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# The re-emergence of measles is posing an imminent global threat owing to decline in its vaccination rates amid COVID-19 pandemic: a special focus on recent outbreak in India – a call for massive vaccination drive to be enhanced at global level

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# Dear Editor,

The ongoing coronavirus disease 2019 (COVID-19) pandemic has severely impacted the quality of life on Earth. Another important challenge that the pandemic brought to the public's health is the disruption of with reference to routine vaccination procedures that were in place for the elimination of other microbial infectious diseases. Among these vaccine-preventable diseases (VPDs), measles, caused by the Measles virus (MeV), belonging to the Morbillivirus genus of the Paramyxoviridae family, is currently responsible for sporadic outbreaks among children. This is majorly attributed to the lag in the distribution of vaccine caused by lockdowns and restricted movements during COVID-19 pandemic. According to the WHO and United Nations International Children Education Fund data, more than 23 million children missed their routine vaccination doses (https://www.who.int/news/ item/15-07-2021-covid-19-pandemic-leads-to-major-backslidingon-childhood-vaccinations-new-who-unicef-data-shows). Disruption in the routine immunizations for other diseases, including diphtheria, pertussis, and tetani (DPT), polio, and others, was confirmed to be prevalent in most countries throughout

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the world<sup>[1]</sup>. Vaccine doses administered in pandemic times were significantly reduced as compared to the prepandemic era<sup>[2]</sup>. Notably, MeV is one of the most contagious viruses, having a basic reproduction number R0 of 12–18 are being transmitted via direct contact and through the air. MeV remains an important reemerging virus revealing continuous increase in prevalence globally during last decade with more than 200 000 deaths per year, and the slow-down of ample vaccination campaigns facilitated aggravation of MeV infections during the COVID-19 times (https://www.who.int/news/item/22-05-2020-at-least-80-million-children-under-one-at-risk-of-diseases-such-as-diphtheria-measles-and-polio-as-covid-19-disrupts-routine-vaccination-efforts-warn-gavi-who-and-unicef).

A prepandemic analysis revealed that globally more than one million children die due to measles. The measles vaccine, the measles-rubella vaccine, and the measles-mumps-rubella triple vaccine are used throughout the world and may potentially contribute to the elimination of these microbes. In the late COVID-19 pandemic, there has been rise of several infectious viral disease outbreaks across the globe. Recently, Mumbai (a metropolitan city in Maharashtra, India) reported several outbreaks of measles across the city. As of 25 November 2022, a total of 233 confirmed cases and 13 deaths have been reported in Mumbai due to measles, with thousands of suspected cases (https://economictimes.indiatimes.com/news/mumbai-news/ mumbai-struggles-with-measles-outbreak-lack-of-vaccinationpoor-living-conditions-to-blame-say-health-officials/articleshow/ 95635875.cms). After tomato flu and acute hepatitis, it is the third culprit affecting children in the COVID-19 era. The etiology of both of the former is unknown and still debatable. Measles is commonly seen in children and can be life-threatening for children and infants. It spreads through the airborne respiratory droplets released during coughing or sneezing. The incubation period of MeV is 10-14 days, and common symptoms include mild fever, cough, skin rashes, sore throat, coryza, diarrhea and conjunctivitis to severe pneumonia and encephalitis<sup>[3]</sup>. MeV infection causes transient immunosuppression and weakens immunity in children, which predisposes them to opportunistic infections and lowers the efficacy of previous vaccinationinduced immunity against other pathogens and thus ultimately makes them susceptible to pneumonia, malnutrition, and other complications<sup>[3]</sup>. Measles could also predispose people to acute encephalitis and other neurological complications. Moreover,

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long-term sequalae, including subacute sclerosing panencephalitis, may be noticed among people infected with MeV<sup>[4]</sup>.

The major reasons for the MeV outbreak are vaccine hesitancy, poor living conditions, inadequate health services, poor nutrition, and missed vaccine doses due to the COVID-19 pandemic. Since the beginning of 2022, Mumbai has recorded over 20 outbreaks of measles, with the D8 strain of virus found to be associated with the most recent outbreak. However, there are no structural changes found in the virus strain, and the recent outbreak is primarily due to immunization gaps (https://time sofindia.indiatimes.com/city/mumbai/mumbai-d8-strain-ofmeasles-behind-outbreak-1-suspected-death/articleshow/ 95613685.cms).

India, along with many other South Asian countries, has resolved to eliminate measles and control rubella by 2020. Many countries across the globe have already put off or given less priority to measles campaigns during the COVID-19 pandemic, and this has increased the risk of bigger measles outbreaks around the world. According to the United Nations International Children Education Fund, 2020, 23 million children will have missed out on a basic childhood vaccine, which is the highest number seen since 2009 and 3.7 million more than the cases recorded in 2019. BMC (Mumbai) revealed that 19 894 children had missed their Measles-Rubella vaccine doses and measlesmumps-rubella doses, which were supposed to be taken at 9 and 15 months after birth, respectively (https://timesofindia.india times.com/city/mumbai/over-20-measles-outbreaks-in-mumbaithis-year-cases-rise-to-142-suspected-deaths-7/articleshow/ 95542546.cms).

During 2022, 29 large or troublesome outbreaks of measles have been reported from Africa, Nigeria, Liberia, the Eastern Mediterranean, and Europe<sup>[5]</sup>. Around 13 000 cases of measles were recorded in India, considered the largest outbreak in 2022, and such a massive measles outbreak has threatened the country's goal to eliminate this disease by its 2023 deadline<sup>[6]</sup>. A recent article published in the JAMA journal has also emphasized that a decreased global vaccination drive amid the COVID-19 pandemic is leading to measles outbreaks<sup>[5]</sup>. Ohio measles outbreak in central Ohio, wherein 73 known cases and 26 hospitalizations have been recorded since late October 2022, while Columbusarea outbreak revealed an unrelated cluster of 22 cases in Minnesota<sup>[5]</sup>. Recently, WHO and CDC have warned that measles is now an imminent threat worldwide due to a decline in global vaccination rates and weakened surveillance of MeV during the COVID-19 pandemic<sup>[7]</sup>.

Measles is an endemic disease in India, leading to noteworthy morbidity and mortality. Apart from India, the re-emergence of diseases such as polio and measles has been reported from Pakistan and other countries<sup>[8]</sup>, which necessitates the importance of enhancing vaccination coverage for VPDs. Considering the recent measles outbreaks in India, it is the high time for urgent and intensified efforts to be made for enhancing measles vaccination campaigns such as Intensified Mission Indradhanush 3.0, targeting unvaccinated children, so as to overcome the current challenges to vaccinate children in a country populated with more than 1.4 billion people and achieve measles and rubella elimination<sup>[6]</sup>.

A three-point program has been initiated to control the measles outbreak. It includes identifying the suspected measles cases, immunizing children who missed the vaccination, and finally, spreading awareness about the importance and need for MeV vaccination. Even though pandemics like COVID-19 may happen or not in the future, the public health administration should consider the lessons learned from experiences during this pandemic and utilize them to improve preparedness and ensure readiness for any such instances in the future. It is essential that the public health administration ensure adequate immunization against the VPDs in order to prevent their re-emergences and potential outbreaks, as evidenced in the case of measles. This could be addressed by a coordinated approach wherein the patient's immunization records are carefully identified using mobile applications and vaccinations are delivered at home. The COVID-19 pandemic is posing eminent threats due to the recently emerged severe acute respiratory syndrome coronavirus 2 Omicron subvariants, which might lead to an increase in cases again as recently faced by China and other countries, but, the reemergence of measles and other infectious diseases during the pandemic urges that the vaccination drives for important pathogens other than severe acute respiratory syndrome coronavirus 2 should not be slowed down. Hence, measles routine vaccination campaigns need to be enhanced on a massive scale at the Indian and global levels to safeguard the health and lives of children.

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# **Data statement**

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