

Is vaccination the rational choice?

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There is a risk from vaccination and there is a risk from a COVID-19 infection. Assuming that I only think about my personal advantage and ignore all others, is it the rational choice to get vaccinated?

In Germany 4.5 million people got infected. We're close to 100.000 deaths due to COVID. So more than 200 out of 10.000 infected died.

In Germany we have over 60 million vaccinated people. [There are 10.000 people who had strong adverse reactions after vaccination.](#)

The chance to have a strong reaction to vaccination is around 1 to 6000. Less than 2 out of 10.000 vaccinated have a strong reaction.

The average chance of infection is currently 1 in 1000 per week. [19 out of 20 people in ICU are unvaccinated.](#)

Since about 70% of people in Germany are vaccinated, there is another factor of more than 2 (there are more than twice as many vaccinated people than unvaccinated).

Vaccination therefore reduces your chance of landing in ICU by at least factor 40. That means the risk to land in ICU when vaccinated is negligible compared to the risk when unvaccinated.

Let's assume that you are young, so you would likely just have a heavy infection, but not die. Then 200 in 10.000 dead and 2 in 10.000 having adverse reactions to the vaccination could be comparable: The danger if you get infected is at least **100x as high** compared to the vaccination. So if there is a 1% chance to get infected, getting vaccinated is the rational choice — even ignoring the effect on others.

Do the math: How many weeks until the risk of infection outweighs the risk of the vaccination? How many weeks do you have to add until you have a 1% chance of contracting COVID-19?

At **1 out of 1000 infected per week**, it takes just 10 weeks for the vaccination risk (that you take up front) to be smaller than the risk the vaccination prevents.

So if you think that COVID-19 will still last more than 10 weeks, getting vaccinated is the individual rational choice. If you also think about others you could infect, the break-even is much earlier.

Update: Reply to: “You say this, but I have some condition that makes the vaccination more dangerous to me!”

Then adjust the values. This article uses only statistical measures. If you cannot get vaccinated, you are dependent on others to protect you. That also means that you are not the focus of this article, which restricts itself to the purely egoistical rational choice.¹

People who want to protect you will have to get vaccinated much earlier than indicated here.

Personal note: They should and I did.

And what about kids, should a schoolkid get vaccinated?

For kids the chance to land in ICU is lower, but around **2 out of 100** infected kids get symptoms lasting more than 12 weeks (German article from child doctor organization, additional evaluation [by RKI](#), also German). So to be on the vaccination-critical side of rational choice, we don't compare with the 10.000 strong adverse effects of vaccination, but with the 100.000 light adverse effects.

2 out of 1000 who get vaccinated have light adverse effects, 2 out of 100 kids who get infected with COVID-19 have long lasting symptoms.

The danger for kids if they get infected is **10x as high** compared to the vaccination. So if there is a 10% chance to get infected, getting vaccinated is the rational choice for kids, even ignoring the effect on others.

Currently the incidence rate for kids of ages 5 to 14 in Germany is **almost 400 per 100.000**, so 4 out of 1000 get infected every week.

Do the math again: How many weeks until the risk of infection outweighs the risk of the vaccination?

At **4 out of 1000 kids** infected per week, it takes 25 weeks for the vaccination risk (that you take up front) to be smaller than the risk the vaccination prevents. If the infection rates continue to rise as they currently do (9th of november), that time is much shorter.

So if you think that COVID-19 will still last more than half a year, getting vaccinated is the individual rational choice for kids. If you also think about your kids friends whom you could infect, the break-even is much earlier.

Though if you live in Germany, you'll want to wait until the [StiKo](#) recommends the vaccination for kids. They survey the scientific results much more meticulously than I can do it.

¹This article uses a very narrow definition of “rational choice” from free market ideology. For more information see [Rational choice theory](#).