

# What is viral load and why are so many health workers getting sick?

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What is viral load?

Your viral load is simply how much virus you have in your body – in medical terms it refers to how much virus is measured in a standard volume of fluid, usually blood or plasma. It is commonly used when talking about HIV – patients whose conditions are being well managed and are on the correct medication have an undetectable viral load, meaning that they cannot pass the disease onto others.

What does it mean for transmission of Covid-19?

The “infectious dose” is the amount of virus that an individual needs to be exposed to for them to pick up the virus. With flu viruses, individuals only need to pick up a small amount of particles for them to become sick. In Covid-19 scientists don't yet know how big a dose a person needs to be exposed to but it is likely to be relatively small because of the high number of people becoming sick.

If I get a higher dose of virus does that mean I will be sicker?

Yes – work on two other coronaviruses: severe acute respiratory syndrome (Sars) and Middle East respiratory syndrome (Mers) has shown this, says Willem van Schaik, professor in Microbiology and Infection at the University of Birmingham, says

“On the basis of previous work on Sars and Mers coronaviruses, we know that exposure to higher doses are associated with a worse outcome and this may be likely in the case of Covid-19 as well,”

“In general with respiratory viruses, the outcome of infection – whether you get severely ill or only get a mild cold – can sometimes be determined by how much virus actually got into your body and started the infection off. It's all about the size of the armies on each side of the battle, a very large virus army is difficult for our immune system's army to fight off.”

Age and whether you have an underlying condition also have a role to play in disease severity and outcome.

Can I have a high viral load but not become ill?

Confusingly, it does seem that levels of viral load seem to affect people differently. Doctors studying the outbreak in Lombardy in northern Italy looked at more than 5,000 people and compared the nasal swabs of those who had symptoms with those who did not. They found no difference in viral load between the two groups – however, they said

because they only studied a small number of people without symptoms they could not draw firm conclusions.

Are some people more at risk than others?

Yes – health workers who have to get close to patients are at particularly high risk and this is why doctors and nurses have been getting so angry about shortages of personal protective equipment such as gloves, visors and masks.

But people caring for loved ones at home are also at risk – this is why the government recommends that if you do fall sick with Covid-19 you should sleep in a separate room and use a different bathroom and toilet where possible.

But while patients who are obviously sick pose a risk, low doses of the virus can also be harmful because of their cumulative effect

“Studies in mice have also shown that repeated exposure to low doses may be just as infectious as a single high dose.

“So all in all, it is crucial for us to limit all possible exposures to Covid-19, whether these are to highly symptomatic individuals coughing up large quantities of virus or to asymptomatic individuals shedding small quantities,”

When am I most likely to transmit the virus to others?

A study of nine patients with mild symptoms found that their “peak shedding” period – that is when they were most infectious – was within a week of first showing symptoms. However, by day 10 they were unlikely to pass the disease on. The study – one of the first to map when people actively transmit the illness to others – showed that patients emit extremely high amounts of the virus at an early stage of their infection.

“Peak shedding” – when a person with Covid-19 is most infectious – typically occurs within five days of picking up the disease, and patients emit 1,000 times more virus than during peak shedding of a Sars

How many health workers have fallen ill with Covid-19?

Around 5,000 health workers in Italy and 3,000 in China have been infected with the disease. It is not yet known in the UK how many health workers have been infected although a lot of staff have been off sick – they may have picked up the disease in the course of their daily life rather than directly from a patient.

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