

I wrote the text below in the middle of the covid pandemic, because I was disgusted by stupidity of antivaxers' arguments. As it seems that covid is not dangerous anymore (comparable to a seasonal flue), I contemplated to remove the text from my web-page. But I noticed that antivaxers and anti-restriction people are becoming again active. They say that we now see that lockdowns were not needed, as well as masks, and vaccination proved to be ineffective. Therefore I decided to keep this text with a preamble added.

One can give a number of arguments and statistic showing why their claims are wrong, but I confine myself to one comment. In the fall 2021, Czech Republic had enough covid vaccines to vaccinate everybody, but a significant fraction of the population decided not to be vaccinated in spite of the raising numbers of sick people. At that time it was the deadly delta mutation. Hospitals were filling with covid patients with serious symptoms and people were dying. But one thing was quite apparent: patients with severe symptoms and those who died were, with a few exceptions, nonvaccinated people. During this wave of covid, 20 000 people died in this country. So it clear that **20 000 people died, only because they thought they did not need to be vaccinated.**

Ten reasons for not to be vaccinated

1. *"Covid-19 vaccines are not safe, because they were developed too quickly."* At the time of writing these lines more that 3 billion doses have been administered. With so many doses applied, covid vaccines belong to the best tested ones. Moreover, they were not designed from scratch; they are based on accumulated know-how and science.
2. *"Vaccination is not natural. It's better to be immunized naturally."* There are certainly viruses for which natural immunization is impossible. E.g., the mortality rate on untreated rabies is over 99%. Incidentally, the only known cure is vaccination. The rabies virus progresses relatively slowly from a wound to the brain. When it reaches the brain, it is over, but if the vaccine is applied in time, the body has enough time to develop antibodies and prevent the virus to reach the brain. Other viruses do not kill immediately but cause cancer, e.g., hepatitis virus and papylloma virus. There are vaccines against both, yet many people are still dying on these preventable diseases. The "natural immunization" idea in the case of covid assumes that the dead toll would not be large, but it is large already now. By now more than 4 million people died on covid. It would have been several times more, if critically ill patients were not treated on intensive care units. But these 4 millions are only from 187 million people who were infected. Imagine what would happen if billions of people were infected.
3. *"Only people with risk factors need to be vaccinated because the virus will eventually mutate to a tame form."* A version of this argument is *"... humans will eventually adapt to the virus."* Although for some viruses, this has happened, there is so far no evidence suggesting that covid-19 will mutate to a substantially less virulent form in the near future. The reason why less virulent mutations are naturally selected is that people with severe symptoms are more isolated—they stay at home and other people

avoid contact with sick people. But people infected by covid-19 spread the infection before they have any visible symptoms. So a natural selective force for a less virulent mutation is missing. Repeated pandemics in the history show that it takes a great dead toll to adapt and sometimes it never happens.

4. “*My decision is based on the opinion of an expert who did not recommend vaccination of young people (or children, or people without risk factors, etc.).*” If you search Internet with an assumption in mind, you will certainly find an article that confirms what you wish to be true. An expert opinion is not an opinion of one expert, it is the consensus reached by many real experts. Many people pretend to be experts in fields they know only superficially. A cardiologist, e.g., certainly knows something about viruses, but is not an expert on epidemics.
5. “*I do not want to obey everything the government says.*” (A teenager version is “... *adults say.*”) This is based on the assumption that everything the government (adults) says (say) is wrong. Or it is a form of a protest against the government (adults). In either case it shows someone’s inability to make his/her own *rational decision*.
6. “*I am free to decide and I decided not to get the shot.*” A vaccinated person still can be infected and may spread infection, but the probability that this happens is small. In contrast, a non-vaccinated person is likely to be infected and when he/she is, then he/she spreads the virus massively. Does freedom mean that one can freely infect other people? The main reason for vaccination now is to stop the pandemic. If we do not manage to stop it, new mutations will arise and people who already had covid will be infected again. And this may go on and on. Our historical experience proves that vaccination is the only way to stop recurring pandemics. Should people be free to boycott efforts of doctors and the majority of population to stop the pandemic?
7. “*Trypanophobia*” (irrational fear of injections) *and other phobias*. Trypanophobia is mostly a problem of children, but there are also adults who suffer this phobia. Most people do not admit that they are afraid of injections and explain why they do not want the vaccine by another reason. However, I think that in the case of covid it is more often a different kind of phobia. It is a phobia of something new, strange, and dangerous: “*there is a new virus, there are new vaccines and who knows what they do*”. Paradoxically, these people are not afraid of the dangerous covid-19 disease, but of the very safe vaccines. This is not surprising—irrational thinking is a symptom of every phobia. This phobia is probably the main reason—all other are only excuses.
8. “*Coronavirus is a hoax.*” Many people believe in various conspiracy theories. Essentially any important event in the history is associated with at least one conspiracy theory. Surprisingly even very intelligent people with university degrees believe in them—including the conspiracy theories about covid.
9. “*All vaccines cause more harm than help.*” Imagine a world without vaccines. It was not so long time ago when there were no vaccines. Was it fun? It was estimated that

in the last 100 years before smallpox was eradicated (by systematic vaccination) about 500 million people died on this disease.¹ Tuberculosis, a disease almost forgotten by now because of vaccination, killed about one quarter of the adult population of Europe in the 19th century.² Until the 20th century child mortality was around 45%, including the most developed countries.³ The dramatic decrease that occurred in the 20th century was in a large extent caused by vaccination.

10. *“It’s cool not to be vaccinated.”* The person, usually a youngster, boasts that he/she is no afraid of covid. But for a youngster, covid-19 is no more dangerous than common cold, so refusing vaccination is not bravery. There must be a different reason and it may well be the *fear* of vaccination. In this pandemic the heroes were doctors and other health workers who did not hesitate to risk their lives and treat covid patients, as well those who volunteered to test the new vaccines.

¹<https://en.wikipedia.org/wiki/Smallpox>

²https://en.wikipedia.org/wiki/History_of_tuberculosis#Nineteenth_c

³<https://ourworldindata.org/child-mortality-in-the-past>