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 (Becker, E. et al., 2021)

Keeping up with COVID: identification of New Zealand's earliest known cluster of COVID-19 cases | OPEN ACCESS

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We report the earliest known cluster of SARS-CoV-2 infection so far reported, which occurred in New Zealand in late February 2020. The cluster includes one confirmed and five probable cases.

The cluster was identified while investigating a weak positive nasopharyngeal swab (NPS) polymerase chain reaction (PCR) test that was returned by a male in his 60s in September 2020. The PCR result, combined with a clear clinical and epidemiological history of a COVID-19 like illness in late February 2020, prompted serological testing. SARS-CoV-2 IgG antibodies were detected and supported historical infection. Serology was also reactive for five close contacts who had also experienced a COVID-19 like illness in February 2020.

Combined case histories and investigations suggest that this local cluster was import related, with the index case identified as a family member visiting from Italy in February. Case investigation also suggests this cluster was active in New Zealand prior to any previously documented local cases, indicating that SARS-CoV-2 was present and local transmission was occurring earlier than initially suspected. A weak positive PCR result, six months after acute infection, supports international evidence that SARS-CoV-2 genetic material can be detected for several months after initial COVID-19 infection, and that this is not necessarily indicative of infectivity.

Case presentation

In early September 2020, a weak positive NPS PCR result (GeneXpert Xpert® Xpress SARS-CoV-2, Cepheid, Sunnyvale, Ca, USA: E gene target CT 40.5; N2 gene 38.2) was notified to the Waikato Public Health Unit. The male in his 60s presented for testing due to symptoms of sore throat, cough and coryza. The case interviewer was unable to identify a potential source of acute SARS-2-CoV infection. The patient did not meet any of the Australian Index of Suspicion Criteria (criteria that could indicate

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cluster, which was active at the time. The case indicated that no suspected infection with SARS-CoV-2 several months earlier.

A family member and close contact of the case had arrived in New Zealand from Italy (Lombardy region) on February 23. This person became unwell shortly after arrival and presented to primary care on February 25 with a flu-like illness that included muscle aches, cough, coryza, sore throat and fever. The individual did not meet the New Zealand Ministry of Health suspected COVID-19 case definition at the time and was not eligible for testing. The individual was advised to follow standard public health advice for 'flu-like illness', which included to self-isolate until symptoms had resolved. Over the following four days, six household contacts became unwell with a similar flu-like illness—they followed the same precautions, self-isolating until symptoms had resolved. No one required medical attention.

The individual returned to Italy in mid-June and had SARS-CoV-2 PCR testing and serology completed shortly after. The PCR test was negative; however, the serology (Total IgG/IgM by ECLIA, I.R.C.C.S Ospedale San Rafaele Milan, It) was reactive for SARS-CoV-2 antibodies, indicative of past infection.

Laboratory testing

Serial NPS (four in total) were collected from the case and PCR results were unchanged over nine days, with GeneXpert Ct values over 36 for both targets, which continues to support a past rather than an acute infection. Whole genome sequencing of the weak positive PCR result was not possible due to the low level of genetic material.

Close contacts had NPS PCR testing completed. All, including one who was symptomatic with a coryzal illness, returned negative results. Workplace close and casual contacts were offered nasopharyngeal PCR testing. No additional positive results were reported. The occupation of the case involved frequent contact with the public and, despite intensive screening for both symptomatic and asymptomatic cases in the region, no case had been detected in relation to his workplace.

The case and the five additional household contacts who reported being unwell in February returned reactive SARS-CoV-2 results on the Roche Diagnostics Elecsys total (IgG and IgM) antibody assay (Paul Austin, Auckland City Hospital). The case also had second-line testing conducted using the Euroimmun IgG specific assay and the Wantai SARS-CoV-2 Ab ELISA. This testing confirmed the presence of IgG antibodies.

Discussion