



# TRAVEL SAFELY WITH VACCINATIONS

A guide to travel-related diseases

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# GLOSSARY

**Antibodies:** Proteins produced by the immune system and built to recognise viruses, bacteria, and abnormal cells

**Airborne transmission:** Transmission through fine droplets that are produced when sneezing, coughing or talking

**Asymptomatic:** Without symptoms

**Basic/primary immunisation:** In most cases repeated administration of a vaccine at a certain interval, building up a basic protection against a disease

**Booster vaccination:** Additional vaccination which may be necessary after basic immunisation in order to achieve long-term disease protection

**Chemoprophylaxis:** Preventive medication to prevent disease

**Faecal-oral transmission:** Transmission route for infections in which faecally excreted pathogens enter the body via the mouth, e.g. through poor hygiene, contaminated drinking water and contaminated food; or via direct contact with infected persons, e.g. in childcare facilities or in the common household as well as during sexual contact (especially with men who have sex with men)

**Immunity:** The body's ability to fight off pathogens, acquired through infection or vaccination

**Incubation period:** The period between the infection of an individual by a pathogen and the manifestation of the illness or disease it causes

**Infection:** The entry of a pathogen into the body followed by proliferation of the pathogen

**Meningitis:** Inflammation of the membranes that surround the brain or spinal cord

**Plasmodia:** Single-celled parasites

**Serogroup:** Is a group of microorganisms of a species or genus with proven common antigenic properties

**Smear infection:** Transmission of pathogens by touching a contaminated object or an infected individual

**Standard vaccination:** Vaccinations recommended as standard for infants, children, adolescents and/or adults

**Ständige Impfkommision (STIKO):**

The German Standing Committee on Vaccination is an independent group of experts at the Robert Koch-Institute in Berlin which develops the current vaccination recommendations at the instigation of the Federal Ministry of Health

# GENERAL INFORMATION ON VACCINATIONS



## Why are vaccinations important?

A vaccination is one of the most important and effective preventive health measures. The aim of immunisation by vaccination is to protect the vaccinated person from infectious diseases and possible serious consequences. Moreover, by vaccinating many people the risk of infectious diseases spreading in the community is reduced, thereby protecting the health of individuals and the community. It is the case for many diseases that the more people who have been vaccinated, the less able the disease is to spread.

## How do vaccines work?

The immune system's job is to fight off pathogens such as bacteria and viruses. To do this, the immune system produces antibodies designed to fight the pathogen. Certain cells (memory cells) in the body also ensure that the defence system can remember the pathogen. If the pathogen enters the body again, the immune system can produce antibodies fast enough to keep it from causing recurrent disease. This natural function of the immune system is mimicked in a vaccination. In contrast to an infection, the infectious agents in vaccines have been either inactivated or weakened or only contain individual components of the pathogen. This is sufficient to stimulate the production of specific antibodies and memory cells without causing disease. In case of a later contact with the real pathogen, the previously formed antibodies can prevent the disease.

## What types of vaccines are available?

In the case of vaccines, a distinction is generally made between dead and live vaccines. Dead/inactivated vaccines contain inactivated pathogens, or components of the relevant pathogens. Such vaccines are not able to cause disease. However, since protection by inactivated vaccines often decreases over time, vaccination usually has to be repeated at regular intervals.

In contrast, live vaccines contain living but strongly attenuated (weakened) pathogens. These vaccines have the potential to cause a mild form of the disease (e.g. vaccine measles), but this is rare. For some live vaccines, vaccination protection can last a lifetime.

## Standard vaccinations and booster vaccinations

Since immunity induced by a vaccine does not always last for life, upcoming travel plans are a good reason to take a closer look at your certificate of vaccination. The Ständige Impfkommission (STIKO) at the Robert Koch-Institut recommends that adults undergo basic vaccination against:

- Diphtheria,
- Tetanus,
- Whooping cough (pertussis) and
- Polio.

Anyone born after 1970 should also be vaccinated against measles, mumps and rubella. For people aged 60 and older, vaccination against pneumococcal infections and herpes zoster (shingles) as well as an annual influenza vaccination is recommended. For people with underlying conditions, further vaccinations may be recommended. Please consult your doctor for more information.



## Travel vaccinations

In Germany, many infectious diseases no longer occur (or only rarely occur) due to good hygienic conditions and consistent vaccination practices. In other countries, however, these diseases may still be common. Climatic differences lead to travellers being confronted with 'foreign' pathogens and getting sick, especially when travelling to distant destinations. Therefore, when planning to travel, you should get information about recommended travel vaccinations for the destination country. Organising any vaccinations well in advance before the trip is important since immunity does not occur overnight, it has to be built up over several weeks.



# Does immunisation protection last a lifetime?

For some diseases, the relevant vaccine provides life-long immunity. With other vaccines, such as those protecting against diphtheria or tetanus, a booster vaccine is required every ten years. The vaccination against seasonal flu should be repeated annually to ensure protection against the currently circulating influenza viruses.

	Diphtheria	Tetanus
<b>PATHOGEN</b>	Bacterium <i>Corynebacterium diphtheriae</i>	Bacterium <i>Clostridium tetani</i>
<b>TRANSMIS- SION</b>	Airborne transmission via droplets (e.g. sneezing and coughing)	Infection of open and dirty wounds (even small-sized wounds)
<b>SYMPTOMS</b>	<ul style="list-style-type: none"><li>• Fever, sore throat, swallowing difficulties, nausea</li><li>• In severe cases: shortness of breath, inflammation of the heart muscle, cardiopulmonary arrest, bleeding and nerve paralysis</li></ul>	Onset with cramps of the facial muscles, which later spread to the whole body and, in the worst case, can lead to respiratory arrest
<b>RECOM- MENDE BOOSTER VACCINA- TION</b>	<ul style="list-style-type: none"><li>• Every 10 years</li><li>• Combined vaccination against tetanus, diphtheria, whooping cough and/or poliomyelitis is available</li></ul>	<ul style="list-style-type: none"><li>• Every 10 years</li><li>• Combined vaccination against tetanus, diphtheria, whooping cough and/or poliomyelitis is available</li></ul>

The easiest way of boosting immunisation is using combination vaccines. For example, with just one vaccination, diphtheria, tetanus and whooping cough can be prevented at the same time. If you are travelling to a country where poliomyelitis has not yet been eradicated, or if your last vaccination was more than ten years ago, a tetravalent vaccination including a polio vaccine is also available.

Pertussis (whooping cough)	Poliomyelitis (polio)
Bacterium <i>Bordetella pertussis</i>	Polio virus
Airborne transmission via droplets (e.g. sneezing and coughing)	<ul style="list-style-type: none"> <li>• Mainly faecal-oral transmission (e.g. through drinking contaminated water or food)</li> <li>• Airborne transmission (via droplets from an infected person)</li> </ul>
<ul style="list-style-type: none"> <li>• Long-lasting cough, fever, and weakness</li> <li>• In the acute stage, the cough may cause shortness of breath or vomiting</li> </ul>	<ul style="list-style-type: none"> <li>• The disease is often asymptomatic</li> <li>• Mild cases: fever, throat or muscle pain and headache</li> <li>• Severe cases: paralysis of the arms, legs or the respiration</li> </ul>
For the next booster vaccination against diphtheria, tetanus and poliomyelitis, adults should receive a tetravalent (4-in-1) vaccine including whooping cough	<ul style="list-style-type: none"> <li>• Primary vaccination: 3 vaccinations (according to the 2+1 vaccination schedule) in childhood; booster vaccination in adolescence</li> <li>• Every 10 years when travelling to high-risk areas</li> <li>• Tetravalent vaccine against poliomyelitis, whooping cough, tetanus and diphtheria is available, as well as other combination and single vaccines</li> </ul>

# PLANNING AND PREPARING FOR YOUR TRIP

No matter whether you're planning a short break in Europe, a safari in Africa or you're going backpacking around Asia, make sure to think about your health:

How good is the **medical care** at the travel destination?

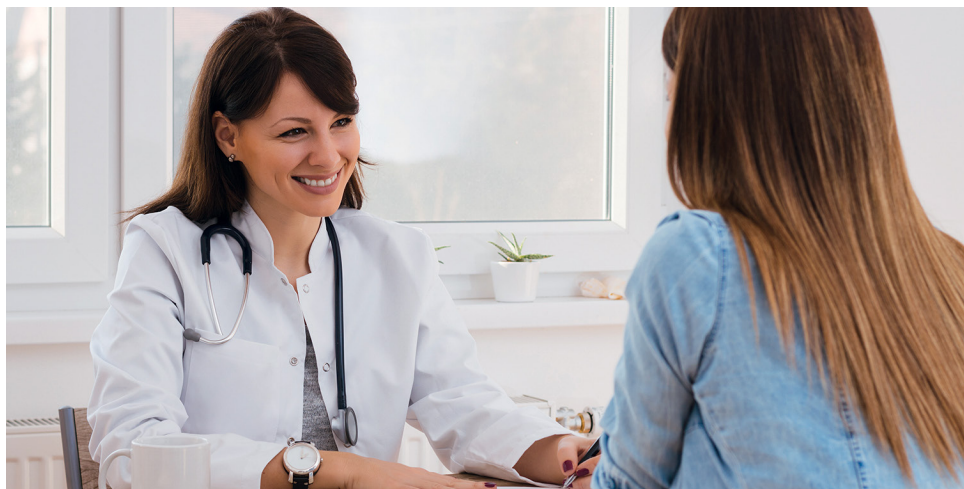
Am I covered by my existing **health insurance** during the trip, or do I need additional **travel health insurance**?

What should I take in my **travel first-aid kit**?

What **potential health risks** are there at my destination?

What **preventive measures** can I take?





## Where can I get answers to my questions?

A medical consultation with your general practitioner, at an institute for tropical medicine or with a travel medicine specialist can help you to adequately prepare for your journey. You should make an appointment and find out about country-specific vaccinations at least six weeks before departure to avoid preventable diseases as unwanted souvenirs. Even in case of a last-minute trip, travel vaccinations (e.g. against hepatitis A) still make sense.

## Who pays for the vaccination?

The costs for primary and booster vaccinations (e.g. against polio or whooping cough), which are recommended at the Robert Koch-Institute by the STIKO, will be covered by German health insurance.

In addition, many health insurance companies also cover the costs of recommended travel vaccinations or malaria prophylaxis (depending on your travel destination). However, these benefits are voluntary and not generally covered. Therefore, you should request relevant information from your health insurance company regarding recommendations for your particular travel destination. If the costs are covered, you usually have to submit the doctor's vaccination invoice to your health insurance company.

# REDUCING THE RISK OF INFECTIONS

## Ways to reduce the risk of infection

- » Avoid unpeeled fruits, salads, or raw vegetables.
- » For drinking or brushing your teeth, use only water you know to be safe (bottled water or tap water boiled for 5–10 minutes).
- » Be careful with ice cubes, ice cream and unpasteurised milk. In countries with warm climates, such foods should only be consumed if you are sure that the products have been produced and stored in accordance with certain hygiene standards.
- » Eat fish and meat with caution and depending on the destination country, only when they have been thoroughly cooked.
- » Reject lukewarm food in restaurants and do not eat foods if you feel unsure about them.
- » Keep flies away from your food.
- » Wash your hands as often as possible, especially after using the toilet and before preparing food.

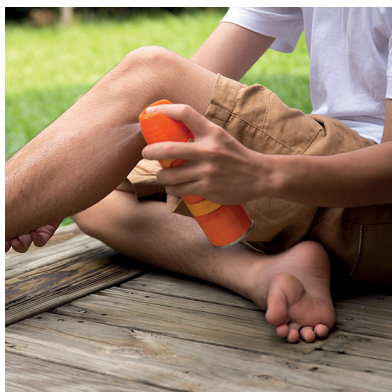




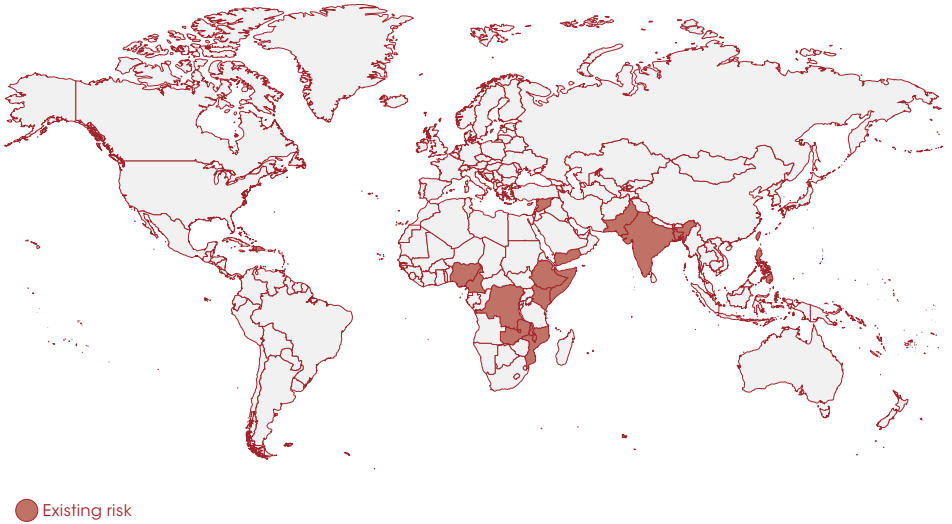
## Protection against insect bites

To avoid certain diseases the best protection is to avoid insect bites:

- » Wear light-coloured clothing that covers the legs and arms.
- » Treat uncovered parts of the body with insect repellent.
- » Stay indoors at night and do not sleep with windows open.
- » Depending on the travel destination, a mosquito net may be useful (also available as specially impregnated nets).



# CHOLERA



## **PATHOGEN**



Bacterium  
*Vibrio cholerae*

## **TRANSMISSION ROUTE**

Faecal-oral transmission (e.g. through contaminated drinking water or food)

## **INCUBATION PERIOD**



A few hours  
to 5 days





## CLINICAL FEATURES

There may be sudden symptoms such as diarrhoea, abdominal pain and vomiting. In severe cases, infected patients develop severe watery diarrhoea with vomiting and severe dehydration. The stool appears grey and contains mucus, hence it being known as rice-water stools. An infected adult may excrete 0.5–1 litre of stool volume per hour, resulting in high loss of water and electrolytes. This puts the circulatory system under great stress with the risk of kidney failure and subsequent shock and coma. It can be fatal in rare but critical cases.

However, in the majority of cases, cholera is asymptomatic.

### VACCINE 1



#### THERE ARE 2 VACCINES AVAILABLE

- An oral vaccination with 2 doses (children from 2 to 6 years of age: 3 doses) can be used to achieve protection for 2 years (only for 6 months in children up to 6 years of age).
- A booster dose is required if you return to high-risk areas within 2 years after the last vaccination (or within 6 months for children under 6 years of age).
- If the last vaccination was more than 2 years ago (or more than 6 months ago in children under 6 years of age), a new primary immunisation is necessary.

### VACCINE 2



- One-dose oral vaccination at least 10 days before travelling to a high-risk region.
- At the moment it is not yet known when and if a booster dose is necessary.

# COVID-19

Current information on high-risk regions can be found on the homepage of the Robert Koch-Institute ([www.rki.de](http://www.rki.de)) in the document entitled: "Internationale Risikogebiete, ausgewiesen durch das Auswärtige Amt, BMG und BMI".

## **PATHOGEN**



Coronavirus  
(SARS-CoV-2)

## **TRANSMISSION ROUTE**

- Airborne transmission via droplets and aerosols that arise when breathing, coughing, talking, singing and sneezing and circulate in the air.
- Contact infection/smear infection: Transmission through close physical contact by touching infected individuals or contaminated objects (e.g. door handles, stair railings, etc.) and subsequent transfer of the pathogen to the mouth and respiratory mucosa.

## **INCUBATION PERIOD**



Approx. 5–6 days



## **CLINICAL FEATURES**

The course of COVID-19 varies in its symptoms and severity: both asymptomatic courses as well as severe cases with pneumonia, lung failure and death can occur. The most frequently recorded symptoms in Germany include cough, fever, congestion, or runny nose as well as loss of smell and taste. SARS-CoV-2 very often causes infections of the respiratory tract, but other organ systems such as the cardiovascular system may also be affected. Particularly in the case of severe respiratory infections, some patients also suffer from symptoms affecting the heart (e.g. heart attack, cardiac arrhythmia, inflammation of the heart muscle). Furthermore, neurological (e.g. headache, dizziness, confusion), gastrointestinal (including nausea, vomiting) and dermatological symptoms (including itchy rashes, redness) may occur.



[www.zusammengegegencorona.de/covid-19/](http://www.zusammengegegencorona.de/covid-19/)

Even weeks or months after an acute COVID-19 infection, symptoms may still be present or appear for the first time (*long COVID*). Even after mild courses of disease, long-term signs of fatigue, memory disorders or word-finding disorders can occur. In children, paediatric inflammatory multi-organ syndrome (PIMS) can develop as a late consequence of COVID-19.

## VACCINATIONS



- Together with social distancing measures and hygiene rules, a vaccination offers the best possible protection against COVID-19.
- As part of the global effort to produce a COVID-19 vaccine, different manufacturing approaches have been pursued:
  - mRNA-based vaccines
  - Recombinant protein vaccines
  - Viral vector-based vaccines
- Check with your doctor which vaccine is recommended for your personal situation (e.g. primary or booster vaccination).

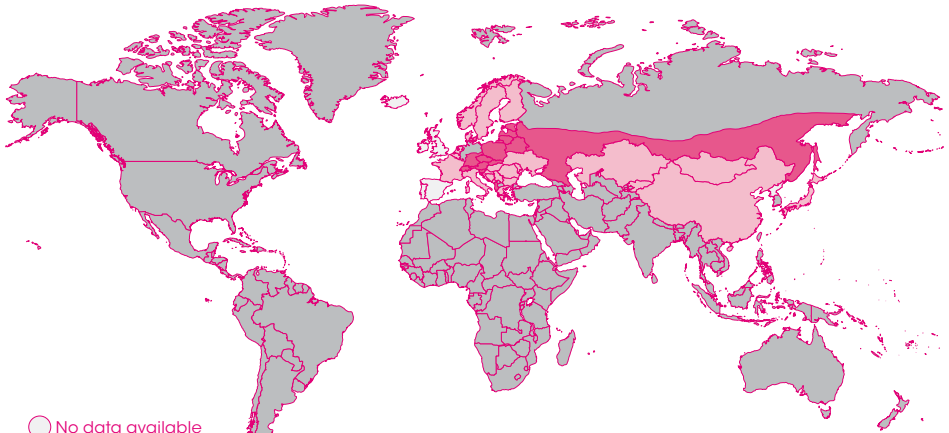
## FURTHER PREVENTIVE MEASURES TO REDUCE THE RISK OF INFECTION:

- Social distancing
- Frequent hand-washing and disinfection
- Wearing a mask over the nose and mouth
- Thorough ventilation of rooms

### GOOD TO KNOW!

- Infectious persons can be contagious as early as 1-2 days before the onset of symptoms.
- Even asymptomatic people can infect other people.

# TICK-BORN ENCEPHALITIS (TBE) \*



- No data available
- No endemic risk
- Few reported cases
- Endemic risk

\*This map shows the distribution of TBE (*tick-borne encephalitis*). TBE is the collective term for all sub-types of virus that may cause tick-borne encephalitis. The German term FSME (Frühsommer-Meningoenzephalitis) refers to the disease caused by the European sub-type.

Endemic regions in Germany: Bavaria, Baden-Württemberg, Brandenburg, Hesse, Lower Saxony, Thuringia, Saarland, Rhineland-Palatinate (tick season: from April to November)

## **PATHOGEN**



Tick-borne encephalitis virus

## **TRANSMISSION ROUTE**

- Infection and transmission through tick bite
- In rare cases, transmission through unpasteurised milk products from infected animals (especially goats)

## **INCUBATION PERIOD**



Approx. 7-14 days





## CLINICAL FEATURES

In the initial phase of the disease, non-specific symptoms such as fever, headache or gastrointestinal problems occur. These symptoms can easily be mistaken for summer flu. After a short symptom-free period, about 5–30% of affected individuals progress to a second disease stage with fever, vomiting, inflammation of the brain/meninges and/or the spinal cord. In severe cases, headaches or paralysis can last for months. However, it is often completely cured, even in severe cases.

## VACCINATIONS



- 3 vaccinations are required for effective primary immunisation.
- Depending on the age of the vaccinated person and the vaccine used, a booster vaccination is required every 3–5 years.
- Rapid immunisation is possible – talk to your doctor in case of a spontaneous trip.

## GOOD TO KNOW!

- The risk of infection is highest during hikes or camping in endemic areas, especially from April to November.
- Check the body carefully for ticks after spending time outdoors.
- If you live in an endemic region, you should get vaccinated against TBE.
- If you discover a tick, you can remove it with a special tick removal device available at the pharmacy. Make sure that the head does not remain embedded and, as a precaution, consult a doctor.

# YELLOW FEVER



## PATHOGEN



## Yellow fever virus

## TRANSMISSION ROUTE

Transmission by the diurnal *Aedes* mosquito



## INCUBATION PERIOD



3-6 days





## CLINICAL FEATURES

The disease usually progresses in two phases. A few days after the mosquito bite, a sudden fever appears, which may be accompanied by chills, muscle pain, headache, nausea, vomiting and nosebleeds. In mild cases, the symptoms subside after three to four days. However, about 15% of symptomatic cases progress to a subsequent toxic phase where organs such as the liver and kidneys are affected and patients may suffer from high fever, disorders of the central nervous system and internal bleeding. About 20–60% of patients progressing to a toxic phase die from the disease.

## VACCINATIONS

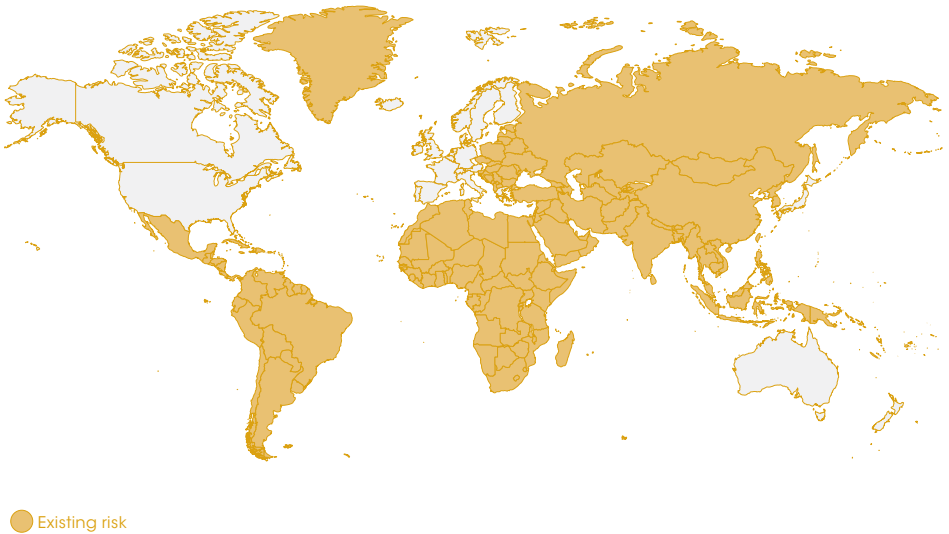


You are protected against yellow fever from just ten days after vaccination. Since 2022, the STIKO has recommended a booster vaccination after ten years for adults travelling to high-risk destinations. Exceptions and special arrangements apply to pregnant women, people with immunodeficiencies, and children.

### GOOD TO KNOW!

- For journeys to some countries, yellow fever vaccination is mandatory. In most cases, this requirement applies if you are traveling from a country with high yellow fever risk.
- The vaccination must be carried out by specialised vaccination centres or vaccination doctors. Information can be found on the website of the Center for Travel Medicine ([www.crm.de](http://www.crm.de)).
- The vaccination must be done at least ten days before expected time of entry.
- The international certificate for a yellow fever vaccination is valid for life. According to the World Health Organization, as of 2016 travellers with a yellow fever vaccination certificate more than ten years old may no longer be rejected.

# HEPATITIS A



## **PATHOGEN**



Hepatitis A virus

## **TRANSMISSION ROUTE**

- Faecal-oral transmission (e.g. through contaminated drinking water or food)
- Transmission can also happen through sexual intercourse, blood and blood products

## **INCUBATION PERIOD**



Approx. 28 days





## CLINICAL FEATURES

Acute hepatitis begins with a sudden onset of fever, accompanied by malaise, nausea and abdominal pain. A few days later, jaundice may occur, as well as darkening of urine and light stools. In children the disease is often mild and asymptomatic. In adults the condition can last for several weeks and a full recovery may take a few months.

An infection with hepatitis A virus induces lifelong immunity.

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## VACCINATIONS

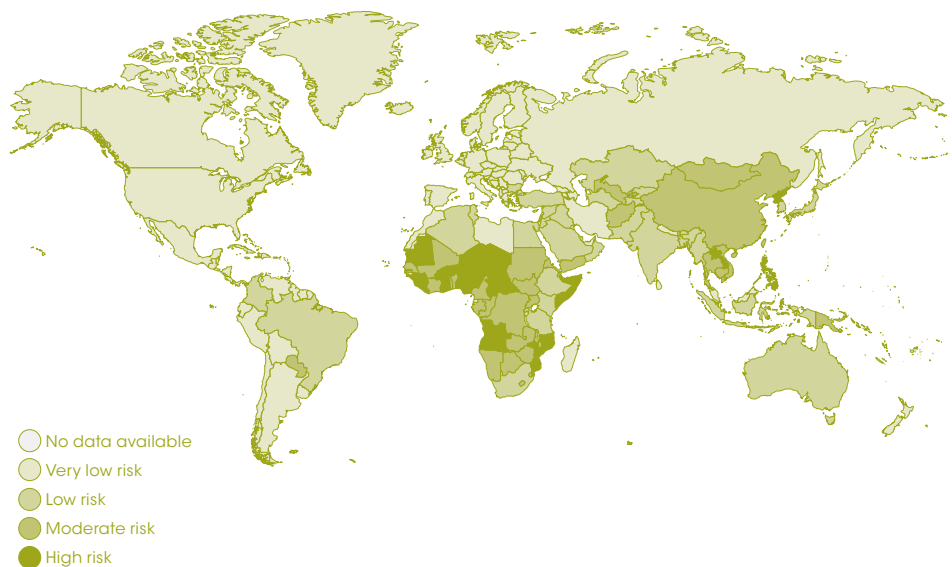


- Two vaccinations as primary immunisation can protect against the disease for up to 10–20 years.
- A booster vaccination is probably not necessary.
- The hepatitis A vaccination is also available as a combination vaccine with hepatitis B.

## GOOD TO KNOW!

The vaccine gives you immunity already after 14 days of the vaccination. This means it is also worthwhile for last-minute trips.

# HEPATITIS B



## **PATHOGEN**



Hepatitis B virus

## **TRANSMISSION ROUTE**

Transmission through body fluids (e. g., blood, semen, saliva)



## **INCUBATION PERIOD**



1–6 months  
(average 60 days)

## CLINICAL FEATURES

Many hepatitis B infections are asymptomatic or only cause mild symptoms. The initial symptoms of acute hepatitis are loss of appetite, malaise, nausea, vomiting and abdominal pain. About 90 days after infection with hepatitis B, approx. 30% of patients experience the yellowing of skin and eyes as well as dark urine and light-coloured stools. The disease usually resolves spontaneously after several weeks. However, 5% of affected adults, up to 90% of affected infants and 30–50% of affected children (1–5 years old) develop chronic disease.

## VACCINATIONS

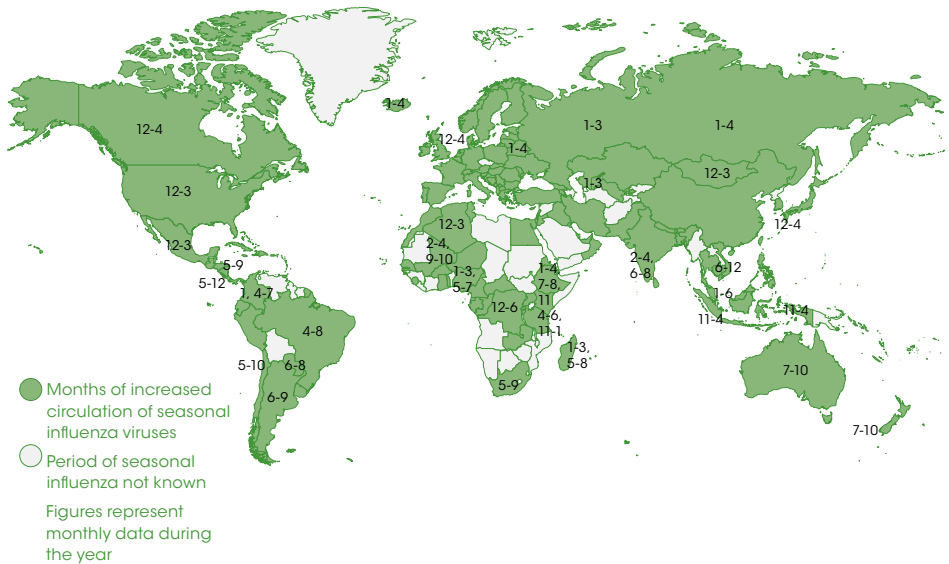


- Three vaccinations within six months can protect you for at least 15 years.
- In exceptional cases, a rapid immunisation schedule for adults is available, which is carried out within three weeks. When using this regimen, a fourth dose is recommended twelve months after the primary vaccinations.
- Vaccination protection against hepatitis A and hepatitis B can be provided by a combined vaccine.
- A hepatitis B vaccine is included in the hexavalent (6-in-1) vaccine used for primary immunisation of infants.

## GOOD TO KNOW!

- Medical staff should use gloves.
- Protect yourself during sexual intercourse by using condoms.
- Use only sterile syringes for injections.
- Be careful if you get a piercing or tattoo, or if you visit a barber shop at your travel destination.

# INFLUENZA (FLU)



## PATHOGEN



## Influenza virus

## TRANSMISSION ROUTE

- Airborne transmission via droplets (e.g. sneezing and coughing)
- Direct contact (e.g. via hands)
- By touching contaminated objects (e.g. door handles, stair railings)

## INCUBATION PERIOD



1-2 days



## CLINICAL FEATURES

Some people mistakenly use the terms “cold” and “flu” interchangeably. However, the flu is much more serious. While a normal cold usually starts slowly with a runny nose and slightly elevated body temperatures, typical flu symptoms are characterised by a sudden onset of high fever and sweating. In addition, there may be a dry cough, headache, muscle pain, a sore throat, and a feeling of tiredness and fatigue. In general, symptoms last five to seven days, but the feeling of illness can last much longer: a complete recovery can take several months. In severe cases, influenza infection can lead to hospitalisation and even death (especially in the elderly and in people with underlying diseases).

### VACCINATIONS



- An annual vaccination before the flu season (in the northern hemisphere usually from October to mid-December) can provide protection against the influenza epidemic which usually begins in January.
- Despite similar symptoms, a cold is different from the flu; therefore, vaccination against influenza does not protect against the common cold.

### REDUCE THE RISK OF INFECTIONS

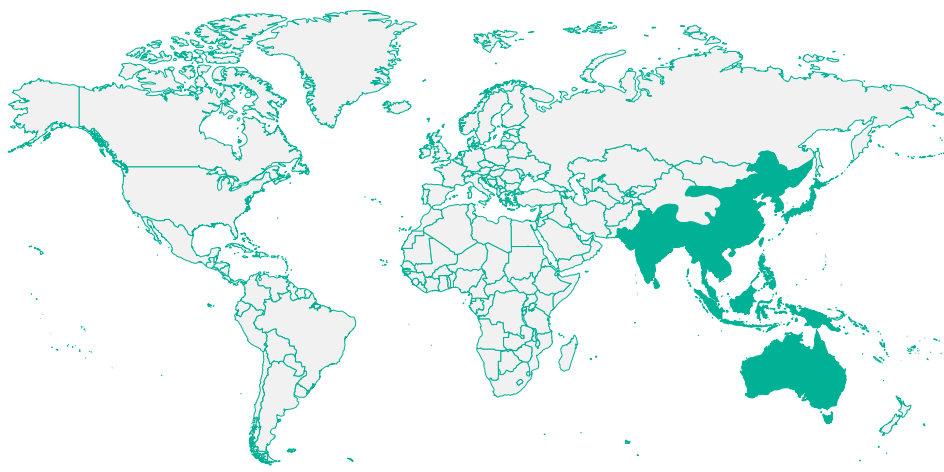


- Frequent hand-washing and disinfection
- Sneeze or cough into tissues or into the crook of your arm
- Thorough ventilation of rooms (several times a day)

### GOOD TO KNOW!

- You can infect other people with influenza viruses up to four or five days after your first symptoms occur.
- People with pre-existing conditions, travellers to the opposite hemisphere, pilgrims and cruise tourists are at increased risk of infection.
- Persons aged 60 years and older: Please ask your doctor or pharmacist which flu vaccine the STIKO recommends for people of your age.

# JAPANESE ENCEPHALITIS



● Existing risk

## PATHOGEN



Japanese  
encephalitis virus

## TRANSMISSION ROUTE

Transmission mainly by mosquitoes of the *Culex* genus that are active at dawn, dusk, and nighttime (transmission is also possible during the day!)



## INCUBATION PERIOD



5–15 days



## CLINICAL FEATURES

In most cases, an infection with the Japanese encephalitis virus presents with mild and flu-like general symptoms such as fever, headache, and body aches. However, in some cases it can lead to inflammation of the brain (encephalitis). In people with severe disease, typical early symptoms are severe headaches and high fever, followed by disorientation, coma, and paralysis; children often suffer from seizures. Permanent damage can occur, and the disease can be fatal.

## VACCINATIONS



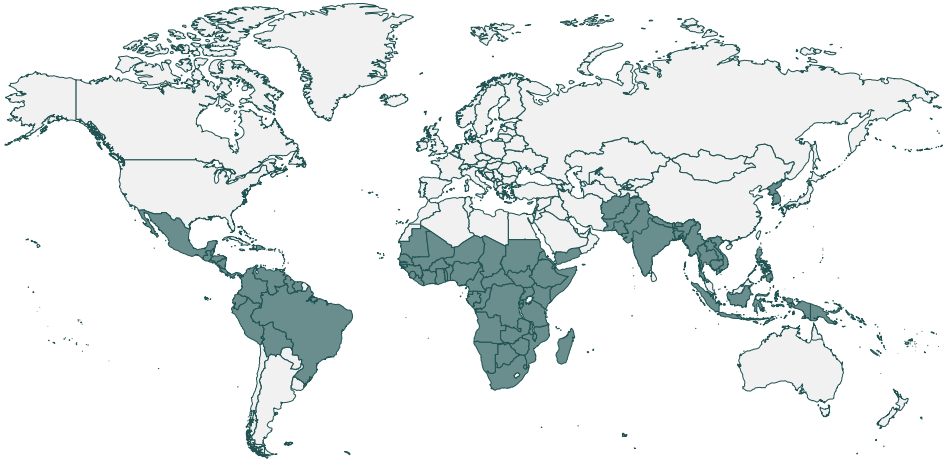
- Two vaccinations are necessary for primary immunisation.
- A booster vaccination should be given within 12 to 24 months after primary immunisation. Another one can be given ten years after the first booster vaccination.



## GOOD TO KNOW!

The risk of infection is relatively low for short trips to urban areas, but it depends on the season, travel behaviour and risk of exposure (e.g. hiking, camping, etc.).

# MALARIA



● Existing risk

## **PATHOGEN**



Plasmodia  
(*P. falciparum*, *P. ovale*,  
*P. vivax*, *P. malariae*  
and *P. knowlesi*)

## **TRANSMISSION ROUTE**

- Transmission mainly by nocturnal, blood-sucking female mosquitoes of the *Anopheles* genus
- In rare cases, transmission through blood transfusions, needlestick injuries, or from the pregnant mother to her child

## **INCUBATION PERIOD**



7–40 days

- There are different types of malaria, so the incubation period can vary from seven up to 40 days
- Longer incubation periods are observed for all forms of malaria

## CLINICAL FEATURES

A distinction is made between the milder forms of *malaria tertiana* and *malaria quartana*, and the life-threatening form of *malaria tropica*. Around 75% of imported malaria cases in Germany are *malaria tropica*.

***Malaria tropica*:** Common first signs are fatigue, headache, and body aches as well as irregular and sudden feverish temperatures. Diarrhoea with fever may also occur. The destruction of red blood cells may lead to lack of blood supply to the vital organs. This can lead to seizures, clouding of consciousness, and coma. Other possible severe complications include kidney failure, liver failure and circulatory collapse. In critical cases, malaria tropica can be fatal.

***Malaria tertiana or quartana*:** The milder forms of malaria are characterised by a high fever, which often appears as a cyclic fever (every 48 or 72 hours). However, the symptoms of the milder forms of malaria practically always take a benign course.



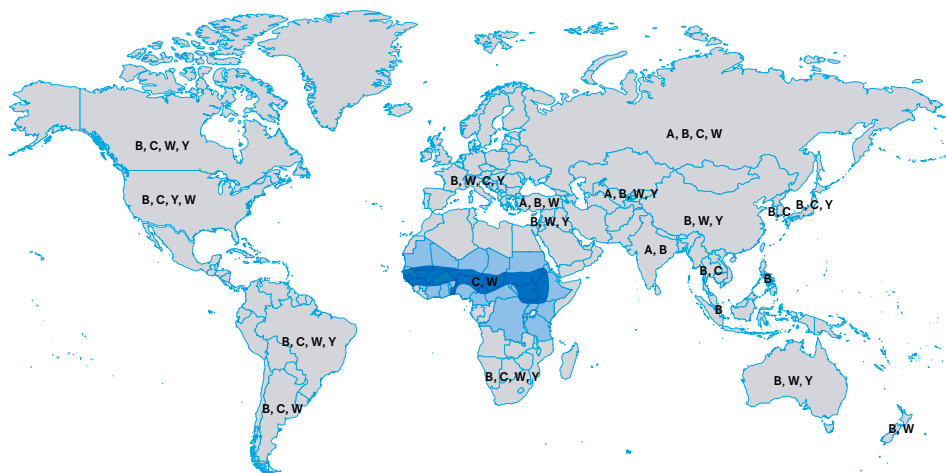
### GOOD TO KNOW!

The specific recommendation regarding the type of malaria prophylaxis must be made by a specialised tropical or travel physician based on travel destination and duration of the trip, the travel style and individual contraindications.

## PROPHYLAXIS

- Good protective measures against mosquitoes are important.
- A vaccination against malaria is not yet available. However, chemoprophylaxis (with tablets) can reduce the risk of disease by destroying the pathogens in the blood.
- When travelling to areas with high malaria transmission potential, chemoprophylaxis is generally recommended. If routine prophylactic measures are not taken in areas with low or moderate risk of malaria, take a provisional medication with you. This can be taken in case of symptoms of suspected malaria and if medical care is not available. However, this should only be an emergency measure until medical attention is obtained.

# INVASIVE MENINGOCOCCAL DISEASE



Distribution of the most common serogroups: A, B, C, W, Y



Countries with high risk



Regions with high risk (meningitis belt)

## PATHOGEN



Bacterium  
*Neisseria meningitidis*

## TRANSMISSION ROUTE

Airborne transmission via droplets (e.g. from sneezing or coughing) or via close contact with infected persons.



## INCUBATION PERIOD



Average: 3–4 days  
(Range: 2–10 days)



## CLINICAL FEATURES

In about one to two thirds of cases, the infection occurs as meningitis (inflammation of the brain and spinal cord membranes) and in about one third, blood poisoning (sepsis) occurs. In some cases, a combination of meningitis and sepsis may occur. In the course of invasive meningococcal disease, sudden headaches, fever, circulatory problems, aversion to light and characteristic neck stiffness can be followed by the development of severe and life-threatening symptoms with bleeding under the skin (pinprick rash), seizures or cranial nerve paralysis. If the pathogen spreads in the bloodstream of the affected individual, sepsis occurs, which can lead to circulatory collapse, organ failure and death within a very short period of time. In around 10 to 20% of all patients, complications occur that may result in permanent damage (e.g. loss of limbs, organ damage, brain damage and numbness).

## VACCINATIONS

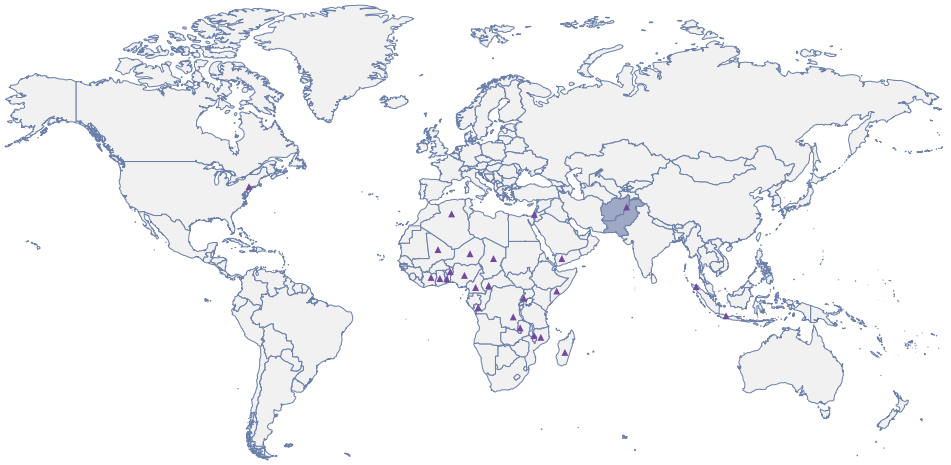


The invasive disease is most commonly caused by the meningococcal groups (so-called serogroups) A, B, C, W and Y. In addition to the standard recommended meningococcal C vaccine in infancy, meningococcal vaccines against serogroup B and combination vaccines against the serogroups A, C, W and Y are also available. Vaccination with the latter is recommended before travelling to specific areas (e.g. Mecca and neighbouring European countries). Your doctor or a tropical institute can advise you according to your travel plans.

## GOOD TO KNOW!

- In the dry season, from December to June, major outbreaks of the disease regularly occur in the “meningitis belt”, a region in Sub-Saharan Africa.
- Avoid large crowds and poorly ventilated rooms in high-risk areas.
- For pilgrims to Mecca, proof of vaccination is mandatory. Please also read the entry requirements.
- Invasive meningococcal diseases caused by the serogroups A, B, C, W and Y also occur in European countries, including Germany. The recommended standard vaccination in infancy against meningococcal C can therefore be replaced by a single vaccination against the four serogroups A, C, W and Y.

# POLIO



- Endemic risk (wild-type poliovirus strains)
- ▲ High-risk countries (live vaccine-derived poliovirus strains)

## PATHOGEN



Polio virus

## TRANSMISSION ROUTE

- Faecal-oral transmission (e.g. through contaminated drinking water or food)
- Airborne transmission (via droplets) is possible shortly after infection

## INCUBATION PERIOD



Average: 7–14 days  
(Range: 3–35 days)



## CLINICAL FEATURES

About 95% of infections are asymptomatic. The remaining patients show different courses of disease:

**Abortive poliomyelitis:** Six to nine days after infection, affected individuals briefly complain of symptoms such as fever, nausea, diarrhoea, stomach pain, muscle pain, headache and sore throat.

**Non-paralytic poliomyelitis (aseptic meningitis):** After three to seven days, high fever appears accompanied by neck stiffness, back pain and muscle cramps. The symptoms are similar to meningitis, but the prognosis is good.

**Paralytic poliomyelitis (classic polio):** Often, the symptoms of non-paralytic poliomyelitis improve initially. However, after two to three days, fever reappears in conjunction with paralysis, which in some cases also affects the respiratory tract. In addition to permanent paralysis, joint deformities, differences in leg and arm length, spinal displacements and bone loss can occur.

## VACCINATIONS

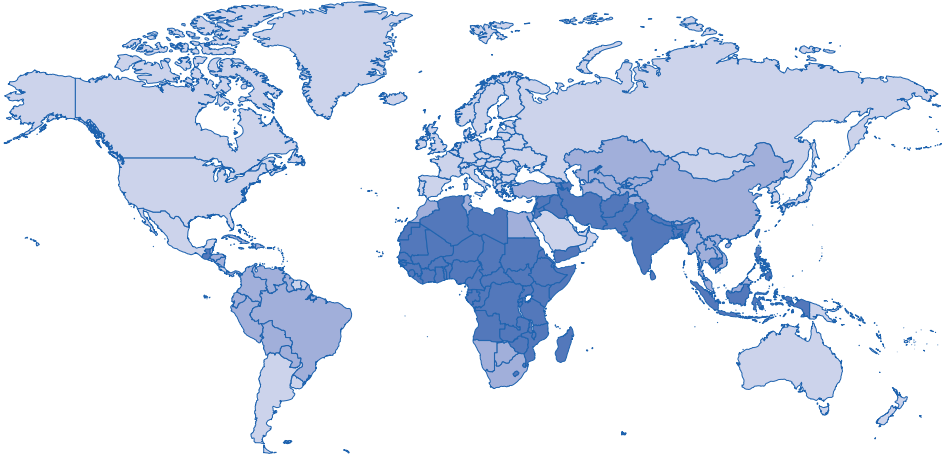


- Primary immunisation against poliomyelitis should start at the age of two months and usually includes three vaccinations in the first year of life (2+1 vaccination schedule).
- At the age of nine to 17 years, a single vaccination is recommended as booster.
- When travelling to areas with increased endemic risk, vaccination protection should be refreshed with a booster if the last vaccination was more than ten years ago.
- Any scheduled primary vaccinations should be organised, or documentation proving immunisation status found. For this purpose, various combination vaccines against polio, whooping cough, tetanus and diphtheria are available.
- A single polio vaccine is also available.

## GOOD TO KNOW!

Together with other partners, the WHO has set the goal of eradicating polio worldwide. However, since the importation of polio virus to Germany and its spread cannot be completely ruled out, vaccination against polio remains important.

# RABIES\*



- Free or mostly free of canine-spread rabies
- Moderate risk of canine-spread rabies
- High risk of canine-spread rabies

\*99% of human cases are transmitted by dogs. As a result, cases of wildlife rabies and bat rabies are not shown on this map.

## **PATHOGEN**



Rabies virus

## **TRANSMISSION ROUTE**

- Transmission by bite or saliva from infected mammals (mainly dogs or foxes)
- Scratches from bats

## **INCUBATION PERIOD**



Average: 2-3 months, but is highly variable, ranging from a few days to several years



## CLINICAL FEATURES

The initial stage of the disease is characterised by burning, itching and increased sensitivity to pain at the site of the bite. At the same time, non-specific symptoms like headache or loss of appetite occur. About 70% of cases develop an inflammation of the brain. Affected individuals are afraid of water (hydrophobia) and display increased salivation ("foaming at the mouth"), hallucinations, aggressive and depressive moods, speech problems and convulsions. A rarer form called paralytic rabies is characterised by increasing paralysis due to changes in the nerves of the spinal cord. Once symptoms occur, rabies is **always fatal**.

## VACCINATIONS



- Depending on the vaccination schedule, two to three doses of a rabies vaccine are required for preventive immunisation.
- Administration of vaccines as post-exposure prophylaxis (2–5 doses depending on vaccination status, vaccination schedule, physical condition and vaccine used) after contact with a potentially infected animal is recommended and should be started as soon as possible. This also includes wound irrigation and antiseptic wound treatment.

## REDUCE THE RISK OF INFECTIONS

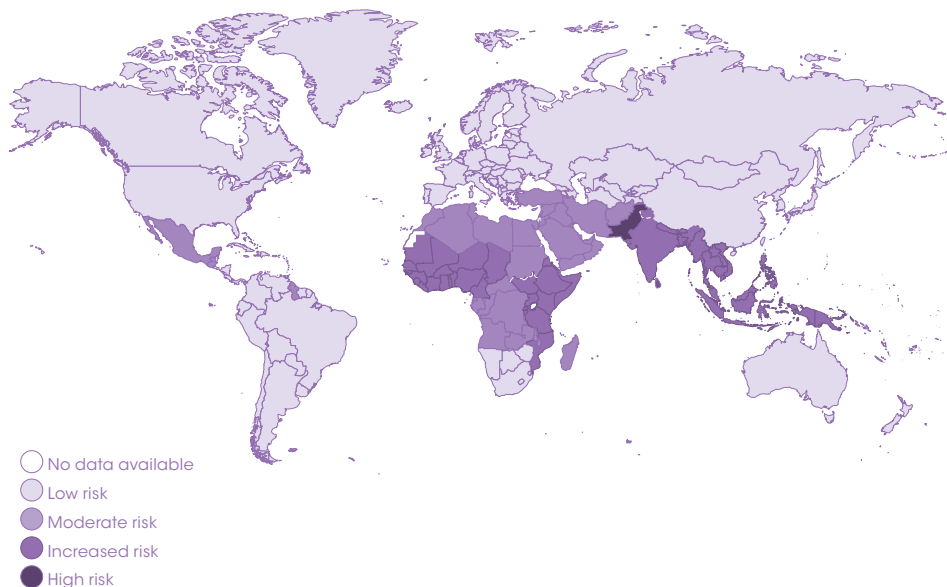
Avoid contact with animals, especially stray dogs, bats and foxes, in affected areas.



## GOOD TO KNOW!

Rabid animals are less shy of humans. After a bite, you must not wait until the first symptoms appear. After contact with a potentially infected animal, consult a doctor immediately.

# TYPHOID FEVER



## PATHOGEN



Bacterium  
*Salmonella Typhi*

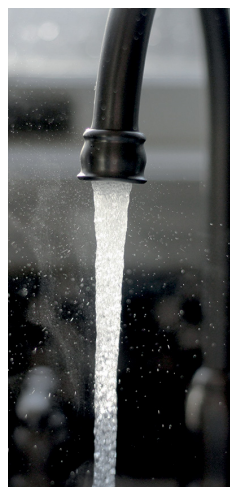
## TRANSMISSION ROUTE

Faecal-oral transmission (e.g. through contaminated drinking water or food)

## INCUBATION PERIOD



3–60 days  
(8–14 days on average)





## CLINICAL FEATURES

Initial symptoms of typhoid fever usually include non-specific symptoms such as malaise, loss of appetite, drowsiness, exhaustion, steadily increasing fever, headache, muscle pain and constipation. In the second or third week of the disease, 'pea-soup' diarrhoea may occur. High fever (approx. 40°C) can last up to three weeks. Other symptoms may include a slow heartbeat and a red rash. About 10% of affected individuals develop a severe form of typhoid fever with impaired consciousness and shock. Possible complications are intestinal bleeding, intestinal perforations and meningitis.

## VACCINATIONS



- A single injection or oral vaccination (three capsules, taken each two days apart) provides protection for up to three years.
- Vaccination provides protection after 14 days (in case of injected vaccination) or 7–10 days after taking the last capsule (in case of oral vaccination).
- In cases where there is increased risk of infection, a booster dose is required every three years.

## GOOD TO KNOW!

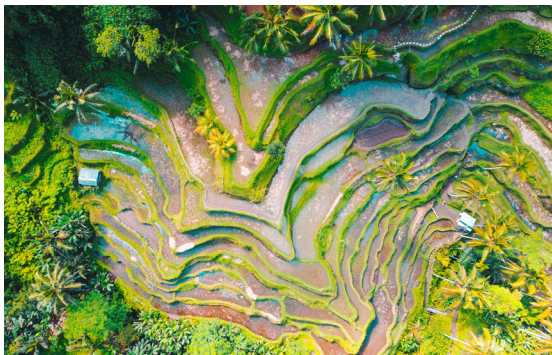
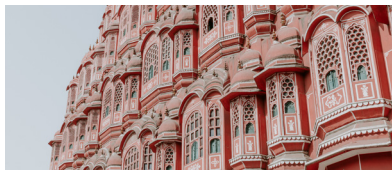
In the case of oral vaccination, concomitant use of antibiotics or malaria prophylaxis should be avoided.



# CHIKUNGUNYA

## DISTRIBUTION AREA

Mainly Africa, Southeast Asia, India and South and Central America; seasonal outbreaks are also possible in Southern Europe



## PATHOGEN



Chikungunya virus

## TRANSMISSION ROUTE

Transmission by mosquitoes of the *Aedes* genus that are mainly active during the day

## CLINICAL FEATURES

The disease is characterised by sudden high fever, severe muscle and joint pain and rash. The symptoms usually improve after a week. However, joint-related symptoms may last for weeks or months (in rare cases also years).

## INCUBATION PERIOD



3–12 days

## GOOD TO KNOW!

Currently there is no vaccination against Chikungunya fever. However, a vaccine candidate is currently being tested and may soon be available.

# DENGUE FEVER

## DISTRIBUTION AREA

Mainly in tropical and subtropical regions of the world



### PATHOGEN



Dengue virus

### TRANSMISSION ROUTE

Transmission by mosquitoes of the *Aedes* genus that are mainly active during the day

### CLINICAL FEATURES

In most cases, the disease proceeds asymptotically or with a low-grade fever. In case of symptomatic courses, there is an abrupt onset of symptoms including high fever, headaches and especially muscle and bone pain. Occasionally, a rash may occur. Most affected individuals recover after a few days. However, an infection with dengue virus can also lead to severe and, in rare cases, fatal disease courses presenting with what is known as dengue haemorrhagic fever, characterised by severe internal bleeding. This can result in organ failure and circulatory failure (dengue shock syndrome). However, these particularly severe forms rarely occur after a primary infection with dengue virus. A second infection, on the other hand, can be more severe and possibly fatal.

### INCUBATION PERIOD



3–14 days

Since 2023, a dengue fever vaccine is available for travellers in the German market. The STIKO recommends full immunization for certain travellers before travelling to dengue endemic areas. For people who have not had a dengue virus infection in the past, the STIKO does not currently give a general vaccination recommendation.

# SHIGELLOSIS

## DISTRIBUTION AREA

Worldwide distribution; however, it is more frequent in warm countries with low hygiene standards



## PATHOGEN



Bacterium *Shigella*

## TRANSMISSION ROUTE

- Faecal-oral transmission (via direct contact with infected persons, e.g. in childcare facilities, or through contaminated drinking water or food)
- Transmission via sexual intercourse (especially men who have sex with men)

## INCUBATION PERIOD



12–96 hours

## CLINICAL FEATURES

The disease usually begins with watery diarrhoea, sometimes in conjunction with fever and abdominal cramps. In severe cases, diarrhoea with bloody mucus accompanied by intestinal spasms is observed. Later, the disease can lead to formation of ulcers in the colon and, in rare cases, to a widening of the intestine and intestinal perforation.

## GOOD TO KNOW!

There is no vaccine against shigellosis. Prevention is based on adequate hygienic conditions (especially careful hand hygiene).

# ZIKA VIRUS INFECTION

## DISTRIBUTION AREA

Mainly in tropical and subtropical regions of the world



## PATHOGEN



Zika virus

## TRANSMISSION ROUTE

- Transmission by mosquitoes of the *Aedes* genus that are mainly active during the day
- The virus may be transmitted by infected pregnant women to the unborn child via the placenta
- Transmission via sexual intercourse in individual cases

## INCUBATION PERIOD



3–12 days

## CLINICAL FEATURES

In most cases, Zika virus has a mild course. The most common symptoms are mild fever, rash, headache, joint and muscle pain as well as conjunctivitis. Many infections are asymptomatic. Zika virus infections usually resolve after a few days without consequences. However, an infection with Zika virus during pregnancy can lead to severe malformations in the unborn child.

## GOOD TO KNOW!

There is no vaccination against Zika virus. Therefore, effective measures to protect against mosquitoes are very important.

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## Publisher:

Sanofi Aventis  
Deutschland GmbH  
Lützowstr 107 | 10785 Berlin  
Telefon 030 25752000 | [impfen.sanofi.de](mailto:impfen.sanofi.de)  
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