Facts and fallacies about vaccination

An independent information document about vaccination in healthcare

As a nurse, you play a vital role in the healthcare system. You support people on their road to recovery and you’ve wholeheartedly committed yourself to this task. Thank you!

In the last few decades, we’ve made great progress in reducing the incidence of many infectious diseases.

Whooping cough, hepatitis, and tuberculosis (TB) are largely things of the past. Some diseases, such as smallpox and polio, have been almost completely eradicated. This is largely due to global vaccination efforts.

Being a healthcare professional, you are more involved with vaccinations than most other people.

Every year, you receive an invitation to get a flu jab. During the COVID-19 pandemic, you were prioritised as one of the first to receive the vaccination. Moreover, patients may approach you with questions about vaccinations. This requires you to place your trust in scientists, vaccine suppliers, and policymakers. Both healthcare professionals and patients have questions about vaccines. And with good reason. Consequently, they are entitled to a well-thought-out answer.

This independent information document provides substantiated and up-to-date information to ensure that you are as well informed as possible.

This enables you to provide guidance to your patients or clients, and to make an informed decision about vaccination for yourself. Alongside this document, you can attend lectures and training courses that provide a comprehensive step-by-step explanation, allowing ample opportunity for questions.

How should I read this document?

You don’t have to read the contents of this document in any particular order. Click the question that is most relevant to you, the information will then be displayed. Click the next question and navigate through the document as you see fit.

What if your question is not listed?

You can find a list of frequently asked questions [here](https://influenzastichting.nl/vragen-en-antwoorden/). If your answer is not listed, you can also submit a question via this link [Dutch Influenza Foundation (NIS)](mailto:info@influenzastichting.nl).

We would appreciate your [feedback](https://forms.gle/mnR227zfgLpgWokTA) on how this document helped you to reach a decision.

Regards,

The Dutch Influenza Foundation.

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# What facts and fallacies surround vaccination?

Is there a specific reason why healthcare professionals like myself should get vaccinated? Why should we bother?

Take a look at the following list of the seven most common reasons for hesitancy, which includes questions and our answers.

## Is the flu vaccine mainly being offered to boost pharmaceutical companies’ profits?

No.

* While pharmaceutical companies do indeed have a financial stake in the sale of vaccines, it is important to emphasise that healthcare institutions are not driven by such considerations. Healthcare institutions provide the flu vaccine to prevent illness among patients and staff.
* The flu can also cause severe illness in young people, who often have to take sick leave. High levels of sick leave among staff can place additional strain on the remaining healthcare workers. This can be prevented by vaccination.
* Additionally, there are patients in hospitals who are unable to receive vaccinations or for whom vaccines may be less effective. Flu can cause severe illness among such patients. By ensuring that healthcare workers are vaccinated, we can effectively protect vulnerable individuals from long-term illness or death.

## I am young and in good health, yet vaccination involves the injection of pathogens and additives into an otherwise healthy body. Surely that’s not right?

If a substantial level of risk was involved, this would indeed be ethically questionable. However, healthy individuals are unlikely to suffer long-term adverse effects from vaccination. The decision on whether to get vaccinated or not is ultimately yours to make.

* Some healthcare professionals, who believe they are already doing their best to serve others, are hesitant to receive flu jabs, for example, due to concerns about damaging their own health. You have the freedom to decide what happens to your own body, so no one can make you get vaccinated against your will.
* The purpose of this document is to help you make an informed choice. In Chapter 8, for instance, you learn that all vaccines must pass rigorous safety tests before being released to the market. That chapter also emphasises the significance of your role as a healthcare professional in identifying and reporting any adverse effects.

## I can skip the occasional jab, I’m just one person so it’s not a big deal

Indeed, if only one person thought that way, it wouldn’t really matter.

* However, if more and more people skip their jab, then vaccination has less and less effect. The higher the uptake, the more effective the vaccine, due to the development of herd immunity. You can read all about it in Chapter 5.

## Should everyone get vaccinated? For some people it’s pointless, right?

Getting vaccinated may not always be necessary, especially if you are already immune, for instance.

* If you just had the flu a month ago, you probably don’t need to get your flu jab. In this case, your body has already developed immunity to that specific flu virus. However, if you want to be sure that you are protected against other strains of the flu, it doesn’t hurt to get vaccinated. That’s because the vaccine provides immunity against several strains of the flu.
* As a healthy person who has not yet developed immunity, it might be useful for you to get vaccinated. That is not only for your own protection; it also helps safeguard vulnerable groups. Vaccination carries potential risks for some people (see Chapter 4). They can decide, in consultation with their attending physician, whether or not to get vaccinated. However, if everyone else does get vaccinated, these vulnerable individuals will benefit from the protection of herd immunity.

## I have never had a bad dose of the flu, so why should I get vaccinated?

Perhaps you’ve never had a severe bout of the flu. Then you’ve been lucky.

* Even in otherwise healthy young people, the flu can cause severe illness. For example, the flu is often accompanied by symptoms like fever and fatigue, which will probably force you to stay in bed for a few days.
* Moreover, the flu weakens your immune system, making you susceptible to subsequent infections or potentially triggering chronic health issues. As a result, you may find yourself grappling with health issues for longer than you would like.
* The risk of long-term adverse effects from the flu jab is generally small, particularly for people who are young and healthy. Collectively, we protect vulnerable people (see Chapter 4) who cannot be vaccinated and who can become seriously ill or die from the flu.

## Why not prioritise vaccinating patients rather than healthcare professionals?

While it is generally advisable for patients to get vaccinations, regrettably, it is not always possible.

* Some vulnerable people (see Chapter 4) cannot be vaccinated, because vaccines can be harmful to them. Alternatively, the vaccine may work less well for them. In situations like this, vaccinating others (both patients and healthcare professionals) can help to protect these groups.
* Thus, in patients for whom it entails no major risks, vaccination is certainly important. As a healthcare professional, you can also help to make patients aware of the benefits and drawbacks of vaccination. You can use the information provided in this document and the source list for this purpose. This will enable patients to make well-informed decisions, based on accurate information, just as you do.

## Real adverse effects are kept under wraps. Vaccines are more harmful than we have been led to believe, right?

None of our reliable sources has ever indicated that adverse effects have been deliberately concealed.

* It is important to find out all the relevant facts for yourself. On the other hand, there is a lot of misinformation out there that unnecessarily fuels people’s concerns about vaccines. In creating this independent information document, we consulted as many sources as possible. This way, you can make an informed decision and effectively guide your patients in making their own choices. We found no evidence to suggest that any adverse effects have been concealed.
* Occasionally, people will inadvertently and unintentionally share false information. For those interested in researching sources other than those listed here, Chapter 9 offers valuable tips on how to identify misinformation and disinformation. This will enable you to make an informed choice (based on reliable information) about whether or not to get vaccinated.

# How do vaccines provide immunity?

Immunity can be acquired in one of two possible ways – by contracting the disease or by getting vaccinated. Vaccination can help patients to avoid the most severe effects of the disease. Vaccinated people are less likely to spread infections, thus preventing serious consequences for those around them.

## How does the immune system work?

Pathogens, such as bacteria, viruses, parasites, or fungi, have the potential to make people ill. The human immune system protects us against them by 1) recognising pathogens and 2) identifying them as foreign invaders. This involves the detection of antigens on the pathogen’s surface (Figure 1.1). When a pathogen enters the body, specialised white blood cells known as B cells respond by producing antibodies (also referred to as immunoglobulins). The unique structure of these molecules enables them to bind specifically to the antigens of the invading pathogen. When the body encounters a pathogen for the first time, it typically takes several days for antibody production to get started. When antibodies have been produced in sufficient numbers and have bound to the pathogen, the invader can be eliminated. Active immunity can be induced when the body responds to a pathogen, whether through vaccination or a natural immune response. Passive immunity can also be acquired through the introduction of antibodies from external sources, such as breast milk or donated blood.

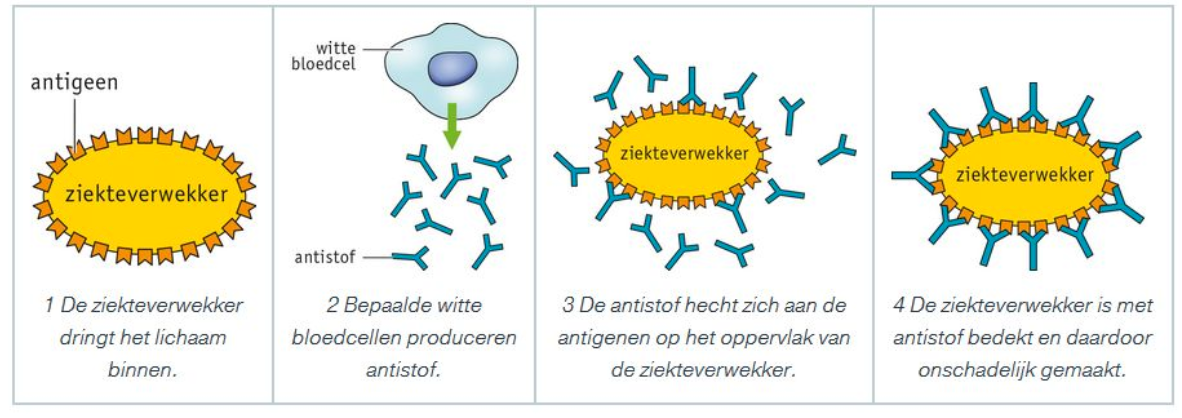


Figure 1.1. How the immune system works

a) the pathogen invades the body; b) specialised white blood cells (B cells), recognise the antigens on the pathogen and initiate antibody production; c) these antibodies bind to the antigens on the pathogen’s surface; d) as a result, the pathogen becomes coated with antibodies, and is thereby rendered harmless.

## What is natural immunity?

When the body first encounters a specific pathogen, the immune system needs time to generate an effective response. That takes a while, and in the meantime we get sick. Once it has produced enough antibodies or specialised cells, the body is able to combat the disease. If we become ill after infection, this can be attributed to two causes: 1) the disease or symptoms caused by the pathogen until it is eliminated and 2) mild symptoms due to the immune system’s response. Once sufficient antibodies have been produced and the pathogen has been eliminated, the threat diminishes. Over time, most antibodies break down, but specific white blood cells remain. These are the immune system’s “memory cells” (B cells). If that same pathogen invades the body again, these cells recognise its specific antigen. The memory cells can rapidly produce antibodies to combat the disease in its early stages. The body is then immune to this particular pathogen. This immunity offers long-term protection against the disease, lasting for months, years, and sometimes even a lifetime.

## Why do we need vaccines to develop immunity?

With certain pathogens, it can be dangerous to wait for the natural immune response to get started. As the immune system takes several days to respond, an infection can rapidly spread throughout the body, resulting in irreversible harm or even death. In infections like this, the pathogen always overpowers the immune system. It is appropriate to use vaccines in such cases. The vaccine does not have the ability to cause an infection, but its constituents are recognised by the immune system. The body responds by producing antibodies (and memory cells). The purpose of vaccination is to introduce antigens into the body while skipping the “getting sick” stage. There are various types of vaccines (Appendix 1). Drug and vaccine development is a complex process. A vaccine that works against one disease (e.g. tetanus) will not be effective against another (e.g. rubella). Vaccine development can involve a variety of techniques. The first vaccine that proves effective and passes the European Medicine Agency’s (EMA) rigorous checks for adverse effects will also be the first one to market. You can rest assured that any vaccine approved by the EMA is both safe and effective.

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| Ms de Vries:  I don’t get it, is natural immunity better than vaccine-induced immunity?  Yes and no;  **Yes**: It’s more effective  Natural immunity caused by disease typically arises from a single natural infection, whereas many doses are often needed for vaccine-induced immunity to develop.  **No**: A natural infection can make you really ill  Before you can develop natural immunity, you must go through the entire disease process (and recover). Vaccination, on the other hand, eliminates the need for this. The severity of a disease can vary greatly between individuals and virus types, ranging from pneumonia associated with influenza to fatal outcomes related to measles (see Appendix 1 for further details). |

# What is the impact of vaccination?

Vaccination reduces the prevalence of a disease in a population. As a result, there has been a sharp decline in health problems and mortality rates linked to various diseases in the Netherlands. Vaccination also helps prevent the development of antibiotic resistance in bacteria.

## Can a disease be eradicated by vaccination?

Thanks to the development of vaccines, numerous diseases have been successfully eradicated (or nearly so) from the face of the Earth. Smallpox, for example, has been completely eradicated and wild poliovirus is only found in a few Asian countries. Vaccination not only reduces the immediate mortality rate, it also lessens the long-term complications associated with these diseases. Vaccination has greatly reduced the occurrence of infectious diseases, resulting in fewer cases, hospitalisations, and deaths. Vaccination also plays a vital part in relieving the burden on healthcare systems. A variety of vaccines against numerous diseases are available in the Netherlands (see Appendix 2).

## Can vaccines have an impact in other areas?

The use of antibiotics in the modern world has led to a new challenge – antimicrobial resistance (AMR). This is where bacteria, for example, can mutate into resistant strains that are more difficult to treat. As antibiotic usage increases, so does the risk of AMR. Vaccination can help to reduce AMR in two ways:

1. Against viral infections

Some viral infections, such as influenza, make people more vulnerable to bacterial infections. Vaccination leads to fewer infections, reducing the need for antibiotics. Herd immunity amplifies this effect by extending the vaccinated population’s protective shield to cover the unvaccinated individuals in society.

1. Against bacterial infections

Bacterial infections are treated with antibiotics. Vaccination against bacterial infections reduces our dependence on antibiotics. If there are fewer cases of AMR, we can minimise the risk of these pathogens spreading and of new variants emerging.

# Which groups benefit the most from vaccination?

Certain vulnerable groups, such as infants, children, pregnant women, the elderly, individuals with chronic illnesses, and those with weakened immune systems, face an increased risk of contracting infectious diseases. That is why they are offered extra vaccinations.   
Compared to the general population, healthcare professionals are more likely to come into contact with pathogens like the flu. Healthcare professionals can also get vaccinated, as a way of protecting both themselves and individuals with weakened immune systems.

## Why do we have a vaccination programme for young children?

Newborns and young children run a greater risk of infection and the resultant adverse effects. The immune system “improves” with increased exposure to pathogens and the accumulation of memory cells. Children are less likely to have preexisting memory cells against a specific pathogen, thereby increasing their susceptibility to infection. Basically, it is actually good for children to encounter pathogens, as this will strengthen their immune system. In some cases, however, a disease carries unacceptable risks. Here, we opt for vaccination as a safer way to trigger an immune response in children. Childhood illnesses often involve much more severe symptoms (such as fever) and increased risks. For instance, the RS virus only causes minor nasal congestion in young adults (usually), but it can be life-threatening for infants.

## Why do premature babies get extra vaccinations?

Infection with a pathogen can have a severe impact on premature babies (and infants with a low birth weight). This is mainly because they have an immature immune system, and have not yet received sufficient antibodies from their mother. For this reason, premature babies are given an extra vaccination when they are 6-9 weeks old.

## Why are pregnant women offered a vaccination?

Due to their reduced resistance, pregnant women are at increased risk of infection and the associated adverse effects. However, the unborn child is at the greatest risk as its immune system is not yet fully developed, making it highly susceptible to infection. For this reason, it is recommended that pregnant women get a flu jab, for example. Pregnant women transfer antibodies against pathogens to their foetus, via the placenta. Once the mother has been vaccinated and starts producing antibodies, the foetus will also get them. As a result, the baby is protected for several months after birth, even though its own immune system is still limited. Flu jabs can only be given to infants that are more than six months of age.

## Why are diseases more dangerous for the elderly?

As individuals age, various functions including organ systems and the immune system tend to decline. Consequently, the elderly are not only more vulnerable to infections but the associated risks are also greater. As people get older, the production of “new” memory cells decreases, which hampers the development of natural immunity. When infected with COVID-19, young adults usually only have mild symptoms, similar to those of a common cold. However, the disease can be fatal in the elderly.

## Should patients with a chronic disease or immune disorder get a vaccination or not?

In patients with chronic conditions or an immune disorder, the immune system doesn’t work properly. That’s why vaccinations are so important in these cases, but they can be risky for individuals with weakened immune systems (especially when the vaccines contain live attenuated viruses). In addition, the risks may vary depending on the type of vaccine involved. For patients in this group, always consult their attending physician.

## Why do certain professions qualify individuals for vaccination?

Besides populations that are particularly vulnerable to infection or at risk of associated adverse effects, there are also groups of people who are at greater risk of infection, regardless of the state of their immune system. These are people with high-risk professions, who work in sectors where they come into contact with many more pathogens than the average person. This category includes healthcare workers and support workers who deal with a large number of patients, teachers who interact with many children, and professions that involve frequent contact with animals or animal remains. All of these groups have a higher risk of infection. Such infections are not serious or dangerous in all cases. Nevertheless, the affected individuals may have to take sick leave, thereby indirectly placing additional strain on others. In the case of healthcare workers, they can also pose an infection risk to their patients, who may be less resistant. Accordingly, it is important to implement any measures that effectively reduce infections in these professional groups. This ensures their own well-being and – in the case of healthcare professionals – it also safeguards the health of their patients. That is why the authorities urge people in high-risk professions to get vaccinated.

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| Mr Talhaoui:  I’ve got a runny nose, was my neighbour right to tell me not to visit someone who just had a baby?  Yes  In a healthy person, a runny nose can be caused by the influenza virus, the Coronavirus, the common cold virus, or RS virus (RSV). While the RS virus is usually harmless for adults, it can be very dangerous for newborns. It can cause serious respiratory infections. It’s the second biggest cause of death in babies, after malaria. At present (2023), self-testing is only recommended for COVID-19. Reliable self-tests for influenza and RSV may become available in the future. If you have a runny nose and aren’t sure if you have RS virus or another virus, it’s best to play it safe and not visit someone who has just had a baby. |

# Why is herd immunity so important?

Vaccines offer protection both to individuals and to the community as a whole. Some people who are highly susceptible to infection may not always be able to get vaccinated, as this poses an even greater risk to them. When everyone around them is vaccinated, these vulnerable and unvaccinated people are protected by something called “herd immunity”.

## What is herd immunity?

When enough people develop immunity to an infectious disease, this can provide partial protection to the entire population. We call this “herd immunity”.

## How does herd immunity work?

Because many people are immune, the disease doesn’t spread as easily between individuals in the community. This greatly reduces your personal risk of infection. Thus, vaccinated people protect those who are not vaccinated, who cannot be vaccinated, or for whom the vaccine is less effective. These include newborns, adults with specific chronic diseases, or individuals with weakened immune systems.

## How does herd immunity affect the pathogen?

As pathogens multiply, the likelihood of a new variant emerging increases. This may reduce the effectiveness of existing vaccines. When a lot of people are immune, it makes it harder for pathogens to spread and multiply, making mutations less likely. As a result, herd immunity helps to prolong the effectiveness of vaccines. What’s more, it reduces the risk of a more dangerous variant emerging.

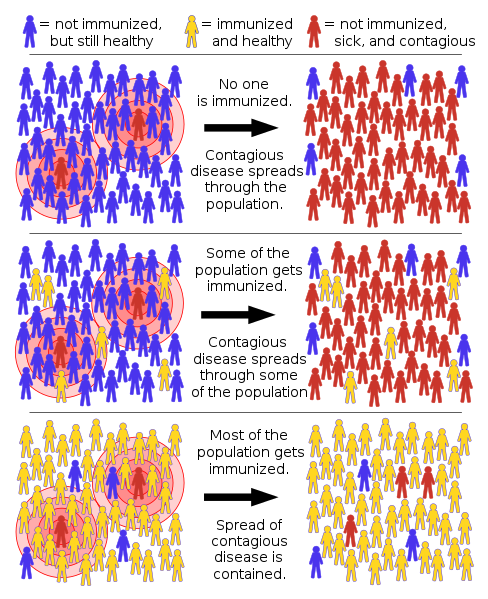


Figure 4.1. Herd immunity

As more people in a group get vaccinated, the risk of any given individual contracting an infectious disease decreases. So, by vaccinating as many people as possible, we can rely on herd immunity to protect vulnerable groups from getting infected, even if they can’t get vaccinated or have incomplete vaccine protection.

## What if we can’t achieve herd immunity?

So we need to vaccinate healthy individuals to safeguard vulnerable people in our society. The number of people needed to achieve herd immunity (i.e. those who get vaccinated or those who have recovered from an infection) depends on the infectiousness of the disease. Vaccine scepticism may cause a large part of the population to refuse to get vaccinated against diseases such as measles, thus posing a threat to herd immunity. This can lead to the resurgence of an infectious disease. Moreover, it can put vulnerable groups at risk. Therefore, it’s vital for everyone to make an informed choice based on accurate information (Chapter 8).

# What’s the difference between COVID-19 and influenza?

As a result of the COVID-19 pandemic, people are now less well protected against other infectious diseases. Strict measures to control the spread of the coronavirus have greatly reduced our exposure to other viruses (such as the influenza virus). This reduced exposure may have negatively impacted our immunity.

## What are we doing to combat influenza (flu)?

Each year, seasonal influenza (flu) is responsible for 290,000 to 650,000 deaths across the world. This disease is caused by the influenza virus. The severity of influenza varies, depending on the circulating virus strain and the effectiveness of the annual vaccine. The Global Influenza Surveillance and Response System (GISRS, WHO) collects and analyses 15,000-40,000 influenza samples from around the world each year, to track the emergence of different virus variants. These samples are analysed to identify the circulating forms of influenza and predict which of them might cause seasonal influenza. The influenza vaccine for that year will be a mix designed to combat four of these ‘high potential’ strains. The WHO and the vaccination industry collaborate closely to tweak the influenza vaccinations each year, ensuring optimal protection against potentially harmful influenza infections.

## What have we done to combat COVID-19?

COVID-19 is caused by a different virus than influenza. It is caused by a corona virus. This is the same type of virus that caused the SARS-Cov-1 and MERS epidemics. A lot of things have changed as a result of the COVID-19 pandemic. We've discovered that vaccines can be developed surprisingly quickly when there’s an urgent demand for them. In the Netherlands, we’ve achieved a certain degree of herd immunity through a combination of vaccination-induced immunity and natural immunity. Before vaccines became available, measures were implemented to minimise the transmission of COVID-19, to avoid healthcare systems being overwhelmed by the impact of this virus. As more people got vaccinated, the pressure on healthcare decreased, leading to a gradual relaxation of these measures.

## Why was there almost no flu during the COVID-19 pandemic?

The stringent measures implemented at the beginning of the COVID-19 pandemic (including lockdowns, mask-wearing, increased hygiene, and social distancing) prevented the spread of other infectious pathogens like influenza. For instance, in the 2020/2021 season, the circulation of influenza (expressed as a percentage) was lower than at any time in the past 100 years. While this may seem like a positive outcome, it does pose two major risks. Firstly, it makes the task of determining the composition of the annually modified influenza vaccine much more challenging. Secondly, our resistance to the flu may be compromised. Because there was less influenza going around, fewer than 1000 influenza samples were collected. This makes it more challenging to predict which variant might trigger the next outbreak, in order to identify the appropriate vaccine target. Moreover, as fewer people catch influenza, memory cells to combat the latest variants are no longer being produced. This weakens our immunity, which can lead to a more aggressive resurgence of the infection. This is also true, although to a lesser extent, of other infectious disease pathogens such as norovirus, RS virus (RSV), and pneumococci.

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| Mr Aslan:  How did they manage to develop the COVID-19 vaccine so quickly?  Necessity  Global vaccine demand skyrocketed as the entire world frantically searched for a way to get back to business as usual, as quickly as possible. Funds were readily available, prompting thousands of researchers to spring into action, while companies explored various types of vaccines. This enabled scientists to accelerate their existing projects on vaccines for diseases like MERS and SARS-CoV-1, and to launch new research projects. Thanks to this extraordinary combination of circumstances, driven by necessity, researchers were able to develop vaccines at an astonishingly rapid pace (see also [frequently asked questions](https://influenzastichting.nl/vragen-en-antwoorden/)) |

# Which vaccines are available in the Netherlands?

To ensure widespread access to vaccines, the Netherlands has established the National Immunisation Programme for children. This protects them against the most serious infectious diseases. Because large numbers of children are being vaccinated, this often leads to the development of herd immunity.

## What vaccines are included in the National Immunisation Programme?

The government of the Netherlands provides free vaccinations for children up to the age of 18, through the National Immunisation Programme (NIP). This helps to maintain herd immunity against a range of serious diseases (Figure 7.1). The Minister of Health decides which vaccines are to be included in this programme. The programme currently (2023) includes vaccinations against twelve infectious diseases. Where possible, a combination of vaccines is administered.

The whooping cough vaccine is given to pregnant women (at 22 weeks), while the other vaccinations are administered to infants at around 2 or 3 months of age, in line with an advisory schedule. The final vaccination is typically given at the age of 14. In 2022 and 2023, special catch-up programmes were launched to provide the HPV (Human Papillomavirus) vaccination to men and women up to the age of 26.

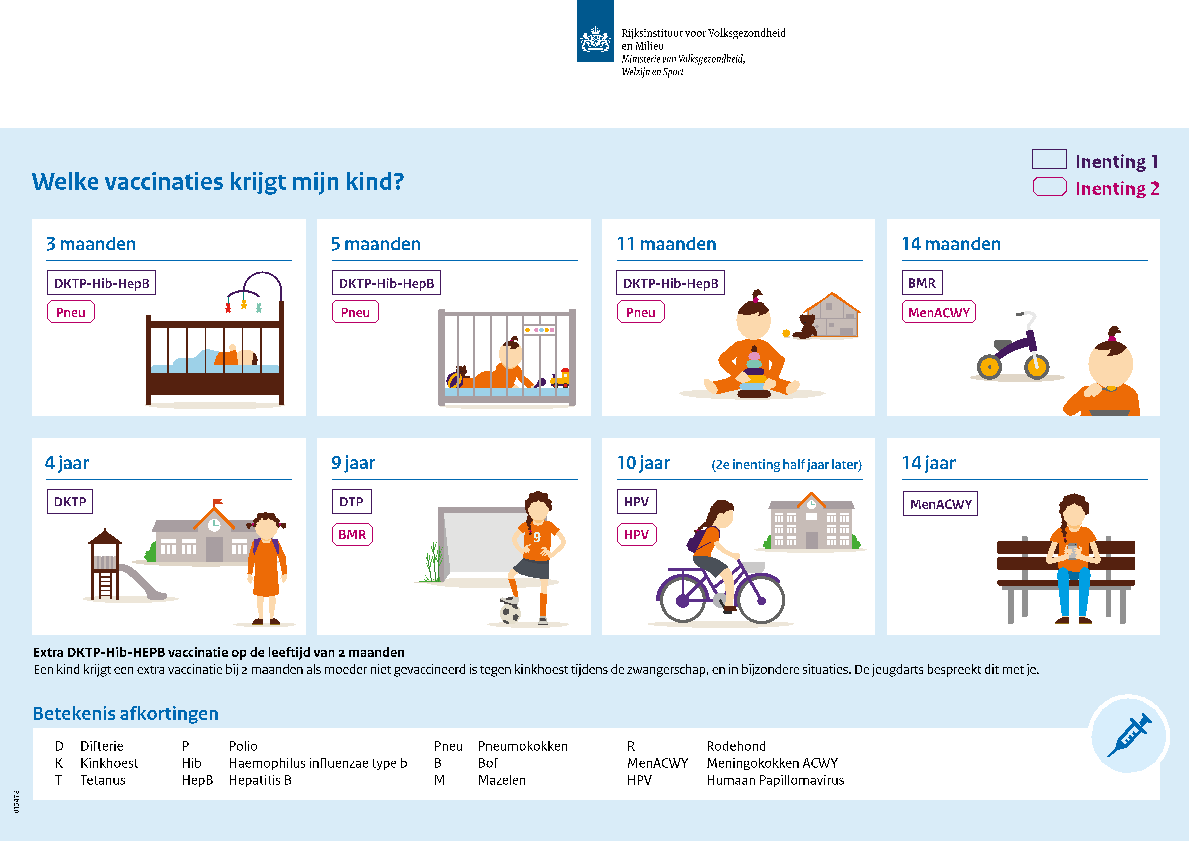
## Which vaccines could be added to the NIP in the future?

6.2.1. Rotavirus

In 2022, the health authorities decided that the rotavirus vaccine should be included in the National Immunisation Programme. This vaccination will probably be added in 2024. Rotavirus causes inflammation of the stomach and bowel, and can produce severe stomach flu symptoms in young infants.

6.2.2. RS virus

In 2023, a vaccine targeting the RS virus (Respiratory Syncytial Virus) was released to the market. The Ministry of Health, Welfare and Sport has asked the Health Council of the Netherlands for advice on whether this vaccine should be included in the National Immunisation Programme. Given that RSV is the second leading cause of infant mortality, after malaria, it’s highly likely that this vaccine will be included in the National Immunisation Programme in the near future.



**Figure 7.1. Vaccination schedule in the Netherlands.** An overview of the vaccination schedule for children born to mothers who received a 22-week vaccination. To streamline the process and reduce the number of injections and appointments, vaccinations are combined whenever possible. For further details, see the [National Immunisation Programme](https://rijksvaccinatieprogramma.nl/vaccinaties/vaccinatieschema).

## Which vaccines are available outside the NIP?

Extra vaccinations are available outside the National Immunisation Programme. The government provides certain vaccinations free of charge, while others are available for a fee.

## Which vaccinations are funded by the government?

The government covers the cost of vaccinations such as the flu jab and coronavirus vaccination. Every year, vulnerable groups receive an invitation to get a free flu jab. Due to their greater risk of severe flu-related effects, people in this particular group are vaccinated free of charge. This vaccination is also available to other Dutch citizens, but they have to pay for it. When COVID-19 vaccinations became available, the government launched a programme to provide these vaccines (including booster shots) to the entire population, free of charge. Such programmes typically prioritise at-risk groups (such as the elderly and chronically ill), ensuring their vaccination is given precedence.

## For which vaccinations is payment required?

Payment is required for some vaccinations that are not covered by the National Immunisation Programme. These can be categorised into vaccinations for children, adults, and travellers. For example, children can be vaccinated against group B meningococci, the flu, and chickenpox (see Appendix 1). Adults can get vaccinations against shingles, flu, and various other conditions, but they have to pay for them. Extra vaccinations are available to anyone planning a journey (particularly outside Europe). These vaccinations often target diseases that are not (or no longer) prevalent in the Netherlands. Certain travel vaccinations, such as those for yellow fever, are compulsory. For others, such as DTP, a booster shot is recommended.

## Should patients in medically at-risk groups be vaccinated or not?

Patients with chronic inflammatory diseases (rheumatoid arthritis, systemic lupus erythematosus, Crohn’s disease, ulcerative colitis, or psoriasis) are sometimes treated with immunosuppressants. This can cause them to develop an immune disorder that makes them more susceptible to infections and associated complications. Furthermore, congenital immune deficiencies, HIV infection, chemotherapy, or medication following an organ or stem cell transplant can compromise the immune system. This weakened immune system leads to a diminished response to vaccination, so the vaccine will be less effective than in people with a healthy immune system. However, the risks of infection are so high that vaccination, even if it is less effective, is still recommended. In certain cases, increasing the frequency of vaccinations can make them more effective. Health insurers do not cover the cost of all vaccinations for medically at-risk groups.

## Why do people in some professions have to get vaccinated?

Certain professions may involve a greater risk of getting specific infectious diseases. In cases like this, vaccination can offer protection. High-risk professions can be categorised into two groups: those where individuals come into contact with germs in the course of their work, and/or those where they interact with vulnerable groups. Certain professions, such as those involving close contact with animals, waste, or children, significantly increase people’s risk of being exposed to a wide range of pathogens. Extra vaccinations may be recommended in these cases. In healthcare professions there is a greater risk of infection, as well as increased exposure to vulnerable groups, which underscores the importance of vaccinations in these occupations.

# To what extent does my role involve reporting adverse effects?

Vaccines are extensively researched, to ensure their safety and effectiveness. This research effort, including the monitoring of adverse effects, continues even after the vaccine has been released to the market. Healthcare professionals can play a key part in monitoring vaccines and reporting any adverse effects.

## How can I be sure that a vaccine that has been released to the market is really safe?

Before they can be released to the market, medicines and vaccines in the Netherlands must first be approved by the European Medicines Agency (EMA). This involves rigorous clinical studies to demonstrate the product’s effectiveness and to assess the risk-to-benefit ratio for common adverse effects. The EMA committee responsible for ensuring the safety of medications consists of experts in medicines safety, scientific experts, patient representatives and healthcare professionals (including specialist nurses).

## Why do previously unknown adverse effects come to light after the vaccine has been released to the market?

Although vaccines undergo extensive testing, there is always a possibility that unforeseen adverse effects will emerge after they are released to the market. The limited size of test groups often makes it difficult to detect rare side effects, as they generate too little data for proper identification. Hence, effects of this kind can only be identified once the vaccine has been administered on a large scale, i.e. after it has been released to the market. Once a vaccine is available on the market and is being routinely administered, a variety of factors can trigger adverse events. This does not necessarily mean that every adverse event is an adverse effect of the vaccination. By diligently reporting, analysing, and investigating all adverse events, it is possible to uncover and identify serious adverse effects.

## To what extent does my role as a healthcare professional involve adverse effects?

There are two ways in which healthcare professionals can contribute to research into adverse effects:

1. Trying to avoid unnecessary events

Healthcare professionals can help patients to manage their immunisation anxiety, while also being mindful of their background and discussing any potential risks.

1. Reporting adverse events

When you are attempting to identify adverse effects, it is important to gather as much data as possible. For this reason, it is very helpful if healthcare professionals report adverse events. However, healthcare professionals are unable to determine whether any given adverse effect is caused by a specific vaccination. We can also encourage people who have been vaccinated to personally report any adverse effects they may experience.

## To whom should I or my patient report an adverse effect?

The Netherlands Pharmacovigilance Centre Lareb manages the reporting of adverse effects in the Netherlands. Lareb serves as both a knowledge centre and notification institution for the adverse effects of medications. Reports of adverse events are analysed and, if required, are subject to further investigations to expand and update knowledge about adverse reactions to medications/vaccines as much as possible.

The Netherlands Pharmacovigilance Centre Lareb website is a valuable source of information about the adverse effects of vaccines and medications. One of Lareb’s key roles is to collect data on adverse events, including reports from healthcare professionals regarding [vaccinations](https://meldformulier.lareb.nl/Forms/Vaccins) and [medications](https://meldformulier.lareb.nl/Forms/reportform).

# How should I handle vaccine scepticism?

If they are to make an informed choice about vaccination, it is essential for people to have access to reliable information. It can be quite difficult to tell the difference between reliable and less reliable information. This often leads to confusion and scepticism about vaccinations. Healthcare professionals can help to narrow the communication gap between the scientific community and the general public.

## Why is there so much controversy about vaccination?

Thanks to the internet and social media, it is now very easy to access a vast amount of information with just a single click of the mouse. At the same time, however, sharing information (regardless of its accuracy) can easily blur the line between fact and fiction. Science guides our understanding of vaccination’s effects and potential risks. However, there is a huge communication gap between the scientific community and the general public. We must work to bridge that gap and ensure that, if nothing else, accurate information reaches the general public. Healthcare professionals can help to narrow that communication gap.

To this end, it is helpful if healthcare professionals:

1. Stay well-informed about pathogens, vaccines, and vaccination;
2. Possess effective communication skills (that they can use to engage with patients and the general public);
3. Are proficient at administering vaccines (if this is part of their job description)

Support is available for healthcare professionals in this regard. That could involve training courses/workshops and information documents like this one.

## How can I effectively communicate and share the right knowledge?

Healthcare professionals need to be able to tell the difference between reliable and unreliable sources. While anyone can share information, it is important to understand that not all of this will be accurate. This can include misleading information (where certain details are left out, leading to a different conclusion) or information that is simply incorrect. The intentional sharing of misleading or false information is described as ‘disinformation’. When this is done unintentionally, it is described as ‘misinformation’. For example, someone may share false information in the mistaken belief that it is accurate, or they may have misinterpreted information causing them to misrepresent it to others. To verify the accuracy of certain information, healthcare professionals need to investigate its source. Does the information you are reading match the content used by the referenced source? Also, it is important to consider the author’s credibility and reliability. In the Netherlands, there is a central government [checklist](https://www.rijksoverheid.nl/onderwerpen/desinformatie-nepnieuws/checklist-tips-tegen-nepnieuws-desinformatie) to help you assess the reliability of information. As nurses, you can use this knowledge to share reliable information with patients in your own way, and in your own words.

## How can and should I respond to vaccine scepticism?

People may have many different reasons for being sceptical about vaccines (such as personal beliefs or lack of trust, etc.). Patients who are hesitant about vaccines can display a spectrum of behaviours, ranging from asking questions to an outright refusal to be vaccinated. The input needed from healthcare professionals (where this is possible) and their potential impact can differ, based on where their patients fall on the spectrum.

To support your patients in making informed choices based on accurate background information, as a healthcare professional it is important to:

1. Find out why someone is hesitant:

By asking questions and attentively listening to people’s answers, you can come to understand why they are hesitant, while learning a great deal about their readiness to accept your input.

1. To find out how well **informed** this person is:

Do they proactively seek information, do they know where to find credible information, and do they use reliable sources?

1. Consider the available options and your personal goals:

You can always answer questions, provide additional information, and share a list of resources, but that could also impact your relationship with the patient. Make your own judgement about the potential impact, the effort required, and whether it’s worth it.

# The choice is up to you

This document provides you with objective information about vaccination. You will find further information and details of the sources used in this document in the upcoming chapter. There is also a list of [frequently asked questions and answers](https://influenzastichting.nl/vragen-en-antwoorden/) at the Dutch Influenza Foundation’s website.

Ultimately, the decision on whether to vaccinate or not is up to you.

Use the following questions as a guide, to help you make this decision.

If you’d like to assist us in improving this document, you can answer the questions anonymously [online](https://forms.gle/mnR227zfgLpgWokTA).

1. **About this document**  
   Did reading this document give you any fresh insights about vaccination?
2. **About your work**

What personally inspires and motivates you to do this work?

1. **About your choice**

List three personal reasons for deciding either to accept or refuse a specific vaccination.

Do you have any questions or topics you would like to discuss with us in relation to this document? If so, send [us](mailto:info@influenzastichting.nl) an email!

# Reference and sources

Websites

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* WHO Vaccine Safety report

# Acknowledgments

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# Appendix 1. What types of vaccines are there?

## Vaccines containing live attenuated viruses

Attenuated vaccines contain live but greatly weakened pathogens. Although these weakened pathogens are no longer capable of causing severe illness, they can still produce a mild infection when administered. This mild infection triggers a robust immune response, leading to the development of immunity.

## Inactivated vaccines

Like attenuated vaccines, inactivated vaccines contain the pathogen in a particular state. In this case, the pathogen is treated in order to “inactivate” (kill) it. An inactivated vaccine retains components of the pathogen which have been rendered inactive, so they are unable to cause disease in the body. Since components of the virus are still present, these inactive pathogens are suitable for use as vaccines.

## Protein vaccines

Protein vaccines do not contain any components of pathogens. In the laboratory, the pathogen’s antigens (proteins or sugar molecules) are isolated or replicated, and subsequently administered via vaccination. These antigens are recognised by the body, triggering an immune response that generates antibodies.

## mRNA vaccines

Instead of administering the antigens directly, we can just administer their “protein code” (mRNA) via vaccination. This protein code is then read by the body and the body itself produces the antigens. The immune system then produces antibodies, thus providing immunity.

## DNA vaccines

A DNA vaccine does not contain the protein code for antigens (mRNA). Instead, it contains the genetic instructions (in the form of DNA) for producing that code. Once the DNA vaccine has been administered, the human body uses the DNA code to generate mRNA (protein code) for antigens, which is subsequently used to produce the antigens themselves. From that point on, it works in the same way as an mRNA vaccine.

## Vector vaccines

A vector vaccine also contains a DNA code, but this code is inserted into a harmless virus. The advantage of this approach is that this virus can replicate in the body without causing disease. In theory, this means that you need less DNA to produce the same amount of antibodies. In other respects, a viral vaccine works in much the same way as a DNA vaccine.

# Appendix 2. For which diseases have vaccines been developed?

|  |  |  |
| --- | --- | --- |
| Disease | Description | In NIP |
| Diphtheria | Diphtheria is a highly infectious disease caused by the bacterium *Corynebacterium diphtheriae*. The bacteria can be transmitted by coughing or touch. You can also contract the disease through contact with infected animals (including pets), or by consuming unpasteurised milk or contaminated food. Symptoms usually appear within two to five days after infection. The bacterium often causes tissue damage to the skin or lungs, for example. In the Netherlands, many children died of diphtheria before a vaccination against this disease became available. | Yes |
| Tetanus | Tetanus, also known as lockjaw, is caused by the bacterium *Clostridium tetani*. The bacterium can be found in street litter, for example. If it enters an open wound (even a small one), it can cause a person to contract a tetanus infection. Children have been routinely vaccinated against tetanus since 1954. If more than ten years have passed since their first vaccination, anyone sustaining deep cuts or lacerations is often given a booster vaccination. | Yes |
| Whooping cough | Whooping cough is a disease caused by the bacterium *Bordetella pertusis*. People can infect each other by coughing. Whooping cough is especially dangerous for young babies. They can become very distressed and exhausted. Almost every year, one or two babies die of whooping cough in the Netherlands. | Yes |
| Polio | Poliomyelitis is also known as infantile paralysis. Polio is caused by one of three types of poliovirus. The virus is transmitted from person to person through various routes, including contaminated food, contaminated faeces, contaminated water, or tiny airborne droplets. The infection can lead to paralysis. Before the introduction of vaccination in 1957, polio was widespread and people often died from this disease. The most recent polio epidemic (among unvaccinated individuals) occurred in 1992/1993. | Yes |
| Hib | Hib (short for *Haemophilus influenzae* type b) is a bacterium that can be found in almost everyone’s nasal cavity from time to time. This bacterium does not usually pose a threat nor does it cause illness. At worst, infected individuals may have a runny nose or a throat, ear, or sinus infection. In young children, the infection can be serious and cause epiglottitis, meningitis, or severe pneumonia. The Hib vaccine has been included in the National Immunisation Programme since 1993. Children receive three doses of Hib vaccine before their first birthday. | Yes |
| Hepatitis B | Hepatitis B is an inflammation of the liver caused by infection with the hepatitis B virus. Transmission can occur from mother to child during birth, through sexual contact, or via contact with contaminated blood. Children who contract hepatitis B are particularly at risk of becoming chronic carriers of the virus. Children receive three doses of hepatitis B vaccine before their first birthday. | Yes |
| Mumps | Mumps is caused by an airborne virus that is transmitted from person to person by coughing and sneezing. The disease causes inflammation of the salivary gland near the ear. Prior to the introduction of the mumps vaccination, approximately 96% of people contracted the disease. Meningitis and deafness were common complications associated with mumps at that time. | Yes |
| Measles | Measles is caused by a highly infectious airborne virus that is transmitted from person to person by coughing and sneezing. You can become infected just by passing an infected person in the supermarket. You can contract measles if you haven’t had the disease before or haven’t been vaccinated against it. Although rare, it’s still possible for someone who has been vaccinated to get measles, but the symptoms are usually less severe. | Yes |
| Rubella | Rubella, which is caused by the rubella virus, is a highly infectious disease. The virus is transmitted by coughing and sneezing. It doesn’t usually make you very ill. However, it does pose a significant risk to pregnant women as it can lead to miscarriage or to serious birth defects in their unborn child. | Yes |
| Meningococci  A/B/C/W/Y | Meningococcal disease is caused by the bacterium *Neisseria meningitidis*. There are several types of this bacterium, the best known of which are types A, B, C, W, and Y. The bacteria are usually found in the upper part of the throat (nasopharynx), but they do not make you ill. However, you can still infect someone else. The bacterium is transmitted from person to person through the air, by coughing, sneezing, or kissing. | Yes |
| Pneumococci | Pneumococcal disease is also caused by bacteria. There are many different types of pneumococci. Many people carry pneumococci without getting sick. You can infect others by coughing, sneezing, or kissing, even if you are not sick yourself. Pneumococci can give rise to conditions such as middle ear infections, sinusitis, and bronchitis. Moreover, they can cause severe pneumonia, meningitis, or bloodstream infections. These severe forms can be fatal. | Yes |
| Human Papillomavirus (HPV) | An infection may go unnoticed initially, but – in the short term – it can lead to the development of genital warts or cancer. Prolonged infection can trigger any of six different types of HPV-related cancer: cervical cancer, cancer of the mouth and throat, of the vagina, of the labia, of the anus, and of the penis. | Yes |
| Typhoid | Typhoid fever, which is caused by a salmonella bacterium, is an infectious disease that primarily affects the bowel. This bacterium is found in the faeces of sick patients or people who carry the bacterium. The illness typically begins with a fever that gradually increases, loss of appetite, headache, malaise, and vague abdominal pain. Treatment is usually required. In children under two years of age, the infection is often remarkably mild. | No |
| Yellow fever | Yellow fever is a tropical disease caused by the yellow fever virus, which is transmitted by tropical mosquitoes. The yellow fever mosquito is always responsible for outbreaks of this disease. Yellow fever is only found in certain tropical regions of Africa and South America. The Netherlands is not at risk of a yellow fever outbreak since the yellow fever mosquito dose not occur in this country. | No |
| Rabies (Hydrophobia) | Rabies, also known as hydrophobia, is a deadly infection caused by a virus. People can get rabies if they are bitten, scratched, or licked by an infected animal. An infection can result in symptoms affecting the nervous system. In the Netherlands, cases of this disease are extremely rare, and usually involve patients who contracted the virus outside the country. | No |
| Japanese encephalitis | Japanese encephalitis is a viral infection that can sometimes cause inflammation of the brain, which can be fatal. You can get the virus if you are bitten by a specific species of mosquito (of the genus *Culex*). Only a very small fraction (1 in 250) of those who are infected with the virus actually get ill. Most people either experience mild flu-like symptoms (such as fever, muscle pain, and headache) or have no symptoms at all. In severe cases, inflammation of the brain (or meningitis) can occur, accompanied by symptoms such as headache, vomiting, drowsiness, coma and epileptic seizures. Fatalities sometimes occur, although this is quite rare. | No |
| Tuberculosis (TB) | Tuberculosis (TB) is an infectious disease caused by a bacterium called *Mycobacterium tuberculosis*, which causes inflammation in the body. Approximately a quarter of the world’s population is infected with TB, but fortunately not everyone gets sick. In the Netherlands, approximately 800 people are diagnosed with tuberculosis (TB) each year. This can take the form of pulmonary tuberculosis or tuberculosis elsewhere in the body. | No |
| Tick-borne encephalitis | Tick-borne encephalitis is an inflammation of the brain (or meningitis) caused by the tick-borne encephalitis virus (TBE virus). Infected ticks transmit the virus from one animal to another, and occasionally to people. In 2016, scientists discovered that ticks in certain areas of the Netherlands can carry the TBE virus. However, in this country, the likelihood of infection from a tick bite is very low since only a small proportion of ticks carry the TBE virus. In Eastern Europe, the disease is much more prevalent. | No |
| Chickenpox | Chickenpox is caused by the varicella zoster virus. Typically, there is a delay of 13-18 days between infection and the onset of symptoms. Once someone has recovered from chickenpox, the virus remains in their body in a dormant state. If the virus becomes active again later in life (reactivation), it can lead to the development of shingles. | No |
| Anthrax | Anthrax or splenic fever is caused by the anthrax bacterium *Bacillus anthracis*. Fortunately, anthrax no longer occurs in the Netherlands. However, it remains common in many parts of Africa, primarily due to inadequate and often costly animal health programmes. People who are in the habit of eating dead animals that they happen to find are at great risk of contracting the disease. | No |
| Cholera | Cholera is an infectious disease. It is an intestinal inflammation caused by the cholera bacterium. The first symptoms of cholera are sudden vomiting and copious watery diarrhoea. This diarrhoea is often called ‘rice water’, due to its pale yellow-green appearance, the presence of flakes, and its minimal odour. The profuse watery diarrhoea quickly leads to dehydration. In healthy travellers, the disease is usually mild and clears up by itself. | No |
| COVID-19 | COVID-19 is a disease caused by the coronavirus SARS (severe acute respiratory syndrome)-CoV(coronavirus)-2, which initially produces symptoms similar to a common cold. The course of the disease differs from person to person, with some having mild symptoms or none at all, while others may face severe outcomes, including death. Even young and healthy individuals can experience long-lasting symptoms (known as ‘long COVID’), resulting in a partial or complete incapacity to work. | No |
| Influenza | The influenza virus also spreads through the air. It can be transmitted just by talking, even at distances of up to two metres. So this virus is highly infectious. The influenza virus causes the flu, which is characterised by inflammation of the respiratory tract and symptoms such as coughing and fever. Generally, most people recover without the need for medication. People with underlying conditions (see Chapter 4) face an increased (or even greatly increased) risk of developing severe complications if they contract an influenza infection. Many will require hospitalisation and some may even die. In Europe, flu causes the deaths of 15,000 to 70,000 people each year (with an average of 4,700 deaths occurring in the Netherlands). The problem with the influenza virus is that it mutates so very quickly. Due to these continuous changes, a new vaccine must be developed every year. | No |
| Shingles | Shingles is a delayed outcome of chickenpox. It occurs when the virus reactivates, long after the initial infection, causing shingles rather than chickenpox. Shingles can cause itching, pain, and fever, as well as spots or blisters on one side of the body. The symptoms typically fade away on their own, but the post-herpetic pain can be severe and long-lasting. | No |
| Rotavirus | A rotavirus infection is an infectious disease in which the stomach and intestines become inflamed. The symptoms are fever, nausea, vomiting and copious watery diarrhoea. Rotavirus infections are common in the Netherlands, especially among young children between six months and two years of age. | No |
| Ebola | Ebola, a rare but severe infectious disease predominantly found in Africa, is often associated with internal bleeding. Officially known as Ebola haemorrhagic fever, it is caused by the Ebola virus. Other viruses that can cause haemorrhagic fever include the Marburg virus and the Lassa virus. | No |
| Leptospirosis | Leptospirosis, a disease caused by Leptospira (bacteria), is the collective name for several syndromes. Different strains of Leptospira bacteria exist, each associated with its own specific host. Mice and rats, in particular, are well-known reservoirs of Leptospira, which can cause mud fever and Weil’s disease in humans. Cattle can also carry Leptospira (which causes dairy farm fever in humans). | No |
| Dengue | Dengue, also known as breakbone fever, is an infectious disease caused by a virus. The virus occurs in tropical and subtropical regions, and is transmitted by mosquitoes. Dengue is common among people who have visited countries where the disease is prevalent. | No |