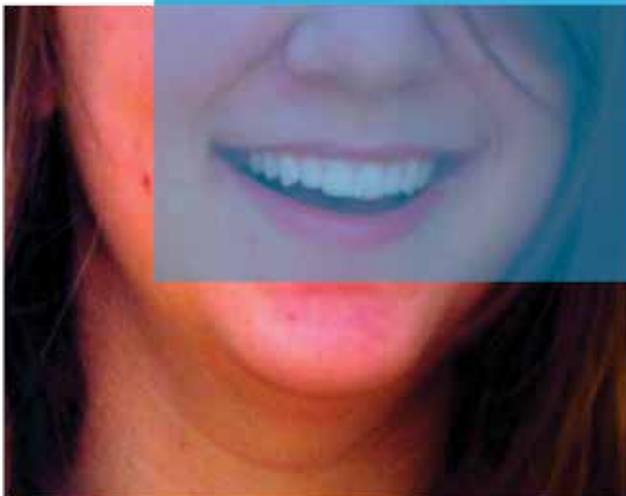




The Burden of Oral Disease in Idaho 2014



**Report prepared by:
Idaho State University
on behalf of the
Idaho Oral Health Program,
Department of Health and Welfare,
Division of Public Health**



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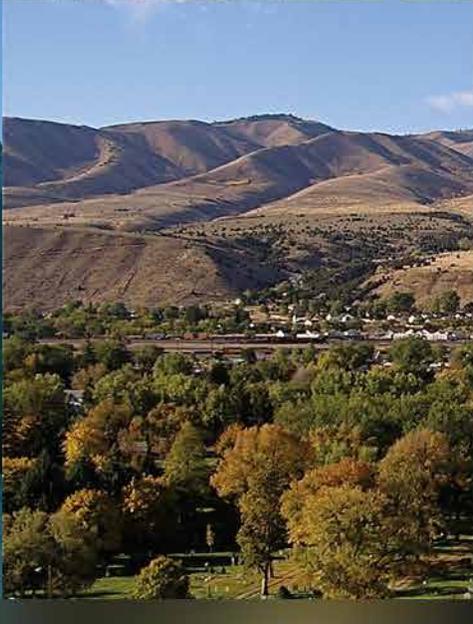
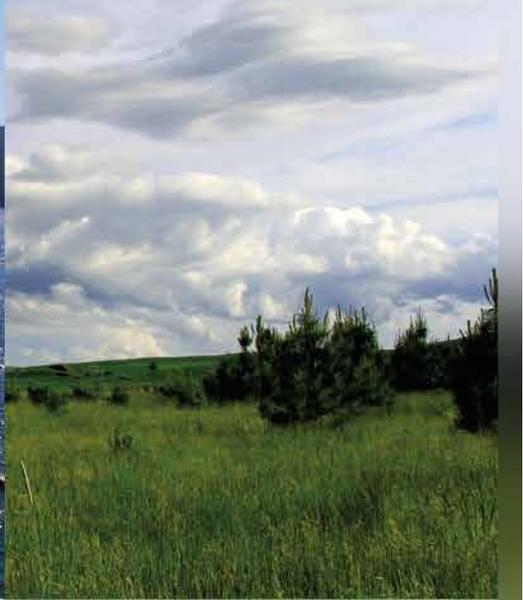
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Contents

7	Executive Summary	
8	Background	8 Overview of Oral Health Problems 9 Idaho Demographics 9 Idaho Public Health Districts
10	National and State Objectives on Oral Health	
17	Burden of Oral Disease	17 Dental Caries 18 Prevalence of Dental Caries Among Third-Grade Students 19 Prevalence of Untreated Tooth Decay 20 Need for Restorative Dental Services 20 Periodontal Disease 22 Tooth Loss 23 Oral and Pharyngeal Cancers 27 Developmental Disorders
28	Other Oral Health Conditions	28 Intentional and Unintentional Injuries 28 Chronic And Disabling Conditions: Oral-Facial Pain and Temporomandibular Disorders
29	Availability and Access to Oral Healthcare Services	29 Oral Health Coverage 30 Workforce Capacity 32 Oral Health Services 32 Idaho Oral Health Program and Public Health Districts 33 Community Health Centers and Federally Qualified Health Centers 33 Delta Dental of Idaho 33 Head Start of Idaho
35	Relationship Between Oral Conditions and Negative Health Outcomes	35 Diabetes 36 Cardiovascular Disease 36 Adverse Pregnancy Outcomes
37	Strategies to Prevent and Reduce Oral Conditions	37 Community Water Fluoridation 39 Dietary Fluoride Supplementation 39 Fluoride Mouthrinses 40 Fluoride Varnish 41 Dental Sealants 42 Preventive Visits 42 Annual Dental Examination 44 Dental Professional Teeth Cleaning 44 Dental Care Among Pregnant Women 46 Oral Health Education 46 Screening for Oral and Pharyngeal Cancer 47 Multivitamin Use During Pregnancy
48	Factors Known to Increase the Risk for Oral Conditions	48 Tobacco Use 50 Methamphetamine Use 50 Sweetened Beverages Consumption
51	Conclusions	
52	References	
54	Appendix	

List of Figures

9	Figure 1: Idaho Public Health Districts, counties and population size served (2012 estimates)
12	Table 1: Healthy People 2020 oral health objectives, target levels, and current measures in the United States and Idaho
16	Figure 2: National Oral Health Surveillance System (NOHSS), Idaho profile
17	Figure 3: Caries prevalence (%) rates in children and youth, 2011-2012
18	Figure 4: Prevalence (%) of dental caries (treated and untreated) among public school third-grade students, 2001-2013
19	Figure 5: Prevalence (%) of untreated tooth decay among public school third-grade students, 2001-2013
20	Figure 6: Percentage of public school third-grade students needing restorative dental services, 2001-2013
21	Figure 7: Percentage of self-reported oral health manifestations during pregnancy, 2005-2010
22	Figure 8: Percentage of tooth loss due to tooth decay or gum disease among adults, 2006-2010
23	Figure 9: Incidence rate (%) of oral and pharyngeal cancers by sex, 1999-2012
24	Figure 10: Morbidity-related measures for oral and pharyngeal cancer by sex, 1999-2012
26	Figure 11: Mortality-related measures for oral and pharyngeal cancer, 1999-2012
27	Figure 12: Natality-related measures and congenital abnormalities, 2007-2012
29	Figure 13: Percentage of adults (18 y+) without dental insurance, 2006-2012
30	Figure 14: Estimated number of oral health personnel, 2009-2014
31	Figure 15: Health Professional Shortage Areas (HPSA) in Idaho
34	Figure 16: Number of children enrolled in Head Start with a dental home at the beginning and end of enrollment year 2012-2013, by city and grantee
35	Figure 17: Prevalence (%) of diabetes in Idaho adults, 2013
36	Figure 18: Prevalence (%) of cardiovascular disease in adults, 2013
38	Figure 19: Access to community water fluoridation 2005-2009
40	Figure 20: Number of fluoride varnish applications in children by age and Public Health District, 2012-2013
41	Figure 21: Percentage of public school third-grade students needing dental sealants, 2001-2013
42	Figure 22: Percentage of adults (18 y+) without an annual dental examination, by demographic and other factors, 2006-2012
44	Figure 23: Percentage of adults (18 y+) who had their teeth cleaned by a dental professional within the past year, 2006-2010 Figure 24: Percentage of pregnant women who received information, during any prenatal visit, on importance of regular dental care
45	Figure 25: Lack of routine dental care during pregnancy, %, selected years
46	Figure 26: Measures of oral health education in high schools
47	Figure 27: Pregnancy-related multivitamin intake, %
48	Figure 28: Percentage of tobacco use among high school students, 2007 and 2013
49	Figure 29: Percentage of cigarette smoking among adults, 2010
49	Figure 30: Percentage of women who smoked cigarettes during last trimester of pregnancy, 2010



Executive Summary

Oral health is an important component of general health and is essential for an adequate quality of life. Oral health encompasses the health of teeth, lips, tongue, salivary glands, masticatory muscles, jaws, palates, and throat. Proper oral health refers to the lack of oral disease such as dental caries, periodontal infections, tooth loss, and oropharyngeal cancers, but it also includes the ability to achieve basic oral functions including speaking, smiling, chewing, and swallowing, among others.

Over the past few decades, improvement in the oral health status of communities across the U.S. has largely been attributed to access to and utilization of oral healthcare services, availability of community water fluoridation, and increased tobacco control efforts. Although Idaho has also seen an improvement in oral health status, barriers to implementing population-level prevention and intervention measures, such as population distribution, geography, healthcare services for the underserved, and funding, have impeded the impact of efforts.

This report presents the most current data available on oral health status in Idaho. It compares Idaho oral health indicators with Healthy People 2020 (HP2020) objective targets, measures at the national level, and describes trends of these indicators over the past years. This report also identifies oral health conditions in selected populations, and provides an update on the use of professional oral healthcare services. In addition, it identifies programs and organizations with a focus on oral health in Idaho and suggests potential partnerships to improve oral healthcare outcomes throughout the state.

Results of this report can be used to guide stakeholders and policymakers in identifying and prioritizing oral health prevention and intervention strategies. Data throughout this report indicate the need to improve access to oral healthcare across the population, including children, the elderly, and low-income and racial/ethnic minority populations. Factors necessary for improving access include the increased availability of free or low-cost services and the development and/or expansion of community-level prevention activities, such as community water fluoridation and school-based dental sealant clinics. In addition, oral healthcare throughout the lifespan needs to be addressed as evidenced by the number of children, adults, and elderly with untreated dental caries, periodontal disease, and underutilization of oral healthcare services.

Background

Overview of Oral Health Problems

Good oral health is critical for achieving overall health and quality of life (1). Oral health problems are highly prevalent globally. In 2010, approximately 4 billion people were affected by an oral health problem. It has been estimated that untreated caries in permanent teeth is the most prevalent health condition in the global population (35%, all ages combined). Other highly prevalent oral health conditions are periodontitis (11%, 6th most prevalent), caries of deciduous teeth (9%, 10th most prevalent), and tooth loss (2%, 36th most prevalent). Oral conditions are also ranked among the top 100 specific causes of disease burden (as measured by Disability Adjusted Life Years, DALYs), with periodontitis ranked 77th, untreated caries ranked 80th, and severe tooth loss ranked 81st. The high prevalence of oral conditions together with their associated moderate disability, makes them substantial contributors of healthy years lost worldwide. It has been estimated that oral conditions combined are responsible for an average health loss of 224 years per 100,000 people (2).

Because the burden of oral conditions increases with age, we expect that the health burden of oral problems will continue to increase with the globally aging population. More important, despite great achievements in the oral health of populations worldwide, oral health problems are highly prevalent in many communities around the world, especially among the disadvantaged groups (3).

Oral health is an important component of general health and is essential for an adequate quality of life. Despite the enormous improvements made in oral health worldwide, oral health is a significant financial burden to all countries in the world; it is considered the fourth most expensive disease to treat (1). In the U.S., much improvement in oral health has been attained over the past few decades, especially in reducing dental caries, periodontitis, and tooth loss (4). These advances are a consequence of individual and community interventions such as enhanced oral hygiene measures, community water fluoridation and tobacco control. Yet, there is still much work to be done in increasing access to oral healthcare and reducing the health and financial burden associated with oral health conditions, especially among the underprivileged populations. To address barriers to improving oral health among all Americans, measures to improving access to care and reducing health disparities at the national and state level are currently being implemented and progress is evaluated using measurable goals.





Idaho Demographics

Idaho is located in the Northwest bordering Washington, Oregon, Nevada, Utah, Montana, Wyoming, and the Canadian province of British Columbia. It is the 14th largest state in the U.S. In 2010, the estimated population of Idaho was 1,634,000, which is approximately 2% greater than the estimated 1,596,000 in 2012.

The population in Idaho is predominantly white non-Hispanic (84%). The proportion of other minority populations such as Black or African American, American Indian or Alaskan native, Asian, and Pacific Islander remains low (<10%). The Hispanic population, on the other hand, is on the rise; there was an increase in the proportion of Hispanics from 8% in 2000 to 11% in 2010. The most common language spoken at home is English (90%) followed by Spanish (8%).

Like many other states in the U.S., the population in Idaho is aging, yet it is a younger population as compared to the U.S. population. The median age of Idahoans in 2010 was 35.4 years, below the national median of 37.2 years.

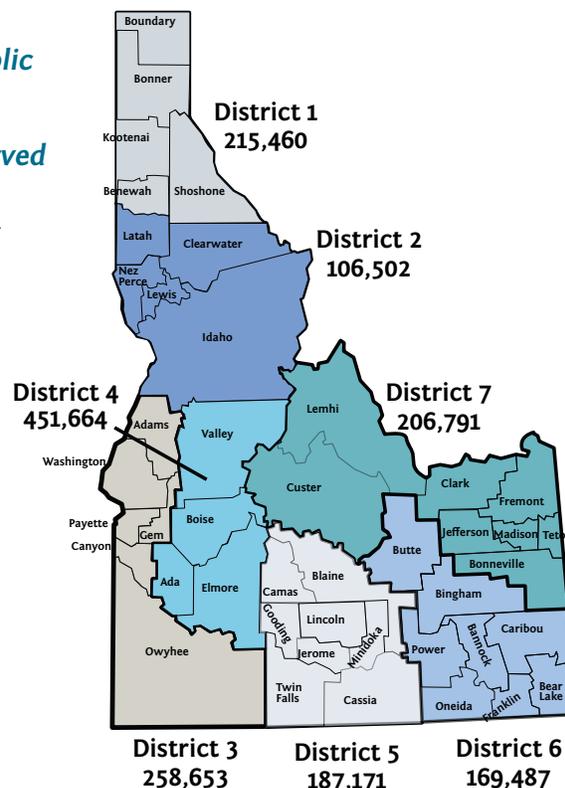
About one third of the population in Idaho is considered to live in a rural setting. Twelve of its 44 counties are considered 100% rural and in 16 counties more than half of their population is considered to be rural. For the 2008-2012 period, the median income in Idaho was US\$ 47,015, about \$6,000 below the national median (US \$ 53,046). Despite the difference in median income, the percent of Idaho families whose income is below the poverty level is at the national average of 11%.

Idaho Public Health Districts

Idaho has seven Public Health Districts (PHD) governed by independent boards of health. Each health district serves as a primary outlet for public health services, including oral health. The PHDs work closely with the Idaho Department of Health and Welfare (IDHW) and other state agencies and programs. Figure 1 shows the seven PHDs, their catchment areas and the population size served by each PHD.

Figure 1: Idaho Public Health Districts, counties and population size served (2012 estimates)

Data source: Idaho Vital Statistics, 2012



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National and State Objectives on Oral Health

Healthy People is a nationwide initiative focused on achieving health promotion and disease-prevention goals set by the United States Department of Health and Human Services. Healthy People 2020 (HP2020) is the result of a long process with objectives developed by diverse people from multiple organizations, and is based on accomplishments of previous Healthy People initiatives including Surgeon General's Reports, and Healthy People 1990, 2000, and 2010. Typically, Healthy People objectives focus on interventions designed to reduce disease, disability and premature death in Americans, at the individual and population levels. In addition, HP2020 has incorporated objectives focused on reducing health disparities and addressing social determinants of health, and has expanded from the previous topic areas to include additional areas of current interest such as genomics, global health, healthcare-associated infections, among others.

HP2020 includes more than 1,200 objectives organized in 42 focus areas. One of these areas is oral health, with 33 objectives. A total of 28 objectives are measurable, which means that they have a reliable data source, a baseline measure, a target to be achieved by 2020, and a target-setting method. Five objectives are developmental, which means that they are important enough to be included in the national agenda but currently have no national baseline data. Oral health goals are focused on preventing and controlling oral and craniofacial conditions, and improving access to oral healthcare and prevention programs. Oral and craniofacial conditions include dental caries, periodontal disease, cleft lip and palate, oral and facial pain, and oral and pharyngeal cancers.

Oral Health goals are focused on preventing and controlling oral and craniofacial conditions, and improving access to oral health-related care and preventive services.

Besides the HP2020 oral health objectives, there are additional oral health indicators monitored by the National Oral Health Surveillance System (NOHSS). The NOHSS is a collaborative effort between the Division of Oral Health from the Centers for Disease Control (CDC) and the Association of State and Territorial Dental Directors (ASTDD), with a focus on monitoring the burden of oral conditions in childhood and adulthood, the use of the oral healthcare system, and the status of community water fluoridation. Monitoring of these additional oral health indicators is used to evaluate progress of state oral health programs and complement the information provided by the HP2020 oral health objectives to better assess the oral health status of populations at the local and state level.

Monitoring state health indicators relies on collecting information in various ways and from different sources to characterize the oral health status of the population of interest. In Idaho, data for child indicators come from the Idaho Smile Survey. This survey is conducted among third-grade students from public schools at four-year intervals, and examines children for decayed, missing or filled primary and permanent teeth, need for restorative and preventive dental services, and the presence of dental sealants and fluorosis.

Most data for adult indicators in Idaho are obtained from the Behavioral Risk Factor Surveillance System (BRFSS), a nation-wide surveillance system developed to monitor major behavioral risks among adults associated with premature morbidity and mortality. Results from BRFSS have national- and state-representativeness. Data for cancer-related indicators in Idaho come from the Cancer Data Registry of Idaho (CDRI), a population-based cancer registry responsible for collecting incidence and survival data on all cancer



patients who reside or were diagnosed with cancer in the state of Idaho. Like all national surveillance reports, information describing the percentage of the population in Idaho on community water systems who receive optimally fluoridated drinking water relies on reports from the Water Fluoridation Reporting System (WFRS).

Table 1 shows the HP2020 oral health objectives, the target to be achieved by 2020, and when available, the most current measure for the U.S. and for the state of Idaho. Out of the 33 objectives, Idaho currently monitors eight of them. Of those, five objectives met or exceeded the 2020 target, one did not meet but moved



toward the target, one moved away from the target, and one was a developmental objective, therefore, it had no target or baseline measure. Thus far, substantial progress was achieved in HP2020 objectives for the oral health focus area in Idaho. A total of six (86%) of the seven monitored oral health objectives with baseline and follow-up measures exceeded, met, or moved toward the target.



Dental caries experience in primary or permanent teeth among children eight years of age was reduced from 65% in 2009 to 62% in 2013. Even though progress was made on this objective, the HP2020 target of 49% is far from being met, and both baseline and follow-up measures for Idaho are much higher than the baseline measure for the U.S. of 54% (1999-2004). On the other hand, untreated dental decay among children 8 years of age was reduced from 21.4% in 2009 to 21% in 2013. Because the baseline measure was below the target of 26% for this objective, the target was exceeded. These data suggest that even though the dental caries experience in children eight years of age is above the national average, dental health professionals are above the national average on treating these conditions.

Tooth loss due to dental caries or periodontal disease among adults 65-74 years of age increased from 15% to 16%. Although the HP2020 target for this objective was met, the current measure moved away from the target.

Table 1: Healthy People 2020 oral health objectives, target levels, and current measures in the United States and Idaho

HP2020 objective		HP2020 target	Baseline measure for the U.S. (year)	Current measure for the U.S. (year)	Baseline measure for Idaho (year)	Current measure for Idaho (year)	Progress towards meeting target in Idaho
1. Dental caries experience							
1.1	Primary teeth – children 3-5 years	30.0%	33.3% (1999-2004)				
1.2	Primary or permanent teeth – children 6-9 years	49.0%	54.4% (1999-2004)		65.4% (2000-2001)	62% (2013)	Not met; moved toward target
1.3	Permanent teeth – adolescents 13-15 years	48.3%	53.7% (1999-2004)				
2. Untreated dental decay – children							
2.1	Primary teeth – children 3-5 years	21.4%	23.8% (1999-2004)	14.2% (2009-2010)			
2.2	Primary or permanent teeth – children 6-9 years	25.9%	28.8% (1999-2004)	16.9% (2009-2010)	27.3% (2000-2001)	21% (2013)	Exceeded target
2.3	Permanent teeth – adolescents 13-15 years	15.3%	17.0% (1999-2004)	11.4% (2009-2010)			
3. Untreated dental decay – adults							
3.1	Dental decay – adults 35-44 years	25%	27.8% (1999-2004)				
3.2	Coronal caries – adults 65-74 years	15.4%	17.1% (1999-2004)				
3.3	Root surface caries – adults 75 years and older	34.1%	37.9% (1999-2004)				
4. Tooth loss							
4.1	Ever having a permanent tooth extracted because of dental caries or periodontal disease – adults 45-64 years	68.8%	76.4% (1999-2004)	96.2% (2009-2010)			
4.2	Losing all natural teeth – adults 65-74 years	21.6%	24.0% (1999-2004)	15.3% (2009-2010)	15.4% (2008)	16.1% (2012)	Exceeded target
5. Moderate or severe periodontitis – adults aged 45-74 years							
		11.5%	12.8% (2001-2004)				



HP2020 objective	HP2020 target	Baseline measure for the U.S. (year)	Current measure for the U.S. (year)	Baseline measure for Idaho (year)	Current measure for Idaho (year)	Progress towards meeting target in Idaho
6. Early detection of oral and pharyngeal cancers						
	35.8%	32.5% (2007)	31.2% (2009)	39.7% (2007)	37.2% (2012)	Exceeded target
7. Annual use of oral healthcare system – children, adolescents, and adults						
	49.0%	44.5% (2007)	42.1% (2010)	68% (2008)	66.7% (2013, adults only)	Exceeded target
8. Annual preventive dental services for low-income children and adolescents						
	33.2%	30.2% (2007)	35.2% (2010)			
9. School-based health centers with oral health components						
9.1	Dental sealants	26.5%	24.1% (2007-2008)			
9.2	Dental health	11.1%	10.1% (2007-2008)			
9.3	Topical fluoride	32.1%	29.2% (2007-2008)			
10. Availability of oral healthcare program						
10.1	In Federally Qualified Health Centers (FOHCs) that have an oral healthcare program	83.0%	75.0% (2007)			90% (2012) Exceeded target
10.2	In local health departments	28.4%	25.8% (2008)	100% (2005)	100% (2009)	Exceeded target
11. Annual oral health services among patients served by Federally Qualified Health Centers						
		33.3%	17.5% (2007)			
12. Dental sealants on one or more molar teeth						
12.1	Primary teeth – children 3-5 years	1.5%	1.4% (1999-2004)			
12.2	Permanent teeth – children 6-9 years	28.1%	25.5% (1999-2004)	32.1% (2009-2010)	52.0% (2000-2001)	58.4% (2013) Exceeded target

HP2020 objective		HP2020 target	Baseline measure for the U.S. (year)	Current measure for the U.S. (year)	Baseline measure for Idaho (year)	Current measure for Idaho (year)	Progress towards meeting target in Idaho
12.3	Permanent – children 13-15 years	21.9%	19.9% (1999-2004)	50.5% (2009-2010)			
13. Population served by optimally fluoridated community water							
		79.6%	72.4% (2008)	74.6% (2010)	31.3% (2006)	36.1% (2010)	Not met; moved toward target
14. Counseling focused on reducing risk factors associated with oral health problems							
14.1	(Developmental) Tobacco use						
14.2	(Developmental) Annual screening of oral and pharyngeal cancer by an oral health professional					24.8% (2011)	No baseline or target
14.3	(Developmental) Testing or referral for glycemic control by a dental health professional						
15. Expansion of existing oral health system infrastructure							
15.1	(Developmental) Availability of state-level system for recording cleft lips and cleft palates						
15.2	(Developmental) Availability of state-level system for referral for cleft lips and cleft palates to rehabilitative teams						
16. Availability of craniofacial health surveillance system at the state-level							
		51 (50 States and Dist. of Columbia)	32 (2009)			In process	



HP2020 objective	HP2020 target	Baseline measure for the U.S. (year)	Current measure for the U.S. (year)	Baseline measure for Idaho (year)	Current measure for Idaho (year)	Progress towards meeting target in Idaho
17. Expansion in the provision of oral health services						
17.1	State and local dental programs that serve 250,000+ persons directed by dental public health professionals	25.7%	23.4% (2008)		In process	
17.2	Indian Health Service and Tribal dental programs directed by public health professionals	12	11			No Indian Health Service area in Idaho serve > 30,000 people



Data sources:

For the U.S.: objectives 1, 2, 3, 4, 5, 12 = National Health and Nutrition Examination Survey (NHANES); objective 6 = Surveillance, Epidemiology, and End Results (SEER); objectives 7, 8 = Medical Expenditure Panel Survey (MEPS); objective 9 = School-Based Health Center Capital Program (SBHCC); objectives 10.1, 11 = Uniform Data System (UDS); objectives 10.2, 16, 17.1 = Association of State and Territorial Dental Directors (ASTDD); and objective 13 = Water Fluoridation Reporting System (WFRS).

For Idaho: objectives 1.2, 2.2, 12.2 = Idaho Smile Survey; objectives 4, 6, 7, 14.2 = Idaho Behavioral Risk Factors Surveillance System (BRFSS); objective 10.1 = Uniform Data System (UDS); objective 10.2 = Idaho Department of Health and Welfare (IDHW); objective 17.1 = CDC webpage.

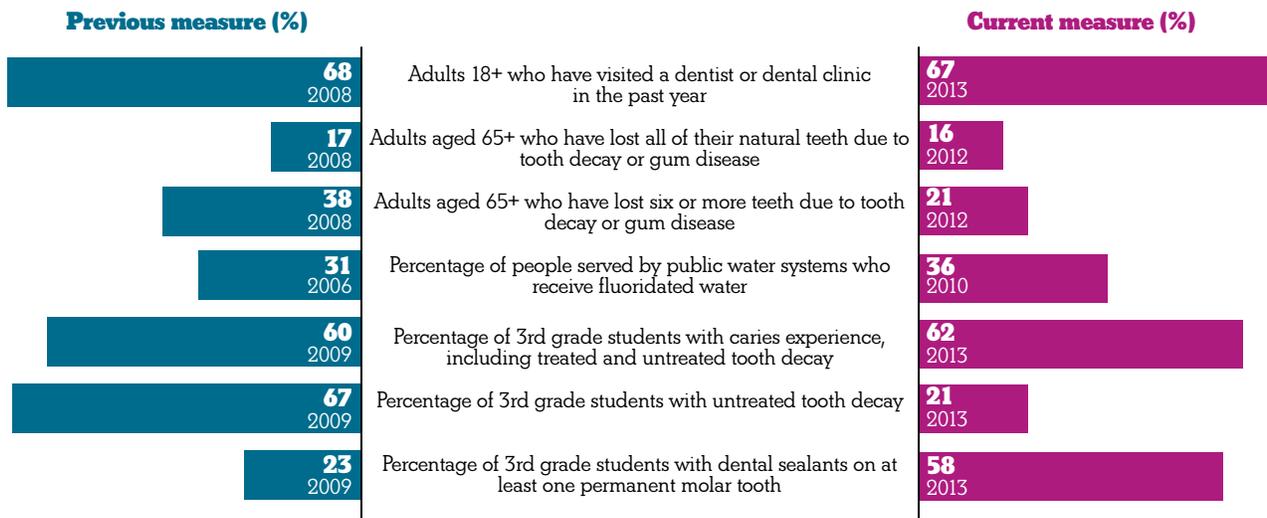
Notes: Idaho Smile Survey is conducted among 3rd grade students (8-9 year-old children); objective 14.2 for Idaho refers to the proportion of adults who were told that they were being examined for signs of oral cancer at their last dental visit. The Idaho BRFSS does not directly ask about pharyngeal cancer.

Figure 2 shows oral health indicators monitored by the National Oral Health Surveillance System (NOHSS), comparing the most currently available data for Idaho and the previous data. Out of the 7 indicators there has been a clear improvement in three:

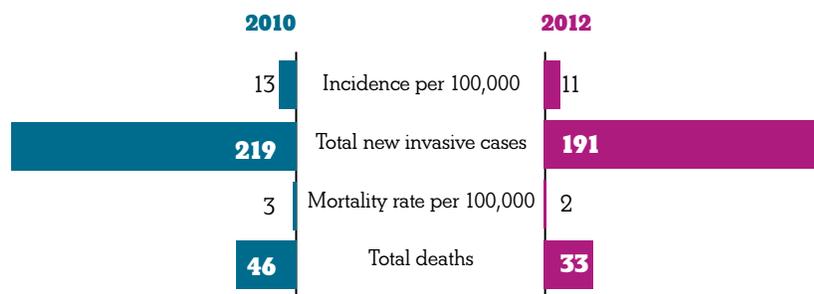
- A reduction in the proportion of adults aged 65+ who lost six or more teeth due to tooth decay or gum disease from 38% in 2008 to 21% in 2012.
- A reduction in the proportion of third-grade students with active untreated tooth decay from 23% in 2009 to 21% in 2013.
- An increase in the proportion of children who received dental sealants on at least one permanent molar tooth from 52% in 2009 to 58% in 2013.

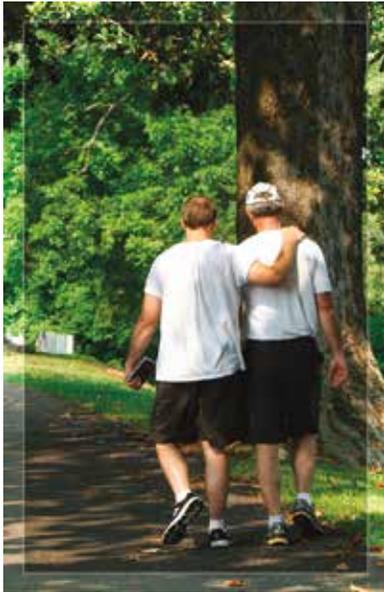
Figure 2: National Oral Health Surveillance System (NOHSS), Idaho profile

Data sources: Dental visit, teeth cleaning, complete tooth loss, lost 6 or more teeth = Idaho Behavioral Risk Factor Surveillance System (BRFSS); fluoridation status = Water Fluoridation Reporting System (WFRS); caries experience, untreated tooth decay and dental sealants = Idaho Smile Survey; cancer of the oral cavity and pharynx = Cancer Data Registry of Idaho (CDRI).
 Notes: Incidence and mortality rates calculated using the U.S. 2000 standard population.



Cancer of the oral cavity and pharynx: Oral and pharyngeal comprises a diverse group of malignant tumors that affect the oral cavity and pharynx





Burden of Oral Disease

Idaho tracks the oral health status of its population using diverse data sources and several indicators; however, there are many gaps of important information to fill to be able to better characterize the burden of oral disease in the state. This report presents the most currently available oral health data for Idaho. When data is available and comparable, trends are presented. Because it is known that oral health conditions disproportionately affect certain population groups, data are presented, when possible, stratified by demographic factors such as sex, socioeconomic status, education, and race or ethnicity.

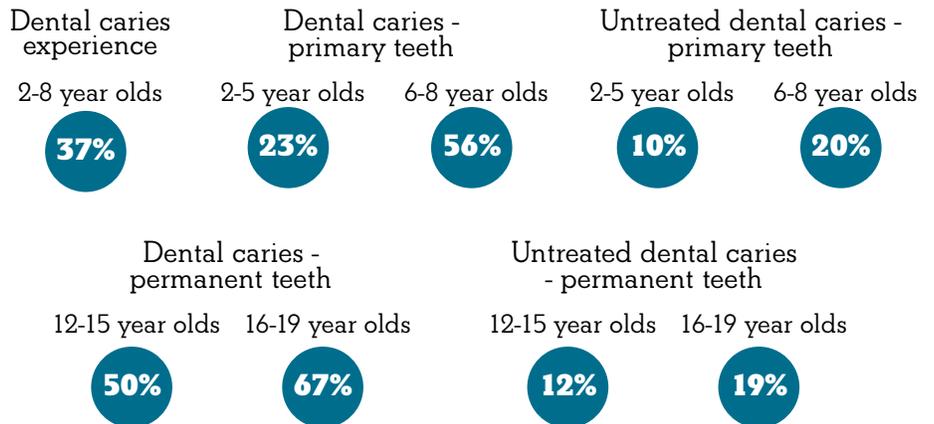
Dental Caries

Dental caries (tooth decay) is the loss of minerals and dissolution of tooth enamel due to acid production by bacterial fermentation of food left on the tooth surface. Dental caries are commonly referred to as cavities, although the cavity is just a late manifestation of the tooth decay. If dental caries progress, the infection can extend through the dentin and the pulp tissue, which untreated, can cause toothache and progress into an abscess and septicemia. Dental caries can occur at any age, and in primary or permanent teeth. Although there is a genetic component in the development of dental caries, the presence of certain negative behaviors such as poor diet, poor oral hygiene, and altered volume and composition of saliva, also increase the risk of developing dental caries.

Dental caries is the most common disease in the world and is the most common disease in childhood in the U.S. Figure 3 shows caries prevalence rates among children and youth in selected age and ethnic groups (5).

Figure 3: Caries Prevalence Rates in Children and Youth

Data source: National Center for Health Statistics (NCHS)



Disparities in caries prevalence



Dental caries is also a common disease in U.S. adults. Virtually all dentate adults 20-64 years in the U.S. (92-96%) have dental caries (treated and/or untreated) in their teeth, and a large proportion (26-31%) have untreated tooth decay. Similar prevalence rates are observed for seniors 65+ years (5).

Prevalence of Dental Caries Among Public Third-Grade Students

Idaho tracks various indicators of oral health in children through the Idaho Smile Survey. This survey, beginning in the 2001 school year, is conducted at four year intervals. About 5,000 third-grade students are examined each year for the survey.

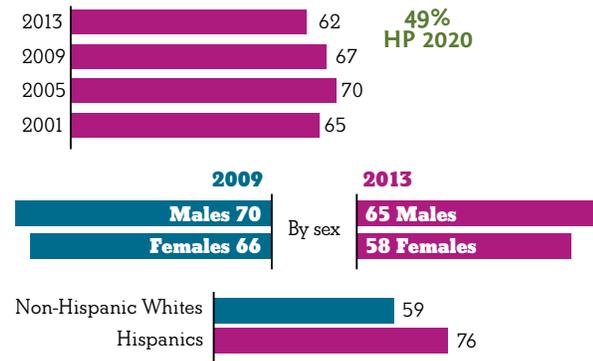


Figure 4 shows the prevalence of dental caries (treated and untreated) among survey participants. The prevalence of dental caries has remained similar statewide since 2001. *As mentioned earlier, the HP2020 target of caries experience among children 6-9 years of 49% has not been met for third-grade students in Idaho.* Dental caries are more frequent among those with lower income and ethnic minorities. Even though income data are not collected as part of the survey, schools are categorized according to the rates of participation in Free and Reduced School Lunch Programs (FRSLP); higher rates of participation indicate a larger proportion of families considered to be low-income. From 2001-2013, the prevalence rate of dental caries in schools with the greatest rates of participation in FRSLP was higher than for schools with the lowest rates of participation, and in Hispanics greater than in non-Hispanic Whites.

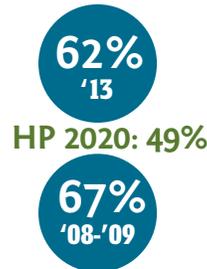
Figure 4: Prevalence (%) of dental caries (treated and untreated) among public school third-grade students, 2001-2013

Data source: Idaho Smile Survey, 2001-2013

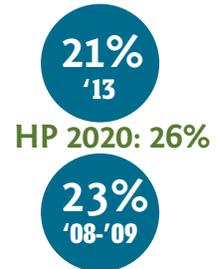
Total prevalence rates (%)



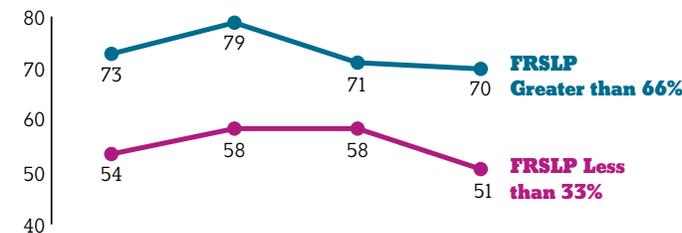
Dental caries experience among third-graders



Untreated dental decay in primary or permanent teeth among third-graders



School participation rate in FRSLP (%)



Prevalence of Untreated Tooth Decay

Figure 5 shows the prevalence of active untreated tooth decay among survey participants. The table shows that the prevalence of active untreated tooth decay has declined from 2001-2013. *The HP2020 target of untreated tooth decay in children 6-9 years is 26%, which was met for third-grade students in Idaho from 2009 onwards.* As with dental caries, the prevalence rate of untreated tooth decay in schools with the greatest rates of participation on FRSLP was higher than for schools with the lowest rates of participation, and in Hispanics greater than in non-Hispanic Whites.

The rate of severe decay for 2013 (defined as four or more teeth with active decay) was significantly less than in 2005 and 2009.

Figure 5: Prevalence (%) of untreated tooth decay among public school third-grade students, 2001-2013

Data source: Idaho Smile Survey, 2001-2013

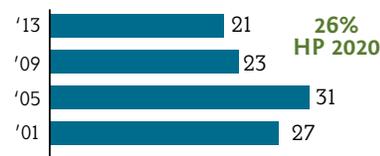
Third-grade children with treated and untreated dental caries, '13



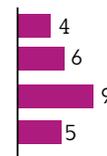
Third-grade children with untreated tooth decay, '13



Any untreated tooth decay (%)



Severe (4+) untreated tooth decay (%)



School participation rate in FRSLP



Race/ethnicity

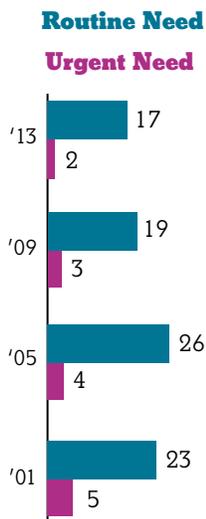


Need for Restorative Dental Services

The Idaho Smile Survey also examines participants according to their need for restorative dental services such as fillings. Figure 6 presents the proportion of survey participants with restorative dental service needs. The figure shows that the need for restorative dental services, both routine and urgent, has declined since 2001.

Figure 6: Percentage of public school third-grade students needing restorative dental services, 2001-2013

Data source: Idaho Smile Survey



Periodontal Disease

The two main types of periodontal disease are gingivitis and periodontitis. Gingivitis refers to the infection of the gums and results from accumulation of dental plaque and the consequent inflammatory response. Early stages of gingivitis are reversible with proper oral hygiene. Because steroid hormones can induce proliferation of oral bacteria, adolescents, pregnant women, and those in steroid treatment or using oral contraceptives are at increased risk of developing gingivitis. Other risk factors for gingivitis include use of certain medications, smoking, or exposure to extreme stress.

Periodontitis refers to the infection of the soft tissue and bone supporting the teeth. Periodontitis is not necessarily preceded by gingivitis, but it is usually accompanied by it. Periodontitis is typically a disease of adulthood, however the process usually begins in puberty. If these conditions remain untreated, they can lead to chronic infection and tooth loss. Periodontal disease is considered the leading cause of tooth loss in adults.

Currently, Idaho does not systematically monitor periodontitis-related indicators in the general population. The only group in which systematic self-reported information on gum disease is collected is pregnant women, as part of the Pregnancy Risk Assessment Tracking System (PRATS). Pregnant women are at a high risk of developing periodontitis, mainly due to vascular and hormonal changes exacerbating the buildup of bacterial plaque. Pregnant women of lower socioeconomic status, lower education, those who smoke and who are overweight are at the highest risk (6).

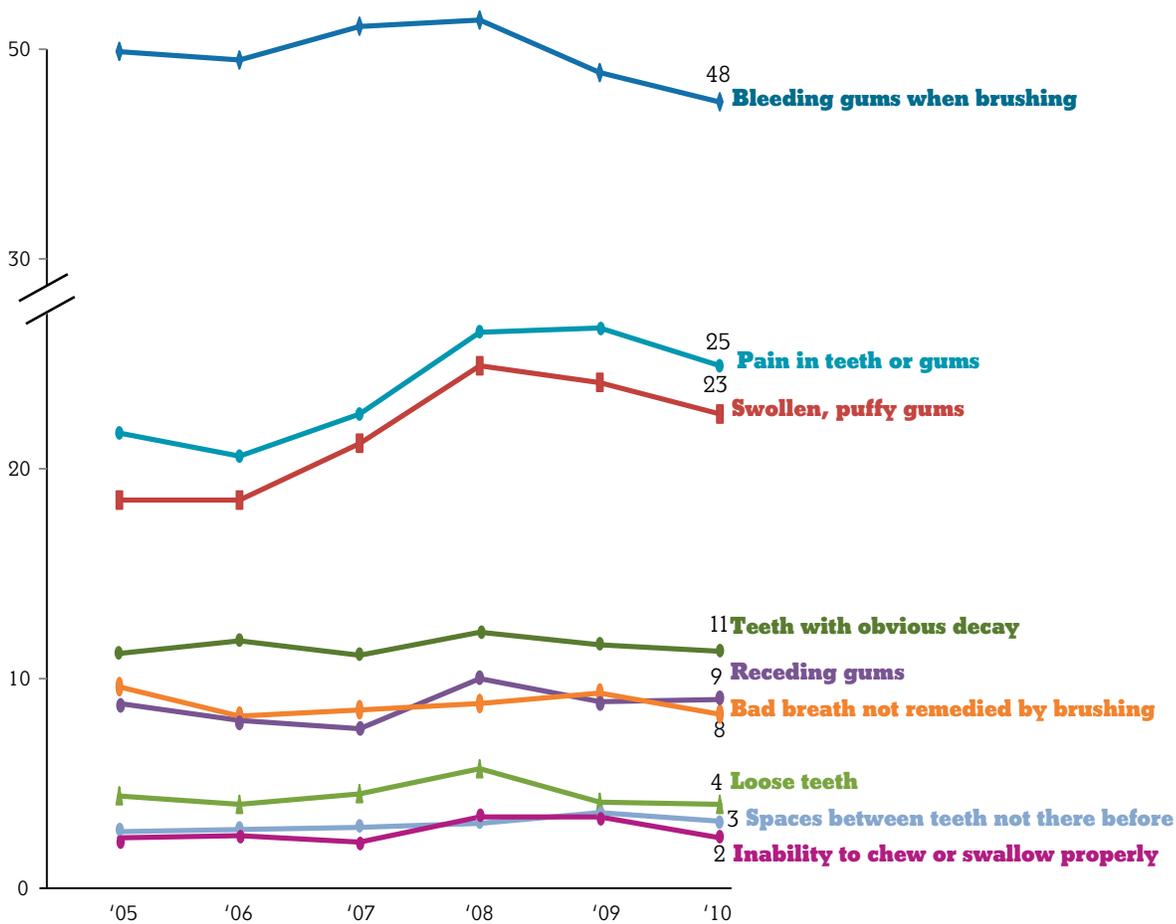


Pregnant women of lower socioeconomic status, lower education, those who smoke and who are overweight are at the highest risk for periodontitis.

PRATS is an annual survey conducted among new mothers in Idaho to evaluate maternal experiences and health practices around pregnancy that may affect pregnancy and child outcomes. PRATS is modelled after the Pregnancy Risk Assessment Monitoring System (PRAMS), a national survey on pregnancy outcomes, in which Idaho does not participate. The Bureau of Vital Records and Health Statistics within the IDHW is responsible for implementing PRATS. Figure 7 presents the prevalence of several oral health manifestations during pregnancy 2005-2010. On average, half of women reported bleeding gums when brushing, and one out of 4-5 had swollen or puffy gums or had pain in their teeth or gums.

Figure 7: Percentage of self-reported oral health manifestations during pregnancy, 2005-2010

Data source: Idaho Pregnancy Risk Assessment Tracking System (PRATS)



Tooth Loss

Tooth loss has serious adverse consequences in an individual. It may impair an individual's ability to chew and digest food which can have negative health and nutritional effects, but it may also have an impact on a person's psychosocial and emotional well-being. Although tooth loss is commonly perceived as a condition of the elderly, all ages can be affected. In children, dental caries is the major cause of tooth loss, however traumatic injury can also be a cause. In adults, periodontal disease is the leading cause of tooth loss. In the elderly, tooth loss is associated to dental plaque accumulation, gum recession, and dry mouth.

In general, males are at higher risk of losing teeth as compared to females, as are those with poorer oral hygiene, poorer dietary habits, smokers, those suffering from certain chronic diseases, and those with limited access to preventive dental health services.

Figure 8 shows the distribution in number of teeth lost due to tooth decay and gum disease among adults in Idaho, 2006-2010. Data for 2009 are not presented because that question was not included in the survey on that year. There were no significant changes in the distribution of the number of teeth lost due to tooth decay or gum disease throughout the years presented, although there was a decreasing trend in the proportion of adults with no teeth lost, from 60% on 2006 to 56% in 2010, and there was an increasing trend in the proportion of adults who lost 1-5 teeth from 27% in 2006 to 31% in 2010. On average, 5% of adults in Idaho have lost all their teeth because of tooth decay or gum disease.

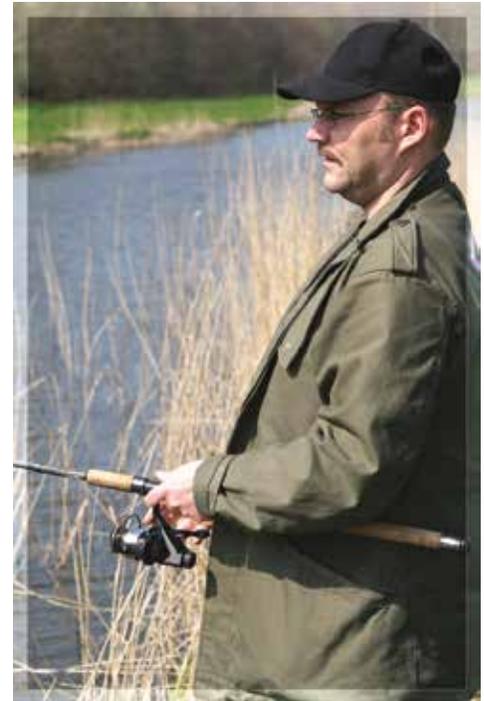
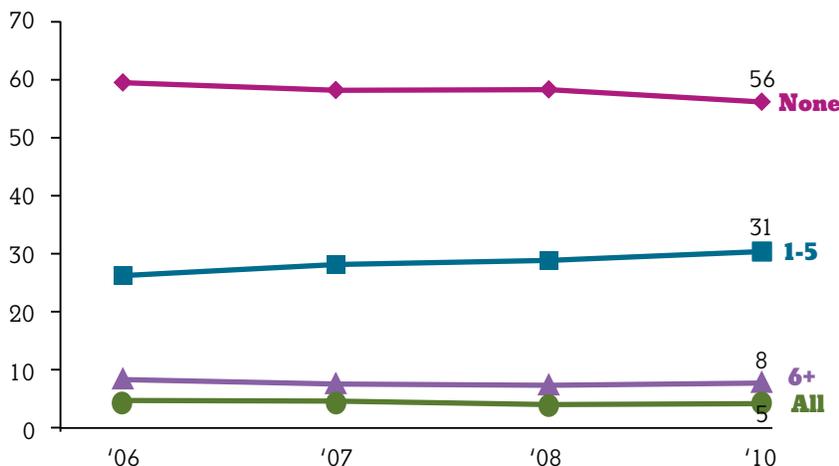


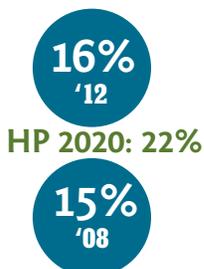
Figure 8: Percentage of tooth loss due to tooth decay or gum disease among adults, 2006-2010

Data source: Idaho Behavioral Risk Factor Surveillance System (BRFSS)

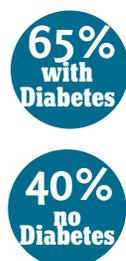


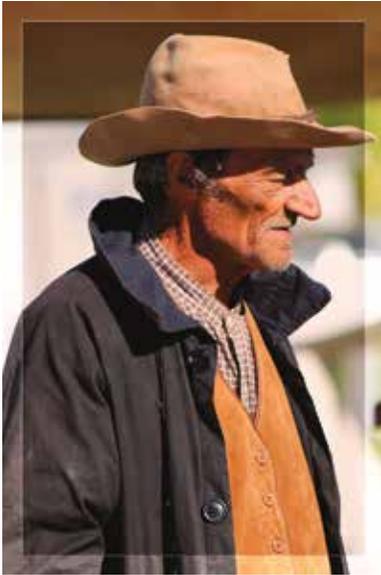
In general, males are at higher risk of losing teeth as compared to females, as are those with poorer oral hygiene, poorer dietary habits, smokers, those suffering from certain chronic diseases, and those with limited access to preventive dental health services.

Tooth loss due to dental caries or periodontal disease among adults 65-74 year olds



People who had one or more teeth removed due to periodontal disease or tooth decay, '10-'12





Oral and pharyngeal cancers detected at an early stage, '11

3%
Idaho

HP 2020: 36%

31%
U.S.

Oral health professional screening for oral and pharyngeal cancer, '11

25%
Adults

Oral and Pharyngeal Cancers

Cancer of the oral cavity and pharynx remains a significant issue in the U.S, accounting for 2-4% of all cancers. It has been estimated that each year around 30,000 new cases of oral and pharyngeal cancers are diagnosed, and around 8,000 people die due to these conditions. The 5-year survival rate has been estimated to be about 50%.

Risk factors for oral and pharyngeal cancers include older age (exponentially increases after age 60 years), being a male (6 times the risk as compared to females), being of black race, tobacco consumption (smoking or smokeless tobacco), heavy alcohol consumption, infection with Human Papilloma Virus (HPV), and certain types of environmental exposures. Between 2006 and 2010, oral and pharyngeal cancers were ranked 8th among all cancers in males, with an incidence of 16.5 per 100,000. Current national efforts to reduce morbidity and mortality associated with oral cancer have focused on primary prevention and early detection.

The latest available measures of morbidity and mortality due to oral and pharyngeal cancer in Idaho are from the year 2012. There were 201 (196 invasive and 5 in situ) newly-diagnosed cases of oral and pharyngeal cancer, corresponding to 3% of the 7,810 newly-diagnosed cancers in the state. Of the 196 invasive cases, 127 were in males and 69 in females. The incidence rate of invasive oral and pharyngeal cancer was 11.3 per 100,000, greater in males (15.1 per 100,000) than in females (7.7 per 100,000). A total of 33 deaths due to oral and pharyngeal cancers were observed in 2012, 28 in males and 5 in females.

Figure 9 shows the age-adjusted incidence rate of oral and pharyngeal cancers in Idaho between 1999-2012, by sex. There was no clear trend in the incidence rate of oral and pharyngeal cancers over the past 12 years, except for an increase in the years 2009 and 2010 followed by a subsequent decrease, for both males and females.

Figure 9: Incidence rate (%) of oral and pharyngeal cancers by sex, 1999-2012

Data source: Cancer Data Registry of Idaho (CDRI)

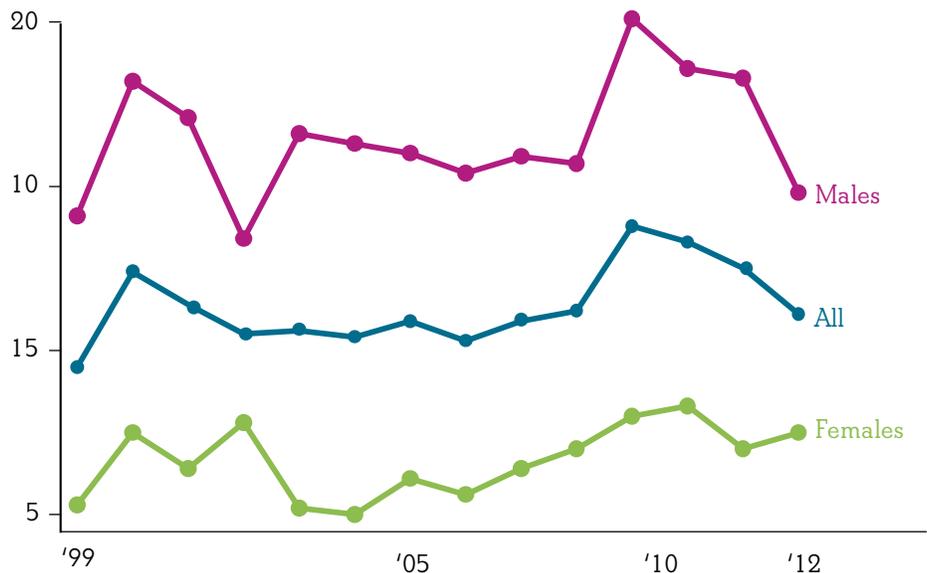


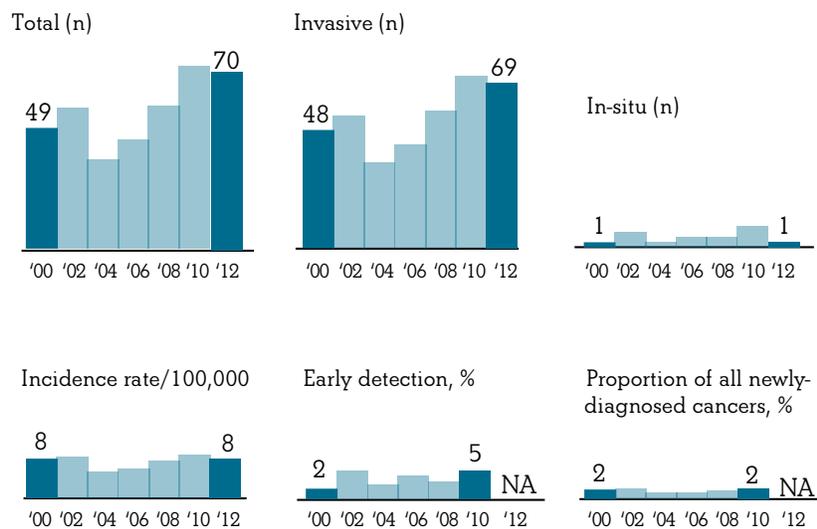
Figure 10 shows morbidity-related measures for oral and pharyngeal cancer from 1999 to 2012, by sex. For all available years, the number of invasive and in-situ oral and pharyngeal cancers was higher among males than females. At all time-points, the incidence in males was two to three-fold higher than the incidence among females. The proportion of early detection among oral and pharyngeal cancers remained low throughout the past 12 years. These measures are much lower than the most current national measure of 31% (2009) and the recommended target of 36%. Out of all newly-diagnosed cancers in Idaho, between 2-3% are of the oral cavity or the pharynx, within the national range of 2-4%. The median age at diagnosis of oral and pharyngeal cancers ranged between 61-65 years.

Figure 10: Morbidity-related measures for oral and pharyngeal cancer by sex, 1999-2012

Data source: Cancer Data Registry of Idaho (CDRI)



Females



Males

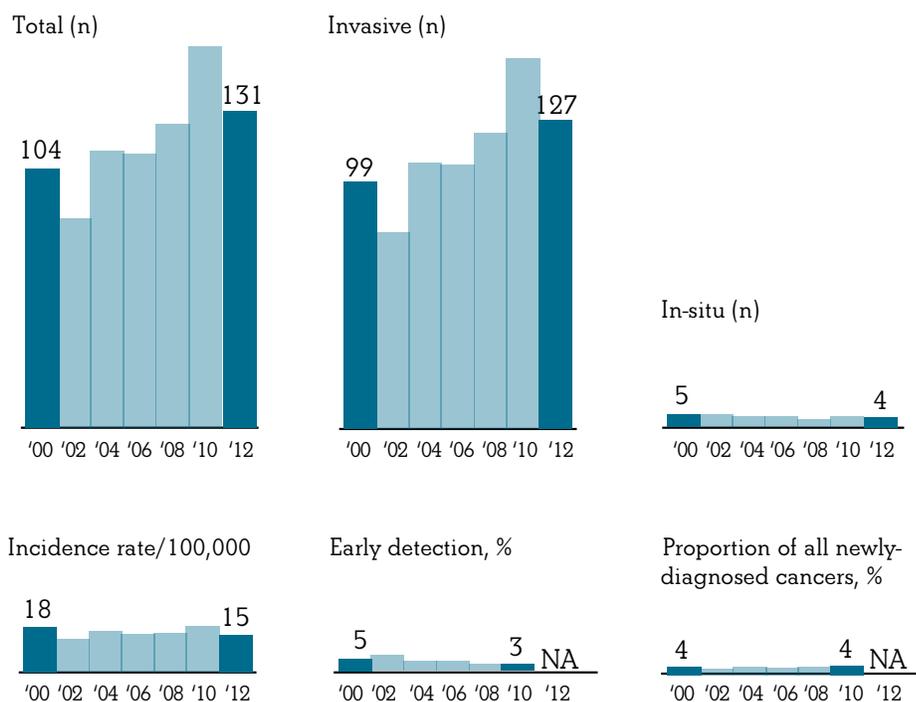


Figure 10 (cont.): Morbidity-related measures for oral and pharyngeal cancer by sex, 1999-2012

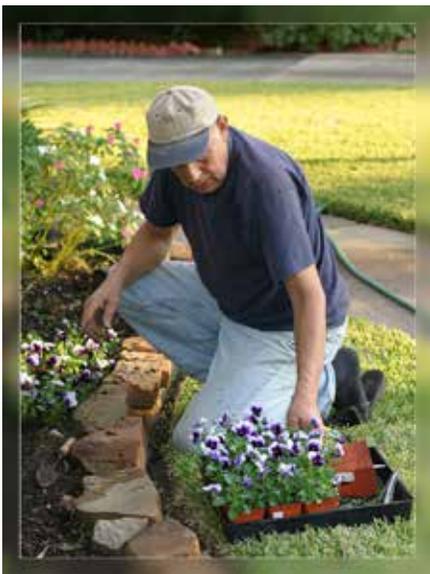
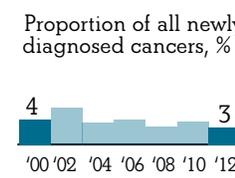
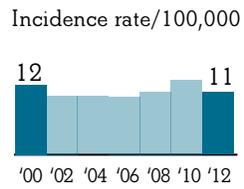
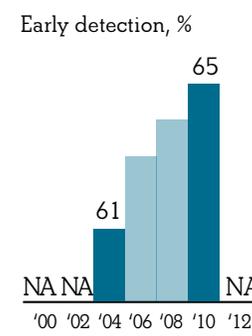
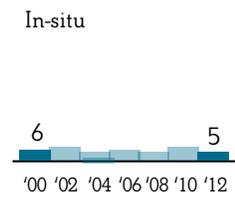
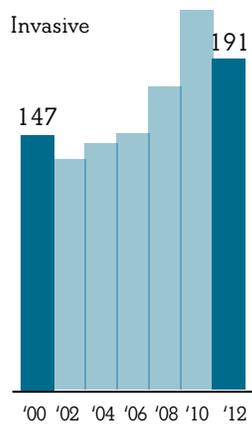
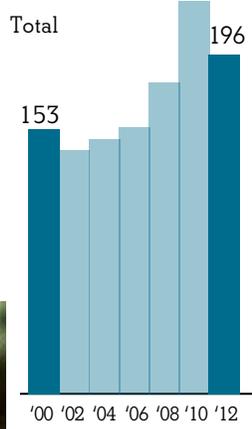


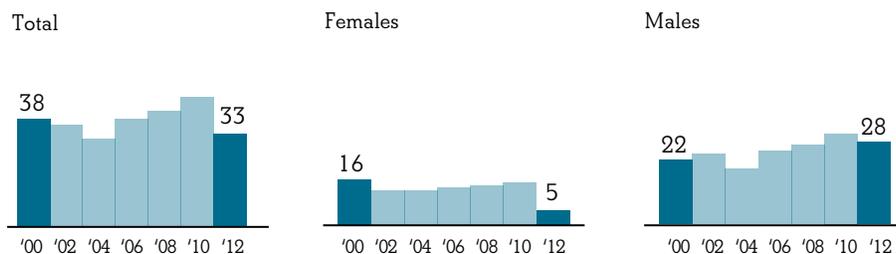
Figure 11 shows mortality-related measures for oral and pharyngeal cancer in Idaho for 1999-2012. In 1999, there were 24 deaths due to oral and pharyngeal cancers, which increased to the highest observed in this period of 46 in 2010. Among males, the number of deaths due to oral and pharyngeal cancer showed an increasing trend from 1999 to 2008-2011, followed by a decrease in 2012. In females, there was not much change in the number of deaths until 2011, where a decrease occurred. As observed for incidence, the number of deaths was also higher in males than in females at all time-points. The median age at death due to oral and pharyngeal cancers ranged between 67-72 years, the total number of years of potential life lost (YPLL) before the age of 75 ranged between 239-459, and the average number of YPLL per death among those under the age of 75 ranged from 10.8-13.1.

Figure 11: Mortality-related measures for oral and pharyngeal cancer, 1999-2012

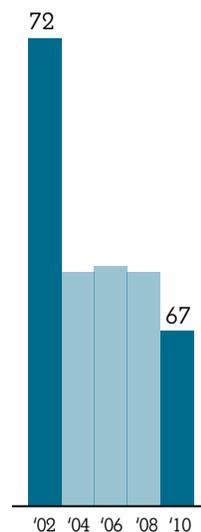
Data source: Cancer Data Registry of Idaho (CDRI)

Note: Incidence rates calculated using the U.S. 2000 population; in-situ cases excluded.

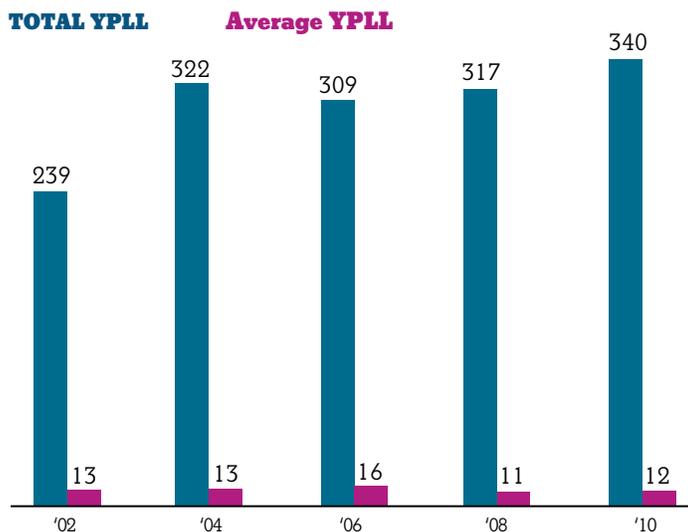
Number of deaths



Median age at death



YPLL before age 75



Developmental Disorders

Males have twice the risk of females of being born with a cleft lip with or without palate, but half the risk of being born with cleft palate alone.

Cleft lip and/or cleft palate are among the most common craniofacial anomalies and birth defects. The incidence rate is 1-2 per 1,000 births. Males have twice the risk of females of being born with a cleft lip with or without palate, but half the risk of being born with cleft palate alone. Clefing is the result of embryological failures due to environmental-gene interactions; they can be inherited, associated to a major syndrome, related to a deficiency in folic acid, or associated to certain environmental exposures such as smoking. Children with these conditions have limitations to conduct certain basic biological functions such as breathing, feeding, and speaking. As a consequence, they are at a higher risk of developing infections and suffering from growth faltering.

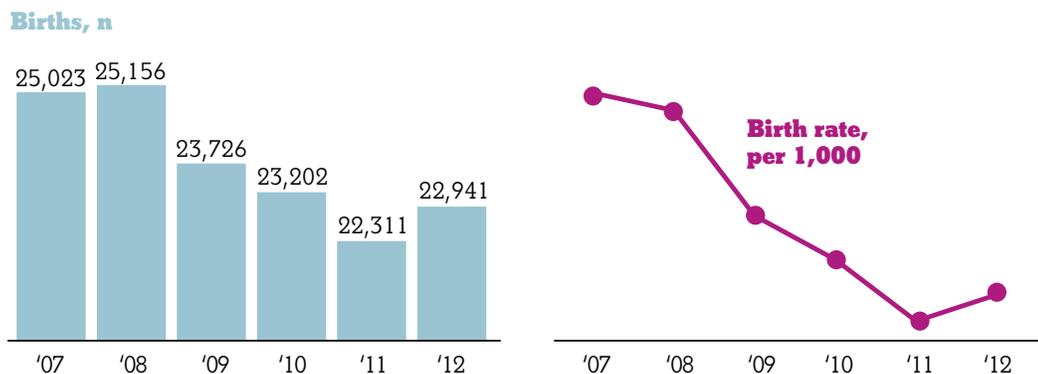
Other developmental cranial bone and dental anomalies are very rare. Primary genetic conditions can result from premature fusion of cranial bones, underdeveloped or missing teeth structures, or impaired development of the tooth enamel. Secondary anomalies can arise as a consequence of a major developmental disorder.

Figure 12 shows natality-related measures and congenital abnormalities in the population in Idaho for selected years. The incidence rate of cleft lip and palate has remained stable over the past six years, between 1.1 and 1.6 per 1,000 births. These rates are comparable to the rest of the U.S, which is estimated to be 1-2 per 1,000 births.

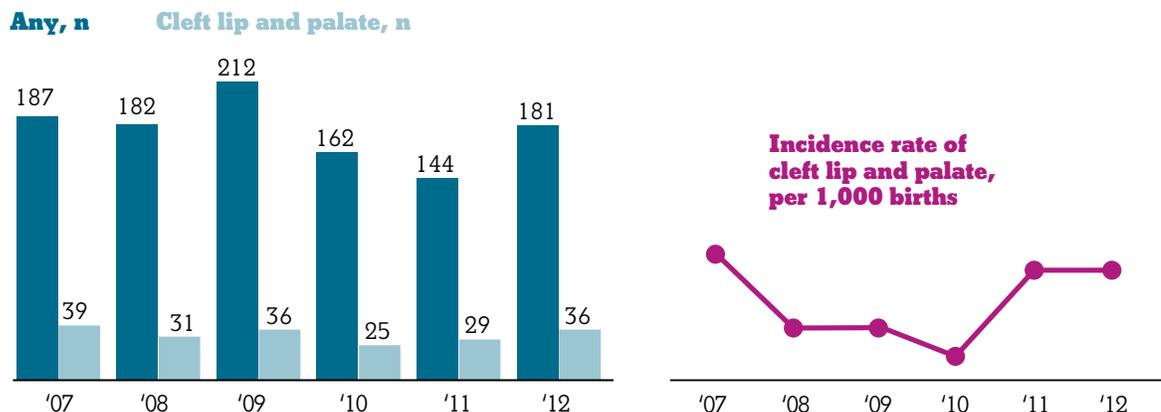
Figure 12: Natality-related measures and congenital abnormalities, 2007-2012

Data source: Idaho Vital Statistics

Natality: Births (n) and birth rate per 1,000



Congenital abnormalities



Other Oral Health Conditions

Intentional and Unintentional Injuries

As opposed to bone fractures, fractures of teeth do not heal. Main causes of tooth loss or fracture include injuries related to certain sports, falls, motor vehicle accidents, or violence.

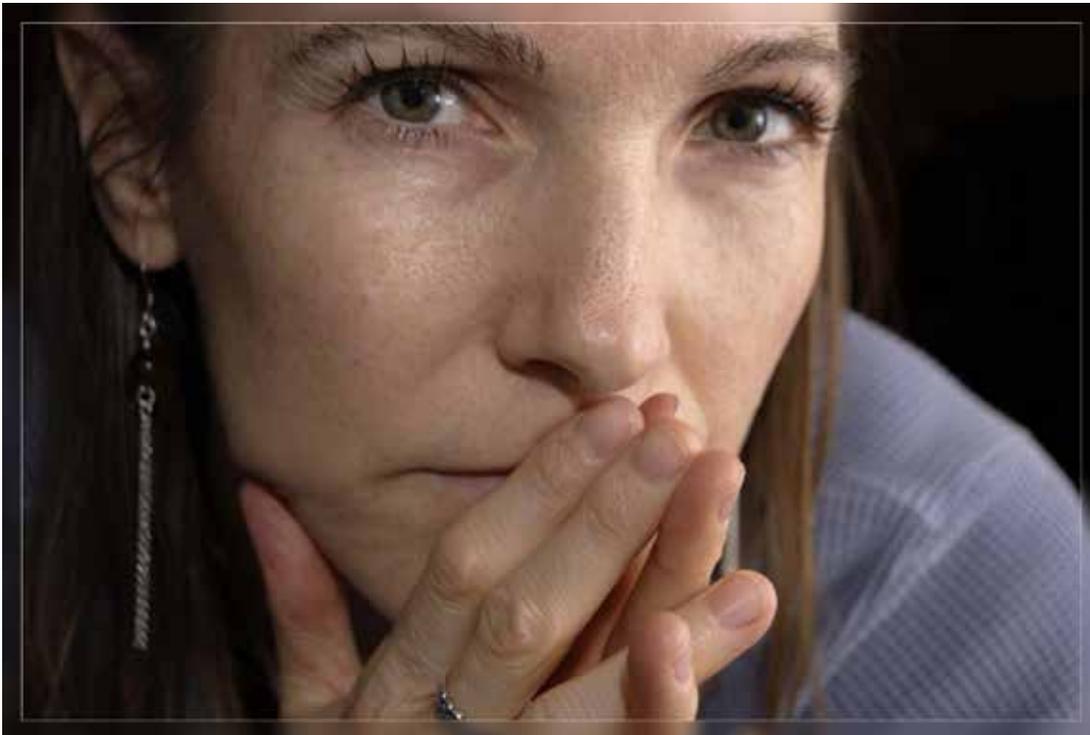
Chronic And Disabling Conditions: Oral-Facial Pain and Temporomandibular Disorders

Improvements in pain-management medication have made a difference in controlling oral-facial pain. Still, chronic pain can be a disabling condition and can cause negative long-term changes in the nervous system. Among the most common causes of chronic oral-facial pain are: 1) atypical facial pain, which is commonly treated with antidepressants and psychotherapy, and 2) a condition of unknown etiology called trigeminal neuralgia, which is characterized by intense pain following one or multiple of the three branches of the trigeminal nerve. In the latter, a combination of antiepileptic medications with more invasive procedures can greatly reduce the pain.

Temporomandibular disorders, characterized by dysfunction in the temporomandibular joint and surrounding muscles, are common in the U.S. The etiology of these disorders is varied; trauma, developmental anomalies, and secondary manifestations of a systemic disease, have been identified to be causal factors. Due to the multicausal nature of the condition, at this time there is no single treatment to effectively manage it.

Currently, Idaho does not systematically monitor indicators on any of these oral health conditions.

Currently, Idaho does not systematically monitor indicators on conditions related to oral-facial pain and temporomandibular disorders.

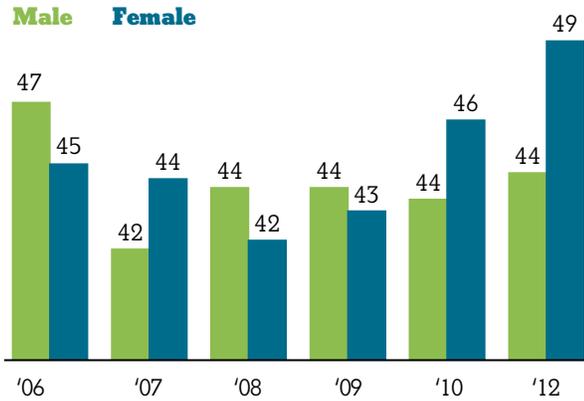


Availability and Access to Oral Healthcare Services

Figure 13: Percentage of adults (18 y+) without dental insurance, 2006-2012

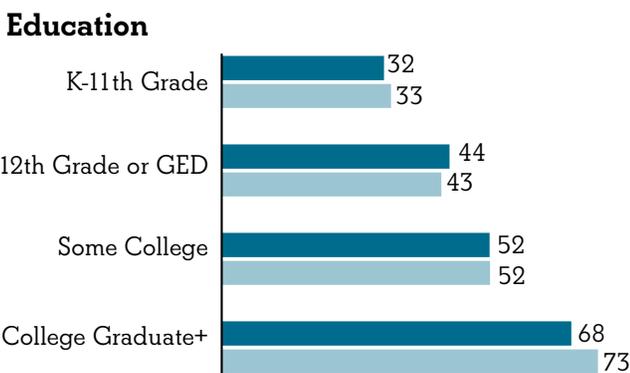
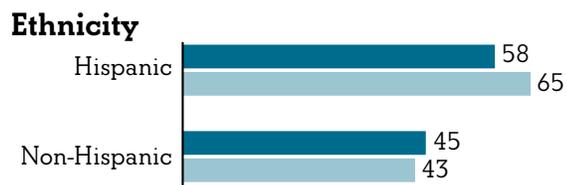
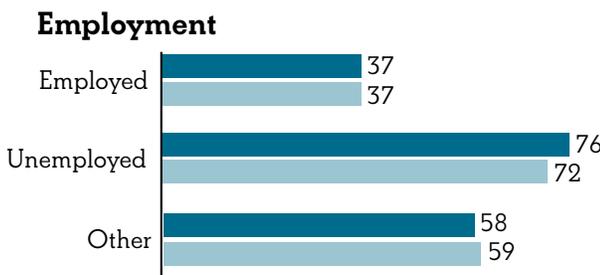
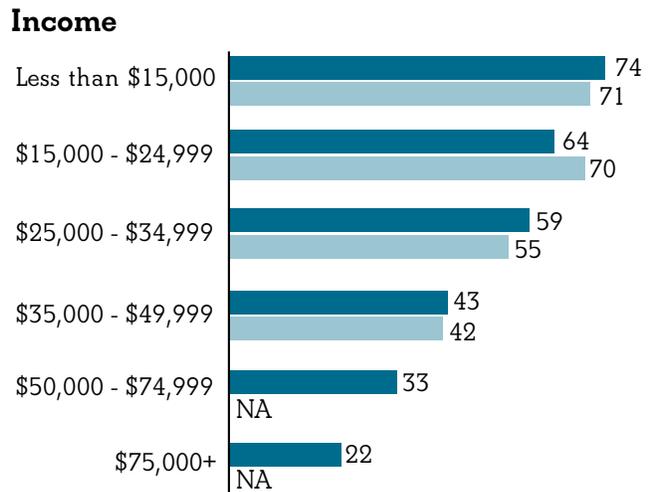
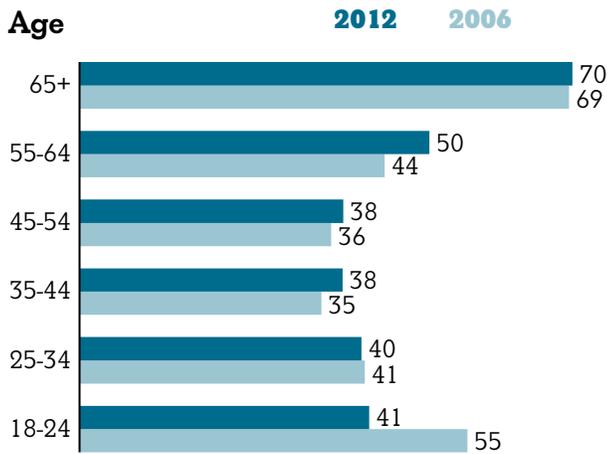
Data source: Idaho Behavioral Risk Factor Surveillance System (BRFSS)

By sex



Oral Health Coverage

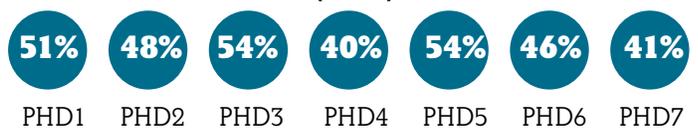
Dental health insurance is an indicator of access to dental care. Figure 13 shows the proportion of adults without dental insurance in Idaho. The data for year 2012 are presented in separate to note that due to the change in methodology in the data collection procedures for this indicator, they are not directly comparable to the previous years. There is some variation on dental coverage according to age, with the oldest (65+) having the least coverage (70% without insurance). It is important to note that this age group is highly susceptible to tooth decay and loss. Those with lower income, less education, unemployed, and Hispanics have the least dental coverage.



Socioeconomic status (2012)



Public Health District (2012)



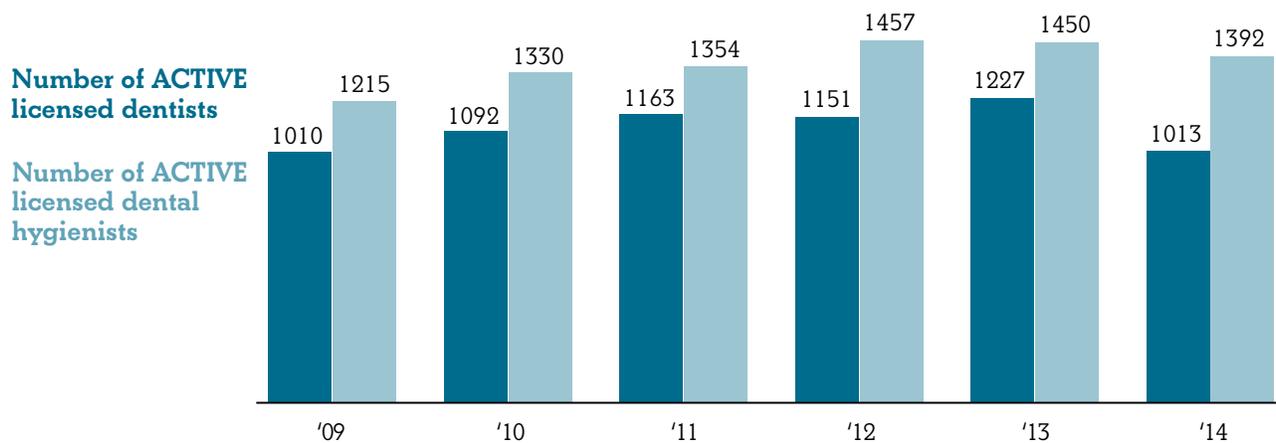
Workforce Capacity

Oral, craniofacial and dental care services are provided by dental, medical, and public health practitioners. To provide adequate and accessible oral health, an adequate workforce capacity is essential.

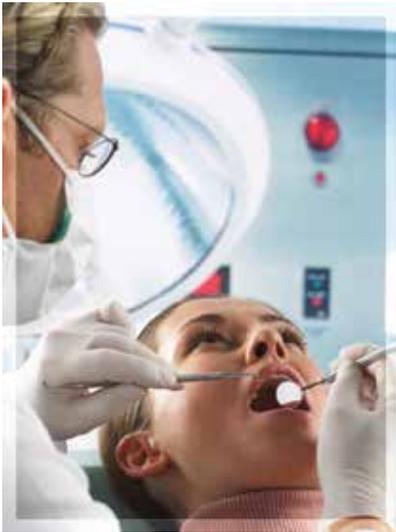
Figure 14 shows the estimated number of oral health personnel in Idaho between 2009 and 2014. In 2013, one of the 44 counties of the state had no dentist and one county had no enrolled Medicaid dentist, leaving population in these counties with no oral health coverage. Forty-two of Idaho's counties have been designated as geographic or population group Dental Health Professional Shortage Areas (HPSAs).

Figure 14 : Number of active dental professionals in Idaho, 2009-2014

Data source: Idaho Board of Dentistry



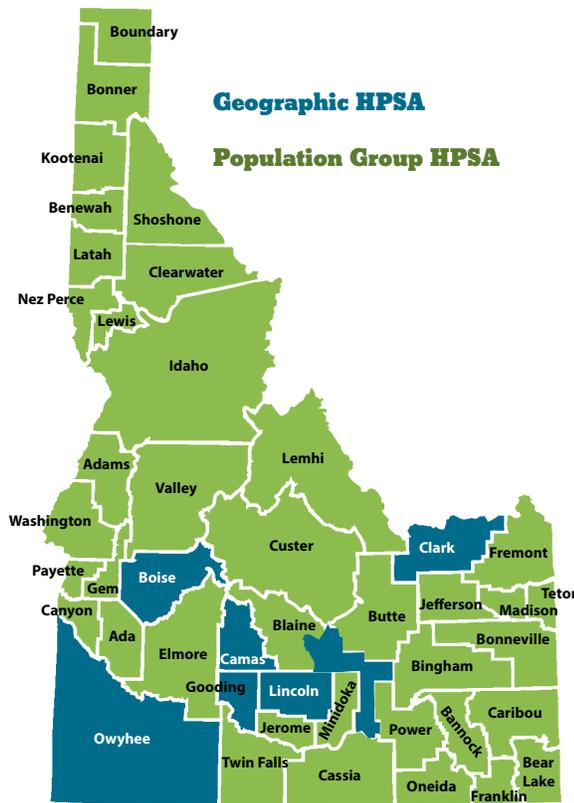
Forty-two of Idaho's counties have been designated as geographic or population group Dental Health Professional Shortage Areas (HPSA).



The medical component of oral health is comprised of dentists, physicians, nurses, and allied health professionals. These teams are responsible for treating more complex oral conditions such as oral and pharyngeal cancers, developmental anomalies, and traumatic injuries.

An important component in the state workforce capacity is the availability of institutions to offer dental professional training. Idaho has limited infrastructure to train dental professionals. Although there are no dental schools in the state, the Idaho Advanced General Dentistry (IAGD) program and the Idaho Dental Education Program (IDEP) are housed at Idaho State University (ISU). The IAGD is a one-year general dental residency program with training sites in Pocatello and Meridian and is accredited by the Commission on Dental Accreditation. Eight residents are accepted into the program each year. The IDEP is a cooperative program between ISU and Creighton University that allows up to eight positions in each year's class to Idaho residents in Creighton University's School of Dentistry with the first year taught at ISU and the second through fourth years taught at Creighton University. Most graduates (76%) of the two ISU dental programs choose to practice in Idaho and around half of them work in rural areas. In addition, four dental hygiene schools are located throughout the state at ISU, Carrington College, College of Southern Idaho, and Lewis-Clark State College.

Figure 15: Health Professional Shortage Areas (HPSA) in Idaho



Note:

Health Professional Shortage Areas (HPSAs) are federal designations that identify geographic areas or populations with a deficit in primary care services within medical, dental, and mental health categories.

HPSA designations are used as an eligibility requirement for many programs and resources available to primary care providers, such as the Conrad J-1 Visa Waiver Program, Idaho State Loan Repayment Program, and NHSC Scholarship and Loan Repayment Programs.

Bureau of Rural Health and Primary Care, Division of Public Health, Department of Health and Welfare, 1/15

Oral Health Services

State and local health agencies are responsible for coordinating and providing support to community-based oral public health programs. The Idaho Oral Health Program (IOHP) operates as recommended by the guidelines set forth by ASTDD. These guidelines include the following:

- Assess oral health status and implement an oral health surveillance system.
- Analyze determinants of oral health and respond to health hazards in the community.
- Assess public perceptions about oral health issues and educate/empower people to achieve and maintain optimal oral health.
- Mobilize community partners to leverage resources and advocate for/act on oral health issues.
- Develop and implement policies and systematic plans that support state and community oral health efforts.
- Review, educate about and enforce laws and regulations that promote oral health and ensure safe oral health practices.
- Reduce barriers to care and ensure use of personal and population-based oral health services.
- Ensure an adequate and competent public and private oral health workforce.
- Evaluate effectiveness, accessibility and quality of personal and population-based oral health promotion activities and oral health services.
- Conduct and review research for new insights and innovative solutions to oral health problems (7).

The IOHP, funded by the Maternal and Child Health (MCH) Block Grant Title V of the Social Security Act, has been in existence for over 35 years. In addition to MCH funding, the program received funding from the DentaQuest Foundation Oral Health 2014 Initiative in September 2011 to focus specifically on Medical-Dental Collaboration and Prevention/Public Health Infrastructure. In September 2013, the program was funded by CDC, Division of Oral Health, to build program infrastructure and capacity.

Idaho Oral Health Program and Public Health Districts

The IOHP works with Public Health Districts throughout Idaho to provide preventive oral health services and education to at-risk children and adolescents, their families, and pregnant women. Activities conducted in public health settings by registered dental hygienists include:

- Fluoride varnish programs in Women, Infants, and Children (WIC) Clinics, Early Head Start, and Head Start Centers
- School-based dental sealant clinics at schools with >35% free and reduced school lunch
- Oral health screenings, assessments and education
- Dental home referrals to all children seen in fluoride varnish programs and school-based sealant clinics

Dental hygienists also conduct additional programs with local dentists and other community partners and stakeholders.





Community Health Centers and Federally Qualified Health Centers

Some of the main safety net dental clinics in Idaho are Community Health Centers and Federally Qualified Health Centers. These centers are non-profit, community-directed providers located in high-need areas that remove common barriers to healthcare. In Idaho, the number of community-based low-income clinics has varied over the past few years. In 2005 there were 10 clinics, in 2006 there were 17, in the years 2007 and 2008 there were 33, and in 2009 there were 20.



According to the U.S. Department of Health and Human Services (USDHSS), in Idaho in 2012, there were 11 federally-supported health centers delivering their services in 65 different sites and serving 130,399 patients. All of these health centers provide primary medical care; 10 provide dental care. A total of 27 FTE dentists and 11 FTE dental hygienists worked in these health centers, conducting a total of 61,969 and 13,356 patient visits, respectively. It has been estimated that the average cost per dental patient in these centers was US\$437.

Delta Dental of Idaho

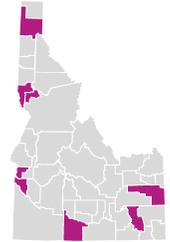
Delta Dental of Idaho is one of the state's largest dental benefits carriers offering dental coverage with an emphasis on preventive care. As a nonprofit organization, Delta Dental of Idaho conducts multiple community outreach programs to help promote dental health for Idaho's low-income children and seniors. Each year, the company provides free cavity prevention clinics to more than 6,000 children in schools throughout the state and works in partnership with dentists to provide low-income seniors with needed care.

Head Start of Idaho

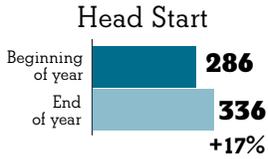
The Office of Head Start (OHS) promotes school readiness of young children from low-income families through local programs. Head Start and Early Head Start programs support the mental, social, and emotional development of children from birth through age 5. Head Start programs provide education, health, nutrition, and social services. Head Start is mainly focused in providing services for preschoolers, whereas Early Head Start mainly serves pregnant women, infants and toddlers. Head Start programs provide oral health education by encouraging dental hygiene habits such as tooth brushing, provide dental health services to pregnant women and children, and promote the establishment of a dental home for children. In 2012 there were 7 Early Head Start programs and 13 Head Start programs in Idaho. Figure 16 shows the number of children and the proportion of eligible children with a dental home in the 2012-2013 enrollment period in Idaho. Establishing a dental home means that the oral health of the child is delivered by a licensed dentist in a comprehensive, family-centered, and accessible way. Establishing a dental home in early childhood has been associated with improved oral health outcomes. In most cases, participation in Head Start and Early Head Start programs was associated with an increase in the number of children with a dental home.

Figure 16: Number of children with a dental home at the beginning and end of enrollment year 2012-2013, by city and grantee

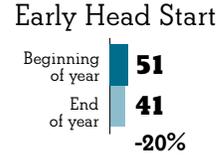
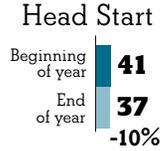
Data Source: Head Start Program



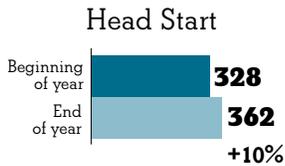
Coeur d'Alene: North Idaho College



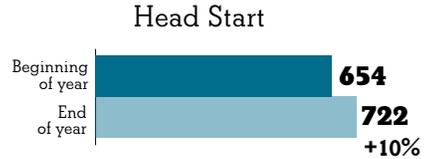
Plummer: Coeur d'Alene Tribe of Idaho



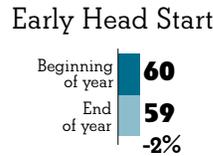
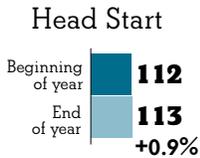
Lewiston: Lewis-Clark Early Childhood Program



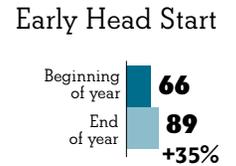
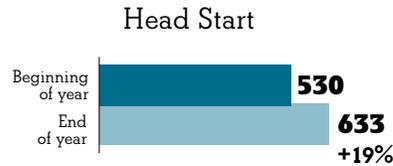
Caldwell: Migrant and Seasonal Head Start Program



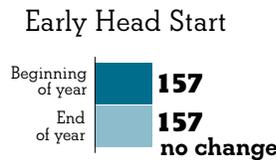
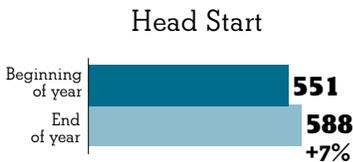
Lapwai: Nez Perce Tribe



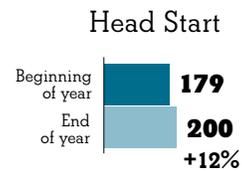
Twin Falls: College of Southern Idaho



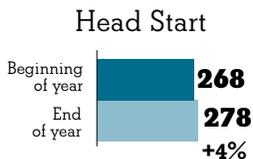
Payette: Western Idaho Community Action Partnership



Pocatello: Pocatello/Chubbuck District #25



Idaho Falls: Eastern Idaho Community Action Partnership



Relationship Between Oral Conditions and Negative Health Outcomes



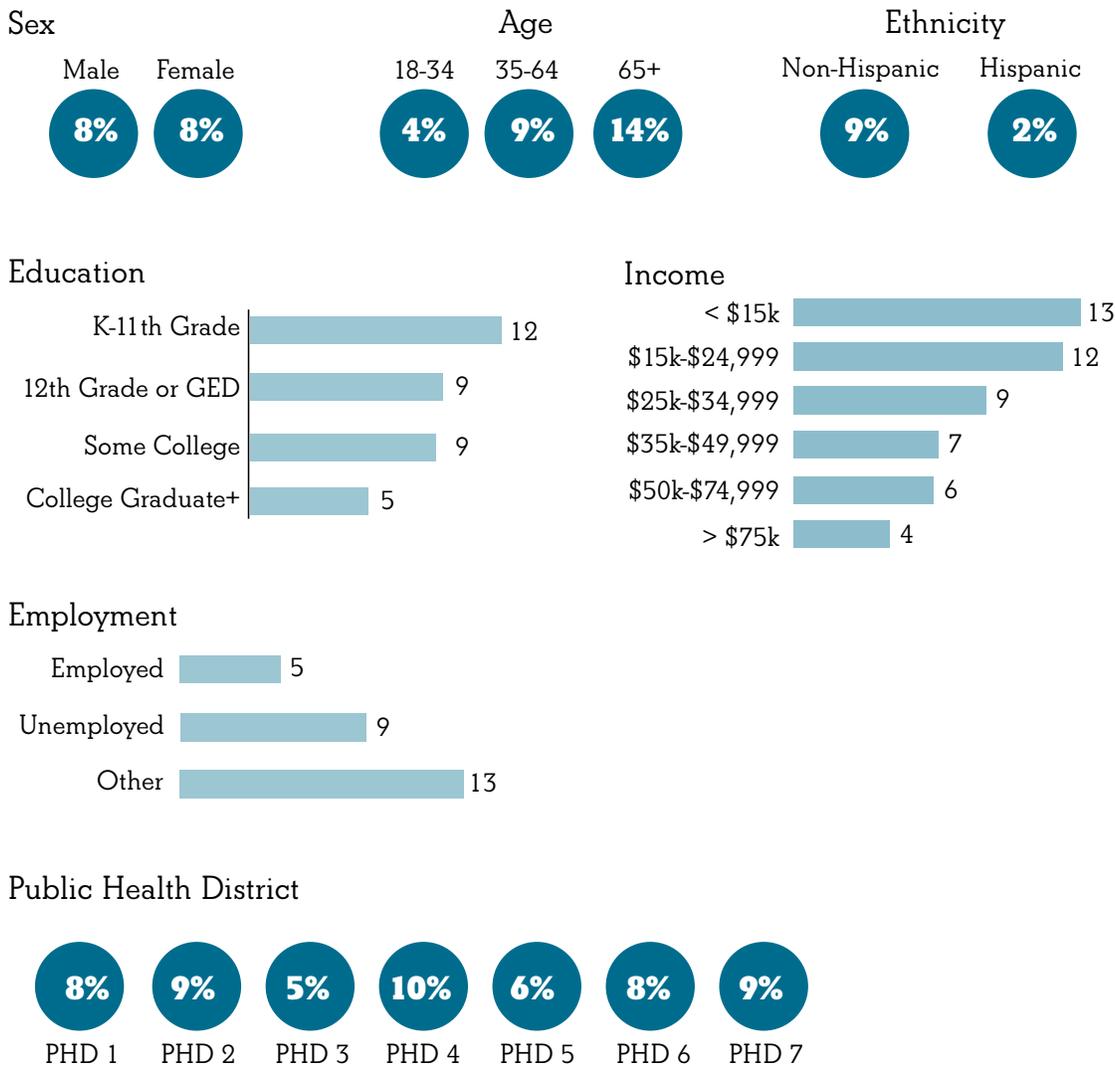
Several studies have reported a relationship between oral infections and negative health outcomes. The most studied associations are the association between periodontal disease and diabetes, cardiovascular disease, and adverse pregnancy outcomes.

Diabetes

Diabetes is associated with an increased risk of developing periodontitis and with its rapid progression, and periodontal disease negatively affects glycemic control among diabetic patients (8). Approximately 65% of people with diabetes in Idaho had one or more teeth removed due to periodontal disease or tooth decay. This is higher than the 40% reported by people without diabetes (aggregated BRFSS from 2010-2012). Figure 17 shows the proportion of adults who have ever been told they have diabetes in Idaho (2013 BRFSS). The prevalence of diabetes in Idaho is lower than the national prevalence but has the same increasing trend.

Figure 17: Prevalence (%) of diabetes in Idaho adults, 2013

Data source: Idaho Behavioral Risk Factor Surveillance System (BRFSS)



Cardiovascular Disease

The relationship between periodontal disease and cardiovascular disease (CVD), coronary heart disease or stroke is less clear than that with diabetes. Core risk factors for CVD such as increased age, smoking, and being overweight are also risk factors for periodontitis, which suggests a common inflammatory pathway; however, a causal association remains unclear (9).

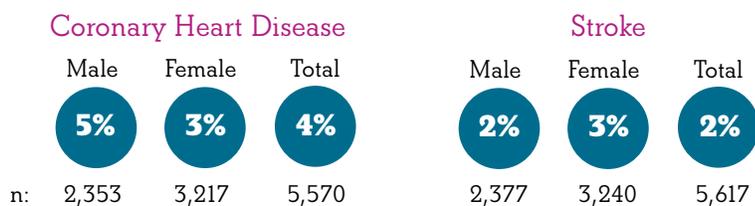
The aggregated BRFSS from 2006-2010 shows that 69% of those reporting having coronary heart disease in Idaho had one or more teeth removed due to periodontal disease or tooth decay. This is higher than the reported 41% by those who do not have coronary heart disease. A similar pattern is observed for those who have reported having had a stroke (75%) vs. those who have not (41%).

Figure 18 shows the proportion of adults who reported having coronary heart disease or stroke in Idaho in 2013. The prevalence of coronary disease and stroke among adults in Idaho has remained relatively stable from 2006 to 2013.



Figure 18: Prevalence (%) of cardiovascular disease in adults, 2013

Data source: Idaho Behavioral Risk Factor Surveillance System (BRFSS)



Adverse Pregnancy Outcomes

Infections are strongly associated with adverse pregnancy outcomes such as low birthweight or preterm birth. The association between periodontal disease and adverse pregnancy outcomes remains controversial; although results from animal and observational studies are promising, experimental studies are needed to confirm this association (10).

Strategies to Prevent and Reduce Oral Conditions

A variety of community, professional and individual strategies have been shown to be effective in reducing most common oral conditions and promoting oral health. At the community level, oral health education focused on improving oral health-related knowledge and behaviors has been effective in helping to prevent dental caries, periodontal diseases, and oral cancers; and community water fluoridation has shown to substantially reduce the risk of developing dental caries.

Several school-based interventions have resulted in improvements in the oral health of children. Distribution of fluoride tablets or mouth rinse, sealant programs, and school-based oral health education have been effective in helping to prevent the development of dental caries and periodontal disease, whereas school-based screening and referral programs aid in the delivery of early treatment of these conditions.

Similar strategies at the professional level have also shown to be effective in improving the oral health of individuals, including implementation of oral hygiene measures, patient oral health education, and promotion of fluoride use. All these strategies, in combination with individual measures such as oral hygiene measures, have caused a great improvement in the oral health of the U.S. population over the past few decades. However, there are still disparities in access to these strategies and measures, with minority groups and those economically disadvantaged having limited or no access.



Because water fluoridation serves whole communities, its effects can potentially reach all its members, regardless of their socioeconomic status.

Population receiving community water fluoridation

36%
'12

Community Water Fluoridation

Widespread use of fluoride is one of the main strategies responsible for the reduction in dental caries worldwide. Adding fluoride to a public water supply—community water fluoridation—is a commonly used strategy to deliver fluoride on a large-scale basis and has been recognized as one of the most important public health achievements of the last century. It has been estimated that community water fluoridation is associated with a 26% reduction in tooth decay among 12-year-old children. Besides the oral health benefits associated with community water fluoridation, there are also substantial cost savings, both for the healthcare system and families. It has been estimated that in communities of more than 20,000 people in the U.S., every \$1 invested in community water fluoridation is associated with \$38 savings in costs of dental treatment. The effectiveness of community water fluoridation on prevention of tooth decay in children and adults, together with its low cost (less than \$1 per person), are the basis for the strong recommendation of its nationwide implementation.

Starting in the 1960s, school-based community water fluoridation programs were implemented in certain regions in the U.S. The objective was to expand access to fluoride among children who had no fluoride in their drinking water at home but whose schools had independent water supplies. Although school-based water supplementation seems like a good strategy to increase access to fluoride in children, especially being non-differential according to socioeconomic status, there are several limitations related to its implementation and operation which has resulted in a reduced popularity and lack of large-scale expansion. In Idaho, there is no water fluoridation at schools.

Despite the widely recognized benefits of fluoride on preventing tooth decay, there are some risks associated to an increased consumption of fluoride during periods of tooth development. Dental fluorosis is a condition occurring in children 8 years or younger, which is characterized by changes in the appearance of the enamel in the teeth in the form of stains. In Idaho, the prevalence of fluorosis is monitored using the Idaho Smile Survey; the survey methodology has been previously described. Results from the Smile Survey estimated that in 2012 the prevalence of fluorosis was 6%. This proportion was similar to the reported 9% in 2000, 11% in 2004, and 8% in 2008. The prevalence of severe fluorosis (teeth with brown spots or pitting) was very low (0.1%), and because community water fluoridation reaches rich and poor alike, there were no significant differences by income, race or ethnicity.



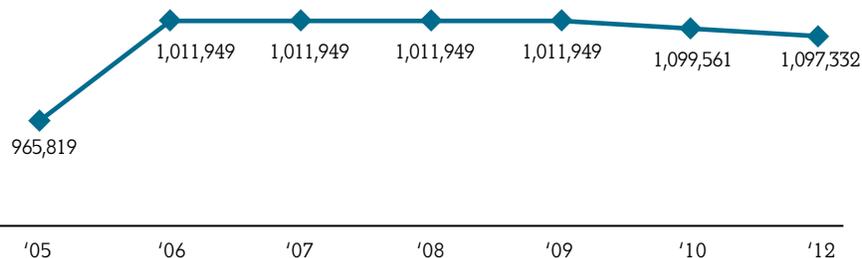
In 2012, it was estimated that 67% of the U.S. population was receiving fluoridated water, below the HP2020 target of 79.6%. In 2012, among the states, Idaho was ranked 46, with 36% of its population receiving fluoridated water. Figure 19 shows trend data for access to community water fluoridation in Idaho between 2005 and 2012.



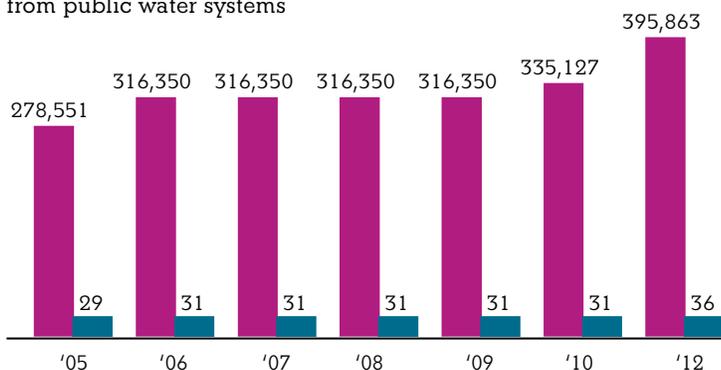
Figure 19: Access to community water fluoridation 2005-2009

Data source: Center for Disease Control and Prevention (CDC)

Population served by public water system



Number and percent of people who receive fluoridated water from public water systems





In Idaho, there are no fluoride supplementation programs at the community-level, or as part of school-based programs.

Dietary Fluoride Supplementation

Fluoride supplements are available for consumption by prescription only. Typically fluoride supplementation is used for children without access to fluoridated water. In the U.S., about 16% of children under the age of 2 years are supplemented with fluoride. Fluoride supplementation is delivered at the individual-level at home, or at the community-level as part of school-based programs. Although the evidence supporting home-based fluoride supplementation is weak, school-based fluoride supplementation programs have shown to be cost-effective in preventing caries.

In Idaho, there are no fluoride supplementation programs at the community-level, or as part of school-based programs.

Fluoride Mouthrinses

Fluoride mouthrinses were developed in the 1960s as a public health strategy to use mainly in school settings. Several studies have demonstrated that fluoride mouthrinses are efficacious in reducing dental caries. It has been estimated that fluoride mouthrinses reduce dental caries, on average, 20-50%. Most studies supporting the efficacy of fluoride mouthrinses were conducted in the 1970s and 1980s, and there is evidence of a declining prevalence of dental caries since then, therefore its cost-effectiveness has been questioned.

The Idaho School Fluoride Mouthrinse Program started in a single school in the 1970s, and then expanded into a statewide strategy. The program targeted children first- to sixth-grade in schools in fluoride-deficient communities with 30% Participation in the Free/Reduced National School Lunch Program, which are assumed to have a lower socioeconomic level and hence are at a higher risk for developing oral health infections. Each Public Health District, through their oral health programs, delivered its services at eligible schools within their catchment area. During the school year 2011-2012, a total of 31,000 students from 141 schools participated in this program. In 2012, the IOHP made the decision to discontinue this program in order to support and assist the Public Health Districts in implementing school-based dental sealant clinics, which are also an evidence-based strategy to reducing dental caries.

Fluoride Varnish

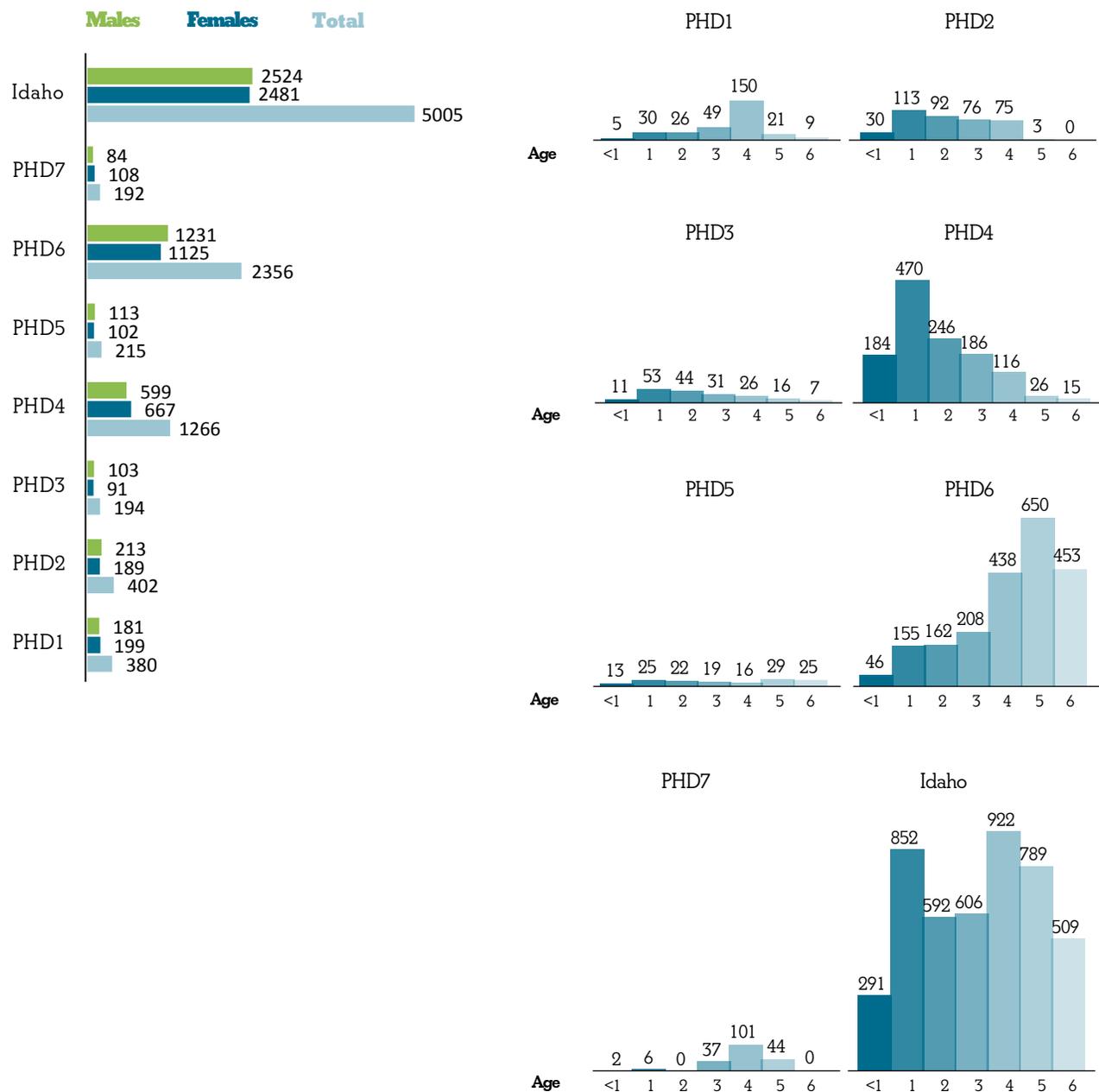
Fluoride varnishes are an attractive delivery vehicle for fluoride because the varnish adheres to the enamel surface for longer periods of time (12 hours or longer) than gels or solutions.

Each Public Health District delivers fluoride varnish programs as part of the activities conducted by Head Start; Women, Infants, and Children (WIC) clinics; or other clinics. Figure 18 shows the number of children receiving fluoride varnish in each Public Health District between October 1, 2012 and June 30, 2013. During this period, 5005 children in Idaho received fluoride varnish treatment. Public Health Districts 6 and 4 delivered the greatest number of fluoride varnish applications.



Figure 20: Number of fluoride varnish applications in children by age and Public Health District, 2012-2013

Data source: Idaho Department of Health and Welfare (IDHW)





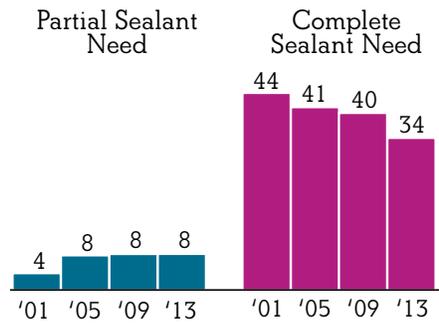
Dental Sealants

Dental sealants are a treatment used to prevent caries development. The application of a plastic material works as a physical barrier over pits and fissures on teeth, preventing the accumulation of food particles and microorganisms, thus preventing the development of dental caries. School-based dental sealant programs have shown to be effective in reducing the risk of caries in school-aged children.

Figure 21 shows dental sealant needs among third-grade students in Idaho. The need for complete sealants has consistently decreased among third-grade students in Idaho from 44.2% in 2001 to 34.1% in 2013.

Figure 21: Percentage of public school third-grade students needing dental sealants, 2001-2013

Data source: Idaho Smile Survey, 2001-2013



Sealants on permanent molars in third-graders



HP 2020: 28%



Preventive Visits

Dental preventive visits are considered an effective strategy for the prevention and early detection and treatment of oral conditions. Patients who routinely see their dentist, in general, have better self-rated oral health, less dental caries, and less missing teeth (11).

Annual Dental Examination

Figure 22 shows the percentage of adults in Idaho who have not had an annual dental examination. In general, there have been no major changes. The only subgroup in which clear improvement has been observed are the youngest (18-24 y), from 40% in 2006 to 24% in 2010. In general, males, the poorest, less educated, and those without dental insurance are less likely to receive an annual dental exam.

Figure 22: Percentage of adults (18 y+) without an annual dental examination, by demographic and other factors, 2006-2012

Data source: Idaho Behavioral Risk Factor Surveillance System (BRFSS)

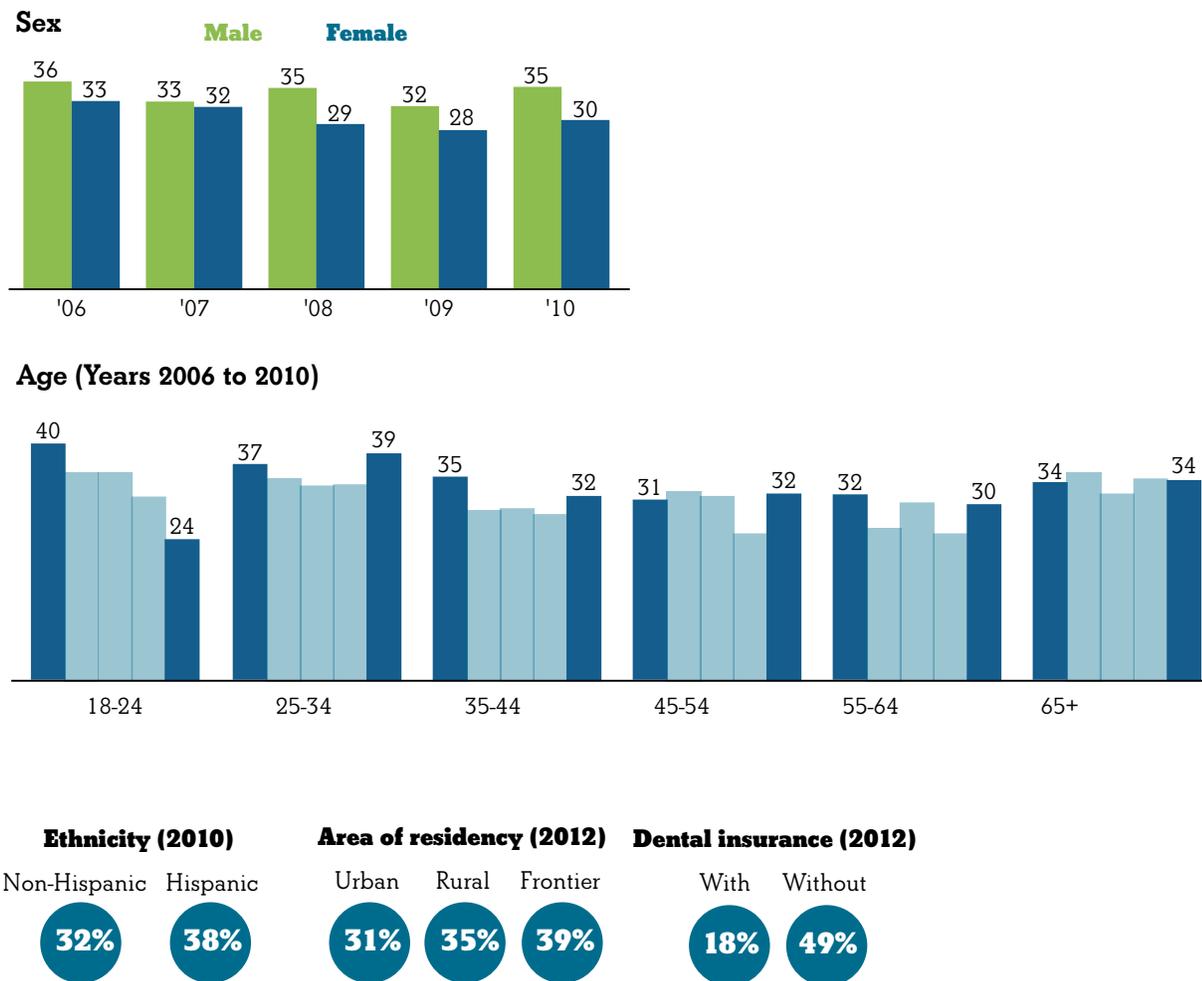
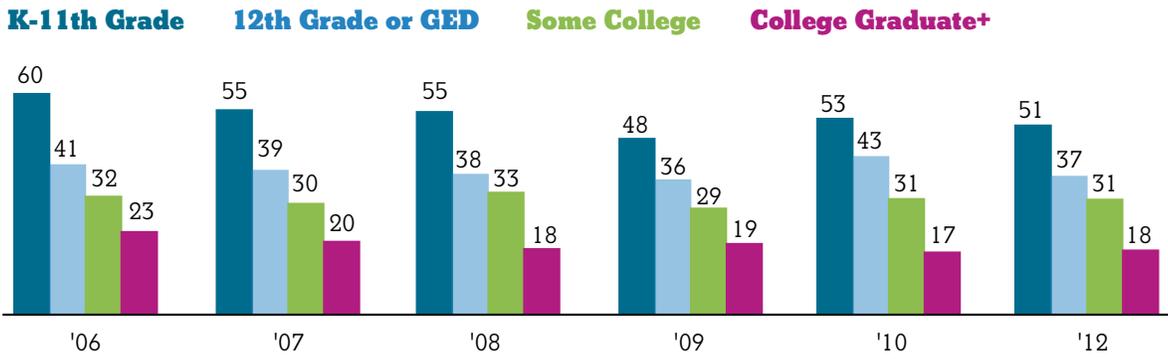


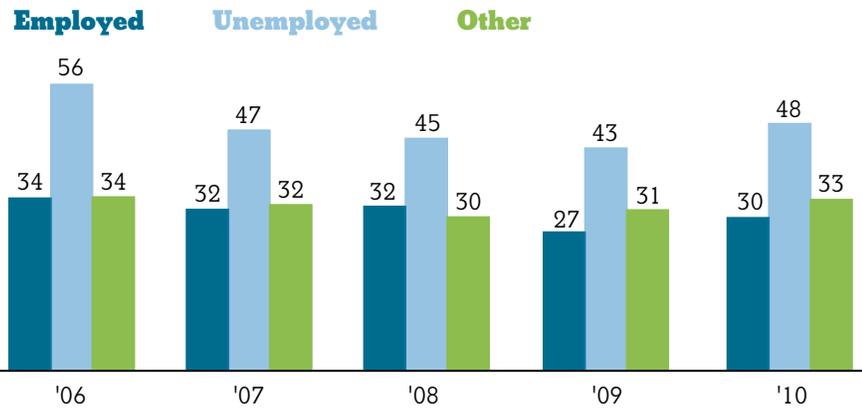
Figure 22 (cont.): Percentage of adults (18 y+) without an annual dental examination, by demographic and other factors, 2006-2012

Education

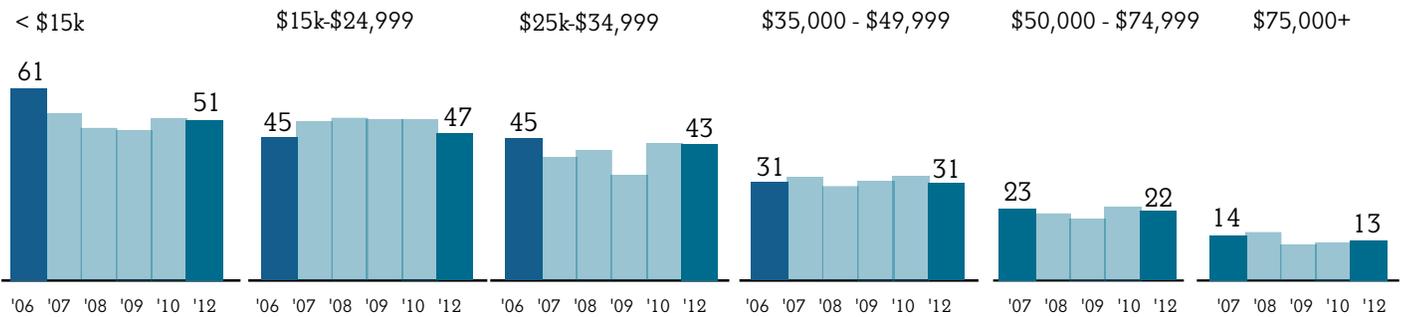


Note: Other employment status includes students, homemakers, retirees and persons unable to work.

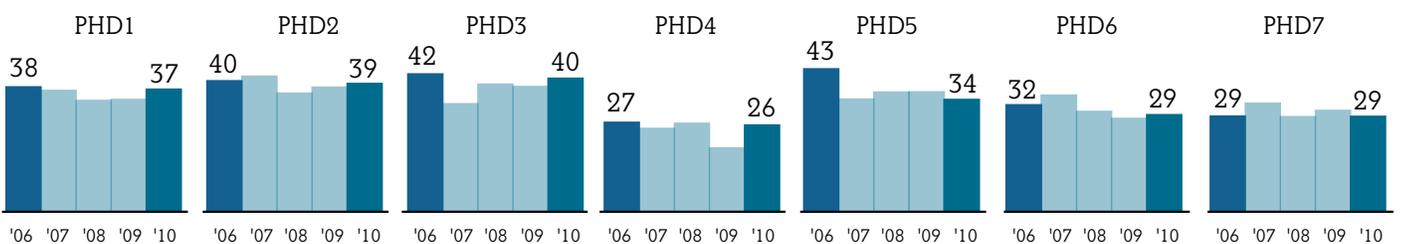
Employment



Income



Public Health District (2006 to 2010)

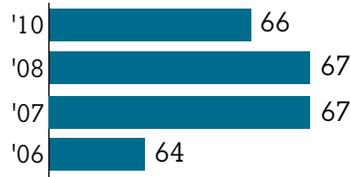


Dental Professional Teeth Cleaning

Figure 23 shows the percentage of adults in Idaho who had their teeth cleaned by a dental professional, 2006-2010. No significant changes occurred between 2006 and 2010.

Figure 23: Percentage of adults (18y+) who had their teeth cleaned by a dental professional within the past year, 2006-2010

Data source: Idaho Behavioral Risk Factor Surveillance System (BRFSS)



Adults 18 and older who visited a dentist or dental clinic

68%
'12

HP 2020: 49%

Adults 18 and older reporting having their teeth cleaned

66%
'10

Dental Care Among Pregnant Women

Figures 24 and 25 show different measures of dental care among pregnant women in Idaho, stratified by several sociodemographic factors. Between 2005 and 2010, there is a trend upward in the proportion of women receiving information on getting regular dental care during pregnancy. In 2010, 57% of women received this information. During the years presented, there has also been an increase in the proportion of women receiving dental care during pregnancy. Women who were younger, Hispanic, unmarried, of lower income, and lower education were less likely to receive dental care during pregnancy, however improvements throughout these years were observed in most subgroups. The primary reason reported for not receiving dental care during pregnancy was lack of insurance or money to pay out-of-pocket (~50%). There was an improvement over time in the proportion of pregnant women having their teeth cleaned over the past year, however, in 2010 only half of the women participated in the survey. This is of particular importance because pregnancy is a period of higher risk for developing oral conditions, especially periodontitis.

Figure 24: Percentage of pregnant women who received information, during any prenatal visit, on importance of regular dental care, 2005-2010.

Data source: Idaho Pregnancy Risk Assessment Tracking System (PRATS)

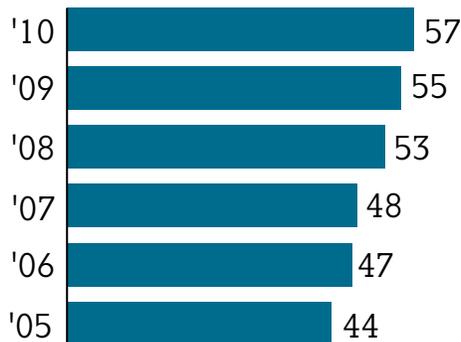
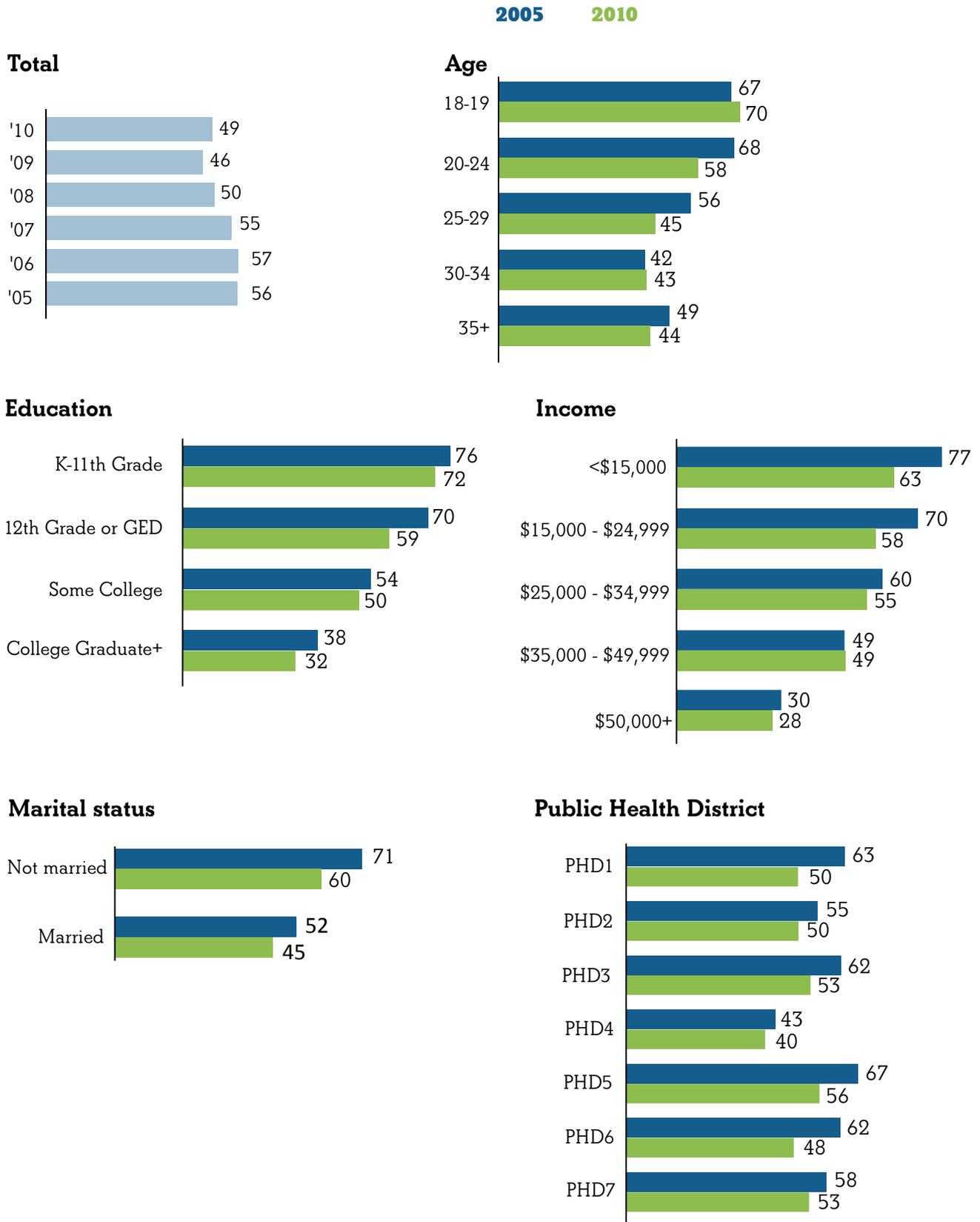


Figure 25: Lack of routine dental care during pregnancy, %, 2005-2010

Data source: Idaho Pregnancy Risk Assessment Tracking System (PRATS)



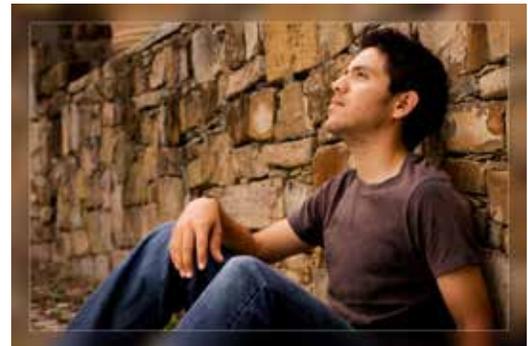
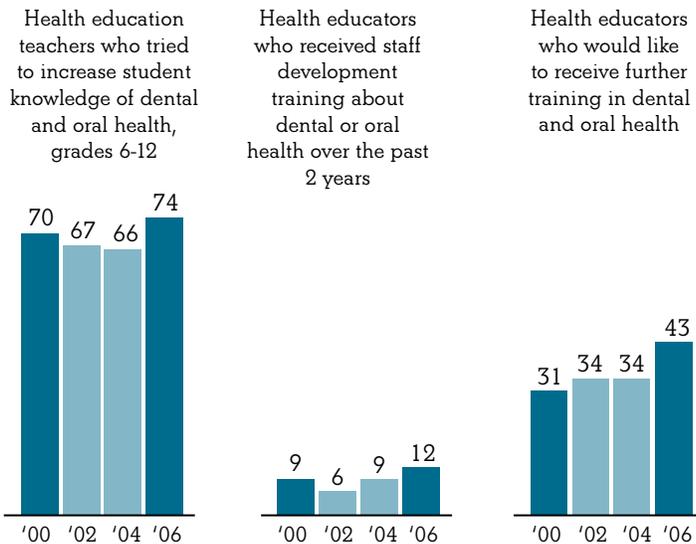
Oral Health Education

Oral health education is an effective strategy used to reinforce behaviors conducive to improve oral health. Oral health education has traditionally been an important component of the health education curriculum in schools in Idaho. As part of the Idaho School Health Education Profile Survey (SHEPS), information regarding oral health education practices is gathered from school principals and health educators. Figure 26 shows measures of oral health education in high schools in Idaho between 2000 and 2006. After 2006, the oral health education component was eliminated from SHEPS, therefore data are unavailable.



Figure 26: Measures of oral health education in high schools

Data source: Idaho School Education Profile Survey (SHEPS), 2000-2006



Screening for Oral and Pharyngeal Cancer

Primary risk factors for oral cancer are the use of tobacco and alcohol products, therefore some strategies to prevent oral cancer are tobacco and addiction prevention programs, especially in school settings. Early diagnosis of oral and pharyngeal cancers is important for prognosis and are usually conducted by primary care providers or dental professionals. Currently, there are no school- or community-based interventions for early detection of oral and pharyngeal cancers.

As part of BRFSS Idaho in 2009 and 2011, information regarding early oral cancer detection was collected. The proportion of adults who were told that they were being examined for oral cancer at their last dental visit was 24% in 2009 and 25% in 2011. This suggests that only one in four dental patients are being screened for oral cancers. However, it is possible that a greater proportion is screened but are not told by the dental professional.

Only one in four dental patients are being screened for oral cancers.

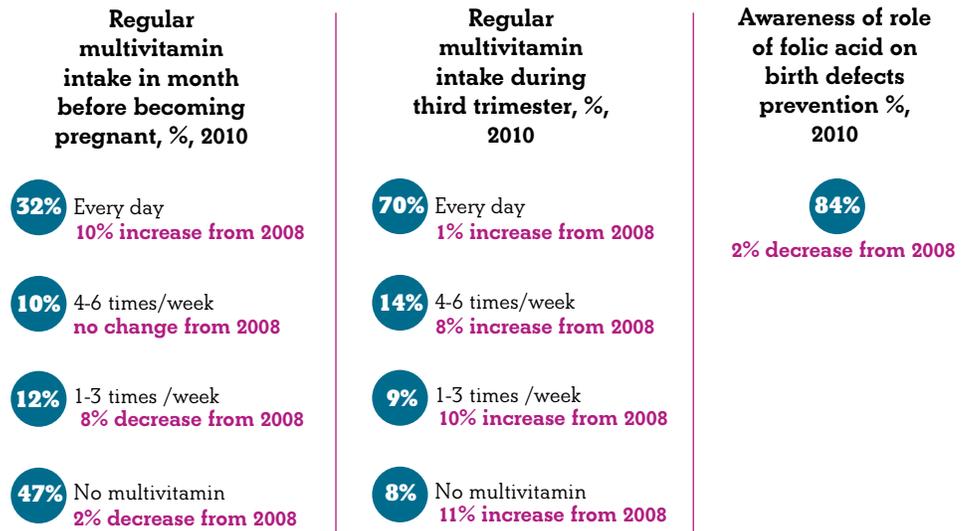
Multivitamin Use During Pregnancy

Multivitamin use in early pregnancy has been shown to prevent the development of oral clefts (12). Figure 27 shows patterns of multivitamin intake before and during pregnancy in new mothers in Idaho. Younger women, those less educated and those of lower income reported the lowest multivitamin use.

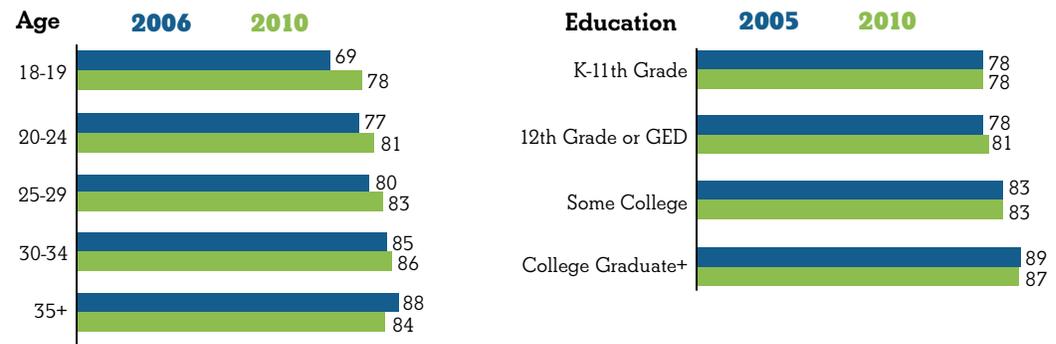
Figure 27: Pregnancy-related multivitamin intake, %

Data source: Idaho Pregnancy Risk Assessment Tracking System (PRATS)

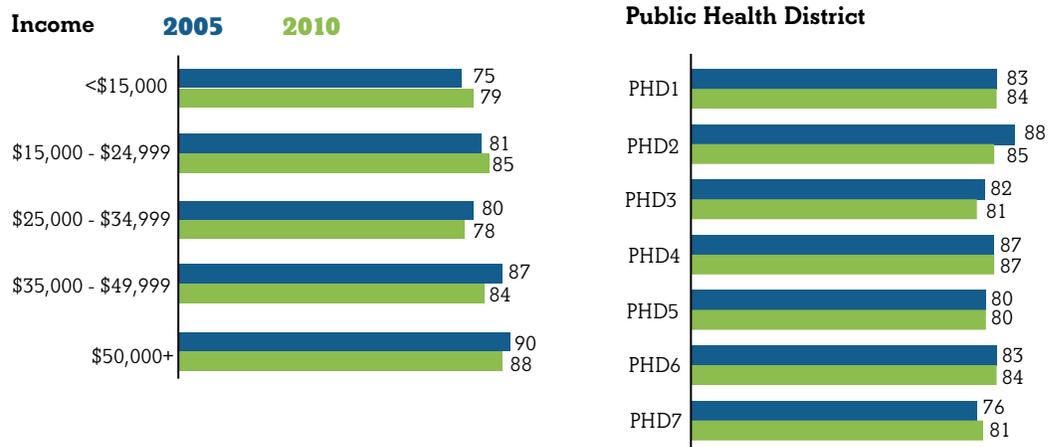
Note: Regular vitamin intake = 4+ times per week



Regular multivitamin intake during third trimester, by demographics and PHD



2005 data not available for this measure



Factors Known to Increase the Risk for Oral Conditions

Tobacco Use

Tobacco use has serious adverse effects on oral health. It is widely recognized that it increases the risk of developing oral and pharyngeal cancers and periodontal disease. During pregnancy, it increases the risk of cleft lip and/or palate in the offspring. It has been estimated that 90% of regular smokers begin smoking before the age of 18, and on average at 13 years of age.

In Idaho, information about tobacco consumption in teenagers is collected as part of the Youth Risk Behavior Survey System (YRBS). Figure 28 shows tobacco use patterns among high school students in Idaho in 2007 and 2013, and the national median in 2013. There has been an improvement in all tobacco use measures over the past 6 years, except for an increase in smokeless tobacco use. In 2013, Idaho had lower percentages in all tobacco use measures as compared to the national median.

Tobacco use among adults in Idaho is monitored using BRFSS. Figure 29 shows the percentage of cigarette smoking in adults in 2010. On average, approximately 16% of the adult population in Idaho smokes. In general, males, younger, those who are lower income or have lower education, and those who are unemployed, have greater proportions of smoking cigarettes.

Tobacco consumption during pregnancy in Idaho is monitored using PRATS. Figure 30 shows the proportion of pregnant women who smoked during the third trimester of pregnancy. The figure shows that the proportion of women who smoked remained relatively unchanged at approximately 8%. The proportions within socioeconomic and age groups has remained relatively unchanged throughout the years presented as well. As for tobacco consumption in adults in general, women who are younger, and those who are lower income or have lower education, have greater proportions of smoking cigarettes. The difference in smoking status during pregnancy between the richest and the poorest, or between the most and least educated is almost 20 times greater.



Figure 28: Percentage of tobacco use among high school students, 2007 and 2013

Data source: Youth Risk Behavior Survey
 Note: Current smoking is defined as having smoked cigarettes on one or more of the previous 30 days.

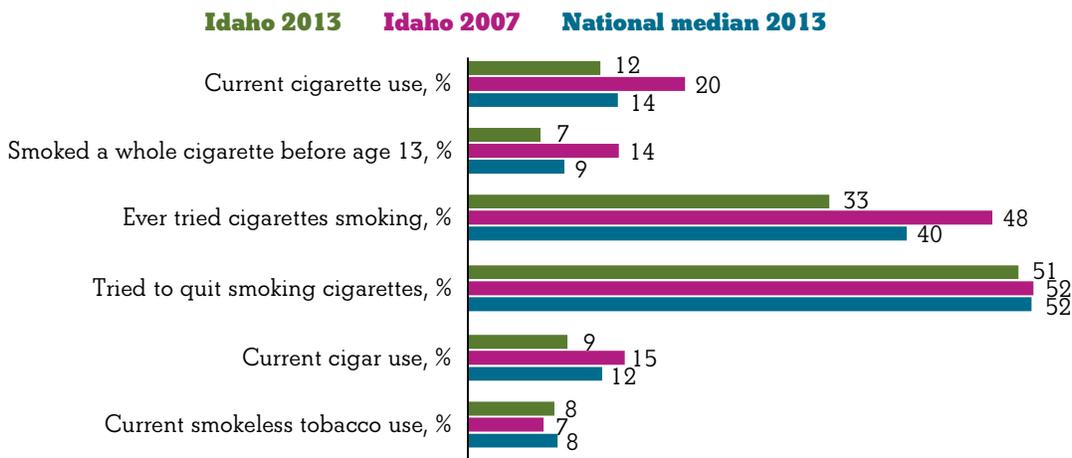


Figure 29: Percentage of cigarette smoking among adults, 2010

Data source: Idaho Behavioral Risk Factors Surveillance Survey

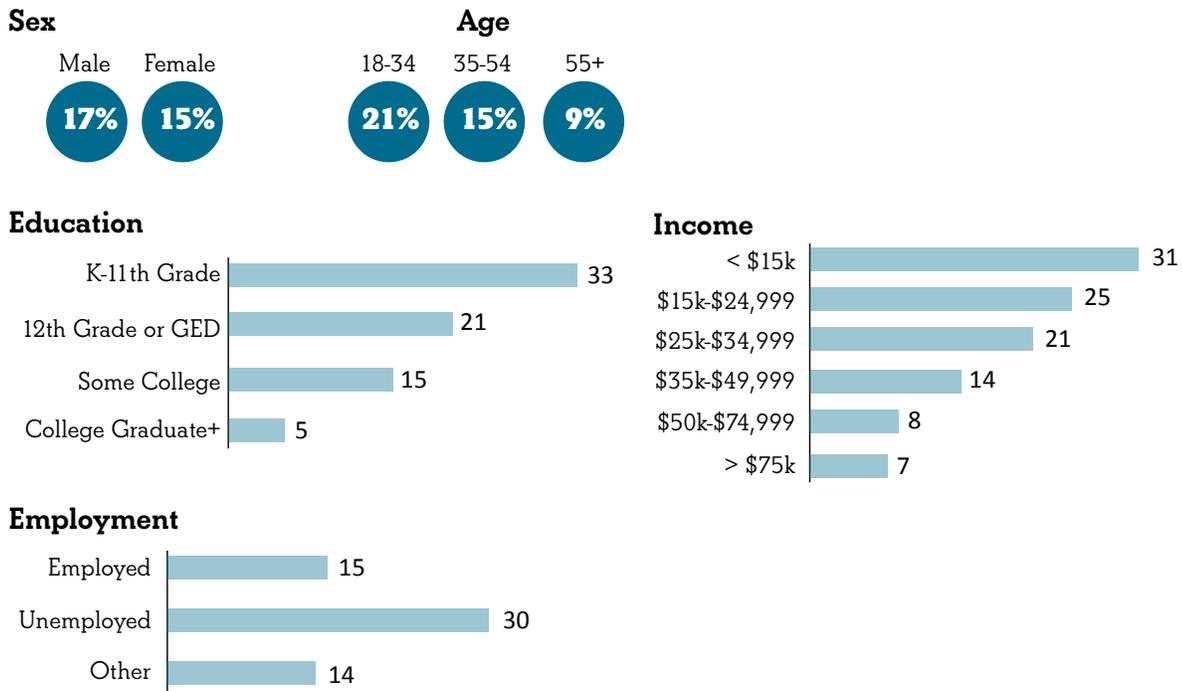
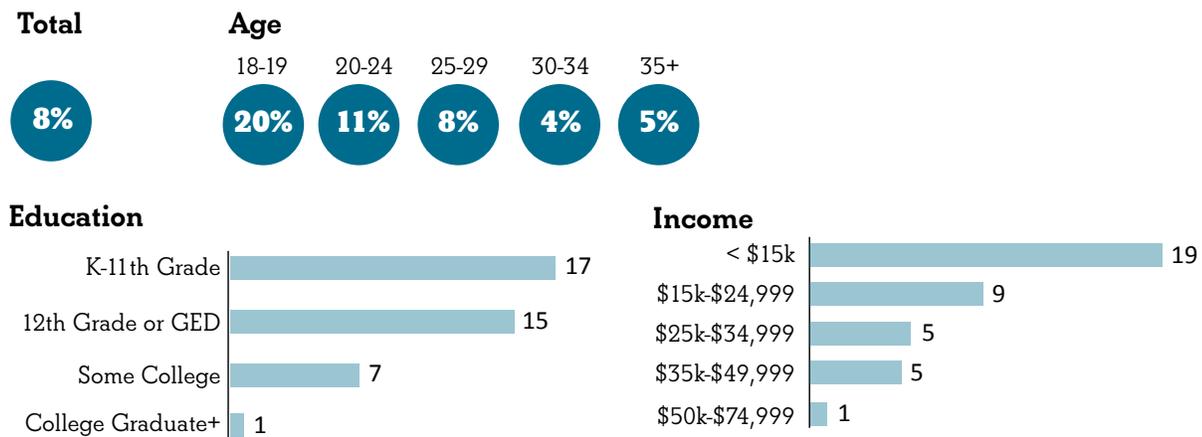


Figure 30: Percentage of women who smoked cigarettes during last trimester of pregnancy, 2010

Data source: Idaho Pregnancy Risk Assessment Tracking System



Methamphetamine Use

Methamphetamine use has been associated with severe oral health effects. The most common oral adverse effect associated with methamphetamine use is known as “meth mouth”. Meth mouth is the result of the combination of an acid from the drug, xerostomia (mouth dryness), poor oral hygiene habits, and tooth grinding and clenching.

In Idaho, methamphetamine consumption among teenagers has decreased over the past few years. Methamphetamine consumption in high school students in Idaho is monitored using YRBS. In 2007, it was estimated that 6% of Idaho high school students had ever used methamphetamines, approximately the same as the national median for the same year. In 2013, this proportion decreased to 3%. Based on results from the *Idaho Meth Use and Attitudes Survey*, it was estimated that in 2010, 11% of teenagers have been offered methamphetamines, 10% of teenagers in Idaho reported having a close friend who uses methamphetamine, 6% have friends who have been in treatment for methamphetamine use, and 16% reported having family members who have been in treatment for methamphetamine use (13).



Sweetened Beverages Consumption

Consumption of sweetened beverages has been associated with dental caries, especially among children. As part of YRBS, high school students are asked about soda consumption. In 2007, 23 % (17% females and 29% males) of high school students reported drinking soda pop one or more times per day during the past week. These proportions decreased in 2013; 15% (12% females and 18% males) of high school students reported drinking soda pop one or more times per day during the past week. The national median in 2013 was 22%, approximately 40% greater than in Idaho.



Conclusions

Several key indicators suggest that marked improvement is needed in the oral health status of Idaho through increased access to care and community-level programs. Although improvement has been noted for children, caries in both adults and children remain higher than the U.S. average, a condition that can be addressed through preventive care. Oral healthcare is limited in the state with adults indicating lack of dental insurance as a reason for not seeking care. Both FOHCs and PHDs provide oral healthcare but their services are limited leaving many without a source of low-cost care. In addition, there are not enough oral health providers to meet the needs of the state. With forty two of Idaho's forty four counties identified as dental HPSAs, access to care will continue to be a barrier.



Although services for children are more common as compared to those for adults, programs are limited in scope. For example, the Public Health Districts provide school-based sealant clinics and fluoride varnish clinics for children but they are not able to provide preventive oral healthcare services to adults. At the population level, community water fluoridation could decrease dental caries in both children and adults yet few municipalities provide fluoridated water.

In addition to oral health providers, primary healthcare services are key to improving the oral health status of the state. Chronic diseases such as diabetes and CVD, have been linked to periodontal disease. In Idaho, patients who self-identified with those diseases reported higher rates of tooth loss compared to the national average, indicating a need for collaborations between medical and dental providers. These collaborations may also improve the early detection rates of oral and pharyngeal cancers, both of which are lower than the national average.

Idaho faces several barriers to improving the oral health status of its population. In addition to the factors listed throughout this report, the ability to track health status and healthcare data is limited to few data sources, most of which are self-reported or are limited to specific segments of the population. The majority of information on oral health status and care is based on BRFSS, which is self-reported data for adults. Oral health status for children is limited to the Idaho Smile Survey which collects data for third graders. The IOHP is in the process of developing a statewide surveillance system which will help to provide a clearer picture of oral health status. Claims data, such as diagnostic codes and procedure codes, could also provide unbiased information in a timely manner. Until a universal reporting system is in place there will continue to be difficulties in providing both a comprehensive summary and measures of progress for the oral health burden in Idaho.

The Idaho Oral Health Burden Report is a living document and will be updated regularly as new information and data are available. This current document and the findings reported serve as a starting point and opportunity to utilize the data and information available as a means of prioritizing oral health efforts throughout Idaho.

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Appendix

Table 1:	National Oral Health Surveillance System (NOHSS), Idaho profile.....	54
Table 2:	Prevalence (%) of dental caries (treated and untreated) among public school third-grade students in Idaho, 2001-2013.....	54
Table 3:	Prevalence (%) of untreated tooth decay among public school third-grade students in Idaho, 2001-2013.....	55
Table 4:	Percentage of self-reported oral health manifestations during pregnancy, Idaho 2005-2010.....	55
Table 5:	Percentage of tooth loss due to tooth decay or gum disease among adults in Idaho, 2006-2010	55
Table 6:	Morbidity-related measures for oral and pharyngeal cancer in the state of Idaho for the years 1999-2012, by sex.....	56
Table 7:	Mortality-related measures for oral and pharyngeal cancer in Idaho for the years 1999-2012.....	57
Table 8:	Natality-related measures and congenital abnormalities in Idaho, 2007-2012	57
Table 9:	Dental insurance status among adults (18 y+) in Idaho, 2006-2012.....	58
Table 10:	Estimated number of oral health personnel in Idaho, 2009-2014.....	59
Table 11:	Children with a dental home at the beginning and end of enrollment year 2012-2013	59
Table 12:	Prevalence (%) of diabetes in adults, Idaho 2006-2010.....	60
Table 13:	Prevalence (%) of cardiovascular disease, Idaho 2006-2010	60
Table 15:	Fluoride varnish applications in children by age and Public Health District in Idaho, 2012-2013	61
Table 16:	Dental sealant needs among public school third-grade students in Idaho, 2001-2013.....	61
Table 17:	Percentage of adults (18 y+) in Idaho without an annual dental examination, 2006-2012	62
Table 18:	Dental care among pregnant women in Idaho, 2005-2010.....	63
Table 19:	Measures of oral health education in high schools in Idaho, %.....	64
Table 20:	Multivitamin intake during pregnancy among women in Idaho, 2005-2010	65
Table 21:	Percentage of tobacco use among high school students in Idaho, 2007-2013.....	66
Table 22:	Percentage of cigarette smoking among adults in Idaho, 2006-2010.....	66
Table 23:	Cigarette smoking during last trimester of pregnancy in Idaho, %, 2006-2010	67

Table 1: National Oral Health Surveillance System (NOHSS), Idaho profile

Data sources: Dental visit, teeth cleaning, complete tooth loss, lost 6 or more teeth = Idaho Behavioral Risk Factor Surveillance System (BRFSS); fluoridation status = Water Fluoridation Reporting System (WFRS); caries experience, untreated tooth decay and dental sealants = Idaho Smile Survey; cancer of the oral cavity and pharynx = Cancer Data Registry of Idaho (CDRI). Notes: Incidence and mortality rates calculated using the U.S. 2000 standard population.

Indicator	Previous measure (year)	Current measure (year)
Dental visit: Adults aged 18+ who have visited a dentist or dental clinic in the past year	68.0% (2008)	67.6% (2012)
Teeth cleaning: Adults aged 18+ who have had their teeth cleaned in the past year (among adults with natural teeth who have ever visited a dentist or dental clinic)	67.4% (2008)	66.3% (2012)
Complete tooth loss: Adults aged 65+ who have lost all of their natural teeth due to tooth decay or gum disease	17.3% (2008)	16.1% (2012)
Lost 6 or more teeth: Adults aged 65+ who have lost six or more teeth due to tooth decay or gum disease	38.1% (2008)	20.9% (2012)
Fluoridation status: Percentage of people served by water public systems who receive fluoridated water	31.3% (2006)	36.1% (2010)
Caries experience: Percentage of 3 rd grade students with caries experience, including treated and untreated tooth decay	60.3% (2009)	58.4% (2013)
Untreated tooth decay: Percentage of 3 rd grade students with untreated tooth decay	67.1% (2009)	20.8% (2013)
Dental sealants: Percentage of 3 rd grade students with dental sealants on at least one permanent molar tooth	22.5% (2009)	62.0% (2013)
Cancer of the oral cavity and pharynx: Oral and pharyngeal comprises a diverse group of malignant tumors that affect the oral cavity and pharynx	Incidence: 13.3 per 100,000 Total new invasive cases: 219 Mortality rate: 2.9 per 100,000 Total deaths: 46 (2010)	Incidence: 11.1 per 100,000 Total new invasive cases: 191 Mortality rate: 1.9 per 100,000 Total deaths: 33 (2012)

Table 2: Prevalence (%) of dental caries (treated and untreated) among public school third-grade students in Idaho, 2001-2013

Data source: Idaho Smile Survey

	2001	2005	2009	2013
Total	65.4	69.8	67.1	61.8
Sex				
Males			69.8	65.3
Females			65.6	58.2
School participation rate in FRSLP				
<33%	53.5	58.3	58.4	50.6
33-66%				
>66%	72.8	78.8	71.1	69.9
Race/ethnicity				
Non-Hispanic Whites				58.7
Hispanics				75.7

Table 3: Prevalence (%) of untreated tooth decay among public school third-grade students in Idaho, 2001-2013

Data source: Idaho Smile Survey

	Any untreated tooth decay				Severe (4+) untreated tooth decay			
	2001	2005	2009	2013	2001	2005	2009	2013
Total	27.3	31.0	22.5	20.8	5.2	9.0	5.6	3.9
Sex								
Males								
Females								
School participation rate in FRSLP								
<33%				15.8				
33-66%								
>66%				25.4				
Race/ethnicity								
Non-Hispanic Whites				18.9				
Hispanics				25.8				

Table 4: Percentage of self-reported oral health manifestations during pregnancy, Idaho 2005-2010

Data source: Idaho Pregnancy Risk Assessment Tracking System (PRATS)

	2005	2006	2007	2008	2009	2010
Bleeding gums when brushing	49.9	49.5	51.1	51.4	48.9	47.5
Swollen, puffy gums	18.5	18.5	21.2	24.9	24.1	22.6
Loose teeth	4.4	4.0	4.5	5.7	4.1	4.0
Receding gums	8.8	8.0	7.6	10.0	8.9	9.0
Pain in teeth or gums	21.7	20.6	22.6	26.5	26.7	24.9
Bad breath that does not go away with brushing	9.6	8.2	8.5	8.8	9.3	8.3
Spaces between teeth that were not there before	2.7	2.8	2.9	3.1	3.6	3.2
Inability to chew or swallow properly	2.4	2.5	2.2	3.4	3.4	2.4
Teeth with obvious decay	11.2	11.8	11.1	12.2	11.6	11.3

Table 5: Percentage of tooth loss due to tooth decay or gum disease among adults in Idaho, 2006-2010

Data source: Behavioral Risk Factor Surveillance System (BRFSS)

	2006	2007	2008	2009	2010
None	59.5	58.2	58.3	NA	56.2
1-5	26.6	28.5	29.2	NA	30.7
6+	8.9	8.1	7.9	NA	8.3
All	5.3	5.2	4.6	NA	4.8

Table 6: Morbidity-related measures for oral and pharyngeal cancer in the state of Idaho for the years 1999-2012, by sex

Data source: Cancer Data Registry of Idaho (CDRI)

1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012

Males: New cases, n

Invasive	79	99	98	79	103	107	110	106	115	119	151	149	150	124
In-situ	0	5	6	5	5	4	4	4	2	3	5	4	2	NA
Total	79	104	104	84	108	111	114	110	117	122	156	153	152	NA
Incidence rate/100,000	14.1	18.2	17.1	13.4	16.6	16.3	16.0	15.4	15.9	15.7	20.1	18.6	18.3	14.8
Early detection, %	0.0	4.8	5.8	6.0	4.6	3.6	3.5	3.6	1.7	2.5	3.2	2.6	1.3	NA
Proportion of all newly-diagnosed cancers, %	2.9	3.5	3.5	2.6	3.4	3.3	3.2	3.1	3.1	3.2	3.9	3.8	3.6	NA

Females: New cases, n

Invasive	34	48	41	54	36	35	44	42	50	56	65	70	60	67
In-situ	0	1	0	3	2	1	1	2	2	2	2	4	4	NA
Total	34	49	41	57	38	36	45	44	52	58	67	74	64	NA
Incidence rate/100,000	5.3	7.5	6.4	7.8	5.2	5.0	6.1	5.6	6.4	7.0	8.0	8.3	7.0	7.5
Early detection, %	0.0	2.0	0.0	5.3	5.3	2.8	2.2	4.5	3.8	3.4	3.0	5.4	6.3	NA
Proportion of all newly-diagnosed cancers, %	1.3	1.8	1.5	1.9	1.3	1.2	1.4	1.3	1.5	1.6	1.8	2.0	1.6	NA

Total: New cases, n

Invasive	113	147	139	133	139	142	154	148	165	175	216	219	210	191
In-situ	0	6	6	8	7	5	5	6	2	5	7	8	6	5
Total	113	153	145	141	146	147	159	154	167	180	223	227	216	201
Incidence rate/100,000	9.5	12.4	11.4	10.5	10.6	10.4	10.9	10.3	10.9	11.2	13.8	13.3	12.5	11.1
Median age at diagnosis	NA	NA	NA	NA	64.0	61.0	61.0	63.0	63.0	64.0	64.5	65.0	63.0	64.0
Proportion of all newly-diagnosed cancers, %	0.0	3.9	4.1	5.7	4.8	3.4	3.1	3.9	1.2	2.8	3.1	3.5	2.8	2.5
Early detection, %	0.0	3.9	4.1	5.7	4.8	3.4	3.1	3.9	1.2	2.8	3.1	3.5	2.8	2.5
Proportion of all newly-diagnosed cancers, %	2.1	2.7	2.5	2.3	2.4	2.3	2.4	2.2	2.3	2.4	2.9	2.9	2.7	2.7

Table 7: Mortality-related measures for oral and pharyngeal cancer in Idaho for the years 1999-2012

Data source: Cancer Data Registry of Idaho (CDRI)

Note: Incidence rates calculated using the U.S. 2000 population; in-situ cases excluded

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Number of deaths, n														
Males	12	22	25	24	22	19	29	25	20	27	29	31	31	28
Females	12	16	14	12	9	12	12	13	12	14	12	15	11	5
Total	24	38	39	36	31	31	41	38	32	41	41	46	42	33
Median age at death, y	NA	NA	NA	NA	72.0	70.0	68.0	72.0	68.1	69.0	68.0	70.0	67.0	NA
Total number of YPLL before age 75	NA	NA	NA	NA	239	235	322	250	309	378	317	459	340	NA
Average number of YPLL per death, persons aged less than 75	NA	NA	NA	NA	12.6	13.1	12.9	10.8	15.5	12.6	11.3	15.8	12.1	NA

Table 8: Natality-related measures and congenital abnormalities in Idaho, 2007-2012

Data source: Idaho Vital Statistics

	2007	2008	2009	2010	2011	2012
Natality						
Births, n	25,023	25,156	23,726	23,202	22,311	22,941
Birth rate, per 1,000 population	16.7	16.5	15.3	14.8	14.1	14.4
Congenital abnormalities						
Any, n	187	182	212	162	144	181
Cleft lip and palate, n	39	31	36	25	29	36
Incidence rate of cleft lip and palate, per 1,000 births	1.6	1.2	1.5	1.1	1.3	1.6
Proportion of cleft lip and palate from all congenital abnormalities, %	20.9	17.0	17.0	15.4	20.1	19.9

Table 9: Dental insurance status among adults (18 y+) in Idaho, 2006-2012

Data source: Idaho Behavioral Risk Factor Surveillance System (BRFSS)

	2006	2007	2008	2009	2010	2012
Proportion without dental insurance, %						
Total	45.7	43.0	43.0	43.5	44.8	46.7
Sex						
Male	46.8	41.8	43.9	43.9	43.5	44.4
Female	44.7	44.2	42.1	43.1	46.2	48.9
Age						
18-24	55.3	36.8	48.2	52.9	44.1	41.3
25-34	40.7	36.0	39.9	41.1	50.0	40.2
35-44	34.5	31.3	31.2	36.8	31.9	37.5
45-54	35.9	31.3	34.7	32.3	37.2	37.6
55-64	43.5	37.1	44.9	38.5	42.4	49.9
65+	69.8	62.7	64.8	63.7	67.0	70.3
Income						
Less than \$15,000	70.8	69.4	64.2	68.6	68.8	73.7
\$15,000 - \$24,999	69.6	67.6	67.2	68.6	70.5	63.5
\$25,000 - \$34,999	54.6	51.1	51.7	54.5	59.5	59.0
\$35,000 - \$49,999	41.7	34.7	37.8	42.2	43.0	42.8
\$50,000 - \$74,999	NA	27.3	27.1	25.7	28.0	32.8
\$75,000+	NA	23.9	24.0	18.9	21.1	21.7
Employment status						
Employed	37.4	36.1	35.5	33.6	34.3	36.5
Unemployed	71.6	65.0	67.6	65.6	66.7	75.5
Other	58.7	53.5	53.4	54.3	56.9	57.7
Education level						
K-11th Grade	73.3	68.4	67.6	64.9	67.1	68.1
12th Grade or GED	52.3	49.4	47.8	53.4	56.8	52.2
Some College	42.8	41.6	42.7	41.5	42.1	44.4
College Graduate+	33.0	29.5	30.6	29.6	29.9	31.6
Ethnicity						
Non-Hispanic	NA	NA	NA	NA	43.4	45.4
Hispanic	NA	NA	NA	NA	65.0	58.3
Socioeconomic status (SES)						
Non-Low SES	NA	NA	NA	NA	NA	27.7
Low SES	NA	NA	NA	NA	NA	71.0
Public Health District						
District 1	46.9	49.2	48.6	47.9	51.5	50.6
District 2	52.5	44.5	46.1	46.6	46.6	47.6
District 3	46.0	46.4	48.5	48.8	49.3	54.4
District 4	38.0	33.5	31.6	31.7	34.7	40.2
District 5	59.7	55.0	49.5	54.0	54.4	54.0
District 6	40.6	41.9	43.7	44.8	49.5	45.7
District 7	47.9	42.0	46.6	46.9	41.1	40.6

Table 10: Estimated number of oral health personnel in Idaho, 2009-2014

Data source: Centers for Disease Control and Prevention (CDC)

	2009	2010	2011	2012	2013	2014
Number of licensed dentists	1643	1725	1673	1744	1687	1248
Number of ACTIVE licensed dentists	1010	1092	1163	1151	1227	1013
Number of licensed dental hygienists	1625	1658	1757	1739	1850	1645
Number of ACTIVE licensed dental hygienists	1215	1330	1354	1457	1450	1392
Number of dentists enrolled as Medicaid providers	637	530	536	533	513	515
Number of counties without a dentist	1	NA	NA	NA	1	NA
Total of county population without a dentist	906	NA	NA	NA	861	NA
Number of counties in state without an enrolled Medicaid dentist*	3	3	2	2	3	3
Total number of Medicaid enrollees in counties without an enrolled Medicaid dentist**	1114	1146	1014	1122	1739	1903

Table 11: Children with a dental home at the beginning and end of enrollment year 2012-2013

Data source: Head Start Program

Grantee	Location	Type of Head Start program	Number at beginning of year	Percentage at beginning of year	Number at end of year	Percentage at end of year
Coeur D'Alene Tribe of Idaho	Plummer	Head Start	41	100.0	37	90.2
		Early Head Start	51	100.0	41	80.4
College of Southern Idaho	Twin Falls	Head Start	530	80.4	633	96.1
		Early Head Start	66	57.4	89	77.4
Eastern Idaho Community Action Partnership	Idaho Falls	Head Start	268	96.1	278	99.6
Friends of children and families, INC	Boise	Head Start	NA	NA	NA	NA
		Early Head Start	NA	NA	NA	NA
Lewis-Clark Early Childhood Program	Lewiston	Head Start	328	85.4	362	94.3
		Early Head Start	66	53.7	66	53.7
Migrant and Seasonal Head Start Program	Caldwell	Head Start	654	82.1	722	90.6
Mountain States Group , Inc	Coeur D'Alene	Head Start	NA	NA	NA	NA
		Early Head Start	NA	NA	NA	NA
Nez Perce Tribe	Lapwai	Head Start	112	86.8	113	87.6
		Early Head Start	60	69.8	59	68.6
North Idaho College	Coeur D'Alene	Head Start	286	79.7	336	93.6
Pocatello School District #25	Pocatello	Head Start	NA	NA	NA	NA
Pocatello/Chubbuck District #25	Pocatello	Head Start	179	85.6	200	95.7
Shoshone-Bannock Tribal business council	Fort Hall	Head Start	NA	NA	NA	NA
Western Idaho Community Action Partnership	Payette	Head Start	551	90.5	588	96.6
		Early Head Start	157	74.4	157	74.4

Table 12: Prevalence of diabetes in adults, %, Idaho 2006-2010

Data source: Idaho Behavioral Risk Factor Surveillance System (BRFSS)

		2006	2007	2008	2009	2010
	Total	6.8	7.9	7.0	8.0	8.0
Sex	Male	7.0	7.2	7.4	8.1	8.8
	Female	6.7	8.6	6.7	7.8	7.1
Age	18-34	1.3	1.6	0.7	1.7	2.1
	35-54	5.4	6.4	5.0	5.9	8.0
	55+	14.9	16.6	16.5	16.9	17.9
Income	Less than \$15,000	10.5	16.4	8.9	14.4	13.1
	\$15,000 - \$24,999	10.3	11.5	10.6	10.7	12.3
	\$25,000 - \$34,999	7.9	8.9	9.1	9.4	8.8
	\$35,000 - \$49,999	5.5	6.3	5.9	7.3	6.6
	\$50,000 - \$74,999	NA	5.6	4.1	6.5	6.4
	\$75,000+	NA	4.4	4.8	4.6	4.4
Employment Status	Employed	4.7	4.7	4.3	5.0	4.6
	Unemployed	9.7	8.3	7.9	6.1	8.5
	Other	10.6	13.7	11.8	13.2	13.0
Education Level	K-11th Grade	7.6	11.1	6.5	9.9	11.5
	12th Grade or GED	7.5	8.1	8.0	9.7	8.8
	Some College	8.2	8.7	6.8	7.5	8.5
	College Graduate+	4.3	5.7	6.5	6.1	5.4
Public Health District	District 1	7.0	10.0	6.4	7.3	8.6
	District 2	6.8	8.3	7.9	8.4	8.7
	District 3	7.9	6.3	7.1	8.8	8.7
	District 4	6.6	8.7	6.0	6.4	6.8
	District 5	5.5	8.4	7.7	9.1	7.6
	District 6	6.9	8.0	8.9	10.2	9.1
	District 7	7.0	8.5	7.1	8.2	7.7

Table 13: Prevalence of cardiovascular disease, %, Idaho 2006-2010

Data source: Idaho Behavioral Risk Factor Surveillance System (BRFSS)

	2006	2007	2008	2009	2010
Coronary heart disease	3.6	3.8	4.0	3.9	3.6
Stroke	2.3	2.5	2.3	2.5	2.2

Table 14: Access to water fluoridation in Idaho, 2005-2009

Data source: Center for Disease Control and Prevention (CDC)

	2005	2006	2007	2008	2009	2010	2012
Population served by public water system	965,819	1,011,949	1,011,949	1,011,949	1,011,949	1,099,561	1,097,332
Percentage of people on public water systems that receive fluoridated water, %	29	31	31	31	31	31	36
Population served by fluoridated water systems	278,551	316,350	316,350	316,350	316,350	335,127	395,863

Table 15: Fluoride varnish applications in children by age and Public Health District in Idaho, 2012-2013

Data source: Idaho Department of Health and Welfare (IDHW)

	PHD1	PHD2	PHD3	PHD4	PHD5	PHD6	PHD7	Idaho
Total, n	380	402	194	1266	215	2356	192	5005
Sex								
Females, n	199	189	91	667	102	1125	108	2481
Males, n	181	213	103	599	113	1231	84	2524
Age, n								
<1	5	30	11	184	13	46	2	291
1	30	113	53	470	25	155	6	852
2	26	92	44	246	22	162	0	592
3	49	76	31	186	19	208	37	606
4	150	75	26	116	16	438	101	922
5	21	3	16	26	29	650	44	789
6	9	0	7	15	25	453	0	509
7	3	0	3	10	13	126	0	155
8	1	0	0	1	9	37	0	48
>8	86	13	3	12	44	81	2	241

Table 16: Dental sealant needs among public school third-grade students in Idaho, 2001-2013

Data source: Idaho Smile Survey

Dental sealant need, %	Partial sealant need				Complete sealant need			
	2001	2005	2009	2013	2001	2005	2009	2013
Total	3.8	7.8	8.1	7.5	44.2	41.0	39.7	34.1

Table 17: Percentage of adults (18 y+) in Idaho without an annual dental examination, 2006-2012

Data source: Idaho Behavioral Risk Factor Surveillance System (BRFSS)

Note: Other employment status includes students, homemakers, retirees and persons unable to work.

	2006	2007	2008	2009	2010	2012
Total	34.6	32.3	32.0	29.9	32.5	32.4
Sex						
Male	36.3	32.8	35.2	32.0	35.4	NA
Female	32.9	31.9	28.9	27.8	29.6	NA
Age						
18-24	40.4	35.8	35.8	31.6	24.3	NA
25-34	36.9	34.8	33.5	33.7	39.0	NA
35-44	35.0	29.2	29.6	28.6	31.7	NA
45-54	30.8	32.5	31.7	25.3	32.1	NA
55-64	31.7	26.2	30.6	25.3	30.3	NA
65+	33.8	35.8	32.1	34.7	34.4	NA
Income						
Less than \$15,000	61.2	53.0	48.5	47.8	51.6	51.0
\$15,000 - \$24,999	45.4	50.5	51.7	51.2	51.4	46.7
\$25,000 - \$34,999	45.2	39.1	41.5	33.4	43.6	43.3
\$35,000 - \$49,999	31.2	32.8	30.0	31.6	33.3	30.9
\$50,000 - \$74,999	NA	22.9	21.3	19.6	23.4	22.0
\$75,000+	NA	14.2	15.4	11.3	12.1	12.8
Employment status						
Employed	33.7	31.5	32.1	27.1	29.9	NA
Unemployed	55.8	46.9	45.3	43.4	48.2	NA
Other	33.9	32.4	30.0	31.4	33.4	NA
Education level						
K-11th Grade	59.7	55.3	54.8	47.6	53.0	51.2
12th Grade or GED	40.5	39.0	37.9	36.4	42.7	37.4
Some College	32.0	30.1	33.1	28.8	31.4	31.2
College Graduate+	22.5	19.9	17.9	19.3	17.0	17.5
Ethnicity						
Non-Hispanic	NA	NA	NA	NA	32.0	NA
Hispanic	NA	NA	NA	NA	37.7	NA
Public Health District						
District 1	37.8	36.7	33.7	34.0	37.1	NA
District 2	39.6	41.0	35.9	37.7	38.8	NA
District 3	41.7	32.7	38.6	37.9	40.4	NA
District 4	27.1	25.3	26.8	19.4	26.3	NA
District 5	43.2	34.1	36.2	36.3	34.0	NA
District 6	32.4	35.3	30.4	28.3	29.4	NA
District 7	29.0	32.9	28.8	30.7	28.9	NA
Area of residency						
Urban	NA	NA	NA	NA	NA	31.2
Rural	NA	NA	NA	NA	NA	35.1
Frontier	NA	NA	NA	NA	NA	38.9
Dental insurance						
With	NA	NA	NA	NA	NA	17.9
Without	NA	NA	NA	NA	NA	48.8

Table 18: Dental care among pregnant women in Idaho, 2005-2010

Data source: Idaho Pregnancy Risk Assessment Tracking System (PRATS)

		2005	2006	2007	2008	2009	2010
Received information on the importance of getting regular dental care during pregnancy at any of the prenatal care visits		43.7	47.1	47.9	52.5	55.1	57.2
Lack of routine dental care during pregnancy							
Total		56.4	56.6	54.5	49.6	46.1	48.9
Age, years	18-19	77.3	67.3	77.8	64.7	53.1	69.9
	20-24	NA	68.2	65.4	62.5	55.8	57.8
	25-29	NA	55.7	53.1	46.9	46.2	45.4
	30-34	NA	42.4	39.4	39.8	38.7	42.8
	35+	NA	49.4	46.5	40.8	34.3	43.8
Ethnicity	Non-Hispanic	53.5	53.3	52.5	46.0	42.9	46.8
	Hispanic	74.0	79.2	70.6	71.9	67.8	63.6
Marital Status	Not married	71.2	73.1	72.6	61.4	52.7	59.6
	Married	52.3	51.7	48.9	46.0	44.0	45.4
Income	< \$15,000	76.8	75.4	75.3	67.4	55.3	62.9
	\$15,000-\$24,999	69.9	76.2	67.0	57.7	59.1	57.6
	\$25,000-\$34,999	59.6	62.5	62.4	56.0	53.3	55.1
	\$35,000-\$49,999	48.6	46.3	49.5	48.4	46.1	48.8
	\$50,000+	30.3	31.6	28.9	31.1	27.8	27.7
Education	K-11th grade	76.0	82.3	78.7	73.4	70.1	71.7
	High school or GED	69.6	69.2	68.0	60.1	55.2	58.7
	Some college	53.5	55.3	51.0	48.6	45.4	50.2
	College graduate+	38.4	36.2	37.7	34.0	28.4	32.1
Public Health District	District 1	63.0	58.1	60.2	57.4	49.2	49.5
	District 2	55.2	52.2	54.1	51.3	51.2	49.6
	District 3	61.9	64.4	60.5	52.8	52.9	53.1
	District 4	42.9	45.1	44.3	38.5	34.2	40.0
	District 5	66.8	65.0	62.5	56.7	56.2	55.7
	District 6	61.7	56.4	54.3	52.4	46.3	48.3
	District 7	57.6	61.5	55.6	51.6	46.6	52.7
Reasons for not receiving dental care during pregnancy							
Last dental visit was within 1 year		10.5	10.0	11.5	13.6	16.6	17.4
No insurance or money to pay out-of-pocket		51.0	54.6	54.9	50.9	50.5	46.3
Perceived no need to go to the dentist		20.3	16.9	20.5	22.9	22.8	26.6
Perceived as unsafe for the baby		11.5	12.2	15.9	15.2	10.9	9.2
Busyness		15.7	15.7	17.5	25.1	24.1	25.2
Other		15.5	13.7	14.5	12.2	13.0	13.3
Last time had teeth cleaned by a dental professional							
Less than 1 year		47.1	48.8	49.3	50.2	54.8	52.2
1-2 years		23.1	21.9	21.8	23.3	22.8	23.6
3+ years		22.4	22.0	21.9	20.9	17.8	19.8
Never have had teeth cleaned		3.1	4.3	3.7	3.0	2.0	1.9
Does not know		4.3	3.0	3.2	2.5	2.6	2.5

Table 19: Measures of oral health education in high schools in Idaho, %, 2000-2006

Data source: Idaho School Education Profile Survey (SHEPS)

	2000	2002	2004	2006
Health education teachers who tried to increase student knowledge of dental and oral health, grades 6-12	70	67	66	74
Health educators who received staff development training about dental or oral health over the past 2 years	9	6	9	12
Health educators who would like to receive further training in dental and oral health	31	34	34	43

Table 20: Multivitamin intake during pregnancy among women in Idaho, 2005-2010

Data source: Idaho Pregnancy Risk Assessment Tracking System (PRATS)

Note: Regular vitamin intake = 4+ times per week

	2005	2006	2007	2008	2009	2010
Multivitamin intake in the month before becoming pregnant, %						
No multivitamin	46.0	44.8	47.2	48.2	47.1	46.7
1-3 times per week	12.0	12.6	11.5	13.2	12.6	12.0
4-6 times per week	9.0	9.2	9.0	9.8	10.2	9.6
Every day of the week	33.1	33.4	32.3	28.8	30.1	31.7
Awareness of the role of folic acid on birth defects prevention, %						
	86.5	86.2	85.5	85.9	84.9	84.2
Received information on the importance of taking vitamin supplements during pregnancy at any of the prenatal care visits						
	94.8	93.8	94.9	94.3	94.4	95.8
Multivitamin intake during the third trimester, %						
No multivitamin	9.3	9.6	9.9	8.7	7.0	7.7
1-3 times per week	8.0	10.2	10.3	9.8	9.4	9.2
4-6 times per week	11.7	11.6	11.6	13.0	13.3	13.6
Every day of the week	71.0	68.6	68.2	68.5	70.3	69.6
Regular multivitamin intake during the third trimester, %						
Total	82.7	80.2	79.8	81.5	83.6	83.1
Age, years						
18-19	76.1	69.0	70.5	67.6	71.8	77.7
20-24	NA	77.0	76.4	76.0	78.3	81.0
25-29	NA	79.7	79.2	85.3	85.1	83.4
30-34	NA	84.5	84.9	81.1	86.9	85.8
35+	NA	87.9	85.7	90.9	90.8	83.9
Ethnicity						
Non-Hispanic	83.5	80.9	80.3	82.3	84.4	83.3
Hispanic	78.5	75.4	75.5	75.1	78.6	81.9
Marital status						
Not married	80.9	79.1	78.5	75.9	78.7	83.3
Married	83.2	80.5	80.2	83.3	85.1	83.1
Income						
< \$15,000	75.3	74.3	72.9	73.8	76.2	79.1
\$15,000-\$24,999	81.0	75.8	79.1	80.0	80.7	85.1
\$25,000-\$34,999	79.9	80.9	79.6	86.6	85.8	77.6
\$35,000-\$49,999	86.5	84.7	82.9	81.2	84.3	83.7
\$50,000+	90.1	85.0	84.7	85.5	89.6	88.0
Education						
K-11th grade	77.6	77.5	70.1	75.2	77.1	77.7
High school or GED	78.4	74.8	76.7	76.8	78.7	80.9
Some college	82.9	79.2	81.4	82.7	84.1	83.1
College graduate+	88.9	87.4	83.9	85.9	89.6	86.9
Public Health District						
District 1	82.7	82.5	79.8	83.7	91.2	83.8
District 2	87.5	84.0	83.4	87.1	86.1	85.2
District 3	82.2	76.3	77.3	79.8	79.3	80.8
District 4	86.9	88.7	85.2	82.2	88.1	87.1
District 5	80.4	77.4	75.1	84.6	83.1	79.9
District 6	83.4	80.8	81.3	79.1	79.9	84.2
District 7	76.3	69.5	75.3	79.0	78.7	80.5

Table 21: Percentage of tobacco use among high school students in Idaho, 2007-2013

Data source: Youth Risk Behavior Survey

Note: Frequent cigarette use is defined as having smoked cigarettes on 20+ of the previous 30 days; current smoking is defined as having smoked cigarettes on one or more of the previous 30 days.

	National median (2013)	Idaho (2007)	Idaho (2013)
Ever tried cigarettes smoking, %	40.4	48.3	33.3
Smoked a whole cigarette before age 13, %	8.9	13.9	6.7
Current cigarette use, %	13.8	20.0	12.2
Current frequent cigarette use, %	4.6	8.2	3.8
Smoke more than 10 cigarettes per day, %	9.2	9.1	4.3
Tried to quit smoking cigarettes, %	51.9	52.1	50.7
Ever smoked cigarettes daily, %	8.2	13.4	6.8
Currently smoked cigarettes daily, %	3.4	NA	2.4
Current smokeless tobacco use, %	8.3	7.0	8.0
Current cigar use, %	12.4	14.5	9.2

Table 22: Percentage of cigarette smoking among adults in Idaho, 2006-2010

Data source: Idaho Behavioral Risk Factors Surveillance Survey

	2006	2007	2008	2009	2010
Total	16.8	19.1	16.9	16.3	15.7
Sex					
Male	18.7	20.9	18.3	18.7	16.8
Female	15.0	17.4	15.4	13.9	14.6
Age					
18-34	20.8	22.7	20.5	19.9	20.9
35-54	17.8	20.7	17.5	17.1	15.1
55+	11.2	13.4	12.3	11.6	8.6
Income					
Less than \$15,000	27.3	32.1	27.6	28.5	30.8
\$15,000 - \$24,999	23.2	27.2	27.9	29.0	24.5
\$25,000 - \$34,999	20.3	24.3	22.1	18.4	20.9
\$35,000 - \$49,999	16.9	19.8	15.8	13.4	14.2
\$50,000 - \$74,999	NA	12.6	11.2	11.8	8.3
\$75,000+	NA	10.9	8.2	6.5	7.3
Employment status					
Employed	17.6	21.0	17.8	15.4	15.0
Unemployed	36.1	36.3	34.3	32.2	30.1
Other	13.4	14.0	12.7	14.5	13.9
Education level					
K-11th Grade	30.9	38.9	34.0	31.6	32.6
12th Grade or GED	23.1	24.6	23.2	23.2	21.0
Some College	14.4	17.2	15.4	15.2	15.4
College Graduate+	8.0	8.2	6.7	5.6	5.3

Table 23: Cigarette smoking during last trimester of pregnancy in Idaho, %, 2006-2010

Data source: Idaho Pregnancy Risk Assessment Tracking System

		2006	2007	2008	2009	2010
Total		8.4	8.0	8.1	8.5	8.0
Age	18-19	11.5	15.4	21.2	12.8	20.0
	20-24	11.2	10.9	11.4	11.1	10.7
	25-29	7.6	6.4	5.6	8.4	8.1
	30-34	6.7	6.4	5.3	5.0	4.0
	35+	5.2	4.9	6.7	7.4	5.2
Income	Less than \$15,000	19.1	19.5	21.3	20.0	18.9
	\$15,000 - \$24,999	9.2	8.9	7.8	7.6	9.3
	\$25,000 - \$34,999	9.6	7.3	8.5	5.4	5.4
	\$35,000 - \$49,999	2.1	4.2	2.7	8.0	4.9
	\$50,000 - \$74,999	1.6	0.8	2.1	1.6	0.9
	\$75,000+					
Education Level	K-11th Grade	16.4	20.1	16.3	16.2	17.4
	12th Grade or GED	16.3	14.1	15.1	16.4	15.2
	Some College	6.6	5.4	7.1	6.8	6.9
	College Graduate+	0.3	1.4	0.6	1.4	0.7

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