INDIANA IMMUNIZATION COALITION
#VACCINATEINDIANA

HPV-Associated Cancer Incidence in Indiana

Introduction

Human papillomavirus (HPV) is a group of more than 200 related viruses, about 40 of which are typically spread by intimate physical contact.[1] **An estimated 13 million people in the U.S. - including adolescents - become infected with the virus every year.**[2] While it is considered the most common sexually transmitted infection in the world,[3] it can also be transmitted without having sex via skin-to-skin contact.

In most people who are infected with HPV, the immune system effectively suppresses or eliminates the virus from the body within one to two years. But some infections, when persistent, lead to diseases, including anogenital warts, recurrent respiratory papillomatosis (characterized by wart-like growths in the larynx and respiratory tract), and several cancers and precancers.[4]

HPV-associated (HPVa) cancers[5] include cervical, anal, vaginal, vulvar, oropharyngeal, and penile cancers. While these cancers can have other causes (for example, smoking or alcohol can cause oropharyngeal cancer), about 80% - or roughly 38,000 new cancer diagnoses in the U.S. each year - are believed to be caused by HPV.[6]

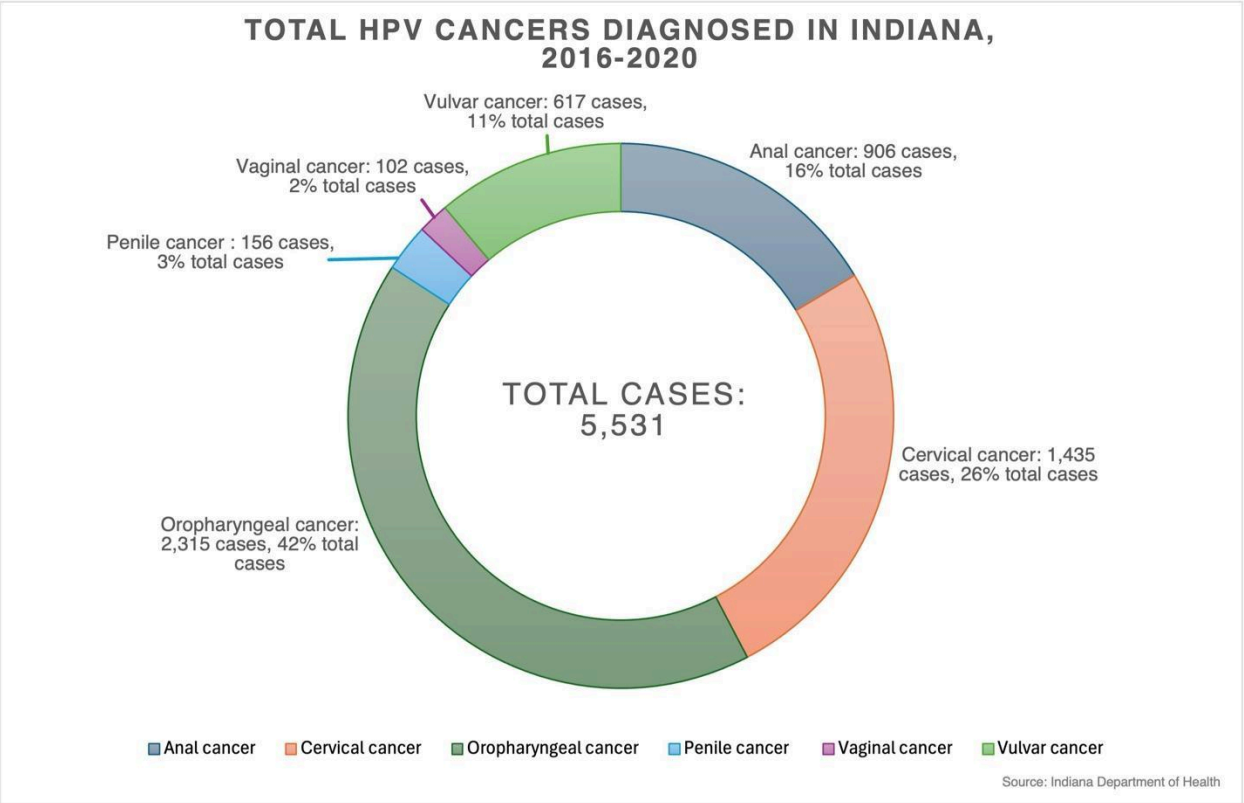
---

[1]REFERENCES

MedlinePlus. (n.d.). *HPV*. U.S. National Library of Medicine. https://medlineplus.gov/hpv.html
[2] Centers for Disease Control and Prevention. (2024). *HPV vaccination*. https://www.cdc.gov/hpv/vaccines/
[3] Jensen, J. E., Becker, G. L., Jackson, J. B., & Rysavy, M. B. (2024). Human Papillomavirus and associated cancers: A review. *Viruses*, 16(5), 680. https://doi.org/10.3390/v16050680
[4] National Institute on Deafness and Other Communication Disorders. (2017). *Recurrent Respiratory Papillomatosis or Laryngeal Papillomatosis*. https://www.nidcd.nih.gov/health/recurrent-respiratory-papillomatosis; National Cancer Institute. (2025). *HPV and cancer*. https://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-and-cancer

[5] We refer to these cancers as “HPV-associated cancers” because this is the term used by the CDC. Additionally, while not all of these cancers are caused by HPV, the vast majority are. These cancers are also located in the areas where HPV infection typically occurs.
[6] All cancers discussed in this document meet the CDC’s definition of HPV-associated cancers, which can be found here. Typically, these are squamous cell carcinomas associated with HPV

In Indiana, there were 5,531 HPVa cancers diagnosed between 2016 and 2020. **These cancers made up around 3% of all new cancers in the state.**[7] In that same 4-year time period, 1,195 people in Indiana died from HPVa cancer.



Oropharyngeal cancer is the most diagnosed HPVa cancer in Indiana, accounting for 42% of total HPVa cancers, followed by cervical cancer and anal cancer. **Incidence rates (the rate of new cancers) for five out of six HPVa cancers are higher in Indiana than in the U.S. as a whole**.

Nationally, HPVa cancer survival rates are poorer than all cancer types combined. They're also worse when compared with breast cancer and prostate cancer, two of the more common types of cancer.[8]

---

infection. National Cancer Institute. (n.d.). *HPV and cancer*. https://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-and-cancer

[7] Estimate calculated with CDC (WONDER) and Indiana Department of Health data. This should be interpreted with caution due to possible differences in data collection and presentation methodologies among entities.

[8] Razzaghi, H., Saraiya, M., Thompson, T. D., Henley, S. J., Viens, L., & Wilson, R. (2018). Five-year relative survival for human papillomavirus-associated cancer sites. *Cancer*, 124(1), 203–211. https://doi.org/10.1002/cncr.30947

Cancer type	Anal	Cervical	Oropharyngeal	Penile	Vaginal	Vulvar
Percent of cancers caused by HPV	>90%	>90%	70%	63%	75%	69%

Source: National Cancer Institute

Beyond the severe personal hardship a cancer diagnosis brings, **the costs to Hoosier families and the state medical system are significant.** In 2017, health care costs associated with cervical cancer tied to HPV exposure in Indiana amounted to $49.7 million.[9]

Ensuring that women and persons with a cervix are regularly screened for cervical cancer can help with secondary prevention and early treatment. Reducing such risk factors as tobacco use can also reduce the incidence of HPVa cancers. However, there are few effective screening options for HPVa cancers other than cervical cancer.

The most powerful tool available for HPVa cancer prevention is HPV vaccination, as it can prevent up to 90% of these diseases.[10] The American Academy of Pediatrics, the American Cancer Society, and the National HPV Vaccination Roundtable recommend routine vaccination for males and females starting at age 9. The vaccine leads to a stronger immune response when administered at a younger age[11] and helps to ensure protection before exposure to the virus through sexual activity.

Delaying first sexual activity and limiting the number of sexual partners are also important methods of lowering the risk of HPV infection.[12] Condoms may reduce HPV transmission, but they have limited effectiveness because they do not prevent all skin-to-skin contact, which is how HPV is transmitted.

HPV Key Facts

HPV infects the thin, flat cells—known as squamous cells—that line the surfaces of organs where HPV infection is common. Once these cells are infected, the virus disrupts how they communicate with one another and creates copies of itself, ultimately causing infected cells to multiply uncontrolled. The most common types of HPVa cancers are squamous cell carcinomas.

---

[9] Indiana Department of Health. (n.d.). *Indiana Cervical Cancer Strategic Plan 2019-2028*.
[10] American Cancer Society. (n.d.). *Cancers Linked with HPV*. https://www.cancer.org/cancer/risk-prevention/hpv/hpv-and-cancer-info.html
[11] Saxena, K., Kathe, N., Sardana, P., Yao, L., Chen, Y. T., & Brewer, N. T. (2023). HPV vaccine initiation at 9 or 10 years of age and better series completion by age 13 among privately and publicly insured children in the US. *Human vaccines & immunotherapeutics*, 19(1), 2161253. https://doi.org/10.1080/21645515.2022.2161253
[12] Indiana Department of Health. (n.d.). *Indiana Cervical Cancer Strategic Plan 2019-2028*.

In the cervix, HPV can affect glandular cells, leading to a type of cancer called adenocarcinoma.[13]

"My oncologist told me the best thing for me to do was to get a radical hysterectomy … It was a really hard time coming to that conclusion because I wanted to have more kids. At that time, I was given the option to freeze my eggs, but I couldn't even think about that because of the expense and just the worry of, 'I gotta get this taken care of now' … Sometimes I still get sad about it because I feel like our family is not complete."

-Kristine Sprigler, 47, Indiana cervical cancer survivor.[14]

There are approximately a dozen HPV types that carry a high cancer risk. They include types 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, and 59.[15] Types 16 and 18 are believed to cause about 80% of all HPVa cancers.[16]

HPV causes almost all cervical cancer, more than 90% of anal cancer, 75% of vaginal cancer, 70% of oropharyngeal cancer, 69% of vulvar cancer, and 63% of penile cancer.[17] HPVa cancer can occur in people in their 20s and 30s, but population incidence rates steadily increase with age. The highest rates of new HPVa cancers are detected in populations aged 55 and older.[18]

It's important to note that infection with high-risk HPV isn't enough on its own to cause cancer. According to the CDC, the majority of women who contract HPV - including high-risk types - will not experience cancer.[19]

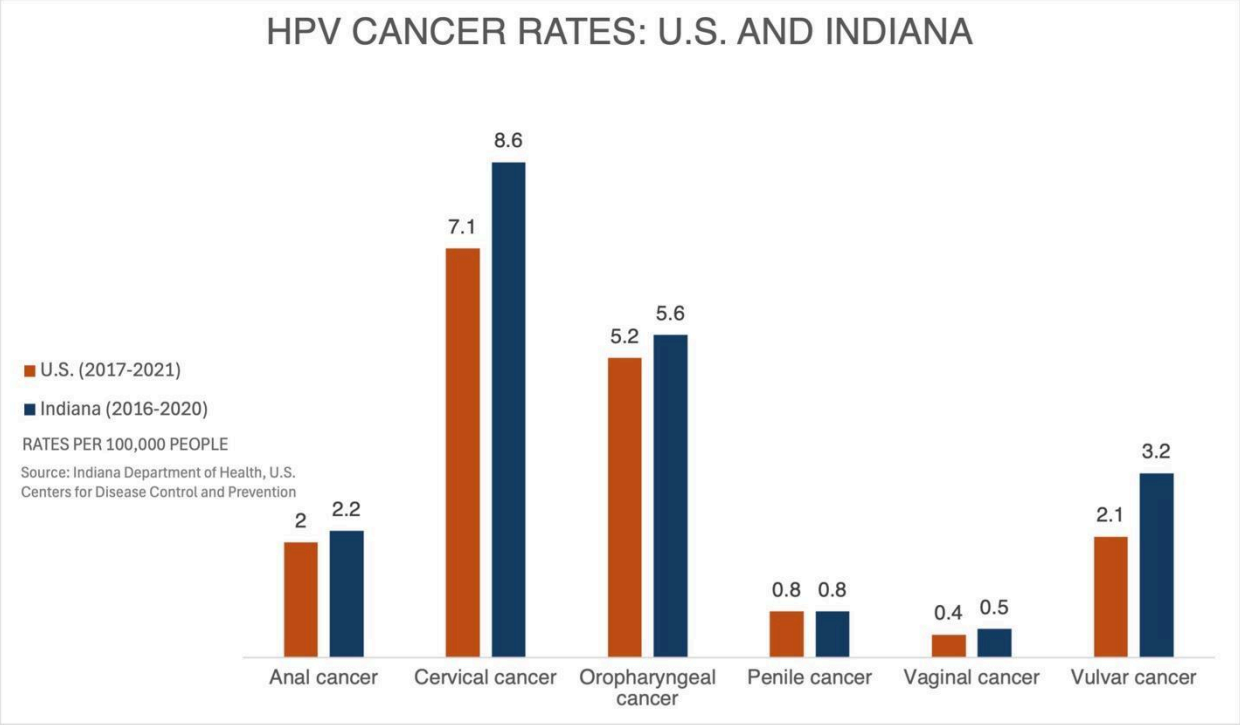
---

[13] National Cancer Institute. (2025). *HPV and cancer*. https://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-and-cancer
[14] Former cancer patient quotes have been edited for clarity.

[15] National Cancer Institute. (2025). *HPV and cancer*. https://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-and-cancer
[16] Centers for Disease Control and Prevention. (2024). *Cancers Associated with Human Papillomavirus*. https://www.cdc.gov/united-states-cancer-statistics/publications/hpv-associated-cancers.html
[17] National Cancer Institute. (2025). *HPV and cancer*. https://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-and-cancer
[18] Centers for Disease Control and Prevention. (2025). *United States Cancer Statistics: Data Visualizations*. https://gis.cdc.gov/Cancer/USCS/?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcancer%2Fdataviz%2Findex.htm#/RiskFactors/
[19] Meites, E., Gee, J., Unger, E. & Markowitz, L. (2024, April 23). Chapter 11: Human papillomavirus. In *Epidemiology and prevention of vaccine-preventable disease*. Centers for Disease Control and Prevention. https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-11-human-papillomavirus.html

Key Facts for Indiana

- 5,531 HPVa cancers were diagnosed in Indiana from 2016-2020, amounting to roughly 3% of the state's cancer burden.
- 1,195 people in Indiana died of HPVa cancer from 2016 to 2020.
- Indiana's HPVa cancer rates are higher than national rates, except for penile cancer.
- Oropharyngeal cancer is the most common form of HPVa cancer in Indiana.
- When analyzed by race/ethnicity, Indiana's White non-Hispanic population experienced the highest rates of half of these cancers. In contrast, the highest rate of any HPV cancer was experienced by the Hispanic population (cervical cancer).
- The Hispanic population in Indiana experienced the highest mortality rate of cervical cancer, while the Black non-Hispanic population experienced the highest mortality rate of oropharyngeal cancer.



HPV cancer rates in Indiana and nearby states[20]	Anal	Cervical	Oropharyngeal	Penile	Vaginal	Vulvar
Indiana (2016-2020)	2.2	8.6	5.6	0.8	0.5	3.2
Illinois (2017-2021)	1.9	6.9	5.2	1.2	0.4	2.2
Kentucky (2017-2021)	2.6	9.4	6.7	1.2	0.6	3.5
Ohio (2017-2021)	2.2	7.5	5.9	0.8	0.4	2.8

Age-adjusted rates per 100,000 people.

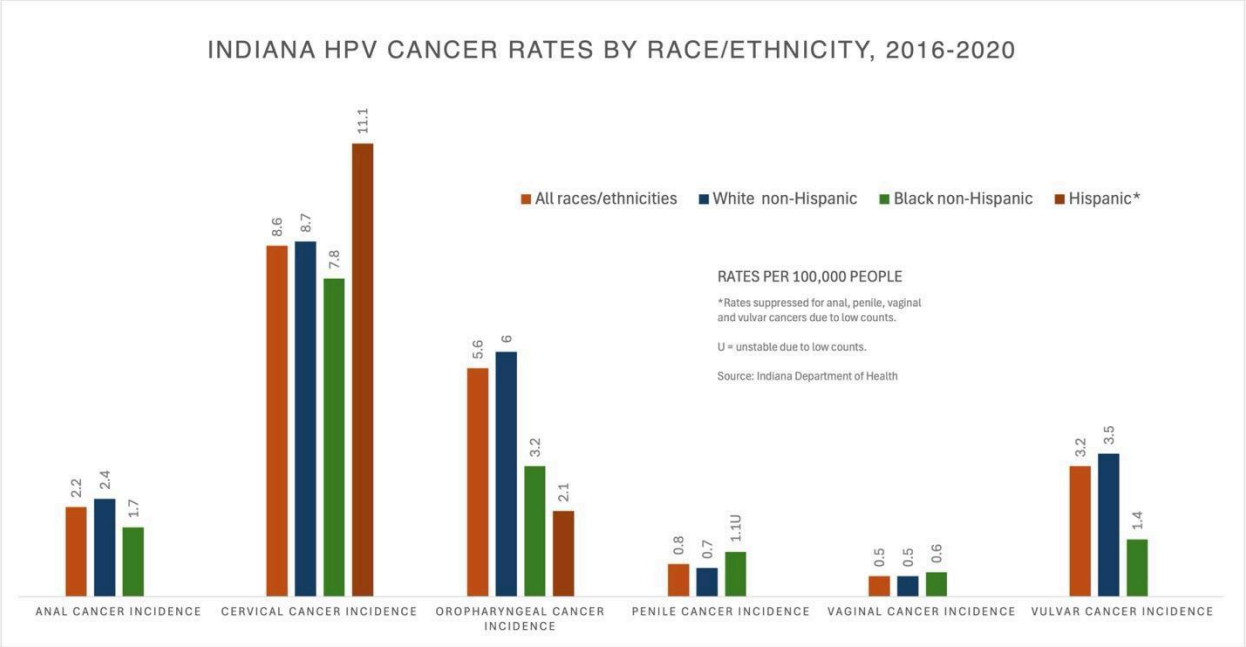
Indiana's HPVa Cancer Burden by Race/Ethnicity

The incidence rate of all HPVa cancers in the U.S. is highest among White populations. In Indiana, the White non-Hispanic population experiences higher rates of three HPVa cancer types - anal, oropharyngeal, and vulvar - than all other races/ethnicities.

Nationally, researchers have found that Black populations of all age groups frequently experience lower 5-year survival rates than White populations for all HPVa cancer types.[21] In Indiana, the Black non-Hispanic population has higher rates of mortality than the White non-Hispanic population for oropharyngeal cancer and cervical cancer - the two cancers for which high-quality mortality data was available.

[20] Data for Illinois, Kentucky and Ohio received from U.S. Cancer Statistics. Data for Indiana received from the Indiana Department of Health. This comparison should be interpreted with caution due to possible differences in data collection and presentation methodologies among entities.

[21]; Baliga, S., Mitchell, D., Yildiz, V. O., Gogineni, E., Konieczkowski, D. J., Grecula, J., Blakaj, D. M., Liu, X., & Gamez, M. E. (2023). Disparities in survival outcomes among Black patients with HPV-associated oropharyngeal cancer. *Journal of medical virology*, 95(2), e28448. https://doi.org/10.1002/jmv.28448



The Black non-Hispanic population in Indiana had higher rates of the two rarest forms of HPVa cancer - penile and vaginal cancer - than the White non-Hispanic population and all races/ethnicities. However, those rates are considered unstable[22] because they are based on relatively small numbers. There were 10 cases of vaginal cancer and 14 cases of penile cancer among Black non-Hispanic residents from 2016 to 2020.

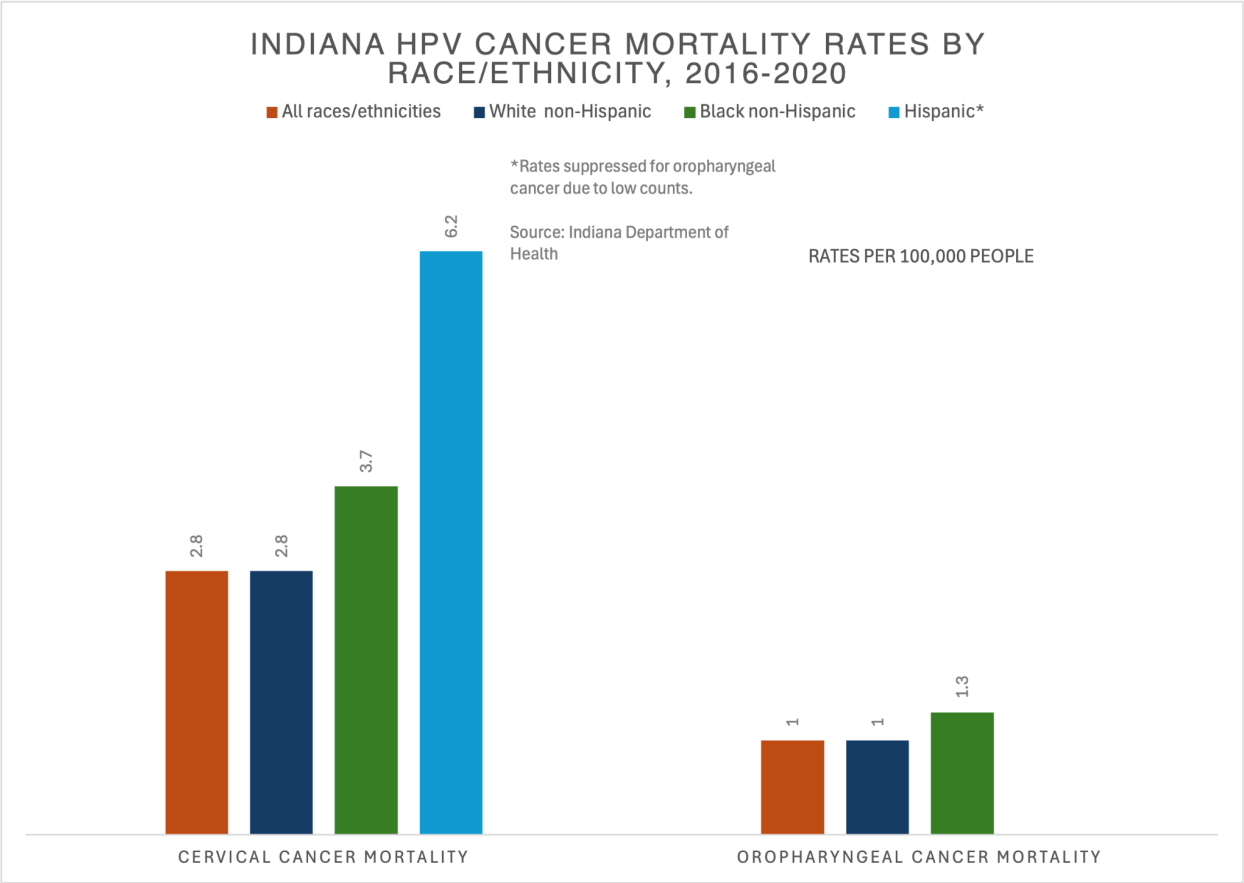
"The treatment cost was significant. I waited until the very end to deal with all of it because if you were trying to deal with it in the middle of treatment, it would have just been overwhelming, the amount of bills that were constantly coming in. I had pretty decent insurance at the time … but by the time we paid everything it was over $50,000 out-of-pocket."

-David Mundy, oropharyngeal cancer survivor

Data provided by the Indiana Department of Health for two types of cancer - oropharyngeal and cervical cancer - shows Hispanics experienced the highest rate of cervical cancer when compared to other races/ethnicities and the state as a whole. In fact, the Hispanic cervical cancer rate is the highest cancer rate among all HPVa cancer types.

The oropharyngeal cancer rate among the Hispanic population is 2.1 cases per 100,000 people, which is lower than the White non-Hispanic population, Black non-Hispanic population, and all other races/ethnicities.

[22] "Unstable" means low cancer counts make the incidence rates volatile, because the possibility of human error or undiagnosed cases could obscure the true incidence rate.



Mortality rates for cervical cancer were highest among the Hispanic population, almost twice as high as the rates for White non-Hispanic and Black non-Hispanic populations. Black non-Hispanic residents experienced the highest rate of oropharyngeal cancer mortality.

Data available for the White non-Hispanic population shows a mortality rate of anal cancer at 0.3 deaths per 100,000 people; vulvar cancer, 1.0 deaths per 100,000 people; and penile cancer, 0.2 deaths per 100,000 people.

Mortality data for the other four HPVa cancers among Black non-Hispanic and Hispanic populations were not provided by the Indiana Department of Health due to low counts. Vaginal cancer mortality rates were not provided for any race/ethnicity.

Reducing Risk of HPVa Cancer

"I lost 50 pounds in a hurry because of my inability to eat where my cancer was. It broke through the back of my throat, if you will, and I constantly had some bleeding in my throat, and blood was coming out a lot. Because of that, I went on a feeding tube right away."

-David Mundy, oropharyngeal cancer survivor

Infection with HPV (particularly a high-risk type like 16 or 18) is a necessary cause of HPVa cancers. However, there are additional risk factors. **People are more likely to develop a persistent HPV infection that can lead to cancer if they:**

- Smoke
- Have a weakened immune system, or are immunocompromised (e.g., being HIV positive)
- Take medicine that suppresses the immune system (like organ transplant recipients, people with autoimmune disorders, or cancer patients)

With respect to cervical cancer, Pap tests (i.e., cytology) are important screening tools for identifying precancerous and cancerous cells in the cervix, paving the way to early treatment and secondary prevention.

In 2024, the U.S. Food and Drug Administration approved self-administered swabs for high-risk HPV detection in the cervix for use in clinic/medical care office settings. This shows promise as a way to overcome HPV screening barriers, including discomfort and embarrassment. Home testing may be approved sometime in the near future.

Cervical cancer is the only HPVa cancer for which routine screening is available. Doctors and dentists may be able to detect other HPVa cancers (e.g., anal and oropharyngeal cancers). [23] Anal cancer screening is recommended annually for adults with HIV.[24]

HPV vaccination is cancer prevention. The vaccine can prevent up to 90% of all HPVa cancers[25]. The vaccine protects the individual from HPV, but also their sexual partners by ensuring high risk forms of HPV are not spread.[26]

---

[23] National Cancer Institute. (2025). *HPV and cancer*. https://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-and-cancer

[24] National Institutes of Health Office of AIDS Research. (2024, July 9). *HIV clinical guidelines now recommend high resolution anoscopy as part of anal cancer screening program for people with HIV* [Press release]. https://oar.nih.gov/update-clinical-guidelines-high-resolution-anoscopy-anal-cancer-screening

[25] Centers for Disease Control and Prevention. (2024). *HPV vaccination*. https://www.cdc.gov/hpv/vaccines/

[26] Chesson, H. W., & Markowitz, L. E. (2025). Strong Herd Effects of Human Papillomavirus Vaccination. *The Journal of infectious diseases*, jiaf121. Advance online publication. https://doi.org/10.1093/infdis/jiaf121

Indiana's Cancer Control Strategies

Indiana's Cancer Control Plan

In 2023, the Indiana Cancer Consortium launched its Indiana Cancer Control Plan for 2023-2027. The plan offers specific recommendations to guide medical professionals, legislators, and other stakeholders in the state as they work to reduce cancer incidence and mortality. The plan focuses on five goals: health equity, primary prevention, early detection, treatment, and survivorship.[27]

"It's stressful because I'm someone who has health insurance, yet the bills kept piling up. It took me 5 years to pay off my surgery."

-Kristine Sprigler, Indiana cervical cancer survivor.

The Plan covers all types of cancer and includes dozens of recommendations for policymakers, health care practitioners, and community leaders. Many of these recommendations have direct implications for the prevention of HPVa cancer. Examples include:

- Promoting health services to all populations by increasing available clinical hours for cancer screenings and providing translation services in medical settings.
- Promoting primary prevention by encouraging strong tobacco-free policies at schools that include alternatives to suspension, and educating leaders from health care, faith, business, education, and community organizations on the impact of secondhand smoke (including from electronic smoking devices).
- Encourage health care professionals to routinely and strongly recommend the HPV vaccination as part of adolescent vaccination packages (MCV4, HPV, Tdap, and Influenza vaccines).
- Conduct educational campaigns to increase public awareness about HPV and the cancers it causes.
- Train and deploy community health workers to identify uninsured women for referral to the Indiana Breast and Cervical Cancer Program, and track their referral.
- Utilize mass media to educate and motivate women to get screened for cervical cancer (Pap test).

More recommendations can be found at indianacancer.org/iccp-report.

[27] Indiana Cancer Consortium. (n.d.). *Indiana Cancer Control Plan 2023-2027*. https://indianacancer.org/iccp-report/

Indiana Cervical Cancer Strategic Plan, 2019-2028

In 2017, Indiana legislators passed House Enrolled Act 1278. **The act required the state's health department to create a strategic plan to "significantly reduce morbidity and mortality from cervical cancer."** As part of the plan, legislators asked the department to gather experts and identify ways to improve screening, prevention, and HPV vaccination rates that did not involve a vaccine mandate.

The resulting strategic plan has an ambitious goal: Increase the HPV up-to-date vaccination rate among Hoosier adolescents aged 13 to 17 years from a baseline of 40.8% in 2017 to 80% by 2026. Experts identified 14 strategies to help reach that goal, including[28]:

- Encourage healthcare professionals to routinely give a strong recommendation for HPV vaccination as part of the vaccination package (MCV4, HPV, Tdap, and Influenza vaccines) for adolescents.
- Encourage insurer-based incentives for doctors who increase their adolescent vaccination uptake and completion.
- Offer continuing medical education opportunities to healthcare professionals regarding the HPV vaccine as cancer prevention.
- Create education opportunities for the general public to create awareness about the connection between HPV and cancer.
- Connecting the Children and Hoosier Immunization Registry Program with the Indiana State Cancer Registry.

HPV Vaccine Information

The 9-valent HPV vaccine (Gardasil 9) is the only available HPV vaccine in the U.S.[29] It protects against nine strains of HPV, including high-risk strains associated with cancer.

Since the first HPV vaccine was approved and recommended in the U.S. in 2006, HPV strains that cause cancer and warts have declined dramatically in teen girls (estimated 88% decrease in virus prevalence) and young women (estimated 81% decrease in virus prevalence).[30] It has also been shown to be effective in preventing genital warts and persistent HPV infection in men.

---

[28] Indiana Department of Health. (n.d.). *Indiana Cervical Cancer Strategic Plan 2019-2028*.
[29] Meites, E., Gee, J., Unger, E. & Markowitz, L. (2024, April 23). Chapter 11: Human papillomavirus. In *Epidemiology and prevention of vaccine-preventable disease*. Centers for Disease Control and Prevention. https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-11-human-papillomavirus.html
[30] Rosenblum H., Lewis R., Gargano J., Querec T., Unger E. & Markowitz L. (2021, March 26). Declines in prevalence of Human Papillomavirus vaccine-type infection among females after introduction of vaccine — United States, 2003–2018. *Morbidity and Mortality Weekly Report (MMWR),* 70:415–420. http://dx.doi.org/10.15585/mmwr.mm7012a2

HPV Vaccine Safety Profile

There is a large body of evidence showing that the Gardasil 9 vaccine is very safe. One study published in Pediatrics, the American Academy of Pediatrics' scientific journal, found that less than .03% of Gardasil 9 vaccination doses administered between 2014 and 2017 were associated with a report of a serious adverse reaction.[31]

In clinical trials, the most common observed side effects were mild: Pain, swelling, or redness at the injection site. Approximately 10% to 13% of people developed fever (100 degrees F), although a similar percentage of participants receiving a placebo also experienced higher temperatures. Other reported symptoms in trials include nausea, dizziness, muscle aches, and a general feeling of unwellness, although respondents receiving a placebo experienced these symptoms at a similar rate.

In rare cases, people have fainted, so vaccine administrators are encouraged to monitor their patients for up to 15 minutes after injection.

Also rare are severe allergic reactions. People with a yeast allergy should not receive the 9-valent HPV vaccine.

"I wouldn't wish that one year of what I had on anybody … I don't ever want to intrude on somebody's individual rights on whether or not they feel like they should be vaccinated, but I do believe mine could have all been prevented if I would have grown up in a day and age when there was an HPV vaccine."

-David Mundy, Indiana oropharyngeal cancer survivor

No new safety concerns were observed among 839,000 Gardasil 9 injections collected in CDC Vaccine Safety Datalink between 2015 and 2017.[32]

Vaccination Guidelines

While the CDC recommends routine vaccination for males and females beginning at age 11 to 12, the CDC also recognizes that the 9-valent vaccine can be administered to individuals as

---

[31] Shimabukuro, T., Su, J., Marquez, P., Mba-Jonas, A., Arana, J. & Cano, M. (2019, December 1). Safety of the 9-valent Human Papillomavirus vaccine. *Pediatrics*, 144 (6): e20191791. https://doi.org/10.1542/peds.2019-1791

[32] Meites, E., Gee, J., Unger, E. & Markowitz, L. (2024, April 23). Chapter 11: Human papillomavirus. In *Epidemiology and prevention of vaccine-preventable disease*. Centers for Disease Control and Prevention. https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-11-human-papillomavirus.html

young as age 9.[33] Vaccination at age 9 is recommended by leading health organizations like the American Cancer Society because it ensures protection from cancer-causing HPV strains before exposure to HPV through skin to skin contact. Studies have also found that the vaccine results in a stronger immune response if administered at a younger age.[34]

The CDC recommends routine "catch-up" vaccinations for people through age 26 who haven't received a full series.[35] It's rare for a person through their mid-20s to be infected with all HPV types prevented by the vaccine, so the vaccine can provide some protection even among individuals through age 26 years.

The HPV vaccine has been approved by the U.S. Food and Drug Administration for individuals aged 27 through 45 years, with a shared clinical decision-making recommendation (SCDM).[36] SCDM means that individuals over the age of 26 should speak with a health care provider about whether the vaccine is right for them.[37]

The vaccine is administered in a 2- or 3-dose series.

> **Two doses**: When the first dose is administered before age 15 years. The second dose should be given 6-12 months after the first dose.
> **Three doses**: When the first dose is administered in people aged 15 or older, or for people who are immunocompromised. The second dose should come 1-2 months after the first dose. The third dose should come six months after the first dose.[38]

Research indicates that longer time intervals between doses does not reduce the effectiveness of vaccination, and the series does not need to be restarted.

---

[33] Centers for Disease Control and Prevention. (2024). *HPV vaccination*. https://www.cdc.gov/hpv/vaccines/

[34] Saxena, K., Kathe, N., Sardana, P., Yao, L., Chen, Y. T., & Brewer, N. T. (2023). HPV vaccine initiation at 9 or 10 years of age and better series completion by age 13 among privately and publicly insured children in the US. *Human vaccines & immunotherapeutics*, 19(1), 2161253. https://doi.org/10.1080/21645515.2022.2161253

[35] Meites, E., Gee, J., Unger, E. & Markowitz, L. (2024, April 23). Chapter 11: Human papillomavirus. In *Epidemiology and prevention of vaccine-preventable disease*. Centers for Disease Control and Prevention. https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-11-human-papillomavirus.html

[36] U.S. Food and Drug Administration. (2018, October 5). *FDA approves expanded use of Gardasil 9 to include individuals 27 through 45 years old* [Press release]. https://www.prnewswire.com/news-releases/fda-approves-expanded-use-of-gardasil-9-to-include-individuals-27-through-45-years-old-300725424.html

[37] Centers for Disease Control and Prevention. (2024). *HPV vaccination*. https://www.cdc.gov/hpv/vaccines/

[38] Indiana Department of Health. (n.d.). *Immunization data*. https://www.in.gov/health/immunization/immunization-data

Indiana HPV Vaccination Rates

As of October 18, 2024 - when data was accessed for this report - only 5.6% of Hoosiers in the key age group for HPV vaccination effectiveness (9-12 years) had received two doses of the vaccine.

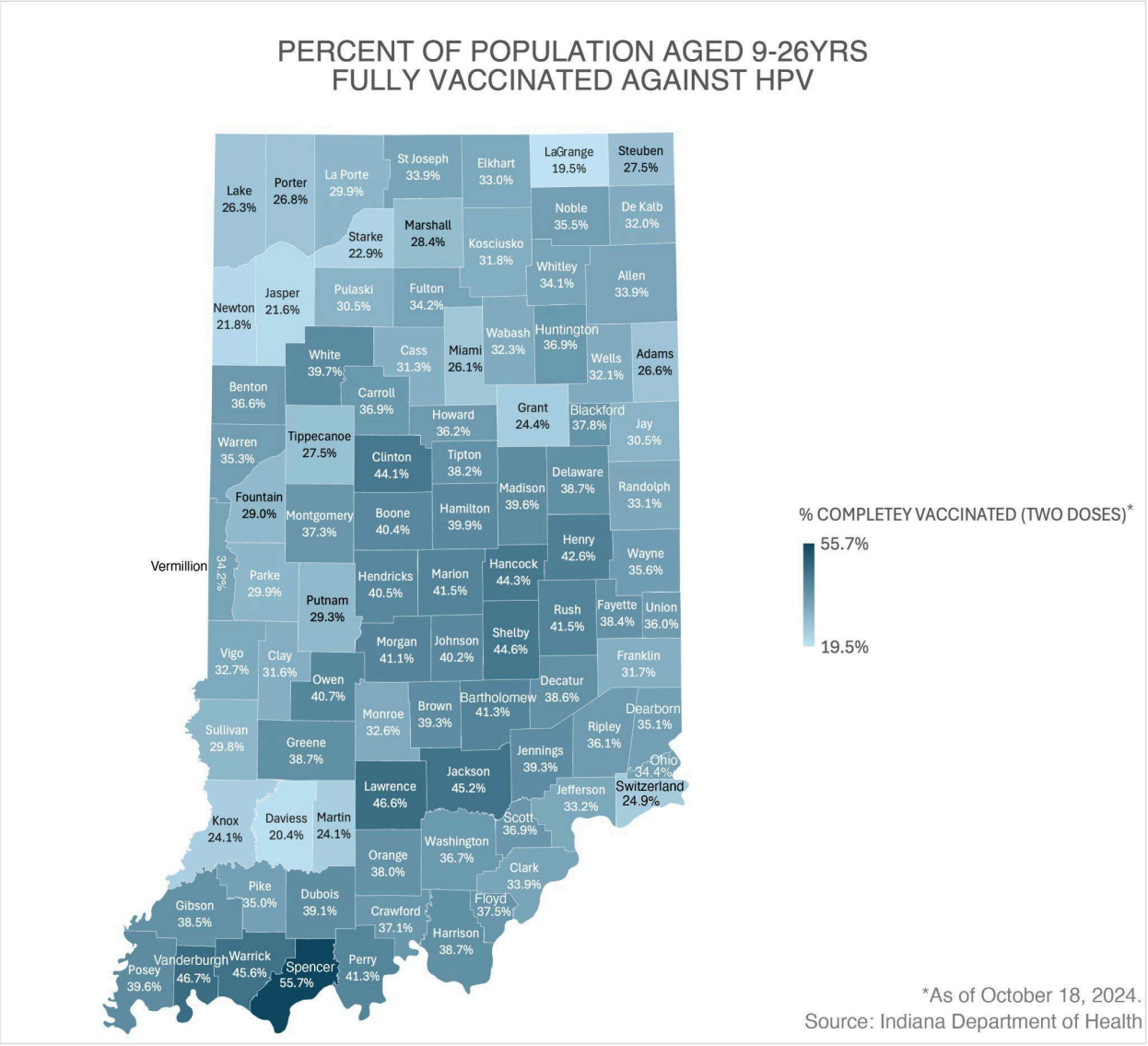
As of October 18, 2024	Percent of Age Group Vaccinated Against HPV (2 doses) in Indiana
Aged 9-12 years	5.6%
Aged 13-18 years	44.4%
Aged 19-26 years	43.2%

Up-to-date HPV vaccination data are available online at the Indiana Department of Health's Immunization Dashboard: in.gov/health/immunization.[39]

"After the cancer was removed, I didn't give myself time to rest, and I didn't give myself time to process what had happened. And I was just ready to go back to my busy lifestyle. My son played baseball, we were traveling everywhere for his baseball tournaments. I was working three jobs … I ended up getting anxiety and depression, and I couldn't step foot outside my house without having an anxiety attack."

-Kristine Sprigler, Indiana cervical cancer survivor

[39] Indiana Department of Health. (n.d.). *Immunization data*. https://www.in.gov/health/immunization/immunization-data



Upstream Policy Opportunities to Reduce HPVa Cancer Incidence

Reducing the impact of HPVa cancer in Indiana requires collaboration between health professionals, politicians, public institutions (ranging from public health agencies to schools), community leaders, and other stakeholders interested in keeping Hoosiers healthy.

Improving access to vaccination and screening can have a profound impact on decreasing HPVa cancers. In Australia, for example, widespread vaccination and screening have placed the country on the path to eliminating cervical cancer by 2035.[40]

The Indiana Immunization Coalition has identified the following upstream policy opportunities to help Hoosiers avoid an HPVa cancer diagnosis:

- Standing orders created by the State Health Commissioner that ensure equitable access to the HPV vaccine for all.
- Establish routine immunization reminder recalls.
- Increase funding from the state budget to support immunization services.
- Increase Medicaid reimbursement rates.
- Update the IHSAA Pre-Participation Physical Evaluation (PPE) form to include HPV vaccination assessment.
- Expand access to HPV testing and cervical cancer screenings.
- Indiana Family and Social Services Administration to implement quality improvement measure(s) related to HPV prevention.
- Increase vaccination services in alternative settings (mobile clinics, school-based clinics, dental practices, non-medical settings).
- Increase rural HPV vaccination research, with a focus on interventional research.
- Implement educational component for vaccine exemptions (e.g., encouraging people to meet with healthcare provider before filing exemption).
- Distribute informational brochure/infographic to all incoming college freshmen regarding HPV prevention.
- Establish administrative fee for adult vaccinations.
- Implement a community health worker immunization certificate program.
- Expand Vaccines For Children (VFC) access in school-based clinics.

In October 2024, IIC organized a gathering of HPV prevention experts in Carmel, Indiana for the organization's biannual HPV Stakeholder Meeting. Registered attendees were given a survey about these upstream policy opportunities to hear their opinion on which are most needed in Indiana. Following the meeting, IIC sent the survey to the organization's entire membership to receive additional feedback.

Eighty-eight (88) IIC stakeholders participated in the survey. Four policy opportunities were chosen as top priorities by more than 50% of respondents. Those policy opportunities include:

- Distribute informational brochure/infographic to all incoming college freshmen regarding HPV prevention. **55 votes (62.5% of survey respondents)**
- Establish routine immunization reminder recalls. **51 votes (58% of survey respondents)**
- Expand access to HPV testing and cervical cancer screenings. **49 votes (55.7% of survey respondents)**

[40] Cancer Council NSW. (n.d.). *Eliminating cervical cancer in Australia by 2035*. https://www.cancercouncil.com.au/research-pt/eliminating-cervical-cancer-in-australia-by-2035/

- Update the IHSAA Pre-participation Physical Evaluation (PPE) form to include HPV vaccination assessment. **44 votes (50.6% of survey respondents)**

Other popular responses (more than 40% support) include:

- Increase vaccination services in alternative settings (mobile clinics, school-based clinics, dental practices, non-medical settings). **43 votes (48.9% of survey respondents)**
- Increase funding from the state budget to support immunization services. **43 votes (48.9% of survey respondents)**
- Implement educational component for vaccine exemptions (e.g., encouraging people to meet with healthcare provider before filing exemption). **38 votes (43.2% of survey respondents)**
- Standing orders created by the State Health Commissioner that ensure equitable access to the HPV vaccine for all. **37 votes (42% of survey respondents)**

In 2023, St. Jude Children's Research Hospital and FTI Consulting took a close look at public policy's impact on HPV vaccination uptake in different states across the country. The following are five policy recommendations based on that analysis (including direct quotations from the report) which would aid HPV cancer prevention in Indiana:

- **Leverage meningococcal conjugate vaccination as a model for HPV vaccination education and recommendations.** Implement staff trainings on the "whole office approach" to ensure consistent messaging throughout the entire clinic/office. Ensure evidence-based messaging techniques are used, such as the presumptive approach and sandwich method. For example, "…your child is due for meningococcal, HPV, and Tdap today." Like HPV, meningococcal conjugate vaccines are recommended in late childhood/early adolescence. Adolescents who receive at least one other early age vaccine are more likely to receive their HPV vaccine.
- **Expand health care provider and staff education and training on HPV vaccination and strengthen HPV vaccination recommendations for parents and caregivers.** A provider recommendation is one of the most effective facilitators of a family's decision to get vaccinated against HPV. Deliver consistent, firm messaging across all levels of the health care team that HPV vaccination is cancer prevention.
- **Improve efforts to recruit and enroll various health care providers at the state level in the federal VFC program.** Policymakers and state-level decision-makers should aim to improve VFC provider participation by increasing the recruitment and enrollment of diverse provider types, such as pharmacists and oral health providers, who could increase access to HPV vaccination for people living in rural areas and for those with lower incomes. Indiana allows chain pharmacies and independent pharmacies to enroll in the VFC program and dentists are permitted to educate and vaccinate.
- **Engage in efforts to preserve and expand eligibility for Medicaid.** While Indiana is one of 41 states (including Washington, D.C.) that expanded Medicaid following the

passage of the 2010 Patient Protection and Affordable Care Act,[41] Hoosier children must belong to families at or under 158% of the federal poverty line to qualify.[42] Raising the limit to 200% or more of the federal poverty line would make more families in the state eligible for Medicaid-funded HPV vaccination and other well-child services.

- **Routinely evaluate state Medicaid reimbursement levels for vaccine administration to ensure providers are adequately reimbursed.**

Overall, researchers at St. Jude and FTI Consulting estimate that these changes, if implemented nationwide, could result in national direct healthcare expenditure savings of $24 million over two years due to the impact they would have on reducing HPVa cancer and other medical care costs.

[41] KFF. (2025, May 9). *Status of state Medicaid expansion decisions*. https://www.kff.org/status-of-state-medicaid-expansion-dchildren mustecisions/

[42] Medicaid.gov. (n.d.). *Medicaid, Children's Health Insurance Program, & Basic Health Program Eligibility Levels*. https://www.medicaid.gov/medicaid/national-medicaid-chip-program-information/medicaid-childrens-health-insurance-program-basic-health-program-eligibility-levels/index.html