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Lessons from two SARS-CoV-2 waves in South Africa

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As of July, 2021, at least four variants of concern are circulating globally in the SARS-CoV-2 pandemic that has resulted in nearly 180 million documented viral infections and almost 4 million COVID-19 deaths worldwide since December, 2019. Variants of concern are lineages that have evolved from the ancestral RNA virus with sufficient mutations to lead to substantial changes in viral characteristics such as increased transmissibility or detrimental change in COVID-19 epidemiology; increased virulence or change in clinical presentation; or decreased effectiveness of public health and social measures, available diagnostics, vaccines, or therapeutics.[1]

In *The Lancet Global Health*, Waasila Jassat and colleagues[2] describe the effect of a circulating variant first described in South Africa (501Y.V2 or B.1.351), now known as Beta, with increased transmissibility and immune evasion.[3] The South African second COVID-19 surge coincided with the onset of the Beta variant, characterised by rapid spread, and higher infections, admissions, and mortality rates than in the first wave—the authors thereby drawing inferences in the differences in virulence of the ancestral and Beta variants. These include evidence of greater morbidity and mortality seen with the Beta variant, although the authors suggest that the inference of greater virulence in the variant had several caveats: most notably the difficulty in differentiating true biological effects from quality of care in a pressurised and overwhelmed health system. This 13-month study of two waves driven by two different viral lineages is both interesting and instructive. We can take several salient lessons away from this South African COVID-19 case study.

The first is that hospital overcrowding at the height of a COVID-19 surge is an important cause of increased mortality. Therefore, a crucial public health measure is to find ways to mitigate overcrowding through rapid expansion of hospital facilities or through a so-called curve flattening strategy. Expansion of hospital facilities is feasible, especially if this includes field, general, and high care beds rather than intensive care facilities, which require more constrained, specialised clinical and technical expertise. Flattening the curve, on the other hand, can prove more challenging. How effective non-pharmaceutical measures have been in this regard, including tightly regulated lockdowns, remains controversial. A combination of the aforementioned strategies might have reduced the effect of COVID-19 in the South African first wave whereby strict lockdowns including an alcohol ban might have reduced hospital demand and crowding especially in emergency and intensive care wards, reducing the acuteness of the surge, which might have afforded health systems sufficient time to expand and prepare.[4]

The second lesson is that new variants are bad news, and every effort should be made to reduce the likelihood of these occurring. Not only do new variants lead to re-infection with evasion of pre-existing immunity to previous infection, but also new mutations favour viral survival with traits such as enhanced transmissibility leading to more rapid spread, more acute surges with inherent hospital crowding, and subsequent increased mortality.[1] It is this effect which Jassat and colleagues describe might have led to the increased mortality in the second wave. After adjusting for, age, sex, race, comorbidities, health sector, province, and weekly admissions, there was still a residual increased mortality (aOR 1·31, 95% CI 1·28–1·35), which they argue might be due to the virus itself.

Appropriate management of chronic conditions and comorbidities is essential during and between COVID-19 surges. Chronic SARS-CoV-2 infection in patients with reduced immunity might be a key mechanism promoting development of variants of concern.[5] Globally, we have witnessed reduced access and retention in care for patients with HIV, tuberculosis, and non-communicable diseases such as diabetes and cancer in the past 18 months.[6] Strengthening of health systems to ensure continuing care for chronic conditions will be crucial to limit new variants of concern.

Finally (and perhaps the most important lesson), vaccination and vaccination coverage in the COVID-19 pandemic is urgent. The speed with which COVID-19 vaccines have been developed, tested, and reviewed for emergency use approval is both unprecedented and crucial as we contemplate potential ways to reach epidemic control. Numerous vaccines are now available on the WHO line listing and show reasonable vaccine efficacy, even in the face of alternative viral strains to the ancestral.[7] Countries and cohort studies are beginning to

report real-world effectiveness data that would indicate not only benefit to the most clinically vulnerable individuals, but also reduction in transmission as a result of reduced community viral load secondary to vaccine coverage. South Africa, and Africa at large, has not yet had the same vaccine coverage as most of the rest of the world. This is largely due to vaccine supply, global vaccine availability, and vaccine nationalism.[8] The consequences of this could play out as ongoing unchecked transmission of SARS-CoV-2 in Africa with ongoing replication and risk of new and potentially problematic variants of concern.

30 years ago, we faced similar inequity around the distribution of life-saving antiretroviral agents to treat HIV.[9] The consequence then was the unnecessary loss of young lives simply because of cost, availability, and neglect. In a few short months we have seen new SARS-CoV-2 variants of concern spread around the globe. Inequitable distribution of COVID-19 vaccines will lead to much more global pandemic devastation. The time to act with conviction and to vaccinate the whole world is now.

We declare no competing interests.

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