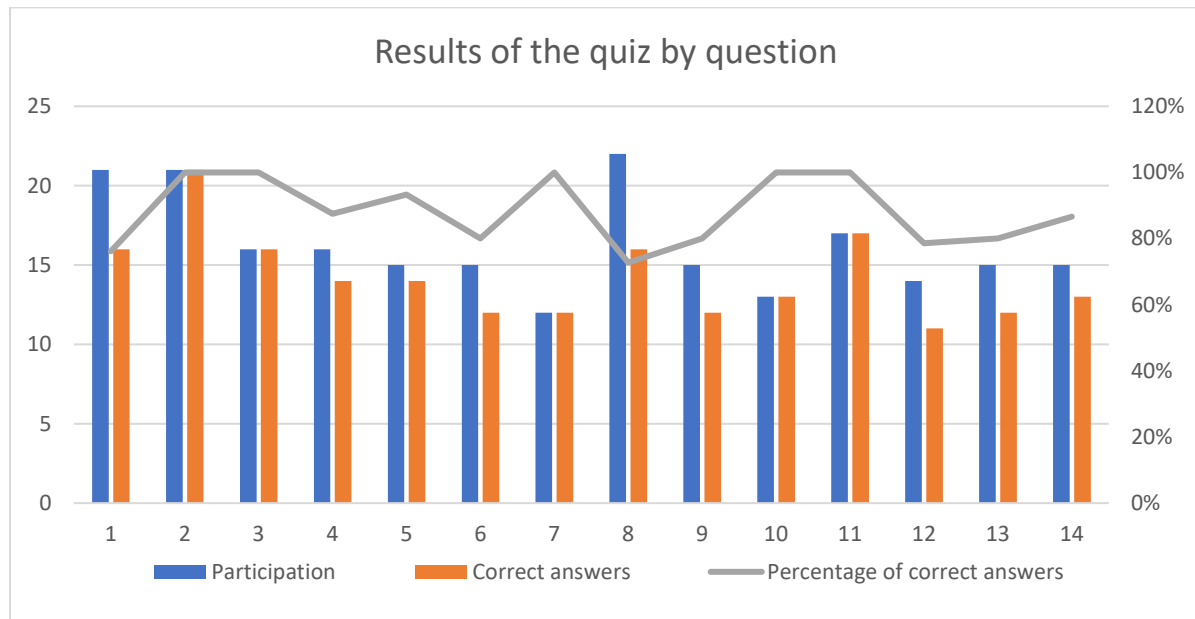


# Questions, answers, explanations and evaluation of the Vaccination quiz by DIFAEM

You can read the entire quiz again here and see how you participated. Here are all the quiz questions listed again, with answers and explanations included the respective participation and percentage of correct answers. In the following graphic you can see all questions divided into participation, correct answers and percentage of correct answers.

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<b>Vaccination Quiz: 1</b>
<b>What is passive immunization ?</b>
<b>Antibodies against a certain disease are given directly.</b>
Dead particles of a certain germ are injected.
A living infectious agent is injected.
In passive immunization antibodies against a disease are given directly. In a natural way, this happens during pregnancy and breastfeeding when the mother passes on different types of antibodies to the baby via the placenta and later via colostrum and breastmilk. We give artificially gained and processed antibodies, immune globulin or antiserum, against an agent to help the patient's immune system to fight a confirmed or suspected infection immediately. We inject, for example, immune globulin immediately around the wound of somebody who was bitten by a dog suspected to carry the rabies virus. This saves time: The foreign antibodies can start eliminating the virus while the body is producing its own antibodies after vaccination. Antibodies can also be called an antiserum, which is given in the case of a snakebite. Therefore, a passive immunization is less a vaccination but rather a post exposure prophylaxis or treatment. Nevertheless, it also uses components of the immune system, the antibodies. The only difference is that antibodies do not come from the patient him- or herself, but are refined or artificial products given as injections. The patient's body plays a passive role. It receives the antibodies and does not have to produce them.
Participants: 21
Percentage of correct answers: 76%

## **Vaccination Quiz: 2**

**What is active immunization?**

The patients have to actively administer the injection themselves.

**A vaccine is injected that triggers the immune response.**

Vaccination campaigns are also called "active immunization".

In active immunization or vaccination, a person's immune system becomes the major actor. We can subdivide active immunization into vaccination with dead or living vaccines. A dead vaccine can consist of different antigens like weakened or slightly changed particles of a germ or the complete dead germ. An example for a dead virus vaccine is the tetanus vaccine. In mRNA and vector based vaccines this is done in a more modern and sophisticated way by initiating the construction of the antigen in the body cells of the vaccinated person. A living vaccine consists of a living infectious agent. Sometimes this living germ causes the infection but it is weakened by technical procedures, so that the infection will be very mild. Our immune system develops antibodies against these infections.

Participants: 21

Percentage of correct answers: 100%

## **Vaccination Quiz: 3**

**Why are some vaccines administered in early childhood?**

**The immune system of a new-born is still immature and the baby is more likely to attract diseases.**

Because small children only need a small dose and that is more economical.

Older children oppose vaccine shots more than young children.

Young children are prone to contract a great variety of diseases which may lead to disability or death. Newborns and infants have not yet had a chance to develop immunity after contact with different potential disease agents. Their immune system still has to grow and to learn. The WHO recommends immunizations in childhood against the 12 diseases tuberculosis, diphtheria, pertussis, tetanus, polio, hepatitis B, haemophilus influenzae type B, pneumococcus, rotavirus, measles, rubella and the human papilloma virus HPV. Only the HPV vaccine is given to older children before the onset of sexual activity. All other vaccines are administered within the first weeks and months after birth. An early immunization against measles and rubella provides life-long immunity; against tetanus, diphtheria, polio and pertussis immunity lasts for at least five to ten years. This carries the young children over the period of greatest vulnerability and protects from dangerous outbreaks in the community.

Participants: 16

Percentage of correct answers: 100%

## **Vaccination Quiz: 4**

**Is it important to vaccinate pregnant women against certain diseases?**

**Yes, certain vaccinations protect the mother and also the newborn against diseases.**

No, because no vaccine can pass the placenta barrier.

No, because it weakens the mother and the foetus and may cause abortion.

It is very important to vaccinate pregnant women against certain diseases. During pregnancy, the pregnant woman's body reduces the activity of its immune system. This is necessary because she would otherwise reject the foetus which consists genetically to one half of the father's cells which are foreign to the woman's body. As a result, she is more vulnerable to contract infections. This vulnerability can be reduced by vaccination. However, full vaccination of a pregnant woman not only reduces her own risk, it also reduces neonatal and young infant morbidity and mortality. Apart from preventing maternal infections, vaccination has a cocooning effect that can potentially protect the foetus. In addition, the mother passes on the antibodies that she has developed due to vaccination through the placenta and during breastfeeding to the baby before and after birth.

As neonates have an immature immune system, they receive thus nest protection from their mothers in the first months of life.

Participants: 16

Percentage of correct answers: 88%

### ***Vaccination Quiz: 5***

**Is it good if we try to achieve herd immunity against various diseases?**

No, because this would mean that the medication against these diseases does not further work.

No, because this is only an invention of the western world to better sell vaccines.

**Yes, because herd immunity also protects vulnerable community members who cannot be sufficiently immunized.**

Vaccination plays a crucial role not only in terms of personal health of an individual but also in terms of the health of the greater public. The higher the number of vaccinated persons is in a community, the harder it is for a virus to find individuals in which it can replicate and mutate. It will die out eventually, if it does not find hosts whom it can infect.

It is therefore the aim of vaccination to achieve a high percentage of vaccinated and thereby immune persons in a community. Even if the vaccination rate remains a bit below 100 percent, the whole group is still protected. This is called herd immunity.

Herd immunity offers the big advantage of protecting those who cannot be vaccinated due to their physical condition. These may be patients suffering from an immune deficiency who cannot receive a live vaccine. It also protects people who do not show a sufficient immune response due to their old age.

The percentage needed for herd immunity varies depending on the disease and how contagious that disease is. Measles, for example spreads so easily that 95% of the population must be vaccinated for herd immunity. Polio, on the other hand, requires a vaccination coverage of 80%.

Participants: 15

Percentage of correct answers: 93%

### ***Vaccination Quiz: 6***

**Should a pregnant woman be immunized against influenza (flu) or COVID 19?**

No. During pregnancy vaccinations should not be given at all, since the immune system of a pregnant woman is compromised and she could become seriously ill from the vaccination.

**Yes. The vaccine can be given at any time in pregnancy, if it is a dead virus vaccine.**

No, because the vaccines could do harm to the baby and lead to malformations.

A pregnant woman's immune system works on a reduced level, so that it does not reject the fetus. Therefore, a pregnant woman is more susceptible to infections. She can become infected with influenza as well as with SARS-CoV 2 and she carries an increased risk to develop severe respiratory and other symptoms. One example: As the baby grows, the woman is less able to breathe deeply, thus increasing the risk of complications such as pneumonia.

Pregnant women benefit from influenza and COVID-19 immunizations during pregnancy. An inactivated or mRNA vaccine does not contain a live version of the virus, therefore, it is safe in pregnancy.

As a rule of thumb: Dead virus vaccines can, living virus vaccines should NOT be administered in pregnancy because there is a theoretical risk of infection of the mother and the fetus although there is no evidence that any live vaccine causes birth defects.

Participants: 15

Percentage of correct answers: 80%

### ***Vaccination Quiz: 7***

**Should a pregnant woman be immunized against diphtheria, tetanus and pertussis (DTP)?**

**Yes, because the DTP vaccine protects the mother and the unborn child.**

**A vaccination is not necessary if a woman has already received a DTP vaccination in former times.**

No need, since the placenta barrier will not allow any vaccine to get through.

Yes. The vaccine against diphtheria, tetanus and the pertussis vaccine (DTP) is perfectly safe to administer during pregnancy. It is necessary to vaccinate a pregnant woman if she has not received a DTP vaccination before. It is normally given in the third trimester of pregnancy and also protects the baby during its early infancy.

Vaccination against diphtheria has caused diphtheria rates to drop dramatically. During the period between 1980 to 2000, the total number of reported diphtheria cases was reduced by more than 90%, which shows the success of childhood vaccination campaigns. But outbreaks still occur.

Pregnant women can be infected with tetanus; we call this maternal tetanus. This is almost a death sentence for the mother and the baby. Neonatal tetanus is usually caused by infections of the unhealed umbilical cord stump, especially when cut with non-sterile instruments. If the mother is properly vaccinated against tetanus, she passes the antibodies via the placenta on to the fetus and protects the newborn from neonatal tetanus.

Infants younger than 6 months are at particular risk of complications and death due to pertussis. Vaccination of pregnant women in the second or third trimester with a pertussis-containing vaccine is a cost-effective strategy in addition to routine primary infant pertussis vaccination in countries with high infant morbidity and mortality from pertussis.

Participants: 12

Percentage of correct answers: 100%

### ***Vaccination Quiz: 8***

**Can a pregnant woman be vaccinated with a live virus vaccine?**

**No, because there is a theoretical risk of infection of the foetus with a live virus or bacteria.**

Yes, a live virus vaccine can be given as any other vaccine.

No, live virus vaccines are ineffective because pregnant women have such a high immune status.

No, a pregnant woman should not receive a live virus vaccine during pregnancy. There is a theoretical risk that the live virus or bacteria passes the placenta and infects the fetus. Live virus vaccines are the vaccine against measles, mumps and rubella (MMR) and the vaccine against chickenpox. An infection of a non-vaccinated pregnant woman with one of these disease agents may cause spontaneous abortion, stillbirth or congenital defects. However, there are no reports that these adverse effects can be caused by the vaccines.

Yet, to be on the safe side, it is better to check the immune status of girls and young women in childbearing age and to update the necessary vaccinations before or after pregnancy. There is no risk to vaccinate breastfeeding women with live vaccines because the live virus is not transmitted through breastmilk.

Pregnant women may safely receive inactivated vaccines like the DTP (or Tdap) against diphtheria, tetanus and pertussis as well as mRNA and viral vector vaccines against Covid-19 like the ones of Moderna, Pfizer and Johnson&Johnson.

Participants: 22

Percentage of correct answers: 73%

### ***Vaccination Quiz: 9***

**Why is it important to immunize against meningococcal bacteria?**

**An infection with meningococcal bacteria may cause meningitis, long-term disability and even a fatal sepsis.**

**Vaccination prevents that individuals become silent carriers of the meningococcal bacteria.**

A vaccination against meningococcal bacteria also prevents an infection with varicella.

A vaccination against the bacterium *Neisseria meningitidis* or other bacteria prevents meningococcal meningitis and a sepsis or septicaemia, which is the technical name for blood poisoning. Both diseases have a high case fatality of over 50% without treatment. Even with antibiotic and hospital treatment, 10% of patients with meningitis or sepsis die. Another 20% of patients will suffer from severe complications and long lasting effects like hearing loss, seizures or difficulties with vision, speech and memory. Some may experience limb weakness or amputations after sepsis. These complications can have an enormous impact on individuals, families and communities, both financially and emotionally.

Vaccination also prevents that individuals become infected or become carriers of the meningococcal bacteria without knowing it. These silent carriers can infect other people, particularly the most vulnerable ones like young babies, older adults or those with a weak immune system. Vaccination prevents these silent carriers and leads to herd immunity.

Participants: 15

Percentage of correct answers: 80%

### ***Vaccination Quiz: 10***

**What are the most effective public health tools to prevent outbreaks of yellow fever?**

We can only control yellow fever outbreaks by preventing mosquito bites.

**We need prompt detection of yellow fever, vaccination campaigns during outbreaks, routine infant immunization, vaccination of travellers, reduction of mosquito breeding sites and prevention of mosquito bites.**

It is sufficient to control if travellers are vaccinated and to use bed nets against the mosquitos.

A yellow fever epidemic occurs when an infected person enters a community where most people are not vaccinated and where many mosquitos breed. Vaccination is a major weapon in eradicating yellow fever. The more people are vaccinated, the fewer the viruess circulating in mosquitos as vectors of transmission. In countries where yellow fever is endemic, public health officials have introduced routine infant immunization, mass vaccination campaigns during outbreaks and vaccination of travellers in order to reduce infection numbers. Yellow fever is a vector-transmitted disease and is transmitted by infected mosquitos called *Aedes aegypti*. As for malaria, we should also have additional tools at hand to control its spread. We have to reduce the breeding sites of mosquitos and we can use mosquito repellents and dress accordingly to avoid mosquito bites. Bed nets do not help, as the yellow fever mosquito bites during daytime.

Participants: 13

Percentage of correct answers: 100%

### ***Vaccination Quiz: 11***

**Which of the following vaccinations protects against a type of cancer?**

**Vaccination against human papilloma virus.**

Vaccination against varicella

Vaccination against rubella

The human papilloma virus, in short HPV, is responsible for cervical cancer in 95% of all cases. Therefore, vaccination against HPV is a huge contribution to the prevention of cervical cancer. The vaccine should be administered in two doses before the onset of sexual activity, meaning before the first exposure to an HPV infection. That means that we should usually vaccinate girls and boys at the onset of their adolescence before they have had their first sexual experience. The main reason for immunizing boys is that they help spreading HPV to their sexual partners. Therefore, if we want to eradicate cervical cancer, we must not only vaccinate those who may suffer from it but also those who spread the virus. In addition to cervical cancer, HPV may cause cancers of the vulva, the vagina, the penis, the anis and the throat. If we immunize girls and boys, we will reach herd immunity against HPV-induced cancer soon.

Participants: 17

Percentage of correct answers: 100%

### ***Vaccination Quiz: 12***

**How do we currently use vaccines to control outbreaks of Ebola virus disease?**

There are no preventive vaccines against Ebola.

**We use the Ebola vaccine in a "ring vaccination" strategy, immunizing persons in direct contact with a patient (ring 1) or in contact with persons of ring 1 (ring 2).**

We only vaccinate medical staff and frontline workers against Ebola virus disease.

In the control of an Ebola outbreak, we use "ring vaccination" as an outbreak control strategy. In ring vaccination, we vaccinate persons who carry the highest risk of infection because they were in direct contact with an infected patient (ring 1). The second ring consists of individuals who were in

contact with those vaccinated in ring 1. Therefore, we usually vaccinate two "rings" of individuals around an Ebola patient.

Apart from these contact persons, we vaccinate at the beginning of an outbreak medical staff and frontline workers responsible for case identification and community sensitization. Actually, the most efficient vaccine is Ervebo with an efficacy of about 97%. To date, we can use the "ring vaccination" strategy against the Zaire Ebola virus but not against other subtypes of the Ebola virus like the Sudan virus.

Participants: 14

Percentage of correct answers: 79%

### ***Vaccination Quiz: 13***

**Which measures are needed to prevent a cholera infection and to control a cholera outbreak?**

**Effective cholera prevention includes water, sanitation and hygiene (WASH) measures and oral vaccination.**

Effective cholera prevention includes avoidance of contaminated food.

Effective cholera prevention includes the use of face masks covering mouth and nose.

Cholera transmission is closely linked to a lack of clean water and sanitation facilities. Therefore the provision of safe water and sanitation are crucial to prevent and control the transmission of cholera. Hand hygiene is necessary to avoid bacteria transmission, as well.

In addition to these measures, we can protect ourselves and particularly vulnerable groups like young children against cholera by vaccination. There are three oral cholera vaccines at our disposal which are very effective, especially for children under five who carry the highest risk of death in case of a cholera infection.

The global strategy called 'Ending Cholera: a global roadmap to 2030' combines surveillance, water, sanitation and hygiene interventions, social mobilisation, treatment, and the vaccination with oral cholera vaccines. There is also a phone-based application containing technical information and practical documents to provide clear guidance and up to date information for early detection, monitoring and efficient response to cholera outbreaks. The application is designed for public health professionals from all sectors working in cholera control and can also be used in an offline modus.

<https://www.gtfcc.org/cholera-app/>

Participants: 15

Percentage of correct answers: 80%

### ***Vaccination Quiz: 14***

**Why does it make much sense in the public health sector to promote vaccination against typhoid fever?**

**In endemic areas, vaccination against typhoid fever helps to prevent acute disease and reduces the number of chronic carriers of the bacteria.**

**Vaccination helps to reduce the development of drug resistance of typhoid bacteria to antibiotics.**

A vaccination against typhoid fever also prevents a cholera infection.

Typhoid fever can be prevented by vaccination. New vaccines are now available that can be used even for young children who carry the highest risk of dying from a typhoid infection. This is even more important, because we can observe an increasing drug resistance of the typhoid bacteria against antibiotics. Multidrug resistant (MDR) typhoid bacteria have caused large outbreaks in Asia and Africa in recent years.

Vaccinating the majority of the population will also reduce the effect of silent carriers of the bacteria. In communities where typhoid fever is endemic and occurs frequently, there will always be chronic carriers who carry the bacteria in their gallbladder and biliary ducts. This also holds true for patients who only experienced mild symptoms not requiring any treatment. Vaccination will lead to an eradication of typhoid fever since the bacteria will find no further hosts in a well immunized population.

In addition, hand and food hygiene as well as water and sanitation have to be improved so that the bacteria cannot easily be transmitted.

Participants: 15

Percentage of correct answers: 87%