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Recommendations of the Standing Committee on Vaccination (STIKO) at the Robert Koch Institute - 2026

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These STIKO vaccination recommendations were endorsed in the 112th STIKO meeting. This version replaces the previous STIKO vaccination recommendations published in Epidemiologisches Bulletin (Epid Bull) 4/2025 of the Robert Koch Institute (RKI). Differences between this publication and the previous ones are marked in blue writing as well as with a blue line on either side of the new text.

Disclaimer

This document is a translation of the original Recommendations of the Standing Committee on Vaccination (STIKO) at the Robert Koch Institute (http://www.rki.de/stiko-empfehlungen) on behalf of the Robert Koch Institute as of 04/2026. The German text is authoritative, and no liability is assumed for any translation errors or for the translation's correctness in case of subsequent revisions to the German original – DOI 10.25646/13636.3

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The Robert Koch Institute is an Institute within the portfolio of the Federal Ministry of Health.

Substantial amendments and additions to the recommendations of 2025

▶ RSV: STIKO now recommends the mRNA RSV vaccine mResvia in addition to protein-based vaccines for RSV vaccination. The single vaccination is recommended as a standard vaccination for all persons aged ≥ 75 years and as an indication-based vaccination for persons aged 60 to 74 years with a relevant underlying condition as well as for residents in long-term care facilities. STIKO has not issued a preferential recommendation for either vaccine. For details, see Epid Bull 15/2025.[59]

▶ Chikungunya: STIKO recommends vaccination against chikungunya for persons at increased risk of developing chronic or severe disease when traveling to areas with ongoing chikungunya outbreaks or making repeated visits to endemic areas. There is an occupational indication for persons who perform specific activities involving chikungunya viruses in accordance with the German Biological Agents Ordinance. STIKO recommends the live attenuated vaccine Ixchiq for individuals aged 12 to 59 years or the inactivated vaccine Vimkunya for individuals ≥ 12 years. For details, see Epid Bull 28/2025.[1]

▶ Mpox: STIKO has revised its vaccination recommendations for protection against Mpox. Vaccination is recommended for people with an increased risk of exposure; men and transgender and non-binary people who have sex with men and frequently change partners, and sex workers are cited as examples. For details, see Epid Bull 29/2025.[41]

▶ Influenza: STIKO has modified its influenza recommendation for indication-based vaccination due to the global spread of highly pathogenic H5Nx viruses among birds and the increased detection of H5Nx in various mammal classes. An annual influenza vaccination with an inactivated influenza vaccine in autumn/winter is now also recommended for people who have frequent, regular, and direct contact with pigs, poultry, wild birds, or seals in their private lives or at work. For more details, see Epid Bull 29/2025.[20]

▶ *Haemophilus influenzae* type b (Hib): In response to an acute outbreak of Hib disease among adults in northern Germany, STIKO has adapted its recommendations for indication-based vaccination and post-exposure chemoprophylaxis in the context of Hib outbreaks. For details, see Epid Bull 34/2025.[9]

▶ Herpes zoster (HZ): STIKO has adjusted its herpes zoster indication-based recommendation and now recommends vaccination with the HZ inactivated vaccine for people aged ≥ 18 years who are at increased risk of developing herpes zoster due to congenital or acquired, particularly iatrogenic, immunodeficiency or due to severe manifestations of a chronic underlying condition. For details, see Epid Bull 45/2025.[13]

▶ Meningococci: STIKO has amended its recommendations for the prevention of invasive meningococcal disease. It now recommends standard vaccination with a quadrivalent conjugate vaccine against serogroups A, C, W, and Y for children and adolescents aged 12 to 14 years. Catch-up vaccinations should be administered up to the age of < 25 years. The previously recommended monovalent vaccination against meningococci of the serogroup C at the age of 12 months is no longer required. For details, see Epid Bull 44/2025.[35]

▶ Pneumococci: STIKO has modified its pneumococcal indication-based vaccination recommendation for individuals aged 2 to 17 years with an increased risk of severe pneumococcal disease and now recommends vaccination with PCV20. The use of the 23-valent pneumococcal polysaccharide vaccine (PPSV23) alone or as part of a sequential vaccination regimen is no longer recommended. For details, see Epid Bull 2/2026.[49]

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Statement of the Standing Committee on Vaccination at the Robert Koch Institute (RKI)

Recommendations of the Standing Committee on Vaccination (STIKO) at the Robert Koch Institute - 2026

1. Introduction

The Standing Committee on Vaccination (STIKO) is an independent expert committee, consisting of around 20 members, as set out under the Protection Against Infection Act [Infektionsschutzgesetz (IfSG)]. The members are appointed by the German Federal Ministry of Health in consultation with the supreme federal state health authorities for a period of 3 years. The IfSG requires the commission to provide recommendations on vaccinations and other measures for the specific prophylaxis of communicable diseases. When developing a new vaccination recommendation, the STIKO conducts a medical and epidemiological risk-benefit assessment based on the best available evidence. This considers the benefit of the vaccination at population level (e. g. expected epidemiological effects of the vaccination recommendation). The STIKO recommendations serve as a basis for public recommendations from the supreme federal health authorities. In line with Volume V of the Social Insurance Code [Sozialgesetzbuch Fünftes Buch (SGB V)], the STIKO recommendations are the basis for decisions made by the Joint National Committee [Gemeinsamer Bundesausschuss (G-BA)] on whether the costs of the vaccination are covered by statutory health insurance.

Vaccinations are among the most effective and significant medical measures. Modern vaccines are well-tolerated, and irreversible serious adverse events (SAE) are very rarely seen. The immediate goal of vaccination is to protect an individual from a specific disease. A high level of vaccination acceptance allows high vaccination coverage rates to be achieved. It is therefore possible to achieve regional, and eventually global, elimination of certain pathogens. The elimination of measles, rubella, and poliomyelitis has been declared as an achievable goal of national and international health policy.

In Germany, vaccinations and other means of specific prophylaxis are "publicly recommended" by the health authorities of the federal states on the basis of the STIKO recommendations, in line with § 20 (3) of the Protection Against Infection Act [Infektionsschutzgesetz (IfSG)]. Compensation for vaccine induced injury caused by "publicly recommended" vaccinations is assured by the federal states.

An important task for physicians is to ensure adequate immunisation of all those under their care. This means starting primary immunisation programmes early, for infants and toddlers, administering these vaccines without delay, and completing vaccination schedules in a timely manner (by 4 to 15 months of age, depending on the vaccination). In addition to primary immunisation in infancy and early childhood, standard vaccinations in childhood, adolescence and adulthood, as well as regular booster vaccinations, must be ensured in order to achieve comprehensive lifelong vaccination protection. Vaccinations based on individual and occupational indications further round off vaccination protection. Every visit to the physician should be used to check the vaccination records of children, adolescents, and adults, and to complete immunisation schedules when necessary.

As well as administering vaccines, the vaccination services provided by physicians include:

- Providing information on the disease to be prevented and the benefits of vaccination;
- Providing information on possible adverse events following immunisation;
- Taking the patient's medical and vaccination history, including possible contraindications;
- Determining the current health status to exclude acute illnesses;
- Giving recommendations for post-vaccination behaviour;
- Giving information on the commencement and duration of the protective effect;
- Giving advice on booster vaccinations; and
- Documenting the vaccination in the patient's vaccination record or issuing a vaccination certificate.

Since 2024, selected vaccinations have also been available in pharmacies for people aged 12 years and older (COVID-19) or 18 years and older (influenza).

2. Immunisation schedule (routine vaccinations)

The routine immunisation schedule for infants, children, adolescents, and adults (see Table 1A "infants and toddlers < 5 years of age [0 to 59 months]" and Table 1B "children aged ≥ 5 years, adolescents and adults") includes vaccinations and immunisations against respiratory syncytial viruses (RSV), rotavirus (RV), tetanus (T), diphtheria (D/d), pertussis (aP/ap), *Haemophilus influenzae* type b (Hib), poliomyelitis (IPV), hepatitis B (HB), pneumococci, meningococci B (MenB), meningococci ACWY (MenACWY), measles, mumps, rubella (MMR), varicella (V), human papillomaviruses (HPV), herpes zoster (HZ), influenza, and COVID-19.

For a better overview, the vaccination schedule is displayed in two tables in portrait format. Table 1A shows the standard immunisations for infants and toddlers < 5 years of age (0 to 59 months), and Table 1B shows those for children aged ≥ 5 years, adolescents, and adults.

The recommended time for vaccination is indicated in weeks, months, and years of age, and is based on the risk evaluation of the person to be protected. For example, "vaccination at the age of 5 to 6 years" means that vaccination should take place between the day of the child's 5th birthday and the day before their 7th birthday. Vaccination should take place at the earliest recommended time. To keep the number of injections as low as possible, combination vaccines should be used if available, and as long as they do not conflict with current STIKO recommendations. It is recommended that physicians check and, when necessary, update vaccination status at every age. Missing vaccinations should be administered immediately in line with the respective age-related recommendations.

Please note that some catch-up vaccinations are only administered until a certain age. Rotavirus vaccination must be completed by the age of either 24 or 32 weeks, depending on the vaccine product used. Vaccination against pneumococci should be administered only until the 2nd birthday (0 to 23 months) and vaccination against Hib and MenB only until the 5th birthday (0 to 59 months). The vaccination against HPV is most effective when administered before the start of sexual activity. Ideally, it should be administered to girls and boys between the age of 9 and 14 years. Catch-up vaccination can be administered up to the day before the 18th birthday.

There are some recommended minimum intervals between two vaccinations, and it is possible to co-administer some vaccines. To check this, physicians should consult the Summary of Product Characteristics ("physician insert") for the vaccine product. It is particularly important for long-term vaccine-induced protection that the recommended minimum interval between the second-to-last and last vaccination is not shortened for primary immunisations. Therefore, the minimum intervals should only be undercut in urgent exceptional cases (e.g. short-term trips abroad).

Vaccination records should be checked and immunisations provided particularly during routine health check-up visits for infants and children (U1 - U9 as well as U10 and U11), school entry health examinations, health checks that take place throughout schooling, the girls' examination (M1), adolescent health checks (J1 and possibly J2), examinations in line with the Youth Labour Protection Act [Jugendarbeitsschutzgesetz], preventive medical examinations for adults, prenatal care in the second and third trimester, and routine examinations of mothers within the first 6 – 8 weeks after birth.

People with chronic diseases should receive the standard vaccinations recommended in the immunisation schedule as long as there are no specific contraindications.

Because of the increased risk of acquiring infectious diseases or developing a severe course of a disease in early childhood, the goal must be to administer recommended vaccinations for infants **as early as possible**. The hexavalent and pneumococcal vaccinations should be completed by the 11th month of life, the MenB vaccination by the 12th month of life, and the MMR vaccination by the 15th month of life. Experience shows that vaccinations that start later than recommended are often not continued in a timely manner. Until vaccination gaps have been detected and closed, for instance at the school entry health examination, inadequately vaccinated children have insufficient vaccination protection. Age-appropriate full vaccination protection must be ensured before entry to a community facility, and at the latest before starting school.

Table 1 | Immunisation schedule (standard immunisations with vaccines and monoclonal antibodies [mAb]); for indication-based vaccinations see Table 2

A - Infants, and toddlers until 59 months of age (< 5 years)

	Age in weeks			Age in months										
Vaccination/Immunisation	0	4	6	2	3	4	5 – 6	7 – 10	11*	12	13 – 14	15	16 – 23	24 – 59
Routine health checks	U2	U3		U4			U5		U6				U7	U7a/U8
Respiratory syncytial virus	mAb (single dose) according to the month of birth[a]													
Rotavirus (RV)			P1[b]		P2	(P3)								
Tetanus (T)[c]				P1		P2			P3[f]					
Diphtheria (D/d)[c]				P1		P2			P3[f]					
Pertussis (aP/ap)[c]				P1		P2			P3[f]					
Hib[c] - *H. influenzae* type b				P1		P2			P3[f]					
Poliomyelitis (IPV)[c]				P1		P2			P3[f]					
Hepatitis B (HB)[c]				P1		P2			P3[f]					
Pneumococci[c, d]				P1		P2			P3[f]					
Meningococci serogroup B[e]				P1		P2				P3[f]				
Measles, mumps, rubella									P1			P2		
Varicella (V)									P1			P2		

B - Children ≥ 5 years of age, adolescents, and adults

	Age in years									
Vaccination	5 – 6	7 – 8	9 – 11	12 – 14	15 – 16	17	18 – 24	25 – 59	60 – 74	ab 75
Routine health checks	U9	U10	U11	J1		J2				
Tetanus	B1		B2				B[h]			
Diphtheria	B1		B2				B[h]			
Pertussis	B1		B2				B3[h]			
Poliomyelitis			B1							
Hepatitis B										
HPV – Human papillomaviruses			P1[g]/P2[g]							
Meningococci serogroups ACWY				P1						
Measles							S[i]			
Mumps, rubella										
Varicella										
Pneumococci									S[k]	
Herpes zoster (HZ)									P1[l]/P2[l]	
Influenza									S (annual)[m]	
COVID-19							Px[j]		S (annual)[m]	
Respiratory syncytial virus										S[n]

Recommended time of vaccination

Recommended time of immunisation with mAb

Catch-up vaccination and immunisation (primary immunisation of all individuals not yet vaccinated or completion of an incomplete vaccination series)

P Primary immunisation (P1–P3)

B Booster vaccination

S Standard vaccination

mAb monoclonal antibody

U/J **routine health check up for children and adolescents**

a Infants born between April and September should receive Nirsevimab in the autumn before the start of their 1st RSV season; newborns of any gestational age born during the RSV season (usually between October and March) should receive Nirsevimab as soon as possible after birth, ideally on discharge from the birth center or at routine health check "U2" (3rd - 10th day of life).

b The first vaccination should be administered at the age of 6 weeks. Depending on the vaccine used, 2 or 3 vaccine doses must be administered at least 4 weeks apart

c Premature infants should receive an additional vaccine dose at the age of 3 months, so in total 4 vaccine doses

d Infants (incl. premature infants) receive a PCV13 or PCV15 vaccine

e According to the product information, vaccination series consists of 3 vaccine doses at the age of 2 - 23 months and 2 vaccine doses from the age of 24 months onwards

f The previous vaccination should be at least 6 months in the past

g Routine vaccination for children and adolescents aged 9 –14 years with 2 vaccine doses administered at least 5 months apart. If administered as catch-up vaccination, with the vaccination series beginning at age > 14 years, or when the 1st and 2nd vaccine doses were administered < 5 months apart, a 3rd vaccine dose is needed

h Td booster vaccination every 10 years. The next due Td vaccination may be administered as a single Tdap vaccination or, if indicated, as a Tdap/IPV combination vaccination

i Single vaccination using a MMR vaccine for all those born after 1970 and ≥ 18 years of age who have a unclear vaccination status, are unvaccinated, or who received only one vaccination in childhood

j Vaccinate until the number of ≥ 3 SARS-CoV-2 antigenic contacts required for baseline immunity (including at least 1 vaccination) is reached. Minimum vaccination interval between P1 and P2 ≥ 4 to preferably 12 weeks, and between P2 and P3 ≥ 6 months

k Vaccination with PCV20

l Two vaccine doses with the adjuvanted herpes zoster inactivated vaccine at an interval of 2 to 6 months

m annual vaccination in autumn (once per season)

n Vaccination with a mRNA- or protein-based RSV vaccine once in late summer/autumn before the start of the RSV season

* Vaccinations can be administered at different vaccination appointments. MMR and varicella can be administered at the same appointment or at least 4 weeks apart

3. Standard vaccinations for adults, indication-based vaccines, boosters, and vaccinations to manage travel or elevated job risk

3.1 Overview

For the implementation of the immunisation schedule for infants, children, adolescents, and adults (see Table 1A and 1B) vaccination status should be checked regularly and brought up to date where necessary. All medical consultations provide suitable opportunities.

In addition to standard vaccinations (S), other indication-based vaccinations (I) may be advisable in particular epidemiological situations or where there is a particular hazard to children, adolescents, and adults (see Table 2). Vaccinations to manage occupational risks (O) and travel vaccinations (T) are particular cases of indicated vaccinations. Travel vaccinations may be required to comply with international health regulations (including yellow fever vaccination) or may be recommended for individual protection while travelling.

Physicians are responsible for recommending the type and chronological order of vaccinations in each individual case, considering the indications and, where applicable, existing contraindications.

In addition to the vaccinations recommended by STIKO, other vaccinations may be indicated based on the vaccine's existing licensure. These specific indications are not further discussed here, but they can be relevant for the protection of individuals, depending on their health situation. Physicians are responsible for informing patients of these additional protective options. The lack of a STIKO recommendation should not prevent physicians from carrying out further vaccinations when justified.

If an individual indication for vaccination is not covered by a licensure valid for Germany or by the Summary of Product Characteristics of the corresponding vaccine, this is known as an off-label use. In case of injury, off-label use has consequences for liability and compensation. The physician administering the vaccine therefore has particular obligations for documentation and the provision of information (see chapter 4.1 and chapter 4.2). Claims for benefits under Section § 4, para. 1, Book XIV of the Social Code, due to a recognised vaccination injury caused by a publicly recommended vaccination, are granted by the relevant pension offices.

The vaccinations in Table 2 differ in both their epidemiological relevance and the coverage of costs (see notes on the cost coverage of protective vaccines, chapter 4.14). They are divided into the following categories:

S **Standard** vaccinations for universal application (see also Table 1A and 1B, immunisation schedule)
B **Booster** vaccinations
I **Indication-based** vaccinations for risk groups with an individually (not occupationally) increased risk of exposure, illness, or complication, as well as for the protection of third parties
O Vaccinations due to an increased **occupational** risk, for example after risk assessment according to the Occupational Health and Safety Act [Arbeitsschutzgesetz]/Ordinance on Biological Substances [Biostoffverordnung]/Ordinance on Occupational Health and Safety Precautions [Verordnung zur arbeitsmedizinischen Vorsorge] and/or for the protection of third parties in the context of occupational activity
T Vaccinations due to privat or occupational **travel** (see also travel vaccination recommendations from STIKO and the DTG)

Table 2 | Recommendations on standard vaccinations for adults, and indication-based (occupational and travel) vaccines and boosters for all age groups

Vaccination against	Cate-gory	Indication	Notes on use (Note package leaflet/ Summary of Product Characteristics)
Chikungunya	O	Persons, who carry out specific tasks involving the chikungunya viruses in accordance with the Biological Agents Ordinance (e. g., in research facilities or laboratories) with concideration to the vaccine recommended for the respective age group.	Vaccination with one dose of the live attenuated vaccine or the inactivated vaccine. For persons aged 60 years and older, only the inactivated vaccine should be used. At this time, no statement can be given regarding the necessity or timing of a booster vaccination. For further information, including contraindications and vaccine characteristics, as well as information for occupational travelers (e.g., military personnel), see Scientific rationale for vaccination against chikungunya in Epid Bull 28/2025[1], and travel vaccination recommendations from STIKO and the DTG
	T	Persons ≥ 12 years of age, ▸ traveling to an area with a current and ongoing outbreak of chikungunya, ▸ those planning a longer stay (> 4 weeks) or repeated short stays in areas where chikungunya is endemic and who are at increased risk of chronicity or severe disease progression (e.g., age ≥ 60 years or severe underlying medical condition).	
Cholera	T	▸ travel in areas with a cholera epidemic with unsure/ limited access to clean drinking water ▸ long-term occupation in areas with a cholera epidemic ▸ work as a disaster relief worker Further information: see travel vaccination recommendations from STIKO and the DTG	According to the Summary of Product Characteristics.
COVID-19 (Coronavirus Disease 2019)	S	All persons aged 18 – 59 years with incomplete baseline immunity (< 3 antigen contacts or unvaccinated)[b]	Vaccination with an approved mRNA or protein-based COVID-19 vaccine with WHO-recommended variant adaptation until the number of ≥ 3 required SARS-CoV-2 antigenic contacts for baseline immunity (of which at least 1 vaccination) is reached.
		Women of childbearing age and healthy pregnant women[a, b] of any age with incomplete baseline immunity	
		Persons ≥ 60 years	▸ Vaccination with an approved mRNA or protein-based COVID-19 vaccine with WHO-recommended variant adaptation until the number of ≥ 3 required SARS-CoV-2 antigenic contacts for baseline immunity (of which at least 1 vaccination) is reached. ▸ Annual vaccination in autumn[d] (once per season) with an approved mRNA or protein-based COVID-19 vaccine with WHO-recommended variant adaptation
	I	Residents of long-term care facilities and people with an increased risk of serious illness in integration aid facilities[b]	
		Persons ≥ 6 months with increased health risk for a severe course of COVID-19 due to an underlying disease,[b] e.g. ▸ Chronic diseases of the respiratory organs (e.g. COPD) ▸ Chronic cardiovascular, liver and kidney diseases ▸ Diabetes mellitus and other metabolic diseases ▸ Obesity (BMI ≥ 30) ▸ CNS diseases, such as chronic neurological diseases, dementia or mental disability, psychiatric diseases or cerebrovascular diseases ▸ Trisomy 21 ▸ Congenital or acquired immunodeficiency (e.g. HIV infection, chronic inflammatory diseases under relevant immunosuppressive therapy, post organ transplantation)[c] ▸ Active/malignant neoplastic diseases[c]	
		Family members and close contacts from the age of 6 months of persons[b] in whom COVID-19-vaccination is not expected to produce a protective immune response	
	O	Staff in medical facilities and long-term care facilities with direct contact with patients or residents[b]	

a) Pregnant women should receive missing vaccine doses from the 2nd trimester onwards and preferably with the authorized/licensed mRNA vaccine Comirnaty. Nuvaxovid may be considered if there is a product-specific, medical or other contraindication to mRNA vaccines

b) Persons aged 12 to < 30 years and pregnant women should generally not receive a Spikevax product.

c) In immunodeficient persons with a relevant restriction of the immune response, additional vaccine doses and a shorter vaccination interval (≥ 4 weeks) may be necessary.

d) If indicated, vaccination against seasonal influenza and pneumococci can also be administered on the same date.

(Table 2 continued)

Vaccination against	Cate-gory	Indication	Notes on use (Note package leaflet/ Summary of Product Characteristics)
Dengue	O	Persons who have had a laboratory-confirmed dengue virus infection and who carry out specific activities involving dengue viruses outside of endemic areas (e.g. in research institutions or laboratories).	Primary immunisation with 2 doses of the tetravalent, live attenuated Qdenga vaccine (minimum interval of 3 months between doses of vaccine). The full vaccination series (2 doses of vaccine) should be completed before departure (for endemic areas, see also https://www.cdc.gov/dengue/areas-with-risk/index.html). Booster vaccinations: At the present time, no statement can be made about the necessity or timing of a booster vaccination. Corresponding studies are not yet completed.
	R	Persons ≥ 4 years old who have a history of a laboratory-confirmed dengue virus infection and are travelling to a dengue endemic area and have an increased risk of exposure there (e.g. longer stay, current outbreak). For persons who have not had a dengue virus infection in the past ('dengue naive'), STIKO does not currently issue a general vaccination recommendation due to the limited data available (see also STIKO information in the box on p 9. For further information, see Epid Bull 48/2023[6] (in English).	
Diphtheria	S/B	Anyone with absent or incomplete primary immunisation, or if either the last vaccination for the primary immunisation or the last booster vaccination was more than 10 years ago.	Adults should receive the next due diphtheria vaccination as a single Tdap combination vaccination or, if indicated, a Tdap-IPV combination vaccination. Unvaccinated people or those with no vaccination record should receive two vaccine doses at intervals of 4-8 weeks and a 3rd vaccine dose 6-12 months after the 2nd vaccine dose. Travel to an epidemic area should not be undertaken before receipt of two doses.
***Haemophilus influenzae* type b (Hib)**	I	People with an increased susceptibility to encapsulated bacteria (e .g. anatomical or functional asplenia).	Single vaccine dose. The usefulness of revaccination cannot be assessed at present because of insufficient data.
		In the event of clustered occurrence or outbreaks, as recommended by the health authorities (see Epid Bull 34/2025[9] and Table 7).	In line with recommendations of the health authorities
Hepatitis A (HA)	I	▸ People with sexual behaviours with increased risk of exposure; route of transmission anogenital-oral ▸ People who frequently receive blood components, e.g., injecting drug users, haemophiliacs, or people with liver disease/general conditions affecting the liver. ▸ Residents of psychiatric institutions or comparable welfare facilities for people with behavioural disorders or cerebral damage	Primary immunisation and booster vaccination according to the Summary of Product Characteristics. Serological screening for antibodies against HA virus is required only for people who have lived for prolonged periods in endemic regions, grew up in families from endemic regions or were born before 1950.
	O	People who are at increased risk of occupational exposure, including trainees, interns, students and volunteers with comparable exposure risk, for example: ▸ Healthcare workers (including paramedics and emergency responders, kitchen, laboratory, technical and cleaning services, psychiatric and welfare institutions) ▸ People in contact with sewage e.g. sewer system and wastewater workers ▸ Employment (including kitchen and cleaning) in children's day care centres, children's homes, sheltered employment facilities, refugee shelters, and others	
	T	Those travelling in regions with a high prevalence of hepatitis A. Further information: see travel vaccination recommendations from STIKO and the DTG	

(Table 2 continued)

Vaccination against	Cate-gory	Indication	Notes on use (Note package leaflet/ Summary of Product Characteristics)
Hepatitis B (HB)	I	1. People at risk of severe hepatitis B because of an existing or expected immunodeficiency or immuno-suppression, or other pre-existing diseases, for example: HIV-positive or hepatitis C-positive individuals, and patients on haemodialysis.[a] 2. People at increased risk of non-occupational exposure, for example: people in contact with HBsAg carriers in the family or flat share, people at high risk of acquiring hepatitis B through sexual contact, injecting drug users, prison inmates, and psychiatric inpatients.[a]	**For indication groups 1-4, the following applies:** Routine serological testing before hepatitis B vaccination to rule out an existing HBV infection is not necessary. There is no risk in vaccinating someone already infected with HBV against infection, but the vaccination is not effective. Serological testing can be reasonable in specific situations (for example, for financial reasons, to avoid unnecessary vaccinations, or in case of high anamnestic risk of exposure, including if a sexual partner is HBsAg positive).[b] To monitor vaccination success, anti-HBs level should be determined 4 - 8 weeks after the 3rd vaccine dose (**successful vaccination:** anti-HBs ≥ 100 IU/l).[c] For "**low-responders**" (anti-HBs 10 - 99 IU/l), an immediate additional vaccine dose is recommended, with repeated anti-HBs monitoring 4 - 8 weeks after vaccination. If anti-HBs is still < 100 IU/l, up to two additional doses are recommended with subsequent anti-HBs monitoring 4 - 8 weeks after each vaccination. There is controversy over reasonable proceedings if the anti-HBs level remains < 100 IU/l after the administration of 6 vaccine doses; for further explanation, see Epid Bull 36/37 2013.[11] For **"non-responders"** (anti-HBs < 10 IU/l), testing for HBsAg and anti-HBc is recommended to exclude an existing chronic HBV infection. If both parameters are negative, proceed as described for "low-responders" above. After successful primary immunisation, defined as anti-HBs ≥ 100 IU/l, routine booster vaccinations are usually not necessary. The exceptions are patients with humoral immune deficiency (annual anti-HBs monitoring and a booster dose when anti-HBs < 100 UI/l), and if applicable, people who are at particularly high individual exposure risk (anti-HBs monitoring after 10 years and a booster dose if anti-HBs < 100 UI/l). An additional vaccine dose followed by serological monitoring, as described above, should be administered to people vaccinated against hepatitis B during infancy but with a newly-developed risk of hepatitis B infection (see indications 1 - 4) and unknown anti-HBs level.
	O	3. People at increased risk of occupational exposure, including trainees, interns, students and volunteers with comparable exposure risk, for example: healthcare personnel (including laboratory personnel and cleaning personnel), paramedics and emergency responders, occupational first aid providers, police officers, and personnel at facilities with large numbers of hepatitis B-virus (HBV)-infected people (for example, correctional facilities, shelters for refugees, immigrants or asylum seekers, and homes for disabled people).[a, b]	
	T	4. Travel-related indication: an individual risk assessment is required.[c] Further information: see travel vaccination ecommendations from STIKO and DTG	
		a) This list of groups provides examples and is not intended to be a definitive list of indicated groups. The vaccination indication should be based on assessment of the actual exposure risk (see Epid Bull 36/37 2013).[11] b) In the field of occupational health services, the recommendations of the regulation on Occupational Health and Safety Precautions [Verordnung zur arbeitsmedizinischen Vorsorge] should also be considered. c) For people in group 4 (travel vaccination), it is necessary to evaluate whether, in view of the real risk of exposure and the individual risk of non-responding, serological monitoring is necessary.	
Herpes zoster (HZ)	S	Adults ≥ 60 years of age	Two vaccinations with the adjuvanted herpes zoster inactivated vaccine at intervals of 2 to 6 months.
	I	Persons aged ≥ 18 years with an increased risk of developing herpes zoster as a result of congenital or acquired, in particular iatrogenic, immunodeficiency or as a result of severe manifestation of a chronic disease, e.g., persons with or after (respectively): ▶ Hematopoietic stem cell transplantation (HSCT) ▶ Cellular therapies ▶ Solid organ transplantation ▶ Immunosuppressive medication (e.g., rituximab, JAK inhibitors, anifrolumab [type I interferon receptor blocker]), cytostatic chemotherapy ▶ Malignant neoplastic diseases ▶ HIV infection ▶ Rheumatoid arthritis ▶ Systemic lupus erythematosus ▶ Chronic inflammatory bowel disease ▶ Chronic obstructive pulmonary disease (COPD) or bronchial asthma ▶ Chronic kidney disease (CKD) ▶ Diabetes mellitus	Two vaccinations with the adjuvanted herpes zoster inactivated vaccine at intervals of at least 2 to 6 months. According to STIKO's assessment, people between the ages of 18 and 59 years with mild or uncomplicated forms of chronic diseases, or those that are well controlled with medication, are not associated with a significantly increased risk of developing herpes zoster and are therefore not subjet to the recommendation.

(Table 2 continued)

Vaccination against	Cate-gory	Indication	Notes on use (Note package leaflet/ Summary of Product Characteristics)
Human papilloma-viruses (HPV)			See human papillomavirus (HPV)
Influenza	S	Adults ≥ 60 years of age	Annual vaccination in autumn/winter (once per season) with an inactivated high-dose or MF-59-adjuvanted influenza vaccine containing the current antigen combination recommended by the World Health Organization (WHO).[b]
	I	All pregnant women from the second trimester, or from the first trimester in case of an increased health risk resulting from an underlying disease.	Vaccination with an inactivated influenza vaccine containing the current antigen combination recommended by the WHO.
		People from 6 months of age with an increased health risk resulting from an underlying disease, for example: ▸ Chronic diseases of the respiratory tract, including asthma and chronic obstructive pulmonary disease (COPD) ▸ Chronic cardiovascular, liver and kidney disease ▸ Diabetes mellitus and other metabolic diseases ▸ Obesity (BMI ≥ 30) ▸ Chronic neurological diseases, e.g., multiple sclerosis with relapses triggered by infections ▸ Congenital or acquired immunodeficiency ▸ HIV infection Residents of retirement or nursing homes. People who might act as a potential source of infection for at-risk patients by living in the same household or providing care. People at risk are considered to include anyone with underlying diseases of the above-mentioned examples, who are more likely to experience a reduced response to influenza vaccines.	Annual vaccination in autumn/winter (once per season) with an inactivated influenza vaccine containing the current antigen combination recommended by the WHO. Children aged ≤ 9 years who are vaccinated against influenza for the first time in their lives should receive 2 vaccine doses at least 4 weeks apart. Children and adolescents aged 2 to 17 years can alternatively be vaccinated with a live attenuated influenza vaccine (LAIV) if no contraindications exist (see Summary of Product Characteristics). If there are reasons for not using an injection (e.g. injection phobia, coagulation disorders) LAIV should be used preferentially. For persons aged 60 years and older, inactivated high-dose or MF-59-adjuvanted influenza vaccines are recommended.[b]
		People who have frequent, regular, and direct contact in their daily lives (at home) with, e.g., pigs, poultry, wild birds (free-range and captive), and seals.[a]	Annual vaccination in autumn/winter (once per season) with an inactivated influenza vaccine containing the current antigen combination recommended by the WHO. For persons aged 60 years and older, inactivated high-dose or MF-59-adjuvanted influenza vaccines are recommended.[b]
		If a severe epidemic is considered to be likely, based on experiences in other countries, or is expected following a manifest antigenic drift or antigenic shift, and the vaccine contains the new variant.	According to the recommendations of the health authorities (pandemic plans on national and federal level: www.rki.de/pandemieplanung).
	O	People at increased risk, e.g., medical personnel, people in establishments dealing extensively with the public, and people who may act as a possible source of infection by caring for individuals at particular risk.	Annual vaccination in autumn/winter (once per season) with an inactivated influenza vaccine containing the current antigen combination recommended by the WHO. For persons aged 60 years and older, inactivated high-dose or MF-59-adjuvanted influenza vaccines are recommended.[b]
		Persons[a], including trainees, interns, students, and volunteers, who have frequent, regular, and direct contact with, e.g., pigs, poultry, wild birds (free-range and captive), and seals as part of their work and who are employed in, for example: ▸ Livestock farms ▸ Zoos or animal parks ▸ Animal shelters or rescue centers ▸ Veterinary practices ▸ Slaughterhouses	
	T/I	Vaccination is generally advisable for travellers aged > 60 years and the groups named under I (indication-based vaccination) whose influenza vaccination status is not up to date. Further information: see travel vaccination recommendations from STIKO and the DTG	Vaccination with an inactivated influenza vaccine containing the current antigen combination recommended by the WHO. For persons aged 60 years and older, inactivated high-dose or MF-59-adjuvanted influenza vaccines are recommended.[b]

a) Vaccination with seasonal human influenza vaccines does not protect against infection with avian or swine influenza viruses, but it can reduce the risk of co-infection with currently circulating seasonal influenza viruses. This is not only a matter of protecting individual employees or other affected persons against infection with seasonal influenza viruses, but also of protecting the population as a whole.

b) If the administration of an MF-59-adjuvanted and a high-dose influenza vaccine is not possible for medical reasons (e.g. due to increased reactogenicity with previous vaccinations), a standard influenza vaccine (egg or cell-based) can also be used for persons aged ≥ 60 years.

(Table 2 continued)

Vaccination against	Category	Indication	Notes on use (Note package leaflet/ Summary of Product Characteristics)
Japanese encephalitis	O	Laboratory staff working specifically with reproductive Japanese encephalitis wild-type virus strains	Basic (primary) immunisation with two doses; 1 booster vaccination before re-exposure with a minimum timeframe of 12 months after basic (primary) immunisation
	T	Periods of residence in endemic areas during the transmission period, particularly during ▸ travels in current outbreak areas ▸ long term visits (> 4 weeks) ▸ repeated short-term stays ▸ expected periods of residence near rice fields and pig farms (not only in rural areas) Further information: see travel vaccination recommendations from STIKO and the DTG	
Measles	S	Those ≥ 18 years and born after 1970 with unclear vaccination status, who have not been vaccinated, or who received only one vaccination during childhood.	Single vaccine dose with an MMR vaccine.
	I	Forthcoming admission or visit to a community facility (e. g. Kindergarten, day care facility for children): ▸ Infants from the age of 9 months	Vaccination with 2 doses of an MMR/V[a]-vaccine. Provided that the 1st vaccination was administered at the age of 9 to 10 months, the 2nd MMR/V[a] vaccination should be administered at the beginning of the second year of life.
		During an outbreak: ▸ Those born after 1970, from the age of 9 months, with unclear vaccination status, who are unvaccinated, or who received only one vaccination during childhood. ▸ Exceptionally 6 to 8-month-old infants after individual risk benefit consideration (*off-label-use*)	Single vaccination with MMR(V)[b] vaccine. If necessary complement vaccinations according to the recommendations applying for the relevant age group. Provided that the 1st vaccination has been administered at the age of 9 to 10 months, the 2nd MMR/V[a] vaccination should be administered at the beginning of the second year of life. With 1st vaccination at the age of 6 to 8 months a 2nd and 3rd MMR/V[a] vaccination should be administered at the age of 11 and 15 months.
		a) MMR/V = MMRV or MMR in co-administration with VZV vaccine b) MMR(V) = MMR with or without co-administration of VZV vaccine	
Measles, Mumps, Rubella (MMR)	O	Individuals born after 1970 in the following fields of professional activity (including trainees, interns, students and volunteers): ▸ Medical facilities (according to § 23 (3) sentence 1 IfSG) including facilities of other human medical health care professions ▸ Occupation with contact to potentially infectious material ▸ Care facilities for mostly elderly people (according to § 71 SGB XI) ▸ Community facilities e. g. day care facility for children or pupils (according to § 33, IfSG) ▸ Institutions housing immigrants, refugees, persons required to leave the country and asylum seekers ▸ Technical and vocational colleges, universities	Vaccination with 2 doses of an MMR-vaccine (or, if varicella vaccination is indicated at the same time, with a MMR/V-vaccine). The number of required vaccine doses depends on the component with the least documented vaccinations. For women, each of the three vaccine components (M-M-R) requires vaccination with two doses. For men, the measles and mumps components require vaccination with two doses. For protection against rubella, a single vaccination is sufficient. There are no safety concerns against further MMR vaccination(s) with existing immunity against individual components.
Meningococci	S	Catch-up vaccination for adults aged 18 to < 25 years[a]	Single vaccination with meningococcal-ACWY-conjugate vaccine
		a) Standard vaccination recommendation (primary immunisation) for children and adolescents aged 12 to14 years; catch-up vaccination should be completed by the age of < 25 years (see Table 1B; vaccination schedule).	
	I	Those whose health is at risk: people with congenital or acquired immunodeficiencies, especially those: ▸ With complement/properdin deficiencies, ▸ Receiving complement C5-inhibitor therapy with e. g. Eculizumab or Ravulizumab ▸ With hypogammaglobulinaemia ▸ With anatomic or functional asplenia (e. g. sickle cell disease).	Vaccination with meningococcal-ACWY-conjugate vaccine and a men-B vaccine. For further details on implementation of meningococcal vaccination see chapter 3.2.
		During outbreaks or regional clusters upon recommendation by the local health authorities. Further information: see chapter 5.2. and Table 7.	In line with the recommendations of the health authorities.
	O	At-risk laboratory personnel (for work involving a risk of exposure to *N. meningitidis* aerosols).	Vaccination with meningococcal-ACWY-conjugate vaccine and a men-B vaccine (see chapter 3.2.

(Table 2 continued)

Vaccination against	Cate-gory	Indication	Notes on use (Note package leaflet/ Summary of Product Characteristics)
Meningococci continued	T	Those travelling to countries with epidemic occurrences, especially if they will be in close contact with the indigenous population (e. g. development aid workers, disaster relief workers, medical personnel, long-term stayer). This also applies to stays in regions with disease outbreaks and vaccination recommendation for the indigenous population (note WHO and country-specific information). Further information: see travel vaccination recommendations from STIKO and the DTG	Vaccination with meningococcal-ACWY-conjugate vaccine. For disaster relief workers and depending on their exposure for development aid workers and medical personnel additionally a men-B vaccination. For further details on implementation of meningococcal vaccination see chapter 3.2.
		Before a pilgrimage to Mecca (Hajj, Umrah). Further information: see travel vaccination recommendations from STIKO and the DTG	Vaccination with a meningococcal-ACWY-conjugate vaccine (see chapter 3.2.). Take note of entry regulations.
		Before long-term stays, especially children and adolescents as well as students or people in training of a specific occupation. Further information: see travel vaccination recommendations from STIKO and the DTG	Vaccination with Meningococcal-ACWY-conjugate vaccine and/or men-B vaccine in line with the recommendations of the destination countries.
Mpox and other Orthopox viruses	I	People at increased risk of exposure (e.g., men as well as transgender and non-binary people who have sex with men and frequently change partners, sex workers)	For primary immunisation persons aged ≥ 12 years or older receive 2 subcutaneous vaccine doses of Imvanex vaccine (Modified Vaccinia Ankara, Bavarian Nordic [MVA-BN]) at least 28 days apart For immunocompetent persons who have been vaccinated against small- pox (variola major) in the past, a single vaccine dose is sufficient. Immunocompromised individuals (e.g., HIV-infected individuals) should receive 2 vaccine doses for protection against mpox, regardless of whether they have been vaccinated against smallpox in the past.
	O	Persons who carry out specific activities involving mpox viruses (MPXV) or other orthopoxviruses in accordance with the Biological Agents Ordinance (e.g., in research facilities or laboratories).	
Mumps	O	See under Measles, Mumps, Rubella	Vaccination with 2 doses
Pertussis	S/B	Adults should receive the next due Td vaccine as a single Tdap combination vaccine.	Vaccination with a Tdap combination vaccine, or if indicated, as a Tdap-IPV combination vaccine (for available vaccines, please see Table 12.
	I	Pregnant women at the beginning of the 3rd Trimester (from the 28th week of pregnancy). If there is an increased probability of premature birth, vaccination should be administered during the 2nd trimester.	Tdap combination vaccine, or if indicated, as a Tdap-IPV combination vaccine. Vaccination indication is independent of the timeframe to a previously administered pertussis vaccine. Indication for vaccination in every pregnancy.
		If in the last 10 years there has been no pertussis vaccination, the following groups should receive 1 dose of pertussis vaccine: ▸ people in close household contact (e. g. parents[a] and siblings, friends) and caregivers of newborns (e. g. day care providers, babysitters, and where applicable grandparents), if possible at the latest 4 weeks before the birth of the child	Vaccination with a Tdap combination vaccine, or if indicated, as a Tdap-IPV combination vaccine (for available vaccines, please see Table 12).
	O	If in the last 10 years there has been no pertussis vaccination, personnel in healthcare as well as in community facilities should receive 1 dose of pertussis vaccine.	
	a) If a mother was not vaccinated during the pregnancy, she should ideally be vaccinated in the first few days after the birth of her child.		
Pneumococci	S	Adults ≥ 60 years of age.	Vaccination with the 20-valent conjugate vaccine (PCV20). Persons who have been vaccinated with the 23-valent polysaccharide vaccine (PPSV23) in the past should receive a vaccination with PCV20 at an interval of 6 years after PPSV23 vaccination. No data are yet available on the need for booster vaccinations after vaccination with PCV20, which is why in this regard no recommendation can be made at this point in time.

(Table 2 continued)

Vaccination against	Cate-gory	Indication	Notes on use (Note package leaflet/ Summary of Product Characteristics)
Pneumococci (continued)	I	Children, adolescents and adults at increased health risk as a result of an underlying disease: **1. Congenital or acquired immunodeficiencies,** such as: ▸ T-cell deficiency or defective T-cell function ▸ B-cell or antibody deficiency (e. g. hypogammaglobulinaemia) ▸ Deficiency or dysfunction of myeloid cells (e. g. neutropenia, chronic granulomatosis, leukocyte adhesion deficiencies, signal transduction defects) ▸ Complement and properdin deficiencies ▸ Functional hyposplenism (e. g. sickle cell disease), splenectomy,[a] or anatomical asplenia ▸ malignant neoplastic diseases ▸ HIV infection ▸ After bone marrow transplantation ▸ Immunosuppressive therapy* (e. g. because of organ transplantation or autoimmune disease) ▸ Immunodeficiency resulting from chronic kidney failure, nephrotic syndrome or chronic liver insufficiency	**Persons ≥ 2 years of age** (children, adolescents and adults): Vaccination with PCV20. Persons ≥ 2 years of age who have already received a sequential vaccination (PCV13/PCV15 + PPSV23) or a single PPSV23 vaccination (Group 2: Other chronic diseases) in the past should receive a vaccination with PCV20 at an interval of 6 years after the PPSV23 vaccination. In the case of severe immunodeficiency, vaccination with PCV20 can be administered as early as 1 year after the PPSV23 vaccination. In addition, individuals who have been vaccinated with PCV13 or PCV15 should receive a PCV20 vaccination at an interval of 1 year.. No data are yet available on the need for booster vaccinations after vaccination with PCV20, which is why in this regard no recommendation can be made at this point in time.
	I	**2. Other chronic diseases,** such as: ▸ Chronic diseases of the cardiovascular system or of the respiratory tract (e. g. asthma, emphysema, or COPD) ▸ Metabolic diseases, e. g. diabetes mellitus treated with oral medication or insulin ▸ Neurological diseases, e. g. cerebral palsy or seizure disorders **3. Anatomical and foreign-material associated risks for pneumococcal meningitis,** such as: ▸ Cerebral spine fluid fistula ▸ Cochlea implant[a]	
	a) vaccination preferably before intervention For information on practical implementation, see chapter 3.2 "Remarks on individual vaccinations"		
	O	Professional activity such as welding or separating metals leading to exposure to metal smoke, including metal-oxidic welding smoke.	Vaccination with PCV20. Persons with an occupational indication who have been vaccinated with the PPSV23 in the past should receive a vaccination with PCV20 at an interval of 6 years after PPSV23 vaccination. No data are yet available on the need for booster vaccinations after vaccination with PCV20, which is why in this regard no recommendation can be made at this point in time.
Polio-myelitis	S/B	Anyone with no or incomplete primary immunisation. Anyone without a one-off booster vaccination.	People are considered fully vaccinated if they received a complete primary immunisation and at least 1 booster vaccination. Missing or not documented primary immunisation vaccine doses are reinstated with IPV in accordance with the Summary of Product Characteristics. Other routine booster vaccinations are not recommended for adults in Germany.
	I	A vaccination is indicated for the following groups of persons: ▸ Those travelling in regions with risk of infection by wild poliovirus (WPV) or by a mutant vaccine virus strain (circulating vaccine-derived poliovirus [cVDPV]) (the current epidemic situation must be considered, especially WHO reports) ▸ Immigrants, refugees and asylum seekers who live in communal accommodation, entering from regions at risk of poliomyelitis; see chapter 4.12 Further information: see travel vaccination recommendations from STIKO and the DTG	People with no primary immunisation record should receive at least 2 doses of IPV-vaccine in an interval of 4 weeks before starting any travels. Missing or undocumented vaccine doses, recommended to achieve full protection should be completed with IPV. For a stay of less than 4 weeks in Afghanistan or Pakistan, the STIKO recommends a poliomyelitis booster vaccination, if the last vaccine dose has been administered more than 10 years ago. For certain countries, the WHO has issued more stringent temporary recommendations if a stay exceeds 4 weeks, e. g. proof of correct vaccination status, (information from the WHO: https://www.who.int/groups/poliovirus-ihr-emergency-committee).

(Table 2 continued)

Vaccination against	Cate-gory	Indication	Notes on use (Note package leaflet/ Summary of Product Characteristics)
Polio-myelitis (continued)	O	▸ Personnel in institutions housing immigrants, refugees and asylum seekers from regions at risk of poliomyelitis ▸ Medical personnel who may come into close contact with cases ▸ Personnel in laboratories with a risk of infection with poliomyelitis	Vaccination or booster vaccination with IPV, if primary immunisation is incomplete or if the last of the primary immunisation vaccinations, or the last booster vaccination was more than 10 years ago. Persons with a continuing risk of exposure should receive booster vaccinations every 10 years
Rabies	O	▸ Veterinarians, hunters, forest workers and other people who handle animals in areas where there is a new occurrence of rabies among wild animals; ▸ People with professional or other close contact with bats; ▸ Personnel in laboratories who work specifically with rabies viruses	If there is an increased exposure to rabies viruses, e.g. in laboratory personnel, standardised serological tests should be carried out to rule out primary vaccination failure after the conventional three-dose vaccination regimen has been administered. This should be done 2 to 4 weeks after the last dose of vaccine. A follow-up test after 6 months is then advisable to detect any secondary vaccination failure. A booster vaccination is recommended if neutralising antibodies are < 0.5 I.U./ml are detected and exposure persists. Subsequently, further check-ups as part of the mandatory occupational health check-up are sufficient.
	T	Those travelling in regions with a high risk of rabies and an increased probability of exposure to rabies (e. g. through contact with stray dogs or bats). Further information: travel vaccination recommendations from STIKO and the DTG	The Summary of Product Characteristics for the two available vaccines, Rabipur and Verorab, contains different information on booster vaccinations when the conventional vaccination schedule is used. The time point for booster vaccinations when the rapid schedules are used has not been determined. STIKO assumes that primary immunisation consisting of 3 vaccine doses provides sufficient capacity for booster vaccination in immunocompetent travellers and that, in the event of exposure, PEP consisting of 2 vaccine doses on days 0 and 3 is sufficient. Routine serological monitoring of travellers is not recommended. For further information, see travel vaccination recommendations from STIKO and the DTG.
Respiratory syncytial virus (RSV)	S	Persons ≥ 75 years of age	Single vaccination, if possible, once before the start of the RSV season with a protein-based or mRNA-based RSV vaccine. Based on the current data, no statement can yet be made on the necessity of booster vaccinations. According to the current state of knowledge, mild or uncomplicated or well-controlled forms of the aforementioned chronic diseases are not associated with a significantly increased risk of developing RSV.
	I	Persons aged 60 – 74 years with severe forms of chronic respiratory diseases, chronic cardiovascular and kidney diseases, haemato-oncological diseases, diabetes mellitus (with complications), a chronic neurological or neuromuscular disease or a severe congenital or acquired immunodeficiency. Residents of care facilities aged 60 – 74 years.	
Rubella	I	Women of childbearing age who are nonimmunised or with an unclear vaccination status. For further information, see Epid Bull 32/2010.[62] Women of childbearing age only vaccinated once. For further information, see Epid Bull 32/2010.[62]	Two vaccinations with MMR vaccine (if varicella vaccination is indicated at the same time, a MMRV combination vaccine can be used). One vaccination with a MMR vaccine.
	O	See under Measles, Mumps, Rubella	Two vaccinations for women One vaccination for men
Tetanus	S/B	Anyone with absent or incomplete primary immunisation, or if the last primary immunisation vaccination or the last booster vaccination was more than 10 years ago.	Adults should receive the next due tetanus vaccination as a single Td combination vaccine, or if indicated, as a Tdap or Tdap-IPV combination vaccine. Incomplete primary immunisation should be completed; booster vaccinations should occur at 10-year intervals. See Table 9 for tetanus immunoprophylaxis in the case of injury (PEP).

(Table 2 continued)

Vaccination against	Cate-gory	Indication	Notes on use (Note package leaflet/ Summary of Product Characteristics)
TBE (tick-borne encephalitis)	I	Persons exposed to ticks in TBE risk areas.	Primary immunisation and booster vaccinations with a vaccine authorised for adults and/or children according to the Summary of Product Characteristics. According to the recommendations of the health authorities. Information on TBE risk areas must be noted; these are published in Epid Bull 9/2026. Note seasonality: April – November **Risk areas in Germany** are currently in particular: ▸ **Baden-Wurttemberg** (except for city district of Heilbronn) ▸ **Bavaria** (except for city district of Schweinfurt) ▸ **Brandenburg**: district of Oberspreewald-Lausitz, district of Oder-Spree, district of Spree-Neiße, city district of Frankfurt (Oder), distric of Elbe-Elster ▸ **Hesse:** district of Odenwald, district of Bergstraße, district of Darmstadt-Dieburg, city district of Darmstadt, district of Groß-Gerau, district of Offenbach, city district of Offenbach, district of Main-Kinzig- Kreis, district of Marburg-Biedenkopf, district of Fulda ▸ **Lower Saxony:** district of Emsland, city district of Celle ▸ **North Rhine-Westphalia:** city district of Solingen ▸ **Rhineland-Palatinate:** district of Birkenfeld ▸ **Saarland:** district of Saarpfalz-Kreis ▸ **Saxony:** city district of Dresden, district of Vogtlandkreis, district of Erzgebirgskreis, district of Bautzen, district of Meißen, district of Zwickau, district of Sächsische Schweiz-Osterzgebirge, district of Mittelsachsen, city district of Chemnitz, district of Goerlitz, district of Nordsachsen ▸ **Saxony-Anhalt:** city district Dessau-Roßlau, district of Anhalt-Bitterfeld, city district of Halle (Saale) ▸ **Thuringia:** city district of Jena, city district of Gera, district of Saale-Holzland-Kreis, district of Saale-Orla-Kreis, district of Saalfeld-Rudolstadt, district of Hildburghausen, district of Sonneberg, district of Greiz, district of Ilm-Kreis, district of Schmalkalden-Meiningen, city district of Suhl, district of Weimarer Land, district of Altenburger Land
	O	Persons at risk of TBE through their profession (exposed laboratory personnel as well as those in risk areas, including forest workers and those exposed in agriculture).	
	T	Tick exposure in TBE risk areas outside Germany. Further information: see travel vaccination recommendations from STIKO and the DTG.	
Tuberculosis		Vaccination with a BCG vaccine is not recommended.	
Typhus	T	When travelling in endemic regions with stays under poor hygienic conditions. Further information: see travel vaccination recommendations from STIKO and the DTG.	According to the Summary of Product Characteristics.
Varicella	I	▸ Seronegative women who wish to conceive, ▸ Seronegative patients before planned immunosuppressive therapy or organ transplantation, ▸ Susceptible patients[a] with severe neurodermatitis, ▸ Susceptible persons[a] in close contact with the two previous groups	Two doses of varicella vaccine (if MMR vaccination is indicated at the same time, a MMRV combination vaccine can be used). For information on the vaccination of seronegative patients receiving immunosuppressive therapy, please refer to rki.de/Immundefizienz.
	O	Seronegative personnel (including trainees, interns, students and volunteers) in the following fields of professional activity: ▸ Medical facilities (according to § 23 (3) Satz 1 IfSG) including facilities of other human medical health care professions ▸ Professional activities involving contact with potentially infectious material ▸ Care facilities for mostly elderly people (according to § 71 SGB XI) ▸ Community facilities e. g. day care facility for children or pupils (according to § 33 IfSG) ▸ Institutions housing immigrants, refugees, persons required to leave the country and asylum seekers	Two doses of varicella vaccine (use of a MMRV-combination vaccine is recommended if MMR vaccination is indicated at the same time).

a) "Susceptible persons" are defined as individuals with no vaccination and no history of varicella or no specific antibodies detected upon serological testing

(Table 2 continued)

Vaccination against	Cate-gory	Indication	Notes on use (Note package leaflet/ Summary of Product Characteristics)
Yellow fever	O	When working in direct contact with yellow fever virus (e. g. in research institutions or research laboratories).	Vaccination in yellow fever immunisation facilities approved by health authorities. A single booster vaccination should be administered prior to re-exposure or in case of continued exposure if 10 or more years have passed since the primary immunisation vaccine dose. After the 2nd vaccine dose, no further booster vaccinations are necessary (max. 2 vaccine doses).
	T	▸ A list of countries with a risk of yellow fever transmission and countries that require a yellow fever vaccination upon entry is provided by the WHO (www.who.int/health-topics/yellow-fever). Further information: see travel vaccination recommendations from STIKO and the DTG	Vaccination in yellow fever immunisation facilities are approved by health authorities. A single booster vaccination should be administered prior to re-exposure or in case of continued exposure if 10 or more years have passed since the primary immunisation vaccine dose. After the 2nd vaccine dose, no further booster vaccinations are necessary. Exceptions and particularities for the following groups of people should be noted: **Pregnant women:** If the 1st vaccine dose (primary immunisation) was administered during pregnancy a 2nd vaccine dose (booster vaccination) should be administered prior to re-exposure or in case of continued exposure, regardless of the interval between the primary and booster vaccine doses (max. 2 vaccine doses). **Immunodeficient individuals:** If at the time of the primary immunisation an immunodeficiency exists, a 2nd vaccine dose should be administered before re-exposure, regardless of the interval between primary immunisation and booster vaccination, in the absence of a contraindication. No serological testing is generally required before or after the 2nd vaccine dose. Before re-exposure or in case of continued exposure, the administration of further vaccine doses should be decided on an individual basis. **Children:** In case of the 1st vaccine dose before the 2nd birthday, a 2nd yellow fever vaccine dose should be administered before re-exposure or in case of continued exposure, provided that 5 or more years have passed since the primary immunisation. No further vaccine dose is necessary in adulthood, provided 2 vaccine doses have been administered in childhood. If only 1 vaccine dose was administered in childhood, a 2nd vaccine dose is recommended before re-exposure in adulthood. In case of the 1st vaccine dose after the 2nd birthday, a 2nd vaccine dose should be administered before re-exposure or in case of continued exposure, if 10 or more years have passed since the primary immunisation (max. 2 vaccine doses). The International Certificate of Yellow Fever vaccination is valid for life already with **one** vaccine dose. This applies to new and existing yellow fever vaccination certificates. Scientific rationale published in Epid Bull 32/2022.[7]

3.2 Remarks on individual vaccinations

This chapter discusses immunisation schemes and application instructions for individual vaccinations. For follow-up vaccinations and irregular vaccination schemes, please refer to the age-appropriate Tables 11 A – E in chapter 6.10. Trade names and age of application for the recommended vaccines are summarized in Table 12 in chapter 6.10. In principle, the information given in the technical data sheet/Summary of Product Characteristics of the individual vaccine is binding. Further helpful information on the use of individual vaccines can be found in the "frequently asked questions" (FAQs) on the RKI website at www.rki.de/impfungen-a-z. Information on supply bottlenecks and details of alternative vaccines can be found on the websites of the Paul Ehrlich Institute (PEI) and STIKO (see also Table 6).

Those insured by statutory health insurance companies are entitled to benefits for protective vaccinations listed in the Protective Vaccination Guidelines of the Federal Joint Committee. Further information on this and on the assumption of costs for vaccinations with professional (occupational) indications can be found in chapter 4.14. In the case of travel vaccinations, the assumption of costs must be clarified on an individual basis; if necessary, the patient must pay for the vaccination themselves.

Chikungunya

For prevention of chikungunya, two vaccines are available in Germany: an inactivated vaccine (Vimkunya, Bavarian Nordic) and a live attenuated vaccine (Ixchiq, Valneva). Both vaccines are licensed for use in persons aged 12 years and older and are administered as a single dose. STIKO recommends vaccination against chikungunya for people aged 12 and older who are traveling to an area where there is currently an outbreak of chikungunya. A vaccination is also recommended for people who are at increased risk of chronicity or severe disease progression (e.g., those aged 60 years or older or those with a severe underlying medical condition), who are planning a longer stay (> 4 weeks) or repeated short stays in a chikungunya endemic area.

STIKO recommends the live attenuated vaccine only for persons up to and including 59 years of age, as an increased number of serious adverse events following vaccination occurred in persons 60 years of age and older after market authorization.

Taking into account the respective age groups, vaccination is also recommended for people with occupational risk who perform specific activities involving chikungunya viruses in accordance with the German Biological Agents Ordinance (BiostoffV) (e.g., in research facilities or laboratories). No statement can be made at this time regarding possible booster vaccinations. For further information, see Epid Bull 28/2025[1].

Vaccination is not recommended for people who have already had chikungunya in the past, as lifelong immunity is assumed after infection.

Cholera

In Germany, two cholera vaccines are currently licensed (Dukoral and Vaxchora). Dukoral is an oral vaccine containing non-viable cholera pathogens. In children aged 6 years and older, adolescents, and adults, primary immunisation against cholera with this vaccine consists of 2 doses, administered with an interval of a minimum of 1 to a maximum of 6 weeks. Children aged 2 to 5 years of age should receive 3 doses (with a minimum interval of 1 week between vaccine doses). The vaccination should be completed at least 1 week before entering an endemic area. Vaxchora is a live attenuated vaccine which is orally administered. In children aged 2 years and older, adolescents, and adults, a single oral dose is sufficient and should be administered no later than 10 days before potential exposure.

Coronavirus Disease 2019 (COVID-19)

An approved mRNA- or protein-based vaccine with a WHO-recommended variant adaptation should be used for vaccination. STIKO recommends baseline immunity against SARS-CoV-2 for all persons aged ≥ 18 years, women of childbearing age and pregnant women, as well as the indication groups listed in Table 2.

A basic level of immunity is reached through at least 3 SARS-CoV-2 antigenic contacts (vaccination or infection). In the special case that the 3 antigen contacts have not yet been reached, according to STIKO, at least **one of the 3 antigenic contacts to build up baseline immunity should be a vaccination**. It is not necessary to serologically confirm any infection that may have occurred. An infection should generally only be counted as an event for the targeted 3 antigenic contacts if the interval to a possible previous vaccination is at least 3 months. Conversely, after an infection, a basic immunisation should be completed at the earliest 3 months later. Missing antigen contacts should be completed by COVID-19 vaccinations. Deviating from the vaccine licensures, STIKO recommends a 3-dose vaccination schedule, if neither SARS-CoV-2 infections nor COVID-19 vaccinations have taken place to date.

According to the STIKO, the first two vaccine doses should be administered at a minimum interval of 4 to preferably 12 weeks, and the 3rd vaccination should be given at least 6 months after the 2nd vaccination to achieve baseline immunity with optimal vaccine-induced protection.

In **infants and young children** aged ≥ 6 months with an underlying disease that is associated with an increased risk of severe COVID-19, primary immunisation with Comirnaty (3 µg) should be carried out according to the schedule with 3 vaccine doses at intervals of 0 - 3 - 8 weeks. To achieve basic immunity, a 4th dose of vaccine is necessary at an interval of 6 months. According to STIKO, a longer vaccination interval between the individual vaccine doses (see above) is also preferable for children from an immunological point of view. When using Spikevax (25 µg, 0.25 mL, only in approved preparation), 3 vaccine doses are required for baseline immunity. When vaccinating children, preceding infections should also be taken into account and considered in terms of when they occurred.

In addition, the following population groups should receive **annual booster** vaccinations in autumn with an mRNA- or protein-based vaccine with a WHO-recommended variant adaptation (see Table 2): people ≥ 60 years of age, persons aged 6 months or older with an increased risk of severe COVID-19 progression due to an underlying disease, residents of care facilities and people with an increased risk of severe disease progression in facilities providing integration assistance, people with an increased work-related risk of infection and direct contact with patients or residents, family members and close contacts aged 6 months or older of people in whom COVID-19 vaccination is not expected to produce a protective immune response. The indication for vaccination should be based on a shared decision-making process between patients and treating physicians, weighing the risk of a severe course of the disease, the benefits of vaccination and the possible side effects.

For **immunocompetent people** who belong to the aforementioned indication groups, who have had a SARS-COV-2 infection in the current year, the annual COVID-19 vaccination in autumn is generally not necessary. Healthy adults < 60 years of age and healthy pregnant women with complete baseline immunity are currently not recommended to receive an annual booster vaccination.

No COVID-19 vaccination is currently recommended for infants, (young) children, and adolescents without underlying disease due to the predominantly mild course of the disease.

In **immunodeficient individual's** further vaccine doses at intervals of at least 4 weeks in addition to the recommended 3 antigenic contacts may be necessary to achieve baseline immunity. The vaccine response can be serologically verified by means of quantitative determination of specific antibodies against the SARS-CoV-2 spike protein; this should be done earliest 4 weeks after administration of a vaccine dose. If a sufficient antibody response has not been achieved despite repeated vaccine administration, the dose can be increased (e.g. doubled) as an off-label use or a vaccine based on a different technology can be used. In order to maintain a protective effect, it may be necessary to administer further doses of vaccine in addition to an annual vaccination in autumn.

Dengue

The tetravalent live attenuated dengue vaccine Qdenga is approved in Germany for use in individuals aged 4 years and older. The primary immunisation series consists of 2 doses of vaccine administered 3 months apart by subcutaneous injection. STIKO recommends vaccination with Qdenga for persons ≥ 4 years of age prior to exposure in a dengue endemic area or for persons who carry out targeted activities with dengue viruses outside of endemic areas (e.g. in research institutions or laboratories) if they have a history of a laboratory-confirmed dengue virus infection. Determining serostatus before vaccination is not recommended due to cross-reactivity between different orthoflaviviruses and the lack of sufficiently sensitive and specific tests that could detect past infection. A minimum interval of 6 months should be observed after a dengue virus infection before the 1st dose of vaccine.

Updated on July 2, 2026

For individuals without a previously laboratory-confirmed dengue virus infection, STIKO currently does not issue a general vaccination recommendation. In seronegative individuals, vaccine effectiveness against dengue virus infections caused by serotypes 3 and 4 (DENV-3 and DENV-4) cannot be inferred from the available data, partly due to the low number of cases. It cannot be ruled out that a natural infection occurring after vaccination may be associated with a more severe course of the disease in dengue-naïve individuals after vaccination. No statement can currently be made regarding possible booster vaccinations. For further information, see Epid Bull 48/2023[6] (in English).

Diphtheria

For primary immunisation of gestational infants against diphtheria, 3 doses of vaccine at the ages of 2, 4, and 11 months are recommended (see Epid Bull 26/2020).[5] It is advisable to perform these vaccinations with a combination vaccine (e. g. DTaP-IPV-Hib-HepB) which simultaneously protects against tetanus, diphtheria, pertussis (whooping cough), poliomyelitis, *Haemophilus influenzae* type b and hepatitis B. For premature babies (born before completed 37 weeks of pregnancy), 4 doses of vaccine at the ages of 2, 3, 4, and 11 months are recommended. There should be an interval of at least 6 months between the last and the preceding dose of the respective vaccination schedule. Booster vaccinations are recommended at 5 – 6 years and 9 – 16 years of age and then at intervals of 10 years. From the age of 5 or older, a vaccine with reduced diphtheria toxoid content (d) is used for booster vaccination and for primary immunisation, generally

combined with tetanus toxoid and pertussis antigen (Tdap) or other indicated antigens.

Haemophilus influenzae type b (Hib)

For primary immunisation of gestational infants against Hib, 3 doses of vaccine at the ages of 2, 4, and 11 months are recommended (see Epid Bull 26/2020).[5] It is advisable to perform these vaccinations with a combination vaccine (e. g. DTaP-IPV- Hib-HepB) which simultaneously protects against tetanus, diphtheria, pertussis (whooping cough), poliomyelitis, *Haemophilus influenzae* type b and hepatitis B. For premature babies (born before completed 37 weeks of pregnancy), 4 doses of vaccine at the ages of 2, 3, 4, and 11 months are recommended.
There should be an interval of at least 6 months between the last and the preceding dose of the respective vaccination schedule. If the 1st Hib vaccination is administered at the age of 1 to 4 years, a single vaccination is sufficient. From 5 years of age and older, Hib vaccination is indicated only in exceptional cases (see Table 2) e.g., in individuals with increased susceptibility to encapsulated bacteria. This, for example, is the case in persons with functional or anatomical asplenia. Monovalent Hib vaccines (Act-Hib, Hiberix) are currently not available in Germany but can be ordered via international pharmacies. For recommendations on post-exposure prophylaxis and outbreaks, see Table 7.

Hepatitis A

For immunisation against hepatitis A, there are monovalent vaccines (Havrix 720 children, Havrix 1440, VAQTA children, VAQTA, and AVAXIM) and combination vaccines (Twinrix children/adults in combination with hepatitis B) licensed in Germany. Twinrix Children is licensed for the age of 1 – 15 years.
Both for children and adults a single dose of Twinrix vaccine does not guarantee adequate protection (e. g. before a trip abroad), since it contains only half as much hepatitis A antigen as the monovalent hepatitis A vaccine. Only after the 2nd dose of the combination vaccine, protection against hepatitis A can be expected for about 1 year. The 3rd dose of the vaccine after 6 (– 12) months provides long-lasting protection for hepatitis A. If needed due to a time crunch before a trip abroad, for adults a shortened schedule (0, 7, 21 days) can be applied when using the Twinrix combination vaccine. It should be noted that a 4th vaccine dose after 12 months is necessary to complete the vaccination series.
When using a monovalent hepatitis A vaccine, full protection is provided for at least 6 months after the 1st dose of vaccine. Completion of primary immunisation or a long-lasting protection requires 2 vaccine doses at intervals of at least 6 – 12 months. Only the monovalent vaccine should be used for post-exposure prophylaxis (PEP). If people are exposed to hepatitis A virus and they are at a particular risk for severe infections, an immunoglobulin preparation should be given at the same time as the 1st vaccine dose (see Table 7).

Hepatitis B

For primary immunisation of full-term infants against hepatitis B (HB), 3 vaccine doses at the ages of 2, 4, and 11 months are recommended (see Epid Bull 26/ 2020).[5] There should be an interval of at least 6 months between the last and second to last dose of the respective vaccination schedule. It is advisable to perform these vaccinations with a combination vaccine (e. g. DTaP-IPV-Hib-HepB) which simultaneously protects against tetanus, diphtheria, pertussis (whooping cough), poliomyelitis, *Haemophilus influenzae* type b, and hepatitis B. For premature babies (born before completed 37 weeks of pregnancy), 4 doses of vaccine at the ages of 2, 3, 4, and 11 months are recommended.
Pre- and post-vaccination serological testing is not necessary to monitor the success of primary immunisation in childhood, adolescence, or adulthood. A booster vaccine dose after vaccination in infancy or early childhood is currently not recommended for children, adolescents, or adults without particular risk factors. Individuals who have been vaccinated against hepatitis B during infancy should only be revaccinated against hepatitis B if a new risk of the disease has developed (for example, new employment in healthcare). In this case, a serological test should be conducted 4 – 8 weeks after vaccination in line with recommendations in Table 2 and Epid Bull 31/2007[12] and 36/37 2013.[11]
Post-exposure hepatitis B prophylaxis in newborns of HBsAg-(Hepatitis-B-surface-Antigen-) positive mothers or mothers of unknown HBsAg status. Since 2023, maternity guidelines state that all pregnant women should have their serum analysed for HBsAg as early as possible after pregnancy has been confirmed as part of their first serological test.

If the result is positive, immunisation of the newborn against hepatitis B must begin immediately postpartum, within 12 hours. The 1st dose of HB vaccine and HB immunoglobulin (30 to 100 IU per kg body weight, usually 1 ml of a preparation with an anti-HBs concentration of 200 IU/ml) should be simultaneously administered into different extremities intramuscularly. Two different vaccination schemes can be applied for primary immunisation with a monovalent vaccine: 0 – 1 – 2 – 12 months of age or 0 – 1 – 6 months of age. The first scheme causes a faster immune response. **Premature babies** should always receive the 0 – 1 – 2 – 12 months of age scheme. If the 0 – 1 – 2 – 12 months of age vaccination scheme is used, the vaccine doses can be administered at the age of 2 and 12 months with a hexavalent vaccine.
For infants who have already received 2 HB vaccine doses, the primary immunisation for tetanus, diphtheria, pertussis, *Haemophilus influenzae* type b, and poliomyelitis can be administered with a pentavalent or hexavalent vaccine. However, additional doses of the hepatitis B vaccine component are harmless. It is important to keep a minimum interval of 5 months between the last 2 vaccine doses at the end of the vaccination series.
In newborns of mothers whose **HBsAg status is not known** and in whom serological testing is not possible before or immediately after delivery, primary immunisation with the HB vaccine should also be started immediately postpartum. If the mother is later determined to be HBsAg positive, passive immunisation with HB immunoglobulin can subsequently be provided for the newborn child within 7 days of birth.
Serological testing is required after the completion of primary immunisation in the newborn child of an HBsAg positive mother. **HBsAg, anti-HBs, and anti-HBc should be checked 4 – 8 weeks after the last vaccine dose of primary immunisation scheme.** If the result of the serological testing shows that there is no immunity, an additional vaccine dose should be administered immediately. The success of the vaccination should be monitored with a serological test (see above). Further procedures (e. g. further vaccination) should be decided individually (see Epid Bull 10/2000 and 8/2001).

Herpes zoster

In Germany, a recombinant adjuvanted inactivated herpes zoster (HZ) subunit vaccine (Shingrix) has been approved since 2018 for people aged ≥ 50 and over; since 2020, it has also been approved for people aged ≥ 18 and over who are at increased risk due to an underlying disease. Distribution of the live vaccine Zostavax, which was not recommended by STIKO due to its limited efficacy and duration of protection (Epid Bull 36/2017),[15] was discontinued in Germany in 2024.

To prevent HZ (shingles) and post-herpetic neuralgia (PHN), STIKO recommends the adjuvanted inactivated HZ-vaccine as a standard vaccine (S) for all persons ≥ 60 years. For individuals ≥ 18 years of age with an increased health risk of developing HZ due to congenital or acquired, particularly iatrogenic, immunodeficiency or due to severe forms of chronic disease, STIKO recommends vaccination with the HZ inactivated vaccine as an indication-based vaccination (I) (Epid Bull 45/2025).[13] Depending on the underlying disease, the indication groups have varying degrees of risk of developing HZ. The risk is highest in individuals with congenital or acquired immunodeficiency (e.g., individuals after hematopoietic stem cell transplantation [HSCT]) and in individuals with certain autoimmune diseases (e.g., systemic lupus erythematosus) or their therapies (e.g., rituximab). However, individuals with severe forms of chronic diseases (e.g., chronic kidney disease, diabetes mellitus) also have an increased risk compared to the general population. According to STIKO's assessment, individuals with severe chronic diseases who benefit most are those whose underlying disease is not well controlled or who are particularly at risk of HZ due to multimorbidity.

According to STIKO, mild or uncomplicated forms of chronic diseases or those that are well controlled with medication are not associated with a significantly increased risk of HZ in people between the ages of 18 and 59 and are therefore not covered by the recommendation.
The vaccination intends to increase the T-cell-mediated immune defense against varicella zoster viruses (VZV) and thus prevents the reactivation of VZV that remains latent inside the nerve ganglia. The vaccination scheme for the inactivated HZ vaccine consists of 2 doses administered intramuscularly at intervals of 2 to 6 months. Based on seroepidemiological studies, it can be assumed that up to 99% of people who grew up in Germany before the introduction of the standard VZV vaccination recommendation in 2004 have had a natural VZV infection (chicken pox). A serological test to determine VZV immune status prior to vaccination

is therefore generally not necessary. The inactivated HZ vaccine can be administered simultaneously with an inactivated, non-adjuvanted seasonal influenza vaccine, a diphtheria-tetanus acellular pertussis vaccine (Tdap), a recombinant, adjuvanted respiratory syncytial virus (RSV) vaccine or a COVID-19 mRNA vaccine, according to the Summary of Product Characteristics. To prevent a recurrence of shingles, it is recommended that the HZ vaccine is administered at least 6 to 12 months after the previous shingles infection. The HZ vaccination should be administered at a time when the acute illness has passed and the symptoms have subsided.

Human papillomaviruses

STIKO recommends routine vaccination against human papillomaviruses (HPV) for all girls and boys aged 9 to 14 years to reduce the burden of disease from HPV-associated tumours. Missing HPV vaccinations should be completed before the age of 18 years. The vaccination series should be completed before first sexual intercourse. Currently, a two-dose immunisation scheme is licensed for children aged between 9 and 14 years (Cervarix, Gardasil 9), with an administration interval of 5 months between the 2 vaccine doses. A 3rd dose is necessary for catch-up vaccinations at age > 14 years, or if the time interval between the 1st and 2nd vaccine dose was < 5 months. The age at the time of the 1st vaccination determines the number of required vaccinations. The Summary of Product Characteristics should be consulted for information on the number of required vaccine doses and the time intervals between vaccinations.
Once a vaccination series is started, it should be completed with the same vaccine product if possible. Further details on the use of HPV vaccines can be found in Epid Bull 16/2016.
HPV vaccination should be used as an opportunity to update other vaccinations recommended for adolescents by STIKO. The Summary of Product Characteristics should be consulted about simultaneous administration with other vaccines.
Women and men who are older than 17 years and have not received an HPV vaccination can also benefit from vaccination against HPV. However, the effectiveness of vaccination in non-HPV-naive individuals might be reduced. Physicians are responsible to point this out to patients after an individual risk-benefit assessment based on the vaccine licensure. The assumption of costs must be clarified individually. Vaccinated women and men must be informed that vaccination with one of the currently available vaccines against human papilloma viruses does not protect against all potentially oncogenic HPV types. Therefore, women are still advised to make use of cervical cancer screening services. The scientific rationale for the recommendation of the HPV vaccination for boys – in addition to the rationale for changing the vaccination age (Epid Bull 35/2014),[17] the rationale for HPV vaccination for girls (Epid Bull 12/2007)[19] and the evaluation of the HPV vaccination (Epid Bull 32/2009)[18] – is published in Epid Bull 26/2018.[16]

Influenza

STIKO recommends the annual influenza vaccination in autumn/winter as a standard vaccination for all persons ≥ 60 years old and as an indication-based vaccination for certain groups of people: e.g. pregnant women and immunodeficient people, (see Table 2). A vaccine with the current antigen combination recommended by the WHO should be used (Epid Bull 31/2024)[22]. For all persons ≥ 60 years of age, the administration of a high-dose or MF-59-adjuvanted vaccine with the current antigen combination recommended by the WHO is recommended. Both vaccines show an improved effectiveness compared to standard vaccines in the target population of ≥ 60-year-olds and can be used equally (see Epid Bull 1/2021, Epid Bull 44/2024).[21, 23] If the administration of an MF-59-adjuvanted or a high-dose influenza vaccine is not possible for medical reasons (e.g. due to increased reactogenicity after previous vaccinations), a standard influenza vaccine (egg- or cell-based) can also be used in persons aged ≥ 60 years. In addition to the inactivated vaccines for injection, which are approved for different age groups depending on the vaccine manufacturer, a live-attenuated vaccine (LAIV) for nasal administration is licensed and approved for the use in the age group of 2 to 17 years. In this age group, the inactivated vaccines or the live-attenuated vaccine can be used. Where there are reasons to avoid injections (for example, a phobia about syringes, or dysfunction of blood coagulation), LAIV should be used. Annual vaccination is recommended even when the antigen composition of the vaccine is unchanged from the previous season.

Japanese encephalitis

Currently, there is only the adjuvanted inactivated vaccine IXIARO licensed in Germany. Vaccination against the Japanese encephalitis virus (JEV) is recommended prior to a stay in endemic regions during the transmission period. The recommendation especially applies if the conditions mentioned under T in Table 2 are met.

In adults, primary immunisation consists of 2 vaccine doses (each 0.5 ml) administered 4 weeks or in a fast scheme 7 days apart (fast scheme: d0 and d7, licensed for adults from 18 until 65 years of age). For children from the age of 2 months to < 3 years, 2 vaccine doses of 0.25 ml are administered 4 weeks apart. From the age of 3 years the regular vaccine dose of 0.5 ml per dose should be administered.

In the case of continued risk of exposure to the virus, it is recommended that a 1st booster vaccine dose should be administered 12 to 24 months after primary immunisation and a 2nd booster vaccine dose (if the indication persists) 10 years after the 1st booster (Epid Bull 18/2020).[30]

Measles

A monovalent vaccine against measles is no longer available in Germany.

For the primary immunisation, 2 vaccine doses of a combination vaccine (MMR vaccine) should be administered at the ages of 11 and 15 months. The vaccination interval between the 2 doses should be at least 4 weeks. The 1st MMR vaccine dose can be administered from 9 months of age depending on the epidemiological situation, especially in the following situations:

- pending admission to a community facility (e. g. Kindergarten, day care for children);
- after contact with measles cases. If the initial vaccination was administered at the age of 9 – 10 months, the 2nd MMR vaccination must be administered at the beginning of the second year of life.

There are no comprehensive data on the safety and efficacy of MMR vaccination in infants younger than 9 months. In the event of an outbreak, these infants must primarily be protected through immunisation of people with whom they come into contact. Individual risk-benefit considerations can, in exceptional cases, justify vaccination at 6 to 8 months. Infants vaccinated between 6 to 8 months of age should receive 2 additional doses of MMR/V vaccine at the age of 11 and 15 months to establish long-term immunity.

Following contact with measles cases, passive immunisation with polyvalent immunoglobulins should be considered up to 6 days after exposure, particularly for unprotected people where active vaccination is contraindicated and who have a high risk of complications, such as infants under 6 months of age, immunodeficient individuals and susceptible pregnant women. This is an *off-label* recommendation. Infants between 6 and 8 months old can receive immunoglobulins after individual risk-benefit consideration, as an alternative to the 1st vaccination. After administration of immunoglobulins, the MMR/V vaccination is not reliably effective for 8 months. This should be taken into consideration in the event of an indication for immunoglobulin administration (see also Table 7, and Epid Bull 2/2017).

MMR vaccination is also recommended for all adults born after 1970 who have unknown vaccination status, are unvaccinated, or received only one vaccination in childhood (single vaccination with an MMR vaccine). A background paper and detailed rationale for this recommendation can be found in Epid Bull 32/2010.[31]

Additionally, 2 doses of MMR vaccination are indicated for adults born after 1970 in certain fields of professional work. This includes staff in healthcare institutions, nursing homes, community facilities, institutions housing immigrants, refugees and asylum seekers, as well as in technical and vocational colleges and universities (see Epid Bull 2/2020).[33]

In March 2020, the Measles Protection Act was inaugurated. Therefore, children enlisted in a kindergarten, a day care facility for children or a school must be able to provide documentation of the recommended STIKO vaccinations or a medical certificate that declares sufficient immunity against measles. Children aged 12 – 23 months must be able to provide documentation for at least 1 vaccine dose against measles and children from the age of 24 months onwards must be able to provide documentation of 2 vaccine doses against measles. As an alternative a medical certificate that declares sufficient immunity against measles can be provided regardless of the age of the child. Unvaccinated children/children without sufficient immunity against measles, can be excluded from the right to be enlisted in a kindergarten/day care facility for children. Employees in kindergartens, schools or other community facilities, asylum seeker and refugee accommodations as well as day care workers must be vaccinated against measles or be immune – provided they were born after 1970. The same applies to professionals in medical facilities born after 1970, e. g.

hospitals or medical practices (see also: www.masernschutz.de/).

Meningococci

Meningococci B

In Germany, two meningococcal serogroup B (MenB) vaccines are licensed: Bexsero is licensed for people from the age of two months, and Trumenba is licensed from the age of 10 years. STIKO recommends a standard vaccination of all infants against MenB. As MenB diseases occur more frequently in the first months of life, the vaccination series should be started as early as possible at the age of 2 months. The vaccine available for this age group (Bexsero), should be administered in a 2+1 schedule at 2, 4 and 12 months of age. Catch-up vaccinations should be administered by the 5th birthday at the latest. When starting the vaccination series at the age of 12 - 23 months, the 2+1 vaccination schedule is also recommended with an interval of 2 months between the first two vaccine doses and an interval of 12 - 23 months between the 2nd and 3rd vaccine doses. From the age of 2 years (≥ 24 months), the vaccination series consists of 2 vaccine doses, which should be administered at least 1 month apart. An adaptation of the vaccination schedule for premature babies is not recommended by STIKO.

To prevent fever or pain after MenB vaccination, prophylactic administration of paracetamol is recommended in children < 2 years of age, which should be started at the same time as the vaccination or shortly afterwards (see Table 3).

Table 3: Paracetamol prophylaxis for infants receiving the MenB vaccine Bexsero

Weight of the infant at vaccination	1st administration of paracetamol	2nd administration	3rd administration	Maximum dosage per day
Paracetamol-suppositories (75 mg)				
≥ 3 to < 4 kg	75 mg (1 suppository) at the time of vaccination	75 mg (1 suppository) 8–12 h following 1st administration	–	150 mg (e.g. 2 suppositories)
≥ 4 kg	75 mg (1 suppository) at the time of vaccination	75 mg (1 suppository) 6–8 h following 1st administration	75 mg (1 suppository) 6–8 h following 2nd administration	225 mg (e.g. 3 suppositories)
Paracetamol-solution (40 mg/ml)				
≥ 3 to < 4 kg	1.0 ml (40 mg) at the time of vaccination	1.0 ml (40 mg) 8–12 h following 1st administration	1.0 ml (40 mg) 8–12h following 2nd administration	160 mg
≥ 4 kg	1.5 ml (60 mg) at the time of vaccination	1.5 ml (60 mg) 6–8 h following 1st administration	1.5 ml (60 mg) 6–8 h following 2nd administration	240 mg

The paracetamol dosage should be adjusted to the weight and age of the child. Regardless of symptoms, prophylaxis should be continued for 24 hours. If high fever or severe pain occurs despite paracetamol prophylaxis, further therapeutic doses of paracetamol can be administered within 48 hours of vaccination at the maximum age- and weight-dependent dose per day. Paracetamol administration that exceeds 48 hours, should only be considered if directed by a doctor. If fever persists or the child's clinical condition worsens, a doctor should be consulted (consider coincidence with other causes of fever). Prophylactic administration of paracetamol is not necessary for MenB catch-up vaccinations from the age of 2 years. The STIKO also recommends prophylactic administration of paracetamol in the form of a syrup/solution for premature babies who have a body weight (BW) of < 3 kg at the time of vaccination. These premature babies should receive 10 – 15 mg/kg BW paracetamol per administration *off-label* according to the children's formulary (maximum daily dose of 45 mg/kg BW).

MenB vaccines can be administered during routine childhood check-ups (e.g. early U4 and late U6) and administered simultaneously with the vaccinations already recommended by STIKO (hexavalent vaccination [DTaP-IPV-Hib-HepB], pneumococcal conjugate vaccination [PCV], rotavirus oral vaccination). In order to achieve the earliest possible immune protection and to reduce the number of vaccination appointments, the STIKO explicitly recommends co-administration of several injection vaccines (1st and 2nd MenB vaccine dose in combination with hexavalent vaccine and PCV). As usual,

injections should be administered into the *M. vastus lateralis* (antero-lateral thigh muscle) on both sides. The distance between 2 injections on the same side should be at least 2 cm. STIKO does not currently recommend standard MenB vaccination for children aged ≥ 5 years, adolescents and adults. STIKO recommends vaccination against MenB for people with congenital or acquired immunodeficiency irrespective of age, (see Table 2). There are no data on the efficacy of the MenB vaccine in these people, but a smaller study found lower immune responses in children and adolescents with complement defects than in healthy or asplenic subjects. In the scientific rationale "Update of meningococcal vaccination recommendations in Germany" it is noted that the risk of invasive meningococcal disease (IMD) varies according to the underlying disease (see Epid Bull 37/2015).[39] For disaster relief workers and, if exposed, also for medical personnel and development aid workers a MenB vaccination is recommended (see: travel vaccination recommendations from STIKO and the DTG) Physicians should therefore base their decisions about MenB vaccination on an individual risk assessment.

Meningococci A, C, W and Y

Vaccination against meningococcal serogroups A, C, W, and Y (MenACWY) is recommended for all children and adolescents aged 12 to 14 years, regardless of prior vaccination status. A single vaccine dose of an age-appropriate quadrivalent conjugate vaccine (MenQuadfi, Menveo, or Nimenrix) should be administered in accordance with the Summary of Product Characteristics. MenACWY catch-up vaccinations should be administered up to the age of < 25 years. A detailed rationale for the vaccination recommendation can be found in Epid Bull 44/2025.[35] A booster vaccination is not currently recommended by STIKO. A MenACWY vaccination is recommended for certain indications, e. g. for people with a congenital or acquired immunodeficiency or for travellers (see Table 2 and Table 7) irrespective of age. In Germany, MenACWY conjugate vaccines are licensed from the age of 6 months (Nimenrix), 12 months (MenQuadfi) and 2 years (Menveo).

Mpox

Vaccination against Mpox is recommended for individuals who are at increased risk of exposure to Mpox viruses (MPXV) or other orthopoxviruses (e.g., men as well as transgender and non-binary individuals who have sex with men and frequently change partners, sex workers) as well as individuals who perform specific activities involving MPXV or other orthopoxviruses in accordance with the Biological Agents Ordinance (e.g., in research facilities or laboratories).

In Germany, the vaccine Imvanex (Modified Vaccinia Ankara, Bavarian-Nordic [MVA-BN]) is approved for vaccination against Mpox for persons aged ≥ 12 years. Imvanex is a 3rd generation smallpox vaccine that is not capable of replicating in humans. For persons who have not had a smallpox vaccination in the past, the primary immunisation is carried out subcutaneously with 2 vaccine doses of Imvanex at least 28 days apart. For immunocompetent persons who have been vaccinated against smallpox in the past, a single dose of vaccine is sufficient. The vaccination can also be carried out in persons with immunodeficiency. Immunocompromised persons (e.g., those infected with HIV) who have been vaccinated against smallpox in the past should also receive 2 doses of the vaccine. The vaccine is not approved/licensed for use in pregnant women and children under 12 years of age. Recommendations for post-exposure prophylaxis are listed in Table 7. The detailed scientific rationale can be found in Epid Bull 25/26/2022[42] and Epid Bull 29/2025.[41]

Mumps

A monovalent mumps vaccine is no longer available in Germany. For the primary immunisation against mumps 2 vaccine doses of a combination vaccine (MMR or MMR/V-vaccine) should be administered at the age of 11 and 15 months. The vaccination interval between the 2 doses should be at least 4 weeks. Pre-existing immunity against one or two of the antigens included in the MMR vaccine is not a contraindication to vaccination with MMR.

Additionally, 2 doses of MMR vaccine are indicated (if varicella vaccination is also indicated use of MMR/V vaccine) for adults born after 1970 in certain fields of professional activity. This includes staff in healthcare institutions, nursing homes, community facilities, institutions housing immigrants, refugees and asylum seekers, as well as in technical and vocational colleges and universities (see Epid Bull 2/2020).[33]

Pertussis

Primary immunisation during infancy: In view of the epidemiological pertussis situation in Germany and the severity of the clinical course of pertussis in infancy, it is advisable to start primary immunisation of infants and toddlers at the earliest possible point in time, that is, immediately after 2 months of age, and to continue vaccination in a timely manner.
For primary immunisation of infants born at term, 3 vaccine doses are recommended at the age of 2, 4 and 11 months (see Epid Bull 26/2020).[5] It is reasonable to use a combination vaccine (e. g. DTaP-IPV-Hib-HepB) which simultaneously protects against tetanus, diphtheria, pertussis (whooping cough), poliomyelitis, *Haemophilus influenzae* type b and hepatitis B. For premature babies (born before 37 completed weeks of gestation) 4 vaccine doses at the chronological ages of 2, 3, 4 and 11 months are recommended.

The interval between the last and second to last dose of the respective vaccination schedules for primary immunisation should be at least 6 months.
Booster vaccinations are recommended at 5 to 6 years of age and 9 to 16 years of age. Vaccines with reduced pertussis antigen content (ap instead of aP) are used from ≥ 5 to 6 years of age for both booster vaccinations and, where applicable, catch-up primary immunisations (for available vaccines see Table 12).
Standard vaccination of adults: STIKO recommends administering the next due Td vaccination for all adults as a single Tdap combination vaccination (see Epid Bull 15/2019) or a Tdap-IPV combination vaccination if indicated. A monovalent pertussis vaccine is no longer available, so administration of combination vaccines is recommended on the required vaccination dates. If there is an existing indication for pertussis vaccination, a Tdap combination vaccine can be used, even if a Td-containing vaccine has recently been administered. A placebo-controlled study has demonstrated that one of the available Tdap combination vaccines can be administered within 1 month of a previous Td vaccination without causing increased side effects (see Epid Bull 33/2009).[45]
Indicated vaccination for pregnant women: Vaccination with a Tdap combination vaccine is recommended at the beginning of the 3rd trimester. In case of an increased probability of premature birth, vaccination should be administered during the 2nd trimester. This vaccination should be administered in every pregnancy, regardless of the interval to previously administered pertussis vaccinations. The aim of pertussis vaccination in pregnancy is to reduce the incidence of the disease, hospitalizations and deaths from *Bordetella (B.) pertussis* infections in newborns and infants (see Epid Bull 13/2020).[44]
Procedure for recognised pertussis clusters: In the context of recognised pertussis clusters, vaccination can also be considered for fully vaccinated children and adolescents in close contact with cases in the household or in community facilities, if the last vaccination occurred more than 5 years ago. Before the birth of a child, it is especially important that people in close household contact and caregivers of the newborn should be checked for adequate immunological protection against pertussis, defined as vaccination within the past 10 years (see Table 2). Vaccination with pertussis-containing vaccines does **not** protect against *B. **para**pertussis* infections.

Pneumococci

Primary immunisation during infancy: The primary goal of universal vaccination of all children up to the age of 24 months (2nd birthday) with a pneumococcal conjugate vaccine is to reduce the morbidity of invasive pneumococcal disease (IPD) and the resulting consequences such as hospitalisation, disability and death. Infants born at full-term aged < 12 months should receive 2 doses of a 13- or 15-valent pneumococcal conjugate vaccine (PCV13 or PCV15) within an interval of 8 weeks starting at the age of 2 months (see Epid Bull 33/2025). Preterm infants (born before completion of 37th week of gestation) from the chronological age of 2 months should receive a total of 3 vaccine doses of PCV13 or PCV15 at intervals of 4 weeks. The primary immunisation will be completed for all infants with a further vaccine dose at the age of 11 months (minimum interval to previous vaccination is 6 months). The recommendation for preterm babies is based on the licensure of the pneumococcal conjugate vaccines, which restricts the use of the 2+1 scheme to full-term infants (as of November 2020). A detailed justification for the pneumococcal vaccine recommendation can be found in Epid Bull 36/2015.[53] Toddlers aged ≥ 12 months to < 24 months (2nd birthday) without previous pneumococcal vaccination should receive only 2 vaccine doses at intervals of at least 8 weeks as a catch up vaccination.

Following the authorization of the 20-valent pneumococcal conjugate vaccine (PCV20) for infants, children and adolescents, STIKO reviewed and evaluated the available data. Based on the current body of evidence, STIKO has reached the conclusion that the existing recommendations for the primary immunisation of full-term and premature infants remain unchanged and that PCV20 will not be considered for the time being. In addition to the sole approval of PCV20 in a 3+1 schedule in infancy, the lower IgG antibody concentrations compared to PCV13 and the results from a dynamic transmission model were decisive factors in the decision-making process (see position statements from 2024 and 2025). STIKO will continue to address the vaccination of infants and young children with PCV20 and will evaluate any new data and study results from the clinical use of PCV20 that may become available.

Standard vaccination of adults aged 60 years and older: For people aged ≥ 60 years who do not belong to any of the risk groups listed under category "I" or "O" in Table 2, the administration of a single dose of the 20-valent conjugate vaccine (PCV20) is recommended as a standard vaccination (category 'S'). Persons who have already been vaccinated with the 23-valent polysaccharide vaccine (PPSV23) should receive a vaccination with PCV20 at least 6 years after the PPSV23 vaccination.

Indication-based vaccination: For people with certain risk factors for pneumococcal diseases (Categories "I" and "O" in Table 2), vaccination against pneumococcal disease is recommended at any age.

For **children and adolescents aged 2 to 17 years and adults (≥ 18 years)** with immunodeficiency (see diseases/risk factors listed as examples in Table 2**, No. 1**), other chronic diseases (see diseases/risk factors listed as examples in Table 2, **No. 2**) and anatomical and/or foreign body-associated risk factors and thus an increased risk of pneumococcal meningitis (illnesses/risk factors listed as examples in Table 2, **No. 3**), vaccination with PCV20 is recommended. Sequential vaccination is no longer recommended because the added benefit of the three additional serotypes of PPSV23 is, in the light of the immunological superiority of the conjugate vaccine over the polysaccharide vaccine, considered to be very low. No data are yet available on the duration of protection provided by PCV20 and thus on the need for revaccination, which is why no recommendation can be made at this time. Table 4 provides information on how to implement the recommendation depending on the current vaccination status. Detailed scientific rationale for these recommendations can be found in Epid Bull 36/2015[53], 37/2016[51], 39/2023[50] and 02/2026.[49]

Table 4 | Administering indication-based pneumococcal vaccination for children (≥ 2 years) adolescents and adults, following consideration of the current vaccination status§

Vaccination status	Recommended vaccination
No prior vaccination	PCV20
PCV10 or PCV13 or PCV15	PCV20 in an interval of 1 year
PPSV23	PCV20 in an interval of 6 years (in cases of severe immunodeficiency vaccination in an interval of 1 year possible)
PPSV23 + PCV13/PCV15	

Poliomyelitis

The wild poliovirus type 2 and 3 have been eradicated worldwide. There is still a risk of infection by wild poliovirus types 1 and by genetically-mutated circulating vaccine-derived polioviruses (cVDPV) of all three types when travelling to some regions. Since 1998, the oral polio vaccine (OPV) is no longer recommended because of the risk – albeit very low – of vaccine-associated paralytic poliomyelitis (VAPP). For protection against poliomyelitis, an injectable inactivated polio vaccine (IPV) (if indicated, as combination vaccine) is recommended. For primary immunisation against poliomyelitis, infants should receive 3 vaccine doses at the ages of 2, 4 and 11 months (see Epid Bull 26/2020).[5] The interval between the last and second to last dose of the respective vaccination schedule for primary immunisation should be at least 6 months. It is reasonable to use a combination vaccine which simultaneously protects against tetanus, diphtheria, pertussis (whooping cough), poliomyelitis, *Haemophilus influenzae* type b and hepatitis B. From 9 to 16 years of age, a booster vaccination containing IPV is recommended. Primary immunisation started with OPV should be completed with IPV (see also Table 2).

Rabies

According to WHO criteria, Germany has been free of terrestrial rabies since 2008. However, illegal importation of pet animals (dogs and cats) from countries with endemic terrestrial rabies still poses a risk. Bat rabies cases are extremely rare. They are caused by bat lyssaviruses (e.g. the European bat lyssavirus). Their pathogenicity corresponds to that of classical rabies viruses (RABV). Prophylactic pre-exposure immunisation (primary immunisation) consists of 3 vaccine doses administered by intramuscular injection on days 0, 7, 21 or 28 and can be carried out with Rabipur or Verorab (see travel vaccination recommendations from STIKO and the DTG). For a shortened vaccine schedule see respective Summary of Product Characteristics. In the case of continued exposure, booster vaccinations should be administered in accordance with the respective Summary of Product Characteristics. For post-exposure prophylaxis (PEP), see chapter 5.5.

Respiratory syncytial virus (RSV)

Infant immunisation (RSV prophylaxis): The monoclonal antibody Nirsevimab (Beyfortus) is recommended for all newborns and infants < 1 year of age in their 1st RSV season, regardless of possible risk factors. Infants born between April and September should receive Nirsevimab (Beyfortus) in the autumn before the start of their 1st RSV season if possible.

Newborns of any gestational age born during the RSV season (usually between October and March) should receive RSV prophylaxis with Nirsevimab (Beyfortus) as soon as possible after birth, ideally when they are discharged from the birth facility or at the routine health check "U2 examination" at 3–10 days of age.

Newborns who remain in hospital for a longer postnatal period should receive Nirsevimab (Beyfortus) in good time before discharge if their stay falls within the RSV season. Passive immunisation with Nirsevimab (Beyfortus) can also be considered during the hospital stay if this appears useful for the prevention of nosocomial infections.

If an immunisation dose of Nirsevimab (Beyfortus) is missed, it should be administered as soon as possible during the 1st RSV season and no later than the child's first birthday.

The single immunisation dose for newborns or infants with a body weight < 5 kg is 50 mg and for infants with a body weight ≥ 5 kg 100 mg. Nirsevimab (Beyfortus) is administered intramuscularly into the anterolateral aspect of the thigh. It can be administered at the same time as or at any interval with the standard vaccinations for infancy.

Nirsevimab (Beyfortus) prophylaxis is not usually necessary for infants who have already had a laboratory-confirmed RSV infection. For healthy newborns whose mothers have received an RSV vaccination during the current pregnancy, Nirsevimab (Beyfortus) is not usually required. However, if the newborn has known risk factors or if the maternal vaccination was administered less than 2 weeks before birth, additional RSV prophylaxis with Nirsevimab (Beyfortus) is recommended.

For children with known risk factors, the use of Palivizumab (Synagis) or Nirsevimab (Beyfortus) can be decided on an individual basis. Parallel or sequential administration of Palivizumab and Nirsevimab is generally not recommended (see Epid Bull 26/2024).[61]

Standard vaccination for adults aged ≥ 75 years: A single RSV vaccination with one of the two approved protein-based vaccines (Arexvy [RSVPreF3] or Abrysvo [RSVPreF]) or the mRNA-based RSV-vaccine mResvia (mRNA-1245) is recommended as standard vaccination for all persons aged ≥ 75 years. For optimal protection during the following RSV season, the single vaccination should be administered in late summer/autumn. It is therefore advisable, but not necessary, to receive the vaccination before the start of the RSV season. No recommendation can be made on the necessity of revaccination based on the available data at this time. The RSV vaccination with one of the protein-based vaccines can be administered concomitant with the seasonal influenza vaccination. According to the Summary of Product Characteristics, the concomitant administration of the RSV vaccines with seasonal influenza and COVID-19 mRNA vaccines is possible.

Indication-based vaccination in people aged 60 to 74 years: For people with a severe underlying disease and for people who live in a care facility and are therefore at significantly increased risk of severe RSV disease, a single RSV vaccination with one of the two approved protein-based vaccines (Arexvy or Abrysvo) or the mRNA-based RSV-vaccine mResvia (mRNA1245) is recommended as an indication-based vaccination. The underlying diseases associated with an increased risk of a severe RSV infection include severe forms of chronic respiratory diseases, chronic cardiovascular and renal diseases, chronic

neurological and neuromuscular diseases, haemato-oncological diseases, diabetes mellitus (with complications) and severe congenital or acquired immunodeficiency. For optimal protection during the RSV season, the vaccination should be administered once in late summer/autumn. According to current knowledge, mild or uncomplicated forms of the chronic illnesses mentioned, or those that are well controlled with medication, are not associated with a significantly increased risk of a severe RSV disease progression (see Epid Bull 32/2024.).[60]

Rotavirus

The rotavirus (RV) vaccines are live attenuated oral vaccines. Depending on the vaccine brand, 2 (Rotarix) or 3 doses (RotaTeq) are administered to the infant starting at the age of 6 weeks, with at least 4 weeks between doses. There is a slightly elevated risk for intussusception (estimated at 1– 2 cases per 100,000 infants vaccinated) within the first week after the 1st RV vaccine dose, which increases with the age of the child. STIKO therefore strongly recommends beginning the vaccination series as early as possible, and by the age of 12 weeks at the latest and completing it by the age of 16 weeks (Rotarix) or 20 – 22 weeks (RotaTeq). The vaccination series must be completed by the age of 24 weeks when using Rotarix or 32 weeks for RotaTeq. The background paper and detailed scientific rationale can be found in Epid Bull 35/2013.[63] The Summary of Product Characteristics should be consulted about simultaneous administration with other vaccines. RV immunisation is recommended for preterm infants at their chronological age and for full-term infants, even if hospitalized. The benefits of RV vaccination in neonatal intensive care units (NICU), providing protection against nosocomial RV infection, significantly outweigh the low risk of RV gastroenteritis in other hospitalized patients through nosocomial vaccine virus transmission. The risk of vaccine virus transmission is low and is sufficiently reduced by common infection control measures on NICUs. A joint statement from STIKO, the German Academy for Pediatrics and Adolescent Medicine (DAKJ) and the German Society for Neonatology and Pediatric Intensive Care Medicine (GNPI) on RV vaccination of preterm infants and neonates during hospitalization is published in Epid Bull 1/2015.

Rubella

A monovalent rubella vaccine is no longer available in Germany. For the primary immunisation against rubella 2 vaccine doses of a combination vaccine (MMR vaccine or MMR/V vaccine) should be administered at the age of 11 and 15 months. The vaccination interval between the 2 doses should be at least 4 weeks. Pre-existing immunity against one or two of the antigens included in the respective combination vaccine is not a contraindication for the vaccination. The primary objectives of the vaccine recommendation are to prevent congenital rubella syndrome (CRS) and to eliminate rubella in Germany.
Mothers for whom no proof of 2 rubella vaccinations has been provided or who have a seronegative rubella test in pregnancy should be given 2 doses of MMR vaccine postpartum at an interval of at least 4 weeks between the vaccine doses. The 1st vaccine dose can be administered with the postpartum examination at the end of the postpartum period. Additionally, 2 doses of MMR vaccine are indicated for women born after 1970 in certain fields and occupational settings. For men, a single dose of MMR vaccine is sufficient to protect against rubella. This includes staff in healthcare institutions, nursing homes, community facilities, institutions housing immigrants, refugees, persons required to leave the country (official removal) and asylum seekers, as well as in technical and vocational colleges and universities (see Epid Bull 2/2020).[33]

Tetanus

For primary immunisation of infants born at full-term, 3 vaccine doses are recommended at the age of 2, 4 and 11 months (see Epid Bull 26/2020).[5] It is reasonable to use a combination vaccine which simultaneously protects against tetanus, diphtheria, pertussis (whooping cough), poliomyelitis, *Haemophilus influenzae* type b and hepatitis B. For premature babies (born before completed 37th week of gestation) 4 vaccine doses at the chronological ages of 2, 3, 4 and 11 months are recommended. The interval between the last and second to last dose of respective vaccination schedules for primary immunisation should be at least 6 months. Booster vaccinations are recommended at 5 – 6 years of age and 9 – 16 years of age. Further booster vaccinations should be administered in intervals of 10 years. Each booster vaccination with Td (including in case of an injury) should be used as an opportunity to check whether pertussis vaccination is indicated and, if applicable, to administer a combination vaccine (Tdap) or if indicated Tdap-IPV.

Tick-Borne encephalitis

Vaccination against tick-borne-encephalitis (TBE) should be completed by the beginning of the tick season in Germany, considering that about 95 % of the cases in Germany are notified in the months from May to November. Please note the current information on risk areas in Germany. Both child vaccines (FSME-IMMUN Junior, Encepur Children) and adult vaccines (FSME-IMMUN Adults, Encepur Adults) are available for vaccination.

An incomplete primary immunisation schedule should be completed with missing vaccine doses. In the Summary of Product Characteristics of FSME-IMMUN it is written that a primary immunisation can only be completed by an additional vaccination after 2 already administered vaccine doses. However, in the opinion of STIKO, the principle "every vaccination counts" also applies here: Once a primary immunisation has been started, it can be continued at any time and NO new primary immunisation is required. Even if a booster vaccination is administered years after the recommended date of vaccination, it offers 3 – 10 years of protection, depending on the age of the vaccinated person (see Summary of Product Characteristics). Both vaccines licensed in Germany protect against the Central European TBE virus subtype as well as the Far Eastern and Siberian TBE virus subtypes.

Typhus abdominalis

In Germany, one live attenuated vaccine and one inactivated vaccine are available for vaccination against typhoid fever. The oral live attenuated vaccine (Typhoral L capsules) should be administered in 3 doses on days 0, 2 and 4. The vaccination series should be completed at least 10 days before travelling to an endemic area. The parenteral inactivated vaccine Typhim Vi is administered once i. m. at least 2 weeks before entry into an endemic area.

Varicella

For primary immunisation of infants against varicella (V), 2 vaccine doses are recommended at the age of 11 and 15 months. A minimum interval of 4 weeks between the two vaccinations is required. Vaccination can be administered either at the same time as the 1st MMR vaccination or, at the earliest, 4 weeks later. These intervals are required as both vaccines are live attenuated vaccines. Regarding the 1st vaccination dose against varicella and measles, mumps, rubella, it is preferable for children below the age of 5 years to simultaneously administer a single varicella vaccine dose and an MMR combination vaccine dose at different body sites. The rationale for this recommendation is a slightly increased risk of febrile seizures 5 – 12 days after application of the combined MMR-varicella (MMRV) vaccine compared with the simultaneous vaccination with a varicella and MMR vaccine. This increased risk was only observed after the 1st vaccination. The 2nd dose of varicella vaccine should be administered at the age of 15 months and a MMRV combination vaccine can be used. See the STIKO statement on "Combined vaccination against measles, mumps, rubella and varicella (MMRV)" in Epid Bull 38/2011.

In all unvaccinated children and adolescents with no history of varicella (chicken pox), catch-up vaccination should take place using 2 vaccine doses. The minimum interval between the 2 doses of varicella or MMRV vaccine is 4 to 6 weeks (depending on the Summary of Product Characteristics provided by the manufacturer). Children and adolescents who have only been vaccinated once against varicella should receive a 2nd dose of varicella or MMRV vaccine.

The background paper and detailed scientific rationale for the varicella vaccination recommendation were published in Epid Bull 32/2009,[66] and an evaluation of the varicella vaccination strategy is available in Epid Bull 1/2013.

Two doses of varicella vaccine are indicated for seronegative persons working in medical institutions, healthcare institutions, nursing homes, community facilities, institutions housing immigrants, refugees, persons required to leave the country (official removal) and asylum seekers, or persons who are in contact with potentially infectious material due to their occupation (see Epid Bull 2/2020).[33]

Yellow fever

Vaccination with the live attenuated yellow fever vaccine (Stamaril) is recommended when traveling to countries where yellow fever is endemic, and is necessary in countries that require proof of yellow fever vaccination as a prerequisite for entry. Other countries require proof of yellow fever vaccination only with entry from yellow

fever endemic countries or after an airport transit of more than 12 h in a yellow fever endemic country. However, infants < 9 months of age are usually not required to provide proof of vaccination.
The WHO list (http://www.who.int/health-topics/yellow-fever) of countries in which there is a risk of yellow fever transmission or an obligation to provide a proof of vaccination on entry, was included in the country table of the travel recommendations of the STIKO and the German Society for Tropical Medicine, Travel Medicine and Global Health (DTG) on travel vaccinations.
In 2013, the WHO decided that 1 vaccine dose against yellow fever is sufficient for almost all people for a lifelong protection. Based on an updated evidence synthesis in 2022 and new assessment of the analysed data,[7] the STIKO adjusted its previous yellow fever vaccination recommendations in collaboration with the DTG. Since, on the basis of the newly evaluated evidence, lifelong immunity cannot be concluded after just 1 vaccine dose and the extent of the declining immunity depends on age and the immune status at the time of the 1st vaccination, a one-time booster vaccination is recommended before re-exposure or in case of continued exposure, provided that 10 or more years have passed since the primary vaccination. After administration of the 2nd vaccine dose no further booster vaccinations are necessary. There are exceptions and particularities for pregnant women, people with immunodeficiency and children.
Yellow fever vaccination is contraindicated in infants < 6 months of age. In infants aged 6–8 months, yellow fever vaccination should only be administered in exceptional cases, e.g. during outbreaks.
Due to the possible risk of transmission of the vaccine virus from breast milk to the breastfed infant, lactating women of infants < 6 months of age should not be vaccinated either.
The complete recommendations can be found in Table 2 and the corresponding detailed scientific rationale in Epid Bull 32/2022.[7]
For further information also see travel vaccination recommendations from STIKO and the DTG.

4. Notes on administering vaccinations

4.1 Information requirements before vaccinations

General information

Providing information to the person to be vaccinated is an important part of the immunisation service offered by physicians and pharmacists (German Civil Code [BGB] § 630e).
According to Section § 20c IfSG, pharmacists in public pharmacies are allowed to vaccinate people against: influenza viruses (from 18 years of age) SARS-CoV-2 viruses (from 12 years of age). According to § 1a para. 11 no. 2a ApBetrO (German Pharmacy Operating Ordinance), the preparation and administration of protective vaccinations by public pharmacies is now a standard pharmacy service. The aim of carrying out vaccinations in public pharmacies is to improve the vaccination rate.
Vaccination is a form of treatment as defined by §§ 630a ff. of the German Civil Code (BGB). Before carrying out a vaccination, it is therefore the duty of the person administering the vaccination to inform the person to be vaccinated or the person authorised to give consent (Section 630d (1) sentence 2 BGB, i.e. legal guardians, authorised representatives or carers as legal representatives; for pharmacies, the regulation of § 35a para. 4 ApBetrO also applies in this respect) about the disease to be prevented and the vaccination so that an effective declaration of consent can be given. In addition, the consequences of not being vaccinated should be explained, regardless of personal opinion and possible concerns or reservations.

Extent of the information

This information should include:

- background on the disease to be prevented and treatment options;
- the benefits of the vaccination;
- the contraindications;
- the administration of the vaccine;
- when vaccination protection starts and how long it lasts;
- what to expect and what to do after immunisation;
- possible side effects and vaccine-associated complications; and
- the need for any follow-up and booster vaccinations and when.

However, the precise scope of the information required always depends on the specific circumstances. The principle of patient-related information applies here, i.e. it should be appropriate to the understanding of the individual patient or person giving consent. Decisive criteria can include age, level of education, previous experience and medical knowledge. It is therefore always necessary to tailor the message to the individual patient or the person giving consent. A general picture of the severity and direction of the risk spectrum associated with vaccination must be provided by the physician.

According to § 630e, para. 3, German civil Code (BGB) giving out information by the physician can be waived, if there are special circumstances, especially if the procedure cannot be delayed or the patient declares explicitly to forgo the information to be provided. The occurrence of such an exception should be documented very precisely by the vaccinating person for reasons of proof.

Form and timing of the information

The **information must be** provided **orally** under § 630e, para. 2, no. 1, BGB, by the person administering the vaccination or by a person who has received the training required to carry out the measure. In addition, reference may be made to written information given to the person to be vaccinated.
Care must be given to ensure that the information is provided in good time and in a way that the person being vaccinated or their accompanying parent or guardian or person who has the power of attorney (German Civil Code [BGB] § 630d, para. 1, sentence 2) can understand the content. Particularly in the case of language barriers, the physician must ensure that the explanation has been understood. In case of doubt, the physician should consider whether an interpreter should be consulted, which may be at the expense of the person to be vaccinated. With regard to the implementation of vaccinations in pharmacies, it should be

noted that, in accordance with § 20c para. 1 IfSG, only pharmacists with the appropriate qualifications who belong to the pharmacy staff may carry out vaccinations in public pharmacies (in addition, pharmacies must meet the requirements regarding qualifications, equipment, etc. in accordance with Section § 2 (3a) ApBetrO).

Information sheets

Information sheets on vaccinations by registered physicians are available free of charge on the website of the "Forum for vaccinating doctors" (www. forum-impfen.de, after password-protected registration). In some cases, information sheets are sold by providers (e. g. the German Green Cross or Thieme Compliance). To support people who do not speak German, the Robert Koch Institute offers translations of information sheets on many different vaccinations and the respective vaccination schedule to download free of charge in various languages (information about immunisation at RKI). The Federal Institute of Public Health (BIÖG) also provides a wide range of information materials on vaccination and vaccine preventable diseases for laypeople via its homepage infektionsschutz.de .

The leaflets also contain a questionnaire on the state of health of the person being vaccinated and previous immunisations which specifically relate to the vaccine under consideration. Those being vaccinated or their parents or guardians must also have the opportunity to have their questions and issues addressed. Most information sheets include declarations of consent which can be signed by the person being vaccinated or their parent or guardian.

Form of consent and documentation

Written consent is not required by law, but can be useful in certain cases. The information provided and record of consent must be documented in the patient's files (§ 630f, para. 2, sentence 1, BGB), regardless of the form in which they were provided. If the information is based on a specific information sheet, this should be mentioned in the documentation. It can also be useful to make a note in the patient's file if the relevant person or their parent or guardian has refused a vaccination. The patient or the person giving consent must receive a copy of any documents that were signed in the context of information or consent (§ 630e, para. 2, sentence 2, BGB).

For pharmacies, information on documentation is specified in accordance with § 35a para. 5 ApBetrO. Among other things, records must be kept for 10 years in the pharmacy. This corresponds to the requirements of § 630f para. 3 BGB.

Minor patients

In the case of minors, the consent of the parent or guardian must be routinely obtained. In cases of opposite opinions of parties in shared custody cases, it can be assumed that in a law suit the party gets decision-making authority that is in favour of the vaccination (see also: Higher regional court (OLG) Frankfurt Main, ruling from 17.08.2021, file number (Az.) 6UF 120/21). Adolescents can give their own consent if they have acquired the necessary cognitive and decision-making ability; this is usually the case at 16 years of age. Physicians must determine whether the individual adolescent "can, according to his [or her] mental and moral maturity, understand the significance and scope of the intervention and the nature of the consent" (Federal Court of Justice in civil matters (BGHZ) 29, 33-37). According to § 630e, para. 5, sentence 1, BGB sets out that people unable to give consent have to be informed in a way that fits with their understanding, as long as they are in a position to understand the explanations and this is not against their best interests.

Public vaccination appointments

For public vaccination appointments (e. g. school immunisation programs), it is recommended that physicians provide information in written form in advance and, if appropriate, obtain a written declaration of consent. This does not, however, absolve physicians from their legal obligation to provide the person being immunised or their accompanying parent or guardian with oral information and the opportunity to ask questions.

4.2 "Off-label" use

"Off-label" use is the prescription of a licensed medical product outside the use for which licensure has been approved by national or European regulatory authorities. This may apply, for example, to the scope of application (indication), age restrictions, dosage, or duration of treatment. For any *off-label* use, the physician concerned is liable for the medical appropriateness of the treatment and any potential adverse events. Medical associations recommend that *off-label* use should be based on valid guidelines or recommendations, or acknowledged scientific literature. For *off-label* use, it is essential to provide comprehensive information to the patient or their legal guardian of the risks and benefits of the vaccination, and explain that the vaccine is being used off-label. Medical treatment and the information provided must be fully documented with an explicit explanation that the treatment is an *off-label* use in the patient's file.

4.3 Documenting the vaccination

General information

According to § 22, para. 1, IfSG, the vaccination has to be immediately documented in the patient's vaccination card or if not applicable in a vaccination certificate by the person authorized to administer the vaccination.

The respective vaccination card or vaccination certificate has to comply with the requirements of § 22, IfSG and needs to include the following information per vaccination: date of vaccination, name (brand) and batch number of the vaccine, name of the disease to be prevented, name (birth name) of the person to be vaccinated as well as the name, address and signature of the person authorized to administer the vaccines. Any form that meets WHO requirements and is in accordance with § 22, IfSG, such as the "International certificates of vaccination and shot record" ("Yellow vaccination card"), can be used as a vaccination card.

Missing vaccination documentation

Vaccination documents are often missing or incomplete. This is not a reason for postponing necessary vaccinations, not catching up on missing vaccinations, or not starting primary or basic immunisation. No particular risk arises from additional vaccinations when vaccine-induced protection already exists. This also applies to multiple vaccinations with live attenuated virus vaccines. Serological tests to check the immune status of an individual are indicated only in exceptional cases (e. g. anti-HBs antibodies for people at increased risk of hepatitis B infection).

4.4 Vaccination management

A well-established vaccination management system in physicians' practices and other medical facilities (e. g. pharmacies) plays an important role in promoting vaccinations and achieving vaccination targets. This type of management system helps to coordinate workflows and establish responsibilities.

Physician practice visits and re-call systems

The individual vaccination status should be monitored and updated, if applicable, at each visit to the doctor. Opportunities to assess immunisation status include screening examinations (e.g. "U" examinations in childhood, "J1/J2" examinations for adolescents, health check-ups and screening examinations for adults as well as routine examinations of mothers within the first 6 – 8 weeks after birth), initial contact with new patients, special events (treatment after accidents or injuries, start of kindergarten, health certificates for internships or new jobs), or seasonal visits (travel vaccinations, tick-borne encephalitis or influenza vaccinations). With the enactment of the Measles Protection Act on 1 July 2020 (§ 20, para. 4 IfSG), the possibility of cross-disciplinary vaccination was established by law. Accordingly, all doctors are permitted to administer any type of vaccination. For example, paediatricians can also vaccinate the parents of the children and adolescents they treat if necessary, or gynaecologists can vaccinate their patients' partners.

A recall system can help to remind patients when vaccinations are due, and therefore increase uptake. Reminders can be sent via email, post, or telephone by e. g. health insurances, public health authorities or physicians. In the latter case individual consent (signature) is required before they are enrolled in a recall system. Templates for a recall consent form are available from the Association of Statutory Health Insurance Physicians (ASHIPs).

Organizational responsibilities and logistics

To run an efficient and successful vaccination management in the doctor's office or the health facility, it can be helpful to assign organizational responsibilities to individual employees. Vaccinating physicians and medical assistants (MAs) tasked with vaccination should be given the opportunity to receive regular training (e.g. via online vocational training) on vaccination management. The routine tasks of these individuals include monitoring inventory, checking expiry dates and ordering vaccines, training other employees, monitoring of routine and emergency procedures, and practical vaccination management. An inventory list, vaccination software or statistics on the number of vaccinations carried out in the last few weeks/months are helpful. It is recommended that an expiry check be carried out and documented regularly (e. g. monthly). Many practice administration systems offer useful tools for managing vaccine inventory.

Responsibilities of practice staff

Practice staff can support practical vaccination management through targeted actions. When arranging appointments, they can remind people to bring their vaccination records to be checked at the next visit, or they can add a reminder to an appointment slip. Trained staff can record the current vaccination status based on entries in the vaccination records, identify any missed vaccinations, and create an individual vaccination plan if needed. When talking to individual people, practice staff can remind them of any outstanding vaccinations, encourage them to be vaccinated and hand out relevant information. Medical personnel can inform physicians of any missed vaccinations when handing over patient records. Practice staff can prepare vaccines and vaccination records if any vaccinations are planned during the visit. Injecting the vaccine can be delegated to qualified medical personnel after the physician has approved the indication, but the liability remains with the physician.

Storing vaccines – Maintaining the cold chain and monitoring

Vaccines are sensitive biological products and must above all be protected from light, frost and heat. Maintaining the cold chain involves ensuring that the optimum temperature is maintained at all times during transport and storage, as well as how vaccines are handled in practice. All vaccines should be stored in their original packaging in a separate refrigerator at + 2°C to + 8°C. To ensure that this target range is maintained even with slight fluctuations, a temperature of +5°C should be aimed for. Vaccines should never come into contact with the external wall of the refrigerator or be stored in the refrigerator door. Special refrigerators for vaccines are particularly suitable, but household refrigerators without a freezer can also be used. The refrigerator should be used exclusively for cooling vaccines and other medicines. The temperature should be monitored by regular checks, preferably every morning and evening, but at least once a day. A digital thermometer that shows the minimum and maximum temperatures, or a thermometer data logger that continuously measures temperatures, are suitable. The following should not be used: alcohol or mercury thermometers, bimetallic thermometers or infrared thermometers. The thermometer should be positioned in the middle of the refrigerator. The observed temperatures should be documented daily. Vaccines that were accidentally stored incorrectly or have been frozen must be discarded. Freezing can lead to hairline cracks in the ampoules and the vaccine could become unsterile. Slightly or completely frozen adsorbed vaccines are less well tolerated and can lead to purulent inflammation or injection abscesses. Vaccines that have been stored at too high temperatures may be less or not effective at all. Live attenuated vaccines (MMR, varicella, herpes zoster, LAIV, rotavirus, yellow fever) containing viruses capable of reproduction are especially sensitive. An uninterrupted cold chain must be maintained for these vaccines.

Preparing and injecting the vaccine

The vaccine should only be removed from the refrigerator shortly before administration. According to the first-in-first-out principle, the vaccines that have been stored the longest should be used up first. Vaccines must not come in contact with disinfectants. The rubber stoppers must be dry. The needle should be dry, and no vaccine should be on the outside of the needle. That would make the injection painful and can lead to inflammation at the injection site. After filling the syringe with the vaccine and removing any air, attach a new needle for the injection. The vaccine should usually be used quickly after filling the syringe. The injection site should be disinfected, taking the (minimum) exposure time indicated by the manufacturer into account. The skin should have dried before the injection is administered. The preferred site for the intramuscular administration of vaccines is the *M. deltoideus*. If this muscle has not yet developed sufficiently (e. g. in infants and toddlers),

injection into the *M. vastus lateralis* (anterolateral thigh) is recommended. The risk of damaging nerves or vessels here is low. Aspiration is not necessary at these injection sites. If more than one injection is administered at a vaccination site, a minimum distance of 2 cm should be maintained between injections. Subcutaneous vaccinations are administered into the subcutaneous fatty tissue.

4.5 Vaccination intervals

General information

The vaccination intervals shown in the immunisation schedule (Table 1A and 1B), Table 2 and Tables 11 A – E as well as in the Summary of Product Characteristics sheets should generally be complied with.

For urgently indicated vaccinations, such as post-exposure rabies prophylaxis or postnatal immunoprophylaxis for hepatitis B in newborns, physicians must strictly adhere to the recommended vaccination schedule.
For long-lasting vaccination protection, it is particularly important that the recommended minimum interval in primary immunisation between the second to last and last vaccination (generally 6 months) is not shortened. However, on the other hand there is generally nothing like an unacceptably long interval between vaccinations. **Every vaccine dose counts.** Additional vaccine doses are not required if intervals between vaccine doses that have already been administered are longer than recommended. Where primary immunisation has been out of date for many years or a booster vaccination has not been carried out in a timely manner, for example against diphtheria, tetanus, poliomyelitis, hepatitis A, hepatitis B, Herpes Zoster or TBE (see www. rki.de/Impfungen A-Z), the immunisation **does not have to be started again** from the beginning. Instead, it should be updated with the missing vaccine doses. This also applies to infants and toddlers. To provide vaccination protection as early as possible, exceeding the recommended vaccination intervals should non the less be avoided, especially in young children. In addition, the HPV vaccination is particularly time-sensitive: for optimum protection, it should be administered between the age of 9 to 14 – years ideally before sexual contact begins. HPV catch up vaccination should be administered the latest until the 18th birthday.
The following applies to intervals between different vaccinations: Live vaccines (attenuated, replication competent viruses) can be administered simultaneously. If they are not administered simultaneously, there must usually be a minimum interval of 4 weeks between the two vaccine administrations.

Immunisation with inactivated vaccines (inactivated pathogens, their antigen components, and toxoids) requires no minimum time interval between the two vaccinations, even if one of the vaccines is a live attenuated vaccine. Possible adverse reactions to preceding vaccinations should have completely subsided before any new vaccinations. The Summary of Product Characteristics should be consulted on the minimum interval between two vaccinations and the co-administration of vaccines.

Interval between vaccination and surgical interventions

If the indication is urgent, surgical procedures can be carried out at any time, even if preceded by a vaccination. For elective procedures, a minimum interval should be allowed of 3 days after the administration of inactivated vaccines, and 14 days after the administration of live attenuated vaccines.
Neither clinical observations nor theoretical considerations suggest that vaccinations and surgical procedures are incompatible. However, to distinguish between possible vaccination reactions and surgical complications, it is recommended that these minimum intervals between vaccinations and operations be maintained.
After surgical procedures, vaccinations can be given as soon as the patient is stable. Vital vaccinations (such as tetanus, rabies, and hepatitis B vaccination) can be administered at any time. Following operations associated with immunosuppressive treatment, e. g. transplantations, vaccinations must be planned in cooperation with the attending physician.

4.6 Notes on reducing pain and stress during vaccination

Background

It is not unusual for pain and stress reactions to be triggered when vaccines are injected. Fear or worry about potential pain can have a lifelong negative impact on attitudes to visiting the doctor, vaccinations and the acceptance of vaccinations amongst both children and their parents. Nowadays, there are several evidence-based sets of recommendations for reducing pain and stress connected with vaccinations. These include particular injection techniques, age-related distraction methods and other behaviours that can lessen the pain of vaccination. These recommendations are summarised in this section. STIKO encourages professionals administering vaccines to apply these techniques on reducing vaccination related pain in their everyday practice to promote public acceptance of vaccination. Additional information can be found in the publications cited.[B–H]

General recommendations

- During vaccination, healthcare professionals should be calm, cooperative and competent. When describing the vaccination procedure to the person being vaccinated, it is important to use neutral language and choose words carefully to avoid increasing the individual's fear or distrust. It is essential to avoid using falsely reassuring or dishonest phrases like "It won't hurt at all!"

Painkillers

- In some cases, lidocaine patches or creams under occlusive dressing can be used for children from birth to reduce the pain caused by the injection. In children aged < 12 months, the patches and creams should not be used concomitantly with drugs (such as sulphonamide) that contribute to the formation of methaemoglobin. Pain patches can also be helpful for adolescents and adults who are afraid of injections. The minimum time required to achieve the optimal pain relief (30 – 60 minutes) must be taken into account during planning.
- An ice spray can also be used to reduce pain. It should be sprayed for 2 – 8 seconds and the vaccination can be administered immediately after skin disinfection.

Other support procedures

- Even before their children's 1st vaccination appointment (from 2 months of age), parents should be informed about forthcoming vaccinations and the concomitant pain and pain-reducing options. This means that the information could be given at the U3 examination to promote the use of pain-reducing strategies at the vaccination appointment.
- Parents of children aged < 10 years should be present in the room during their child's vaccination.
- Children aged ≥ 3 years, adolescents and adults should all receive information about what will happen during the vaccination and how they can best deal with pain or fear, e. g. by holding their parent's or the accompanying person's hand immediately before the injection. Children aged ≤ 6 years should have their attention diverted from the pain by suitable tactics (e. g. blowing up a balloon, pinwheels, blowing soap bubbles, toys, videos, conversations or music) immediately before and after the injection. Adults can be encouraged to cough slightly or hold their breath for distraction.
- If infants are still being breastfed, mothers can nurse them during the vaccination. Alternatively sucking on a dummy can be used to calm the infant and reduce pain.
- Children aged < 2 years who are no longer being breastfed can be given 2 ml of 25 % glucose solution or another sweetened liquid a minute or two before the vaccination. As rotavirus vaccines contain sucrose, this should be administered first if it is one of several vaccinations being administered at the same time.

Recommended body position

- Small children aged < 3 years should preferably be carried or sit on their parents' lap during the vaccination and be gently rocked and stroked afterwards.
- Children aged ≥ 3 years, adolescents and adults should sit as upright as possible during the vaccination. Children can sit on their parents' laps so that their parents can help to keep their limbs still.
- People who have experienced fainting during vaccinations or other medical interventions should be vaccinated lying down.

Recommended injecting techniques

- For infants aged < 2 months, the length of the needle should be 15 mm. For older infants and small children, it should be 25 mm and for adolescents and adults, 25 – 50 mm.
- Irrespective of age, intramuscular injections should be administered without aspiration. Aspiration is unnecessary because there are no major blood vessels in the body parts where the injection is administered (*M. vastus lateralis* or *M. deltoideus*).
- If several vaccinations are being administered at the same time, the most painful injection should be given last. Pneumococcal and MMR injections can be particularly painful.
- A rapid injection can reduce pain for intramuscular injections.

Pain-reducing techniques that are not recommended

- Warming the vaccine.
- Manual stimulation of the area to be injected, e. g. by rubbing or pinching.
- Administering oral analgesics before or during the vaccination (An exception is the paracetamol prophylaxis for the MenB vaccination of < 2-year-olds).

4.7 Contraindications and false contraindications

Contraindications

Children, adolescents, and adults with acute diseases requiring treatment should only be vaccinated after recovery, with the exception of post-exposure vaccination.

In principle, vaccinations should be carried out in a medical environment in which clinical monitoring after vaccination and, if necessary, treatment of an anaphylactic reaction can be carried out. Depending on the diagnosis, adverse events temporally correlated with a vaccination are not an absolute contraindication against a further vaccination with the same vaccine. If necessary, vaccination can be carried out with particular caution, e. g. in a day-care setting or with a follow-up observation period of 30 minutes in the practice. Obstacles to vaccination can include allergies to components of the vaccine. These may include neomycin, streptomycin, and egg protein in rare cases. People who have had an anaphylactic reaction after a vaccination should seek allergological clarification in order to identify the causative component of the vaccine and avoid it in future. Vaccines that have triggered an anaphylactic reaction without the triggering agent being identified are contraindicated.

Persons who react with anaphylactic symptoms (e. g. angioedema, breathing difficulties or circulatory collapse) within a short period of time after oral consumption of chicken egg protein should not be vaccinated with vaccines that have been grown in incubated chicken eggs (yellow fever and relevant influenza vaccines). Vaccines that use cell cultures with chicken fibroblasts to multiply the virus (e.g. TBE or MMR vaccines) contain barely detectable traces of chicken egg protein. An allergy to chicken egg protein is therefore not a contraindication to the TBE or MMR vaccination. The risk of anaphylactic reactions after MMR vaccination in people with a proven allergy to chicken egg protein is no higher than the general risk of an anaphylactic reaction.

For congenital or acquired immunodeficiency, the physician treating the immunodeficiency should be consulted before vaccination with a live attenuated vaccine. **Serological monitoring of the success of vaccination is under certain constellations indicated in patients with immunodeficiency.** (Further information see: www.rki.de/Immundefzienz)

Vaccinations that are not recommended or not urgently indicated should not be carried out during pregnancy. Live attenuated vaccines against dengue, measles, mumps, rubella, and varicella are contraindicated in pregnancy. It is permissible to administer a yellow fever vaccination in pregnancy where there is a clear indication and following careful risk-benefit consideration. The yellow fever vaccination is contraindicated in infants < 6 months of age and for breastfeeding women with infants < 6 months of age (see Chapter 3 for details). The live attenuated vaccine against dengue is also contraindicated for breadfeeding women.

False contraindications

Indicated vaccinations are often omitted because certain conditions are erroneously considered contraindications. These include:

- Common infections, even if they are accompanied by subfebrile temperatures (< 38.5 °C);
- Possible contact between the person to be vaccinated and people with contagious diseases;
- Seizures in the family;
- Febrile convulsions in the medical history of the child to be vaccinated;
- Eczema including dermatoses and localised skin infections;
- Treatment with antibiotics;
- Treatment with low doses of corticosteroids or locally applied steroid-containing preparations;
- Pregnancy of the mother of the child to be vaccinated (including varicella vaccination after risk assessment)*;
- Congenital or acquired immunodeficiencies upon vaccination with inactivated vaccines;
- Neonatal jaundice;
- Premature birth: premature babies should be vaccinated at the recommended vaccination age regardless of their gestational age and current weight;
- Breastfeeding women: they can receive every required vaccination except for yellow fever and dengue (see above: Contraindications)
- Breastfed infants: infants who are exclusively or partially breastfed can be vaccinated in line with the STIKO recommendations, like infants who are fed formula or another baby food.

Indicated vaccinations should also be undertaken in people with chronic diseases, including neurological diseases, as these people are especially endangered by severe courses and complications of vaccine-preventable diseases. People with chronic diseases should be informed of the benefits of vaccination compared with the risk of the disease. There is no evidence that flare-ups or progressions of chronic diseases, which may occur in temporal association with vaccination, can be causally linked to vaccination.

* Considering the current vaccination coverage for varicella, the risk of connatal varicella syndrome in a seronegative pregnant woman in contact with her unvaccinated child (that is therefore at risk of being infected), is greater than the risk of a complication due to the vaccination of the child and transmission of vaccine-induced varicella via the child to the pregnant mother.

4.8 Vaccinations to protect reproductive health, for women with the wish to have children and during pregnancy and lactation

Certain vaccine-preventable infections before and during pregnancy and in the postpartum period are associated with increased risks for women's health, the course of pregnancy and the health of the unborn or newborn child.[I] Timely administration of the recommended standard vaccinations from infancy onwards and avoidance of vaccination gaps in childbearing age offer the best protection against the impact of vaccine-preventable diseases on women's health and the health of their children.

Vaccinations to protect against sexually transmitted diseases

Vaccination against the sexually transmitted diseases **hepatitis B** and **HPV** are part of the standard immunisation schedule for **infants** aged 1 year (hepatitis B) and **children aged 9 – 14 years** (HPV).
The majority of acute hepatitis B cases are observed after sexual transmission in young adults. Infections are also possible, e. g. in families or in communal facilities for children, due to other possible transmission routes, e. g. through contact of infected body fluids with mucous membranes or minor injuries or otherwise damaged skin. The reason for a hepatitis B vaccination recommendation in infants is, among other things, a particularly high risk of a chronic form of progression among the rare cases of the disease in infants and toddlers, which can lead to liver cirrhosis or hepatocellular carcinoma. While in adults a chronic course of the disease occurs in 10 % of cases, the proportion of cases in infants and children amounts up to 90 %. If the vaccination was missed in infancy, a catch-up vaccination is recommended until the age of 17.
The goal of HPV vaccination of girls and boys is to reduce the burden of disease from HPV-induced tumours. Besides causing genital warts, persistent HPV infections can lead to cell changes in the area of the cervix, vagina and vulva, penis, anus and throat. Over time, these cell changes can lead to cancer and may therefore have a relevant, long-term influence on the sexual health of both men and women. In addition, HPV infections during pregnancy and necessary surgical procedures on the cervix for the diagnosis and treatment of high-grade precancerous lesions have an impact on women's reproductive health, as they are associated with an increased risk of premature birth and, in some cases, further pregnancy complications.

The timing of the vaccination is crucial for best possible protection: the vaccination series should ideally be completed before any sexual contact occurs. A catch-up vaccination is recommended until the age of 17.

Catch-up vaccinations in women of childbearing age and vaccinations for women with the wish to have children

Rubella and **varicella infections** of pregnant women can result in a congenital rubella syndrome (CRS) or a congenital varicella syndrome with involvement of single or multiple organs in the unborn child. A peripartum varicella infection of the mother can lead to life-threatening neonatal varicella. The STIKO recommends women of childbearing age who are unvaccinated or with unclear vaccination status to be vaccinated against rubella with 2 doses of an MMR vaccine. Women of childbearing age with 1 previous dose should receive a 2nd MMR vaccination. In addition, the STIKO recommends two vaccinations against varicella for seronegative women of childbearing age. Pregnant women who contract **measles** have an increased risk of developing pneumonia, furthermore increased preterm labour, premature births and spontaneous abortions have been observed. A measles infection at the end of the 3rd trimester or around birth can lead to neonatal measles (see Epid Bull 32/2010).[28] STIKO recommends that all persons born after 1970 who are ≥ 18 years of age with unclear vaccination status, without vaccination or with only 1 vaccine dose in childhood, receive a single vaccination against measles with an MMR vaccine. If there is a simultaneous indication for MMR vaccination or varicella vaccination, an MMR/V combination vaccine may be used if necessary.

Against measles, mumps, rubella and varicella only live attenuated vaccines are available that bear a contraindication during pregnancy. Therefore, any vaccination gaps that may exist in women of childbearing age should be closed in a timely manner. After vaccination with a live attenuated vaccine, pregnancy should be avoided for one month. Accidental vaccination with a live attenuated vaccine during early pregnancy does not constitute an indication for an abortion.

In the context of spontaneous reporting of adverse events following vaccination and a systematic evaluation of epidemiological studies involving several thousand documented vaccinations during pregnancy with rubella or MMR vaccine, for a long time no cases of rubella embryopathy caused by the vaccine virus were reported but recently, a single possible case was published (Boutry E et al., Pediatrics 2023).Missing or incomplete vaccinations against **tetanus, diphtheria** and **poliomyelitis** should be completed according to the general recommendations of the STIKO (see Table 11E). If applicable, vaccination against hepatitis B should be given before conception (see Table 2). Vertical transmission from the most often chronically infected mother to the child is the main cause of hepatitis B in infected children,[L] which leads to a chronic course in about 90 % of cases of perinatal infection.[M]

In contrast to live attenuated vaccines, after vaccination with an inactivated vaccine, no time interval has to be considered before a potential conception.

Vaccinations during pregnancy

Due to theoretical considerations, vaccinations with a **live attenuated vaccine**, such as against dengue, measles, mumps, rubella or varicella, **generally poses a contraindication** in pregnancy.

Vaccination with the live attenuated vaccine against **yellow fever** may be administered during pregnancy in the presence of an unambiguous indication and after a careful risk-benefit assessment.

Inactivated vaccines are considered **safe** for the pregnant woman and fetus.[N] Therefore, pregnancy is not a contraindication for the administration of inactivated vaccines (such as those against influenza, tetanus, diphtheria, pertussis, hepatitis A and B). In the first trimester of pregnancy, only urgently indicated vaccinations should be administered to avoid that spontaneous abortions, which are frequent in early pregnancy, are associated with the vaccination. There are no safety concerns regarding the administration of COVID-19 mRNA vaccines during pregnancy or breastfeeding.

Vaccination against seasonal **influenza** and **pertussis** is explicitly recommended by the STIKO during every pregnancy (see Influenza and Pertussis in Table 2). The principal vaccination goal of influenza vaccination of pregnant women is to prevent a severe course of disease progression, since pregnancy is associated with an increased risk of severe disease. Whereas the goal of pertussis vaccination in pregnancy is to reduce the disease burden in terms of frequency and severity of the disease in newborns and young infants; who cannot yet be vaccinated themselves (adequately).

If the pertussis vaccination recommended during pregnancy has not been administered, the mother should

preferably be vaccinated in the first days after birth. Especially before the birth of a child, it should be reviewed whether close household contacts and close contacts of the newborn have sufficient immunological protection (vaccination within the past 10 years) against pertussis (see Table 2).

Vaccinations during lactation

Breastfeeding women can receive all vaccinations recommended by the STIKO with the exception of the dengue and – in case of breastfed infants < 6 (9) months of age – the yellow fever vaccination (see chapter 4.7 "Contraindications and false contraindications"). The postnatal examination at the end of the postpartum period is particularly useful for vaccination prophylaxis. Mothers who do not have 2 documented doses of rubella vaccine or who tested seronegative for rubella during pregnancy should be administered 2 MMR vaccine doses postpartum at a (minimum) interval of 4 weeks.

4.9 Vaccinating patients with immunodeficiency

Patients with immunodeficiency frequently suffer from infectious diseases. These diseases often have a particularly severe course in this group. People with immunodeficiency should therefore be given as much protection as possible by vaccination. It is also important for infection protection that those who come into household contact with people with immunodeficiency are properly protected by vaccination in line with STIKO recommendations. This also applies to other people in the patient's direct environment (for example in the health service, day care centre for children or school).

Table 2 of the STIKO recommendations already lists some groups of patients with a congenital or acquired immunodeficiency. When planning and carrying out vaccinations, special attention must be paid to some particularities in these patient groups. This may involve:

- Recognition and assessment of the severity of the immune defect;
- Assessment of indications and contraindications for specific vaccinations or vaccine types, depending on the type and severity of the underlying disease or if applicable the immunosuppressive medication and the thereof resulting immune deficiency;
- Considering the time of vaccination (e. g. before a planned iatrogenic immunosuppression);
- The comprehensive provision of information to the patient, especially if an *off-label* application is necessary.

To assist vaccinating physicians with the mentioned points above and to provide decision-making assistance, a group of experts has developed vaccination guidelines for patients with immunodeficiency under the leadership of STIKO. These instructions are published in four themed documents and are available online (www.rki.de/immundefizienz.de, in German only). This includes the basic paper (Paper I), the application instructions for vaccinating patients with primary immunodeficiency diseases (including autoinflammatory diseases) and HIV infection (Paper II), the instructions for vaccination against haematological and oncological diseases (antineoplastic therapy, stem cell transplantation), organ transplantation and asplenia (Paper III) and the instructions for vaccination against autoimmune diseases, other chronic inflammatory diseases and under immunomodulatory therapy (Paper IV).

4.10 Vaccine associated reactions, complications and health damage, and how to report them

Criteria for differentiating normal vaccine reactions from potential complications

Under the Protection Against Infection Act (IfSG) (§ 6, para.1, no.3), every suspected vaccine-associated complication must be notified to the responsible local public health authority. This notification is a medical duty. Vaccine-associated complications are defined as damage to health that goes beyond the usual reaction to vaccination. To differentiate vaccination associated complications, which must be reported, from normal vaccination reactions, STIKO has defined the characteristics of normal reactions to vaccination, as requested by IfSG (§ 20, para. 2, sentence 3).

Solicited vaccine reactions (Reactogenicity)

Solicited (normal) vaccination reactions that are exempt from notification are defined as temporary local and systemic reactions that do not go beyond the usual dimensions of a reaction to vaccination and can be seen as the expression of the interaction between the organism and the vaccine. STIKO has set out the following criteria for **solicited reactions to vaccines:**

- Over a period of 1 – 3 days (occasionally longer): prolonged reddening, swelling or pain around the injection site (local reactions);
- Over a period of 1 – 3 days: fever < 39.5°C (rectal measurement), headache and joint pain, tiredness (fatigue), discomfort (malaise), nausea, restlessness, swelling of regional lymph nodes (systemic reactions);
- 1 – 3 weeks after administration of live attenuated vaccines: symptoms of an ascribable "vaccination illness" such as mild parotid swelling, short-term arthralgia or a temporary exanthema after measles, mumps, rubella or varicella vaccinations, or mild gastrointestinal complaints, e. g. following oral rotavirus or typhoid vaccinations.
- Symptoms which are obviously ascribable to a cause other than the vaccine are also exempt from notification.

All other reactions should be reported.

Reporting the suspicion of vaccine-associated complications

Under the Protection Against Infection Act (IfSG) (§ 6, para. 1, no. 3), any suspicion of damage to health (suspicion of vaccine-associated complications) that goes beyond solicited vaccine reactions must be reported within 24 hours by name to the local public health authority (§ 9, para. 1 and 3 IfSG). The physician's notification must immediately be forwarded by the local public health authorities to the relevant state authorities under § 11, para. 4 (IfSG) and from there to the respective federal authority (PEI). The obligation to notify was made statutory to ensure immediate triggering of the relevant immunological tests (e. g. to exclude an immune defect) or microbiological tests (e. g. to exclude an intercurrent infection by differential diagnosis) required to clarify adverse drug reactions and to acquire and store the necessary test materials such as serum or stool samples.

The notification obligation applies whether or not the vaccine is publicly recommended. To ensure uniform reporting of suspected cases nationwide, PEI has developed a report form in collaboration with STIKO and the German Ministry of Health entitled, "Bericht über Verdachtsfälle einer über das übliche Ausmaß einer Impfreaktion hinausgehenden gesundheitlichen Schädigung" (Report of suspected cases of damage to health going beyond the usual reaction to vaccination). This is available online at: www.pei.de/SharedDocs/Downloads/DE/ arzneimittelsicherheit/pharmakovigilanz/ifsg-meldebogen-verdacht-impfkomplikation.pdf and can also be obtained from the health authorities. The reports help to improve the pool of data on vaccine associated complications.

Under § 6 of their professional code, physicians are also obliged to report any unsolicited adverse drug reactions they encounter in the course of providing treatment to the Drug Commission of the German Medical Association (www.akdae.de). The manufacturer can also be informed.

Vaccine-associated health damage and its recognition under the Infection Protection Act (IfSG)

A vaccine-associated health damage is a non-temporary health impairment that has already existed for at least 6 months, which goes beyond the usual extent of a reaction to a vaccination and for which a causal connection to the vaccination or specific prophylaxis is proven or probable (§§ 4, 5 and 24, social code book [SGB] XIV). **Anyone who has been vaccinated** in accordance with § 2, no. 9, IfSG or who has undergone another measure of specific prophylaxis in accordance with § 2, no. 10, IfSG,

- ➔ which has been publicly recommended by a competent state authority in accordance with § 20, para. 3, IfSG and carried out in its area,
- ➔ which was carried out on the basis of an entitlement in line with a statutory order in accordance with § 20i, para. 3, SGB V or, in the case of a vaccination, was carried out for a person insured under private health insurance to an extent corresponding to the entitlement in line with a statutory order in accordance with Section § 20i, para. 3, SGB V,
- ➔ which was carried out free of charge by local health authorities in accordance with § 20, para. 5, IfSG or
- ➔ which was mandated on the basis of a statutory order in accordance with § 20, para. 6, or para. 7 IfSG or was otherwise stipulated by law,

and has suffered such a health impairment as described above receives social compensation benefits if the requirements of § 4, para. 1, SGB XIV are met (since 01.01.2024 regulated by § 24, SGB XIV; until 31.12.2023 § 60, IfSG). This also applies if the vaccination was carried out with pathogens capable of replication (i.e. with live attenuated vaccines) and a person other than the vaccinated person was harmed. Conditions are fulfilled in accordance with § 4, para. 1, SGB XIV if the relevant health impairment is causally attributable to a damaging event (in this case a vaccination) and has been recognised. The existence of the eligibility requirements must be determined by the competent authority (pension office) upon application. The procedure for recognition of vaccine associated health damage differs and is separate from the process of reporting a suspected vaccination complication (see previous sections). Local public health authorities or attending physicians should inform people affected or their parents or guardians of statutory provisions for compensation following vaccine-associated health damage (SBG IVX), the responsible authority of the federal state as descripted in the Federal Benefit Act (§ 113, para. 5, SGB IVX) and the procedure. Information on this can also be obtained from the regional pension offices themselves.

4.11 Vaccination of personnel in medical facilities

Vaccination of personnel in medical facilities is of particular importance. On the one hand, due to their professional activity, medical workers are exposed to an increased risk of exposure to certain infectious agents. In this case the occupational indicated vaccination serves to protect the individual worker against infections. On the other hand, the personnel themselves can become a source of infection for the patients they care for or for colleagues. The vaccination of medical personnel can thus serve to avert vaccination-preventable nosocomial infections of the patients (so-called third-party protection). Recommendations of the STIKO according to § 20, para. 2, IfSG generally consider both aspects. The STIKO has published a statement on vaccinations for personnel in medical facilities to support managers and directors of medical facilities and those responsible for implementing vaccinations, in reducing the transmission of vaccine preventable infectious diseases in their areas of responsibility and to ensure that the personnel working in medical facilities have adequate vaccination protection in accordance with their area of application. The statement includes a table with information on selected vaccine-preventable infectious diseases and the occupationally indicated vaccination recommendations as well as information on postexposure prophylaxis (PEP) (see Epid Bull 4/2021).

4.12 Vaccination recommendations for migrants and refugees living in Germany

Migrants and refugees living in Germany should be vaccinated according to the STIKO recommendations for their age. An overview of the vaccinations recommended in individual countries can be found on the websites of the European Centre for Disease Prevention and Control (ECDC) (https://vaccine-schedule.ecdc.europa.eu/) or WHO (https://immunizationdata.who.int/global?topic=Vaccination-schedule&location=DZA).

Any available vaccination documents should be used to assess the individual's vaccination status. Any missing vaccinations should be administered (see chapter 6). Often, vaccination status cannot be assessed because of a lack of documents. Vaccinations that are not documented are considered not to have been administered, and should be administered following STIKO recommendations. However, credible oral statements on prior vaccinations should be taken into account.

- Children and adolescents who are unvaccinated or whose vaccination status is unclear should receive vaccinations against diphtheria, tetanus, pertussis, poliomyelitis, measles, mumps, rubella, varicella, hepatitis B, and meningococci B (up to the age of < 5 years). Children and Adolescence aged 9 years and above should recive a HPV vaccination and furthermore at the age of 12 to 14 years a vaccinatation against meningococci of the seogroups A, C; W and Y is recommended. Infants should also receive the monoclonal antibody Nirsevimab for RSV prophylaxis in their 1st RSV season and the vaccination against rotaviruses, with the vaccination course completed by the age of 24 weeks (Rotarix) or 32 weeks (RotaTeq). Infants and toddlers should be vaccinated against pneumococci (up to the age of 24 months) and *Haemophilus influenzae* type b (up to the age of < 5 years). Children with documented primary immunisation against tetanus, diphtheria, pertussis, and poliomyelitis need 1 booster vaccination 5 years after their primary immunisation. Children and adolescents with an underlying condition that is associated with an increased risk of severe COVID-19 should have a baseline immunity to SARS-CoV-2 and receive an annual (once per season) COVID-19 vaccination in autum.

- Unvaccinated adults or adults whose vaccination status is not clear should receive initial immunisation against diphtheria, tetanus, pertussis, and poliomyelitis. Adults who already have primary immunisation against tetanus, diphtheria, pertussis, and poliomyelitis should receive a Tdap-IPV booster vaccination 10 years after the previous vaccination. People born after 1970 should receive a single vaccination against measles (MMR).Unvaccinated women of child-bearing age or with unclear vaccination status should be vaccinated twice against rubella (MMR), and seronegative women who wish to have children should be vaccinated twice against varicella. In addition, pregnant women with **in**complete baseline immunity to SARS-CoV-2 should receive the necessary COVID-19 vaccinations from the 2nd trimester onwards. From the age of 60 years, a pneumococcal vaccination (see chapter 3.2) herpes zoster, and an annual (once per season) influenza and COVID-19 vaccination (in autumn) should also be administered. Additionally, persons aged ≥ 75 years should receive a RSV vaccination

So that people can be informed about the diseases to be prevented and the vaccination planned, the RKI provides an educational package, including consent forms for various vaccinations in several languages on the internet (COVID-19, hepatitis A, hepatitis B, herpes zoster (inactivated vaccine), HPV, influenza, MMR, meningococci A, C, W, Y and B, Mpox varicella, pneumococci, rotavirus, RSV, Tdap-IPV, and 6-in-1 vaccination [DTaP-IPV-Hib-HepB]): www.rki.de. Invoicing for publicly recommended vaccinations for refugees is regulated by the Benefits for Asylum Seekers Act (AsylbLG, § 4, para. 3). Health insurance normally pays for vaccinations for all other migrants.

Recommended vaccinations for refugees in reception centres and other shared accommodation facilities with crowded living conditions

Living together for extended periods in crowded conditions (e. g. in reception centres for asylum seekers) increases the probability of outbreaks of infectious diseases. A growing number of inadequately vaccinated people can lead to the development of an epidemiologically relevant, unprotected demographic group. Closing gaps in the vaccination coverage of these groups can be difficult because of the decentralized healthcare system and the required selfresponsibility in Germany. However, public health workers or contracted physicians have good access to reception centres and shared accommodation facilities, where they can implement targeted measures to close vaccination gaps. Administering vaccinations soon after arrival in Germany can achieve the following aims:

- individual protection through closing of vaccine gaps;
- limiting or preventing outbreaks of diseases preventable by vaccination in facilities;
- preventing demographic groups that are unvaccinated and difficult to reach.

The situation (size of the facility, length of stay, resources) and the organization of vaccination appointments vary widely among the reception centres and shared accommodation facilities. If possible, all vaccinations recommended by STIKO should be included in vaccination appointments. In facilities in which it is difficult to implement the STIKO recommendations because stays tend to be short, only one vaccination appointment may be possible. In that case, vaccinations should be prioritized.

Table 5 (next page) lists high-priority vaccinations that should be started soon after arrival and admission to the facility, if possible in the first few days. After leaving the facilities, licensed physicians or public health workers at the refugee's next destination should complete the primary immunisation or start new age appropriate vaccinations based on catch-up vaccination recommendations (see chapter 6.10).
General information provided by STIKO on vaccinations should be taken into account (see chapter 4.). If there are not enough vaccines in the facility, children should be given priority. Vaccinations to control outbreaks of diseases preventable through vaccination should be given first priority, and if applicable, combined with other required vaccinations.
There is an elevated risk of influenza outbreaks in reception centres and shared accommodation facilities because of the crowded living conditions. Beyond STIKO recommendations, local public health authorities can consider offering vaccinations against seasonal influenza in the autumn and winter months to all residents, and not only to groups at high risk.

Table 5 | Prioritizing vaccinations for the 1st vaccination appointment soon after arrival for unvaccinated refugees and refugees whose vaccination status is not clear

Age at 1st vaccination	1st vaccination appointment[a]
2 to 8 months	DTaP-IPV-Hib-HepB[b]
9 months to 4 years	DTaP-IPV-Hib-HepB[b]
	MMR/V[c]
5 to 17 years	Tdap-IPV[d]
	MMR/V [e]
Adults born after 1970	Tdap-IPV[d]
	MMR[e]
Adults born before 1970	Tdap-IPV[d]
Additional indicated vaccinations for: • Pregnant women from the 2nd trimester[f] • People aged 60 years and older • Children and adults with chronic diseases[g]	During autumn/winter months: Influenza and COVD-19 (in addition to the above vaccinations)

a The vaccines mentioned here can be administered simultaneously.
b A pentavalent vaccine can also be used.
c In children aged <5 years, it may be better to separate the 1st dose of MMR and V vaccines, instead of using the MMRV combination vaccine.
d Pregnancy is not a contraindication.
e Contraindicated during pregnancy.
f COVID-19 vaccination only for unvaccinated pregnant women or pregnant women with incomplete baseline immunity
g In case of unclear anamnesis, set indication to vaccinate generously.

Recommendations for vaccinating employees in reception centres and shared accommodation facilities

Employees (including e. g. volunteers) in reception centres or shared accommodation facilities should be vaccinated following the STIKO vaccination recommendations for their age. Vaccination status for tetanus, diphtheria, poliomyelitis, pertussis, measles (for people born after 1970), mumps, and rubella should be assessed based on entries in vaccination records whenever possible. Vaccination for protection against varicella is recommended for all seronegative persons (see Epid Bull 2/2020).[33] The ArbMedVV (Ordinance on Occupational Health Care) should be followed for those employed.

STIKO also recommends the following vaccinations for employees with elevated risk of exposure in these facilities. Indications should be defined based on an estimation of the actual risk of exposure:

- hepatitis A
- hepatitis B
- poliomyelitis booster vaccination if the last vaccination was more than 10 years ago
- seasonal influenza

4.13 Vaccine supply shortages

Since October 2015, the PEI website has included information about shortages in the supply of vaccines and the probable duration of non-availability (www.pei.de/lieferengpaesse). This information is derived from notifications from pharmaceutical companies, which report shortages as soon as the delivery chain for supplying a vaccine is interrupted for a period of at least 2 weeks. PEI also announces on their website if one or more alternative vaccines with the same composition are available and can be used instead.

If no licensed vaccine with comparable antigen composition is available for the respective indication and age, the STIKO gives recommendations on how protection through vaccination can be ensured alternatively using other available vaccines (see table 6). Even though there are no unacceptably long vaccination intervals and every vaccination counts, a timely immunisation in accordance with the recommendations – especially in infants and toddlers – is preferable from the STIKO's perspective. This also applies to the influenza vaccination, where immunity through vaccination should ideally be achieved before the start of the

influenza season. Booster vaccinations may be postponed if primary immunisation is complete, since the time intervals recommended by the STIKO for booster vaccinations allow a certain degree of flexibility.

Table 6 lists recommendations for the most frequent or relevant supply shortages for which no alternative vaccine with comparable composition is available. The alternative recommendation should be applied as soon as the PEI website mentioned above informs about a supply shortage of the originally recommended vaccine. A query in several regional supply pharmacies can clarify whether, despite the supply shortage declared by the PEI, residual stocks of this vaccine are still available regionally. For the application of the alternative recommendations, the information on the PEI website is authoritative; in addition, the STIKO provides information on its website (www.stiko.de > Lieferengpaesse). The alternative recommendation loses its validity as soon as the PEI cancels the determination of the supply shortage on its website (see above). In addition, the STIKO will also remove the reference of the applicability of the alternative recommendation from its website. For further information, see Epid Bull 23/2021.[31]

Table 6 | Alternatively recommended vaccines in case of supply shortages

Vaccination against[a]	Recommended vaccine affected by supply shortage[a]	Recommended alternative(s)[b]
Diphtheria, tetanus, pertussis, poliomyelitis, *Haemophilus influenzae* type b, hepatitis B	Hexavalent vaccine (DTaP-IPV-Hib-HepB)	Pentavalent vaccine (DTaP-IPV-Hib) plus monovalent HB vaccine **Alternative:** DTaP vaccine (trivalent) plus monovalent vaccines IPV, Hib and HB
DTaP	Trivalent vaccine with high antigen concentration	Pentavalent vaccine (DTaP-IPV-Hib)
Hepatitis A, hepatitis B	Combination vaccine HepA+B	Monovalent vaccine HepA plus monovalent vaccine HepB
Hepatitis B	Monovalent HepB vaccine	Combination vaccine HepA+B
Herpes zoster	Adjuvanted herpes zoster inactivated vaccine	No alternative (postponement of the vaccination appointment)
Haemophilus influenzae type b	Monovalent Hib vaccine	Combination vaccine with Hib component e. g. pentavalent vaccine (DTaP-IPV-Hib) or hexavalent vaccine (DTaP-IPV-Hib-HepB)[c]
Influenza (standard vaccination for persons ≥ 60 years)	Inactivated, high-dose influenza and MF-59-adjuvanted vaccine, with current antigen combination recommended by WHO	Inactivated, influenza vaccines (cell culture based, split virus, subunit, recombinant and adjuvanted vaccines)
Measles, mumps, rubella	MMR combination vaccine	MMRV combination vaccine[d]
Measles, mumps, rubella, varicella	MMRV combination vaccine	MMR combination vaccine plus monovalent varicella vaccine
Pneumococcal disease (persons ≥ 2 years)	20-valent conjugate vaccine (PCV20)	No alternative[e] (postponement of the vaccination appointment)
Tetanus, diphtheria, pertussis	TdaP/Tdap combination vaccine with low antigen concentration	Tdap-IPV combination vaccine

a According to immunisation schedule (standard vaccinations) for infants, children, adolescents and adults in Table 1, recommendations on standard vaccinations for adults and indication and booster vaccinations for all age groups in Table 2, postexposure vaccinations in Table 7, and age-dependent recommendations for the implementation of catch-up vaccinations in Table 11 A - E, respectively.
b In compliance with license restrictions and according to the Summery of Product Characteristics.
c When administered to persons aged ≥ 5 years, depending on the vaccine used, information on *off-label* use may be required.
d Note slightly increased risk of febrile convulsions in children < 5 years of age 5 - 12 days after initial administration of combined MMRV vaccine (see Epid Bull 30/2012); however, the STIKO considers this slightly increased risk to be secondary to timely MMR immunisation in the event of a supply shortage.
e Depending on the duration of the supply shortage and the individual risk profile, it may be advisable in individual cases not to await re-availability and instead to use PCV15. In this case, a vaccination with PCV20 at an interval of at least 1 year should be considered when PCV20 becomes available again.

Abbreviations: diphtheria: D or d (depending on antigen concentration); *Haemophilus influenzae* type b: Hib; hepatitis A: HepA; hepatitis B: HepB ; measles mumps rubella: MMR; pertussis: aP or ap (depending on antigen concentration); poliomyelitis: IPV: tetanus: T; varicella: V

4.14 Notes on invoicing for vaccinations

There are various possible options for covering the cost of vaccinations. Under § 20i, para. 1 first sentence of Book V of the Social Code [SGB V], insured people are entitled to vaccination under § 2 no. 9 of the Protection Against Infection Act (IfSG). Based on STIKO recommendations, in accordance with § 20i, para. 1, sentence 3 and 4 SGB V the Federal Joint Committee (G-BA) must provide vaccination guidelines (see www.g-ba.de) that establish the details of the obligation to reimburse the cost of vaccinations (including requirements, type and scope). Therefore, the significance of the vaccinations for public health should be considered. According to SGB V, § 20i, para. 1, Sentence 2, this entitlement to coverage also applies to vaccinations that are indicated due to an increased health risk caused by a stay abroad – but only if the stay abroad is for professional or educational reasons or if there is a special interest in preventing the introduction of a communicable disease into the Federal Republic of Germany in order to protect public health.

Any deviations from the STIKO recommendations must be specifically justified.
If a G-BA decision is not made within 2 months following publication of the STIKO recommendations, vaccinations recommended by STIKO must be provided by health insurance companies until the guideline comes into existence. The optional benefits coverage provided by health insurance companies can also include the reimbursement of the cost for further vaccinations that are not part of the guidelines of the Federal Joint Committee. The health insurance company associations have to jointly and uniformly make agreements regulating the funding of vaccinations and the reimbursement of vaccine costs at the regional level with the regional authorities responsible for carrying out vaccinations.
Apart from the health insurance companies, other payers can cover the cost of vaccinations. The vaccinations denoted “O” in the STIKO recommendations also include those for professional groups that are not subject to the named ordinances. This category includes vaccinations that are primarily indicated for the protection of third parties. Even if no regulations apply in these cases, it is in the interests of employers to offer these vaccinations, because this allows them to counter possible claims for regress and avoid the costs of employee absenteeism. The protective vaccination guidelines of the Federal Joint Committee determine how far the recommendations denoted “O” are standard services for the statutory health insurance companies.

5. Post-exposure vaccinations and other measures for specific prophylaxis of communicable diseases

5.1 Overview

As well as recommendations for standard and indicated vaccinations, STIKO issues recommendations about post-exposure vaccinations and other measures for specific prophylaxis among those in contact with diseases in private and occupational settings or community facilities. These recommendations include advice on how insufficiently-protected individuals can be protected after exposure to specific infectious agents to prevent further spread of the disease or to mitigate the course of the disease. Postexposure vaccination, passive immunisation by administration of immunoglobulins, and chemoprophylaxis are specified as preventive measures. Information on post-exposure prophylaxis of specific infectious diseases can also be found in the "RKI Guidebooks" ("RKI-Ratgeber", www.rki.de/ratgeber).

5.2 Vaccinations in cases of clusters or outbreaks of meningococcal diseases

- **A "meningococcal disease outbreak"** is defined as two or more cases of the same serogroup within 4 weeks in a children's facility, school class, playgroup, or a community facility with a household like character (for example, student dormitories, boarding school, or barracks);
- **A "regionally clustered occurrence"** is defined as three or more cases of the same serogroup within 3 months:
  - in a restricted age group of the population (e.g., adolescents) in one place; or
  - in a region with a resulting incidence ≥ 10/ 100,000 in the relevant population.

As well as antibiotic prophylaxis for close contacts (see Table 7, and the recommendations of the German Society of Paediatric Infectious Diseases [Deutsche Gesellschaft für Pädiatrische Infektiologie (DGPI)], or the National Reference Centre for Meningococci, and the RKI-Ratgeber "Meningokokken" ["Meningococcal Disease Guide"] of the RKI), the responsible health authorities can recommend prophylactic vaccination if the clustered occurrence or the outbreak was caused by a strain preventable by vaccination. This is justified by the possibility of further cases occurring up to a few months after the onset of the first illnesses (see Epid Bull 31/2009).[34]

As with antibiotic prophylaxis, close contacts in the households of patients, their intimate partners, and close contacts in children's facilities, school classes, playgroups, and community facilities with a household-like character can be included in prophylactic vaccination if there is an outbreak.

For a regionally-clustered occurrence, the responsible health authorities must decide on recommendations considering the epidemiological and temporal correlations of the cases, their age distribution, the level of public concern, and the feasibility of the measures.

For vaccination, the licensed vaccines for the meningococcus serogroup causing the outbreak can be used (see notes on use in Table 2 and notes on vaccination against meningococcal infection in chapter 3.2).

Whenever meningococcal meningitis is suspected, a specimen for isolation of the pathogen should immediately be sent to a suitable laboratory. The responsible local Public Health Department should urge that samples of isolated meningococci be sent as rapidly as possible to the National Reference Centre to ensure typing and to permit preventive vaccination to be recommended in the event of a clustered occurrence.

Table 7 | Post-exposure vaccinations and other measures for specific prophylaxis

Disease	Indication	Notes on use (Note package leaflet/ Summary of Product Characteristics)
Diphtheria	For people in close (face-to-face) contact with cases.	Chemoprophylaxis: Independent of vaccination status, preventive antibiotic treatment is recommended, e.g., with erythromycin (see RKI's Guidebook for Physicians, on diphtheria, www.rki.de/ratgeber > Diphtherie). Post-exposure vaccination is indicated if the most recent vaccination was > 5 years ago.
	During epidemics or increased morbidity in the region.	Vaccination in line with health authority recommendations.
***Haemophilus influenzae* type b (Hib)**	Following close (face-to-face) contact with a person with invasive Hib infection or contact with their oropharyngeal secretions, chemoprophylaxis (PEP) is recommended for the following groups of people: ▸ Unvaccinated or insufficiently vaccinated children < 5 years of age who are exposed in communal facilities ▸ All close contact persons with a medically justifiable increased risk of invasive Hib disease[a] ▸ All members of the household of the infected person if there is at least one unvaccinated or insufficiently vaccinated child < 5 years of age or a person with a medically justifiable increased risk of invasive Hib disease[a] in their household. Residents of facilities (e.g., communal accommodation for asylum seekers or homeless people, boarding schools, dormitories, barracks, prisons) who have household-like contact are considered household members. In outbreak situations, additionally: ▸ All children and their caregivers (regardless of vaccination status and age) within the same group at a community facility for children < 5 years of age, if ≥ 2 cases have occurred there within approximately 2 months and the facility among others takes care of children who are not or not sufficiently vaccinated ▸ All close contact persons (face-to-face contact; regardless of vaccination status and age) who themselves have close and regular contact with vulnerable persons[a] in the outbreak.	Chemoprophylaxis: **Rifampicin (first choice):** **≥ 1 month**: 1 x 20 mg/kg body weight (maximum 600 mg) orally (p.o.) for 4 days **≥ 18 years**: 1 x 600 mg p.o. for 4 days **Ceftriaxone:**[b] < 12 years: 50 mg/kg body weight (max. 1,000 mg/day) parenterally for 2 days ≥ 12 years and adults: 1,000 mg/day parenterally for 2 days **Levofloxacin:**[b] In all age groups: 8-10 mg/kg body weight (max. 1,000 mg/day) p.o. for 4 days For chemoprophylaxis in pregnant women, the choice of antibiotic should be made on an individual basis, taking into account the information in the Summary of Product Characteristics. If PEP is indicated, it should be started as early as possible, at the latest 7 days after the onset of illness in the index case. In outbreak situations, PEP may be useful up to day 28 after the onset of illness in the index case for close contact persons who are themselves vulnerable or who have close and regular contact with vulnerable persons in the outbreak.
	Unvaccinated or insufficiently vaccinated children < 5 years of age should receive a catch-up vaccination against Hib. In outbreak situations, additionally: ▸ Hib vaccination for people with a medically justifiable increased risk of invasive Hib disease[a] with exposure to a potentially infecting agent.	Vaccination: Single vaccination with an age-appropriate approved vaccine (e.g., Act-Hib, Pentavac, or a comparable vaccine with a Hib component) Combination vaccines with a Hib component, which are regularly used in childhood, pose a potentially increased risk of local and systemic reactogenicity due to a higher tetanus toxoid, diphtheria toxoid, or Bordetella pertussis antigen content than Tdap combination vaccines for adults.

a) Medically justifiable increased risk of invasive Hib disease exists, for example, due to increased susceptibility to encapsulated bacteria (e.g., anatomical or functional asplenia), drug use, precarious living conditions/homelessness, chronic liver or kidney disease, or malnutrition.

b) Taking into account contraindications, age, possible side effects and potential drug interactions, duration of therapy and dosage regimen of the active substance used, and, where applicable, ensuring the best possible adherence to therapy among hard-to-reach groups (e.g., drug users or homeless people), chemoprophylaxis can also be carried out with ceftriaxone or levofloxacin as an alternative to rifampicin. If these are not available, ciprofloxacin (see package leaflet/Summary of Product Characteristics for instructions for use) can also be used for PEP.

(Table 7 continued)

Disease	Indication	Notes on use (Note package leaflet/ Summary of Product Characteristics)
Hepatitis A (HA)	Contact with hepatitis A patients (especially in community facilities) or after consuming HA virus contaminated food in a food-borne outbreak.	Post-exposure vaccination with monovalent hepatitis A vaccine within 14 days of exposure: Following the exposure of people for whom a hepatitis A infection poses a particular risk (e.g., those chronically infected with HBV or HCV), an immunoglobulin preparation should be administered simultaneously with the 1st vaccination. See also "Ratgeber Hepatitis A" ["Hepatitis A Guide"] at www.rki.de/ratgeber > Hepatitis A.
Hepatitis B (HB)	Injuries from objects potentially containing HB virus (e.g., a needle) or blood contact with mucous membranes or broken skin.	See post-exposure hepatitis B immune prophylaxis (chapter 5.3 and Figure 1)
	Newborn babies with HBsAg-positive mothers or mothers with unknown HBsAg status (regardless of birth weight).	See comments on specific vaccinations (chapter 3.2)
Measles	People with unclear vaccination status, who have not been vaccinated, or who received only one vaccination during childhood after contact with measles cases: 1) At the age of 6 to 8 months: exceptionally after individual risk-benefit consideration (*off-label-use*). 2) At the age of 9 to 10 months 3) At the age of 11 months to 17 years. 4) At the age of 18 years or more, born after 1970	Vaccination with MMR(V)[a] vaccine preferably within 3 days of exposure. For the number of vaccine doses and the time of administration, please consider the following age-specific recommendations: To 1) Following 1st vaccination; a 2nd and 3rd vaccine dose should be administered at the ages of 11 and 15 months. To 2) Following 1st vaccination; the 2nd vaccination should be administered at the beginning of the 2nd year of life. To 3) People with unclear vaccination status or who have not been vaccinated should be given 2 vaccine doses, administered at least 4 weeks apart; People who have received only one vaccination should be given 1 more vaccination. To 4) People who have not been vaccinated, with unclear vaccination status, or who were administered only one vaccination during childhood should be given 1 vaccination.
	a MMR(V) = MMR with or without co-administration of varicella vaccine.	
Measles	Unprotected people with a high risk of complications and for whom active immunisation is contraindicated after exposure to measles: ▸ Infants < 6 months of age ▸ susceptible pregnant women ▸ immunodeficient individuals	Post-exposure administration of immunoglobulins *(off-label- use)* as soon as possible, preferably within 6 days of exposure: 1 x 400 mg/kg body weight, intravenously. For infants between 6 to 8 months of age, passive immunisation with immunoglobulins can be considered instead of the 1st vaccination, based on an individual risk-benefit assessment, for instance if the contact happened more than 3 days before. After administration of immunoglobulins, the MMR vaccination is not reliably effective for 8 months. This should be taken into consideration in the event of an indication for immunoglobulin administration (see also Epid Bull 2/2017).

(Table 7 continued)

Disease	Indication	Notes on use (Note package leaflet/ Summary of Product Characteristics)
Meningo-cocci	Chemoprophylaxis is recommended for all those in close contact with someone with invasive meningococcal infection (all serogroups). This includes: ▸ All household contacts of patients; ▸ People directly exposed to the patient's oropharyngeal secretions; ▸ Contacts in childcare facilities for children under 6 years of age (if the groups are well-separated, only in the affected group); ▸ People with close contacts in community facilities with a household-like character (boarding schools, student dormitories and barracks) Chemoprophylaxis is indicated if close contact with the index patient took place in the 7 days preceding the onset of illness. Chemoprophylaxis should take place as soon as possible after diagnosis of the index patient; however, it is useful up to 10 days after the last exposure. As well as chemoprophylaxis, post-exposure vaccination is recommended for **unvaccinated household contacts or close contacts in similar settings,** if the infection of the index case was caused by serogroups A, C, W, Y or B. The vaccination should be administered as soon as possible after the serogroup of the pathogen has been determined for the index case.	**Chemoprophylaxis:** *Rifampicin*: **Newborn babies:** 2 x 5 mg/kg body weight per oral for 2 days **Infants, children and adolescents up to 60 kg:** 2 x 10 mg/kg body weight (max. dosage 600 mg) per oral for 2 days **Adolescents and adults from 60 kg:** 2 × 600 mg per oral for 2 days. Eradication rate: 72–90 % Or: *Ciprofloxacin*: **From 18 years of age:** 1 × 500 mg per oral Eradication rate: 90–95 % Where applicable, *Ceftriaxone*: **From 2 to 11 years of age (< 50 kg):** 1 x 125 mg, administered intramuscularly **From 12 years of age (≥ 50 kg):** 1 x 250 mg, administered intramuscularly Eradication rate: 97 % Where applicable, *Azithromycin:* **From 18 years of age** (especially for pregnant women after exposure): 1 x 500 mg per oral Eradication rate: 93 % Administration of rifampicin and ciprofloxacin is contraindicated in pregnant women, so ceftriaxone (1 x 250 mg, administered intramuscular or intravenous) or azithromycin (1 x 500 mg per oral) can be used as prophylaxis if necessary. An index case with an invasive meningococcal infection should also receive rifampicin after completion of therapy, unless given intravenous treatment with a third-generation cephalosporin. **Post-exposure vaccination:** ▸ **For serogroups A, C, W or Y:** Vaccination with a quadrivalent conjugate vaccine (ACWY), if licensed for the age group ▸ **For serogroup B:** Vaccination with a men B vaccine, in line with the Summary of Product Characteristics and if licensed for the age group. (see also updates in Epid Bull 33/2010[37] and Epid Bull 31/2012[36]).
Mpox and other orthopox-virus diseases	▸ After close physical contact via non-intact skin (skin lesions) or mucous membranes (e.g. sexual contact, interpersonal contact between houshold members) or after prolonged unprotected face-to-face contact < 1 m with a person who is infected with Mpox (e. g. household contacts) and after contact with potentially infectious material (e.g., clothing or bed linen belonging to infectious persons). ▸ After close contact without adequate personal protective equipment (gloves, FFP2 mask/medical face mask and protective gown) with a person with confirmed – Mpox infection, their bodily fluids (e. g. needlestick injury) or contaminated potentially infectious material (e. g. clothing or bedding of infected people) in medical care. ▸ Laboratory personnel having accidental unprotected contact with laboratory samples containing non-inactivated MPX or other orthopoxvirus material; especially when virus enrichment is carried out in cell cultures.	▸ Post-exposure vaccination with Imvanex (Modified Vaccinia Ankara, Bavarian-Nordic [MVA-BN]) of asymptomatic persons aged ≥ 12 years as early as possible within a period of up to 14 days after exposure. ▸ If no mpox disease has occurred after administration of the post-exposure vaccination and there is a continuing risk of exposure, a second vaccine dose should be administered at least 28 days after the first vaccine dose to complete the primary immunisation series. ▸ In people who have had a smallpox (Variola maior) vaccination in the past, a single dose of vaccine is sufficient. ▸ In the event of a local infection cluster (outbreaks), a vaccination can be administered to persons aged ≥ 12 years without proven direct or indirect contact with an infected index case (ring vaccination).

(Table 7 continued)

Disease	Indication	Notes on use (Note package leaflet/ Summary of Product Characteristics)
Mumps	▸ People with unclear vaccination status, who have not been vaccinated, or who received only 1 vaccination during childhood, who have been in contact with mumps cases	Single vaccination with an MMR vaccine (if possible within 3 days of exposure).
Pertussis	▸ People without vaccination protection in close contact with a case in the family, a shared accommodation, or a community facility. ▸ Vaccinated persons with close contact to a pertussis case, if there are persons at risk in their environment (e.g. unvaccinated or incompletely vaccinated infants, children with underlying cardiac or pulmonary diseases or pregnant women during the last trimester).	Chemoprophylaxis with a macrolide is recommended (see also RKI-Ratgeber "Pertussis" ["Pertussis Guide"] at www.rki.de/ratgeber > Pertussis).
Poliomyelitis	All contacts of a poliomyelitis cases regardless of their vaccination status. A secondary case is a cause for ring vaccinations.	Immediate post-exposure vaccination with IPV. Immediate extensive investigations and establishment of measures by the health authorities. Ring vaccinations with IPV and establishment of further measures by decree of health authorities.
Tetanus	See Table 9	
Rabies	See Table 10	
Varicella	1. Unvaccinated people without prior history of varicella and in contact with people at increased risk.	Post-exposure vaccination within 5 days of exposure[a] or within 3 days of rash onset in the index case. Additionally, contact with people at risk (for example, those listed in point 2) should be avoided at all costs
	2. Persons at increased risk of varicella complications, including: ▸ Unvaccinated pregnant women with no history of varicella; ▸ Immunodeficient patients with uncertain or absent varicella immunity; ▸ Newborn babies whose mothers became ill with varicella between 5 days before and 2 days after delivery; ▸ Preterm babies born in or after the 28th gestation week, whose mothers are not immune, if exposed in the neonatal period; ▸ Preterm babies born before the 28th gestation week if exposed in the neonatal period regardless of their mother's immune status.	Post-exposure administration of varicella zoster immunoglobulin (VZIG) as soon as possible and no later than 96 hours after exposure.[a] VZIG can prevent or markedly alleviate the disease. Please follow the Summary of Product Characteristics for the administration and dosing of VZIG! Post-exposure administration of VZIG can be given in combination with antiviral chemoprophylaxis, if applicable
	a Exposure is defined as: 1 hour or more with an infectious person in a room; Face-to-face contact; Household contact.	

5.3 Post-exposure hepatitis B immunoprophylaxis

Prompt prophylaxis is required following exposure to the hepatitis B virus (HBV). The following notes were compiled for application in the field of occupational health and can be transferred to other health service fields.

Lacerations and puncture wounds (especially with hollow needles) and blood contact with mucosa or broken skin provide a risk of infection. Any such event (for example, during patient care of an "index case") should be reported as an occupational accident by the employees (the "exposed people"). The HBsAg status of the index case and the hepatitis B vaccination status of the exposed people should be determined.
Further measures depend on the HBsAg status of the index case:

1. **If the index case is HBsAg-negative:** Further measures to prevent hepatitis B are superfluous.* If the exposed people have not been vaccinated or vaccination is incomplete, primary immunisation should be started or completed.

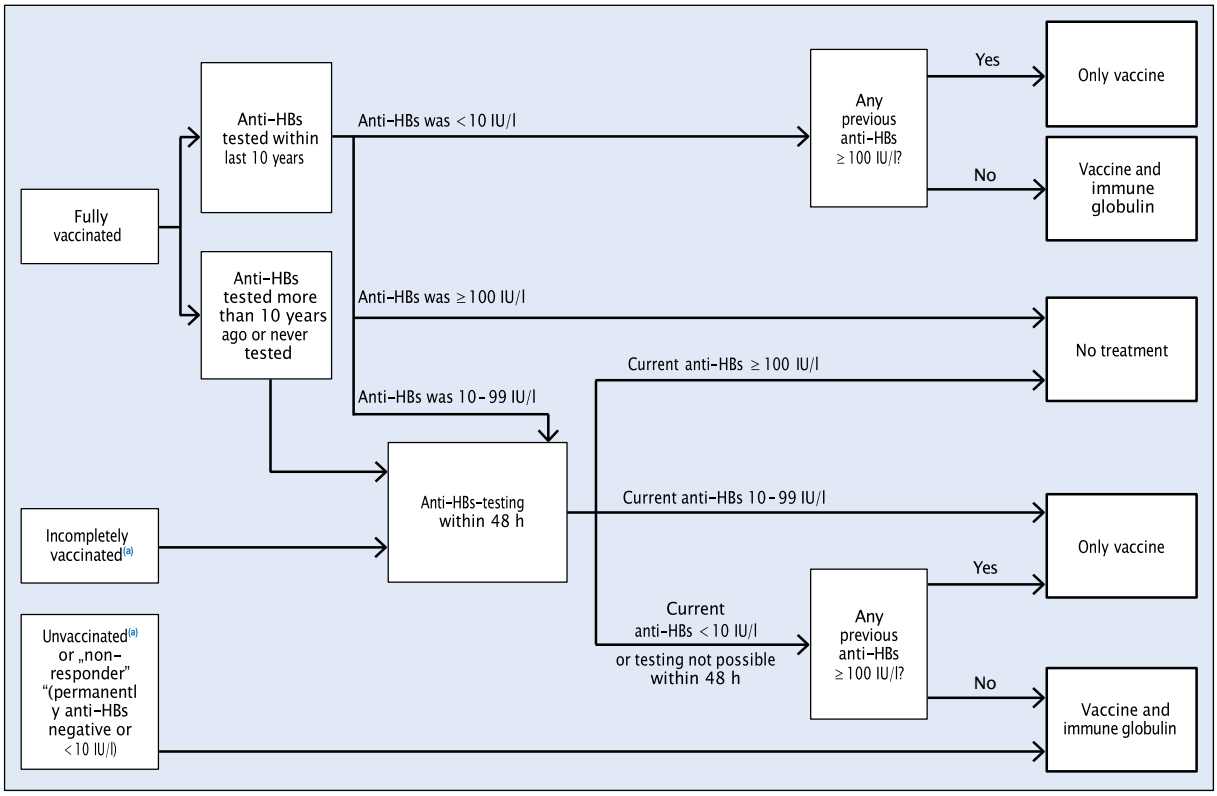
2. **If the index case is HBsAg-positive:** Further measures depend on the vaccination status of the exposed people and are explained below.
3. **If the HBsAg status of the index case is unknown:** The HBsAg level of the index case should be determined immediately (within 48 hours). Depending on the result of the HBsAg testing, intervention should proceed as described in 1 or 2, above. If testing is not possible within 48 hours or at all (e. g., injury from a hollow needle in a rubbish bag), the index case is classified as HBsAg-positive, and further measures depend on the vaccination status of the exposed people.

The process described below is also shown in a flow chart (see Figure 1).

* Very rarely, HBsAg-negative people can be infectious. From a cost-benefit point of view, routine testing for HBV-DNA of all index cases does not seem practicable.

** An isolated positive result of an anti-HBc test possibly necessitates further diagnostic clarification. However, required vaccination should not be delayed.

Figure 1 | Procedure for post-exposure hepatitis B immunoprophylaxis (see text for details)



a In incompletely vaccinated or unvaccinated persons primary vaccination schedule should be completed.

For exposed people with complete vaccination:

The measures to be taken depend on the most recent anti-HBs level:

- *Anti-HBs was determined within the last 10 years:*
  - Anti-HBs was ≥ 100 IU/l: No action.
  - Anti-HBs was 10 – 99 IU/l: Immediate determination of the current anti-HBs level, with further action depending on the test result (see Table 8).
  - Anti-HBs was < 10 IU/l: Blood withdrawal (testing for HBsAg, anti-HBc, and anti-HBs), followed by immediate simultaneous administration of HB vaccine and HB immunoglobulin without waiting for the test results.** Exception: If at a point more than 10 years ago, an anti-HBs ≥ 100 IU/l was recorded, only HB vaccine (not HB immunoglobulin) should be administered (see the flow chart in Figure 1).
- *Last anti-HBs testing was more than 10 years ago or never (or if test result is unknown):* Immediate testing of the current anti-HBs level. Further action depends on the test result (see Table 8).

For exposed people with incomplete vaccination:

- Immediate testing of the current anti-HBs level. Further action depends on the test result (see Table 8).
- Administration of missing vaccinations (where applicable, a shortened vaccination schedule can be used; see Summary of Product Characteristics).

For unvaccinated exposed people and known "non- responders" (individuals with permanent anti-HBs < 10 IU/l):

- Blood withdrawal (testing for HBsAg, anti-HBc, anti-HBs), and subsequent immediate simultaneous administration of HB vaccine and HB immunoglobulin without waiting for the test results.**
- For unvaccinated people, 2 additional vaccine doses (after the initial dose) should be administered following the standard immunisation schedule, to achieve a complete primary immunisation. Antibody response following HB vaccination is not affected by simultaneous administration of immunoglobulin.

** An isolated positive result of an anti-HBc test possibly necessitates further diagnostic clarification. However, required vaccination should not be delayed.

Table 8 | Hepatitis B immunoprophylaxis after exposure, depending on current anti-HBs value
(Note flowchart in figure 1 and text!)

Current anti-HBs level		Required administration of	
		HB vaccine[a]	HB immunoglobulin
≥ 100 IU/l		No	No
10 - 99 IU/l		Yes	No
< 10 IU/l, or not determinable within 48 hours, AND	Anti-HBs was previously ≥ 100 IU/l	Yes	No
	Anti-HBs was never ≥ 100 IU/l, or is unknown	Yes	Yes

a) Not all HB vaccines are licensed for immunoprophylaxis.

5.4 Post-exposure tetanus immunoprophylaxis following injury

Even trivial injuries can be entry points for *Clostridium tetani* and its spores. Following any injury, the treating physician should always verify the current tetanus vaccination status (see Table 9). Post-exposure tetanus vaccinations, where necessary, must be carried out immediately. Missed primary immunisation vaccinations must be reinstated (see chapter 6.10 "Age-dependent recommendations for conducting catch-up vaccinations").

Table 9 | Tetanus immunoprophylaxis following injury

	Documented tetanus vaccination status	Time since last tetanus vaccination	DTaP/ Tdap[b, e]	Tetanus immuno-globulin (TIG)[c]
Clean, negligible wounds	Unvaccinated or unknown		Yes	Yes
	Less than 3 vaccine doses		Yes[d]	No
	At least 3 vaccine doses or more	≥ 10 years	Yes	No
		< 10 years	No	No
All other wounds[a]	Less than 3 vaccine doses or unknown		Yes[d]	Yes
	At least 3 vaccine doses or more	≥ 5 years	Yes	No
		< 5 years	No	No

a This includes wounds that are deep and/or soiled (contaminated with dust, earth, sputum, or stool), and injuries with tissue fragmentation and reduced oxygen supply or penetration of foreign bodies (e.g., contused, lacerated, bite, puncture, or gunshot wounds), severe burns and frostbite, tissue necrosis, and septic abortions.

b Children under 6 years of age receive a combination vaccine with DTaP, and older children and adolescents receive Tdap. Adults also receive Tdap if they have not yet received a pertussis vaccination as adults (≥ 18 years of age) or if there is a current indication for pertussis vaccination (see Table 2).

c TIG = Tetanus immunoglobulin. Generally, 250 IU are used; TIG is administered simultaneously with a DTaP/Tdap vaccine in contralateral parts of the body. The TIG dose can be increased to 500 IU for: (a) infected wounds (that do not receive adequate surgical treatment within 24 hours); (b) deep or contaminated wounds with tissue damage and reduced oxygen supply; (c) foreign body penetration (e. g. bites, stab or bullet wounds); (d) severe burns and frostbite, tissue necrosis and septic abortions.

d For patients who have started but not completed primary immunisation (e.g. infants), the interval to the last dose must be taken into account. Post-exposure vaccination on the day of wound treatment is expedient only if the interval to the previous vaccine dose is at least 28 days. The STIKO catch-up vaccination recommendations apply to completing primary immunisations.

e According to information issued by the Deutsche Gesetzliche Unfallversicherung (DGUV) [German Statutory Accident Insurance] in April 2018, the costs of combined tetanus vaccinations will generally be covered if in line with STIKO recommendations a tetanus prophylaxis is required after an occupational accident.

5.5 Post-exposure rabies immunoprophylaxis

Detailed information on the epidemiology of rabies in Germany and around the world can be found in the travel vaccination recommendations from STIKO and the DTG.

Notes on post-exposure rabies immunoprophylaxis

- Potentially contaminated body sites and all wounds must be cleaned immediately and generously with soap or detergent for at least 15 minutes, rinsed thoroughly with water, and treated with 70% alcohol or an iodine preparation. When possible, wounds should not primarily be sutured.
- From exposure level II, immunisation with a rabies vaccine is carried out according to a schedule indicated for post-exposure prophylaxis, following the Summary of Product Characteristics.
- From exposure level III, both immunisation with a rabies vaccine and application of human rabies immunoglobulin (20 IU/kg body weight) are initiated for persons without active rabies protection. As much rabies immunoglobulin as possible is instilled in and around the wound, and the remaining amount is administered intramuscularly into *M. vastus lateralis*.
- If an indicated administration of rabies immunoglobulin was missed at 1st vaccination, it can still be administered until 7 days after the 1st dose of rabies vaccine.
- If someone who was previously vaccinated with a rabies vaccine is newly exposed, this person should still receive PEP as quickly as possible. After complete pre-exposure prophylaxis (PrEP), 2 doses of vaccine are required for post-exposure treatment on days 0 and 3. In principle, PEP does not require the administration of immunoglobulins if PrEP (with 2 or 3 doses of vaccine) has been administered.
- If the vaccination history shows incomplete vaccination, full immunoprophylaxis should be carried out in line with Table 10.
- If indicated, immunoprophylaxis must be carried out immediately. There should be no delay while waiting for clarification of a suspected infection in the animal. If the suspicion of rabies in the animal is not confirmed by veterinary examination, immunoprophylaxis can be discontinued or continued as pre-exposure vaccination.
- Because of the great variability in the incubation period, which can last between < 10 days and > 1-year, post-exposure prophylaxis is still useful for weeks to months after exposure, if there is a reasonable suspicion that it may be necessary.
- Care must be taken to check tetanus vaccination documentation and if necessary to administer simultaneous tetanus immunoprophylaxis (see Table 9).
- **People with immunodeficiency** should always be vaccinated according to a rabies vaccination schedule (number of doses and time intervals between the vaccine doses according to the Summery of Product Characteristics) from exposure level II onwards, even if the pre-exposure primary immunisation has been fully completed. Simultaneous administration of the rabies immunoglobulin on day 0 is indicated for this group of people from exposure level II onwards. Two to 4 weeks after the last vaccine dose, an antibody check should be carried out to determine whether an additional vaccine dose is required.

Table 10 | Indications for a post-exposure rabies immunoprophylaxis (rabies PEP) in immune-healthy individuals

Level of exposure	Type of exposure from a wild animal, pet, or bat with suspected or confirmed rabies	Post exposure immunoprophylaxis (Note the Summary of Product Characteristics)	
		Unvaccinated or incompletely vaccinated persons	Persons with complete primary immunisation[b]
I	Touching/Feeding of animals; licking of intact skin.	No vaccination	No vaccination
II	Superficial scratches or abrasions without bleeding; licking or nibbling on non-intact skin (in case of superficial wounds from a bat, exposure level III is applied).	Rabies vaccination schedule[a]	Immunisation with 2 vaccine doses at an interval of 3 days[b]
III	Bites or scratches; sputum contact with mucous membranes or wounds (e.g., through licking); suspected bite or scratch from a bat or mucous membrane contact with a bat.	Rabies vaccination schedule,[a] simultaneously administration of rabies immunoglobulin (20 IU/kg body weight).	Immunisation with 2 vaccine doses at an interval of 3 days[b]

a Two vaccines are licensed and available for immunisation in Germany: Rabipur and Verorab. According to the Summary of Product Characteristics, the following vaccination schedules can be used for the rabies PEP in unvaccinated or incompletely vaccinated persons:
Essen schedule: 1 vaccine dose each on days 0, 3, 7, 14 and 28
Shortened Essen schedule: 1 vaccine dose each on days 0, 3, 7, 14. Only licensed for Rabipur in healthy, immunocompetent persons.
In the case of exposure level II: Vaccination without additional administration of immunoglobulins is based on the recommendations of the WHO and represents a deviation from the Rabipur Summary of Product Characteristics.
Zagreb schedule: 2 vaccine doses on day 0 (simultaneously), 1 additional vaccine dose each on days 7 and 21 (0, 0, 7, 21). Only applicable in healthy immunocompetent people.

b Data for Verorab and the previously used rabies vaccine (HDC) inactivated have shown that one year after application of a PrEP regimen consisting of 2 vaccine doses, there is a booster capability with 2 vaccine doses. Therefore, in case of exposure within the first year, PEP with 2 vaccine doses on day 0 and day 3 is sufficient. For people with a PrEP of 2 doses of rabies vaccine, a 3rd dose of vaccine should be administered after an interval of 1 year, if there is continued exposure. If this 3rd dose of vaccine has not been administered, there is currently no data for booster eligibility with 2 doses of vaccine in case of exposure and necessary PEP. If PEP is indicated, administration of immunoglobulins is not required if 2 or more vaccine doses were administered as PrEP.

6. Recommendations on catch-up vaccinations for children, adolescents and adults with incomplete or unknown vaccination status

6.1 Introduction

These notes are based on the recommendations for routine vaccination of infants, children, adolescents and adults (see chapter 2 immunisation schedule).

These notes are intended to help medical personnel including physicians and pharmacy staff to decide which vaccinations are required for unvaccinated, delayed, or incompletely vaccinated individuals to achieve the vaccination protection recommended for their age. Evidence supporting this guidance is often limited, because there are few studies of high methodological quality examining vaccine effectiveness under irregular immunisation schedules. The recommendations given here are therefore mainly based on the long-term experience and expertise of STIKO members.
The recommendations also took into account expert opinions and the recommendations of other international immunisation technical advisory groups.[O,P,T-X] The literature is reverenced at the end of the chapter 6 "Recommendations on catch-up vaccinations".
All consultations with physicians, whether involving children, adolescents or adults, should be used to check the individual's vaccination status and to prompt catch-up of missing vaccinations.

6.2 Unvaccinated people and those with unclear vaccination status

An overview of the recommended catch-up vaccinations and the corresponding immunisation schedule for different age groups is given in Tables 11 A – E. Age groups were chosen to incorporate age-related particularities in vaccination recommendations and application notes in the Summary of Product Characteristics of licensed vaccines. The relevant age for the required vaccinations is the **age at the start of the catch-up series.**

6.3 People who have been partially vaccinated

For partly immunised children, adolescents, and adults, all documented vaccinations to date are counted, provided the interval between single doses was not shorter than the recommended minimum interval. For long-lasting vaccination protection, it is especially important that the recommended minimum interval between second-to-last and last vaccinations (6 months for most vaccines) is not shortened during primary or basic immunisation (P). Based on this condition, the following applies:

Every vaccination counts!

This means that there are, in principle, no illegitimately long intervals between vaccinations. Usually, a primary immunisation series that has been interrupted for many years for example, against diphtheria, TBE, tetanus, poliomyelitis, or hepatitis B does not have to be started again from scratch. A booster vaccination that has not been administered according to schedule can also be administered at a later point in time.
Individual immunisation schedules should be compiled, considering the individual's current **age**, and the number and timing of previous vaccines.
For vaccinations that are recommended only until a specific age (pneumococcal for infants/children, Hib, rotavirus), an interrupted primary immunisation series should not be continued if the person is now beyond this specific age.
An incomplete HPV vaccination series, however, should be completed even after the age of 18. Care is needed to clarify who will bear the cost.

6.4 Procedure when vaccination documents are missing

If the vaccination card is not traceable or lost, medical files should be used to identify previous vaccinations. Where appropriate, a new vaccination card can be issued based on the documented history of vaccinations.
Missing vaccination cards are a frequent problem among recently immigrated children, adolescents, and adults. A summary of up-to-date vaccination recommendations by country of origin can be found on the

WHO (https://immunizationdata.who.int/global?topic=Vaccination-schedule&location=DZA) and ECDC (https://vaccine-schedule.ecdc.europa.eu/) websites, which list all national immunisation schedules. In principle, however, all vaccinations that are not documented should be administered following the STIKO recommendations.
For people with unknown vaccination status, including missing or incomplete documentation of vaccinations, it is in the interest of the individual to be protected. It should therefore be assumed that the relevant vaccinations are missing. Anamnestic information on vaccination or disease history (including measles, mumps and rubella) is, with the exception of varicella, often unreliable and should not be incorporated into the planning of catch-up vaccinations. Deviations from this principle are justifiable in individual cases.

6.5 Medical history information on varicella

Anamnestic information on varicella (chicken pox) is mostly reliable. Studies show that information about a previous history of varicella with typical clinical manifestations is highly valid.[Q] A varicella vaccination is not required after an anamnestic response indicating a prior varicella disease. If in doubt, the serostatus should be clarified and the varicella vaccination administered if the serology is negative, especially because varicella complications (including pneumonia, encephalitis, and the risk of fetopathy if contracted during pregnancy) increase among adolescents and young adults.[R] It should be noted that adolescents and young adults coming from tropical countries, especially Southeast Asia, are less frequently immune to varicella than individuals in Europe.

6.6 Indication of serological titer determination

Serological testing to determine the need for catch-up vaccinations based on antibody titers only makes sense in exceptional cases, because the test methods used in clinical laboratories often do not have sufficient sensitivity and specificity. For some vaccine preventable diseases (e. g., pertussis), no reliable serological correlate exists that would be suitable as a surrogate marker for the presence of immunity. Antibody titer levels also do not allow conclusions to be drawn about potential cellular immunity. In principle, routine antibody testing is not appropriate before or after routine vaccinations. Exceptions are verifying vaccination success in people with immunodeficiency (see "Grundlagenpapier mit Anwendungshinweisen für Impfungen bei Personen mit Immundefizienz" [Framework paper on immunisation of immunocompromised people] (www.rki.de/immundefizienz), and confirming protection against hepatitis B among those for whom vaccination is indicated under Table 2. Serological testing is also recommended to confirm protection against varicella among women who wish to conceive and who have unclear anamnesis of varicella.

6.7 Is "over-vaccination" dangerous?

In general, there is no elevated risk of side effects resulting from excess vaccine doses. To limit the number of injections, it is therefore possible to use combination vaccines even if not all antigens or vaccine components are needed (see also "Choice of vaccines", below). On rare occasions, the repeated administration of inactivated vaccines can cause adverse events such as pronounced local reactions including painful swelling and reddening of the affected extremity (called the "Arthus reaction"). This self-limiting reaction is most likely to occur in case of high individual serum antibody concentrations in combination with very frequent vaccination with tetanus and/or diphtheria toxoid. In this case, antibody testing should be conducted before the administration of further Td vaccines. This risk does not exist for pertussis antigens.[S]

6.8 Choice of vaccines

Combination vaccines should be used instead of monovalent vaccines as this can reduce the number of injections, the vaccination goal can be reached at an earlier date, and vaccination acceptance can be increased. In Germany, there are currently no monovalent vaccines available against certain diseases (e. g. diphtheria, measles, mumps, rubella, and pertussis). In these cases, combination vaccines must be used (for example, to catch up a missing mumps or rubella vaccination with an MMR vaccine). Individual immunisation schedules are often necessary because of age-dependent changes in vaccination indications (for example, vaccination for *Haemophilus influenzae* type b until the 5th birthday, and pneumococci until the 2nd birthday) and the restriction of licensed vaccine administration to certain age groups.

The current Summary of Product Characteristics states that the hexavalent vaccines Infanrix hexa (DTaP-IPV-Hib-HepB), Vaxelis and Hexyon can be used for primary immunisation and booster vaccinations for infants and small children. No concrete age limit is given. In its function as national regulatory authority, the PEI states that in this context there is no binding definition of the term "small child". The current Summary of Product Characteristics notes that the pentavalent vaccines Infanrix-IPV+Hib (DTaP-IPV-Hib) and Pentavac are suitable from the age of 2 months and no upper age limit is given (see Table 12). For primary immunisation against *Haemophilus influenzae* type b, a single dose of vaccine from 12 months of age is sufficient. The usual pentavalent or hexavalent vaccines DTaP-IPV-Hib(-HepB) can, however, continue to be administered if this is necessary to complete the other vaccinations. No negative effects from excess Hib vaccine doses are expected. Alternatively, missing vaccinations can be completed with the trivalent vaccine Infanrix (DTaP, licensed until the 6th birthday) and, simultaneously or sequentially, with monovalent vaccines against hepatitis B and poliomyelitis. A vaccination series started with a specific combination vaccine can be completed using vaccines from a different manufacturer.
Depending on age, vaccines with different dosages are used for hepatitis B and Hepatitis A vaccination (for more details see the Summary of Product Characteristics).

6.9 Vaccinations against tetanus, diphtheria, poliomyelitis and pertussis from the age of 5 years

In older children and adults, protection against pertussis can be achieved with a single dose of a combination vaccine including the pertussis component, because the current prevalence of *Bordetella pertussis* means that few people are immunologically naïve against pertussis. A study showed that 1vaccine dose induced an immunological response in more than 90 % of vaccinated individuals aged 11 years and older.[P] Equivalent information can also be found in the relevant Summary of Product Characteristics of the vaccines.
Starting at the age of 5 years, vaccines with reduced antigen content (d instead of D and ap instead of aP) should be used for vaccinations against diphtheria and pertussis. Whilst the Td vaccine Td-Immun, and the monovalent IPV vaccine IPV-Mérieux are licensed for primary immunisations according to the Summary of Product Characteristics, the combination vaccines with pertussis components (**Tdap:** Boostrix, Covaxis, **Tdap-IPV:** Boostrix-Polio, Repevax) are mainly intended for booster vaccinations.
The PEI defines the term "primary immunisation" as first-time immunisation during infancy and early childhood, for which vaccines with higher antigen content (upper case D and P) should be used. In its function as the national regulatory authority for vaccines in Germany, the PEI has determined that the ap-containing vaccines above can be used for the first-time immunisation of older children, adolescents and adults whose vaccination status is unknown or who have not been previously vaccinated against Tdap-(IPV).
The use of Boostrix (Tdap), Boostrix-Polio (TdapIPV), Covaxis (Tdap) and Repevax (Tdap-IPV) is covered by licensing for primary immunisation from the adolescent age of ≥ 12 years.
When these vaccines are used outside the relevant age group, information about *off-label* use should be provided (see chapter 4.2 for *off-label* use), and this should also be documented in writing. For booster vaccinations, all these vaccines can be used without restrictions for the age stated in the relevant license. This includes the completion of previously-initiated vaccination series.
STIKO has published information on the "Use of Tdap and Tdap-IPV vaccines for the primary vaccination of individuals" in a statement in Epid Bull 4/2016

6.10 Age-dependent recommendations for the implementation of catch-up vaccinations

Tables 11 A – E list the recommended catch-up vaccinations for children, adolescents and adults with missing primary or basic immunisation. The respective **table for the current age is to be used.**

C Catch-up vaccination
B Booster vaccination
P Primary immunisation
Hib *Haemophilus influenzae* type b
MMR Measles, mumps, rubella
HPV Human papilloma virus
RSV Respiratory syncytial virus

Table 11A | Catch-up and booster vaccinations for children aged < 12 months

Vaccination/Immunisation against	Minimum interval in months after previous vaccination dose			Age in years	
	0	2	6	5 – 8	9 – 16
Tetanus	C1	C2	C3	B1	B2
Diphtheria (D)	C1	C2	C3	B1	B2
Pertussis (aP)	C1	C2	C3	B1	B2
Hib	C1	C2	C3		
Poliomyelitis	C1	C2	C3		B1
Hepatitis B	C1	C2	C3		
Pneumococci	C1	C2	C3		
Meningococci B	C1	C2	C3		
RSV prophylaxis	C1				

Infants aged < 12 months

Missing DTaP-IPV-Hib-HepB, pneumococcal conjugate, and MenB-vaccine doses should be administered. To complete primary immunisation against DTaP-IPV-Hib-HepB, pneumococcal disease, and MenB 2 vaccine doses should be adminstered at 2 months intervals and a 3rd dose with the respective vaccine after an interval of ≥ 6 months since the previous vaccination (use vaccines with age-appropriate antigen content, see Table 12).

There is only a short time slot for catch-up of the rotavirus immunisation series, because administration of the 1st vaccine dose should take place before the age of 12 weeks and the last dose preferably before the ages of 16 weeks (Rotarix) or 20 – 22 weeks (RotaTeq) depending on the vaccine brand (see Summary of Product Characteristics). The vaccination series must be completed by the age of 24 (Rotarix) or 32 (RotaTeq) weeks. RSV immunisation with a single dose of Beyfortus (Nirsevimab) for newborns and infants in their 1st RSV season should be administered as soon as possible during the RSV season (usually October to March). Additional vaccinations are carried out according to the general STIKO immunisation schedule.

Table 11B | Catch-up and booster vaccinations for children aged 12 months to < 5 years

Vaccination against	Minimum interval in months after previous vaccination dose			Age in years	
	0	1 - 2[a]	6	5 - 16	
Tetanus	C1	C2	C3	B1[b]	B2[b]
Diphtheria (D)	C1	C2	C3	B1[b]	B2[b]
Pertussis (aP)	C1	C2	C3	B1[b]	B2[b]
Hib	C1				
Poliomyelitis	C1	C2	C3		B1
Hepatitis B	C1	C2	C3		
Pneumococci[d]	C1	C2 (Vaccination interval ≥ 8 weeks)			
Meningococci B[f]	C1	C2	C3		
MMR[e]	C1	C2			
Varicella[e]	C1	C2			

a Interval depends on vaccine or indication.
b Booster vaccination 5–10 years after the last dose of the primary immunisation, or after a previous booster vaccination.
c The booster vaccination should be administered at the age of 9–16 years.
d The pneumococcal vaccination is not recommended as a routine vaccination after the age of 24 months; there is no need for catch-up vaccination.
e Starting at the age of 11 months.
f At the age of 12 – 23 months 3 vaccine doses (0 – 2 – 12 to 23); from the age of 2 years 2 vaccine doses at least 1 month apart.

Children aged 12 months to < 5 years

To complete primary immunisation against DTaP-IPV-Hib-HepB and pneumococcal disease 2 vaccine doses should be administered at an interval of 2 months, plus a 3rd vaccination after an interval of ≥ 6 months since the previous vaccination (use vaccines with age-appropriate antigen content, see Table 12). Booster vaccinations are administered at the ages of 5 – 6 years (at the earliest, 2 years after the 3rd vaccine dose) and 9 – 16 years. From the age of 12 months, Hib only requires 1 vaccine dose, and pneumococci only 2 vaccine doses at an interval of at least 8 weeks. From the age of 2 years, a pneumococcal vaccination is only recommended for children in a risk category (indication-based vaccination). MenB vaccinations should be administered up to the 5th birthday. When starting the vaccination series at the age of 12 - 23 months of age, the 2+1 vaccination schedule is also recommended with an interval of 2 months between the first two vaccine doses and an interval of 12 - 23 months between the 2nd and 3rd vaccine doses. According to the product information sheet, the vaccination series consists of 2 vaccine doses from the age of 2 years (≥ 24 months), which should be administered at least 1 month apart.

Additionally, 2 MMR and varicella vaccinations should beadministeredat intervals of 4 – 6 weeks. There is a slightly increased risk of febrile convulsions after the 1st MMRV combination vaccine dose, in comparison with the simultaneous administration of the

MMR vaccine and the varicella vaccine, so preference should be given to separate MMR and varicella vaccines for the 1st dose in children aged < 5 years. For the 2nd vaccination against MMR and varicella, either the MMRV combination vaccine or separate MMR and varicella vaccines can be used.

Table 11C | Catch-up and booster vaccinations for children aged 5 to < 11 years

Vaccination against	Minimum interval in months after previous vaccination dose			Age in years
	0	1	6	10 – 17
Tetanus	C1	C2	C3	B1 [a]
Diphtheria (d)	C1	C2	C3	B1 [a]
Pertussis (ap) [b]	C1	C2	C3	B1 [a]
Poliomyelitis	C1	C2	C3	B1
Hepatitis B	C1	C2	C3	
MMR	C1	C2		
Varicella	C1	C2		
HPV [c] (children and adolescents) from 9 years	P1		P2	

a Depending on the age at completion of the primary immunisation, 2 booster vaccinations may be appropriate before adulthood (the interval between P and B1 and between B1 and B2 is 5 –10 years).
b There is no monovalent pertussis vaccine available in Germany, so only Tdap or Tdap–IPV combination vaccines can be used.
c Primary immunisation (P) with 2 vaccine doses at least 5 months apart (note Summary of Product Characteristics).

Children aged 5 to < 11 years

Missing poliomyelitis vaccinations and DTaP or Tdap vaccine doses should be administered using vaccines with an antigen content appropriate for the age (see Table 12). Until the 6th birthday, the Summary of Product Characteristics states that it is possible to administer the trivalent vaccine Infanrix (DTaP) and simultaneously inject an IPV vaccination against poliomyelitis into the other arm.
From the age of 5 or 6 years (depending on the Summary of Product Characteristics), a vaccine with a reduced concentration of diphtheria toxoid (d) and pertussis antigen (p) should be administered (3 vaccine doses in intervals of 0 – 1 – 6 months, see Table 12).
In Germany, however, no Tdap or Tdap-IPV vaccine is currently licensed for primary immunisation in the age group 6 – 11 years. An *off-label* use of one of the vaccines that are approved from the age of 12 is required for children in this age group. Appropriate information of patients and documentation is required.
Depending on age on completion of the primary immunisation series, it might be appropriate for this age group to receive 1 or 2 Tdap booster vaccinations between the ages of 10 and 17 years. A booster vaccination should be administered at the earliest 5 years after the last dose of the primary immunisation or the previous booster vaccination. Primary immunisation against hepatitis B consists of 3 vaccinations (0 – 1 – 6 months). Two MMR and 2 varicella vaccinations should also be administered at an interval of 4 – 6.
Children and adolescents aged 9 to 14 years should receive 2 HPV vaccinations at least 5 months apart (note the Summary of Product Characteristics).

Table 11D | Catch-up and booster vaccinations for children/adolescents aged 11 to < 18 years

Vaccination against		Minimum interval[c] in months after previous vaccination dose			Vaccination interval
		0	1	6	5 - 10 years
Tetanus		C1	C2	C3	B1
Diphtheria (d)		C1	C2	C3	B1
Pertussis (ap)[a]		C1			B1
Poliomyelitis		C1	C2	C3	B1
Hepatitis B		C1	C2	C3	
Meningococci ACWY ≥ 12 years		C1			
MMR		C1	C2		
Varicella		C1	C2		
HPV[b] (children and adolescents)	9 – 14 years	P1		P2	
	> 14 years	C1	C2	C3	

a There is no monovalent pertussis vaccine available in Germany, so only Tdap or Tdap-IPV combination vaccines can be used.
b If 1st vaccine dose is administered at the age of 9 -14 years: Primary immunisation (P) consists of 2 doses, administered at least 5 months apart. For catch-up vaccinations (C) with the 1st vaccination at the age of > 14 years, 3 doses are necessary (note Summary of Product Characteristics).
c For some vaccines minimum intervals may differ from the Summary of Product Characteristics.

Children/adolescents aged 11 to < 18 years

Where there is a missing vaccination against pertussis, protection can be achieved with 1 dose of a Tdap or Tdap-IPV vaccine.[Y] If primary immunisation against tetanus, diphtheria and poliomyelitis is also indicated, the 1st of the required 3 vaccinations (0 – 1 – 6 months) should be conducted with a Tdap or Tdap-IPV vaccine (see Table 12).

A booster vaccination with Tdap or Tdap-IPV should be administered 5 to 10 years after completion of the primary immunisation series and, if possible, before reaching adulthood.

Primary immunisation against hepatitis B should be conducted with 3 vaccine doses (0 – 1 – 6 months) using the vaccine licensed for that age group. Additionally, 2 MMR and 2 varicella vaccinations should be administered with an interval of 4 – 6 weeks.

Children and adolescents aged 12 to 14 years should receive a single vaccination against meningococcal serogroups A, C, W and Y with a quadrivalent ACWY conjugate vaccine, regardless of their vaccination status. The vaccination should be caught up until the age of <25 years.

Children and adolescents under the age of 15 years should receive a 2-dose HPV vaccination at an interval of at least 5 months. Catch-up vaccinations should be offered until the age of 17 years. Three vaccine doses are necessary for catch-up vaccinations when the 1st dose of the primary immunisation series was administered at the age of > 14 years (note the Summary of Product Characteristics).

Table 11E | Catch-up and booster vaccinations for adults aged ≥ 18 years

Vaccination against	Minimum interval[d] in months after previous vaccination dose				Vaccination interval
	0	1	2	6	Every 10 years
Tetanus	C1	C2		C3	B
Diphtheria (d)	C1	C2		C3	B
Pertussis (ap)[a]	C1				B1 (one-time)
Poliomyelitis	C1	C2		C3	B1 (one-time)
Meningococci ACWY for adults < 25 years	C1				
Measles for people born after 1970	C1				
Rubella for women in childbearing age[b]	C1	C2			
Varicella for seronegative women who wish to conceive	C1	C2			
Pneumococci for adults ≥ 60 years of age	C1				
Herpes zoster for adults ≥ 60 years of age[c]	C1		C2		
RSV for adults ≥ 75 years of age	C1 (one-time)				

a There is no monovalent pertussis vaccine available in Germany, so only Tdap or Tdap-IPV combination vaccines can be used.
b Unvaccinated women or women without documented vaccinations should be given 2 doses. Women who have been vaccinated once should be given 1 vaccine dose. In the absence of a monovalent rubella vaccine, an MMR vaccine can be used.
c Two vaccine doses with inactivated herpes zoster vaccine in an interval with at least 2 months to a maximum of 6 months in between vaccinations.
d For some vaccines minimum intervals may differ from the Summary of Product Characteristics.

Adults from 18 years of age

Adults should receive all vaccinations recommended for their age group, including catch-up vaccinations for tetanus, diphtheria, pertussis and poliomyelitis if necessary. Unvaccinated people or those with unknown vaccination status can receive 3 vaccine doses of a Td or Td-IPV combination vaccine (0 – 1 – 6 months). To achieve protection against pertussis, the 1st vaccination should be administered as a Tdap or Tdap-IPV combination vaccine (see Table 12).[U] Td booster vaccinations should be administered 10 years after the previous vaccination in all cases. For the 1st booster, a Tdap combination vaccine should be used once.
Children and adolescents aged 12 to 14 years should receive a single vaccination against meningococcal serogroups A, C, W and Y with a quadrivalent ACWY conjugate vaccine, regardless of their vaccination status. The vaccination should be caught up until the age of <25 years.
People born after 1970 and ≥ 18 years of age should receive a single dose of a vaccine containing measles virus, preferably an MMR vaccine. Women of childbearing age should be given 2 rubella vaccinations with an MMR vaccine. Varicella vaccination (2 vaccine doses with an interval of 4 – 6 weeks) is recommended for seronegative women who wish to conceive.
From the age of 60 years, STIKO recommends routine vaccination against pneumococcal disease with PCV20, vaccination against herpes zoster with the inactivated vaccine (2 vaccinations at intervals of at least 2 to a maximum of 6 months), annually in autumn/winter (once per season) vaccination with a high-dose or MF-59-adjuvanted vaccine against seasonal influenza, and annually in autumn vaccination against COVID-19. From the age of ≥ 75 years, the STIKO recommends a one-time vaccination against RSV, administered preferably in late summer/autumn.

Table 12 | Trade names and age of administration in Germany for vaccines and monoclonal antibodies mentioned in the text according to summery of product characteristics (there is no guarantee that this list is complete, please note product information; influenza and COVID-19 vaccines are not listed)

Antigens	Trade name	Market authorization from[a]	Approved up to the age of [a]
Chikungunya	Ixchiq	12 years	No upper age limit
	Vimkunya	12 years	No upper age limit
Cholera	Dukoral	2 years	No information (limited data for persons aged 65 and older)
	Vaxchora	2 years	No information (limited data for persons aged 65 and older)
Dengue	Qdenga	4 years	No upper age limit
DTaP	Infanrix	2 months	< 6 years
DTaP-IPV-Hib	Infanrix-IPV + Hib	2 months	No information
	Pentavac	2 months	No information
DTaP-IPV-Hib-HepB	Infanrix hexa	Infant age	Infants and small children[b]
	Hexyon	6 weeks	Infants and small children[b]
	Vaxelis	6 weeks	Infants and small children[b]
Haemophilus influenzae type b	Hiberix	2 months	Infants and small children[c]
Hepatitis A	Avaxim	16 years	No upper age limit
	Havrix 720 Junior	1 year	< 16 years
	Havrix1440	15 years	No upper age limit
	VAQTA Paediatric 25 E	1 year	< 18 years
	VAQTA 50 E	18 years	No upper age limit
Hepatitis A+B	Twinrix Paediatric	1 year	< 16 years
	Twinrix	16 years	No upper age limit
Hepatitis B	Engerix-B Paediatric	Birth	< 16 years
	Engerix-B	16 years	No upper age limit
	Fendrix[e]	15 years	No upper age limit
	HBVAXPRO 5 micrograms	Birth	< 16 years
	HBVAXPRO 10 micrograms	16 years	No upper age limit
	HBVAXPRO 40 micrograms[d]	18 years	No upper age limit
	HEPLISAV B	18 years	No upper age limit
Herpes zoster	Shingrix	18 years	No upper age limit
HPV	Cervarix	9 years	No information
	Gardasil 9	9 years	No information
IPV (Poliomyelitis)	IPV-Mérieux	2 months[f]	No upper age limit
	Imovax Polio	2 months	No upper age limit
Japanese encephalitis	Ixiaro	2 months	No upper age limit
MMR	M-M-RVaxPro	(9-)12 months[g]	No upper age limit
	Priorix	9 months	No upper age limit
MMRV	Priorix-Tetra	(9-)11 months[g]	No upper age limit
	ProQuad	(9-)12 months[g]	No upper age limit
Meningococcus ACWY	MenQuadfi	≥ 12 months	No upper age limit
	Menveo	2 years	No upper age limit
	Nimenrix	6 weeks	No upper age limit
Meningococcus B	Bexsero	2 months	No upper age limit
	Trumenba	10th birthday	No upper age limit

(Table 12 continued)

Antigens	Trade name	Market authorization from[a]	Approved up to the age of[a]
Meningococcus C	Menjugate 10 micrograms	2 months	No upper age limit
	NeisVac-C	2 months	No upper age limit
Mpox	Imvanex	12 years	No upper age limit
Pneumococci	Prevenar 20	6 weeks	No upper age limit
	Pneumovax 23	2 years	No upper age limit
	Prevenar 13	6 weeks	No upper age limit
	Synflorix (PCV10)	6 weeks	5th birthday
	Vaxneuvance (PCV15)	6 weeks	No upper age limit
Rabies	Rabipur	Birth	No upper age limit
	Verorab	Birth	No upper age limit
Rotavirus	Rotarix	6 weeks	24 weeks
	RotaTeq	6 weeks	32 weeks
Respiratory syncytial virus	Abrysvo	18 years, pregnant women	No upper age limit
	Arexvy	18 years	No upper age limit
	mResvia	18 years	No upper age limit
Respiratory syncytial virus (mAb)	Beyfortus	Birth	23 month
T (tetanus)	Tetana	2 month	No upper age limit
Td	Td-IMMUN	5th birthday (60 months)	No upper age limit
Tdap	Boostrix	4th birthday (48 months)[h]	No upper age limit
	Covaxis	4th birthday (48 months)[h]	No upper age limit
	TdaP-IMMUN (currently not available)	4th birthday (48 months)[i]	No upper age limit
Tdap-IPV	Boostrix Polio	3rd birthday (36 months)[h]	No upper age limit
	Repevax	3rd birthday (36 months)[h]	No upper age limit
Td-IPV	Revaxis	5th birthday (60 months)	No upper age limit
Tick-borne encephalitis (TBE)	Encepur Children	1 year	11 years
	Encepur Adults	12 years	No information
	FSME-IMMUN 0,25 mL Junior	1 year	< 16 years
	FSME-IMMUN Adults	16 years	No information
Typhus	Typhoral L Capsules	5 years	No upper age limit
	Typhim Vi	2 years	No upper age limit
Yellow fever	Stamaril	9 months[j]	No upper age limit[k]
Varicella	Varilrix	(9-)11 months	No upper age limit
	Varivax	(9-)12 months	No upper age limit

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a See also Summary of Product Characteristics (as of January 2026).
b The Summary of Product Characteristics states that the vaccine can be used to vaccinate "infants and small children". According to the licensing authority (PEI), there is no binding definition of the term "small child".
c From the age of 5 years, Hib vaccination is only indicated in exceptional cases (e.g. functional or anatomical asplenia).
d Vaccine for predialysis and dialysis patients.
e Vaccine for patients with renal insufficiency and for pre-dialysis and dialysis patients.
f Also licensed for primary and first-time immunisation.
g If earlier immunisation protection is considered necessary, the vaccination can be given starting at the age of 9 months; see recommendations for measles in chapter 3.2.
h Primary immunisation of individuals from 12 years of age whose vaccination status is unknown or who have, so far, not been vaccinated complies with licensing.
i Primary immunisation of individuals from the age of 4 years whose vaccination status is unknown or who have so far not been vaccinated complies with licensing. N.B. Despite the upper case "P" in the name of the compound TdaP-IMMUN, it is one of the pertussis vaccines with reduced antigen content (ap).
j According to the Summary of Product Characteristics, the vaccine is licensed from the age of 6 months but is not recommended for children aged 6 to <9 months; yellow fever vaccination should only be administered to children aged 6 to <9 months under special circumstances.
k According to the Summary of Product Characteristics, persons aged 60 years and older should only be vaccinated if there is a significant and unavoidable risk of yellow fever infection.

Updated on July 2, 2026

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List of STIKO recommendations and their scientific rationales (*in German*)

Chickungunya

1 Wissenschaftliche Begründung der STIKO-Empfehlung zur Impfung gegen Chikungunya; publiziert im Epid Bull 28/2025

Cholera

2 Änderung der Empfehlungen zur Impfung gegen Cholera; publiziert im Epid Bull 31/2010

COVID-19

3 Aktualisierung der COVID-19-Impfempfehlung in den allgemeinen Empfehlungen der STIKO 2024; publiziert im Epid Bull 2/2024

4 Implementierung der COVID-19-Impfung in die allgemeinen Empfehlungen der STIKO 2023; publiziert im Epid Bull 21/2023

DTaP-IPV-HIB-HepB

5 Wissenschaftliche Begründung für die Empfehlung zur Grundimmunisierung gegen Diphtherie, Tetanus, Pertussis, Poliomeyelitis, *Haemophilus influenzae* Typ b und Hepatitis B mit dem 6-fach-Impfstoff im Säuglingsalter nach dem 2+1-Impfschema; publiziert im Epid Bull 26/2020

Dengue

6 STIKO-Empfehlung und wissenschaftliche Begründung der STIKO zur Impfung gegen Dengue mit dem Impfstoff Qdenga; publiziert im Epid Bull 48/2023

Yellow fever

7 Wissenschaftliche Begründung der STIKO für die Empfehlung zur Gelbfieber-Auffrischimpfung vor Reisen in Endemiegebiete und für exponiertes Laborpersonal; publiziert im Epid Bull 32/2022

8 Wissenschaftliche Begründung zur Änderung der Gelbfieber-Impfempfehlung aufgrund der Änderungen in den Regelungen der Internationalen Gesundheitsvorschriften zu Gelbfieber; publiziert im Epid Bull 35/2015

Hemophilus influenzae Typ b

9 Wissenschaftliche Begründung zur Erweiterung der STIKO-Empfehlung zu Indikationsimpfung und postexpositionellen Chemoprophylaxe gegen Haemophilus influenzae Typ; b publiziert im Epid Bull 34/2025

Hepatitis B

10 Wissenschaftliche Begründung für die Anpassung der Empfehlungen zur Impfung gegen Hepatitis A und B; publiziert im Epid Bull 35/2017

11 Wissenschaftliche Begründung für die Änderung der Empfehlung zur Impfung gegen Hepatitis B; publiziert im Epid Bull 36/37/2013

12 Hinweise zur Notwendigkeit der Wiederimpfung 10 Jahre nach erfolgter Grundimmunisierung gegen Hepatitis B (HB) im Säuglings- bzw. Kindesalter; publiziert im Epid Bull 31/2007

Herpes zoster

13 Wienschaftliche Begrüngung für die Erweiterung der Indikationsimpfempfehlung zur Herpes zoster-Impfung mit dem adjuvantierten subunit-Totimpfstoff für Personen ≥ 18 Jahre mit einem erhöhten Risiko, an Herpes zoster zu erkranken; pubiziert im Epid Bull 45/2025

14 Wissenschaftliche Begründung zur Empfehlung einer Impfung mit dem Herpes zoster subunit-Totimpfstoff; publiziert im Epid Bull 50/2018

15 Wissenschaftliche Begründung zur Entscheidung die Herpes zoster Lebendimpfung nicht als Standardimpfung zu empfehlen; publiziert im Epid Bull 36/2017

HPV

16 Wissenschaftliche Begründung für die Empfehlung der HPV-Impfung für Jungen im Alter von 9-14 Jahren; publiziert im Epid Bull 26/2018

17 Wissenschaftliche Begründung für die Änderung der Empfehlung zur Impfung gegen humane Papillomviren; publiziert im Epid Bull 35/2014

18 Impfung gegen HPV – Aktuelle Bewertung der STIKO; publiziert im Epid Bull 32/2009

19 Impfung gegen humane Papillomaviren (HPV) für Mädchen von 12 bis 17 Jahren – Empfehlung und Begründung; publiziert im Epid Bull 12/2007

Influenza (seasonal)

20 Wissenschaftliche Begründung der STIKO zur Erweiterung der Indikations- und beruflichen Indikationsempfehlung für die saisonale Influenza-Impfung; publiziert im Epid Bull 29/2025

21 Wissenschaftliche Begründung zur Empfehlung der STIKO zur Anwendung von Hochdosis- oder MF-59 adjuvantierten Influenza-Impfstoffen bei der Influenza-Standardimpfung von Personen ≥ 60 Jahre; publiziert im Epid Bull 44/2024

22 Wissenschaftliche Begründung zum Wechsel von quadrivalenten zu trivalenten Influenza-Impfstoffen; publiziert im Epid Bull 31/2024

23 Wissenschaftliche Begründung für die Aktualisierung der Influenza-Impfempfehlung für Personen im Alter von ≥ 60 Jahren; publiziert im Epid Bull 1/2021

24 Wissenschaftliche Begründung für die Empfehlung des quadrivalenten saisonalen Influenzaimpfstoffs; publiziert im Epid Bull 2/2018

25 Wissenschaftliche Begründung für die geänderte Empfehlung zur Anwendung von Influenzaimpfstoffen bei Kindern und Jugendlichen im Alter von 2 – 17 Jahren; publiziert im Epid Bull 35/2017

26 Wissenschaftliche Begründung für die Änderung der Empfehlung zur Impfung gegen Influenza; publiziert im Epid Bull 36/37/2013

27 Änderung der Empfehlungen zur Impfung gegen Influenza; Empfehlung zur Impfung von Schwangeren; publiziert im Epid Bull 31/2010

28 Begründung der STIKO für die Influenza Impfung bei PatientInnen mit Multipler Sklerose (MS) mit durch Infektionen getriggerten Schüben; publiziert im Epid Bull 32/2004

29 Wirksamkeit und Sicherheit der Influenza-Impfung für PatientInnen mit chronischen Lungenerkrankungen (online verfügbar unter: www.rki.de > Kommissionen > STIKO > Empfehlung der STIKO > Begründung > Influenza)

Japanese encephalitis

30 Wissenschaftliche Begründung für die Empfehlung zur Impfung gegen Japanische Enzephalitis bei Reisen in endemiegebiete und für Laborpersonal; publiziert im Epid Bull 18/2020

Supply shortage

31 Empfehlung und wissenschaftliche Begründung zum Beschluss der STIKO zu Lieferengpässen von Impfstoffen; publiziert im Epid Bull 23/2021

Measles

32 Änderung der Empfehlung zur Impfung gegen Masern; publiziert im Epid Bull 32/2010

Measles Mumps Rubella and Varicella

33 Empfehlung und wissenschaftliche Begründung für die Angleichung der beruflich indizierten Masern-Mumps-Röteln-(MMR-) und Varizellen-Impfung; publiziert im Epid Bull 2/2020

Meningococci

34 Empfehlung und Begründung einer postexpositionellen Meningokokken-Impfung; publiziert im Epid Bull 31/2009

Meningococci ACWY

35 Wissenschaftliche Begründung zur Evaluation einer quadrivalenten Meningokokken-Impfung für Kleinkinder sowie ältere Kinder, Jugendliche und junge Erwachsene; publuziert um Epid Bull 44/2025

36 Änderung der Empfehlungen zur Indikationsimpfung gegen Meningokokken; publiziert im Epid Bull 32/2012

37 Änderung der Empfehlungen zur Impfung gegen Meningokokken; publiziert im Epid Bull 32/2010

Meningococci B

38 Wissenschaftlichen Begründung für die Standardimpfempfehlung von Säuglingen gegen Meningokokken der Serogruppe B; publiziert im Epid Bull 3/2024

39 Aktualisierung der Meningokokken-Impfempfehlung: Indikationsimpfung – Postexpositionelle Impfung – Berufliche Indikation; publiziert im Epid Bull 37/2015

Meningococci C

40 Empfehlung der Impfung gegen Meningokokken im Säuglings- und Kindesalter – Impfung der Kinder im 2. Lebensjahr mit konjugiertem Meningokokken-Impfstoff der Serogruppe C; publiziert im Epid Bull 31/2006

Mpox

41 Wissenschaftliche Begründung der STIKO für die Anpassung der Empfehlungen zur Indikationsimpfung sowie zur postexpositionellen Impfung zum Schutz vor Mpox; publiziert im Epid Bull 29/2025

42 Wissenschaftliche Begründung der STIKO für die Empfehlung zur Impfung gegen Affenpocken mit Imvanex (MVA-Impfstoff); publiziert im Epid Bull 25/26/2022

Mumps

43 Änderung der Empfehlung zur Impfung gegen Mumps; publiziert im Epid Bull 31/2012

Pertussis

44 Wissenschaftliche Begründung für die Empfehlung der Pertussisimpfung mit dem Tdap- Kombinationsimpfstoff in der Schwangerschaft; publiziert im Epid Bull 13/2020

45 Zusätzliche Pertussis-Impfung im Erwachsenenalter als Tdap-Kombinationsimpfung bei der nächsten fälligen Td-Impfung - Empfehlung und Begründung; publiziert im Epid Bull 33/2009

46 Klinische Studien mit azellulären Pertussiskomponenten-Impfstoffen bei Erwachsenen: Anlage zum Epid Bull 31/2009

47 Erweiterung der beruflichen Indikationen für eine Pertussis-Impfung; publiziert im Epid Bull 31/2009

48 Begründung für die STIKO-Empfehlung einer Pertussis-Auffrischimpfung im Vorschulalter; publiziert im Epid Bull 3/2006

Pneumococci

49 Aktualisierung der Empfehlung der STIKO zur Indikationsimpfung für Kinder und Jugendliche mit Risikofaktoren im Alter von ≥ 2 bis 17 Jahren gegen Pneumokokken-Erkrankungen; publiziert im Epid Bull 02/2026

50 Aktualisierung der Empfehlungen der STIKO zur Standardimpfung von Personen ≥ 60 Jahre sowie zur Indikationsimpfung von Risikogruppen gegen Pneumokokken und die dazugehörige wissenschaftliche Begründung, publiziert im Epid Bull 39/2023

51 Wissenschaftliche Begründung zur Aktualisierung der Empfehlung zur Indikationsimpfung gegen Pneumokokken für Kinder und Erwachsene; publiziert im Epid Bull 37/2016

52 Wissenschaftliche Begründung zur Aktualisierung der Pneumokokken-Impfempfehlung bei Senioren (Standardimpfung ab 60 Jahren); publiziert im Epid Bull 36/2016

53 Wissenschaftliche Begründung zur Änderung der Pneumokokken-Impfempfehlung für Säuglinge; publiziert im Epid Bull 36/2015

54 Wissenschaftliche Begründung für die Änderung der Empfehlung zur Indikationsimpfung gegen Pneumokokken; publiziert im Epid Bull 36/2014

55 Begründungen zur allgemeinen Empfehlung der Impfung gegen Pneumokokken im Säuglings- und Kindesalter - Pneumokokken- Impfung mit 7-valentem Konjugat-Impfstoff für Kinder unter 2 Jahren; publiziert im Epid Bull 31/2006

56 Zur Impfung gegen Pneumokokken-Krankheiten; publiziert im Epid Bull 31/2005

57 Begründung der STIKO-Empfehlung zur Pneumokokken-Impfung; publiziert im Epid Bull 28/2001

Travel vaccinations

58 Empfehlungen der Ständigen Impfkommission (STIKO) und der Deutschen Gesellschaft für Tropenmedizin, Reisemedizin und Globale Gesundheit e.V. (DTG) zu Reiseimpfungen; publiziert im Epid Bull 27/2026

Respiratory syncytial virus (RSV)

59 Empfehlung und wissenschaftliche Begründung zur Ausweitung der STIKO-Empfehlung der Standardimpfung gegen Erkrankungen durch Respiratorische Synzytial-Viren (RSV) für Personen ≥ 75 Jahre sowie der Indikationsimpfung von Personen im Alter von 60 bis 74 Jahren mit Risikofaktoren um einen mRNA-Impfstoff; publiziert im Epid Bull 15/2025

60 Empfehlung und wissenschaftliche Begründung für eine Standardimpfung gegen Erkrankungen durch Respiratorische Synzytial-Viren (RSV) für Personen ≥ 75 Jahre sowie zur Indikationsimpfung von Personen im Alter von 60 bis 74 Jahren mit Risikofaktoren Epid Bull 32/2024

61 Empfehlung wissenschaftliche Begründung zur spezifischen Prophylaxe von RSV-Erkrankungen mit Nirsevimab bei Neugeborenen und Säuglingen in ihrer 1. RSV-Saison. Epid Bull 26/2024

Rubella

62 Änderung der Empfehlungen zur Impfung gegen Röteln; publiziert im Epid Bull 32/2010

Rotavirus

63 Empfehlung und wissenschaftliche Begründung der Empfehlung zur Rotavirus-Standardimpfung von Säuglingen; publiziert im Epid Bull 35/2013

Rabies

64 Änderung der Empfehlungen zur Impfung gegen Tollwut; publiziert im Epid Bull 31/2010

Varicella

65 Wissenschaftliche Begründung für die Änderung der Empfehlung zur passiven Immunisierung mit Varizella-Zoster-Immunglobulin (VZIG); publiziert im Epid Bull 35/2015

66 Impfung gegen Varizellen im Kindesalter: Empfehlung einer zweiten Varizellenimpfung; publiziert im Epid Bull 32/2009

67 Begründung der STIKO für eine allgemeine Varizellenimpfung; publiziert im Epid Bull 49/2004

National immunisation schedule available in 21 languages: www.stiko.de/en

Disclaimer

This document is a translation of the original Recommendations of the Standing Committee on Vaccination (STIKO) at the Robert Koch Institute (www.rki.de/stiko-empfehlungen) on behalf of the Robert Koch Institute as of 04/2026. The German text is authoritative, and no liability is assumed for any translation errors or for the translation's correctness in case of subsequent revisions to the German original – DOI 10.25646/13636.3

Weitere Informationsmaterialien
(further information)

RKI-Ratgeber zu einzelnen Infektionskrankheiten
www.rki.de/ratgeber

Kurz & Knapp: Faktenblätter zum Impfen
rki.de > impfen-infomaterial

- COVID-19-Impfung
- Falsche und richtige Kontraindikationen bei Impfungen
- FSME-Impfung
- Herpes-zoster-Impfung
- HPV-Impfung
- Impfungen in der Schwangerschaft
- Influenza-Impfung
- Masern-Impfung
- Meningokokken-Impfung
- Pneumokken-Impfung
- RSV-Impfung für ältere Menschen
- RSV-Prophylaxe

Fremdsprachige Informationsmaterialien zu Impfungen (further information in different languages)
www.rki.de/impfen > Informationsmaterialien in verschiedenen Sprachen

- Impfkalender in 21 Sprachen
- Aufklärungsbögen und Einverständniserklärungen in deutscher Sprache
- Aufklärungsinformationen zu folgenden Impfungen in Fremdsprachen:
- COVID-19-Impfung mit mRNA-Impfstoff (BioNTec/Pfizer, Moderna);
- COVID-19-Impfung mit proteinbasiertem Impfstoff (Nuvaxovid/Novavax);
- Mpox-Impfung;
- Hepatitis-A-Impfung;
- Hepatitis-B-Impfung;
- Herpes-zoster-Impfung mit dem Totimpfstoff;
- HPV-Impfung;
- Influenza-Impfung
- Influenza-Impfung mit dem Lebend impfstoff (nasal);
- Meningokoken-B-Impfung;
- MenACWY-Impfung;
- MMR-Impfung;
- Pneumokokken-Impfung;
- Rotavirus-Impfung;
- RSV-Impfung, RSV-Prophylaxe (Nirsevimab);
- TdaP-IPV-Impfung;
- 6-fach-Impfung (DTaP-IPV-Hib-HepB);
- Varizellen-Impfung
- Informationen zu Kinderlähmung (engl., franz., arab.)

Stressfrei Impfen
rki.de/schmerzreduziertes-impfen

- Praxis-Poster Schmerz- und Stressreduktion beim Impfen
- Merkblatt für Ärztinnen und Ärzte mit Hinweisen zum schmerzreduzierten Impfen im Praxisalltag

Laienverständliche Informationsmaterialien des Bundesinstituts für Öffentliche Gesundheit (BIÖG) zum Thema Impfen (teilweise fremd-sprachig): infektionsschutz.de/mediathek/

Mythen und Falschinformationen zum Impfen
rki.de/impfen-falschinformationen

- Faktensandwiches zu häufig vorkommenden Falschinformationen zu Impfungen (rki.de/impfmythen)
- Gesprächskarten als Hilfestellung zum Führen schwieriger Gespräche zum Thema Impfen (rki.de/impfen-gespraechskarten)

Ständige Impfkommission (STIKO) beim Robert Koch-Institut

Vorsitzender (Chairperson)
Prof. Dr. Reinhard Berner, Pädiater und Infektiologe, Direktor der Klinik und Poliklinik für Kinder- und Jugendmedizin des Universitätsklinikums Carl Gustav Carus der Technischen Universität Dresden

Stellvertretende Vorsitzende (deputy chairperson)
Dr. Marianne Röbl-Mathieu, Niedergelassene Gynäkologin, München

Mitglieder der STIKO (list of members)
Siehe stiko.de > Mitgliedschaft

Geschäftsstelle der STIKO (executive secrateriat)
Robert Koch-Institut, Abteilung für Infektionsepidemiologie, Fachgebiet Impfprävention, Seestraße 10, 13353 Berlin

Das Fachgebiet Impfprävention am Robert Koch-Institut bietet telefonische Auskunft bei Fragen zur Umsetzung der STIKO-Empfehlungen an (nur für impfende ÄrztInnen!). Es wird keine reisemedizinische Impfberatung angeboten.

Telefon (Hotline): 0049 30 18754 -35-39, Donnerstag von 12.00 - 14.00 Uhr

Bezugsmöglichkeiten der Empfehlungen der Ständigen Impfkommission (STIKO) beim Robert Koch-Institut (Epid Bull 4/2026)

Einzelexemplare können beim RKI zu folgenden Bedingungen angefordert werden:

- kostenfrei bis zu 2 Exemplare nach Einsenden eines adressierten und mit 1,80 Euro frankierten Rückumschlages für das Format A4,
- mehr als 2 Exemplare nach schriftlicher Bestellung gegen Rechnung.

Bitte verwenden Sie zur Bestellung folgende Adresse:

Robert Koch-Institut
Kennwort „STIKO-Empfehlungen“
Nordufer 20
13353 Berlin

Die Impfempfehlungen der STIKO sind auch im Internet abrufbar unter **www.stiko.de**, in englischer Sprache unter **www.stiko.de/en**.

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