A case of prolonged SARS-CoV-2 viral shedding for 150 days

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Community SARS-CoV-2 (COVID-19) transmission was eliminated in New Zealand by May 2020 following a stringent nationwide lockdown.[1] Other than two discrete community clusters (179 cases in August 2020 and 15 cases in February 2021) there has been no evidence of ongoing community transmission in New Zealand despite extensive surveillance testing.[2] Here we report a case of prolonged viral shedding in an individual infected in the August 2020 cluster, who tested positive again 150 days later.

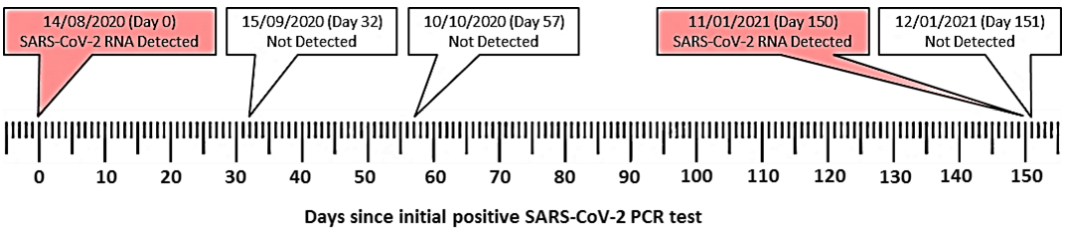
Case report

A fit and well 34-year-old man with mild COVID-19 symptoms tested positive on 14 August 2020 (nasopharyngeal swab [NPS], in-house E-gene RT-PCR assay,[3] cycle threshold [Ct] value 17.6) (Figure 1). The patient was linked to the August 2020 cluster epidemiologically (likely infected via his church congregation) and genomically (identical lineage with signature T15867G single nucleotide polymorphism). He re-presented 150 days later on 11 January 2021 with acute breathlessness and tested positive again for SARS-CoV-2 on two different highly specific commercial RT-PCR assays, effectively ruling out a false-positive result due to non-specific reactions or laboratory contamination (NPS, BioFire Respiratory 2.1*plus* Panel and Xpert Xpress SARS-CoV-2 [E/N2 Ct values 36.9/38.4]). He denied infective symptoms and could not be linked contemporaneously to any imported COVID-19 cases or high-risk exposures. The aetiology of his breathlessness was mediastinal lymphadenopathy causing bronchial obstruction, and he was later diagnosed with sarcoidosis. Re-infection was considered unlikely, and since there was an alternative diagnosis for his clinical presentation, the "weak" positive (high Ct value) result from 11 January 2021 was attributed to prolonged viral shedding from the upper respiratory tract and he was discharged without further isolation. Whole genome sequencing was attempted but failed to yield any analysable sequence, likely due to the low viral load in the sample (reflected by the high Ct value). He had tested negative twice on pooled tests in the interim since his initial positive result, and repeat testing the following day was negative.

Discussion

New Zealand is one of the few countries to have eliminated COVID-19, and this post-elimination setting presents a relatively unique opportunity to observe patterns of SARS-CoV-2 viral shedding in the absence of re-infection or re-exposure. Viral shedding duration (presence of detectable

Figure 1: Summary of the patient's SARS-CoV-2 PCR test results.



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viral nucleic acid) should be distinguished from duration of infectivity (presence of viable virus). Infectivity generally ends 10 days after symptom onset in adults with mild–moderate COVID-19, with replication-competent virus rarely isolated after this time.[4–6] In contrast, upper respiratory tract viral shedding lasts for a mean of 17 days and can persist for months after recovery.[4,7] Prolonged viral shedding in no longer infectious individuals can result in unnecessary isolation, inappropriate use of PPE and limited isolation rooms, delays in medical care, discharge and return to work and separation from social support.[4] Laboratory testing alone cannot reliably establish a case as being "historical": RT-PCR Ct values should not be used to exclude infectivity,[8] and due to considerable variation in serological assay performance and individual patient seroconversion rates and timings, serology should not be used to exclude acute SARS-CoV-2 infection.[9] Classification of any newly detected case as non-infectious should be made cautiously with expert consultation.[4]

This case is important for illustrating that, in individuals previously infected with SARS-CoV-2, sporadic positive RT-PCR results may be obtained many months after initial infection, even with multiple negative results in the interim. At 150 days, this case represents one of the longest shedding durations reported to date.[7] It has important public health implications for the interpretation of SARS-CoV-2 RT-PCR results in previously infected individuals and for studies characterising the SARS-CoV-2 shedding duration, which may otherwise fail to accurately capture the maximum shedding duration and thus underestimate the mean duration of viral shedding.

Competing interests:
Nil.
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