



## Fear of COVID-19 Reinfection

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How long does the immunity inferred from COVID-19 infection last? What are the chances of contracting the virus again? How likely is reinfection with a new strain? What will be the severity of a probable reinfection? When will herd immunity against COVID-19 set in? Queries of such nature are puzzling not just the general population, but are also posing a formidable challenge to scientists and epidemiologists.

Epidemiologically, reinfection can be defined as any positive RT-PCR report, having a CT value less than 35, occurring more than 90 days of first episode of illness, irrespective of symptoms [1]. ICMR records provide an estimate of 4.5% being the risk of reinfection in India [2]. Despite presence of adequate evidence suggesting that cellular and humoral immunity are active for several months after SARS-CoV-2 infection, the scenario of possible reinfections remains an elephant-in-the-room. There are various reports showing re-emergence of symptoms in recovered patients of COVID-19, which yield positive RT-PCR tests, giving rise to the concern of a potential reinfection, or a false-positive result. Focussing on the former should raise concern as it indicates a malfunctioning of the host's humoral immunity. The humoral immunity's main mechanism of action in defence and recovery against pathogens is production of neutralising antibodies, which intercept viruses from binding to their receptors and reduce viral replication; developing within 3-7 weeks of infection, signified by increasing titres of IgG and decreasing titres of IgM [3].

Reinfections, however, do not compulsorily mean the lack of antibodies after primary exposure. Inversely, the presence

of antibodies against a prior infection doesn't necessitate the protection from reinfection. Usually, levels of IgG remain at a significant titre value for years following a viral infection, a phenomenon being refuted by infections caused by SARS-CoV-2 by disabling the host's immune system to mount sufficient resistance against a reinfection [3]. Studies to determine persistence of IgG antibodies against SARS-Cov-2 have shown a rapid decline in their levels, in as little as 90 days - indicating early antibody waning [1]. It remains unclear if reinfection mandates a more severe or less severe infection. Despite reports suggesting that individuals with asymptomatic and milder illnesses showed more propensity for reinfection than those with moderate-to-severe primary illnesses, there is no conclusive evidence as contradictory cases have also been reported aplenty [3]. A more severe infection may be attributed to antibody-dependent enhancement, the strain of the virus infecting, and also the concentration of exposure [4].

As time lapses, we are continuously identifying different clades and sub-clades of the virus, current numbers being over a thousand. Natural selection may promote the strains which can escape immune responses generated by primary infection, resulting in genetic shift of the virus [1]. Reinfection, undoubtedly, becomes an inescapable phenomenon in this currently hypothetical but plausible situation. Cases of reinfection also imply that herd immunity against COVID-19 cannot set in with simply immunity resulting from natural infections [5]. Establishment and maintenance of herd immunity can only occur if there are sustained immunoglobulin concentrations. In majority of COVID-19 illnesses however, 40% of asymptomatic individuals and 12.9% of symptomatic individuals

become seronegative in the early convalescent phase of infection itself, which is 8 weeks after infection [3,6]. Only rigid vaccination implementation strategies can ensure us a herd immunity against COVID-19.

Public percept, and their resultant action, is an essential factor in ensuring the rapid impediment of the diabolical pandemic. Without their dedicated efforts, it is a situation impossible to be realised. Hence, reaching out to the masses in an attempt to educate them about COVID-19 Appropriate Behaviour becomes essential. Addressing their fears about reinfection, priming them to its likelihood and its prevention strategies, and asking for constant vigilance irrespective of the peaks and troughs in the course of the pandemic, are some of the various ways to enable their compliance. Advantages of encouraging testing and surveillance, maintaining strict social distancing measures, mask-compliance and early vaccination should be made clear to the general population by governments and policy-makers across the world, only then can a collective triumph over COVID-19 will prevail.

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