Cite this as: *BMJ* 2022;376:o1
http://dx.doi.org/10.1136/bmj.o1
Published: 03 January 2022

Covid-19: An urgent call for global "vaccines-plus" action

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SARS-CoV-2 has infected more than 278 million people globally, with at least 5.4 million deaths recorded by the World Health Organisation as of 26 December 2021. The omicron (B.1.1.529) variant of concern is spreading rapidly.[1]

Some countries view infection as a net harm and pursue strategies ranging from suppression to elimination.[2] They seek to sustain low infection rates through a combination of vaccination, public health measures, and financial support measures (vaccines-plus). Other countries implemented mitigation strategies that aim to prevent health systems from being overwhelmed by building population immunity through a combination of infection and vaccination. These countries rely on a vaccines-only approach and seem willing to tolerate high levels of infection provided their healthcare systems can cope.

The high transmissibility and degree of immune escape by the delta and omicron variants means sustained protective population immunity is unlikely to be achieved with the current vaccines based on the original strain.[3] Compared to delta, omicron is much more likely to infect those who were vaccinated or exposed to previous SARS-CoV-2 variants, suggesting significant immune escape.[4]

Widespread transmission brings a degree of unpredictability to the pandemic response. High transmission risks more rapid adaptation of SARS-CoV-2, with outcomes that include increased transmissibility (seen with α, delta, and omicron), increased antibody immune escape (β and omicron) or greater pathogenicity (delta and α).[5]

There are other drawbacks to a vaccines-only strategy. Countries which tolerated high transmission have seen rises in both covid-specific and all-cause mortality, healthcare worker shortages, and repeated lockdowns to control surges in case numbers.[2 6-9] Countries which suppressed transmission early saw reduced mortality and less economic damage.[2 7 10 11]

While vaccination greatly reduces risks of serious illness and death, long covid remains a concern.[12 13] Disruption to education as a result of staff and student sickness, and/or repeated lockdowns due to failure to control the virus, are likely to have a lasting impact on the wellbeing and prospects of the next generation.[14]

High levels of transmission also create a negative feedback loop, whereby important public health measures such as test, trace, isolate and support systems become overwhelmed, making them less effective, further fuelling transmission.[15]

For all these reasons, a vaccines-plus approach should be adopted globally. This strategy will slow the emergence of new variants and ensure they exist in a low transmission background where they can be controlled by effective public health measures, while allowing everyone (including those clinically vulnerable) to go about their lives more freely.

We welcome the World Health Organisation's recent guidance on community and healthcare mask use, but believe more can be done to suppress transmission without adversely impacting economic or social activity.[16 17] Accordingly, we call upon the World Health Organisation and national governments to:

- Unequivocally declare SARS-CoV-2 an airborne pathogen and stress the implications for preventing transmission.18 A clear message from the World Health Organisation will help to remove confusion that has been used to justify outdated policies.[18]
- Promote the use of high-quality face masks for indoor gatherings and other high-transmission settings. The significant benefits of community masking are now well established.[19 20] Respirators (e.g. N95, P2/FFP2 or KF94) should be preferred in all indoor settings where people mix, and for healthcare workers at all times.[20 21]
- Advise on effective ventilation and filtration of air. It is time to go beyond opening windows and aim for a paradigm shift to ensure all public buildings are optimally designed, built, adapted, and utilised to maximise clean air for occupants—strategies which have been shown to reduce SARS-CoV-2 transmission.[22-24]
- Set criteria for imposing or relaxing measures to reduce covid-19 spread based on levels of transmission in the community. Effective find, test, trace, isolate, and support will continue to be essential to intercept transmission. Low rates of transmission give all available measures the best chance of being effective, creating a positive, self-reinforcing cycle of disease control. Sufficient financial and practical support for isolation should be implemented everywhere, particularly in low- and middle-income countries and deprived parts of high-income countries.[25 26]
- Support urgent measures to achieve global vaccine equity, including vaccine sharing, suspension of vaccine patents, removal of barriers to technology transfer, and establish regional production centres to create a plentiful local supply of high-quality vaccines everywhere.[27] Global vaccine rollout should include coordinated efforts to tackle misinformation to ensure people have access to timely, accurate data on vaccine effectiveness and protection.

Vaccines-plus is affordable and achievable. It is the policy advocated by the Director General of the WHO,

Tedros Adhanom Ghebreyesus in his statement of 14 December 2021: "I need to be very clear: vaccines alone will not get any country out of this crisis. Countries can and must prevent the spread of Omicron with measures that work today. It's not vaccines instead of masks, it's not vaccines instead of distancing, it's not vaccines instead of ventilation or hand hygiene. Do it all. Do it consistently. Do it well."

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Competing interests: Martin McKee, Susan Michie, Christina Pagel, and Kit Yates are members of Independent SAGE. Nothing further declared.

Provenance and peer review: not commissioned, not peer reviewed

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1 *United Kingdom Health Security Agency. Omicron Daily Overview, 20 December 2021.* UKHSA, 2021.
2 Kochańczyk M, Lipniacki T. Pareto-based evaluation of national responses to COVID-19 pandemic shows that saving lives and protecting economy are non-trade-off objectives. *Sci Rep* 2021;11:2425. doi: 10.1038/s41598-021-81869-2 pmid: 33510274
3 Randolph HE, Barreiro LB. Herd Immunity: Understanding COVID-19. *Immunity* 2020;52:737-41. doi: 10.1016/j.immuni.2020.04.012. pmid: 32433946
4 Planas D, Saunders N, Maes P, etal. Considerable escape of SARS-CoV-2 variant Omicron to antibody neutralization.*bioRxiv* 2021doi: 10.1101/2021.12.14.472630.
5 Fisman D, Tuite A. Progressive Increase in Virulence of Novel SARS-CoV-2 Variants in Ontario, Canada, February to June, 2021.*medRxiv* 2021.
6 Jazieh AR, Kozlakidis Z. Healthcare transformation in the post-coronavirus pandemic era. *Front Med (Lausanne)* 2020;7:429. doi: 10.3389/fmed.2020.00429 pmid: 32850915
7 Giattino C, Ritchie H, Roser M, et al. Excess mortality during the Coronavirus pandemic (COVID-19). *Our World in Data* 2021 Updated 13th December 2021.
8 Wu S, Neill R, De Foo C, etal. Aggressive containment, suppression, and mitigation of covid-19: lessons learnt from eight countries. *BMJ* 2021;375:e067508. doi: 10.1136/bmj-2021-067508. pmid: 34840136
9 McCann P, Ortega-Argilés R, Yuan P-Y. The Covid-19 shock in European regions. *Reg Stud* 2021:1-19.
10 Kung S, Doppen M, Black M, Hills T, Kearns N. Reduced mortality in New Zealand during the COVID-19 pandemic. *Lancet* 2021;397:25. doi: 10.1016/S0140-6736(20)32647-7. pmid: 33333005
11 Oliu-Barton M, Pradelski BSR, Aghion P, etal. SARS-CoV-2 elimination, not mitigation, creates best outcomes for health, the economy, and civil liberties. *Lancet* 2021;397:2234-6. doi: 10.1016/S0140-6736(21)00978-8. pmid: 33932328
12 Sudre CH, Murray B, Varsavsky T, etal. Attributes and predictors of long COVID. *Nat Med* 2021;27:626-31. doi: 10.1038/s41591-021-01292-y pmid: 33692530
13 Ledford H. Do vaccines protect against long COVID? What the data say. *Nature* 2021;599:546-8. doi: 10.1038/d41586-021-03495-2. pmid: 34815580
14 Engzell P, Frey A, Verhagen MD. Learning loss due to school closures during the COVID-19 pandemic. *Proc Natl Acad Sci U S A* 2021;118:e2022376118. doi: 10.1073/pnas.2022376118. pmid: 33827987
15 McKee M, Pagel C, Gurdasani D. The NHS is complex, and that's why we should be worried. *BMJ* 2021;375:n3128. doi: 10.1136/bmj.n3128. pmid: 34930722
16 COVID-19 infection prevention and control living guideline: mask use in community settings, 22 December 2021, World Health Organisation.
17 WHO recommendations on mask use by health workers, in light of the Omicron variant of concern: WHO interim guidelines, 22 December 2021.
18 Greenhalgh T, Ozbilgin M, Contandriopoulos D. Orthodoxy, *illusio,* and playing the scientific game: a Bourdieusian analysis of infection control science in the COVID-19 pandemic. *Wellcome Open Res* 2021;6:126. doi: 10.12688/wellcomeopenres.16855.3. pmid: 34632088
19 (US) CfDCaP. *Science Brief: Community Use of Masks to Control the Spread of SARS-CoV-2.* CDC, 2021.
20 Bagheri G, Thiede B, Hejazi B, Schlenczek O, Bodenschatz E. An upper bound on one-to-one exposure to infectious human respiratory particles. *Proc Natl Acad Sci U S A* 2021;118:e2110117118. doi: 10.1073/pnas.2110117118. pmid: 34857639
21 Ferris M, Ferris R, Workman C, etal. FFP3 respirators protect healthcare workers against infection with SARS-CoV-2.*Authorea Preprints* 2021.
22 Morawska L, Allen J, Bahnfleth W, etal. A paradigm shift to combat indoor respiratory infection. *Science* 2021;372:689-91. doi: 10.1126/science.abg2025. pmid: 33986171
23 Berry G, Parsons A, Morgan M, Rickert J, Cho H. A review of methods to reduce the probability of the airborne spread of COVID-19 in ventilation systems and enclosed spaces. *Environ Res* 2022;203:111765. doi: 10.1016/j.envres.2021.111765. pmid: 34331921
24 Gettings J, Czarnik M, Morris E, etal. Mask Use and Ventilation Improvements to Reduce COVID-19 Incidence in Elementary Schools - Georgia, November 16-December 11, 2020. *MMWR Morb Mortal Wkly Rep* 2021;70:779-84. doi: 10.15585/mmwr.mm7021e1. pmid: 34043610

25 Cevik M, Baral SD, Crozier A, et al. Support for self-isolation is critical in covid-19 response: British Medical Journal Publishing Group, 2021.

26 Patel J, Fernandes G, Sridhar D. How can we improve self-isolation and quarantine for covid-19? *BMJ* 2021;372:n625. doi: 10.1136/bmj.n625. pmid: 33692026

27 Katz IT, Weintraub R, Bekker L-G, Brandt AM. From Vaccine Nationalism to Vaccine Equity - Finding a Path Forward. *N Engl J Med* 2021;384:1281-3. doi: 10.1056/NEJMp2103614 pmid: 33830709

28 Morawska L, Milton DK. It is time to address airborne transmission of coronavirus disease 2019 (COVID-19). *Clin Infect Dis* 2020;71:2311-3. doi: 10.1093/cid/ciaa939 pmid: 32628269