

Human Papillomavirus (HPV) – Related Cancers: Assessment of prevention programs, policies and measures

Opportunities to improve **HPV prevention** and **cancer control**

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Prepared by
Oregon Health Authority
Public Health Division

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Executive summary

Introduction

Senate Bill 722 was passed by the 2013 Oregon Legislative Assembly. The bill requires the Oregon Health Authority (OHA) to prepare a Human Papillomavirus (HPV) and related cancer plan as an addendum to the Oregon Comprehensive Cancer Control Plan. The HPV-related cancers are cervical, anal and genital (anogenital), and cancers of the mouth and throat (oral cavity and pharyngeal).

The bill requires OHA to assess the following in an HPV-related cancer control plan: prevention programs, surveillance, policies, measures, public and health care provider awareness, gaps in knowledge, opportunities to improve disease prevention, and policy recommendations.

Work group process

This report is the product of an internal Public Health Division (PHD) work group, on behalf of OHA. The PHD was delegated to establish an internal work group to prepare a report in response to SB722. The work group met monthly, beginning in August 2013. Members included representatives from PHD Adolescent Health, HPV Impact, Immunization, Oral Health and Oregon State Cancer Registry programs. The work group also contacted major health systems to inquire about HPV-related activities and research. Kaiser Permanente Northwest provided information about research on cervical and oral HPV screening, cervical surgical procedures and vaccine effectiveness.

The PHD work group reviewed statewide programs, data measures and policies related to HPV prevention and cancer control. This is a limitation of the findings and opportunities identified in this report. The development of a comprehensive HPV-related cancer control plan would require input and engagement with stakeholders and partners at the state and local level. The plan would require the development of objectives, strategies and outcome measures which are feasible and adequately resourced.

The work group made this assessment by reviewing:

- Data on HPV-related cancers and HPV vaccine use in Oregon;
- Literature on HPV awareness and knowledge of the public and health care providers;
- Information from special projects related to HPV prevention, screening and incidence in Oregon; and
- National recommendations from the Center for Disease Prevention and Control.

Work group findings

- The annual rate of new HPV-related cancers in Oregon has increased since 2002.
- The most common HPV-related cancers in Oregon are cancer of the cervix for women and cancer of the mouth and throat (oropharynx) for men.

- Knowledge and awareness of HPV-related diseases and HPV vaccine is low for the general public in the U.S., and limited for health care providers.
- Evidence strongly supports the use of HPV vaccine for prevention of HPV and related cancers.
- Health care provider recommendations increase the chances that HPV vaccine will be given.
- Health care providers in the U.S. are less likely to recommend HPV vaccine for children under 13 years of age than for older children.
- Focusing on the use of HPV vaccine for cancer prevention increases its acceptance.
- In the U.S., states that mandate HPV vaccine for school attendance have lower rates of HPV vaccination than the national average.
- There is currently no coordinated or comprehensive approach for HPV prevention and cancer control in Oregon.

Opportunities to improve HPV prevention and cancer control

The following opportunities were identified as key components of a comprehensive approach to HPV prevention and cancer control. The work group emphasized that state and local engagement and adequate funding are essential to fully explore these opportunities and make any efforts successful.

1. Use strategies outlined in the Centers for Disease Control and Prevention (CDC) call to action. In particular, encourage health care providers to recommend HPV vaccine.
2. Encourage use of vaccine reminder systems for health care providers and patients.
3. Collaborate with non-traditional partners to raise HPV awareness and provide HPV vaccination.
4. Support a coordinated care organization metric for HPV vaccine provision.
5. Address cost barriers for HPV vaccination and screening.
6. Explore the possibility of school vaccine clinics.

Other approaches considered

The work group had extensive discussions about other potential strategies to improve HPV prevention and cancer control. The group concluded that a better understanding of the available evidence, systems impacts and policy implications is needed before these approaches can be considered. Key work with education and health systems partners at the state and local levels is needed to fully understand the impact of these strategies and determine if they should be pursued.

Other approaches considered included:

1. Increase capacity and support for adolescent well-visits.
2. Lower the age of consent for vaccination from 15 years to 11 years.
3. Require HPV vaccination for school attendance.

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The PHD work group reviewed statewide programs, policies and data measures related to HPV prevention and cancer control. The work group also reviewed relevant literature to better understand public and provider knowledge and awareness of HPV. The work group's findings are summarized in this report.

Human Papillomavirus (HPV)

About the virus

Human papillomavirus (HPV) is a virus that causes cancer of the cervix in women. HPV also causes cancer of the anus, genitals, mouth and throat in men and women. Scientists have found over 150 different types of HPV. About 18 “high-risk” types of HPV cause infections that can lead to cancer. High-risk HPV types 16 and 18 cause about 70% of cases of cervical cancer. High-risk HPV types 45 and 31 cause another 5 to 10% of cervical cancers.

“Low-risk” types do not cause cancer. Some low-risk types cause genital warts and wart-like growths on the vocal cords. HPV types 6 and 11 are two low-risk types that cause about 90% of genital warts. Some low-risk types usually do not cause any disease at all.

Most people who are infected with HPV — including the high-risk types — do not have any signs or symptoms. Their bodies eliminate the infection completely within a year or two. In a few people, high-risk virus remains in the body. Some of these people develop cancer years later. It can be 20 years or more from the time someone becomes infected with HPV until the time when cancer emerges.

Persistent high-risk infections of the cervix in women can be detected by regular Pap smear testing. These infections can be treated to prevent cancer from developing later. Women should therefore get recommended Pap-smear testing to prevent cervical cancer. Similar testing and treatment for high-risk HPV infections of other parts of the body is not routinely available at this time.

Spread of HPV

Oral and genital HPV is spread by skin-to-skin contact, including sexual intercourse, oral sex, anal sex or any other contact involving the genital area (for example, hand to genital contact). People do not become infected with the virus by touching an object, such as a toilet seat.

The more sex partners a person has in his or her lifetime, the higher the likelihood of being infected with HPV that affects the oral or genital regions. Almost everyone who is sexually active has had at least one HPV infection of the oral or genital regions. Scientists estimate that 75–80% of sexually active adults will acquire an oral or genital HPV infection before the age of 50 years. Most men and women first become infected with oral or genital HPV between the ages of 15 and 25 years.

HPV-related cancer in Oregon

HPV is known to cause cancer of the cervix, vagina, vulva, anus, rectum, penis, mouth and throat.

When we look at all those cancer types together, we see that the rate of HPV-related cancers in Oregon has increased over time since 2002 (Figure 1).

Figure 1.

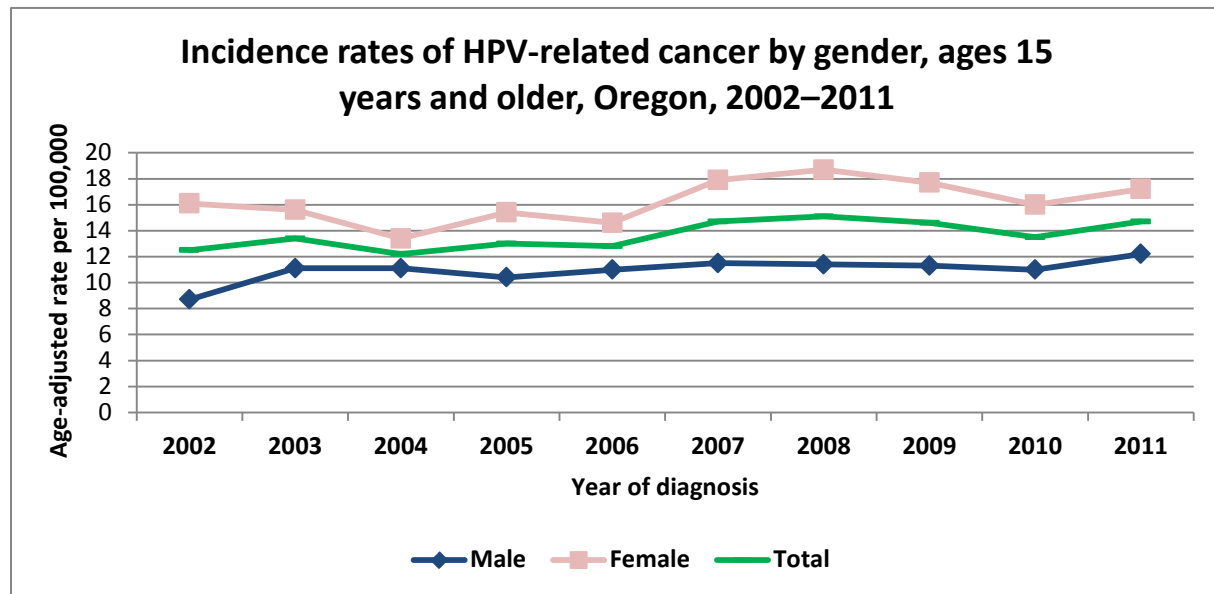


Figure 2 shows cancer of the cervix is the most common HPV-related cancer for women in Oregon. Cancer of the mouth and throat (oropharynx) is the most common HPV-related cancer for men in Oregon. The type of cancer of the mouth and throat caused by HPV can also be caused by tobacco use. We cannot say that all cases of HPV-related mouth and throat cancer are the result of HPV infection alone. But HPV infection is thought to be an important factor in many of these cancers.

Figure 2.

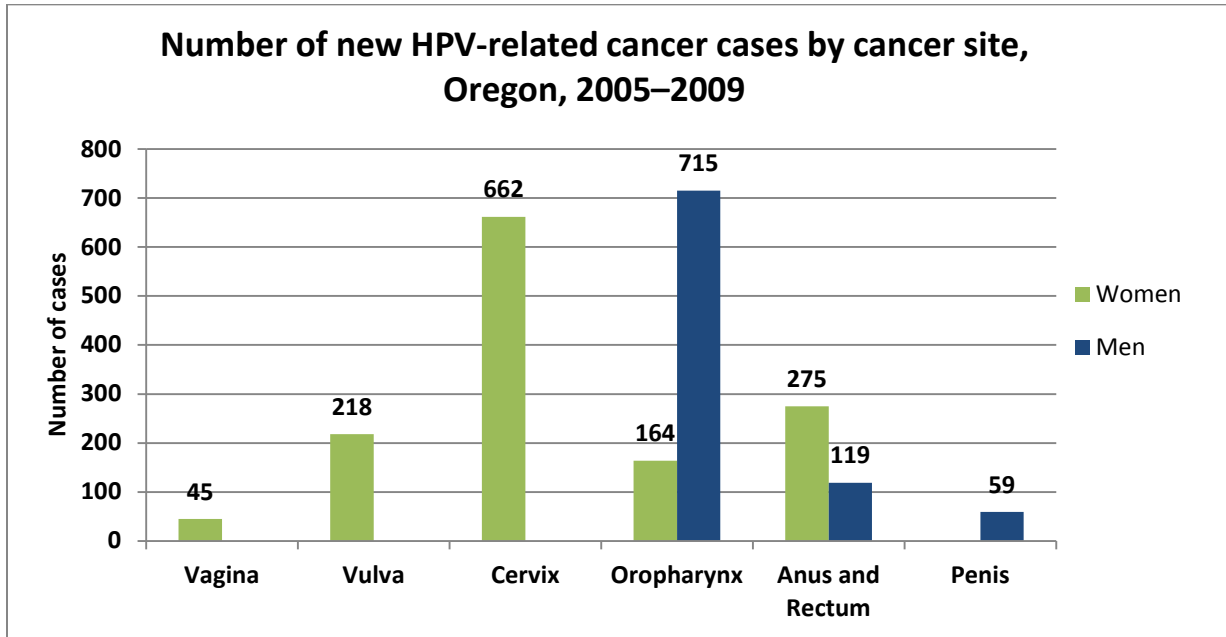


Figure 3 shows rates of cancer of the cervix are lower in Oregon than the national average. Rates of HPV-related cancer of other parts of the body are similar for women in Oregon compared to the U.S.

Figure 3.

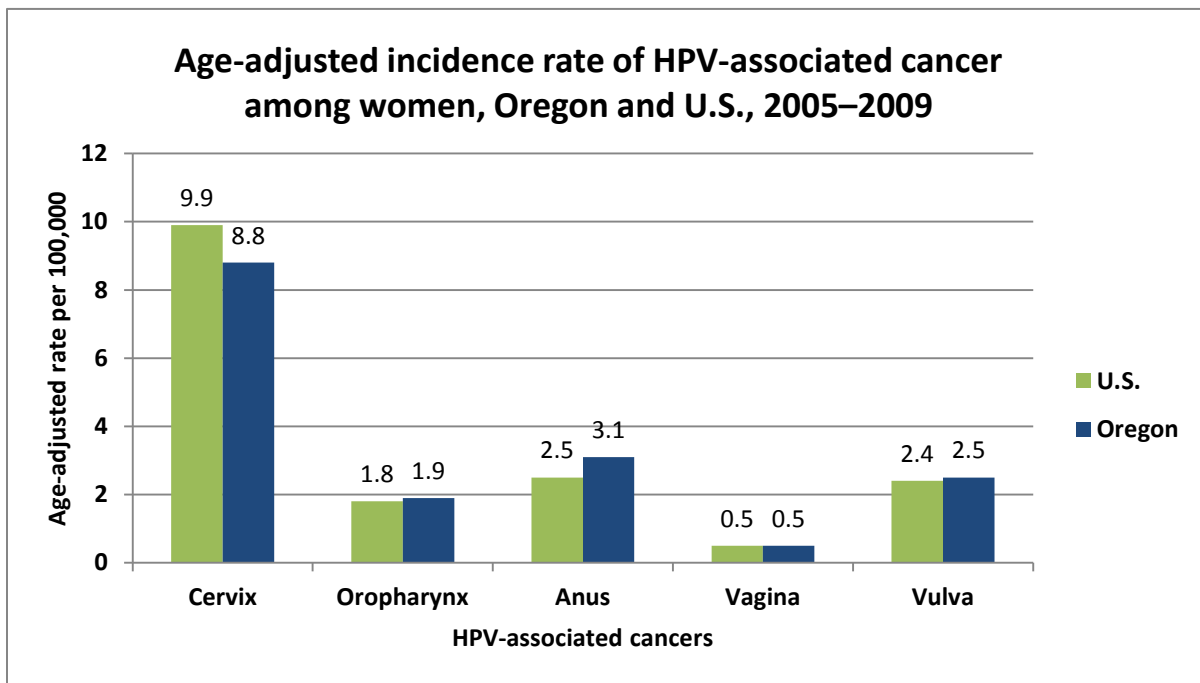


Figure 4 shows that men in Oregon have similar rates of HPV-related cancer in various parts of the body compared to the U.S.

Figure 4.

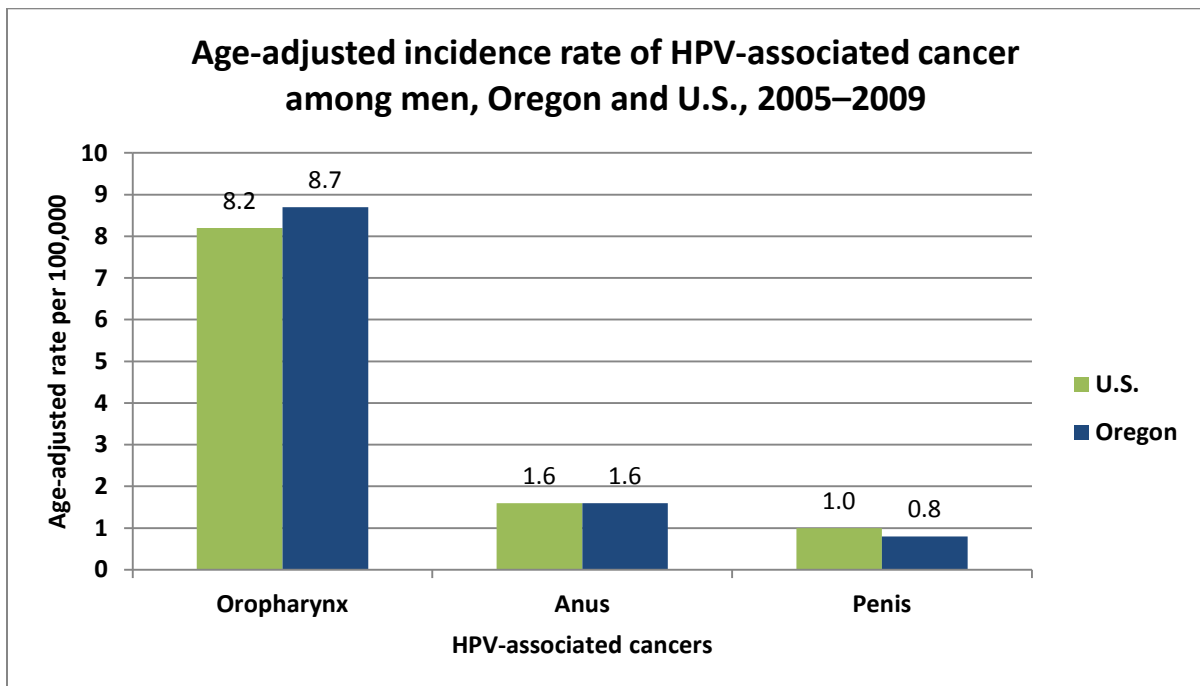


Figure 5 shows there are higher rates of HPV-related cancer among older age groups. The highest rates of HPV-associated cancer occur among people aged 50 years and older. Older

people are more affected for several reasons. It can take 20 years or more after HPV infection for cancer to develop and be found. Older people also have more exposures to HPV during their lifetimes. In addition, they have more exposures to things that contribute to the development of HPV-related cancer, like tobacco.

Figure 5.

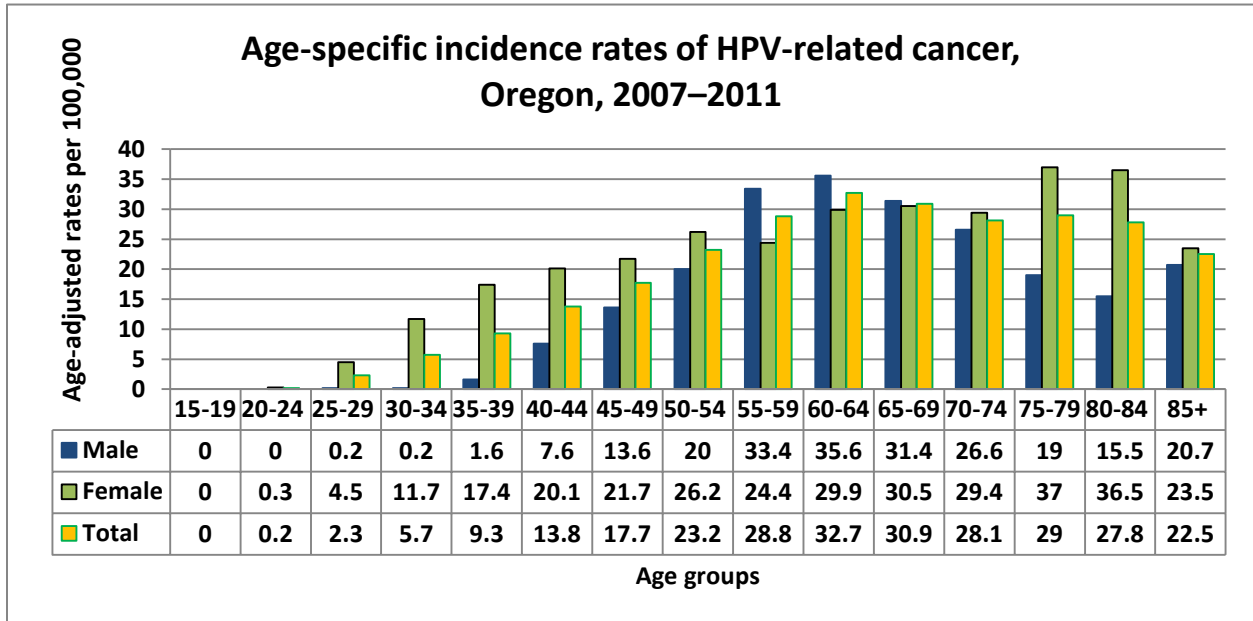
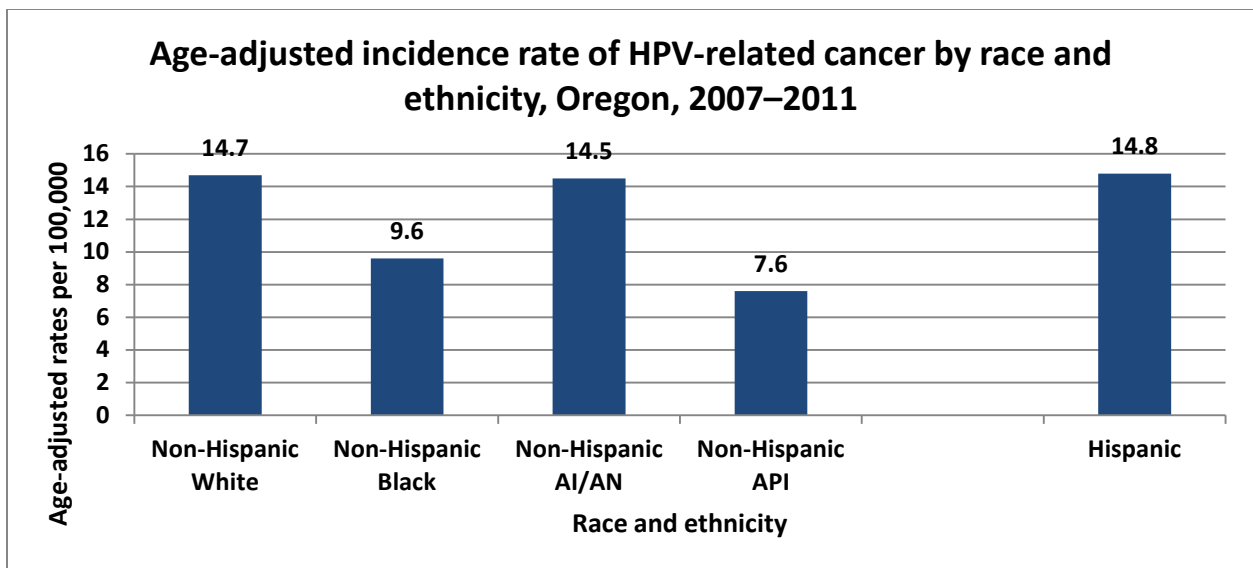


Figure 6 shows HPV-related cancers are most common in Oregon among people who identify as White, American Indian or Alaska Native, and Hispanic.

Figure 6.



This information shows HPV infections have a major impact on the health of people in Oregon. There are about 450 cases of HPV-related cancer every year in Oregon. Cancer of the cervix alone, a preventable cancer, results in 37 deaths every year.

Preventing HPV infections is a priority in Oregon and can be done using the approaches outlined below.

HPV prevention and cancer control strategies for individuals

There are four main things people can do to keep HPV from spreading to more people and possibly causing cancer:

1. Decrease the likelihood and frequency of sexual encounters that may result in HPV infection through skin-to-skin contact involving the genital area.
2. Use condoms to reduce skin-to-skin contact in the genital area for sexual encounters that occur.
3. Get the HPV vaccine to reduce the chances of HPV infection when skin-to-skin contact involving the genital area occurs.
4. Get screened for HPV infection and related cancers.

Decreasing the likelihood and frequency of sexual encounters

The risk of HPV exposure increases with the number of sexual partners and the number of sexual encounters a person has. Therefore, people are less likely to get HPV if they have their first sexual contact at an older age. They are also less likely to get HPV if they have fewer sexual partners and fewer sexual encounters with the partners they have.

Raising awareness of these risks and offering guidance that promotes health-protective behaviors can reduce the risk of HPV exposure.

Condom use

Consistent condom use has been shown to reduce the chance of getting an HPV infection in men and women. However, condoms do not provide complete protection from HPV infection because condoms do not cover all exposed genital skin.

Increasing the rate of correct and consistent condom use for those who are sexually active can reduce the risk of HPV exposure.

HPV vaccination

Two vaccines (Gardasil® and Cervarix®) are available to prevent infection with several types of HPV known to cause cervical cancer. Gardasil® helps to prevent infection with 4 HPV types (6, 11, 16, and 18). Cervarix® prevents infection with HPV types 16 and 18, and it may offer some protection against HPV types 45 and 31.

Both vaccines work best in people who have never been exposed to HPV. The vaccines prevent about 90 to 100% of HPV-related diseases in people who have never been exposed to HPV. People who have never been sexually active have the lowest risk of being exposed to HPV. Therefore, the best time for people to get HPV vaccine is before they become sexually active or as soon as possible after they become sexually active.

For these reasons, medical guidelines recommend HPV vaccination for people between the ages of 11 and 12 years.

Increasing the rate of HPV vaccination can reduce the rate of HPV infection and related cancers.

Screening for HPV and related cancers

Cervical cancer screening means checking a woman's cervix for cancer before there are signs or symptoms of the disease. The Pap test (or Pap smear) looks for precancers, which are cell changes on the cervix that may become cervical cancer if they are not treated appropriately. When cervical cancer is found early, it is highly treatable and associated with long survival and good quality of life.

There is no test similar to the Pap smear that is routinely available to screen for HPV infections of other parts of the body.

Population-level HPV prevention and cancer control

Preventing HPV infections and related cancers in the population requires effort in several different areas. These are described below.

A. Tracking HPV infections and related cancers

Tracking HPV infections and related cancers allows us to understand the number of people affected by the problem. It also tells us if there are specific groups of people who suffer from the problem more than others. That information can help focus attention on groups that will benefit the most from cancer prevention efforts. Following disease rates over time tells us if prevention efforts are making a difference.

B. Increasing HPV-related knowledge and awareness to promote healthy behaviors

Increased knowledge and awareness of HPV infections allows people to choose healthy behaviors. Healthy behaviors that reduce the risk of HPV infection include choices about sexual contact and receiving the HPV vaccine. The risk of HPV infection is lower for people who are older when they first have sex, have fewer sexual partners and consistently use condoms. Receiving all 3 doses of the HPV vaccine at the right age is one of the most effective ways to prevent HPV infection and HPV-related cancers.

C. Increasing HPV vaccine supply and use

Getting all 3 doses of the HPV vaccine at the right age is one of the most effective ways to prevent HPV infection. Making the HPV vaccine affordable and available to as many people in as many places as possible is therefore a priority for preventing HPV infections in the population.

D. Ensuring HPV vaccine is effective and safe

Ensuring the HPV vaccine is effective and safe improves the benefit of the vaccine for anyone who gets it. It also encourages more people to get the vaccine, which improves the benefits it offers for the whole population.

E. Improving screening and medical care for HPV infections and related cancers

No method for preventing HPV infections is completely effective. Therefore, improved screening and medical care is still needed to improve control of HPV infections and related cancers.

Existing statewide programs for HPV prevention and cancer control

Several statewide programs are in place to prevent and control HPV infections and related cancers in Oregon. These programs address various elements of population-level HPV prevention. Several of these programs are coordinated by the Oregon Public Health Division. Kaiser Permanente Northwest (KPNW) is engaged in active research on HPV infection and cancer control. Screening and clinical care for HPV and related cancers occurs through health systems and local health departments throughout the state.

Oregon Public Health Division (PHD)

A. The Oregon State Cancer Registry (OSCaR)

OSCaR is a statewide, population-based registry that collects and analyzes information about cancer diagnosed in Oregonians. OSCaR was established in 1995 by the Oregon Legislature, and began collecting data in 1996 on all reportable cancers according to Oregon Administrative Rules (OAR). Reportable cancers include HPV-related cancers.

Contribution to HPV prevention and cancer control

Tracking HPV infections and related cancers: The OSCaR program tracks HPV-related cancers throughout the state of Oregon. These include cancers of the cervix, anus, vulva, vagina, penis, mouth and throat.

Tracking and reporting this information allows us to understand the number of people affected by HPV-related cancers and if specific groups of people suffer from the problem more than others. That information can help focus attention on groups that will benefit the

most from prevention efforts. Tracking disease rates over time tells us if prevention efforts are making a difference.

B. HPV Impact Program

The HPV Impact Program tracks rates of high-grade cervical dysplasia. High-grade cervical dysplasia is a precancerous condition. Almost all cases of high-grade cervical dysplasia are caused by long-term HPV infection. Many cases of high-grade cervical dysplasia resolve by themselves, but some infections persist and lead to cervical cancer.

Pathology laboratories are required to report high-grade cervical dysplasia to the PHD. Mandatory reporting in Oregon began in 2012.

Contribution to HPV prevention and cancer control

Tracking HPV infections and related cancers: The HPV Impact program helps track HPV-related diseases of the cervix at an early stage to assess the effect of HPV vaccine on diseases before they become cancer. HPV Impact also tests tissue samples for different types of HPV to assess what types of HPV are common in Oregon. If current vaccines do not cover all of the cancer-causing types of HPV that are circulating in Oregon, they may not be as effective at preventing HPV-related cancers here.

C. Adolescent and School Health Program

a. School-Based Health Centers

School-Based Health Centers (SBHCs) are medical clinics that offer primary care services at schools. There are currently 68 certified SBHCs that provide clinical preventive services including immunizations and well-child visits. SBHCs are important and effective providers of HPV vaccinations to adolescents. Vaccine series completion rates among those who received the HPV vaccine at an SBHC are higher than the general population.

Contribution to HPV prevention and cancer control

Increasing HPV-related knowledge and awareness: SBHCs provide access to age-appropriate preventive health services for school-aged youth. Visits to SBHCs offer an opportunity for patient education on HPV prevention.

Screening and medical care for HPV infections and related conditions: SBHCs provide convenient, confidential access to recommended screenings for youth who are currently sexually active. These include pelvic exams and Pap tests to screen for HPV infection and cervical cancer.

b. School Health Program

The School Health Program works with education partners in the development of education policy and standards that support comprehensive health education. These include content standards for STI/HIV/HPV risk reduction.

Every 2 years, the School Health Program helps facilitate the CDC School Health Profiles Survey. This survey measures school health policies, programs and services. It includes an assessment of health educator training needs to support the prevention of sexually transmitted infections (STIs).

c. Youth Sexual Health Program

The Youth Sexual Health Program supports the implementation of ¡Cuídate!. ¡Cuídate! is a culturally-based HIV and pregnancy prevention program designed to reduce the risk of HIV/AIDS, other sexually transmitted infections and unplanned pregnancy among Latino youth. ¡Cuídate! is provided in 6 Oregon counties through the county health department. Information on where to get the HPV vaccine is shared with all participants.

Contribution to HPV prevention and cancer control

Increasing HPV-related knowledge and awareness: The School Health and Youth Sexual Health programs help develop educational environments that provide accurate, age-appropriate information on HPV. The School Health Profiles survey helps assess school educational needs on health issues such as HPV prevention.

D. Oregon Immunization Program

The Oregon Immunization Program (OIP) works to reach and maintain high immunization rates in Oregon. This occurs through work with immunizing providers, partnership development and vaccine tracking. High immunization rates ensure people are protected from illness and death caused by vaccine-preventable diseases, including those caused by HPV.

Contribution to HPV prevention and cancer control

OIP supplies HPV vaccine for children and adolescents and helps more people get HPV vaccine. OIP also tracks how many people get HPV vaccine.

Increasing HPV vaccine supply: OIP supplies HPV vaccine through the Vaccines for Children (VFC) program. VFC provides vaccines at no cost for qualified groups through age 18 years. Qualified groups include Medicaid-eligible, uninsured, American Indian/Alaskan Native and underinsured children and adolescents. About half of children in Oregon can get vaccines through VFC.

Since 2006, OIP has sent out more than 275,000 doses of HPV vaccine at a cost of about \$33 million.

Increasing HPV vaccine use:

Health care settings

OIP makes sure that children and young adults can get HPV vaccine where they get health care by working with pediatricians and other partners. OIP partners include groups like SBHCs, Planned Parenthood of the Columbia Willamette and others.

Pharmacists giving vaccine

Since 2011, pharmacists in Oregon can provide all recommended vaccines for people 11 years of age and older. This makes it easier for people to get HPV vaccine where it is most convenient. The HPV vaccine series requires three doses to be complete. People can now start or complete the series at a local pharmacy. No doctor's office visit is required.

Vaccine reminders

In 2012, OIP received the federal Adolescent Reminder Recall Grant. This grant, which includes HPV vaccine, provides training and funding for health care providers to remind patients that they are due for vaccinations. The goal is to reach about half of all adolescents in Oregon to advise them to get vaccinated. The grant continues through 2014.

As of December 1, 2013, OIP trained clinics serving over 150,000 patients. That is nearly a third of all people aged 13 to 17 years in Oregon. Early data show that adolescents who get reminders are more likely to start and complete the HPV vaccine series.

Tracking vaccine use

OIP tracks vaccine use in Oregon through the ALERT Immunization Information System (ALERT IIS). ALERT IIS includes immunization records for all people in Oregon. It tracks the number of HPV vaccine doses given in Oregon each year. ALERT IIS also tracks the total number of adolescents who get HPV vaccine each year. ALERT IIS reminds health care providers that HPV vaccine can be given as early as 9 years of age. ALERT IIS also helps health care providers know who needs HPV vaccine by showing when it is due.

E. Oral Health Program

The Oregon Health Authority's Oral Health Program is responsible for advancing evidence-based strategies to improve the oral health of all Oregonians. The Program is designed after the Association of State and Territorial Dental Directors' (ASTDD) model for state-based oral health programs. The Oral Health Program takes a comprehensive approach to address oral health issues across the lifespan.

Activities include: data collection and maintenance of the Oregon Oral Health Surveillance System, policy development, delivery of school-based oral health programs, oral health promotion and education for the public, building partnerships and collaboration to support the integration of oral health, and workforce development. The Oral Health Program works closely with local, county, regional, statewide and national partners. These partners include the Oregon Oral Health Coalition, the Oregon Dental Association, the Oregon Dental Hygienists' Association, OHSU School of Dentistry, DentaQuest Foundation and the Oregon Oral Health Funders Collaborative. Funding for the Oral Health Program is provided through federal grants and state general funds.

Collaboration on this report represents the full extent of the Oral Health Program's current work related to HPV. However, the Oral Health Program, the Oregon Dental Association, the Oregon Dental Hygienists Association and the Oregon Dental Assistants Association all recognize the need for increased attention to HPV prevention and screening in the dental community.

Contribution to HPV prevention and cancer control

The Oral Health Program can contribute to HPV prevention and cancer control by raising the visibility of the issue in the dental community.

Kaiser Permanente Northwest (KPNW)

Kaiser Permanente Northwest (KPNW) is a health care organization serving about 470,000 members in Oregon and Washington. Researchers at the KPNW Center for Health Research have done several years of research on HPV with a variety of partners, including the Centers for Disease Control and Prevention (CDC), the Oregon Public Health Division and the National Cancer Institute (NCI). Research has focused on HPV vaccine and on tracking and screening for HPV diseases. Vaccine studies have looked at how many people use HPV vaccine, how safe it is and how well it prevents diseases. Disease tracking and screening studies have focused on cancer of the cervix, mouth and throat.

Contribution to HPV prevention and cancer control

KPNW studies have shaped national HPV vaccine policies and recommendations. The studies have also improved the current understanding of the best screening methods for HPV and the health effects of HPV infections. Results have been used to help improve vaccination rates for the large population served by KPNW. KPNW studies have shown that HPV vaccination is reducing HPV-related illness among Oregonians.

Increasing HPV vaccine use:

KPNW took part in 2 studies looking at why people start and complete the HPV vaccine series. The results showed rates of vaccine uptake and completion at KPNW were similar to the

rest of the U.S. But both studies showed more people need to get HPV vaccine. Older people were more likely to start and complete the HPV vaccine series. People were also more likely to get HPV vaccine when they knew more about it and when their doctors told them they should get it.

Ensuring HPV vaccine is safe:

KPNW worked with the CDC, along with 9 other health care partners, to study HPV vaccine safety. KPNW did a 3 year study of women 9–26 years of age who got HPV vaccine. No serious side effects from HPV vaccine were found.

Ensuring HPV vaccine is effective:

KPNW is working with the CDC on 2 studies to determine how well HPV vaccine prevents disease. One study will look at how HPV vaccine changes the type of HPV that infects the cervical tissue of women aged 20–29 years. The hope is that more low-risk HPV types will be found after the vaccine became available. This would lower the chances of cervical cancer.

The second study will look at how well HPV vaccine prevents warts on the genitals and around the anus.

Improving screening for HPV infections:

Cervical cancer screening

KPNW was 1 of 4 sites that took part in a study of cervical cancer screening methods. The study compared Pap tests for cervical cancer screening to liquid-based cytology. The goal was to find out if one test gave better results than the other. Results showed that women in certain age groups got better results with certain types of liquid-based cytology testing.

A second KPNW study assessed if Pap screening in older women can reduce the rate of new cervical cancer cases. Screening reduced the risk of cervical cancer in older women, especially in the first year following screening.

Tracking HPV infections and related diseases:

Oral HPV screening

In 2014, KPNW will start a pilot study to figure out how common it is for people to have high-risk HPV infections in their mouths. The study will look at how demographics and behaviors relate to HPV infection of the mouth. The study will include 1,000 men and women aged 30–69 years. Study participants will be recruited from the dental practices of at least 20 participating clinics. Selected patients will provide a mouth rinse sample that will be tested for HPV virus.

Impact of cervical surgical procedures

KPNW is studying how surgical treatments for HPV of the cervix affect a woman's chances of having a healthy baby. Outcomes of interest include time to pregnancy following surgery, infant birth weight, pre-term delivery and Cesarean delivery. Study results are expected to be published in 2014.

Measures for tracking HPV prevention and cancer control

Several existing measures allow for tracking of HPV prevention and control in the population. Information for these measures comes from a variety of sources. Some information is reported directly to the PHD, as required by law. Other information is collected by surveys that are regularly conducted by telephone or in schools. Health care providers, hospitals, and laboratories provide some of the information. Additional information is collected through research studies by KPNW and others.

A. Measures to track HPV infections and related cancers

- a. OSCaR tracks reportable HPV-related cancers of the cervix, vagina, vulva, penis, mouth, throat and anus in the following ways:
 - Annual rates of new cancers at the state and county level.
 - Stage-specific rates of new cancers at the state and county level.
 - Distribution of cancer by race and ethnicity.
 - Distribution of cancer by age groups.
 - Annual death rates at the state and county level.
- b. HPV Impact tracks the following measures:¹
 - Incidence of HPV infections in Oregon over time.
 - Distribution of HPV strains in Oregon over time.
 - Rates of Pap screening among Oregon women over time.
- c. KPNW:
 - **Oral HPV Screening study**
The results of this study will offer valuable insight into factors related to oral HPV infections in Oregon.
 - **Impact of cervical surgical procedures study**
The results of this study will help show the scope of health problems caused by HPV infections.

¹ At present, these measures are applied to the Portland Metropolitan area. Monitoring will be expanded to the entire state as reporting and analytic capacity increases.

B. Measures for HPV-related knowledge, awareness and healthy behaviors

Existing data collection systems monitor adolescent health behaviors and risks. Others monitor school health policies and programs.

- a. The Oregon Healthy Teens survey provides data on several key behaviors for 8th and 11th graders:
 - Age of first sexual intercourse;
 - Number of sexual partners; and
 - Use of condoms at last intercourse.

Tracking these behaviors over time can show the progress being made in HPV prevention. HPV infections could be reduced with a higher age of first sexual intercourse, fewer sexual partners and consistent condom use at last intercourse.

- b. The School Health Profiles survey collects information about sexual health education and services available in schools:
 - Teacher efforts to increase 6th–12th grade student knowledge about preventing sexually transmitted infections.
 - School provision of condoms.
 - School administration of HPV vaccine.
 - Referral to other organizations for condoms or HPV vaccine.

This information helps us know if training, education and health services in schools are addressing issues like HPV prevention.

- c. Coordinated care organizations (CCOs) and SBHCs report:
 - Percentage of adolescent patients who receive a well-visit.

The adolescent well-visit offers the chance to give the HPV vaccine and to teach healthy behaviors that can prevent HPV infection.

C. Measures to track HPV vaccine supply and use

Information about statewide HPV vaccine supply and use is tracked by the OIP. OIP tracks the number of HPV doses given each year. It also tracks the rate of adolescent HPV vaccination.

- a. Annual HPV doses given:

In 2013, nearly 102,000 doses of HPV were given to individuals in Oregon. Ninety-three percent of these doses were given to people between 7 and 18 years of age.
- b. Annual adolescent HPV vaccination rates:

OIP tracks adolescent HPV vaccination rates each year using two data sources (Tables 1 and 2).

Table 1. Oregon adolescent (13–17 years) HPV immunization rates, 2013 and 2014

	Female		Male	
	1+ HPV	3+ HPV	1+ HPV	3+ HPV
2013 Oregon totals	61.3%	32.7%	25.6%	6.3%
2014 Oregon totals	62.9%	34.5%	39.1%	13.7%

Data source: Oregon’s ALERT Immunization Information System

The Oregon Adolescent Rates are based on reports sent to ALERT IIS when someone gets HPV vaccine (Table 1). These rates are available at the state and county levels and allow users of the data to monitor differences in coverage rates across the state. HPV coverage rates increased between 2013 and 2014, with a larger increase seen among adolescent males.

Oregon county-level adolescent rates are available at:

<http://public.health.oregon.gov/PreventionWellness/VaccinesImmunization/Pages/researchteen.aspx>

OIP also uses rates produced by the National Immunization Survey to monitor how HPV rates in Oregon compare with national immunization rates (Table 2).

Table 2. Estimated vaccination coverage for HPV vaccine among adolescents aged 13–17 years, by state and selected area: National Immunization Survey-Teen, United States, 2013

	Female			Male		
	≥ 1 dose HPV	≥ 2 doses HPV	≥ 3 doses HPV	≥ 1 dose HPV	≥ 2 doses HPV	≥ 3 doses HPV
U.S.	57.3%	47.7%	37.6%	34.6%	23.5%	13.9%
Oregon	66.3%	54.9%	39.5%	35.8%	20.8%	12.2%

D. Measures for vaccine efficacy and safety

a. KPNW

- One recent KPNW study showed no serious side effects from HPV vaccine. Two others will assess how effective HPV vaccine is in preventing anogenital warts and high-risk HPV infections of the cervix.

E. Measures for screening and medical care for HPV infections and related conditions

Data from SBHCs and CCOs is helpful in assessing opportunities to screen for and provide care for HPV infections. Both report on the percentage of their adolescent patients who receive a well-visit. The adolescent well-visit is a chance to assess risks for sexually transmitted infections like HPV. It offers the chance to educate adolescents on healthy behaviors that can prevent HPV infection. HPV vaccine can also be given as part of the adolescent well-visit.

- a. SBHC usage
 - Annual adolescent well-visit to SBHC.
- b. CCOs
 - Annual adolescent well-visit.
- c. KPNW
 - **Cervical cancer screening studies**

Results of 2 KPNW studies of cervical cancer screening have improved our knowledge in this area. One study showed that screening can reduce cervical cancer in older women. The other showed that certain screening techniques work better for specific groups of women.

Policies supporting HPV prevention and cancer control

Several statewide policies support different elements of HPV prevention and control. Some policies allow for collection of data to track HPV-related diseases. Some establish sexual health education standards for Oregon schools. Other policies support access to quality health care. Together, these policies allow for education, screening and treatment for HPV-related diseases.

A. Policies supporting tracking of HPV infections and related cancers

- a. OSCaR

Oregon state laws and rules make several HPV-related cancers reportable to OSCaR. These include cancers of the cervix, anus, vulva, vagina, penis, mouth and throat. These laws and rules include ORS 432.500-432.900, which established OSCaR in 1995 and OARs 333-010-0000 through 333-010-0090, which specify reportable cancers.
- b. HPV Impact

Oregon state rules changed in 2011 to make certain precancerous conditions reportable to the PHD. OARs 333-010-0000 through 333-010-0090 were changed to require Oregon pathology laboratories to report these conditions. This improves tracking of HPV infections in Oregon.

B. Policies supporting increased HPV-related knowledge and access to clinical care

The policies below define education standards in Oregon for diseases like HPV. The policies also allow minors confidential access to health services. SBHC certification standards ensure health services needed for diseases like HPV are available. Together, these policies ensure adolescents have the chance to gain knowledge about HPV in school and clinical settings and allow for confidential access to health services for HPV screening, vaccination and treatment.

- a. Comprehensive sexuality education statutes and health education standards (ORS 336.455 and OAR 581-022-1440)

These state statutes define standards for health education content and support health education related to immunizations and HPV.

- b. Minor consent standards (ORS 109.610 and ORS 190.640)

These state statutes allow minors aged 15 years and over to consent for immunizations and general health care. Minors of any age can access birth control-related information and services. They can also get testing and treatment for STIs such as HPV without parental consent.

- c. SBHC Certification Standards (ORS 413.225 and OARs 333-028-0200 through 333-028-0250)

These standards require SBHCs to provide age-appropriate services.

C. Policies for tracking HPV vaccine supply and use

- a. Oregon rules require that health care providers who receive state-supplied vaccine report all the doses they give to ALERT IIS. Oregon Administrative Rules 333.047 and 333.049 establish this requirement. They also require that any pharmacist who gives vaccine report to ALERT IIS. Reporting has to happen within 14 days of the vaccine being given. This ensures that immunization records are complete. It also reduces the chances of giving too many doses of vaccine to one person.

D. Policies supporting vaccine efficacy and safety

No existing state-wide policies regarding vaccine safety or efficacy were identified.

Public and health care provider awareness and knowledge of HPV-related disease and HPV vaccine

The work group reviewed available studies throughout the U.S. that have addressed awareness and knowledge of HPV. Below is a summary of the findings from that review.

Public knowledge and awareness in the U.S.

- Fewer than half of women and adolescents have heard of or understand HPV.
- Women want to know more about HPV.
- Health care providers are seen as the best source of information about HPV.
- A study of Oregon adolescents showed the most important factor in completing the HPV vaccine series was knowing how many shots were required.
- Some women might be concerned that getting HPV vaccine will be seen as acknowledging risky sexual behavior.

- Black and Hispanic parents are less aware of HPV vaccine than White parents.
- Black and Hispanic parents are still as likely as White parents to get their daughters vaccinated.
- Racial and ethnic minority girls are less likely to get a recommendation for HPV vaccine from a health care provider. But they are just as likely to get HPV vaccine.
- Health care providers in Los Angeles noted a number of untrue beliefs among parents, such as:
 - “Older children do not need vaccinations;”
 - “No- or low cost vaccines are not available for older children;”
 - “Vaccines may promote sexual activity;” and
 - A lack of a school requirement makes HPV vaccine less important than other vaccines.
- Some parents (<20%) might not support their children getting HPV vaccine because they think it promotes sexual activity.

HPV information sources in the U.S.

- Vaccine advertisements have been a major source of information since the vaccine was introduced in 2006.
- The most common HPV information sources are: advertisements (34%), health care providers (26%), media (22%), social networks (15%) and the internet (3%).

Health care provider HPV knowledge and awareness in the U.S.

- Provider recommendation of HPV vaccine makes it 5 times more likely that a child will get HPV vaccine.
- Provider recommendation for timely HPV vaccination is not universal.
- Health care providers are not as likely to recommend HPV vaccine to children aged less than 13 years.
 - It is not certain why this happens.
 - The national Advisory Committee on Immunization Practices recommends that HPV vaccine be given to boys and girls beginning at age 11 years.
 - National surveys show that physician knowledge of HPV vaccine and HPV-related diseases might be incomplete.
 - Physicians with greater knowledge of HPV might be more likely to recommend vaccination.
- Alternative providers in Oregon appear to be less likely to recommend vaccines of all types compared to traditional providers.

Opportunities to improve HPV prevention and cancer control

For HPV prevention, some evidence supports the effectiveness of behavior change, such as condom use. However, the strongest available evidence supports increased use of HPV vaccine among boys and girls at the appropriate age.

For HPV and cervical cancer screening, the effectiveness of Pap tests is well-established. Pap tests can find cervical precancer before it turns into cancer. Efforts to increase access to Pap tests may help prevent more cases of cervical cancer. Recent changes in the health insurance system may help increase access, as described below.

The opportunities identified below focus on increased use of HPV vaccine, given the strong evidence supporting its use for preventing HPV infections and related cancers. These opportunities will require adequate funding to be fully realized. Federal grants limit the scope of work that state public health programs can do. State or local funds are therefore needed to explore and capitalize on these opportunities.

Local engagement is also needed to create an appropriate plan for Oregon. Prior to consideration, any of the options below should be explored thoroughly with community partners to identify the level of support and potential drawbacks. Possible concerns include financial impacts and unintended consequences, such as increased vaccine refusal or decreased school attendance.

1) Use strategies outlined in the Centers for Disease Control and Prevention (CDC) call to action

The CDC has developed strategies for state and local immunization programs to increase HPV vaccination rates. With funding to support outreach and collaboration with key stakeholders, the PHD and local partners could identify strategies to use in Oregon and work to implement them.

CDC strategy areas include:

- a. Support health care providers in recommending HPV vaccine.
 - o Remind providers to make a strong, clear recommendation to parents.
 - o Focus on HPV vaccine for cancer prevention.
 - o Strongly encourage providers to recommend the HPV vaccine series just like other adolescent vaccines.
 - o Promote the use of existing CDC-developed materials for health care providers. Materials are available at www.cdc.gov/vaccines/youarethekey.
- b. Use data to drive decision making.
- c. Develop new partnerships. Make use of existing partnerships.

2) Encourage use of vaccine reminder systems for health care providers and patients

Vaccine reminders are a proven strategy for increasing immunization rates. See www.thecommunityguide.org/vaccines for more information.

Reminders can be used to prompt health care providers when a vaccine is due for a patient or to alert parents or young adults when immunizations are due. Media promotion can remind people at what age a vaccine is recommended. Promotion in the media also can be used to reinforce the importance of vaccines. Additional funding could provide more opportunities to expand the use of HPV vaccine reminders.

3) Collaborate with non-traditional partners

With funding to support more outreach, work could be done with non-traditional partners to increase HPV vaccination. Partners could raise awareness of vaccine recommendations and give referrals to providers who give HPV vaccine. Some partners could vaccinate people themselves.

Non-traditional partners could include:

- Pharmacists - Oregon pharmacists can provide immunizations for patients aged 11 years and older but are an underused resource. Pharmacists gave less than 1% of HPV vaccines in 2013.

Potential opportunities:

- Ensure uniform payment when HPV vaccine is given by a pharmacist.
- Expand the VFC provider network to include pharmacists.

- Dental community - Oral cancer screening related to tobacco use is a standard part of a dental visit. HPV prevention and cancer screening may or may not be. Possible partners to address HPV prevention and screening include the Oregon Oral Health Coalition and dental membership organizations. Other possible partners include the Oregon chapter of the American Cancer Society, local immunization coalitions and health plans.

Potential opportunities:

- Work with partners to raise awareness about HPV-related oral cancers and HPV vaccine recommendations.
- Have dental providers inform parents about the recommendations for HPV vaccination.
- Include HPV-related questions on patient health history forms.
- Incorporate training into the curriculum of the dental schools.
- Ensure that current payment through Medicaid covers HPV screening and education of patients in a dental setting.

4) CCO metric for HPV vaccine provision

HPV vaccination for adolescents has been proposed as a new CCO incentive measure for 2015. An HPV vaccination incentive measure would encourage CCOs and other partners to focus on increasing HPV immunization rates. It would also foster collaboration with the PHD.

5) Address cost barriers for HPV vaccination and screening

Most people in Oregon can get HPV vaccine with minimal or no out-of-pocket costs, provided they are in an age group for which HPV vaccination is recommended. The Patient Protection and Affordable Care Act (ACA) requires all new insurers to provide coverage for HPV vaccines at no cost. HPV vaccine is provided through the Vaccines for Children (VFC) program for males and females aged 9 through 18 years who are enrolled in Medicaid, are uninsured or underinsured, or are American Indian/Alaska Native. Medicaid also covers HPV vaccine for males and females aged 19 through 26 year if there is a clinical reason for them to get it.

Although most people can receive the vaccine with minimal or no out-of-pocket costs, financial barriers exist for some people in Oregon. Examples include families of uninsured children who cannot afford to pay vaccine administration fees or other office visit fees, uninsured adults, or individuals with an insurance plan that is not covered under ACA and does not pay for HPV vaccine.

The ACA also requires Pap tests for recommended populations with no cost sharing. This should remove a financial barrier for appropriate cervical cancer screening and help to decrease cervical cancer rates.

Two strategies could be employed to address perceived and real financial barriers to receiving HPV vaccine:

1. Increase awareness that HPV vaccination is a covered benefit for most private and public insurance plans.
2. Address and eliminate the situations where true financial barriers exist. One possible approach is providing funding to cover vaccine administration fees that are needed to cover operating costs.

6) School vaccine clinics

Most Oregon adolescents are enrolled in public and private middle and high schools. With funding, school-located vaccine clinics could be established to vaccinate students during the school day or after school hours. School-located HPV vaccine clinics would make HPV vaccine available at a location that is convenient to adolescents and parents. There are challenges to running school-located clinics that would need to be addressed at the local

level before moving forward with plans to establish school-located clinics for HPV vaccine. These may include school board support, parental consent and insurance billing.

Other approaches considered

The work group had extensive discussions about other potential strategies to improve HPV prevention and cancer control. The group concluded that a better understanding of the available evidence, systems impacts and policy implications is needed before these approaches can be considered. Work with key education and health systems partners at the state and local levels is needed to fully understand the impact of these strategies and determine if they should be pursued.

As with the options above, possible concerns include financial impacts and unintended consequences, like increased vaccine refusal or decreased school attendance. Similarly, the opportunities below would require adequate funding if they were to be pursued.

1. Increase capacity and support for adolescent well-visits

Adolescent well-visits offer a chance to give HPV vaccine. They also offer a chance to screen for HPV infections, to provide other needed vaccinations, and to provide education on HPV prevention.

Multiple options exist for supporting adolescent well-visits. These options include:

- Increasing funding to SBHCs to expand adolescent well-visits within the school setting.
- Increasing or ensuring payment to health care providers for adolescent well-visits.
- Requiring adolescent well-visits for school attendance.

Benefits:

- Well-visits offer a chance to:
 - Give recommended vaccines such as HPV vaccine.
 - Get education about behaviors that reduce the risk of HPV infection and related cancers.
 - Screen for HPV infections and provide other needed health services.
- Adolescent well-visits are a CCO incentive measure. Increasing rates of adolescent well-visits supports the triple aim of better health, better care, and lower costs.

Challenges:

- Funding may not be available for these options.
- Schools and Oregon Department of Education may not support a requirement for adolescent well-visits for school attendance. It would place considerable administrative burden on schools.
- There is no existing method in Oregon for documenting, tracking or enforcing a school requirement for adolescent well-visits.

- Oregon’s primary care system may not have the capacity to provide well-visits to all adolescents.
- It is unclear what would happen if students were unable to complete a well-visit prior to the start of school.
- Schools would incur a cost if their information tracking systems have to track compliance with a well-visit requirement.

2. Lower the age of consent for vaccination from 15 years to 11 years.

Minor consent standards (ORS 109.610 and 109.640) allow minors aged 15 years and older to consent for immunizations and general health care. Youth of any age can access care for diagnosis and treatment of STIs or can obtain birth control. Policy options could include allowing consent for services for prevention of STIs at any age, or lowering the age of consent for immunizations to 11 years of age.

Benefits:

- Lowering the age of consent for immunizations to 11 years of age would potentially allow more adolescents to be vaccinated in a school setting or other venues where parents might not be present.
- Lowering the age of consent may allow more adolescents to get HPV vaccine at the recommended time, ages 11–12 years.
- Lowering the age of consent empowers adolescents to take responsibility for their own health choices.
- Minors of any age are currently able to consent to diagnosis and treatment of STIs. They are not able to receive preventive services like immunization without parental consent.

Challenges:

- Lowering the age of consent could be misperceived as excluding parents from the decision making process for their child’s health.
- It is unclear who would pay for immunizations if confidentiality is to be maintained.

3. Require HPV vaccination for school attendance

In the United States, 2 states and Washington, D.C. require HPV vaccine for school attendance. These laws were passed in 2007. Many other states have considered HPV vaccine requirements but did not enact them. Texas became the first state to require the HPV vaccine for school attendance. However, the executive order adding the vaccine to the state’s required immunization list was overturned by the Texas legislature before the law was ever implemented. The Virginia law went into effect in 2008. It requires a dose of HPV vaccine for females before entry to the 6th grade. Females have to complete the HPV vaccine series over 6 months. The Washington, D.C. law went into effect in 2009. It requires completion of 3 HPV vaccines for 6th graders (male and female) or for transfer into the 6th

through 10th grade. In Virginia and Washington, D.C., parents or guardians can opt-out of the requirement after reviewing educational materials about HPV.

The 2013 National Immunization Survey shows that the HPV vaccination rates for females aged 13–17 years for both Washington D.C. and Virginia are lower than the national average.

In Oregon, vaccination against 11 diseases is required for school entry. These diseases include: diphtheria, tetanus, pertussis, polio, varicella, measles, mumps, rubella, hepatitis A, hepatitis B, and *Haemophilus influenzae* serotype B. In previous instances when vaccines have been added as a requirement for school attendance in Oregon, non-medical exemptions have increased for all school-required vaccines.

ORS 433.245 mandates an advisory committee that guides the Oregon Health Authority on school immunization law. The advisory committee has established a set of 12 criteria to evaluate vaccines for potential recommendation as school requirements. The advisory committee has evaluated HPV against these criteria (most recently in 2012), and voted to not recommend HPV vaccine as a school requirement.

Oregon could require all girls and boys to have 3 doses of HPV vaccine for 7th through 12th grade attendance. As noted above, such a requirement could have the unintended consequence of lowering vaccination rates for other adolescent vaccines, such as Tdap, and increasing the number of parents who choose to opt-out from vaccines.

Benefits:

- For vaccines other than HPV, school immunization requirements have been demonstrated to help raise immunization rates.

Challenges:

- To date, evidence in the U.S. shows that states with HPV vaccine requirements for school attendance have rates of HPV immunization that are lower than the national average.
- The Oregon school immunization law advisory committee has voted to not recommend HPV vaccine as a school requirement.
- When other vaccines have been added as school immunization requirements, non-medical exemption rates have increased for all vaccines.
- Parental hesitation and lack of a strong provider recommendation may further increase HPV vaccine refusal if HPV vaccine were added as a school requirement.
- Schools must pay for updates to student immunization tracking systems when new immunization requirements are added.

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