supplied with information regarding the known benefits and risks in order to make informed choices for themselves and their children. Fluoride is available in dietary drops and tablets, toothpaste, mouth rinse, and varnish. In 1995, California passed Assembly Bill 733, the fluoridated drinking water act. The legislation requires water systems with 10,000 or more service connections to fluoridate. It's worth noting that very few rural communities in California have water systems with 10,000 connections and are therefore exempt from AB 733 leaving each water supplier to decide whether or not to fluoridate. In the Redwood Coast Region only Eureka, Arcata and Scotia in Humboldt County, and Crescent City and surrounding area in Del Norte County have community water fluoridation.

Improve the Racial and Ethnic Diversity in the Oral Health Workforce

Across the nation, Blacks, Latino and Native Americans are severely underrepresented in the oral health workforce and efforts to improve this disparity could enhance access and utilization of oral health care by racial and ethnic minorities.[1] Since the Redwood Region has a large population of Native Americans and a growing population of Latino residents, attracting a multi-cultural dental workforce would be beneficial.

Increase Oral Health Workforce in Rural Areas

Expanding the oral health workforce is particularly salient in rural communities, where there is generally a shortage of qualified dental professionals. Loan repayment programs have been established to increase the number of medical and dental professionals practicing in high need areas. Loan repayment programs available through The National Health Service Corps/State Loan Repayment Program (NHSC/SLRP) are available for dentist, and dental hygienist that practice in areas designated as HPSA (health professional shortage areas). The majority of the Redwood Coast Region qualifies for this designation.[30] Oral health professionals can have student loans paid for by the state in exchange for two years of service in an HPSA region. Currently, the Dental Advisory Board of Humboldt County has identified recruitment and retention of Dentists as an essential component to improving access to dental care. However, few dentists utilize the NHSC/SLRP program.[31] Reaching dentists early in their training may facilitate this process as the loan repayment program provides an attractive incentive for graduating dental students. Local dentists already recruit interns from dental schools within the state to work in the Humboldt County area.

Decrease Barriers to Oral Health Care in the Redwood Coast Region

Open Door Community Health Centers in Humboldt County operates a Mobile Dental Van that provides dental services at various schools in the community. The Mobile Dental Van has been in operation since 2002. The van serves children who are currently insured by Medi-Cal or lack insurance. Humboldt County's Mobile Medical Office is a similar program but they serve a broader population and rotate among nine different sites on a routine schedule. Mobile Medical is operated by a local non-profit and provides medical and preventive dental care to uninsured and underinsured individuals around the Humboldt County area free of charge. Among the services they provide are oral health screenings, education, application of fluoride varnish, and distribution of oral hygiene supplies and xylitol gum. They often operate from local family shelters as well as in high risk clinic sites.

Continue Monitoring Oral Health in the Redwood Coast Region

State and Federal funding should support ongoing efforts for assessment. This study was the largest study to date on access to health care in rural regions. However, assessments should be ongoing in order to determine effective and ineffective strategies. While establishing baseline rates are important, periodic assessments are a method of measuring progress.

Methods & Demographics

Exhibit 11: Methods

The Rural Health Information Survey was conducted by the California Center for Rural Policy in the fall of 2006. The purpose of the survey was to assess health disparities, access and utilization of healthcare, and other determinants of health among residents in rural Northern California with the goal of providing useful information for planning and policy development.

A four-page self-administered survey was developed by project administrators at CCRP. The survey instrument was based on existing surveys (Behavioral Risk Factor Surveillance Survey, California Health Interview Survey, Canadian Community Health Survey and Mendocino Community Health Survey). New questions were developed as needed to inquire about areas of rural health not previously explored, such as access to transportation, phones, computers and Internet as well as skills for responding to emergency medical situations.

A total of 23,606 surveys were mailed to a random sample of adults residing in the four counties of Humboldt, Del Norte, Trinity and Mendocino. The sampling strategy employed the use of a Geographic Information System (GIS) to map the population density for Zip Code Tabulation Areas (ZCTA)[32]with an overlay of the locations of post offices. All of the post offices in low population density areas (<11 people per square mile) were selected (total post offices = 24; total post office boxes = 8,165). Post offices located in higher population density areas (≥11 people per square mile) were randomly selected (total post offices = 19; total post office boxes = 15,441) (Exhibit 1).

The total number of returned surveys was 3,003 for an overall response rate of 12.7%. A total of 2,950 surveys provided usable responses for analysis. Responses were analyzed with SPSS version 14.0. Chi Square was used to test for differences between groups with a *P*-value less than .05 considered statistically significant. When multiple comparisons were made adjustments were made to account for alpha inflation.

Sample Demographics are presented in Exhibit 12.

A total of 41.4% of the sample lives in a low-income household (<200% FPL).

Exhibit 12: Sample Demographics

Characteristics	Frequency	Percent
Federal Poverty Level[33]		
≤99%	416	16.2
100%-199%	645	25.2
200%-299%	491	19.2
≥300%	1009	39.4
Total	2561	100
Ethnicity		
White	2459	84.2
African American	7	0.2
Latino/Latina	34	1.2
Asian	13	0.4
Native American	148	5.1
Multiracial	173	5.9
Other	87	3.0
Total	2921	100
Gender		
Female	1882	64.1
Male	1053	35.9
Other	2	0.1
Total	2937	100
Age (mean = 55.3)		
18-29	173	6.0
30-39	240	8.3
40-49	455	15.7
50-59	930	32.2
60-69	656	22.7
70-79	310	10.7
≥ 80	126	4.4
Total	2890	100
County of Residence		
Del Norte	421	14.3
Humboldt	880	29.8
Trinity	940	31.9
Mendocino	705	23.9
More than 1 of above	4	0.1
Total	2950	100

Source: Rural Health Information Survey, 2006, California Center for Rural Policy.

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Join us in the community...

The California Center for Rural Policy will continue to share research results with the community through briefs, reports and meetings. We plan to engage the community in dialogue about potential solutions and policy recommendations to address identified problem areas. We hope you will join us as we work together to improve health in our region. If you would like to receive information from CCRP please contact us to get on our mailing list: (707) 826-3400 or ccrp@humboldt.edu

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CCRP welcomes opportunities to collaborate with community partners for more in-depth research on this topic.

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The California Center for Rural Policy at Humboldt State University is a research center committed to informing policy, building community, and promoting the health and well-being of rural people and environments.

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