

Long COVID affects 1 in 5 people following infection—vaccination, masks and better indoor air are the best protections

April 13 2022, by John Donne Potter and Amanda Kvalsvig

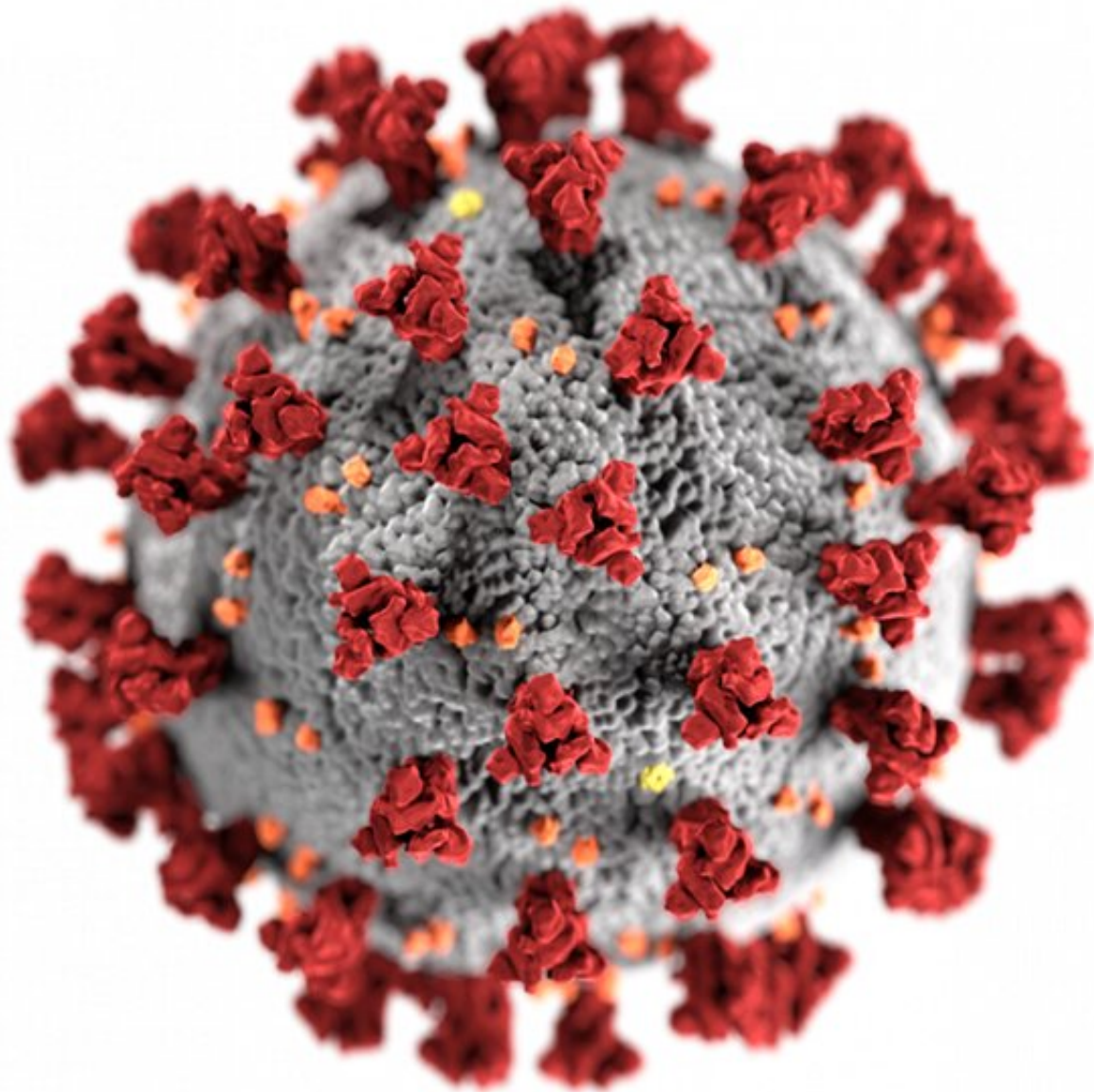


Image of the ultrastructural morphology exhibited by the 2019 Novel Coronavirus (2019-nCoV). Credit: CDC

Many patients recover from COVID within a week or two, but at least one in five experience persistent or new symptoms more than four weeks after first being diagnosed.

Long COVID is a growing concern. But we still don't have a clear definition and there are insufficient data to provide a trajectory or a timeline for how long it lingers. The National Institute for Health and Care Excellence ([NICE](#)) has proposed a [working definition](#): "Signs and symptoms that develop during or after an infection consistent with COVID-19 but continue for more than 12 weeks and are not explained by an alternative diagnosis. It usually presents with clusters of symptoms, often overlapping, which can fluctuate and change over time and can affect any system in the body."

Although some symptoms resolve over time, others persist or re-emerge. There are many individuals with symptoms [lasting 12 months or longer](#).

Downstream damage can affect the brain, heart, lungs, pancreas (causing diabetes) and other organs. However, we know that [vaccination is protective against long COVID](#), whether given before or after the [initial infection](#) and illness.

On average, the risk is higher for people with more [severe disease](#), but many develop long COVID after a mild initial illness. Long COVID is more common in women than men, but there is no consistent relationship with age. Although the initial viral illness is more severe for older people, this is not true for long COVID.

Long Covid in New Zealand: Sufferers warn of virus' long-term impacts <https://t.co/v5bDM0mXZ2>

— Crawford Kilian (@Crof) [April 8, 2022](#)

Common symptoms of long COVID

Most studies show a general pattern of higher prevalence of long COVID for people with more severe illness. The estimates of prevalence range from from [19% to 57%](#), with one outlier at more than 80%.

The three [largest cohort](#) studies place it at [19% to 30%](#), showing long COVID is common enough to be a major public-health threat, independently of acute COVID.

It is becoming increasingly clear that long COVID is much more than a collection of symptoms. Rather, it is a recognisable clinical syndrome (or set of syndromes) with well described underlying pathology.

SARS-CoV-2 infection can contribute to long COVID in a [variety of ways](#). It can cause direct damage to tissue as well as [microscopic blood clots](#), which sometimes result in deep vein thrombosis, pulmonary embolism and stroke.

The [immune system](#) can itself cause damage when it begins to attack normal tissue or produce a [cytokine storm](#). All of these effects are seen in COVID-related brain damage, which is likely to be the result of infection, microclots, lack of oxygen and an activated [immune response](#).

Impacts on the brain and heart

A study across 62 healthcare organisations reported that, among almost 250,000 patients with COVID, 33.6% were diagnosed with [neurologic and psychiatric conditions](#) in the following six months, with 12.8% being new-onset conditions. For ICU patients, the comparable estimates were 46.4% and 25.8%.

Specific outcomes included stroke, Parkinson's, dementia, anxiety and psychosis. A large [study of US veterans](#) reported elevated risk of anxiety and depression. Studies in the UK and China established evidence of [cognitive decline](#), again related to the severity of the initial illness.

A brain-imaging study in the UK involved participants who were initially scanned pre-infection, making it possible to see clearly the [timeline of changes](#). The COVID-affected group showed damage to brain tissue and an overall reduction in [brain size](#) compared with those who had not been infected—changes that occurred with even relatively mild infection.

The most comprehensive [study of cardiovascular complications](#) of SARS-CoV-2 infection involved a cohort of more than 150,000 US veterans and more than 11 million controls. It revealed an elevated risk of new-onset stroke, heart arrhythmia, pericarditis and myocarditis, [ischaemic heart disease](#) and clotting disorders.

As with the brain, risks and burdens were evident even among individuals who were not hospitalised with acute infection and increased in graded fashion across non-hospitalised, hospitalised and intensive care. Other studies have shown [inflammatory changes in the heart](#) and markedly [reduced oxygen supply](#) to both blood and tissue.

Long COVID affects lungs and other organs

COVID can result in prolonged changes in both the [lung blood supply and immune system](#), which may produce lethal lung disease and seems

likely to cause persistent lung damage in those who recover.

A meta-analysis of eight studies with more than 3,700 patients reported 14.4% of those hospitalised with COVID [developed diabetes](#). Patients with pre-existing type 2 diabetes are already at higher risk, but this provides evidence that SARS-CoV-2 can cause new-onset diabetes.

The virus can also [damage muscles](#), which plausibly explains the very common symptoms of fatigue and muscle pain. [Immune abnormalities](#) probably contribute to the chronic inflammatory aspects of long COVID. [Kidney damage](#) occurs early during long COVID, particularly among those with respiratory failure. Clots in [small blood vessels](#) can cause [erectile dysfunction](#).

Long COVID in children

Post-acute effects have been described in all infectious childhood diseases and COVID is no exception. It is useful to consider the [persistent effects of COVID in children](#) in three main groups:

- multisystem inflammatory syndrome in children, a rare but [severe syndrome](#) that occurs from two to five weeks after the initial illness
- longer-term symptoms grouped under the umbrella term of long COVID, with similar symptoms to adults
- tissue-level damage (heart, lungs, blood vessels and brain) that may be silent during childhood but cause chronic disease in later life.

LongCovidKids is an international charity supporting children and their families with [#longcovid](#). With New Zealand's Omicron we expect there to be more children suffering from [#longcovid](#) so [#longcovidkidsnz](#) is being established as part of the wider

group. 1/n

— Long Covid Kids New Zealand (@LCKNewZealand) [April 9, 2022](#)

Minimising harm from long COVID

Prevention measures currently in place are not enough, given what we now know about the full population impact of widespread COVID infection. Prevalence is much less clear in children but the impacts of the pandemic could potentially last decades. Damage to tissues that may be undetected in childhood could emerge as chronic disease as the pandemic generation ages.

We now have a good sense of the [services we need in Aotearoa](#) for long-COVID patients.

There is strong and consistent evidence that [vaccination protects against long COVID](#). However, recurrent infections with Omicron (and any future variants) suggest we need a "vaccine plus" approach while we wait for universal, sterilizing vaccines.

Public-health measures such as mask wearing remain highly protective because they are effective for all variants. But most of all, New Zealand urgently needs to deliver a high standard of [air quality in all indoor settings](#), especially schools. These vital protections against airborne viruses are essential to ensure New Zealand can safely navigate the remainder of the pandemic without generating a long shadow of chronic disease.

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