

How bad is covid really?

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<https://sebastianrushworth.com/2020/08/04/how-bad-is-covid-really-a-swedish-doctors-perspective/>

Ok, I want to preface this article by stating that it is entirely anecdotal and based on my experience working as a doctor in the emergency room of one of the big hospitals in Stockholm, Sweden, and of living as a citizen in Sweden. As many people know, Sweden is perhaps the country that has taken the most relaxed attitude of any towards the covid pandemic. Unlike other countries, Sweden never went in to complete lockdown. Non-essential businesses have remained open, people have continued to go to cafés and restaurants, children have remained in school, and very few people have bothered with face masks in public.

Covid hit Stockholm like a storm in mid-March. One day I was seeing people with appendicitis and kidney stones, the usual things you see in the emergency room. The next day all those patients were gone and the only thing coming in to the hospital was covid. Practically everyone who was tested had covid, regardless of what the presenting symptom was. People came in with a nose bleed and they had covid. They came in with stomach pain and they had covid.

Then, after a few months, all the covid patients disappeared. It is now four months since the start of the pandemic, and I haven't seen a single covid patient in over a month. When I do test someone because they have a cough or a fever, the test invariably comes back negative. At the peak three months back, a hundred people were dying a day of covid in Sweden, a country with a population of ten million. We are now down to around five people dying per day in the whole country, and that number continues to drop. Since people generally die around three weeks after infection, that means virtually no-one is getting infected any more. If we assume around 0.5 percent of those infected die (which I think is very generous, more on that later), then that means that three weeks back 1,000 people were getting infected per day in the whole country, which works out to a daily risk per person of getting infected of 1 in 10,000, which is miniscule. And remember, the risk of dying is at the very most 1 in 200 if you actually do get infected. And that was three weeks ago. Basically, covid is in all practical senses over and done with in Sweden. After four months.

In total covid has killed under 6,000 people in a country of ten million. A country with an annual death rate of around 100,000 people. Considering that 70% of those who have died of covid are over 80 years old, quite a few of those 6,000 would have died this year anyway. That makes covid a mere blip in terms of its effect on mortality.

That is why it is nonsensical to compare covid to other major pandemics, like the 1918 pandemic that killed tens of millions of people. Covid will never even come close to those numbers. And yet many countries have shut down their entire economies, stopped children going to school, and made large portions of their population unemployed in order to deal with this disease.

The media have been proclaiming that only a small percentage of the population have antibodies, and therefore it is impossible that herd immunity has developed. Well, if herd immunity hasn't developed, where are all the sick people? Why has the rate of infection dropped so precipitously? Considering that most people in Sweden are leading their lives normally now, not socially distancing, not wearing masks, there should still be high rates of infection.

The reason we test for antibodies is because it is easy and cheap. Antibodies are in fact not the body's main defence against virus infections. T-cells are. But T-cells are harder to measure than antibodies, so we don't really do it clinically. It is quite possible to have T-cells that are specific for covid and thereby make you immune to the disease, without having any antibodies. Personally, I think this is what has happened. Everybody who works in the emergency room where I work has had the antibody test. Very few actually have antibodies. This is in spite of being exposed to huge numbers of infected people, including at the beginning of the pandemic, before we realized how widespread covid was, when no-one was wearing protective equipment.

I am not denying that covid is awful for the people who do get really sick or for the families of the people who die, just as it is awful for the families of people who die of cancer, or influenza, or an opioid overdose. But the size of the response in most of the world (not including Sweden) has been totally disproportionate to the size of the threat.

Sweden ripped the metaphorical band-aid off quickly and got the epidemic over and done with in a short amount of time, while the rest of the world has chosen to try to peel the band-aid off slowly. At present that means Sweden has one of the highest total death rates in the world. But covid is over in Sweden. People have gone back to their normal lives and barely anyone is getting infected any more. I am willing to bet that the countries that have shut down

completely will see rates spike when they open up. If that is the case, then there won't have been any point in shutting down in the first place, because all those countries are going to end up with the same number of dead at the end of the day anyway. Shutting down completely in order to decrease the total number of deaths only makes sense if you are willing to stay shut down until a vaccine is available. That could take years. No country is willing to wait that long.

Covid has at present killed less than 6000 in Sweden. It is very unlikely that the number of dead will go above 7,000. An average influenza year in Sweden, 700 people die of influenza. Does that mean covid is ten times worse than influenza? No, because influenza has been around for centuries while covid is completely new. In an average influenza year most people already have some level of immunity because they've been infected with a similar strain previously, or because they're vaccinated. So it is quite possible, in fact likely, that the case fatality rate for covid is the same as for influenza, or only slightly higher, and the entire difference we have seen is due to the complete lack of any immunity in the population at the start of this pandemic.

This conclusion makes sense of the Swedish fatality numbers – if we've reached a point where there is hardly any active infection going on any more in Sweden in spite of the fact that there is barely any social distancing happening then that means at least 50% of the population has been infected already and have developed immunity, which is five million people. This number is perfectly reasonable if we assume a reproductive number for the virus of two: If each person infects two new, with a five day period between being infected and infecting others, and you start out with just one infected person in the country, then you will reach a point where several million are infected in just four months. If only 6000 are dead out of five million infected, that works out to a case fatality rate of 0.12 percent, roughly the same as regular old influenza, which no-one is the least bit frightened of, and which we don't shut down our societies for.

<https://sebastianrushworth.com/2020/08/08/what-is-the-best-way-to-measure-rates-of-covid-immunity/>

A [study carried out at Karolinska Institutet](#) (where I went to medical school), which is still awaiting publication, looked at the presence of both antibody-based and T-cell specific immunity to covid among people in Stockholm. The data was collected during May. The first covid fatality in Sweden was in mid-March, so at that point covid had been raging for about two months.

The study was funded by Karolinska Institutet, the Swedish Research Council, and a number of private foundations and charities. The authors reported no conflicts of interest.

Study participants were recruited in to five distinct cohorts, with a total of around 200 individuals:

The first cohort was made up of patients who had had a mild infection and recovered. Most of these (78%) had not been sick enough to be admitted to hospital. The few that had been admitted had at most required one liter of supplemental oxygen. This was the “mild convalescent” cohort.

The second cohort was the “severe convalescent” cohort, which consisted of patients who had been sick enough to require larger amounts of oxygen and/or mechanical ventilation, and then recovered.

The third cohort was made up of family members of people in the mild convalescent and severe convalescent group. In order to qualify to be part of this cohort, participants had to have spent time in the same household as the sick family member when they were sick, but not themselves been diagnosed with covid 19. This was the “exposed family members” cohort.

The fourth cohort consisted of a random sample of people who donated blood in May 2020, while the fifth cohort consisted of a random sample of people who donated blood in July to September of 2019. The fifth cohort served as a form of control group, since the blood was collected before the beginning of the pandemic.

Although each of the cohorts is a bit small for my liking, it is an interesting mix, which can potentially answer some important questions about how the immune system reacts to covid, and how prevalent covid was at this point in time in Stockholm.

Now to the interesting part, the results:

Let's start with the blood donors who donated blood in 2019. They weren't tested for antibodies (strange, I would have tested them just to have a baseline, to see what the rate of false positives was, but maybe there was some technical reason as to why this wasn't possible) but they were tested for covid-specific T-cells. Not surprisingly, no-one in that group had T-cells (0/37).

Next, we can look at the people who were convalescing from severe disease. Among these individuals, 100% had antibodies, and 100% had T-cells (23/23). This makes sense. When you have a severe illness, you get a strong immune response.

Next up, let's look at the people who were convalescing from mild disease. In this group 87% had antibodies (27/31), while 97% had T-cells (30/31). Again, this makes sense – if you have symptomatic disease, then that is a sign your immune system has realized there is an infection going on, so there should eventually be signs of that in the form of measurable antibodies and/or T-cells.

Now we can look at the exposed family members. Remember, this was a group of people that had not shown signs of symptomatic disease. In this group, 60% had antibodies (17/28), while 93% had T-cells! (26/28). This is pretty astonishing, and it shows two things. Firstly, if you lived with someone who had covid then you were most likely also infected. This is true even if you didn't have symptoms, and even though you didn't have symptoms, you most likely developed an adaptive immune response. Secondly, that immune response involved T-cells more often than antibodies.

Finally, we can look at the people who donated blood in May 2020. This was a random sample, so we don't know how many had had symptomatic disease and how many had been completely asymptomatic up to the time point when their blood was drawn. In this group, 13% had antibodies to covid (4/31) and 29% had T-cells (9/31). That is pretty astounding. Now, again, this was a small trial and the cohort was small so the confidence intervals are wide. But it is still remarkable that twice as many people had T-cells as had antibodies in the random sample.

Additionally, this was in May, two months in to the pandemic. If 29% of Stockholm's population had T-cells in May, then it's reasonable to expect that by now, three months later, that number has at least doubled, which makes for a very reasonable explanation as to why the covid death rate has fallen so precipitously in Sweden – we've now reached the point where we have herd immunity. This is a speculative conclusion considering the small sample size, but it makes sense.

As yet, no proper studies have been performed, to my knowledge, showing that antibodies give immunity to covid, and no studies have been done showing that T-cells give immunity to covid either for that matter. However, we know from experience of infectious diseases in general that an antibody response and/or a T-cell response usually means that you are protected from future infection, at least for a time, and often for a lifetime.

This study has its weaknesses. The main problem with it is that it is small. It would be beneficial if a similar larger study could be performed to corroborate the results. Another problem is that it hasn't gone through peer-review yet. It is noticeably rough around the edges. The text is overly technical and quite disorganized, and the graphs are hard to understand if you don't spend a significant amount of time with them. Additionally, there seem to be some bugs in the text, like the number of participants appearing to differ in different places without any explanation offered.

However, the implications of this study are huge.

Firstly, the fact that significantly more participants had T-cells than had antibodies, suggests that if we want to know the true rate of immunity in a given population, then we should be looking at the proportion who have covid specific T-cells, not the proportion who have antibodies.

Secondly, if it's true that Sweden now has herd immunity, then it seems likely that many other countries will follow over the coming months. By the time a vaccine appears at some point next year (with luck), there might not be many people left that actually need it.