XBB.1.5 emerges in the Americas: what it means to the region

Peter Hotez

Texas Children's Hospital Center for Vaccine Development, Department of Pediatrics and Molecular Virology and Microbiology, National School of Tropical Medicine, Baylor College of Medicine, Houston, TX, USA

The Lancet Regional Health - Americas 2023;18: 100433

Published Online 24 January 2023

https://doi.org/10.1016/j.lana.2023.100433

Now that the XBB.1.5 SARS-2 coronavirus omicron subvariant has emerged in the United States, a major question is what this means for the entire region of the Americas. Previously, both delta and omicron variants devastated Latin America as they did in the United States, resulting in catastrophic losses in human life. In all, almost 3 million people have died from COVID-19 in the Western Hemisphere, with two-thirds of those deaths in Latin America.[1] A worry is that XBB.1.5 will eventually spread from the United States where it currently predominates and penetrate the South. For example, a case of XBB.1.5 was reported last week in Brazil from a woman who had recently visited the United States.

Here is the immediate concern: The World Health Organization recently announced that XBB.1.5 is highly transmissible and among the most contagious of all SARS-2 coronaviruses to date.[2] Moreover, XBB.1.5 has immune escape properties that may exceed other omicron subvariants. For instance, XBB.1.5 can evade some plasma antibodies against earlier omicron subvariants, including BA.1, BA.5, and BF.7.[3] Preliminary studies from Peking University and the Chinese Academy of Sciences indicate that the enhanced transmissibility of XBB.1.5 results from a combination of antibody evasion and strengthened binding interactions of this mutated virus to its mammalian ACE2 receptor.[3]

In terms of virus spread, here is what we know so far: For the week ending January 7, 2023, just over one-quarter (approximately 27–28%) of the COVID-19 cases in the US were caused by the XBB.1.5 omicron subvariant, but this percentage varies significantly across the country. In the northeastern states, more than 70% of the cases are caused by XBB.1.5 whereas only 5–6% of the cases were from XBB.1.5 in the Upper Midwest.[4] In Texas, the gateway US state to Mexico and Latin America, just under 20% of the cases were from XBB.1.5.

In New York and other northeastern states where XBB.1.5 has become dominant, hospitalizations are rising precipitously so there are concerns that entry of XBB.1.5 into the Latin American region—where much of the population is under-vaccinated or unboosted—could produce a sharp increase in serious illness and deaths. This concern may be especially relevant to the bivalent booster directed against the omicron BA.4/BA.5 subvariants, which offers some cross-neutralization versus XBB,[5] and therefore possibly XBB.1.5 as well. Currently, only 15% of the US population has received the new bivalent booster (that became available in September 2022) according to the CDC,[3] but the COVID-19 Vaccine Tracker based at McGill University in Montreal, Canada reports that neither bivalent booster from Pfizer or Moderna respectively, has been approved in any countries in the Americas outside of the US and Canada,[6] although both Brazil and Peru have recently approved it for health care professionals or other priority groups.[7,8] Overall, however, the adoption by Latin American countries is very limited and relatively late in the game. This adds to the vulnerability of the Latin American and Caribbean region.

There is no certainty that XBB.1.5 will gain a foothold in Latin America. The fact that the percentage of XBB.1.5 cases remain low in the Upper Midwest suggests that this variant could potentially stay confined to a small geographic region and not affect Central or South America. After all, the lambda variant did not make much of a public health impact North America after it emerged in Peru, or the mu variant from Colombia.[9] However, the fact that cases are now rising in Texas means that we should anticipate at least some virus spread into Mexico and elsewhere in Latin America, including for example the case in Brazil highlighted above.[10]

In addition to clarifying whether XBB.1.5 has spread beyond North America and into Central and South America, we need to understand the effectiveness of currently available vaccines. If confirmed that the recently released bivalent booster directed versus BA.4/5 elicits some cross-protection than it is imperative that we make it available for the entire Western Hemisphere.[11] Alternatively, our Texas Children's Hospital Center for Vaccine Development, which made available a unique low-cost and patent-free recombinant protein COVID-19 vaccine technology for India, Indonesia, and elsewhere, is now preparing a BA.4/5 version for inclusion in a bivalent recombinant protein vaccine for use globally. Still another option is to quickly pivot and prepare an XBB.1.5-specific mRNA or recombinant protein for administration—possibly as a trivalent vaccine along with the vaccines to the original lineage and BA.4/BA.5—for the Western Hemisphere.

This year the Pan American Health Organization will celebrate its 120th Anniversary. Whether 2023 will also become the year in which COVID-19 slows or finally halts, or whether XBB.1.5 becomes the latest COVID-19

E-mail address: hotez@bcm.edu.

wave similar to those resulting from the delta or early omicron SARS-2 variants remain unknown. Still another issue is whether a new variant might arise out of China in the coming weeks during its devastating pandemic. Ultimately, the hope is that 2023 will not be as bad as 2022 or 2021. However, this may depend on how quickly we act to counter this vexing latest variant.

Declaration of interests

PJH is a co-inventor of a COVID-19 recombinant protein vaccine technology owned by Baylor College of Medicine (BCM) that was recently licensed by BCM non-exclusively and with no patent restrictions to several companies committed to advance vaccines for low- and middle-income countries. He has no involvement in license negotiations conducted by BCM. Similar to other research universities, a long-standing BCM policy provides its faculty and staff, who make discoveries that result in a commercial license, a share of any royalty income. To date, BCM has not distributed any royalty income to the co-inventors on the COVID-19 recombinant protein vaccine technology. Any such distribution will be undertaken in accordance with BCM policy.

Acknowledgments

Funding: PJH is not specifically funded for the studies reported here.

References

1 PAHO-WHO. Coronavirus disease (COVID-19) pandemic. https://www.paho.org/en/topics/coronavirus-infections/coronavirus-disease-covid-19-pandemic.
2 Hotez PJ. This new variant could make you pay for skipping the booster. The Daily Beast, January 05, 2023. https://www.thedailybeast.com/this-new-variant-could-make-you-pay-for-skipping-the-booster
3 Yue C, Song W, Wang L, et al. Enhanced transmissibility of XBB.1.5 is contributed by both strong ACE2 binding and antibody evasion. *bioRxiv*. 2023. https://doi.org/10.1101/2023.01.03.522427.
4 CDC. COVID data tracker. https://covid.cdc.gov/covid-data-tracker/#variant-proportions.
5 Davis-Gardner ME, Lai L, Wali B, et al. Neutralization against BA.2.75.2, BQ.1.1, and XBB from mRNA bivalent booster. *N Engl J Med*. 2023;388:183–185. https://doi.org/10.1056/NEJMc2214293.
6 COVID-19 vaccine tracker. https://covid19.trackvaccines.org/vaccines/225/. https://covid19.trackvaccines.org/vaccines/approved/.
7 Peru Ministry of Health. Todos los profesionales del sector salud recibirán la vacuna bivalente contra la covid-19, January 6, 2023. https://www.gob.pe/institucion/minsa/noticias/686396-todos-los-profesionales-del-sector-salud-recibiran-la-vacuna-bivalente-contra-la-covid-19.
8 ANVISA – Brazilian National Surveillance Agency. Comrnaty Bivalente (Pfizer), December 13, 2022. https://www.gov.br/anvisa/pt-br/assuntos/paf/coronavirus/vacinas/comirnaty-bivalente-pfizer.
9 Schwalb A, Armyra E, Méndez-Aranda M, Ugarte-Gil C. COVID-19 in Latin America and the Caribbean: two years of the pandemic. *J Intern Med*. 2022;292(3):409–427. https://doi.org/10.1111/joim.13499.
10 Pacifico F. 1º caso da XBB.1.5 no Brasil: moradora de SP infectada com nova variante da Covid-19 teve sintomas leves e viajou aos EUA. Globo.Com, January 6, 2023 https://g1.globo.com/sp/campinas-regiao/noticia/2023/01/06/1o-caso-da-xbb15-no-brasil-moradora-de-sp-infectada-com-nova-variante-da-covid-19-teve-sintomas-leves-e-viajou-aos-eua.ghtml.
11 Hotez PJ. SARS-CoV-2 variants offer a second chance to fix vaccine inequities. *Nat Rev Microbiol*. 2022:1–2. https://doi.org/10.1038/s41579-022-00824-8. Epub ahead of print.