Information about

childhood vaccinations

for parents and relatives

Directorate of Health
Chief Epidemiologist for Iceland

June 2023

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Publisher: The Directorate of Health - Chief Epidemiologist
7th edition 2023

ISBN 978-9979-9485-6-8

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Questions and answers about vaccinations

What is vaccination?

Vaccination is an active immunisation intended to prevent infectious disease. Vaccines are produced by attenuating (making weaker) diseasecausing viruses or bacteria, or extracting or synthesizing substances found in these germs. The vaccines cause few or no symptoms but provoke a specific immune response in the body. That decreases the likelihood of vaccinated children later becoming ill from the disease. Vaccinations and vaccines derive their names from the vaccinia (cowpox) immunization which was widely used as a prevention against smallpox from the late 1700s. Smallpox had nearly wiped out the nation in earlier centuries. Mandatory vaccination against smallpox was introduced in Iceland in 1802. Worldwide vaccination led to the elimination of smallpox in the late 1970s, after which vaccinia immunization stopped in Iceland.

What is the purpose of vaccination?

The objective of vaccination is to prevent serious diseases, especially in children. Vaccinations also prevent epidemics of contagious diseases and minimize the dangerous consequences of those diseases. In some cases, it is possible to eliminate diseases entirely, from a population or even the world. Many diseases such as measles, diphtheria, whooping cough, and polio are now rarely seen in countries where vaccination is widespread. Infant mortality due to these diseases was common up to the early 20th century in Iceland. The experience of many European states shows that these diseases can return if childhood vaccinations are underutilized.

What is the usefulness of vaccinations?

The usefulness of vaccinations is primarily the protection which it provides for the individual child. Additionally, a vaccinated child does not transmit a disease it has been vaccinated against to other susceptible children. That decreases the spread of illness in a widely vaccinated population, protecting even the unvaccinated against the disease, a phenomenon called herd immunity. In order to achieve this level of protection, vaccinations need to be general and reach as many children as possible. No other preventive measures against diseases have a herd effect and the World Health Organisation has stated that no other intervention is as cost-effective as immunization.

Can there be a reason for not vaccinating a child?

There is very rarely a reason not to vaccinate a child. If any of the following applies to your child, you should discuss it with the doctor or nurse at your health care center. In most cases, the vaccine can still be given:

- The child is unwell or has a fever. A known, mild illness is not a reason to delay the vaccine (for example; ear infection).
- The child has suffered a side effect or complication from prior vaccinations.
- The child has had a severe allergic reaction (mouth or throat-swelling, breathing difficulties, etc.) or anaphylaxis after consuming gelatin.
- The child is using certain medications, especially steroids.
- The child has a chronic disease compromising immunity.

Which diseases are preventable by general vaccination in Iceland?

Diphtheria

Diphtheria is a contagious disease caused by a bacterium. The main symptoms are an extremely sore throat with a grey-white coating. The bacterium releases a toxin that is transmitted into the blood. This toxin is damaging to tissues, such as the heart muscle. Antibiotics kill the bacteria without preventing the toxic effects. Therefore, vaccination is the only prevention against the disease. Diphtheria is extremely rare because of effective and widespread vaccinations.

Tetanus

Tetanus is caused by a bacterium that is found in the environment, e.g. soil and animal manure. The tetanus bacteria can infect a wound contaminated by dirt. The bacteria produce toxins that lead to muscle stiffness that can cause death. An antidote exists that is effective if used quickly enough, while the only secure protection is vaccination.

Pertussis, whooping cough

Pertussis (whooping cough) is caused by another toxin-producing bacterium. The disease is highly contagious. The symptoms begin with a mild cold, then an increasing cough, mucus buildup, and severe coughing spells, particularly at night. The disease is often severe and prolonged and can be life-threatening to infants. They usually have severe coughing spells with noisy inspiration (whoop) and may stop breathing (apnoea). Antibiotics are of little use. Vaccinations in pregnancy and early infancy can protect newborns and infants.

Polio

Polio or poliomyelitis is caused by a virus that can be transmitted from person to person or by fecal contamination of food and water. Symptoms are often mild, but a small proportion of infections lead to paralysis and even death. No medication is effective against the disease. Polio is now rare all over the world and may be eliminated entirely if widespread vaccination continues.

Haemophilus influenzae type b *(Hib)*

Haemophilus influenzae type b is a bacterium that can cause several serious diseases, such as meningitis, epiglottitis, pneumonia, sepsis, and arthritis. Vaccination against this bacterium has been very successful. Before vaccination started in Iceland in 1989 approximately 10 children were diagnosed every year with meningitis caused by Hib. Thirty years have now passed without a case of Hib disease in Iceland.

Pneumococcus *(Strep. pneumoniae)*

Pneumococci are bacteria that can cause several diseases, some life-threatening, especially for young infants, such as meningitis, sepsis, pneumonia, ear infection, and sinusitis. The most dangerous of these diseases are meningitis and sepsis. Before the time of vaccinations, 11 children were diagnosed with serious pneumococcal infections every year in this country. Serious pneumococcal infections are now rare in children in Iceland. In 2022, serious infections occurred in vaccinated children, due to subspecies from (2023) have been added to the vaccine.

Meningococcus ACWY *(Neisseria meningitidis)*

Up to the year 2003, approximately 10-15 individuals were diagnosed with a disease caused by meningococcus C every year in this country. The infections were very serious as approximately 10% of those infected died, and another 20% suffered severe consequences. Vaccination against meningococcus C was introduced in Iceland in 2002 and since then no cases of the disease have occurred in the vaccinated population and the infection has become very rare among those unvaccinated

Varicella, chickenpox

Varicella is caused by a virus that is very contagious and is transmitted between people by airborne droplets. The disease is usually mild, but on occasion, it can cause dangerous complications, such as encephalitis or even death. After the resolution of varicella disease, the varicella virus remains in the body and can cause a painful rash, and shingles, later in life. Vaccination gives good protection against varicella and shingles.

Morbilli, measles

Measles disease is caused by a very contagious virus that is transmitted between people by airborne droplets. The intensity of symptoms varies, but the disease can be dangerous and even cause death. Approximately 10% of those who are infected have serious complications such as meningitis or pneumonia. Vaccination gives good protection.

Mumps *(parotis epidemica)*

The viral infection known as mumps is most often a mild disease, but serious complications are known. Hearing loss is the most common complication; other complications are meningitis and inflammation of the testicles, which can cause sterility. Vaccination provides protection against the disease.

Rubella

Rubella is a mild viral infection in children, but if a pregnant woman contracts the disease, the fetus can be harmed. Fetal damage can involve hearing impairment, blindness, deformities, growth impairment, or even miscarriage. Vaccinating everyone in the community can prevent epidemics of rubella and protect women of childbearing age from being infected.

HPV *(Human Papilloma Virus)*

HPV is an abbreviation for Human Papilloma Virus, a common virus easily transmitted through sexual intercourse, despite condom use. It is estimated that approximately 80% of sexually active people contract the virus in their lifetime. The virus has many subspecies that can cause genital disease. In most cases, the infection is temporary. However, some types of it can cause persistent infections and cancer, especially in the cervix of the uterus.

The HPV vaccine is active against the most common viral types that can cause cervical cancer, as well as other types of cancers in all genders. In Iceland, all genders are vaccinated from 12 years of age, since 2023.

Despite vaccinations, it is important that girls undergo regular testing for cancer later in life.

Is there cause for concern about the consequences of vaccinations?

What should be done if the child develops a fever?

If the child develops a fever, doctors and nurses normally advise that the child be given a weight-appropriate dose of paracetamol to reduce the fever. This can be repeated 4-6 hours later if needed. If the fever lasts longer than 24 hours or if it is accompanied by other symptoms a doctor or nurse should be consulted.

Children that have experienced febrile seizures should receive antipyretic medication (e.g. paracetamol) soon after vaccination against pertussis, pneumococcus, or meningococcus since fever is most likely to occur that same day or the next. Administration of such medications is less effective after vaccinations against measles, mumps, rubella, or varicella.

What about the injection site?

Sometimes redness or inflammation occurs at the injection site. This is normal and will resolve without intervention. If you are concerned, you should speak with a nurse or a doctor at a health care center.

When should a doctor be consulted?

If you have any concerns contacting a nurse or a doctor is recommended. If the child develops a high fever, cries

Safety and side effects of vaccinations

Vaccine against whooping cough, diphtheria, tetanus, haemofilus influenzae type b, and polio
(administered at 3-, 5-, and 12-months)

Side effects are generally mild and resolve within two to three days. Mild fever, irritation, and general discomfort can appear in 4–6 hours and normally subside within 24 hours after vaccination. Swelling and redness may appear at the injection site and cause discomfort for a few days. An induration may appear at the injection site and will gradually subside.

Vaccine against pneumococcus
(administered at 3-, 5-, and 12-months)

The most common side effects are pain, redness, and swelling at the injection site as well as a fever on the day of the vaccination. Serious side effects have not been reported.

Vaccine against meningococcus ACWY
(administered at 12-months)

Side effects are mild. Pain, redness, and swelling at the injection site may occur and the child may develop a fever.

Vaccine against varicella (chickenpox)
(administered at 18-months and 2.5-years)

Side effects are generally mild. Fever and rash may occur 8-21 days after the dose in 10-15% of cases, but children rarely become unwell. Local redness, soreness, and slight swelling may appear at the injection site in 5- 10%, usually with the second dose. The symptoms resolve within a few days.

Vaccine against measles, mumps, and rubella
(administered at 18-months and 12-years)

Side effects are generally mild. Fever and rash may occur 5–12 days after the dose in less than 10% of cases. However, children generally do not become very unwell. A local redness, soreness, and mild swelling may appear at the injection site in less than 10% of cases. These symptoms subside within a few days.

Vaccine against whooping cough, diphtheria, and tetanus
(administered to 4-year-old children)

Side effects of these vaccines are generally mild. Mild fever, irritation, and general discomfort may appear in 4–6 hours but normally resolve within 24 hours. Swelling and redness may appear at the injection site and cause discomfort for a short time. An induration may develop at the injection point and gradually subside.

Vaccine against HPV *(administered to 12 year-olds)*

Side effects of the vaccine are pain and discomfort at the injection site, which soon subsides. Other side effects, such as fever, are rare. Adolescents are more likely than younger children to faint with vaccinations, but that is not related to the specific vaccine. Serious side effects have not been established.

Vaccine against polio, whooping cough, diphtheria, and tetanus *(administered to 14-year-old children in one injection)*

Side effects are rare. Redness and discomfort may occur at the site up to 48 hours after vaccination and last for one or two days.

General vaccinations of children in Iceland from July 2023

Age:	Vaccination against:
3 months	Whooping cough, diphtheria, tetanus, Haemophilus influenzae type b, and polio in one injection. Pneumococcus in a separate injection.
5 months	Whooping cough, diphtheria, tetanus, Haemophilus influenzae type b, and polio in one injection. Pneumococcus in a separate injection.
12 months	Whooping cough, diphtheria, tetanus, Haemophilus influenzae type b (Hib), and polio in one injection. Pneumococcus in a separate injection. Meningococcus in the third injection.
18 months	Measles, mumps, and rubella in one injection. Chickenpox in a separate injection.
2.5 years	Chickenpox.
4 years	Whooping cough, diphtheria, and tetanus in one injection.
12 years	Measles, mumps, and rubella in one injection. HPV in a separate injection.
14 years	Whooping cough, diphtheria, tetanus, and polio in one injection.

Basic vaccination against whooping cough, diphtheria, tetanus, Haemophilus influenzae type b, and polio, as well as pneumococcus (two separate injections), is included in two vaccinations of infants aged 3 and 5 months. In order to strengthen the child's defense, they are vaccinated again at 12 months against whooping cough, diphtheria, tetanus, Haemophilus influenzae type b (Hib), and polio, as well as pneumococcus. Furthermore, three separate dosages of meningococcal vaccine are administered.

At the age of 4 and 14 years of age, the vaccination against whooping cough, diphtheria, tetanus, and polio is repeated.

It is recommended to maintain the protection for diphtheria, tetanus, and polio with repeated vaccinations every 10 years, at least in the context of travelling to countries where the respective diseases are endemic.

Vaccination against chickenpox is completed with 2 doses during the second year of life. No booster is recommended at this time.

Basic vaccination against measles, mumps, and rubella is administered to 18-month-old children and a booster dose at age 12. Individuals should then have received lifelong protection against these diseases.

In Iceland, all genders are vaccinated against HPV at 12 years of age, with a minimum of two doses with at least 6 months between injections.

Further information about childhood vaccinations can be obtained from the website of the Directorate of Health **(www.landlaeknir.is)** and at health care centers.

LITRÓF – *Umhverfisvottuð prentsmiðja*