

## Epidemiology, not geopolitics, should guide COVID-19 vaccine donations



With COVID-19 vaccine supplies shifting from scarcity to abundance in high-income settings, such as Canada, the EU, the USA, and the UK,<sup>1</sup> the June 11–13, 2021, Group of Seven (G7) summit in Cornwall, UK, is the time when leaders from those countries should act on their promises<sup>2–4</sup> to send surplus COVID-19 vaccine supplies to the many other countries where doses remain scarce.

Vaccine donations are not the only solution to the gap that has emerged between countries with and without sufficient doses of COVID-19 vaccines. Yet, the potential number of surplus vaccine doses purchased by G7 nations is likely to be in the hundreds of millions or more.<sup>15</sup> Vaccine manufacturers based in those countries have also offered to sell more than a billion doses at cost for use in low-income and middle-income countries (LMICs) in 2021, which G7 governments could buy and donate.<sup>6</sup> These supplies are sufficiently large to help with near-term vaccine demands while investments are made in technology transfer to LMICs and in scaling up global manufacturing capacity for vaccines and vaccine inputs to respond to SARS-CoV-2 and future pandemic threats.<sup>7</sup>

Maximising the potential of vaccine donations in this pandemic depends on vaccine doses going where they can do the most good. But there is currently no consensus on where that would be. The USA has committed to sending three-quarters of its first tranche of donated vaccine doses to COVAX<sup>2</sup> and EU officials have promised “many” of their surplus doses will go to COVAX.<sup>8</sup> However, COVAX has been criticised for its population-based allocation scheme that does not direct most of its early vaccine supplies to the settings at the greatest risk of otherwise having high COVID-19 death rates.<sup>9</sup> COVAX organisers argue that its commitment to ensuring each participating country can vaccinate roughly 20% of its population makes sense, given uncertainty about the next COVID-19 surge or when the next variant of SARS-CoV-2 will emerge.<sup>10</sup> Many donor countries could find it difficult to justify waiting while vaccine doses go to each of the more than 100 COVAX participating countries still beneath COVAX’s vaccination threshold before

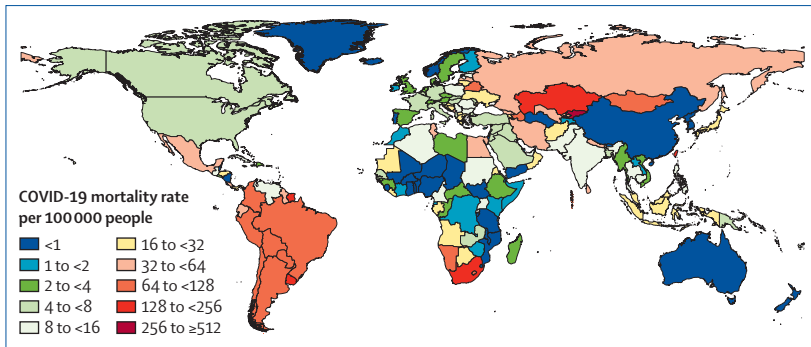
responding to the pleas of countries with surging COVID-19 cases now.

Nations donating COVID-19 vaccines bilaterally have not done better in prioritising urgent health needs. They have used their donations more as a means of cementing spheres of influence than advancing global vaccine equity and ending this pandemic.<sup>11</sup> All but two of the countries to which China has pledged donations of COVID-19 vaccines are participants in China’s Belt and Road Initiative.<sup>11</sup> India directed its largest vaccine donations to many of the same countries as China, jockeying for influence in the Asia-Pacific region. Russia has generally donated vaccine doses to nations considering purchases of its Sputnik V vaccine.<sup>11</sup> More COVID-19 vaccine donations have been promised to the athletes who are expected to participate in the 2021 summer Tokyo Olympics than have been donated in the first 5 months of the global roll-out of those vaccines to nations such as Peru, South Africa, and Ukraine, where COVID-19 cases have been increasing.

Without a compelling metric of where the greatest public health benefit will be gained from vaccine donations, G7 policy makers are likely to split the difference between these paths and direct some spare vaccine doses to COVAX’s population-based allocation scheme while sending the remaining doses to allies, economic partners, and countries where they have strategic interests. On June 3, 2021, the administration of US President Joe Biden announced a plan to donate 25 million vaccine doses to 45 countries and territories that includes wealthy allies (eg, Canada, South Korea, and Taiwan), as well as to the Pacific Islands, Caribbean Community countries, and African nations to be designated in coordination with the African Union.<sup>2</sup> Although understandable from a diplomatic perspective, broader application of this approach will not support those nations with the greatest need for vaccine doses and will perpetuate global vaccine inequity.

Whether donated through COVAX or bilaterally, spare COVID-19 vaccine doses should be allocated to reduce the most premature deaths.<sup>12</sup> Although it is impossible to know for certain where future COVID-19 deaths

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**Figure:** Estimated COVID-19 mortality rate per 100 000 people from June 1, 2021, to Aug 31, 2021, plotted by country

Estimates are based on the current parameterisation of the baseline Institute for Health Metrics and Evaluation COVID-19 model,<sup>14</sup> updated with recently published estimates of COVID-19 vaccine supply, meta-analyses of vaccine effectiveness by SARS-CoV-2 variant, country-specific vaccine hesitancy, and immunity breakthrough and increased infectiveness of variants as reported by Faria and colleagues.<sup>15</sup> SARS-CoV-2 variant distributions are from open access sources for the USA,<sup>16</sup> Europe,<sup>17</sup> Brazil,<sup>15</sup> and South Africa.<sup>18</sup>

will occur, it is possible to anticipate impending needs in this pandemic. The predominant models of global COVID-19 deaths have performed well in short-term forecasts of up to 12 weeks.<sup>13</sup>

The figure we have devised shows estimated deaths across all countries with SARS-CoV-2 transmission until Aug 31, 2021. It is based on a previously published Susceptible–Exposed–Infectious–Recovered (SEIR) transmission dynamics model in which transmission intensity of SARS-2-CoV is a function of mobility, mask use, seasonality, and testing per capita.<sup>14</sup> We have updated this baseline model to account for vaccination with different COVID-19 vaccines and the dominant SARS-CoV-2 variants in those locations, since some vaccines might be less effective than others against certain escape variants.<sup>15</sup> In the figure, current circulation of various SARS-CoV-2 variants of concern is based on publicly available data,<sup>15–18</sup> and spatial spread is predicated on data published by Public Health England.<sup>19</sup> Rates of increased transmission intensity and potential for cross-variant immunity breakthrough are based on published studies, and these estimates should be continuously updated as more and better data emerge.<sup>15</sup>

On the basis of the estimates in the figure, the areas of greatest need, taking into account the available data on secured vaccines and likely SARS-CoV-2 variants, are in Latin America, central and eastern Europe, central Asia, and South Africa—settings that have received among the fewest COVID-19 vaccine donations to date.<sup>11</sup> Within Latin America, countries expected to have high COVID-19 death rates in the next 3 months but that

have received few or no vaccine donations to date include Bolivia, Colombia, Peru, and Uruguay. COVID-19 crises are also likely to loom throughout central Asia, but only two countries in that region (Kyrgyzstan and Uzbekistan) have received vaccine donations. By contrast, most countries in the Asia-Pacific region are projected to have lower COVID-19 death rates than in other regions, but have received nearly 60% of all vaccine donations so far.<sup>11</sup> The USA, India, Japan, and Australia have pledged to provide even more vaccines to the Asia-Pacific region, promising to produce and disseminate 1 billion vaccine doses to nations in the region by the end of 2022.<sup>20</sup>

On May 17, 2021, Biden promised not to use donated doses “to secure favors from other countries” but rather to ensure those supplies are “delivered in a way that is equitable and follows science and the public health data”.<sup>2</sup> This is a commitment that the USA should keep and other G7 nations should adopt, grounding future COVID-19 vaccine donations in epidemiology not geopolitics. Additionally, the G7 should commit to work with COVAX on further developing the regulatory and liability arrangements, model contracts, and distribution capacity needed to facilitate COVID-19 vaccine donations and on expanding the size and scope of COVAX’s humanitarian buffer to enable greater prioritisation of countries facing major COVID-19 outbreaks.<sup>21</sup> Countries’ determinations of which surplus COVID-19 vaccine doses to donate should account for emerging data on the effectiveness of that vaccine against the dominant SARS-CoV-2 variants in a location.

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