

Public Health Impact

Declining vaccination coverage threatens Clackamas County residents

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Vaccine-preventable diseases on the rise

Measles outbreaks are occurring across the country. Since the beginning of 2019, there have been 465 measles cases; 85 people in Washington and Oregon alone have contracted measles.¹⁻³ In an era when vaccine-preventable diseases seldom occur in the United States, these measles outbreaks highlight the Portland metropolitan region's vulnerability to infectious diseases.

While the number of known cases of vaccine-preventable diseases is low, and hospitalizations and deaths have also rapidly decreased over time, complications of vaccine-preventable diseases remain serious and often life-threatening (see figures a and b for current and past case counts). This is especially so for young children, pregnant women, older adults and others with compromised immune systems.⁴ Measles, for example, is particularly dangerous for children – one out of every 10 children with measles will permanently lose their hearing; one out of 20 will develop pneumonia; and for every 1,000 children who contract measles, one to two will die.⁵ High vaccination rates (95% and above) are important to stop the spread of infectious disease and protect those who cannot be vaccinated or do not have a strong immune response to vaccines (also known as community immunity).

In 2013, the Institute of Medicine reported that a growing trend of delaying vaccinations, or exempting from them entirely, has contributed to increases in vaccine-preventable outbreaks in the United States.^{6,7} Lack of access to health care services is also a significant issue. Nationally, vaccination coverage is lower among uninsured and Medicaid-insured children under three-years-old and among children living in rural areas. These disparities are larger for vaccines that require a booster dose in the second year of life.⁸

Clackamas County Public Health and our partners have a role to play to eliminate vaccine-preventable diseases. This report outlines trends in Clackamas County and our strategies to improve vaccination rates within our communities.

Vaccines save millions of lives and billions of dollars each year

Vaccines are one of the safest and most effective public health interventions. The success of vaccines is evidenced by the near eradication of most vaccine-preventable diseases and the number of lives saved. A recent study estimated that for a single birth cohort (4,261,494 infants from birth until death), vaccinating against 13 diseases would save \$13.5 billion in direct costs and prevent nearly 20 million cases of diseases, including over 40,000 deaths.⁹ Contrast these savings to

the recent measles outbreak in Washington, which has cost the state over \$1 million to investigate the exposure of more than 20,000 people.¹⁰ Without doubt, this outbreak could have been prevented because the measles, mumps, and rubella (MMR) vaccine, with just one dose, is 93% effective, and it costs less than \$71 per dose.¹¹

Vaccination Facts for Clackamas County

- 9.1% (397) of Clackamas County kindergarteners have at least one non-medical exemption
- 6.2% (3,820) of all Clackamas County students (K-12) have one or more non-medical exemptions
- 3.4% (2,124) of all Clackamas County students (K-12) are completely unvaccinated
- 79 students have medical exemptions to one or more vaccines, which accounts for .001% of all Clackamas County students

Case Counts

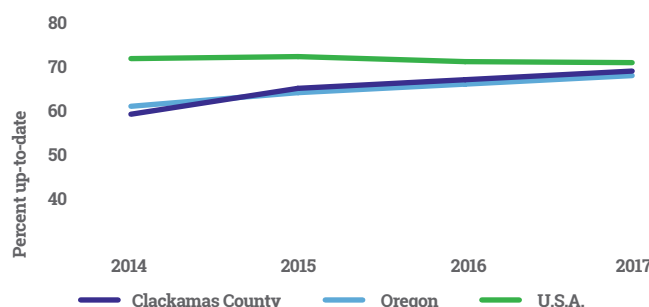
Figures a and b

Clackamas	2009-2013	2014-2018	January - March 2019
Measles	0	0	1
Mumps	1	7	1
Pertussis	175	250	1

Portland Tri-county Region*	2009-2013	2014 - 2018	January - March 2019
Measles	4	5	7
Mumps	6	37	1
Pertussis	1,129	717	17

Percent of Two-Year-Old Children Up-to-Date on Vaccinations

2014-2017, Figure c



In early 2016, an individual who worked in food service in Clackamas County exposed thousands of people to hepatitis A. No one contracted the virus, in large part, because the majority of those exposed were vaccinated. Hepatitis A is a highly contagious infection that affects the liver and can be deadly in certain populations.

Early childhood vaccination coverage

Nationally, early childhood total vaccination coverage has slowly increased over the last decade, but more recently has held steady around 70%.⁸ In Oregon and Clackamas County, early childhood total vaccination coverage has consistently increased over the last five years (figure c).^{12,13} However, there are alarming trends in national early childhood vaccination coverage; notably, the proportion of children who receive no vaccines by age 24 months has increased (0.3% in 2001 to 1.3% in 2015).⁸ Nationally, there is lower total vaccination coverage among children insured by Medicaid, living in rural areas, living below the poverty level, or who are American Indian/Alaska Natives or Black.⁸ There is no disparity on early childhood vaccination status when comparing urban and rural areas in Clackamas County.

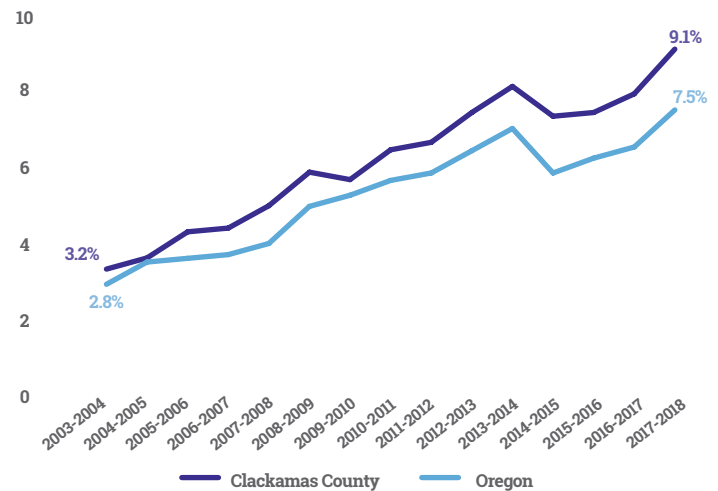
Children from underserved populations have less vaccine coverage in Clackamas County. In 2018, 15,059 children received their vaccines through the Vaccines for Children (VFC) program, at 48 different participating clinics across Clackamas County. Vaccines for Children is a federal safety net program that supplies participating health clinics with vaccines, so that eligible children can get their vaccines at no charge to the family. However, only 66% of two-year-olds who received one or more VFC vaccines were current with all their vaccines, compared to 71% of two-year-olds whose vaccines were covered through health insurance.

School-aged children and vaccine coverage

Once children enter school, vaccination coverage dramatically increases because of school vaccine requirements. National vaccination coverage for MMR, diphtheria, tetanus, pertussis (DTaP), and varicella vaccines among children enrolled in kindergarten was approximately 94% during the 2017-2018 school year.¹⁴ Oregon and Clackamas County vaccination coverage among kindergartners enrolled during 2017-2018 is

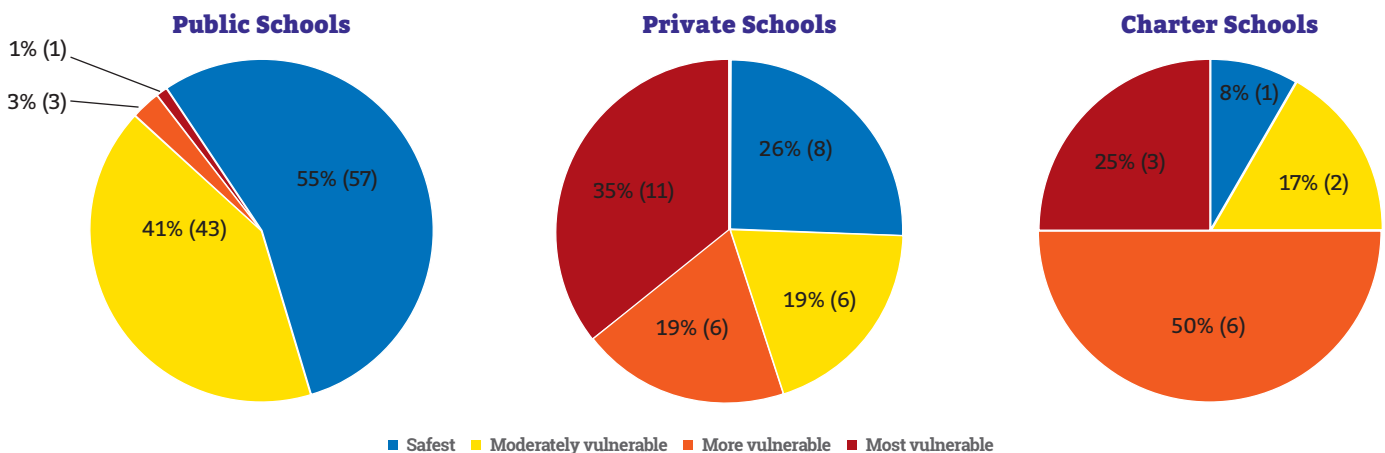
Kindergarten non-medical exemption rate, Oregon and Clackamas County vaccinations

2003-2018, Figure d



Which schools are vulnerable to outbreaks?

Figure g



As a condition of attending any school in Oregon, all children are required to be immunized against 11 vaccine-preventable diseases, including: diphtheria, tetanus, pertussis, polio, measles, mumps, rubella, varicella, hepatitis A and B, and haemophilus influenzae type b (Hib).

lower than national figures (Oregon 93%; Clackamas County 91%) (figure d).¹¹ Despite the drastic gains in vaccination coverage once children enter school, the national and statewide vaccination rates are still far below the recommended community immunity threshold of 95-100% (figure e).

Vaccine exemptions

In the majority of states, children must be vaccinated to enroll in school unless they have a medical reason (also known as medical exemptions). Common reasons for a medical exemption include serious allergies or having a weakened or failing immune system (e.g., children who have cancer, HIV/AIDS, or type 1 diabetes). However, a minority of states, including Oregon, allow parents or guardians to seek exemptions for children based on personal beliefs (also known as non-medical exemptions). Non-medical exemptions pose a risk to vulnerable people and the unvaccinated child. Oregon presently has the highest percentage of non-medical exemptions among kindergarteners in the country.¹⁴ Clackamas County ranks seventh among Oregon counties that have the highest percentage

of kindergarteners who have a non-medical exemption. The Portland metropolitan region is vulnerable to vaccine-preventable disease outbreaks because of the high number of non-medical exemptions among school-aged children.¹⁵

The percent of fully vaccinated students differs between Health Equity Zones (HEZ); and between public, charter, and private schools (figures f, g, h, i). Schools within the Estacada, Gladstone, Lake Oswego, and Oregon Trail HEZs fall within the safest category, meaning 95% or more students are fully vaccinated. The rest of the HEZs fall into the moderately vulnerable category, with only 90-94.5% of students fully vaccinated. Only 54% of public schools, 25% of private schools, and 8% of charter schools fall into the safest category. This fact is troubling since the overall goal of school vaccine requirements is to keep schools healthy and safe for children. Students who need medical exemptions to vaccines are particularly vulnerable to infection because they are not immunized and rely on community immunity to stay healthy. Forty-five percent of these students are in a school environment that is vulnerable to outbreaks.

Why is vaccination coverage declining?

The reasons for the decline in vaccination coverage are complex and are likely driven by a mix of scientific, socioeconomic, sociocultural, and political factors.

- Socioeconomic disadvantage may indicate limited access to health care resources and vaccines.¹⁶
- Affluence may relate to knowledge about non-medical exemptions and opposition to vaccines.¹⁶⁻¹⁸
- Vaccine opposition might be a result of a lack of trust in vaccine safety, pharmaceutical companies, and conventional health care systems.¹⁸⁻²¹
- Widespread availability to misinformation about vaccines has increased skepticism about vaccine science and health risks. A wide range of sources from internet blogs, online celebrity activism, and various social media sites have influenced how individuals obtain information about vaccines.²²

However, vaccines are not just about individual choices. They are about our connection and responsibility to others. Declining vaccine coverage has introduced a number of harmful

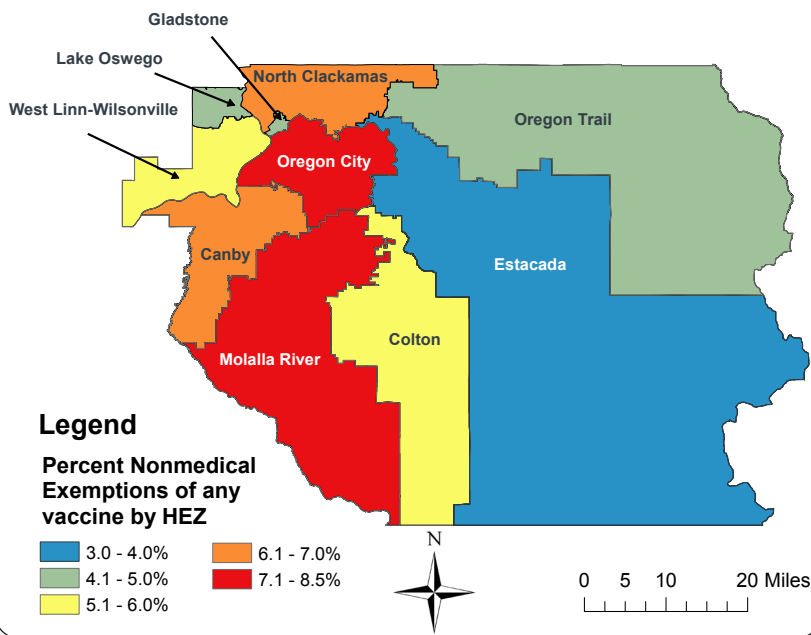
Oregon Health Authority defines the following four categories for vaccine community immunity:

- Safest:** 95 to 100% of students are fully vaccinated
- Moderately vulnerable:** 90 to 94.9% of students are fully vaccinated
- More vulnerable:** 80 to 89.9% of students are fully vaccinated
- Most vulnerable:** less than 80% of students are fully vaccinated

Figure e

Clackamas County Non-medical Exemptions by Health Equity Zone

2017-2018 School Year, Figure f



ⁱ Health Equity Zones are 10 distinct geographic regions in Clackamas County where Public Health can examine the specific factors that impact the health of those living within the zone. They highlight health inequities and community assets so stakeholders can use this information to improve the social and economic conditions that influence health.

infectious diseases back into our communities and is threatening lives.

Taking action to protect our communities

Last year marked the 100th anniversary of the influenza pandemic, which infected more than one-third of the world's population and was one of the deadliest infectious disease outbreaks ever recorded. The recent measles outbreaks across the country should be a dire warning that immediate and coordinated action is needed so we do not experience a resurgence of highly contagious and potentially life-threatening diseases.

For long-term success, strategies need to be targeted to groups with limited access to health care resources and those who are obtaining non-medical exemptions. A vision for the future includes all the work below.

Public health policy: Increase vaccination coverage among all Oregonians

Oregon must consider modifying the current immunization law to improve vaccination coverage. States that eliminate non-medical exemptions have demonstrated slower-growing opt-out rates and less vaccine-preventable disease outbreaks over time.¹⁵ Because vaccination coverage still differs by insurance status, Oregon must continue to develop progressive health care policies like "Cover All Kids," which ensures that every child has access to vaccines, regardless of immigration or documentation status.

Health systems: Improve access and education regarding vaccines

Healthcare providers need additional supports to help them practice parent-centered care and to engage effectively in vaccination acceptance conversations.²³ Web-based, social media applications are an effective strategy that health care providers can use with pregnant women to improve childhood vaccine acceptance.²⁴ In order to improve access to vaccines, health care providers must also increase their participation in the VFC program, implement vaccine reminder systems for patients, introduce standing orders so all providers can assess a patient's immunization status and administer vaccinations, and evaluate other access options like expanded clinic hours and the clinic's location to public transit and rural communities.²⁵

Local strategies: Partnerships between Clackamas County Public Health and community organizations

In order to improve vaccination rates, Clackamas County and our community partners must address vaccine access barriers, especially for low-income, under-insured, or uninsured individuals. These community members often do not have personal and public transportation options. And very few

vaccination providers are located in rural areas of Clackamas County. One strategy to increase access is to integrate vaccinations into existing community services like the Women, Infants, and Children (WIC) program and in schools.²⁵ Clackamas County presently provides immunization education to families participating in WIC, reviews vaccine records, and refers children in need of vaccines to health care providers. Further, there are five school-based health centers (SBHC) in Clackamas County where students receive vaccines. State-level SBHC data for the 2017-2018 school year indicates that 31% of overall SBHC services are for vaccines. School-based Health Centers are an important vaccine access point, especially in rural HEZs like Oregon Trail and Estacada.

Community engagement: Increase parent-to-parent education

An emerging practice that Clackamas County supports to increase vaccination rates within communities that are delaying, or exempting from all vaccines altogether, is to partner with parent-to-parent vaccine education organizations. Because health care providers often are not allotted the time to have lengthy discussions with parents, parent-to-parent education can fill a critical gap, especially for discussing concerns or addressing culturally-specific behavior. For example, Boost Oregon is a local, parent-led organization that disseminates evidence-based information about vaccines through online and printed materials and community workshops. Vax Northwest, a partnership of health organizations in Seattle, Voices for Vaccines, a national advocacy group, and South Carolina Parents for Vaccines are other organizations that encourage parents to learn and share facts about vaccines.

Methods

The data included in this report have been obtained from ALERT IIS, a statewide immunization information system, and the Oregon Public Health Epidemiologists' User System (ORPHEUS).

Limitations

Data at the local level regarding demographics (race/ethnicity), income, immigration status, and insurance status is unavailable. Data for two-year-olds does not include any information about why children are not up-to-date.

About Health, Housing & Human Services

The mission of the Health, Housing & Human Services Department is to remove barriers for vulnerable individuals and families on their path to improved health, wellness, prosperity, and inclusion.

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