**Introduction**

This fact box will help you to weigh the benefits and harms of the combined whooping cough booster vaccine for adolescents and adults. The numbers presented in the fact box are based on summaries of the best available evidence.

This fact box was created by the Harding Center for Risk Literacy.

**What is whooping cough?**

Whooping cough (Pertussis) is a highly contagious disease of the upper air passages, caused by the bacterium "Bordetella pertussis". In contrast to other diseases against which vaccinations are administered, whooping cough cannot be eliminated. Adolescents and adults mostly suffer from influenza-like symptoms such as rhinitis, fatigue and possibly fever as well as coughing lasting for several weeks. The disease can be spread to other persons by sneezing, speaking or coughing. Even vaccinated people who do not develop symptoms can unknowingly act as a transmitter for a short time after contact with an infected person. Furthermore, the vaccination protection is of limited duration, leading to a possible infection despite a vaccination as well as a possible re-infection after an already obtained disease. Especially infants and small children are at risk of getting whooping cough as infections that may be life-threatening for them. Very rare but dreaded complications, especially with babies until six months of age, are pneumonia, seizure, brain damage through lack of oxygen, and at the extreme, death by asphyxiation [9].

**What is the combined whooping cough booster vaccine?**

Usually vaccinating against whooping cough is done by a combination vaccination with tetanus and diphtheria (Tdap). A vaccine solely against whooping cough is not available anymore in Germany. It is possible though, to vaccinate against polio (Poliomyelitis; IPV) at the same time (Tdap-IPV)[9, 10].

**Who might consider combined booster vaccine?**

The German Standing Committee on Vaccination (STIKO) recommends refreshing of the vaccination against tetanus and diphtheria every 10 years. Adults can request to receive the pertussis boost simultaneously with the next due vaccination against tetanus and diphtheria [9].
Combined whooping cough booster vaccine for adolescents and adults

Numbers for adolescents and adults with regard to potential contact with the whooping cough bacterium.

The combined whooping cough booster vaccine may prevent from getting pertussis in case of contact with the whooping cough bacterium. Redness, pain or swelling due to the vaccination around the injection site are possible. Severe reactions due to the vaccination are unknown.

<table>
<thead>
<tr>
<th>100 people without combined booster vaccine exposed to the whooping cough bacterium</th>
<th>100 people with combined booster vaccine exposed to the whooping cough bacterium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits*</td>
<td></td>
</tr>
<tr>
<td>How many people suffer from whooping cough?</td>
<td>45-79</td>
</tr>
<tr>
<td>How many people suffer from coughing lasting longer than three weeks due to whooping cough?</td>
<td>36-77</td>
</tr>
<tr>
<td>How many people suffer from vomiting after coughing due to whooping cough?</td>
<td>8-51</td>
</tr>
<tr>
<td>100 people with tetanus and diptheria vaccination (TD)</td>
<td>100 people with tetanus, diptheria and pertussis vaccination (Tdap)</td>
</tr>
<tr>
<td>Harms**</td>
<td></td>
</tr>
<tr>
<td>How many people had a high temperature (over 37.5°C) after booster vaccine?</td>
<td>5-33</td>
</tr>
<tr>
<td>How many people suffered from a headache after booster vaccine?</td>
<td>32-44</td>
</tr>
<tr>
<td>How many people suffered from fatigue after booster vaccine?</td>
<td>26-41</td>
</tr>
</tbody>
</table>

*Receiving pertussis as a combined booster shot also prevents against tetanus and diphtheria.

**Redness, pain or swelling as local side-effects around the injection site are possible on both vaccination-types, against diphtheria and tetanus as well as similarly occurring with the tetanus-, diphtheria- and whooping cough vaccination within 48 hours after the vaccination.


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The fact box shows the benefits of combined whooping cough booster vaccine for adolescents and adults compared to unvaccinated people at contact with the whooping cough bacterium model-based numbers. In the harms section, the side-effects of the tetanus- and diphtheria-vaccination are compared to the tetanus-, diphtheria- and whooping cough vaccination.

The outcomes may be summarised as follows:

If 100 adolescents and adults without a combined booster vaccination came in contact with the whooping cough bacterium, about 45 to 79 of these people would fall ill. However, about 3 to 12 of each 100 vaccinated people would become sick after contact with the bacterium.

There are no relevant differences between the side-effects of the combination vaccination against tetanus and diphtheria and the side-effects of the triple vaccination against tetanus, diphtheria and whooping cough. About 5 to 33 of 100 adults with either vaccination suffered from a higher temperature.

The numbers in the fact box are rounded. The data in the benefits section of the frequency of disease are amongst other things based on cumulative data from clinical practice. This includes information from physicians and course book information about contagion indexes (share of the infected among those that were in contact with the bacterium) and manifestation indexes (share of symptomatically ill among the infected) when there are no current patient studies available. The data based on the clinical practice do not necessarily correspond to the changed health condition of the current population and every vaccine offered in Germany [1-6].

The data in the harms section are based on two randomised-controlled studies with overall 1.000 participants [7, 8].

The probability of contact with a bacterium depends on many factors. Among those are for example the number of vaccinated people in the population and the capabilities of the bacterium to spread. Contacts with the pathogen become increasingly rare when a majority of a vaccinated population hinder the bacterium from spreading (herd immunity).

Additional information: According to laboratory results, it must be assumed that the protection after the booster vaccination lasts for at least 5 years. [1]. Despite the booster vaccination, becoming sick of whooping cough is not impossible [11]. Further, a prior illness does not protect from an additional
sickening [9].

**Quality of evidence**

The overall evidence is of moderate quality. The contagion and manifestation indexes have not been researched with adequate randomised-controlled studies. However, the dimensions of the effectivity of the vaccines among several populations have been validated with different study designs.

Thus at least the reduction of the disease symptoms among vaccinated people against unvaccinated people is documented with evidence. The data about harms are based on two randomised-controlled studies.

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**Sources**

Information within the fact box were obtained from the following sources:

**Benefits:**

**Protection**


On the risks of infection (contagion index) and of symptomatic course of the disease in case of infection (manifestation index)


On the frequency of symptoms

**Harms:**


**Accompanying text:**


**Actuality of the fact box**

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