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# NEWS

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## Omicron struggles



James  
Heath  
@JamesHeath

14 December



Coro

## doses

GETTY IMAGES

## The heavily mutated Omicron variant has led to a serious dent in the ability of vaccines to protect us from catching the Covid virus.

Two doses of some vaccines offer almost no protection from an Omicron infection, although they should still greatly reduce the risk of becoming so ill you need hospitalisation.

The vaccines that have emerged two months ago.

So can a third dose or has Omicron changed the rules?

Fortunately for most, a booster is not yet necessary.

The protection is still memorable though.

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## Covid science

Fighting coronavirus

One option is to figure out how to get it right. However, there is a risk of getting it wrong and ending up seriously ill.

Vaccines are more like a school - a safer environment to further your immune system's Covid education.

The first dose is the primary school education that nails the fundamentals.

Your second and third doses are comparable to sending your immune system to secondary school and then university to dramatically deepen its understanding. It's not just repeating primary school over and over.



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"The immune system is left with a richer knowledge and understanding of the virus," said Prof Jonathan Ball, a virologist from the University of Nottingham.

He said for all the talk of the dastardly tricks of Omicron, a highly-trained immune system is "an incredibly difficult and hostile environment" for the virus and its variants.



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Antibodies ar

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A flurry of laborator  
antibodies you have after two doses of a Covid vaccine were far less effective  
against Omicron.

Prof Danny Altmann, an immunologist from Imperial College London, said you  
were left with "absolutely zilch" and were a "sitting duck for infection".

So back to school.

Every dose of the vaccine triggers another round of antibody evolution within  
the immune system. It seeks out better antibodies that attach themselves more

firmly to the virus. It's a process called affinity maturation.

"Your antibodies are a better fit as time goes on, they are getting fancier and more sophisticated," said Prof Altmann.

If the antibodies are able to bind more tightly to the coronavirus then it will be harder for Omicron's mutations to help it wriggle free. And while the new variant is heavily mutated, it is still the same fundamental virus and has parts that have not changed at all.

Further rounds of vaccination also lead to the immune system broadening its antibody repertoire as it finds new ways of attacking the virus.

## Numbers

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And then there's T-cells, which again become more plentiful and better at attacking Covid viruses in response to boosting.

T-cells use a different trick to spot the virus and patrol our body looking for any sign of cells being infected with Covid. T-cells recognise parts of the coronavirus that the virus finds harder to mutate.

So while Omicron is squirming away from our immune system, each vaccine dose and indeed each infection is giving our body's defences more tools to hunt it down.



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hand it down.

All this bodes well for vaccines protecting us from becoming seriously ill.

"Immunity against a virus is almost never absolute - you can almost always get re-infected and what you want to do is get re-infection so trivial you don't know you've got it or it's very mild," said Prof Bangham.

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