



VACCINATION INFORMATION

FACTS AND RESOURCES

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This document was created as an accompaniment to the Allen County Combined Health District Board of Health Statement on Vaccination adopted March 10, 2017.

Note: The terms “vaccination” and “immunization” may be used interchangeably in this document.

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1. Vaccines and How They Work

A vaccine is a biological preparation that provides active acquired immunity to a particular disease. The immune system is a complicated and elaborate network of molecular reactions designed to protect the host. There are two main immune strategies found in vertebrates. The innate immune system consists of cells and proteins that are always present in the body to fight microbes at the site of infection. The adaptive immune system is composed of highly specialized, systemic cells and processes that eliminate pathogens or prevent their growth by creating immunological memory after an initial response to a specific pathogen, and leads to an enhanced response to subsequent encounters with that pathogen. For example, a child can acquire a respiratory virus in youth. The body develops immunity by proliferation of gamma globulins against the components of the virus. With age the immune memory persists and protects the host versus the same pathogen later in life. This process of acquired immunity is the basis of vaccination.

Adaptive immunity is sub-divided into two major types depending on how the immunity was instigated. Naturally acquired immunity occurs through contact with a disease causing agent, when the contact was not deliberate. This occurs when a person acquires pneumonia when inhaling a *Streptococcus* someone else sneezed. Artificially acquired immunity develops only through deliberate actions such as vaccination. Both naturally and artificially acquired immunity can be subdivided depending on whether immunity is induced in the host or passively transferred from an immune host. Passive immunity is acquired through transfer of antibodies or activated T-cells from an immune host, and is short lived—usually lasting only a few months—whereas active immunity is induced in the host itself by antigen and lasts much longer, sometimes lifelong. For instance Hepatitis B immune globulin can be administered and provide instant protection passively. The protection would be immediate but last only weeks or a month. Hepatitis B vaccine is an active immune agent. It doesn't act immediately but causes the proliferation of immune protection that lasts for life.

A vaccine typically contains an agent that resembles a disease-causing microorganism. This is defined as an antigen. The antigen is made from weakened or killed forms of the microbe. The microbe antigen is formed from its toxins or one of its surface proteins from the cell wall. The antigen stimulates the body's immune system to recognize the agent as a threat, destroy it, and keep a record - this is immune memory. Eventually the immune system can more easily recognize and destroy any of these microorganisms that it later encounters in the host's life. Vaccines are usually prophylactic to prevent or ameliorate the effects of a future infection by any natural pathogen.

Vaccines have played an important role in eradication of infection. Historically, in the 9th century, Al Razi described the clinical presentation of smallpox and measles and described that people exposed to these specific agents who survived did not have the disease again in their life even when subsequently exposed to the disease.

The administration of vaccines is called vaccination. The effectiveness of vaccination has been widely studied and verified; for example, the influenza vaccine, the HPV vaccine, and the chicken pox vaccine. Vaccination is the most effective method of preventing infectious diseases. Widespread immunity due to vaccination is largely responsible for the worldwide eradication of smallpox and the restriction of diseases such as polio, measles, and tetanus from much of the

world.

Licensed vaccines are currently available to prevent or contribute to the prevention and control of twenty-six infections. It is estimated that vaccination prevents 2.5 million deaths each year. With 100% immunization, and 100% efficacy of the vaccines, one out of seven deaths among young children could be prevented, mostly in developing countries, making this an important global health issue.[1] Four diseases were responsible for 98% of vaccine-preventable deaths: measles, *Haemophilus influenzae* serotype b, pertussis, and neonatal tetanus.[1]

Vaccine-preventable deaths are usually caused by a failure to obtain the vaccine in a timely manner. This has been proven repeatedly with outbreaks of whooping cough and measles. Worldwide this may be due to financial constraints or to lack of access to the vaccine. This is not the case in the United States.

The WHO lists 26 vaccines available worldwide. In the United States not all are necessary. Many of the illnesses are not endemic in the United States and therefore no vaccine is needed, such as yellow fever. There are also some vaccine-preventable diseases, which are not on the WHO-list. There are vaccines which are not very good according to present standards (Q fever) or the disease is no longer a threat (Plague, Anthrax and Smallpox). These vaccines have been phased out. Of note, Anthrax should be considered eradicated, but since the 2001 Anthrax terrorism, the vaccine has been used for first responders and military personnel.

Herd immunity is a term used when vaccination of the susceptible population in the community protects the entire population. Many of the vaccines wane in years but boosters have not been necessary because the population is protected by vaccinating at risk individuals. When the susceptible population is not vaccinated, then the rest of the population is subject to infection. The infection will then spread at will. Therefore, by having a successful vaccination program, the entire community benefits. Childhood vaccination is important because children are at risk and need protection from diseases. If not vaccinated, they can carry a pathogen which could have an adverse reaction to the child and spread the infection to other susceptible populations.

The WHO lists 26 diseases for which vaccines are available:

1. [Cholera](#)
2. [Dengue](#)
3. [Diphtheria](#)
4. [Hepatitis A](#)
5. [Hepatitis B](#)
6. [Hepatitis E](#)
7. [Haemophilus influenzae type b \(Hib\)](#)
8. [Human papillomavirus \(HPV\)](#)
9. [Influenza](#)
10. [Japanese encephalitis](#)
11. [Malaria](#)
12. [Measles](#)
13. [Meningococcal meningitis](#)
14. [Mumps](#)
15. [Pertussis](#)
16. [Pneumococcal disease](#)
17. [Poliomyelitis](#)
18. [Rabies](#)
19. [Rotavirus](#)
20. [Rubella](#)
21. [Tetanus](#)
22. [Tick-borne encephalitis](#)
23. [Tuberculosis](#)
24. [Typhoid](#)
25. [Varicella](#)
26. [Yellow Fever](#)

[1]

2. Vaccine Safety

Vaccines are safe

Before a vaccine is licensed in the United States, the Food and Drug Administration (FDA) reviews how it was developed, including where and how the vaccine is made. The FDA also reviews the studies that have been conducted in people who received the vaccine. They will not license a vaccine unless it meets specific standards for safety and for how well it works. Results of studies get reviewed again by the Centers for Disease Control and Prevention (CDC), the American Academy of Pediatrics, and the American Academy of Family Physicians before a licensed vaccine is officially recommended to be given to children. Every lot of vaccine is tested to ensure quality and safety before it is available to be given to the public. In addition, FDA regularly inspects the places where vaccines are made to make sure they follow strict manufacturing guidelines. [2]

Vaccines are monitored

To monitor the safety of vaccines after licensure, the FDA and the CDC created the Vaccine Adverse Event Reporting System (VAERS). All doctors must report certain side effects of vaccines to VAERS. Parents can also file reports with VAERS. Since 1990, VAERS has received over 200,000 reports, most of which describe mild side effects such as fever. Very rarely, people experience serious adverse events following immunization. By monitoring such events, VAERS helps to identify any important new safety concerns and assists in ensuring that the benefits of vaccines continue to be far greater than the risks. [3]

For more information about VAERS, visit www.vaers.hhs.gov or call the toll-free VAERS information line at 800-822-7967.

Facts and Fears

Parents' concern for their child's safety is understandable. Many parents worry about the potential for risks and long-term side effects of vaccines. Research shows us that most of parents' biggest fears about vaccinations are unfounded.

Vaccine link to autism is not supported

A common myth that parents hear or read on the internet is that vaccines can cause autism. The facts are: the one study in 1998 that suggested a connection between the measles, mumps, rubella (MMR) vaccine and autism has been fully retracted by the journal that published it (*The Lancet*), the primary author, Andrew Wakefield, has been stripped of his medical license in the UK, and despite many studies, the results of that study have never been replicated. [4]

More information about Andrew Wakefield's study can be found at:

<http://www.autism-watch.org/news/lancet.shtml>

Children's immune systems can handle multiple vaccines at once

Parents sometimes hear that a child's immune system cannot handle too many vaccines at once, and instead of following the recommended schedule for vaccinations, want to follow their own

schedule. The fact is that we may never know exactly how many germs a baby's immune system can handle at one time, but it is considerably more than they will ever get from vaccines. From the day a baby is born, his/her immune system has to deal with the thousands of germs we are exposed to as part of daily life. [5]

The Institute of Medicine (IOM) is an independent, nonprofit organization that works outside of government to provide unbiased and authoritative advice to decision-makers and the public. IOM convened a committee in 2013 to conduct an independent evaluation of the safety of the childhood immunization schedule. The IOM committee uncovered no evidence of major safety concerns associated with adherence to the childhood immunization schedule and rather than exposing children to harm, following the complete childhood immunization schedule is strongly associated with reducing vaccine-preventable diseases. [6]

More information about vaccine schedules can be found at:

<https://www.cdc.gov/vaccines/parents/vaccine-decision/sets-schedule.html>

Ingredients in vaccines

Parents sometimes worry about what's in vaccines. Vaccines contain ingredients, called antigens, which cause the body to develop immunity. Vaccines also contain very small amounts of other ingredients such as thimerosal, or aluminum - which play necessary roles either in making the vaccine, or in ensuring that the vaccine is safe and effective. Although no evidence suggests that there are safety concerns with thimerosal, it has been removed from all routinely used childhood vaccines with the exception of flu vaccine in multi-dose vials. [5]

More information about preservatives in vaccines can be found at:

<https://www.fda.gov/BiologicsBloodVaccines/SafetyAvailability/VaccineSafety/UCM096228#t1>

Parents need the facts to make informed decisions

Research has been conducted on all of these topics and studies continue to find vaccines to be a safe and effective way to prevent serious disease. The link below contains a list of vaccine-related studies and provides links to the original publications to allow parents to review the evidence for themselves. These studies do not show any link between autism and the MMR vaccine, thimerosal, multiple vaccines given at once, fevers or seizures.

A summary of vaccine-related studies can be found at:

<https://healthychildren.org/English/safety-prevention/immunizations/Pages/Vaccine-Studies-Examine-the-Evidence.aspx> (webpage updated 1/26/17)

Or an older PDF list of studies is available at:

https://www.aap.org/en-us/Documents/immunization_vaccine_studies.pdf (April 2013)

Still have questions? This is another website that has links to reliable, science based facts about vaccination safety: <https://www.cdc.gov/vaccinesafety/caregivers/index.html>

3. Vaccination is a Community Priority

Vaccines save lives and protect against the spread of disease. The more members of a community who are vaccinated against a disease, the safer the community will be from that disease spreading. If you decide not to immunize your child, you're not only putting your child at risk to catch a disease that is dangerous or deadly, but also putting others who come in contact with your child at risk. [2]

Vaccines work

A child's immune system produces immunity following vaccination the same as it would following "natural" infection with a disease. The difference is that the child doesn't have to get sick first. [5] Vaccines have kept children healthy and have saved millions of lives for more than 50 years. Most childhood vaccines are 90% to 99% effective in preventing disease. If a child has been vaccinated and does get that disease, the symptoms are usually milder and less serious than in a child who hasn't been vaccinated. [2]

Vaccines are still necessary today

Reducing and eliminating the diseases that vaccines prevent is one of the top achievements in the history of public health. In the United States, vaccines have protected children and continue to protect children from many diseases. Because of this success, most young parents have never seen the devastating effects that diseases like polio, measles, or whooping cough (pertussis) can have on a family or community. However, vaccine-preventable diseases are still common in many parts of the world and can easily be brought into the United States by unvaccinated travelers who are infected while abroad. Children in the United States can—and still do—get some of these diseases. [2, 7]

Vaccinations help protect everyone

A very important concept in vaccination is *herd immunity*. Herd immunity refers to the benefit everyone receives from a vaccinated population once immunization rates reach a critical level. When enough people are vaccinated, everyone receives some protection from the spread of diseases even if they are too young to be immunized or have medical reasons why they cannot be immunized. [2]

Relying on herd immunity to keep *your* child safe is risky. If more and more parents rely on other parents to vaccinate *their* children, the fewer vaccinated children we will have, and the more likely a serious disease will return and infect all of those who are unvaccinated. [2]

Vaccinations benefit communities in many ways

Vaccination has greatly reduced the burden of infectious diseases. According to the World Health Organization, "The benefits of vaccination extend beyond prevention of specific diseases in individuals...Vaccination makes good economic sense, and meets the need to care for the weakest members of societies." [8]

Vaccines are among the most cost-effective clinical preventive services and are a core component of any preventive services package. Childhood immunization programs provide a

very high return on investment. For example, for each birth cohort vaccinated with the routine immunization schedule (this includes DTap, Td, Hib, Polio, MMR, Hep B, and varicella vaccines), society:

- Saves 33,000 lives.
- Prevents 14 million cases of disease.
- Reduces direct health care costs by \$9.9 billion.
- Saves \$33.4 billion in indirect costs. [9]

What happens when we stop vaccinations?

Consider Measles:

Before the measles vaccination program started in 1963, an estimated 3 to 4 million people got measles each year in the United States. Of these, approximately 500,000 cases were reported each year to CDC; of these, 400 to 500 died, 48,000 were hospitalized, and 1,000 developed encephalitis (brain swelling) from measles. Since then, widespread use of measles vaccine has led to a greater than 99% reduction in measles cases compared with the pre-vaccine era. [10]

In 2000, the United States declared that measles was eliminated from this country. Measles elimination is defined as the absence of continuous disease transmission for 12 months or more in a specific geographic area. Measles is no longer endemic (constantly present) in the United States. Since 2000, the annual number of people reported to have measles ranged from a low of 37 people in 2004 to a high of 667 people in 2014. [11]

There were 23 measles outbreaks in 2014, including one large outbreak of 383 cases, occurring primarily among unvaccinated Amish communities in Ohio. Many of the cases in the U.S. in 2014 were associated with cases brought in from the Philippines, which experienced a large measles outbreak. There were 667 cases of measles across 27 states.

- The majority of people who got measles were unvaccinated.
- Measles is still common in many parts of the world including some countries in Europe, Asia, the Pacific, and Africa.
- Travelers with measles continue to bring the disease into the U.S.
- Measles can spread when it reaches a community in the U.S. where groups of people are unvaccinated. [12]

More information about vaccine-preventable diseases during the 20th century (pre-vaccine era) and recent numbers (2009) can be found at:

<https://www.cdc.gov/mmwr/preview/mmwrhtml/su6004a9.htm>

4. Vaccines and School Attendance

Vaccination Laws

Vaccination requirements for children to attend childcare/preschool, school and college are established through state law. The purpose of these requirements is to reduce the incidence of vaccine-preventable disease by increasing vaccination rates. [13] High rates of vaccination (“herd immunity”) protect students who cannot be immunized due to age or medical reasons, and prevent spreading infection to susceptible persons in the community.

Ohio Laws

The state of Ohio requires several vaccines for school attendance. The required vaccines are to be administered according to the Advisory Committee on Immunization Practices (ACIP) schedule. At this time, Ohio does allow vaccine exemptions for medical, religious or philosophical reasons through the use of a required waiver, signed by the parent or guardian.

More information about immunizations and Ohio school attendance can be found at:

<https://www.odh.ohio.gov/odhprograms/bid/immunization/imunchsc.aspx>

Mississippi and West Virginia are the only states that don’t allow parents to claim religious or philosophical exemptions to the rules for vaccinating children before they enroll in school. Only medical exemptions are allowed in Mississippi and West Virginia. Mississippi has the highest vaccination rate for school-age children. In 2014, 99.7 percent of Mississippi’s kindergartners were fully vaccinated. [14]

Americans support mandatory vaccinations

Most Americans support requiring the measles, mumps and rubella vaccine for public school children in order to protect public health. They see high preventive health benefits of such vaccines, and low risk of side effects, and they consider the benefits of the vaccine to outweigh the risks.

Parents of young children, parents of school-age children and those with no minor age children hold roughly similar views on this issue, with a majority of all three groups saying that healthy schoolchildren should be required to be vaccinated because of the health risk to others when children are not vaccinated. [15]

What are the risks of unvaccinated children in school?

For parents who may oppose some or all vaccinations for their child, they should know that their unvaccinated child could spread disease to another child who is too young to be vaccinated or whose medical condition, such as leukemia, other forms of cancer, or immune system problems, prevents them from being vaccinated. This could result in long-term complications and even death for the other child.

Another point to consider is that if every parent exempted their child from vaccination, these diseases would return to our community in full force.

Parents must also be aware that if they choose not to have their child vaccinated, their child may be excluded from his or her child care facility, school, sports events, or other organized activities during disease outbreaks.

Allen County School Immunization Status

The chart below shows the percentage of Allen County schools compared to Ohio for students with required immunizations, with medical exemptions, and with religious or philosophical exemptions, as well as students whose information and/or immunizations are not completely up to date. Definitions from the School Immunization Status Assessment Data Dictionary about the data are listed below the chart. The “Pupils Not Complete” has the highest percentage among those that do not have the required immunizations. Under-vaccinated children are missing some vaccinations/are not up-to-date on their immunizations. While the reasons children are under-vaccinated can vary from access to care issues to parental decisions on vaccination schedules, the results are the same. Under-vaccinated children are not fully protected.

School Type	Report Year	District Name	Pupils With Required Immunizations	Pupils With Medical Contraindication	Pupils With Religious or Philosophical Exemption	Pupils Not Complete
Private & Public	2015	Allen TOTAL	91.49%	0.41%	1.58%	6.01%
Private & Public	2015	Ohio TOTAL	89.44%	0.24%	1.74%	8.57%

These data were provided by the Ohio Department of Health. The Department specifically disclaims responsibility for any analyses, interpretations or conclusions. [16]

School Immunization Status Assessment Data Dictionary

The Ohio Department of Health - January 2016

- **Pupils with Required Immunizations:** Number of students who have received all the immunizations required for school entry per ORC 3313.671 and the ODH Director’s Journal.
- **Pupils With Medical Contraindication:** Number of students who have a medical contraindication to one or more vaccines on record.
- **Pupils With Religious Exemption:** Number of students who have a religious or philosophical contraindication (‘good cause’) to one or more vaccines on record.
- **Pupils Not Complete:** Number of students who do not have all required vaccines, do not have an exemption on file, or have no record on file [16]

5. Allen County Public Health Vaccination Services

Allen County Public Health offers and participates in several evidence-based programs to help maintain high rates of vaccination and to support on-time immunizations in order to reach our ultimate goal of reducing and eliminating vaccine-preventable diseases among Allen County residents. Programs are offered to healthcare providers to help them raise immunization rates within their practice. We also administer vaccines to the public and participate in the Vaccines for Children Program. A brief summary of each of the programs follows.

Provider Programs

Ohio Assessment, Feedback, Incentives and eXchange (AFIX) Project

Assessment, Feedback, Incentives, and eXchange (AFIX) is a quality improvement program used to raise immunization coverage levels, reduce missed opportunities to vaccinate, and improve standards of practices at the provider level.

Maximizing Office Based Immunizations (MOBI)

Maximizing Office Based Immunization (MOBI) is a free, statewide immunization education and training program developed for health-care providers. This program, which offers one hour of continuing medical education to eligible participants and a copy of the CDC's Pink Book, trains practices in evidence-based strategies to overcome barriers to immunizations. It is offered through the Ohio Chapter, American Academy of Pediatrics (Ohio AAP), and funded by the Ohio Department of Health with technical assistance from the National Immunization Program, Centers for Disease Control & Prevention.

Teen Immunization Education Sessions (TIES)

Teen Immunization Education Sessions (TIES) is a free immunization education and training program developed for health-care workers. This program, which offers one hour of continuing medical education to participants, trains practices in evidence-based strategies to overcome barriers to adolescent immunizations. It is offered through the Ohio Chapter, American Academy of Pediatrics (Ohio AAP), and funded by the Ohio Department of Health with technical assistance from the National Immunization Program, Centers for Disease Control & Prevention.

Vaccine Administration

Immunizations are available for infants, children, adolescents and adults. The Allen County Health Department follows the CDC Recommended Immunization Schedules for all vaccines. We participate in the Vaccine for Children (VFC) Program through the Ohio Department of Health – see below. Costs vary depending upon eligibility requirements. Please call the Nursing Division at 419-228-4457 for details. We are a participating provider with Anthem Blue Cross/Blue Shield, Aetna, United Health Care, AmBetter and Medical Mutual.

More information about Allen County Public Health childhood vaccination services can found at:<http://www.allencountypublichealth.org/nursing/%C2%B7immunizationshots/childhood-immunization/>

We also offer adult vaccination services for regularly scheduled adult vaccinations, individuals planning international travel, and for students entering a medical profession. More information about our adult/travel vaccines can be found on our [website](#).

Vaccines for Children (VFC)

The Vaccines for Children (VFC) program is a federally-funded program overseen by the Centers for Disease Control and Prevention (CDC) and administered in Ohio by the Ohio Department of Health. The VFC program supplies vaccine at no cost to public and private health care providers who enroll and agree to immunize eligible children in their medical practice or clinic. The VFC program was created by the Omnibus Budget Reconciliation Act of 1993 and began on October 1, 1994. The VFC program was designed to:

- Reduce the cost of vaccines for a physician or medical practice.
- Create fewer barriers for parents to immunize their children.
- Save parents about \$2,200 per child in expenses for vaccines.
- Keep children in their medical home when they qualify for VFC.

Any child from birth through 18 years of age is eligible to receive VFC-supplied vaccine if he/she meets at least one of the following criteria:

- The child does not have health insurance.
- The child is enrolled in Medicaid (including Medicaid HMOs).
- The child is an American Indian or Alaskan Native.
- The child has health insurance that does not pay for vaccine (applicable only to children attending a Federally Qualified Health Center, Rural Health Clinic or local health department).

Sources:

[1] <http://www.who.int/immunization/en/>

[2]

<https://healthychildren.org/English/safety-prevention/immunizations/Pages/Vaccine-Safety-The-Facts.aspx>

[3] <https://vaers.hhs.gov/index/about/index>

[4]

<https://healthychildren.org/English/safety-prevention/immunizations/Pages/Vaccine-Studies-Examine-the-Evidence.aspx>

[5] <https://www.cdc.gov/vaccines/parents/tools/parents-guide/parents-guide-part4.html>

[6] <https://www.cdc.gov/vaccinesafety/research/iomreports/index.html>

[7] <https://www.cdc.gov/features/reasonstovaccinate/index.html>

[8] <http://www.who.int/bulletin/volumes/86/2/07-040089/en/>

[9]

<https://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases>

[10] <https://www.cdc.gov/measles/vaccination.html>

[11] <https://www.cdc.gov/measles/about/faqs.html>

[12] <https://www.cdc.gov/measles/cases-outbreaks.html>)

[13]

<https://www.thecommunityguide.org/sites/default/files/assets/What-Works-Vaccines-factsheet-and-insert.pdf>

[14]

https://www.washingtonpost.com/news/storyline/wp/2015/01/30/mississippi-yes-mississippi-has-the-nations-best-child-vaccination-rate-heres-why/?utm_term=.bdf83727d3a7

[15]

<http://www.pewinternet.org/2017/02/02/vast-majority-of-americans-say-benefits-of-childhood-vaccines-outweigh-risks/>

[16] Ohio Department of Health