bmjmedicine

Tracking the progress of inequalities in SARS-CoV-2 infections into the third covid-19 wave

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Cite this as: *BMJMED* 2023;2:e000512. doi:10.1136/bmjmed-2023-000512

Received: 3 February 2023
Accepted: 16 February 2023

The risk of SARS-CoV-2 infection among populations at risk fell during the third covid-19 wave, but knowing why is crucial

Covid-19 is a global public health concern—according to the World Health Organization, 753 million people worldwide have been infected with SARS-CoV-2 as of 24 January 2023, resulting in about seven million deaths.[1] In high income countries, the first and second waves of the covid-19 pandemic were marked by widespread reports of inequalities in SARS-CoV-2 infections and covid-19 morbidity and mortality.[2–4] SARS-CoV-2 infection and covid-19 mortality rates were disproportionately high in some populations such as ethnic minority groups, people with low socioeconomic status, and individuals with physical disabilities.[2–4] Increased infection and mortality among these populations at risk was attributed to factors such as working in the front line, living in large households, having a higher burden of underlying medical conditions, and barriers to accessing covid-19 information.[2–4]

The contextual situation in many high income countries changed as the covid-19 pandemic progressed. For instance, in the second wave, targeted interventions were introduced to mitigate the higher rates of SARS-CoV-2 infections and covid-19 mortality among populations at risk. Such measures included translating covid-19 messages into several languages and conducting awareness campaigns in locations with a large proportion of populations at risk.[2] Covid-19 vaccination programmes were also introduced.[5] These situational changes might have influenced the progress of covid-19 inequalities into the third wave and beyond.

While covid-19 mortality inequalities have been reported to have worsened in the third wave despite several public health efforts,[6] little is known of how SARS-CoV-2 infections progressed into the third wave and beyond. In fact, covid-19 mortality rates can be influenced by factors such as disease severity, lack of access to healthcare, and type of treatment received, which do not necessarily influence SARS-CoV-2 infection. As a result, data on how inequalities in SARS-CoV-2 infections evolved into the third wave are still needed. Such data will be helpful in implementing better public health interventions if disproportionally higher SARS-CoV-2 infections persisted among these populations at risk.

A linked study published in *BMJ Medicine* by Larsen and colleagues (doi:10.1136/bmjmed-2022-000187) is therefore timely.[7] The authors analysed inequalities in SARS-CoV-2 infections among 39 million people aged 10 years and older (roughly 70% of the population of England in 2021) by linking data on SARS-CoV-2 testing across England with the 2011 UK census. This study was conducted between 1 September 2020 and 10 December 2021 during the second and third waves of the covid-19 pandemic.

The authors estimated that close to six million participants were infected with SARS-CoV-2 during the study period, accounting for about 15% of the study population. They also reported that as opposed to the first and second waves, the risk of SARS-CoV-2 infections among ethnic minority groups, people with low socioeconomic status, those with a lower educational attainment, and those with physical disabilities declined substantially in the third wave as compared with populations at low risk (eg, white British, no physical disability, and higher socioeconomic status). However, the fall in risk was mainly among individuals younger than 65 years, compared with those aged 65 years and older.

The authors hypothesised that the decline in the risk of SARS-CoV-2 infections in the third wave could be explained in part by a higher number of previous infections in the groups at risk. Compared with low risk groups, many individuals from the groups at risk were infected with SARS-CoV-2 in the first and second waves and were able to develop immunity against SARS-CoV-2 and consequently less vulnerable to reinfection in the third wave. The authors further hypothesised that previous interventions to reduce SARS-CoV-2 infections among these populations at risk had been successful. For instance, they speculated that improved testing rates for covid-19 might have led to fewer forward transmissions from infected individuals among these groups. Additionally, reduced isolation periods along with payment and compensation schemes for individuals infected with SARS-CoV-2 might have increased adherence to isolation, resulting in fewer transmissions. While the authors' list of explanations is not exhaustive, other factors could also possibly have been at work. For example, covid-19 awareness programmes among populations at risk through trusted community organisations such as churches and mosques,[8] as well as translation of covid-19 messages into multiple languages,[9] would have dispelled false information or conspiracy theories of covid-19 leading to an increased uptake of prevention measures.

The fact that the drop in SARS-CoV-2 infections among populations at risk in the third wave was mostly in those individuals younger than 65 years, rather than in those aged 65 years and older, remains

a public health concern. The authors attribute this finding to living in multigenerational and overcrowded households, which puts susceptible older people at risk compared with older people with a higher socioeconomic status and who might live in separate homes. However, the high number of underlying medical conditions such as diabetes among older people in the groups at risk might also be a contributing factor.[10]

In summary, the findings of the study by Larsen and colleagues provide the groundwork for public health initiatives. A notable decline in the risk of SARS-CoV-2 infections was seen among populations at risk during the third wave of the covid-19 pandemic. Studying and understanding the factors that led to the decline is necessary to facilitate public health prevention measures. Further research is needed to determine what specific preventive measures led to the decline of SARS-CoV-2 infection risk among these populations at risk in the third wave, whether these populations have lower rates of reinfection with SARS-CoV-2 and longer lasting immunity, and why older individuals in these populations are still at high infection risk despite improvements in their younger counterparts. Answers to these questions might help policymakers in the United Kingdom with the necessary tools to institute relevant public health interventions.

Contributors FPC drafted the article. CA revised the article critically for content.

Competing interests We have read and understood the BMJ policy on declaration of interests and declare the following interests: none.

Provenance and peer review Commissioned; not externally peer reviewed.

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