The British vaccination committee already knew the estimates for the "number needed to vaccinate" last autumn. The public only found out about it three months later.

800 to 210,000 Covid boosters prevented one hospitalization

Martina Frei / 3.03.2023

A British calculation shows over 260-fold differences in different population groups.

The UK Health Security Agency (UKHSA) used the data of the British vaccination register to calculate how many people had to be boosted against Covid again (i.e. vaccinated a fourth time) in order to prevent severe Covid disease among those vaccinated. Internally, the UKHSA presented its estimate of the "number needed to vaccinate" at the end of October 2022. It was released at the end of January 2023.

The UKHSA calculations Berechnungen der UKHSA show that even if there were risk factors, the vast majority of people were no longer threatened with hospitalization because of Covid, even if they could not be boosted in autumn 2022. The big differences between vulnerable people and younger people without risk factors are striking. The vaccination was therefore much more useful for the risk groups than for the non-risk groups.

An example: According to the estimate, the Covid booster vaccination in autumn 2022 prevented one in 6000 people aged 40 to 49 with risk factors from being hospitalized for Covid. The other 5999 people would not have come to the hospital because of Covid even without this fourth dose of vaccination.

In the case of 40 to 49-year-olds without risk factors, it even took 92,500 booster vaccinations to spare one of these boosted people of hospitalization for Covid. The other 92,499 boosted people would not have come to the hospital because of Covid even without this fourth vaccination – but they risked side effects if they were vaccinated. The benefit of the booster was therefore questionable in this and in the younger age groups.

	Programme			
Age	Primary	Booster (2+1)	Autumn 2022 boost	Spring 2023 boost
5 to 11	34200			
12 to 15	31400			
16 to 19	11200	76000	73500	
20 to 29	13300	17600	40900	
30 to 39	9900	15300	35900	
40 to 49	10000	9600	20600	
50 to 59	3000	3000	8000	
60 to 69	1200	1000	3600	
70+	300	500	800	
In a risk group	Primary	Booster (2+1)	Autumn 2022 boost	Spring 2023 boost
20 to 29	2400	3400	7500	7500
30 to 39	1600	3100	7800	7800
40 to 49	2200	2500	6000	6000
50 to 59	800	1200	3100	3100
No risk group	Primary	Booster (2+1)	Autumn 2022 boost	Spring 2023 boost
20 to 29	19900	33900	168200	
30 to 39	21700	53800	210400	
40 to 49	21700	44900	92500	
50 to 59	10900	15800	43600	

How many people with and without risk factors need to be vaccinated against Covid to avoid hospitalization for a year? The "number needed to vaccinate" (NNV) is given from July 2022 for the first vaccination (primary, two doses of vaccine), the first booster vaccination, the second booster vaccination and for a possible further booster in spring 2023. Reading example: In the age group of people over 70 who were vaccinated against Covid for the first time from July 2022 (first and second dose), the vaccination statistically prevented hospitalization in about one in 300 people. At the third dose (first booster) the NNV for this age group was around 500, at the fourth dose (second booster) it was 800. © Department of Health and Social Care / UKHSA

The NNV was lowest in those over 70 years of age

The "number needed to vaccinate" (NNV) indicates how many people have to be vaccinated in order to save one of them - depending on the calculation - from illness, hospitalization or premature death. It provides an indication of how important a vaccination is from a public health perspective compared to other vaccinations or measures. The effectiveness of the vaccination, the incidence and the existing immunity against the pathogen in the population influence NNV.
The lowest NNV in the British estimate was for people aged 70 and over: the booster vaccination in autumn 2022 prevented hospitalization in one in 800 people in this age group who were boosted and one in 7500 avoided intensive care.

	Programme			
Age	Primary	Booster (2+1)	Autumn 2022 boost	Spring 2023 boost
5 to 11	112200			
12 to 15	162600			
16 to 19	106500	193500	185100	
20 to 29	166200	418100	275200	
30 to 39	87600	188500	217300	
40 to 49	53700	40600	175900	
50 to 59	18700	16200	48300	
60 to 69	5700	9200	27300	
70+	2500	10400	7500	
In a risk group	Primary	Booster (2+1)	Autumn 2022 boost	Spring 2023 boost
20 to 29	11400	43500	59500	59500
30 to 39	10700	28600	40500	40500
40 to 49	9400	10600	49800	49800
50 to 59	5600	6100	18600	18600
No risk group	Primary	Booster (2+1)	Autumn 2022 boost	Spring 2023 boost
20 to 29	no cases	no cases	706500	
30 to 39	318400	no cases	no cases	
40 to 49	186800	190400	932500	
50 to 59	51600	107000	256400	

This table shows how many people had to be vaccinated or boosted to prevent intensive care. © Department of Health and Social Care / UKHSA

No differentiation among seniors

The UKHSA calculations are based on the status of July 2022. At that time there was a small omicron wave in Great Britain. The UKHSA assumed in its calculations that the effectiveness of the vaccination against the coming virus variants will remain the same as against the omicron variant, that the vaccination protects all age groups equally well and that its effectiveness (protection from hospitalization) depends on the time since the last vaccination dose is between 90 and 50 percent.

In the 70+ age group who were vaccinated against Covid for the first time from July 2022 (first and second dose), the vaccination statistically prevented around one in 300 people from being hospitalised, according to the UKHSA. At the third dose (first booster) the NNV for this age group was around 500, at the fourth dose (second booster) it was 800.

Since estimates of the NNV are always subject to uncertainty, it would be interesting to know how large this uncertainty is and also what the results were for the different vaccines. However, the UKHSA does not provide any information on this when asked. She also does not go into detail for the over 70-year-olds, for example by differentiating between very old

residents and comparatively healthy seniors who live independently.

In the manufacturer-sponsored studies, the mean NNV was lower.

A group led by the US scientist Andrew Larkin US-Wissenschaftler Andrew Larkin calculated the NNV using the information in the large, manufacturer-sponsored vaccination studies. Across all age groups, it was 2714 after the first two Pfizer/Biontech vaccine doses to prevent hospitalization. In an Israeli study it was 4004 and in the Moderna vaccination study it was 502. However, these numbers are not directly comparable with those of the UKHSA because they relate to different and much shorter time periods.
There are several reasons why the NNV is now so much higher: Firstly, the very high vaccination protection initially postulated in the studies was "never reproducible" in reality. That's what the Austrian expert Franz Allerberger said recently in an interview with Infosperber.

Secondly, by autumn 2022, a large number of people had already come into contact with the corona virus and had built up immunity.

In Switzerland it should have been over 97 percent of the population in August 2022, reported the "Blick". NNV increases when many people in the population are immune to the disease and when incidence is low. Third, it is repeatedly reported that the omicron variant is less dangerous weniger gefährlich than earlier virus variants.

According to Federal Councilor Alain Berset, the NNV to prevent hospitalization was allegedly only 50 at the beginning of November 2021 (across all age groups). "On average, one hospitalization can be avoided for every 50 vaccinations and an occupancy in the intensive care unit for every 150 vaccinations," claimed the Federal Office of Public Health Bundesamt für Gesundheit shortly before the vote on the Covid 19 law (Infosperber)reported.

Great Britain has largely stopped booster vaccinations for the time being.

Great Britain has now stopped the Covid booster vaccinations for the population on February 12, 2023. Only selected high-risk people would be offered another booster dose later in the year, the National Health Service said on its website.

Although data from other countries cannot be transferred 1:1 to Switzerland, one can assume that the situation in Switzerland is at least similar. The figures from Great Britain would support the Swiss vaccination recommendation

last autumn, the Federal Office of Public Health (BAG) announced on request.

At that time, the national health service BAG recommended empfahl das BAG the booster to people aged 65 and over, people aged 16 and over with chronic diseases or with trisomy 21, as well as pregnant women and anyone "who would like to reduce their risk of infection for professional and/or private reasons".

The purchase price for a booster dose is kept secret. In June 2022, the state of Bern Kanton Bern named a target price for self-payers of CHF 60 per Covid vaccination dose. Based on this amount, the booster doses in autumn 2022 for people over 70 would have cost around 48,000 francs to prevent hospitalization. For 40 to 49 year olds, this would have required more than CHF 1.2 million.

In order to prevent intensive treatment of a boosted person, the vaccination costs for people over 70 would be CHF 450,000 based on this assumption, for those aged 40 to 49 an average of around CHF 10.6 million and for those aged 40 to 49-year-olds with risk factors to almost three million francs.

The "Number needed to vaccinate" (NNV) for other vaccinations.

The benefit of a vaccination is measured by how effective it is and how often it causes undesirable effects. From a public health point of view, a comparison with other vaccinations makes sense. Here are some examples from studies, but they should be interpreted with caution. Because the calculations also depend on which generous or conservative assumptions the authors of the study have made. In the case of flu vaccination, for example, the overall evidence is weak.

The NNV changes with the effectiveness of a vaccination, with the period chosen, with the frequency of new cases and with whether or not the disease circulates in an already largely immune population. Secondary effects are not recorded with the NNV, for example whether a vaccination not only protects against the disease but also reduces its further spread.

Vaccination	age group	how many people have to be vaccinated to prevent hospitalization (NNV)	place of study	citation remark	Price per dose in Switzerland
flu	all risk groups for which the flu	3360 per winter season	Portugal	«BMC Public Health»	19,20 CHF

Vaccination	age group vaccination is recommended	how many people have to be vaccinated to prevent hospitalization (NNV)	place of study	citation	remark	Price per dose in Switzerland
flu	Persons aged 65 and over	741 per winter season	Portugal	«BMC Public Health»	Whether the flu vaccination prevents hospitalizations at all is controversial.The evidence for this is tenuous. A very large British study found no effect on preventing hospitalizations among the elderly.	41.15 CHF (new vaccine for seniors, currently not covered by basic insurance)
flu	Children aged 6 to 23 months	1031 to 3050 per winter season	USA	«Pediatrics», «Vaccine»	Assumption: vaccination effectiveness is 50%	19,20 CHF
flu	Children aged two to five years	4255 to 6897 per winter season	USA	«Pediatrics», «Vaccine»	Assumption: vaccination effectiveness is 50%	19,20 CHF
Pneumococci (can cause pneumonia)	from 65 years	576 to 1620 in four to five years of observation time	Niederlande	«New England Journal of Medicine», «arznei-telegramm», CDC, «Vaccine»	wide range of results. A manufacturer-sponsored calculation gives a NNV that is much lower than that calculated by the US CDC and others	83 CHF
whooping cough	Babies under 12 months	at least 5,000 to 18,500 parents	Italien	«Vaccine», «Vaccine»	Vaccination of families to indirectly protect the babies	36,25 CHF

Vaccination	age group	how many people have to be vaccinated to prevent hospitalization (NNV)	place of study	citation	remark	Price per dose in Switzerland
whooping cough	Babies under 12 months	4800 to over 47,000 parents	Kanada	«Clinical Infectious Diseases» , «Vaccine »	Vaccination of families to indirectly protect the babies	36,25 CHF

Original document in German:

https://www.infosperber.ch/gesundheit/800-bis-210000-covid-booster-verhinderten-eine-hospitalisation/