

What is immunisation?

Immunisation is a simple, safe and effective way to protect your child against certain diseases. The risks from having these diseases are much greater than the risk of any minor side effects from immunisation.

What causes infection?

Infections are caused by germs entering the body:

- through cuts,
- when we breathe in, or
- when we swallow.

The germs then cause diseases such as meningitis (inflammation of the lining around the brain), pneumonia (a lung infection) or septicaemia (blood poisoning).

What is a contagious disease?

This is a disease that spreads from one person to another usually through coughs and sneezes. Some people 'carry' the germs in their body but are not sick themselves. For example, 1 in 10 of us carry meningococcal germs but only 1 in 10,000 gets sick with meningitis or septicaemia. Other examples of contagious diseases include measles, whooping cough, tuberculosis (TB), diphtheria and polio. How does my child's body fight infection? When germs enter your child's body, your child's immune system makes 'antibodies' to the germs. Antibodies do two things:

1. They attack and destroy the germs. However, it takes time for the body to make enough antibodies. Sometimes the germs may damage your child's body before the antibodies can destroy them.
2. They stay in your child's body to protect them against future infections. If the same germs try to infect your child again, the antibodies will destroy them before they have a chance to make your child sick. This way of dealing with germs is called 'natural immunity'. It is why most people get diseases like measles or chickenpox only once, even though they might be exposed to them many times.

The problem with getting natural immunity from germs is that your child has to get sick before they develop immunity. In fact, some germs could make your child very sick or even kill them before their body could produce enough antibodies to destroy the germs. This is why we give vaccines to protect your child against these germs.

How do vaccines work?

When your child is given a vaccine, their body responds by making antibodies, in the same way as if they had caught the disease but without getting sick. The antibodies that your child's body makes then stay in their body to protect them against the actual disease.

How long do vaccines take to work?

It usually takes a few weeks for vaccines to work, so your child will not be protected immediately. Why does my child need more than one dose of a vaccine? Most vaccines need to be given several times to build up longlasting protection. For example, a child who gets only one or two doses of the whooping cough vaccine is only partly protected against whooping cough and may still catch the disease.

This is why it is so important that your child completes all five visits to the GP (doctor) and gets all their immunisations.

When your child reaches school age, they will get more doses of some vaccines to give them even better long-term protection.

These are called booster doses.

Why are vaccines given at such an early age?

Young children are most at risk of getting these diseases and need to be protected as early as possible. For example, children younger than six months are at the highest risk for serious complications of whooping cough (6 out of 10 children in this age group need to go into hospital, and 9 out of 10 deaths from whooping cough are in this age group). Also, the rotavirus oral vaccine can only be given to children under 8 months of age. This is because in very rare cases a child can get a blockage in the gut if the vaccine is given later.

The MMR vaccine is an exception. It is not usually given to children under 12 months because it may not work properly in young children. Your child needs to get the vaccines at the right age so that they are protected from serious diseases when they are most vulnerable.

Why are so many vaccines given together?

Some parents worry that giving several vaccines at once will overload their child's immune system or that the vaccines may not work properly. However, there is nothing to worry about as your child's immune system can easily cope with vaccines. Studies have shown that vaccines are just as safe and effective when they are given together as when they are given separately. By getting several vaccines at the same time, your child is protected at a younger age and needs fewer injections. For example, if your child received single injections of the measles, mumps and rubella vaccines instead of the combined MMR vaccine, they would have to have 6 injections instead of 2. Your child needs a number of vaccines to get the best protection, so it is important to complete the course of vaccines.

Will immunisations still work if my child doesn't get the vaccines at the right time?

Yes. Most of these vaccines can be given at any age, and a child who misses one injection in a course of injections does not have to start again. But your child will not be fully protected until they get all the vaccines. Remember the rotavirus oral vaccine can only be given to children under 8 months of age.

What will happen if my child doesn't get the vaccines at all?

One of two things could happen:

1. your child may never come into contact with the germs that cause these diseases and so would not become ill.
2. your child may come into contact with the germs, either as a child or as an adult. If they do, there is a good chance they will get the disease. If your child gets the disease, they could be:

→ mildly ill and have to stay inside for a few days; or

→ very sick and have to go into hospital or, at worst, die. Your child could also spread the diseases to others who are not protected, such as children who are too young to be vaccinated. Many people could get very sick and some could die if not enough people in your community are protected.

What are my child's chances of being exposed to these diseases?

Some of these diseases are very rare in Ireland today, so the chances of exposure are small, but others are still fairly common. Also, even though some of the diseases are rare in Ireland they are common in other countries, so your child could get those diseases while travelling abroad. Don't assume that your child is completely safe from diseases, even the rare ones. There are still cases of diphtheria in some Asian countries and one child died from diphtheria in Belgium in 2016. In 2010, there was a large polio epidemic in Eastern Europe. Polio still occurs in Pakistan and Afghanistan. With increased travel to and from these countries, it is possible that these diseases will happen in Ireland. If there are not enough people immunised, there will be epidemics in which many people will get the disease and some will die. If your child is not immunised, they are at a greater risk of getting these infections when they are older. Some infections are more serious in teenagers or adults than in children. For example, mumps in teenage boys or young men may cause swelling of the testicles and they may not be able to have children. If a woman catches rubella during the early stages of pregnancy, her child may have major birth defects. Also, measles can be more serious in adults.

Do vaccines always work?

Vaccines work most of the time, but not always. Most childhood immunisations protect at least 9 out of 10 (90% to 99%) of the children who get them, but sometimes a child will not respond to certain vaccines.

This is another reason why it's important for all children to be immunised. A child who does not respond to immunisation depends on the immunity of others around them for protection. Your child could be infected by a child who hasn't been immunised.

How effective are vaccines?

Vaccine	Percentage of children immune after getting the recommended doses of vaccine
Diphtheria	97%
Hepatitis B	80 to 100%
Hib	95 to 100%
MMR	95%
MenB	88%
MenC	90%
Pertussis (whooping cough)	75 to 90%
Pneumococcal (PCV)	90%
Polio	99%
Rotavirus (oral) Tetanus	82 to 94% Almost 100%

Vaccine contents and safety

What is in vaccines?

Vaccines contain:

- active ingredients (the vaccine itself); and
- additives such as preservatives and stabilisers.

Active ingredients

Some vaccines are made from tiny amounts of the same germs that cause infections. However, the germs in vaccines are either killed or weakened. This means they won't make your child sick and are safe to use.

Additives Vaccines may contain:

- a small amount of preservative to protect the vaccine from contamination; • other additives to make sure that the active vaccine ingredient is evenly mixed throughout the injection mixture; and
- a small amount of aluminium salt, which helps the body to respond better to the vaccine.

The level of additives in vaccines is very low and within internationally recommended levels. These additives do not cause any serious health problems in infants and young children.

Are vaccines safe?

The vaccines used in Ireland are safe. All medicines can cause side effects, but with vaccines these are usually mild, like a sore arm or leg after the injection, or a slight fever. Serious side effects to vaccines are extremely rare. Research from around the world shows that immunisation is the safest way to protect your child's health. Your GP (doctor) or practice nurse can discuss the risks with you before giving your child their vaccines.

Who regulates vaccines in Ireland?

All the recommended vaccines used to protect children in Ireland are licensed by the Health Products Regulatory Authority (HPRA) or the European Medicines Agency. They are licensed for use only when they have been shown to be both safe and effective.

Where can I find out more about the vaccines used in Ireland?

You can find out more in the:

- Patient Information Leaflet (PIL), which gives a list of ingredients; and
- the Summary of Product Characteristics (SmPC), which contains more detailed information, particularly in Sections 2 and 6.1. These documents are available on the following websites:

www.hpra.ie

www.medicines.ie

www.ema.europa.eu/ema/

You will need to know the name of the vaccines to search these websites. The product name of each vaccine is available on our website www.immunisation.ie

Common questions about immunisation

Are there any children who should not get these vaccines?

Very few. Your child should not get the vaccine if they have had a very severe reaction (anaphylaxis) to a previous vaccine or to any part of a vaccine. Rotavirus Your child should not get rotavirus oral vaccine if they have:

- a history of blocked gut (intussusception);
- a diagnosis of severe combined immunodeficiency (SCID);
- a problem with their gastrointestinal tract (gut) which might increase the risk of a blocked gut;
- a sugar intolerance.

Are there any reasons to delay immunisation?

Very few. If your child has a high fever, wait until your child is better. However, infants and children with minor coughs and colds, or those on antibiotics, can be immunised safely and effectively.

You should delay getting the MMR vaccine at 12 months if your child:

- is on high-dose steroids;

- having chemotherapy or radiotherapy; or
- has an illness or disease that affects their immune system.

What if my child was premature, had a low birth weight or had jaundice?

It is important that premature infants are protected from infectious diseases as they are more at risk of certain infections. In general, premature infants should be immunised as normal. If your child had a very low birth weight, you should talk to your paediatrician (a doctor who has special training in medical care for children) about the child's immunisation needs.

What if my child has a serious disease?

It is very important that children with serious diseases are immunised because they are often more at risk from complications of infections. Children with neurological conditions such as cerebral palsy or Down syndrome should be immunised as normal. However, care is needed if your child's illness, or its treatment, may lower their immunity. Talk to your GP (doctor) about immunisation if your child:

- has cancer;
- has severe combined immunodeficiency (SCID);
- has any other immune deficiency; or
- is taking medicines which may reduce their ability to fight infection.

If your child had a blood transfusion or received blood products, they should not get the MMR vaccine until at least six months after the transfusion.

What if my child has asthma, eczema or hay fever?

Children with asthma, eczema or hay fever should be immunised. Children taking steroids by inhaler or in a low-dose steroid cream should be immunised as normal. If you have any questions, talk to the GP (doctor) or practice nurse giving the immunisation. Can my child get the MMR vaccine if they are allergic to eggs? In the past it was believed that children who were allergic to eggs should not get the MMR vaccine. If your child simply dislikes eggs or has diarrhoea or stomach pains after eating eggs, they should still get their MMR vaccine. Even children with a severe egg allergy should get MMR vaccine. What if my child has epilepsy? If their condition is stable, these children should be immunised. Children with a family history of fits or epilepsy should also be immunised as normal. What if my child has had febrile convulsions (fits)? Some children get fits (febrile convulsions) if they have a high fever. As some children get a fever after the MenB vaccine which is given at 2 months and 4 months of age (visits 1 and 2), we recommend that you give your child liquid infant paracetamol after this vaccine. See page 23 for more details on how to give this. If your child gets a high fever (over 39°C) after the vaccines at 6, 12 and 13 months of age (visits 3, 4 and 5), you can also give them liquid infant paracetamol or infant ibuprofen. Follow the directions on the package.

What if my child has recently had, or is due to have, surgery?

They should still be immunised. Having surgery is not a reason to put off immunisation, and a recent immunisation is not a reason to put off surgery. However, if your child had surgery for a gut problem they should not get the rotavirus oral vaccine at 2 and 4 months of age.

What if my child has already had one of these diseases?

You should still immunise your child. It is important that your child is protected against all the diseases that the vaccine covers, even if the child has caught one of the diseases before. Children under two years do not get enough natural immunity following illness with Hib, MenC or pneumococcal disease so they should still be immunised.

Can my child use the swimming pool if they haven't finished all their vaccinations?

Yes. It is perfectly safe for children to start swimming from birth before having their vaccinations. The diseases children are vaccinated against are not carried in water. You can take your child swimming at any time.

Do some children also need other vaccines?

Yes. Some children may need the flu vaccine or hepatitis A vaccine as they are more at risk of infection. These include children who have had their spleens removed or who have cystic fibrosis, Down syndrome, an immune deficiency, chronic heart, lung, liver or kidney disease, sickle cell disease, diabetes or any long-term illness. Talk to your GP (doctor) about this. If you are travelling to another country, remember to find out if your child needs any special vaccines.

If you have any questions or doubts, talk to the GP (doctor) or practice nurse giving the immunisation.

How soon after the rotavirus oral vaccine can I feed my child?

You can feed your child at any time before or after the rotavirus oral vaccine.

What if my child has an allergic reaction to vaccines?

Serious allergic reactions to vaccines are extremely rare. About one child out of one million may have a serious allergic reaction. Serious allergic reactions usually happen within a few minutes of receiving the vaccine. Signs of a serious allergic reaction include difficulty breathing, hoarseness, wheezing, paleness, weakness, a fast heartbeat, dizziness and swelling of the throat. If the reaction is treated quickly, the child will recover fully. Doctors and nurses who give immunisations are trained to deal with allergic reactions.

Could my child suffer any side effects from the vaccines?

The main side effects from vaccines are tenderness, swelling or pain where the injection was given, or a mild fever. Most of these minor side effects happen in the first day or two after immunisation and children usually recover within a day or two. However, after the MMR vaccine, some children may get a fever or a rash six to 10 days later (called 'mini-measles'). This is not contagious. The Health Products Regulatory Authority (HPRA) monitors all reported side effects of vaccines in Ireland. Other countries also monitor side effects. This is so they can detect new or rare side effects quickly and take any action that may be necessary. If your child has any side effects after immunisation, let your GP (doctor) know so that he or she can report it to the Health Products Regulatory Authority (HPRA).

If my child was unwell after the last dose of vaccine, should they get the next dose? Some children may be unwell after their immunisation. Usually there is no reason not to finish the course of vaccine. However, if your child had a serious allergic reaction (that is, difficulty breathing, hoarseness, wheezing, paleness, weakness, a fast heartbeat, dizziness and swelling of the throat), they should not get that vaccine again. Talk to the GP (doctor) about the reaction.

How serious are these diseases?

Any of these diseases can kill a child or an adult. It's easy to forget how serious they are because – thanks largely to vaccines – we don't see them nearly as much as we used to. Measles used to kill thousands of people in Europe and the United States every year. In the 1940s and 1950s, tens of thousands of children were crippled or killed by polio. As recently as the mid-1980s, 100 children a year in Ireland suffered from meningitis and other serious complications as a result of Hib infection. Meningococcal B disease causes 1 to 2 deaths in young children in Ireland each year. This is why the MenB vaccine has been introduced into the childhood immunisation schedule. These diseases have not changed. They can still cause dehydration, pneumonia, choking, meningitis, brain damage and heart problems in children who are not protected. These diseases still kill children in many parts of the world, even in Ireland. The next few pages tell you more about the diseases and the vaccines which protect your child against these diseases.

The diseases and the vaccines that protect against them

Disease	Effect of disease	Side effects of the vaccine
Diphtheria – contagious bacteria spread by close contact with an infected person or carrier and which causes a sore throat and severe breathing difficulties	If 1,000 people get diphtheria: • 50 will die. The bacteria release a toxin (poison) which can lead to paralysis and heart failure.	If 1,000 people are immunised: • 100 will have discomfort, redness and swelling where the injection was given or will have a fever.
Haemophilus influenzae type b (Hib) – contagious bacteria spread by close contact with an infected person and which cause meningitis (inflammation of the lining around the brain), epiglottitis (swelling in the throat that causes choking), septicaemia (blood poisoning) and osteomyelitis (infection of the bone).	If 1,000 people get Hib meningitis: • 50 will die. • 250 will have permanent brain damage or deafness. If 1,000 people get Hib epiglottitis (swelling in the throat that causes choking): • 10 will die.	If 1,000 people are immunised: • 200 will have discomfort, redness and swelling where the injection was given. • 20 will have a fever.
Hepatitis B – contagious virus spread by contact with the blood or other body fluid of an infected person and which causes liver disease. Children have a higher risk of having hepatitis B infection for life.	If 1,000 people get chronic hepatitis B infection: • 250 will die from scarring of the liver (cirrhosis) or liver cancer	If 1,000 people are immunised: • 100 will have discomfort, redness and swelling where the injection was given or will have a fever.
Measles – highly contagious virus spread by close contact with an infected person and which causes fever, a cough and a rash.	If 1,000 people get measles: • 1 or 2 will die. • 50 will get an ear infection. • 40 will get pneumonia or bronchitis. • 5 will have convulsions (fits). • 160 will get diarrhoea. • 1 will develop encephalitis (inflammation of the brain).	If 1,000 people are immunised: • 100 will have discomfort, redness and swelling where the injection was given or will have a fever. • 50 will get a rash six to 10 days later (this is not contagious). • 1 will have a convulsion (fit).

Disease	Effect of disease	Side effects of the vaccine
	<p>For every 10 children who develop encephalitis:</p> <ul style="list-style-type: none"> • 1 will die • Up to 4 will have brain damage. <p>1 in 8,000 children under two years of age get SSPE (brain degeneration), which may be many years after measles and is always fatal.</p>	<p>1 in 10 million will develop encephalitis (inflammation of the brain).</p> <p>1 in 22,000 will get a temporary blood clotting problem.</p>
<p>Meningococcal B (MenB) – contagious bacteria spread by saliva or close contact with an infected person or carrier and which cause meningitis or septicaemia, or both. (The MenB vaccine does not protect against other types of meningitis.)</p>	<p>If 1,000 people get MenB disease:</p> <ul style="list-style-type: none"> • 50 will die. • 100 people who recover from meningococcal disease will have a major disability such as deafness, brain damage or loss of fingers, toes, hands, feet, arms or legs. 	<p>If 1,000 people are immunised:</p> <ul style="list-style-type: none"> • 500 will have a fever. • 100 will have discomfort, redness and swelling where the injection was given. • 10 will have a high fever.
<p>Meningococcal C (MenC) – contagious bacteria spread by saliva or close contact with an infected person or carrier and which cause meningitis or septicaemia, or both. (The MenC vaccine does not protect against other types of meningitis, including that due to Meningococcal B disease.)</p>	<p>If 1,000 people get MenC disease:</p> <ul style="list-style-type: none"> • 50 will die. • 100 people who recover from meningococcal disease will have a major disability such as deafness, brain damage or loss of fingers, toes, hands, feet, arms or legs. 	<p>If 1,000 people are immunised:</p> <ul style="list-style-type: none"> • 50 will have discomfort, redness and swelling where the injection was given or will have a fever. • 500 will become irritable. • 10 will get a tummy upset or vomit.
<p>Mumps – contagious virus spread by close contact with an infected person and which causes swollen neck glands and a fever.</p>	<p>If 1,000 people get mumps:</p> <ul style="list-style-type: none"> • 50 will get viral meningitis. • 1 will get encephalitis (inflammation of the brain). • 400 men who have mumps will get swollen testicles. • 300 will get fever, a headache, and swollen salivary glands under the jaw. 1 in 20,000 will become deaf. <p>Mumps can also rarely cause infertility in men.</p>	<p>If 1,000 people are immunised:</p> <ul style="list-style-type: none"> • 100 will have discomfort, redness and swelling where the injection was given or will have a fever. • 10 will develop swelling of the salivary glands under the jaw in the third week after immunisation (this is not contagious). <p>1 in 10 million may get encephalitis (inflammation of the brain).</p>

Disease	Effect of disease	Side effects of the vaccine
<p>Pertussis (whooping cough) – contagious bacteria spread by close contact with an infected person and which cause a ‘whooping’ cough and vomiting. The disease can last up to three months.</p>	<p>If 1,000 people get whooping cough:</p> <ul style="list-style-type: none"> • 2 will die from pneumonia or brain damage (almost all deaths are in children under the age of 6 months). • 10 will have fits (15 if under 6 months old). • 1 will get encephalitis (inflammation of the brain) (2 if under 6 months old). • 50 will get pneumonia (100 if under 6 months old). • 200 will need to go into hospital. 	<p>If 1,000 people are immunised:</p> <ul style="list-style-type: none"> • 100 will have discomfort, redness and swelling where the injection was given or will have a fever. <p>4 in 10,000 will cry for more than three hours after immunisation.</p> <p>1 in 10,000 will have a convulsion (fit).</p>
<p>Pneumococcal disease – contagious bacteria spread by close contact with an infected person or carrier, and which cause invasive disease such as pneumonia, meningitis and septicaemia (blood poisoning).</p>	<p>If 1,000 people develop invasive pneumococcal disease:</p> <ul style="list-style-type: none"> • 250 will develop pneumonia. • 250 will develop meningitis. • 100 will die. 	<p>If 1,000 people are immunised:</p> <ul style="list-style-type: none"> • 100 will have discomfort, redness and swelling where the injection was given or will have a fever.
<p>Polio – contagious virus spread by close contact with an infected person or their faeces (poo). It causes fever, headache and vomiting and may progress to paralysis.</p>	<p>If 1,000 people get polio:</p> <ul style="list-style-type: none"> • Up to 10 will become paralysed. <p>Of these 10 people with paralysis:</p> <ul style="list-style-type: none"> – 5 will be permanently paralysed, and – 1 may die. 	<p>If 1,000 people are immunised:</p> <ul style="list-style-type: none"> • 100 will have discomfort, redness and swelling where the injection was given or will have a fever.
<p>Rotavirus – contagious virus spread by close contact with an infected person, nappy changing coughing, and sneezing.</p>	<p>By the age of 5 years children will have had vomiting and diarrhoea from rotavirus.</p> <p>If 1,000 children get rotavirus:</p> <ul style="list-style-type: none"> • 1,000 get vomiting and diarrhoea. • 3 will need to be admitted to hospital for treatment. • Young children need to stay in hospital for an average of 5 days, if they are admitted. 	<p>If 1,000 people are immunised:</p> <ul style="list-style-type: none"> • 100 will have mild diarrhoea. • 10 will have tummy pain. • 10 will have inflamed skin.

Disease	Effect of disease	Side effects of the vaccine
<p>Tetanus – bacteria from soil which release a toxin and cause painful muscle spasms, convulsions and lockjaw.</p>	<p>If 1,000 people get tetanus:</p> <ul style="list-style-type: none"> • 100 will die. • The risk is greatest for the very young or old. 	<p>If 1,000 people are immunised:</p> <ul style="list-style-type: none"> • 100 will have discomfort, redness and swelling where the injection was given or will have a fever.
<p>Rubella (German measles) – contagious virus spread by close contact with an infected person and which causes a rash, fever and swollen glands. It may cause major birth defects in the child if the mother gets rubella in early pregnancy.</p>	<p>If 1,000 mothers develop rubella in early pregnancy:</p> <ul style="list-style-type: none"> • 900 children will have a major birth defect (such as deafness, blindness, brain damage or heart defects). <p>If people get rubella:</p> <ul style="list-style-type: none"> • 1 in 3,000 get thrombocytopenia (bruising or bleeding of the skin). • 1 in 6,000 get encephalitis (inflammation of the brain). • 1 in 2 will get a rash and painful swollen glands <p>More than half of women with rubella get painful joints</p>	<p>If 1,000 people are immunised:</p> <ul style="list-style-type: none"> • 100 will have discomfort, redness and swelling where the injection was given or will have a fever. • 50 will get swollen glands, a stiff neck, or joint pains. • 50 will get a rash (which is not contagious). <p>1 in 25,000 will get bruising or bleeding.</p> <p>1 in 10 million may get encephalitis (inflammation of the brain).</p>