

## Letter to the Editor

**Cite this article:** De La Cruz-Hernández SI and Álvarez-Contreras AK. Omicron BA.5 subvariant provokes the fifth COVID-19 wave in Mexico: Closer to the end of this pandemic? *Disaster Med Public Health Prep.* **17**(e344), 1–3. doi: <https://doi.org/10.1017/dmp.2023.14>.

### Keywords:

COVID-19; Mexico; Omicron subvariant BA.5; SARS-CoV-2; vaccinated people

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# Omicron BA.5 Subvariant Provokes the Fifth COVID-19 Wave in Mexico: Closer to the End of This Pandemic

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## To the Editor

When the Omicron variant of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) emerged at the end of 2021 and provoked millions of cases of coronavirus disease 2019 (COVID-19) in various countries worldwide, it was thought that the end of this pandemic was near.<sup>1–3</sup> This idea would have arisen in part, because while this new variant caused millions of infections around the world, the number of deaths was not as high in comparison with those deaths registered during the last COVID-19 waves.<sup>2–4</sup> However, the different types of vaccines applied worldwide, the population's response to this new variant, and the mild clinical manifestations that it was triggering, made it difficult to predict the end of this pandemic.<sup>5</sup> Instead of reaching the end of this public health emergency of international concern, new Omicron subvariants arose between the end of 2021 and the beginning of 2022. Thus, the Omicron subvariants BA.1, BA.2, BA.4, and BA.5 emerged in South Africa and were designated as variants of concern. Whereas, the BA.2.12.1 subvariant was identified in the United States.<sup>6</sup> These new Omicron subvariants have been characterized as having additional mutations in their spike proteins, evading neutralizing antibodies and being more transmissible in comparison with other variants of concern.<sup>7,8</sup> Thus, these Omicron subvariants spread to several countries worldwide.<sup>2,9</sup>

In early 2022, the Omicron BA.1 subvariant triggered the fourth wave of COVID-19 in Mexico.<sup>4</sup> At the end of this wave, other Omicron subvariants arose, first the BA.2 subvariant, and a month later, the BA.2.12.1 subvariant. However, there was no uptick in new COVID-19 cases with the presence of these new Omicron subvariants (Figure 1). Just two months after the end of the fourth COVID-19 wave in Mexico, the Omicron BA.5 subvariant emerged in our country and caused the fifth wave ( $r = 0.6444$ ;  $P < 0.00001$ ) characterized by a high number of COVID-19 cases. Nevertheless, the number of deaths was noticeably lower compared with those registered in previous waves. It is noteworthy that, during this fifth wave, the percentage of vaccinated people was approximately 75% (Figure 1).<sup>10</sup>

It is a fact that, although vaccines cannot prevent all SARS-CoV-2 infections, their main function has been to decrease the risk of developing severe illness, hospitalization, and death from COVID-19.<sup>11</sup> On the other hand, it is important to consider that, two months before that this fifth wave of COVID-19 appeared in Mexico, our country was leaving behind the fourth wave, which has been the largest wave of infections seen in Mexico.<sup>4</sup> It is possible that the lowest number of deaths registered in this fifth COVID-19 wave is the result of a combined protection between vaccination and previous SARS-CoV-2 infection that the population has developed. However, it is necessary to prevent new infections to avoid the emergence and spread of new SARS-CoV-2 variants, which could provoke new waves of COVID-19 in the coming months.<sup>12</sup>

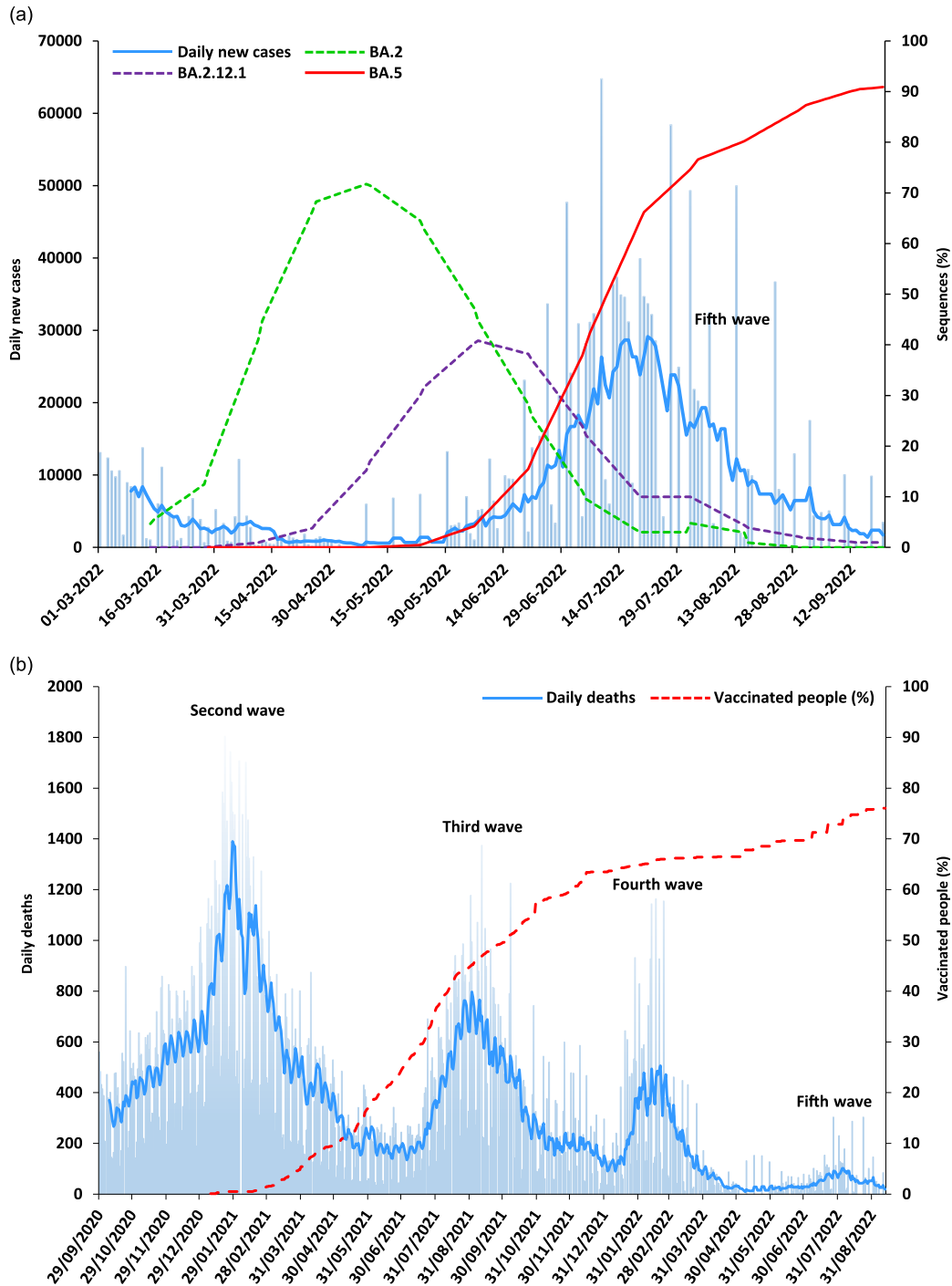
Although we will not be able to eradicate SARS-CoV-2, if we continue administering vaccines and these can protect us against the new variants, we will be able to see the end of this pandemic. In the meantime, we must continue applying the same measures, such as wearing face masks and social distancing, to prevent new infections.

**Acknowledgments.** We thank Francisco José Aréchiga-Ceballos for reviewing this manuscript and Andrés Gerardo Tapia-Flores for supporting the statistical analysis.

**Author contributions.** Sergio Isaac De La Cruz-Hernández wrote the manuscript, analyzed the epidemiological data along with the proportion of vaccinated people and the reported sequences of the Omicron variant of SARS-CoV-2 and, finally, he supported to make the figure. Ana Karen Álvarez-Contreras obtained and analyzed all the data from the Johns Hopkins University & Medicine, Coronavirus Resource Center, along with other sources such as Our World in Data, and CoVariants, Enabled by data from GISAID and made the figure.

**Funding.** This manuscript did not have any funding sources.

**Conflict of interest.** The authors declare that there are no conflicts of interest.



**Figure 1.** Daily new cases provoked by the presence of Omicron BA.5 subvariant, and daily new deaths registered through the immunization of people by vaccination during the last waves of COVID-19 in Mexico. Reports of daily new cases (a) and deaths (b) were obtained from Johns Hopkins University & Medicine; Coronavirus Resource Center.<sup>2</sup> Pearson's correlation coefficient was used to test the association between daily new cases with the proportion of reported sequences of the Omicron BA.5 subvariant, from the beginning to the peak of the fifth wave of COVID-19. The proportions of sequences (not cases) of the Omicron subvariants BA.2, BA.2.12.1 (dashed lines) and BA.5 (solid line) shown in (a) from Mexico were obtained from CoVariants, Enabled by data from GISAID.<sup>9</sup> Proportions of vaccinated people [indicated by dashed lines in (b)] were obtained from Our World in Data.<sup>10</sup>

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