

**What was the challenge?**

Shortly after birth, every child in Germany receives their Certificate of Vaccination to keep record on vaccinations. By adulthood the little yellow WHO booklet should be filled with at least thirteen vaccinations. But every second German is missing important vaccinations and 43% don't know which diseases they're protected against. Also many parents underestimate the

terrible consequences of so-called childhood diseases: More than 50% of the two-year-olds haven't received all necessary vaccinations.

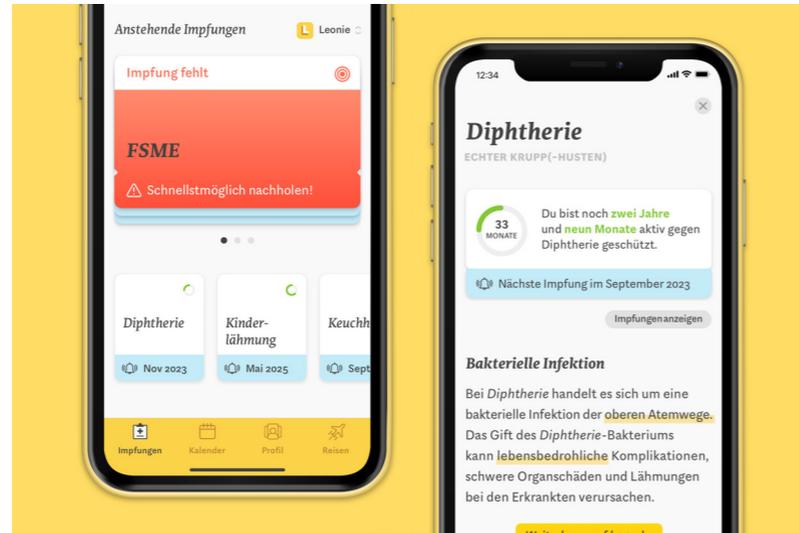


International Certificate of Vaccination (WHO)

Prof. Dr. Betsch, an expert for vaccination behavior at the University of Erfurt, explains the situation as follows:

**Most people are willing to be vaccinated – but keeping track of vaccinations is too much of a hassle. People are also often not aware that or when they should be vaccinated.**

The problem is intensified by the fact that 22% of the population don't know where their Certificate of Vaccination is located. Unfortunately, there is no central vaccination register in Germany, which means if the paper document gets lost, there is no backup available.



**left:** dashboard view with color-coding shows one missing and two upcoming vaccinations **right:** In-depth information about Diphtheria and the circular visualized vaccination status

**What was the solution?**

I developed a smart digital Certificate of Vaccination that helps people to better understand their vaccination status and keep track on their vaccinations. The iOS app also works as a secure backup to ensure your vaccination data can't get lost. The Certificate of Vaccination app has four main sections: Vaccination status, vaccination calendar, family account and travel vaccinations.

**Vaccination status**

All vaccinations are listed in a dashboard, sorted by disease. Missed or pending vaccinations are highlighted to immediately gain the users attention. Vaccinations that aren't yet necessary or have already been completed are shown in a list of tiles. The vaccination status for each disease is visualized with a decreasing circle indicating how long the vaccination protection will last. The user is also able to read additional information on the specific diseases and learn why it's important to be vaccinated against them.

**Family feature**

To make life easier for families, parents are able to connect their children's Certificate of Vaccination with their own. The family feature helps parents to schedule their kids vaccination appointments more easily.

**Vaccination calendar**

The calendar displays all vaccinations as a timeline in chronological order to give users a better overview. In addition to the past vaccination dates, the future vaccinations are also shown. Besides the purpose of information this form of visualization also shows the user that protecting your health with vaccinations is a life-long process.

**Travel vaccinations**

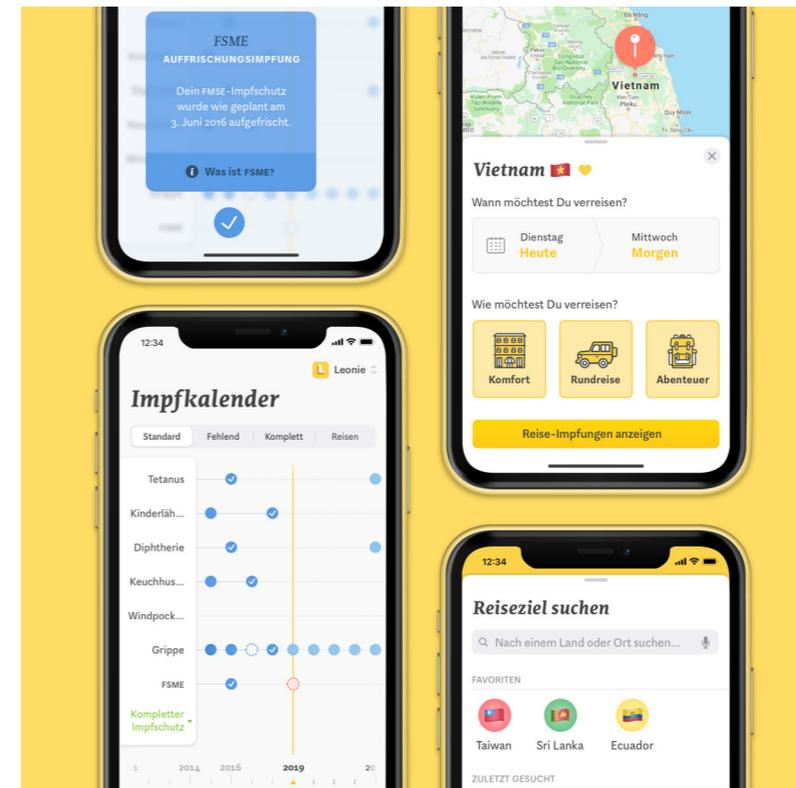
More and more people travel around the world either for business or holidays. This caused an increased need for additional travel vaccinations (e.g. yellow fever). The travel vaccination feature looks up all required vaccinations for the chosen destination and automatically reminds the user to get their vaccinations in time for their trip.

**Smart notifications through nudging**

To remind people of their required vaccinations without opening the app I created an approach for smart notifications based on findings from behavioral science and psychology. Nudging influences human behavior through small communicative impulses without using prohibitions or rules. I combined nudging strategies with the so called 5C model, a scientific questionnaire to analyze which factors influence a persons motivation to get vaccinated. The results were used to create individual notifications for each user that fits their main motivating factors (e.g. risk perception, sense of responsibility)



Exemplary notifications for users with an upcoming measles vaccination



**left:** vaccination calendar view shows additional data via force touch on vaccination dots **right:** travel vaccinations feature with map and options to choose style of travel and time

**What was the effect?**

As user tests with a high-fidelity prototype of the digital Certificate of Vaccination have shown, the dashboard gave people a better overview and therefore they felt more secure in handling their vaccinations. Probandns stated that the frequent notifications encouraged them to talk to their doctor about missing vaccinations. Especially parents found organizing vaccination appointments much easier with all their children's data in one place.

Being provided with additional information about the diseases raised the users awareness for the importance of vaccinations and the possible effects of missed vaccinations on their health.

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