



Covid-19 reinfection – what could the absence of evidence suggest?

Jack West

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EDITORIAL COMMENTARY



Covid-19 reinfection – what could the absence of evidence suggest?

In the present issue, under ‘Reinfection of SARS-COV-2 – Analysis of 23 Cases from the Literature’ Roberts et al. [1] analyzed the existing confirmed reinfections of Covid-19 to date, searching for trends in severity and duration of immunity. The discussion section of the paper addresses the current uncertainty surrounding real reinfection rate. This commentary piece will pose that the current absence of large numbers of confirmed Covid-19 reinfections supports a positive outlook at this stage of the pandemic.

To date over 115 million confirmed cases have been recorded over a period of a little more than one year (WHO Coronavirus (COVID-19) Dashboard | WHO Coronavirus Disease (COVID-19) Dashboard, no date) [2].

Clear consensus does not yet exist regarding the duration of immunity that can be expected following an infective episode or vaccine. If immunity were to last for a period of only weeks to months, populations exposed to high Covid-19 prevalence; such as the United Kingdom, would already have ample opportunity for re-exposure and reinfection.

This commentary argues that cautious inferences about reinfection risk can already be made from the current proportion of cases represented by reinfections.

The 23 cases identified by the review represent a tiny proportion of total (115 million) confirmed cases, approximately 1 in 5 million. These reported cases likely represent only a small proportion of total episodes of reinfection. However, if these 23 cases represent only 1 in 1000; 1 in 10,000; or 1 in 100,000 of the true number of reinfections, the proportion of total Covid-19 cases represented by reinfections would remain a slim minority. This range of potential figures is represented in the calculations below.

(A) $23 \times 1000 = 23,000$

(Estimate of true Covid-19 reinfections as 1,000 times greater than the literature reported 23 reinfection cases)
 $23,000/115,000,000 = 0.0002$ (0.02% of total infections)

(B) $23 \times 10,000 = 230,000$

(Estimate of true Covid-19 reinfections as 10,000 times greater than the literature reported 23 reinfection cases)

$230,000/115,000,000 = 0.002$ (0.2% of total infections)

(C) $23 \times 100,000 = 2,300,000$

(Estimate of true Covid-19 reinfections as 100,000 times greater than the literature reported 23 reinfection cases)

$2,300,000/115,000,000 = 0.02$ (2% of total infections)

All of the values in the range would be small proportions of overall infections. This is meaningful in giving an approximate scale to the reinfection problem, currently of a magnitude 50- to 5000-times smaller than initial infections.

The limited timeline that these data populate must be noted. If immunity is found to diminish significantly between one and two years, the fraction of cases represented by reinfections may climb rapidly over the months to follow.

Concrete data in this area has only recently become available, with pre-print data from the UK based SIREN study. The SIREN study provides a model for the risk of reinfection in a high-risk environment, tracking over 20,000 UK healthcare workers. The preliminary data set of the SIREN study suggests reinfection rates of <1% [3]. This value falls midway through the estimated ranges of reinfection proportion discussed above, and as more data become available predictions can be further refined. During the longitudinal study, it was also found that over two thirds of reinfections are asymptomatic [4]. This finding could help to explain the paucity of confirmed reinfection cases reported, and why estimates of true numbers must be thousands of times greater than the 23 cases reviewed in order to align with the SIREN study data.

In summary, whilst ‘Reinfection of SARS-COV-2 – Analysis of 23 Cases from the Literature’ demonstrates the wide geographic reach of Covid-19, the scarcity of confirmed cases available supports a viewpoint that reinfection is uncommon. The recent UK SIREN study

pre-print data corroborates this, but all conclusions must be made cautiously only one year into the pandemic and with limited concrete data to draw on.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Jack West

University Hospitals Dorset NHS Foundation Trust, Dorset, UK

 jackwest@doctors.org.uk

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