

- Virus

## What Covid-19 in our wastewater means

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Traces of Covid-19 have been detected in wastewater samples taken from a Wellington treatment plant.

Stuff looks at what this means, and how the virus could have ended up in the capital's sewage.

The Institute of Environmental Science and Research (ESR) found the first weak positive test result late on Friday. A follow-up sample on Saturday returned a second weak positive result.

What is wastewater testing for Covid-19?

Wastewater testing for Covid-19 first started in April last year, with the aim of giving an early warning of outbreaks or an additional surveillance tool.

The science has been developed since then, with a test in November.

The number of sites has steadily expanded and ESR now does regular wastewater testing across sites in Auckland, Wellington, Christchurch, Rotorua, Hamilton and Queenstown. The samples are processed in ESR's laboratory in Wellington, and checked for accuracy.

What does a weak positive test mean?

The weak positive test shows one or more people in Wellington have had coronavirus, but ESR said it does not indicate an outbreak – as consistent detection of the virus at relatively high levels would be needed to show this.

This is the reason why a series of samples are taken, rather than one-off tests.

“Historical cases could produce the occasional sporadic low-level result, but they are not going to produce ongoing detectable levels,” ESR said on its website.

ESR science leader Dr Brent Gilpin earlier told Checkpoint a positive test result is a sign to encourage additional testing, to ensure there is not undetected Covid-19 in the community.

Positive wastewater results in parts of Australia did not result in community cases being found.

So what caused the positive results then?

The Ministry of Health said the weak positive results are most likely due to recently recovered cases continuing to shed the virus in the community.

In recent weeks, three recovered cases who live in the Wellington region have left the Auckland quarantine facility. A further historical case left a Wellington managed isolation facility the same day the second sample was taken.

Additionally, it is possible that one or more recently recovered cases from elsewhere could have flown into Wellington.

Further wastewater samples in Wellington were being tested at the weekend.

How can just one person cause a positive test in wastewater?

Based on what it has observed so far, the tests are sensitive enough to discover about 10 cases in an area of 100,000 people.

That's not a hard and fast rule as some people shed at different rates depending on the timing of their infection, and how infectious they are.

There are many other factors that affect detection, including how many people contribute to a sewerage stream and the presence of recently recovered cases that are still shedding the virus.

A positive detection in the wastewater indicates that at least one person has been shedding Covid-19 into the wastewater in the 24 hours before each sample was collected.

Just as a negative finding does not necessarily guarantee the absence of Covid-19 in the community, a positive finding also does not necessarily mean that active Covid-19 infections are present in the community, ESR said.

A positive detection in the wastewater could be due to a case in a managed isolation facility, a non-infectious historical case, or a recently recovered case who is still shedding low levels of the virus.

But why was there a positive test result in Wellington, when other outbreaks and recovered cases don't get picked up in wastewater?

It is unknown at this stage why the Wellington recovered cases have produced a positive result, when other recovered cases have not.

However, the combination of three recovered cases in Wellington and a further historical case in the region could have caused it.

In contrast to the latest sewage result, just one weak positive result came from wastewater in south Auckland's Papatoetoe outbreak in March, likely linked to the Auckland February cluster.

In Papatoetoe, positive cases were detected through regular testing very early in infection and were moved to the Auckland Quarantine Facility, ESR said.

This means that it was likely only two to three people were shedding at any one time. It is also a much bigger sewage network.

Further, the ESR team have been regularly testing Auckland's Jet Park Hotel, where positive cases are quarantined.

The Jet Park wastewater is almost always positive for Covid-19, and this allows ESR to better understand detections in samples from greater areas.

Should we be concerned?

Epidemiologist Michael Baker said the positive test doesn't mean there is an infection in the community, it is a signal to investigate further.

“This is a surveillance system, it just shows early warning.”

It could be a historical case who is no longer infectious but still has traces of Covid-19, he said.

“Traces of Covid-19 in the water doesn't tell you if there is an active person, it just shows there is some sort of debris in the water.”

If I live in Wellington, what should I do?

Anyone who develops symptoms consistent with Covid-19 should call Healthline (0800 358 5453) or their doctor, or visit a testing station to get a test.

Symptoms include a new or worsening cough, fever, shortness of breath, a sore throat, sneezing and runny nose and or temporary loss of smell.

Wellington Region Primary Health Organisations will extend testing centre hours if required.

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Michael Baker epidemiologist