



Omicron: 50% fewer hospitalizations and deaths compared to delta (Ontario)

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#### Fewer severe cases, vaccine failure, rapid spread, murky origins.

### Covid severity

Data from South Africa indicated that the impact of the omicron variant was much lower than previous variants. However, South Africa had already a total infection rate of about 80%, including about 200,000 covid deaths in 60 million people, i.e. a population fatality rate of about 0.3%.

Thus, it was not immediately clear if the lower impact in South Africa was due to prior immunity or lower intrinsic virulence of the omicron variant. Early data from Europe remained ambiguous, too, as omicron primarily affected young people and travelers.

But recent data from Denmark, Britain and Canada, although still preliminary, appear to show that omicron really causes fewer severe cases of covid, regardless of vaccination and immunity status.

For instance, a preprint study from Ontario covering about 15,000 people found that the risk of hospitalization or death was about 50% lower among omicron cases compared to delta cases (see chart above; the 95% confidence interval ranges from 25% to 75%).

The latest official data from Denmark also shows a ~50% lower hospitalization rate with omicron compared to delta (0.6% vs. 1.1%). An analysis by Imperial College London estimates that the hospitalization rate of omicron is about 25% to 50% lower compared to delta.

The somewhat lower virulence of omicron will be especially important for people at high risk of severe covid, whereas the general population may not notice much of a difference. Indeed, case studies of (vaccinated) omicron outpatients describe symptoms very similar to previous variants, including chest pain or shortness of breath in about 30% of cases, see e.g. "7 boostered Germans go to South Africa" (table 2) and "33 boostered nurses have a party in the Faroe islands" (table 1).

### **Omicron in South Africa:**



**Omicron in South Africa (FT)** 

## Why is omicron milder?

Preliminary cell culture studies and animal studies show that, while omicron achieves very high viral loads in the upper airways – explaining its rapid spread and short incubation period –, it appears to achieve lower viral loads in the lungs. In addition, omicron appears to induce much less cell fusion, thus causing much less tissue damage (see next charts). According to a study by researchers at the University of Glasgow, omicron has even switched its preferred cell entry mechanism from the ACE2 cell receptor to endosomal fusion.

### Omicron: Lower viral load in the lungs and lower cell fusion:



hamsters

# Vaccine protection

Several studies have shown that existing covid vaccines, which are still based on the original 2019 Wuhan coronavirus strain, achieve almost no neutralization against omicron. Protection against infection, even after a booster, appears to be at most 30% to 50% and is waning within weeks.

In many countries, infection rates among vaccinated people are currently higher than among unvaccinated people, perhaps because there are already more recovered people among the unvaccinated people (catch-up effect), or because recently vaccinated or boostered people have a higher infection risk (i.e. the well-known post-vaccination spike in infections).

At any rate, vaccination provides no longer any meaningful protection against infection with omicron, and "vaccine passports" have become entirely useless or counterproductive.

Nevertheless, it looks like vaccination still provides significant protection against severe disease; it has been argued that this might be due to a T cell response or immune memory.

Previous infection also provides good protection (50%-60%) against severe disease, but it can no longer prevent reinfection: in Denmark, about 5% of cases per day are reinfections.

On the positive side, there are first antibody neutralization results showing that an infection with omicron provides protection against the delta variant, too.



Vaccines: Zero protection after 45-90 days, negative after >90 days.

Vaccines: Zero protection after 45-90 days, negative after >90 days. (Denmark)

# Rapid spread

Omicron has already taken over from delta in parts of Europe and the US, or is currently in the process of doing so. In many countries, and also at the global level, coronavirus infections have reached a new all-time high.

Despite a hospitalization rate that is 25% to 50% lower (see above), omicron has already significantly increased hospital and ICU admissions and even deaths in places like Denmark, England and New York City (see next charts).

It is true that some of these hospitalization are not "due to covid", but in-hospital transmission is not a positive thing, either: in Wales, for example, about 25% of all covid deaths are people who caught the virus in hospital.

Therefore, early treatment of high-risk patients should remain a top priority.

At the global level, a clock-like 120-day coronavirus infection cycle has been observed in the last two years; the current global cycle should peak around January 3, but it is also possible that omicron will break this cycle and continue its expansion.

#### Denmark (cases, hospital admissions, ICU patients, deaths):



**Omicron in Denmark (OWD)** 

## England (hospital admissions):



**Omicron in England (Covid Actuary)** 

#### New York City (hospital and ICU patients):



New York City (hospital and ICU patients) (New York)

#### Australia (infections):



Omicron in Australia (Ian MSC)

Murky origins

The origins of the omicron variant, probably in South Africa, remain very murky. First, the last known ancestor of omicron dates back to March-June 2020 (!). Second, the extreme imbalance between synonymous and non-synonymous mutations (non-changing vs. changing amino acids) indicates an unnatural origin (i.e. not via evolution, not even in mice).

This currently points to either some lab experiment (e.g. during immune escape research, which was performed in some South African labs), or possibly to a variant created by the molnupiravir drug trial in South Africa (i.e. the Merck pill that induces a very high rate of mutations).

Meanwhile, Taiwan confirmed that in late November, a scientist in a BSL-3 lab got infected by the delta variant of the coronavirus during lab work.



### Omicron: last known ancestor from March/May 2020:

**Omicron origin (Twitter/Nextstrain)** 

# See also

- Omicron hits the mutation jackpot
- The return of the flu
- Covid early treatment

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