

Delaware Faces Immunization Challenges Head-on

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Abstract

This article explores the recent history of under immunized vaccine preventable diseases, along with recent outbreaks and how the Delaware Division of Public Health has responded to each. Delaware's vaccination efforts for children have achieved high coverage rates for all of the vaccine preventable diseases, leading to low incidences rates in the state. The main reason for these high rates is the law for mandated immunization for children entering kindergarten. As children age out of primary school, vaccination uptake declines. HPV vaccination rates are a prime example, as even though Delaware's rates as compared to the National average are better, they fail to meet Healthy People 2020 standards of 80% vaccinated. To get to the heart of an under immunized population, a study to determine where the lower vaccinated rates are, along with the surveillance rates to cross match the results must be undertaken. It is understood that for communities where vaccination rates are lower, risk for disease is greater, with several recent outbreaks corroborating this. A pertussis outbreak in the Delaware Amish community was managed by the State with education and outreach in the community, with mixed results. Hepatitis A is an epidemic in a number of states, and Delaware has taken steps to try to protect our vulnerable population, using outreach, education and vaccination clinics to prevent the outbreak from occurring locally. While work continues, resources will need to be continually applied to ensure that vulnerable populations have the means to access the services needed. DPH continuously monitors State vaccine coverage level data and disease outbreaks within and outside Delaware's borders and has implemented the above-mentioned public health initiatives to promote immunization awareness and address community health concerns.

Introduction

Vaccination efforts save countless lives and billions of dollars each year in avoidable medical expenses. Since 1993, the Vaccines for Children Program has enabled the government to vaccinate uninsured and underinsured children. In its first 20 years, this program saved an estimated \$295 billion in direct health care costs and over \$1 trillion in societal costs, such as lives and work hours saved.¹

Delaware's vaccination efforts for children have achieved great results. The State of Delaware requires that children in licensed daycare centers and entering kindergarten through grade 12 at public, private, and home schools be immunized against certain communicable diseases before enrolling in school. Delaware Administrative Code 4202, "Control of Communicable and Other Disease Conditions," requires immunizations against measles, mumps, and rubella (MMR); tetanus, diphtheria, and pertussis/whooping cough (Tdap); polio (IPV or OPV); hepatitis B; and chickenpox (varicella).² These diseases can be fatal or have serious complications that can result in blindness, deafness, and developmental delays.

Each year, the Centers for Disease Control and Prevention's (CDC) National Center for Immunization and Respiratory Diseases (NCIRD) sponsors the National Immunization Survey

(NIS). The NIS is a group of telephone surveys used to monitor vaccination coverage among children 19-35 months and teens 13-17 years, along with flu vaccinations for children 6 months to 17 years. In 2017, Delaware's rate for the series 4:3:1:3:3:1:4 (4+DTaP, 3+Polio, 1+MMR, 3+Hib, 3+HepB, 1+Varicella, and 4+ PCV) was 77.1%, higher than the national average of 70.4% and close to the Healthy People 2020 goal of 80%.³

Due to the successes of vaccination, fewer health care providers and parents have witnessed the serious and sometimes life-threatening consequences of vaccine-preventable diseases. Yet small numbers of cases can lead to the re-emergence of vaccine-preventable diseases, especially if there are increasing numbers of unvaccinated people. Disease outbreaks sporadically surface nationally and in Delaware, and the State's challenge is to respond quickly to outbreaks to prevent them from spreading rapidly. We describe challenges and opportunities in vaccination and vaccine-preventable disease in Delaware by focusing on three case studies: pertussis, human papillomavirus, and hepatitis A. We conclude with discussion of vaccination availability in Delaware through the Vaccines for Children (VFC) Program.

Pertussis Challenge

Occasional outbreaks of whooping cough (pertussis), a highly contagious respiratory disease, occur in Delaware. Typically, pertussis outbreaks have occurred among Kent County's Amish community, a population that is largely unvaccinated. The Amish community practices separation from the world through group solidarity and caring for their own. Though their religious doctrine does not prohibit vaccination, coverage levels for routine childhood vaccination remain low for various reasons, including misinformation about the safety and/or content of vaccines and a strong belief in naturally acquired immunity.

While Delaware has seen an improvement in coverage rates in pertussis, identified cases are still being reported every few years. Pertussis in Delaware has ebbed and flowed, with reported case spikes in 2014 and 2018. In 2014, 202 cases of pertussis — the state's largest caseload since 2005 — were reported to the Division of Public Health (DPH); most were due to an outbreak among the Amish. In May 2018, DPH learned of a new pertussis outbreak among the Amish. As of December 31, 2018, the case count for that outbreak was 183 total cases, with 74 confirmed and 109 considered probable. Most reported cases were in individuals 10 years of age and younger. For comparison with other years, there were 20 pertussis cases in Delaware in 2015, 15 in 2016 and 9 in 2017 (Delaware Health and Social Services [DHSS], 2019). For all years, the actual number of cases was likely higher due to underreporting and misdiagnosis.

Response to Pertussis Outbreaks

These re-occurring outbreaks demonstrate the challenges of addressing disease in the Amish population. DPH has served generations of the Amish and over the past 45 years has strived to gain their trust. Amish leaders and midwives serving the population have educated DPH staff about their homeopathic approach to treating disease. Some within this community do not consider immunization necessary to prevent diseases from occurring, or in response to outbreaks. Instead they view getting some diseases and getting over them naturally without the intervention of a vaccine, a 'rite of passage'. Similarly, a 2017 study sought to determine the knowledge, beliefs and attitudes among Amish communities in Ohio. Through it, some respondents shared

fears of having too many recommended immunizations and that immunizations would overwhelm a child's own natural immune system.⁴

In response to the 2018 pertussis outbreak, DPH initiated a multi-pronged effort to control the spread of the disease. One of the early activities was to set up a meeting between the DPH Director, key staff and the Amish leadership (Bishops). During this meeting, DPH staff learned that the primary drivers behind low vaccination rates were misinformation about the makeup and safety of the vaccine, perceived pain and distress to the children during vaccination, and a belief that if you let the disease run its course that children could not be re-infected. The Bishops were happy that DPH expressed concern about the community's well-being and indicated they would be willing to distribute educational materials within the community.

These educational materials included flyers highlighting the symptoms of pertussis, the benefits of seeking and completing antibiotic treatment, and the benefits and safety of vaccination. Distribution of materials occurred at Amish owned businesses, as well as businesses frequented by members of the community, physician's offices, and schools. Generally, the distribution of the flyers was well received, however, DPH did encounter resistance to its distribution of information in the schools from some parents. Amish schools in Delaware are not part of the public school system and so distribution of materials from outsiders must be approved by the community's leadership. For this reason, DPH was asked to stop using the school system to distribute information.

An important aspect of DPH's outbreak response was epidemiological surveillance and direct contact with the community. DPH spent weeks conducting door-to-door case finding and a contact investigation campaign to maximize active surveillance and control measures. Teams of DPH epidemiologists and clinic nurses visited homes of community members where reports of pertussis had been confirmed, and asked questions to determine if there were other close contacts at risk. From a treatment perspective, updated standing orders allowed for the distribution of antibiotics for treatment and prophylaxis in households where DPH identified symptomatic persons and their contacts. The Delaware Immunization Program also made field visits to offer vaccine and antibiotics at the Public Health Clinics throughout the State.

During visits, information gained through administering survey questions informed DPH's response. Some of those who had received immunizations in the past, or had their children vaccinated for various reasons, but who subsequently stopped getting vaccinated said it was because DPH no longer conducted immunization clinics in their community. In the past, DPH conducted immunization clinics in the community but stopped due to lack of attendance.

It is apparent that since this community is hesitant to seek and find vaccinations, DPH must offer immunizations where the Amish are most receptive to receiving them. Another way DPH addressed this issue was to work with a midwife who sees pregnant Amish women to provide pertussis vaccines in accordance with the Advisory Committee on Immunization Practices (ACIP). The midwife is a trusted source of medical guidance for Amish women in the community. DPH is providing the midwife with Tdap vaccine so she can vaccinate her clients during their well visits, if the women agree. DPH also contacted, and provided information, to chiropractors, who are another source of medical advice for this population.

DPH also reached out to Holmes County General Health District in Ohio for public health approaches that were successful with their Amish communities. Holmes County provides health

clinics in the Amish community that offer immunizations, health screenings, and other services. They also help organize an annual Amish Health and Safety Day, which provides another opportunity to share information. In addition to Ohio, DPH reached out to the State of Pennsylvania, who has a large Amish populations to understand how they faced vaccine-preventable disease outbreaks.

DPH's educational outreach was not limited to the Amish community, because ultimately pertussis spread to the non-Amish population in Delaware. In the 2018 outbreak, 10 pertussis cases occurred among non-Amish individuals. DPH issued a press release to the public through media contacts, and on August 27, 2018 informed health providers by issuing a Health Alert (<https://healthalertde.org/>) through the Delaware Health Alert Network (DHAN). In addition, DPH created and distributed a flyer to all licensed medical providers in Kent County and asked them to share it with their patients. The flyer announced the outbreak to help engage patients in conversations about receiving Pertussis vaccinations and other ways they could protect themselves and their families.

Through these multi-faceted measures, DPH has re-established open lines of communication with the Amish community, and hopes that it will encourage more of these individuals to reach out to the Agency in the event of future outbreaks.

Human Papillomavirus

According to the CDC, every year 33,700 women and men are diagnosed with a cancer caused by human papillomavirus (HPV) infection. HPV vaccination could prevent more than 90% of these cancers (31,200 cases ever year) from ever developing.⁵ HPV vaccinations coverage levels remain low across the nation. In 2017, only 49 percent of adolescents were up to date on the HPV vaccine, and 66 percent of teens ages 13-17 years received the first dose to start the vaccine series.⁶ According to the 2017 National Immunization Survey (NIS), 58 percent of Delaware adolescents were up to date on the HPV vaccine, and 75 percent received the first dose to start the vaccine series.⁷ Although Delaware's HPV coverage rates are above the national average, HPV vaccination rates are much lower than for other adolescent-recommended vaccines within Delaware, such as Tdap (89.6%) and Meningococcal (90.5%), both recommended at the same time as the HPV vaccine (Delaware HPV Vaccination Report, December 2018).

The lower vaccination rates are not due to lack of vaccine or vaccine availability. In the fiscal year beginning July 1, 2017 to June 30, 2018, medical providers in Delaware ordered 31,745 doses of HPV. In the current fiscal year that began on July 1, 2018, medical providers in Delaware have ordered 13,103 doses as of January 8. The CDC estimates that Delaware will have ordered enough vaccine to vaccinate all of the 11-year-olds in Delaware this year. Yet while sufficient doses are ordered, some providers are not reporting administered doses to the State Immunization Information System (IIS) suggesting that the true vaccination rate is higher than what is reported.

To address the issue of low HPV rates, the Delaware Immunization Program recently collaborated with the Delaware Cancer Prevention program and the Delaware Cancer Consortium to identify and implement activities designed to promote HPV awareness and increase immunization rates. The Cancer Prevention program provided funding to support three projects in order to increase lagging HPV rates within the state. These activities included

initiating an HPV media campaign, continuing state Immunization Information System (IIS) reports training for Vaccines for Children (VFC) providers, and continuing HPV-education workshops for local providers.

The HPV education for VFC provider's project involved contracting with a vendor to conduct this training for approximately 100 VFC providers. DPH established a contract with a vendor to recruit and train these providers from November 1, 2018 thru June 30, 2019. The vendor developed a HPV training curriculum using the CDC's "You Are the Key to HPV Cancer Prevention" guide.⁸

These training sessions range from small groups to one-on-one encounters with providers. Topics include the benefits of vaccinating at an early age, role play activities to appropriately address parental safety concerns with the HPV vaccine, and utilizing reports within the IIS (i.e. coverage level, Not Up-To- Date, Patient Roster, and Reminder Recall reports), to improve vaccination rates.

The DPH also entered into a contract with another vendor to offer VFC providers training on the Delaware's IIS reports module to assist them through the Assessment, Feedback, Incentive and Exchange (AFIX) process and help providers increase their immunization coverage rates.

The providers receive training on the following reports:

1. AFIX Snapshot – Report allows providers to run immunization coverage levels for specific age cohorts within their practice.
2. Patient Roster reports – Report allows the provider to identify all the patients within their practice who are currently active in the IIS.
3. Patient Inactivation reports — Report allows the provider to inactivate any patients in the patient roster report that are no longer active within their practice.
4. Not-Up-To- Date reports – Report allows the provider to identify patients that require additional immunizations to be compliant with immunization recommendations.
5. Reminder Recall reports – Report allows the provider to generate a list of all their patients that require additional immunizations and print out post-card reminders to mail to these individuals.

The primary objective is to attempt to mirror the immunization coverage data from a provider's medical record with the Immunization Program's IIS and the NIS to get a true picture of the HPV coverage rate in Delaware. Since implementation of the IIS report training, the IIS HPV coverage rate rose to 68.7% for the first dose, an increase of 1.5% from June 1, 2018. The up-to-date coverage for the series completion reflects a 2% increase from December 13, 2017.

The DPH Cancer Prevention and Control Program contracted with a vendor to develop and implement a statewide marketing campaign that encourages parents of children ages 11 or 12 to have their children receive the HPV vaccine in the same visit when they are vaccinated for other serious diseases, like meningitis and whooping cough. This campaign consists of print, radio, social media, and digital ads; direct mail; and social influencers targeting parents of 11-12 year olds. There is a social media plan for Facebook and Instagram that includes live chat events with physicians, school nurses, or parents speaking on the advantages of getting children vaccinated

for HPV, and polls that engage parents using facts and statistics about HPV and the HPV vaccine. A private school outreach plan encompasses HPV presentations at parent events; HPV messaging in parent newsletters or emails; parent/child HPV vaccination videos; and posters and other printed resources to promote HPV awareness.

The Immunization Program continues to conduct AFIX provider site visits to all VFC providers within the state as part of the federal requirements for the VFC program. During the initial site visits, a DPH staff member reviews the current immunization coverage levels for the provider's practice and discusses issues or barriers contributing to any lower rates. The staff also works with the provider to develop quality improvement activities that they can incorporate into their existing workflow to increase their immunization coverage rates. Special attention is given to their HPV coverage rates at this visit and the staff offer the provider educational materials on HPV and encourage them to offer this vaccine in the same way and on the same day that they offer other vaccines at the 11 and 12-year-old well visits.

Providers are also encouraged to take the IIS Reports training class. DPH provides registration information during the site visit. DPH conducts a follow-up visit six months later to discuss changes in their coverage rate and the progress made on the quality improvement activities. The Immunization Program saw increased coverage levels in providers who had received these visits and completed the IIS Reports training.

Hepatitis A

Since March 2017, several state and local health departments have battled hepatitis A outbreaks that spread through person-to-person contact. The outbreaks are occurring primarily among persons who use injection and non-injection drugs, and/or among persons who are homeless and their close direct contacts.

Hepatitis A outbreaks have occurred in California, Utah, Arkansas, Missouri Michigan, Ohio, Kentucky, West Virginia, Tennessee, North Carolina and the city of Philadelphia. Those outbreaks compelled the ACIP on October 24, 2018 to recommend that "all persons at least 1 year old who are experiencing homelessness should be routinely immunized against hepatitis A"⁹.

Delaware's Hepatitis A Response

Since the beginning of October 2018, DPH has contacted homeless shelters, transitional housing organizations, and outpatient facilities to provide Hepatitis A vaccinations to persons experiencing homelessness. A questionnaire distributed to homeless and residential shelters asked for the number of residents, their ages, if they are required to leave each morning, and what would be a good time for DPH to hold a hepatitis A vaccination clinic there, if interested. If a facility expressed interest in hosting a vaccination clinic, the Delaware Immunization Program shared that information with DPH's Northern and Southern Health Services teams, who would reach out to schedule one that would fit everyone's needs. Since homeless individuals are transient, a continuous presence at these sites should occur with further vaccination clinics scheduled.

For other agencies with homeless clients, but without the capability to provide the hepatitis A vaccine, DPH created an educational flyer to give to individuals at intake to start the vaccination

conversation. DPH also provides vaccination at State Service Centers located throughout Delaware. It is DPH's hope that the shelters will include hepatitis A immunizations as part of their intake policy. This will protect not only the residents of these shelters, but the community at large as the residence interact in their communities.

Brandywine Counseling and Community Services (BCCS), a leading outpatient care provider in Delaware, has sites throughout the state and caters to the population that DPH has focused on to prevent the spread of hepatitis A. DPH collaborated with BCCS to provide hepatitis A vaccine at their facilities. The agreement calls for BCCS to screen their clients when they arrive to determine their immunization status for hepatitis A. If clients are not up to date on their hepatitis A coverage, BCCS will vaccinate them and schedule a date and time for the final dose. If this initiative is successful, and with appropriate budgets and staff support, DPH can visualize an effort to immunize all homeless individuals with all vaccines recommended for adults.

Section 317 Vaccine

Section 317 of the Public Health Service Act authorizes the federal purchase of vaccines to vaccinate children, adolescents, and adults. Over its 50-year history, Section 317-purchased vaccine was directed to priority populations. Most recently, this included underinsured children ineligible for VFC and uninsured adults. Section 317 discretionary funding also supports immunization program operations at the local, state, and national levels.¹⁰

In Delaware, while VFC vaccine covers most, if not all children, Section 317 vaccine is used in two areas: pandemic response exercises, and uninsured and underinsured adults and children. Each year, every state health department is required to perform a Point of Dispensing Exercise (POD). The POD allows DPH staff to practice immunizing a large population in a timely manner. Since 2015, DPH has operated its largest flu clinics as PODs, a maneuver with several benefits. Combining efforts allows the State to purchase more influenza vaccine to vaccinate those in the general population, and it enables DPH to practice their required POD duties.

Also in 2015, DPH provided Section 317-purchased vaccines to ten local Federally Qualified Health Centers (FQHCs) and one non-profit provider clinic to assist with immunizing their under- and uninsured adult populations. These vaccines include: tetanus, diphtheria and pertussis/tetanus diphtheria (Tdap/Td); hepatitis A and B; measles, mumps, and rubella (MMR); human papillomavirus (HPV), varicella, meningococcal B (Men B), meningococcal ACWY (MCV4), pneumococcal conjugate (PCV13), pneumococcal polysaccharide (PPSV23), and influenza. DPH continues to provide these above-mentioned clinics with all adult vaccines as recommended by the ACIP with the exception of the zoster vaccine. In Fiscal Year 2019, the State of Delaware received approximately \$167,000 in Section 317-vaccine funding, an amount equal to Fiscal Year 2018.

In 2018, DPH was able to supply all needed vaccine to these clinics and utilized all funding by the end of the fiscal year. Just two months into Fiscal Year 2019, DPH processed 23 adult 317 vaccine orders and spent 18% of the budget. As of December 2018, 3,560 doses of influenza vaccine were distributed using 317 vaccine funds which was a 22% increase from the number of influenza doses distributed by December 2017. These doses were distributed as follows; 1,400 doses were used for POD activities and 2,160 doses were delivered to Section 317 providers.

These partnerships allow more underserved at-risk adults to receive the immunizations they need. Vaccination data is reported to the State Immunization Information System (DeIVAX).

Conclusion

The DPH diligently monitors State vaccine coverage level data and disease outbreaks within and outside Delaware's borders. As a result, DPH has collaborated with stakeholders throughout the State to:

- implement HPV provider trainings and a state-wide media campaign designed to promote HPV awareness and increase coverage levels,
- establish hepatitis A vaccination clinics in sites that provide services for at-risk populations (i.e. Homeless shelters, Drug Treatment Centers), and
- rapidly responded to a pertussis outbreak by conducting field case investigations, educational outreach, and medical management (antibiotics and vaccinations) as appropriate within the Amish community.

In addition; DPH issued a public Health Alert regarding the outbreak, distributed Pertussis flyers to medical providers in Kent County to share with their patients in order to increase awareness and promote vaccinations, and reached out to other states to identify public health approaches that were successful within their Amish communities.

Resources for Readers

For more information on immunizations for children, adults, and health care providers, visit DPH's immunizations website, <http://www.dhss.delaware.gov/dhss/dph/dpc/immunize.html>, or call the Immunizations Hotline at 1-888-282-8672 weekdays between 8:00 a.m. and 4:30 p.m. Children without medical insurance may receive free vaccines through the VFC program. For details, call the hotline or visit <http://www.dhss.delaware.gov/dhss/dph/dpc/immunize.html> to learn more.

The CDC's website, <http://www.cdc.gov/vaccines/>, offers additional information such as the recommended immunization schedule. Health care providers can view the immunization schedule on tablets or smart phones by downloading the CDC Vaccines Schedules app at www.cdc.gov.

References

1. Jennewein, M. (2018, Jan). Vaccination: More than just your health. *SITN.hms.harvard.edu*. <http://sitn.hms.harvard.edu/flash/2018/vaccination-just-health/>
2. State of Delaware. (2019). 4202 Control of communicable and other disease conditions. *delaware.gov*. [http://regulations.delaware.gov/AdminCode/title16/Department%20of%20Health%20and%](http://regulations.delaware.gov/AdminCode/title16/Department%20of%20Health%20and%20)

20Social%20Services/Division%20of%20Public%20Health/Health%20Promotion%20and%20Disease%20Prevention/4202.shtml

3. CDC. (2018, Jan). About the National Immunization Surveys (NIS). *cdc.gov*. <https://www.cdc.gov/vaccines/imz-managers/nis/about.html>
4. Kettunen, C., Nemecek, J., & Wenger, O. (2017, June 1). Evaluation of low immunization coverage among the Amish population in rural Ohio. *American Journal of Infection Control*, 45(6), 630–634. [PubMed https://doi.org/10.1016/j.ajic.2017.01.032](https://doi.org/10.1016/j.ajic.2017.01.032)
5. CDC. (2017, Mar). Why is HPV important? *cdc.gov*. <https://www.cdc.gov/hpv/hcp/hpv-important.html>
6. CDC. (2017). 2017 Adolescent Human Papillomavirus (HPV) Vaccination Coverage Dashboard. *cdc.gov/teenvaxview*. <https://www.cdc.gov/vaccines/imz-managers/coverage/teenvaxview/data-reports/hpv/dashboard/2017.html>
7. CDC. (2018, Aug). HPV Vaccination Coverage Data. *cdc.gov*. <https://www.cdc.gov/hpv/hcp/vacc-coverage/index.html>
8. CDC. (2017, Nov). You Are the Key to HPV Cancer Prevention – Train the Trainer. *cdc.gov*. <https://www.cdc.gov/vaccines/ed/hpv/you-are-key.html>
9. Walker, M. (2018, Oct). ACIP: Routinely vaccinate homeless against hepA. *MedPageToday.com*. <https://www.medpagetoday.com/meetingscoverage/acip/75902>
10. CDC. (2016, Feb). Questions Answered on Vaccines Purchased with 317 Funds. *cdc.gov*. <https://www.cdc.gov/vaccines/imz-managers/guides-pubs/qa-317-funds.html>

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