

HEALTH AND EDUCATION IN OREGON: **KEY FACTS**



Oregon
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Authority

PUBLIC HEALTH DIVISION
Office of the State Public Health Director

Education and health are deeply connected. Educational attainment is associated with better lifelong health, and health contributes to educational achievement. However, rising health care costs limit Oregon's ability to invest in education services and other public priorities as the state confronts increasing rates of chronic disease. This revenue drain contributes to poorly resourced schools, inadequate teacher-to-student ratios, and declining rates of high school graduation. These challenges threaten Oregon's ability to be competitive in the global economy and offer a desirable standard of living for residents.

“ Oregon is one of few states where the achievement gap is not closing. Low-income students in Oregon rank among the lowest performing students in the nation, having lost ground since 2003.”¹

Oregon's high school graduation rate is the 46th worst in the United States. In 2011, only 67% of Oregon students graduated from high school within four years, and only 70% within five years.² More than 4% of all students drop out each year.³ School dropout is increasing among younger students,⁴ and youth of color and youth from low-income families drop out at higher rates than their white and higher-income counterparts.⁵ In addition, Oregon ranks 47th among states in share of high school graduates who head to college, with only about half of students enrolling.⁶

In recognition of the critical importance of the early years on developmental outcomes and later academic success, over the past decade Oregon lawmakers have allocated resources to support preschool education. State General Fund moneys supplement federal Head Start dollars to maximize the number of low-income children taking part in quality Oregon prekindergarten (OPK) programs. Following budget reductions in 2010, the state Legislature allocated additional funding in 2012 to increase the percentage of children receiving OPK services. Despite rising poverty rates, the percentage of eligible children enrolled in programs grew from 55% to 64%.⁷ Early care and education programs will receive an additional boost with the infusion of federal Race to the Top – Early Learning Challenge dollars. As one of 14 states awarded Race to the Top funds, Oregon will receive \$20 million over four years to strengthen the state's early childhood system and ensure that Oregon children reach school ready to succeed.

Noting Oregon's record of educational attainment, in January 2011 upon taking office, Governor John Kitzhaber announced his education reform policy agenda. Subsequently, the Oregon Legislature adopted an ambitious 40/40/20 goal to ensure that by 2025:

40 percent of adult Oregonians will have earned a bachelor's degree or higher;

40 percent of adult Oregonians will have earned an associate's degree or post-secondary credential as their highest level of educational attainment;

20 percent of all adult Oregonians will have earned at least a high school diploma, an extended or modified high school diploma, or the equivalent of a high school diploma as their highest level of educational attainment.⁸

The importance of educational status as a major determinant of future well-being has led to the inclusion of high school graduation as a key public health indicator.⁹ Healthy People 2020 — a list of national objectives for health improvement — includes graduation rate as a leading health indicator.¹⁰ In addition, the 2011–2020 Oregon Health Improvement Plan lists educational attainment, specifically high school graduation, as an indicator of success in reducing health disparities.¹¹

Multiple factors contribute to students not completing their high school education. Optimal health for children is critical for school success from kindergarten through high school graduation. Regular school attendance and positive educational outcomes are more likely when children and youth:

- Have nurturing and safe relationships at home and communities;
- Receive early screening and intervention for developmental delays and social-emotional health;
- Receive timely immunizations for vaccine-preventable diseases;
- Receive recommended periodic preventive health visits;
- Receive preventive dental care;
- Eat nutritious meals and engage in physical activity every day;

- Do not use tobacco, alcohol or drugs;
- Avoid unintended pregnancy;
- Have access to mental health services.

Public health programs and services are essential to strengthening educational success and meeting Oregon’s 40/40/20 goal. The Oregon public health system, comprised of state, local and tribal public health departments and public and private partnerships, promotes lifelong health and prevention of leading causes of death, disease and injury for all people in Oregon.

This paper explores the role of health in Oregon’s educational goals to improve kindergarten readiness and high school graduation rates. Section One examines linkages between health in early childhood and kindergarten readiness. Section Two reviews connections between the health of school-age children and high school graduation. Evidence of effective public health interventions is provided where applicable.

SECTION ONE: THE ROLE OF EARLY CHILDHOOD HEALTH AND KINDERGARTEN READINESS

The seeds for educational success and lifelong health are planted very early — beginning prenatally and sown through infancy and the preschool years. To flourish, children must be born healthy in safe and nurturing environments with secure attachments to their parents and primary caregivers. Caring and stable relationships are essential for optimal development and set the stage for kindergarten readiness and later success in school. Conversely, the absence of these solid relationships and exposure to adverse childhood experiences (ACEs) may produce a series of negative health outcomes over the lifespan. Mounting evidence shows that many adult diseases originate in adverse events experienced during the years before children enter school.¹² Supportive relationships must continue throughout adolescence to prepare healthy young adults for college and/or careers.

PREVALENCE AND IMPACT OF ADVERSE CHILDHOOD EXPERIENCES (ACEs)

Adverse childhood experiences (ACEs) include verbal, physical or sexual abuse as well as neglect, and family dysfunction (an incarcerated, mentally ill, or substance-abusing family member, domestic violence, and absence

of a parent due to divorce or separation). These experiences create trauma in a child's life and lead to physiological changes that affect immune system function, ability to cope with stress, and susceptibility to chronic diseases. A higher number of ACEs is associated with developmental delays, social, emotional and behavioral problems in early childhood, other health risk factors (e.g., tobacco, alcohol and drug use), and the presence of high blood pressure, heart disease, cancer, and/or depression, which may surface at various times throughout the lifespan.¹³ According to experts at the Center on the Developing Child at Harvard University, "... health promotion and disease prevention policies focused on adults would be more effective if evidence-based investments were also made to strengthen the foundations of health and mitigate the adverse impacts of toxic stress in the prenatal and early childhood periods."¹⁴

In 2011, a representative sample of Oregon adults aged 18 years and older reported adverse experiences from their childhoods. Results show:

- Among Oregon adults, 62.2% have at least one ACE.
- More than a quarter of Oregon adults (26.4%) have three or more ACEs.
- One in 11 Oregon adults (9.2%) has five or more ACEs.¹⁵

Preliminary research shows that the level of ACE exposure is linked to academic failure, chronic absenteeism, severe school behavior problems and frequently-reported poor health.¹⁶ ACEs are associated with an increased risk of chronic disease and premature death. In a national study of 17,337 adults over a two-year period, people with six or more ACEs died nearly 20 years earlier on average than those without ACEs.¹⁷

Interventions in the environment, family, and other relationships can counteract the impact of ACEs. Those that create safety, build and sustain quality attachments, enhance protective factors, reduce risk factors, and provide parent support and education can reduce the effects of trauma and increase the likelihood of academic success for children who have been exposed.¹⁸ These interventions can take place throughout the life course, but are most effective if begun prenatally or at birth.

EARLY CHILDHOOD INTERVENTIONS

Early childhood interventions and policies are most effective when they consider how family and community capacities influence health outcomes. Family capacities include financial resources, time spent with children, psychological resources, and human capital (educational attainment, health literacy). Community capacities include institutional resources (parks, fresh food markets, safety of early education centers) and collective efficacy (informal social structures that instill trust and shared values). These capacities can be linked to the core foundations of children's health: responsive caregiving (preventing risk factors for toxic stress, such as child abuse and neglect), safe and secure environments, adequate and appropriate nutrition, and health-promoting behaviors.¹⁹

Several early childhood interventions in Oregon address developmental issues caused by exposure to ACEs, including public health home visiting programs, Early Intervention, Early Childhood Special Education, and early care and education programs, such as Head Start and Early Head Start. Other public health programs, including Women, Infants and Children (WIC) and oral health screenings, promote children's physical health by supporting healthy nutrition and preventing tooth decay.

Home visiting programs

Home visiting is one of the most commonly used and effective approaches for families with pregnant women, newborns and young children. Rigorous longitudinal studies demonstrate the long-term outcomes of evidence-based home visiting programs. Compared to high-risk children who do not receive nurse home visiting services, children served are healthier because they more likely receive regular well-child visits, immunizations, developmental screening, nutrition assessments, and breastfeeding support for mothers. Nurse home visiting also has been linked to improved school readiness and performance, including improvements in cognitive and language development and higher scores on achievement test scores in reading and math.²⁰ Research under way suggests that the Nurse Family Partnership and Early Head Start home visiting programs have been effective in mitigating ACE scores.²¹

Oregon has several home visiting models with varying costs and levels of effectiveness. For example, the Nurse Family Partnership program is estimated to cost \$9,600 per participant and result in long-term benefits

of almost \$23,000 per participant.²² Existing programs lack the scope to meet the need for services; the potential unmet need may be as much or more than twice the number currently being served.²³ Public health, in collaboration with many state and local partners, is leading efforts to develop an integrated home visiting approach in Oregon.

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Early care and education (ECE)

Early Intervention (services for children birth to age 3 and parents) and Early Childhood Special Education (instruction for children ages 3 to the age of public school eligibility) address developmental issues caused by exposure to ACEs. In addition, quality early care and education (ECE) programs, including Head Start, build social-emotional and cognitive skills to foster resiliency and competence in young children with lasting effects.

Early care and education (ECE) programs can reduce achievement disparity typically by 20 percent to 50 percent.²⁴

Numerous evaluations have shown that children at risk for poor outcomes who participated in these programs had improved health outcomes, higher graduation and employment rates, and lower rates of incarceration and teen pregnancy compared to children at risk who were not enrolled. ECE

programs can reduce achievement disparity typically by 20 percent to 50 percent.²⁴ Public health supports the professional development and quality improvement of the ECE workforce and the development of Oregon's Tiered Quality Improvement System. By providing technical assistance to ECE providers as well as partners, public health helps to strengthen health and safety practices and standards that promote improved quality of care.

Women, Infants and Children (WIC) program

The Women, Infants and Children (WIC) program, a public health nutrition program designed to improve the nutritional health of low-income pregnant women and children, supports early learning by promoting children's healthy brain development and strengthening overall child and family health. WIC reduces the risk for preterm birth and low birth-weight babies by 25 percent and 44 percent, respectively. WIC has the most protective effect on children younger than 12 months of age, when their brains more than double in size when nutritional building blocks are provided.²⁵ WIC also improves child and family health by increasing breastfeeding rates.

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Oregon's breastfeeding rates are some of the highest in the nation, with more than 90% of Oregon infants breastfed at birth.²⁶ Oregon WIC data indicate that lower-income women in Oregon initiate and sustain breastfeeding at a rate comparable to more affluent women, whereas in most other states there is a wide gap between these two groups. Breastfeeding decreases a baby's risk of infections, diarrhea, Sudden Infant Death Syndrome (SIDS), childhood leukemia and chronic diseases such as obesity, diabetes, and asthma; and decreases a mother's risk of breast and ovarian cancers, and chronic diseases such as diabetes, high blood pressure, high cholesterol, and cardiovascular disease. In addition, WIC nutrition education leads to an increased consumption of whole grains, fruits and vegetables, and lower-fat milk among the entire family.²⁷ Good nutrition and access to healthy foods improve children's cognitive functions and learning abilities.

Oral health programs

Early Childhood Caries is defined as the presence of one or more decayed, missing (due to caries), or filled tooth surfaces in any primary tooth in a preschool-age child between birth and 71 months of age. The American Dental Association (ADA) recognizes that "early childhood caries is a significant public health problem in selected populations and is also found throughout the general population."²⁸ Children from low-income families are more likely to develop caries.

Preschoolers in households with incomes less than 100% of the federal poverty level (FPL) are three to five times more likely to have cavities than children from families with incomes equal to or above 300 percent of the FPL. The Third National Health and Nutrition Examination found visible decay in 30 percent of two- to five-year-old children in poverty and 24 percent of near-poor children (100%–200% of the FPL). Caries was present in only 12 percent of middle-income youngsters and 6 percent were from families with the highest income.²⁹

Public health supports early childhood caries prevention through workforce development, including no-cost continuing education training for medical and dental providers to implement preventive oral health services for infants and toddlers ages 3 and under. Public health also promotes early childhood

oral hygiene and nutrition education. In addition, public health works to increase children's access to dental visits by 12 months of age; preventive dental sealants; and fluoridated water. Oregon ranks 48th in the nation for

having a low percentage (22.6%) of people who receive fluoridated water.³⁰

Fluoridation produces a median decrease in caries of 29.1% to 50.7% among children aged 4 to 17 years.³¹

Water fluoridation produces a median decrease in caries of 29.1% to 50.7% among children aged 4 to 17 years.³¹

Early childhood interventions to improve children's health establish a strong foundation for early learning and kindergarten readiness. Health continues to be critically important for the educational success of school-age children and adolescents.

SECTION TWO: THE ROLE OF HEALTH IN SCHOOL AND HIGH SCHOOL GRADUATION

As children progress through primary and secondary school, their health affects attendance, academic performance and likelihood of high school graduation.

Students who are chronically absent (missed 10% or more of school in an academic year for any reason) from school are less likely to graduate from high school than their peers with better attendance. Twenty-three percent of Oregon students in grades kindergarten through 12 were chronically absent in 2009–2010.³² Asthma causes three times more school absences than any other chronic disease causing 60% of students with asthma to miss school days every year.³³ Also a recent study found that about 11% of students without access to dental care missed school compared with 4% of those with access.³⁴

School safety and climate affect health and school attendance. Bullying is associated with depression, anxiety, health complaints, poorer school participation, decreased academic achievement, and suicide.³⁵ In 2009, 41% of eighth-graders and 27% of 11th-graders in Oregon reported being bullied or harassed at school in the past 30 days. Among Oregon youth who identify as lesbian, gay, bisexual or questioning (LGBQ), more than 50% report being bullied in the last 30 days, and nearly 15% have missed school due to safety concerns in the last 30 days, compared to 28% and 4% of straight youth, respectively.³⁶

School absenteeism is associated with health risk behaviors, including substance use, unintentional injuries, violence and risky sexual behaviors. Students with and without permission for being absent are more likely than non-absent students to engage in risk behaviors. Students absent without permission are twice as likely as students with excused absences to engage in risk behaviors.³⁷

Graduating from high school has broad social and economic benefits. Graduates are more likely to be employed and earn higher wages than non-high school graduates.³⁸ High school graduates are less likely to become dependent on government assistance,³⁹ become involved in crime,⁴⁰ and to use substances such as tobacco, alcohol, marijuana and other illicit drugs.⁴¹ An analysis done in Oregon found that high school dropouts were twice as likely to be incarcerated as high school graduates, and African American male dropouts were five times more likely to be incarcerated than African American males who graduated from high school.⁴² Furthermore, the children of high school graduates are more likely to graduate high school themselves and to experience positive health outcomes as compared to children of non-graduates.⁴³

Student health impacts graduation rates and subsequent lifetime achievement. For example, a 14-year study of students with diabetes found that the high school dropout rate among people with diabetes was 6% higher than among non-diabetic peers and the likelihood of attending college was 8%–13% lower. During a lifetime, a person with diabetes could lose more

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than \$160,000 in wages as a result of the disease.⁴⁴ For every avoided high school dropout, the State of Oregon would save \$14,192 in reduced expenditures for Medicaid and uninsured care over the course of a student's lifetime.⁴⁵

As described in the following sections, healthy students learn better, healthy school employees are more productive, and healthy school environments benefit students, staff and the broader community.

STUDENT HEALTH

Student health is positively associated with academic achievement, which is widely documented by the Centers for Disease Control and Prevention (CDC) and several studies.^{46,47,48} Linkages between health and academic indicators include:

- Poorer oral health status is associated with dental pain, missed school and lower school performance among children.⁴⁹
- Poor nutrition and hunger (including from skipping breakfast) has been definitively associated with poorer cognitive function, and school breakfast programs have been shown to improve academic performance and attendance (which is also associated with school success).⁵⁰
- Student depression affects academic achievement.⁵¹
- School health interventions support academic achievement.⁵²

Data from the Oregon Healthy Teens Survey (OHT), an anonymous school-based survey of eighth- and 11th-graders, indicate that Oregon students who are healthier also learn better. Students who reported mostly A and B grades were less likely to experience various health risk factors than students with grades of C or lower. Students with D and F grades were the most likely to experience health risk factors. This pattern is consistent with other state and national findings from the Centers for Disease Control and Prevention.⁵³

Academic grades and health risk factors, Oregon 8th-graders, 2011

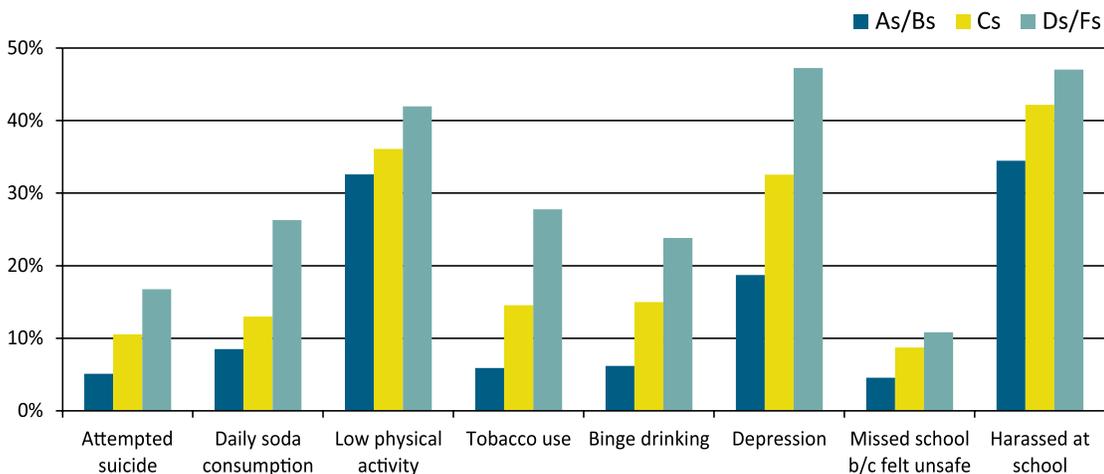
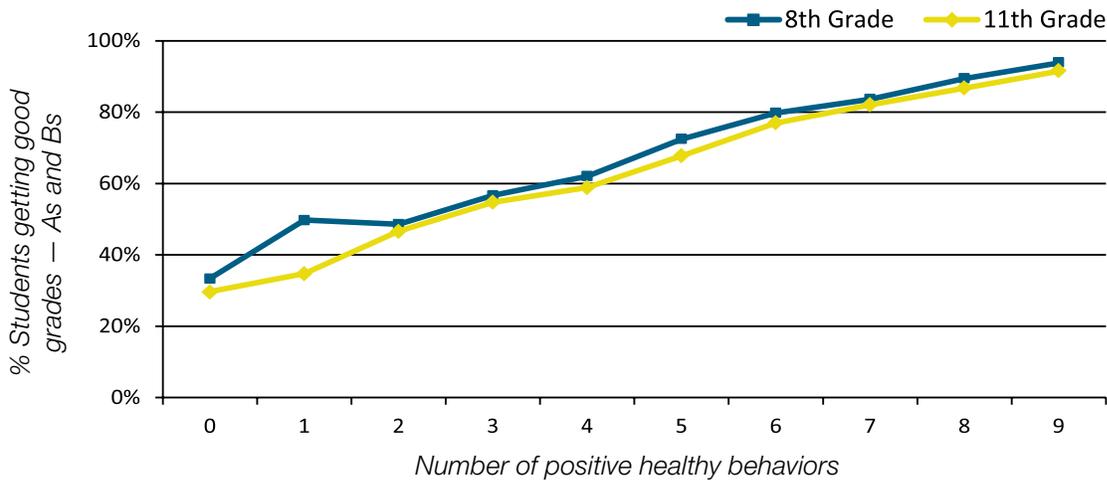


Figure 1 Source: Oregon Healthy Teens Survey, 2011.

In addition, young people’s healthy choices have a cumulative, positive impact. The percentage of students getting good grades in school increases for each healthy factor present (Figure 2). Healthy factors include eating fruits and vegetables, not smoking cigarettes, and not being harassed at school. For both eighth- and 11th-grade students, the increase of each healthy factor was associated with approximately a seven percentage-point increase in the number of students who reported getting good grades in school. This suggests that for each health factor supported in school settings, there may be an additive effect on a student’s ability to succeed in school, even when a relatively large number of healthy factors are already present.

Percentage of students with good grades in school by number of positive health factors



Source: Oregon Healthy Teens Survey, 2006-2009 combined. “Positive Healthy Behaviors” includes the sum of up to 9 factors: sufficient fruit/vegetable consumption, eating breakfast, drinking fewer sodas, sufficient physical activity, maintaining a healthy weight, not experiencing depression, not smoking cigarettes, not feeling harassed at school, and meeting the Positive Youth Development Benchmark.

Figure 2

Figure 2 includes the Positive Youth Development (PYD) Benchmark, a set of six Oregon Healthy Teens Survey questions that measure resiliency and developmental assets (self-rated physical and emotional health, presence of caring adults, community participation, self-efficacy and self-confidence). PYD has been shown to be strongly associated with academic achievement. Statewide, about two-thirds of youth in eighth and 11th grades meet the PYD benchmark.

These data in Figures 1 and 2 illustrate that health is a key factor in Oregon students' educational success. Interventions to improve school health address a wide range of physical, mental, social, oral and environmental health issues to help students maintain regular attendance, achieve academic excellence, and graduate from high school on time. School health interventions also support teachers and staff to stay healthy and promote a healthy school environment.

SCHOOL HEALTH INTERVENTIONS

The literature provides extensive examples of specific, effective school-based health interventions, including efforts to improve oral health,⁵⁴ reduce student tobacco use, improve nutrition, increase physical activity, reduce harassment and bullying and improve other aspects of health.⁵⁵ Since resources to support school health are limited, schools are challenged

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to decide which health interventions will achieve the most significant educational outcomes. Public health is uniquely positioned to partner with education to address health-related barriers to learning.

Coordinated School Health

Coordinated School Health is an evidence-based public health approach that tailors school health interventions to the needs of each school community. The organizing framework is illustrated in Figure 3.

This comprehensive approach is based on an assessment of school health policies, programs and strategies and requires collaboration with multiple stakeholders, including families and community partners. The model also emphasizes the need for school health efforts to be coordinated to ensure that all of the components listed in Figure 3 have a complementary and synergistic impact.⁵⁶

The Coordinated School Health Model



Figure 3

According to the Institute of Medicine:

A [comprehensive] school health program is an integrated set of planned, sequential, school-affiliated strategies, activities, and services designed to promote the optimal physical, emotional, social, and educational development of students. The program involves and is supportive of families and is determined by the local community based on community needs, resources, standards, and requirements. It is coordinated by a multidisciplinary team and accountable to the community for program quality and effectiveness.⁵⁷

The Oregon public health system has several programs that support comprehensive school health efforts.

School employee wellness

Employee wellness, one component of a Coordinated School Health approach, includes actions that help employees integrate healthy behaviors, such as nutrition, physical activity, and tobacco cessation, into daily routines. Effective wellness programs obtain administrative support and create a team to gather data and develop a plan for how to support workplace health. School employee wellness is essential to ensuring student academic success, as educators and other staff model healthy habits for children while they

learn life skills to become successful, healthy community members.⁵⁸ School employees make up a large portion of Oregon's workforce; approximately 104,000 staff work in Oregon's public schools. A healthy school

Every dollar spent on comprehensive employee wellness programs saves an average of five dollars.⁵⁹

staff increases productivity at a time when schools are under pressure to do more with less. Every dollar spent on comprehensive employee wellness programs saves an average of five dollars.⁵⁹ For example, Baker School District credits its employee wellness program with an 11% drop in substitute teacher costs, as a result of fewer sick days. Baker also reports reductions in obesity, hypertension and cholesterol among educators and staff. By creating a culture of health for staff, schools can attract and retain healthy employees; improve employee morale; reduce absenteeism and lower health care costs, disability and workers' compensation.⁶⁰

School-Based Health Centers

Oregon has 63 Certified School-Based Health Centers (SBHCs) in 21 counties. The SBHC system of care promotes the health and educational success of Oregon's school-aged population through evidence-based practices within a public health framework. In addition to providing comprehensive physical and mental health services, SBHCs prioritize prevention and early intervention services, such as immunizations, well-child exams and health assessments. The well-child exam and health assessment address key health promotion topics, including family support, healthy weight and development, nutrition and physical activity, mental health and substance abuse, healthy sexuality development, safety and injury prevention, and oral health. Only slightly more than half of Oregon's eighth- and 11th-graders reported having a well-visit in the past year.⁶¹ SBHCs increase young people's access to care by providing services in school settings and serving all students regardless of their ability to pay. Furthermore, SBHCs allow students to return to the classroom faster and ready to learn.

CONCLUSION

Optimal health, beginning in early childhood and continuing throughout the lifespan, is critical for educational success in kindergarten and beyond. Since health and learning are intertwined, strategies that support health in early childhood and in school settings improve educational and health outcomes for all Oregonians. Public health strategies and interventions

Public health strategies and interventions support the State of Oregon's 40/40/20 goal to improve the number of adults who graduate from high school and complete post-secondary education.

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Early childhood interventions, including home visiting, early care and education, Women, Infants and Children (WIC) programs, and oral

health programs, have been shown to improve child health and contribute to kindergarten readiness. As children progress through primary and secondary school, health is associated with regular attendance, academic achievement and increased likelihood of high school graduation. Public health approaches to improve the health of students and school employees and promote healthy school environments include Coordinated School Health, school employee wellness initiatives, and School-Based Health Centers.

Public health contributes to educational success by strengthening health and education partnerships; by gathering information on the health status of specific populations through improving and coordinating data systems; and by developing, implementing and evaluating health interventions and policies that enable Oregonians to be ready to learn, play and work.

Health and education are natural partners in improving the health and educational success of Oregonians and ensuring the long-term prosperity of Oregon.

1. State of Oregon Office of the Governor. *Ten Year Plan for Oregon: Education Policy Vision*, Salem, OR; April 2012. <http://www.oregon.gov/COO/Ten/docs/EducationOutcome.pdf>. Accessed November 7, 2012.
2. State of Oregon Office of the Governor. *Ten Year Plan for Oregon: Education Policy Vision*. Salem, OR; April 2012. <http://www.oregon.gov/COO/Ten/docs/EducationOutcome.pdf>. Accessed November 7, 2012.
3. Oregon Department of Education. *Summary of 2010-11 Cohort Graduation Rates, Four-year Cohort (2007-08 to 2010-11)*, Salem, OR. <http://www.ode.state.or.us/wma/data/schoolanddistrict/students/docs/summarycohortgrad1011.pdf>. Accessed January 8, 2013.
4. Powers LE, Geenen S. *Dropping out of school: Problems and solutions. Transition Toolbox*. Salem, OR: Oregon Department of Education; 2007.
5. Braveman P, Egerter S. *Overcoming Obstacles to Health*. Princeton, NJ: Robert Wood Johnson Foundation; 2008. <http://www.rwjf.org/content/dam/farm/reports/reports/2008/rwjf22441>. Accessed January 8, 2013.
6. State of Oregon Office of the Governor. *Ten Year Plan for Oregon: Education Policy Vision*. Salem, OR; April 2012. <http://www.oregon.gov/COO/Ten/docs/EducationOutcome.pdf>. Accessed November 7, 2012.
7. Oregon Department of Education. Annual Performance Progress Report for Fiscal Year 2011-2012.
8. State of Oregon Office of the Governor. *Ten Year Plan for Oregon: Education Policy Vision*. Salem, OR; April 2012. <http://www.oregon.gov/COO/Ten/docs/EducationOutcome.pdf>. Accessed November 7, 2012.
9. Freudenberg N, Ruglis J. Reframing school dropout as a public health issue. *Prev Chronic Dis* 2007;4(4). http://www.cdc.gov/pcd/issues/2007/oct/07_0063.htm. Accessed November 27, 2011.
10. U.S. Department of Health and Human Services. Adolescent Health Objectives. Healthy People 2020. [Web page]. Washington, DC. <http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=2>. Accessed November 18, 2012.

11. Oregon Health Policy Board and Oregon Health Authority. *Oregon Health Improvement Plan*. Salem, OR; December 2010. <http://public.health.oregon.gov/ProviderPartnerResources/HealthSystemTransformation/OregonHealthImprovementPlan/Pages/index.aspx>. Accessed November 18, 2012.
12. Shonkoff JP. Investment in early childhood development lays the foundation for a prosperous and sustainable society. In: Tremblay RE, Boivin M, Peters RDeV, eds. *Encyclopedia on Early Childhood Development*. Montreal, Quebec: Centre of Excellence for Early Childhood Development and Strategic Knowledge Cluster on Early Child Development; 2009:1-5.
13. Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: the Adverse Childhood Experiences (ACE) Study. *Am J Prev Med*. 1998;14:245-258.
14. Center on the Developing Child at Harvard University. *The Foundations of Lifelong Health are Built in Early Childhood*. Boston, MA; 2010. <http://www.developingchild.harvard.edu>. Accessed November 18, 2012.
15. Oregon Behavioral Risk Factor Surveillance System. Portland, OR; 2011.
16. Blodgett C. *Adopting ACEs Screening and Assessment in Child Serving Systems*. Working Paper. Spokane, WA; July 30, 2012.
17. Brown DW, Anda RF, Tiemeier H, et al. Adverse childhood experiences and the risk of premature mortality. *Am J Prev Med*. 2009 Nov;37(5):389-96.
18. Blodgett C. *From ACEs to Action: The Emerging Art and Science of Community Change*. Spokane, WA: Washington State University; 2012.
19. Mistry KB, Minkovitz CS, Riley AW, et al. A new framework for childhood health promotion: the role of policies and programs in building capacity and foundations of early childhood health. *Am J Public Health*. 2012;102(9):1688-1696.
20. Paulsell D, Avellar S, Sama Martin E, Del Grosso P. *Home Visiting Evidence of Effectiveness Review: Executive Summary*. Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services; 2010.
21. Blodgett C. *Adopting ACEs Screening and Assessment in Child Serving Systems*. Working Paper. Spokane, WA; July 30, 2012.
22. Washington State Institute for Public Policy. *Return on investment: Evidence-based options to improve statewide outcomes*. Olympia, WA; April 2012. Available at: <http://www.wsipp.wa.gov/rptfiles/12-04-1201.pdf>. Accessed January 9, 2013.
23. Oregon Health Authority Public Health Division. *Oregon Home Visiting Needs Assessment Report*. Portland, OR; 2012. <http://public.health.oregon.gov/HealthyPeopleFamilies/Babies/HomeVisiting/Pages/HVNAReports.aspx>. Accessed January 7, 2013.

24. Advisory Committee on Head Start Research and Evaluation. *Final Report Submitted to the Secretary of the U.S. Department of Health and Human Services*. Washington, DC; August 2012. http://www.acf.hhs.gov/sites/default/files/opre/eval_final.pdf. Accessed January 7, 2013.
25. National WIC Association. *The Role of WIC in Public Health*. Washington, DC; January 2012. http://www.paramountcommunication.com/nwica/Role_of_WIC_Public_Health.pdf. Accessed January 3, 2013.
26. Centers for Disease Control and Prevention. *Pediatric Nutrition Surveillance 2010 State Tables*. Atlanta, GA; 2011.
27. National WIC Association. *The Role of WIC in Public Health*. Washington, DC; January 2012. http://www.paramountcommunication.com/nwica/Role_of_WIC_Public_Health.pdf. Accessed January 3, 2013.
28. American Dental Association. *Statement on Early Childhood Caries*. Chicago, IL; 2013. <http://www.ada.org/2057.aspx>. Accessed January 3, 2013.
29. Vargas C, Crall J, Schneider D. Sociodemographic distribution of pediatric dental caries: NHANES III, 1988-1994. *J Am Dent Assoc*. 1998;129:1229-1238.
30. Centers for Disease Control and Prevention. *2010 Water Fluoridation Statistics*. [Web page]. Atlanta, GA; 2010. <http://www.cdc.gov/fluoridation/statistics/2010stats.htm>. Accessed January 7, 2013.
31. Community Preventive Services Task Force. *The Community Guide: Oral health. Dental caries (cavities)*. <http://www.thecommunityguide.org/oral/caries.html>. Accessed January 7, 2013.
32. Attendance Works. Nearly a Quarter of Oregon Students are Chronically Absent. [Web page]. ECONorthwest analysis of Oregon Department of Education data, 2009-10. <http://www.attendanceworks.org/state-reports/oregon>. Accessed January 9, 2013.
33. Oregon Health Authority Public Health Division and Healthy Kids Learn Better. *Health and Academic Achievement Research Fact Sheet*. <http://public.health.oregon.gov/HealthyPeopleFamilies/Youth/HealthSchool/HKLB/Documents/FactSheetHKLB.pdf>. Accessed November 27, 2012.
34. Seirawan H, Faust S, Mulligan R. (2012). The impact of oral health on the academic performance of disadvantaged children. *Am J Public Health*. 2012;9(2):1729-1734.
35. StopBullying.gov. *Effects of Bullying*. [Web page]. 2012. <http://www.stopbullying.gov/at-risk/effects/index.html>. Accessed January 8, 2013.
36. Oregon Health Authority Public Health Division. Oregon Healthy Teens Survey. 2009. <http://public.health.oregon.gov/BirthDeathCertificates/Surveys/OregonHealthyTeens/Pages/index.aspx>. Accessed January 7, 2013.
37. Eaton DK, Brener NB, Kann LK. Associations of health risk behaviors with school absenteeism. Does having permission for the absence make a difference? *J School Health*. 2008;78(4):223-229.

38. Hauser RM, Anderson Koenig J, eds. *High School Dropout, Graduation, and Completion Rates: Better Data, Better Measures, Better Decisions*. 2011. http://www.nap.edu/catalog.php?record_id=13035. Accessed November 1, 2012.
39. Levin H, Belfield C, Muennig P, Rouse C. *The Costs and Benefits of an Excellent Education of All of America's Children*. New York, NY: Columbia University; 2007. <http://www.literacycooperative.org/documents/Thecostsandbenefitsofanexcellentedforamerchildren.pdf>. Accessed November 1, 2012.
40. Lochner L, Moretti E. The effect of education on crime: evidence from prison, arrests, and self-reports. *Am Economic Review*. 2004;94:155-189.
41. Townsend L, Flisher AJ, King G. A systematic review of the relationship between high school dropout and substance use. *Clinical Child and Family Psychology Review*. 2007;10(4):295-317.
42. House E. *Oregon's high school dropouts: Examining the economic and social costs*. Portland, OR: Cascade Policy Institute and The Foundation for Educational Choice; 2010. <http://www.edchoice.org/Research/Reports/Oregon-s-High-School-Dropouts--Examining-the-economic-and-social-costs.aspx>. Accessed November 1, 2012.
43. Ross CE, Mirowsky J. The interaction of personal and parental education on health. *Soc Sci Med*. 2011;72(4):591-599.
44. Fletcher JM, Richards MR. Diabetes' 'Health Shock' to Schooling and Earnings: Increased Dropout Rates and Lower Wages and Employment in Young Adults. *Health Affairs (Millwood)*. 2012 Jan;31(1):27-34.
45. Alliance for Excellent Education. *Healthier and Wealthier: Decreasing Health Care Costs by Increasing Educational Attainment*. Washington, DC; November 2006. <http://www.all4ed.org/files/HandW.pdf>. Accessed January 30, 2013. (Note: Oregon figure was adjusted for inflation and reported in 2010 dollars.)
46. Centers for Disease Control and Prevention. *Health and Academics*. [Web page]. Atlanta, GA; 2011. http://www.cdc.gov/HealthyYouth/health_and_academics/index.htm. Accessed November 1, 2012.
47. Basch CE. Executive Summary: Healthier Students are Better Learners. *J Sch Health*. 2011;81(10):591-92.
48. California Endowment, James Irvine Foundation, William and Flora Hewlett Foundation. *Healthy Steps Toward Student Achievement: Research-based Recommendations for Policy and Practice*. May 2011. http://www.childrennow.org/uploads/documents/bwlw2011_healthy_steps_synthesis.pdf. Accessed November 30, 2011.
49. Jackson SL, Vann WF, Kotch JB, Pahel BT, Lee JY. Impact of Poor Oral Health on Children's School Attendance and Performance. *Am J Public Health*. 2011;101(10):1900-1906.
50. Basch CE. Breakfast and the achievement gap among urban minority youth. *J Sch Health*. 2011 Oct;81(10):635-40.

51. Hishinuma ES, Chang JY, McArdle JJ, Hamagami F. Potential causal relationship between depressive symptoms and academic achievement in the Hawaiian High Schools Health Survey using contemporary longitudinal latent variable change models. *Dev Psychol.* 2012 Jan 23. [Epub ahead of print].
52. Dilley JA. *Healthy Students, Successful Students: How School-based Health Interventions Can Improve Academic Success.* Olympia, WA: Washington State Board of Health; September 2009. <http://sboh.wa.gov/Pubs/docs/Health&AA.pdf>. Accessed January 8, 2013.
53. Centers for Disease Control and Prevention. Health and Academics Data and Statistics. [Web page]. http://www.cdc.gov/healthyyouth/health_and_academics/data.htm. Accessed January 9, 2013.
54. Community Preventive Services Task Force. *The Community Guide: Preventing Dental Caries. School-based or -linked Sealant Delivery Programs.* <http://www.thecommunityguide.org/oral/schoolsealants.html>. Accessed January 7, 2013.
55. Centers for Disease Control and Prevention. Adolescent and School Health, Health Topics. [Web page]. <http://www.cdc.gov/healthyyouth/healthtopics/index.htm>. Accessed November 18, 2012.
56. Basch CE. Healthier students are better learners: high-quality, strategically planned, and effectively coordinated school health programs must be a fundamental mission of schools to help close the achievement gap. *J Sch Health.* 2011;81(10):650-62.
57. Institute of Medicine. *Schools and Health: Our Nation's Investment.* Washington, DC: National Academy Press; 1997.
58. OEA Choice Trust. *Employee Health Matters in Oregon Schools.* Tigard, OR; 2012.
59. Chapman LS. The art of health promotion: meta-evaluation of worksite health promotion economic return studies: 2005 update. *Am J Health Promotion.* July/Aug 2005;19(6).
60. Chapman LS. The art of health promotion: meta-evaluation of worksite health promotion economic return studies: 2005 update. *Am J Health Promotion.* July/Aug 2005;19(6).
61. Oregon Health Authority Public Health Division. Oregon Healthy Teens Survey. 2011. <http://public.health.oregon.gov/BirthDeathCertificates/Surveys/OregonHealthyTeens/Pages/index.aspx>.



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