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Measles Resurgence in Bangladesh: Lessons on Immunization Gaps, Health-System Resilience and Surveillance for India

Over the last several years, Bangladesh had made substantial progress towards the elimination of measles. Reported coverage for measles improved from 89% (2000) to 118% (2016) for the first dose and from 22% (2012) to 121% (2024) (*See footnote*).¹ Confirmed measles incidence had also declined sharply during the period. However, since January 2026, the number of cases of measles was gradually increasing. This significant increase led the National IHR Focal Point of Bangladesh to notify WHO of this sustained domestic transmission. Between March and April 2026, Bangladesh reported 19161 suspected and 2973 laboratory-confirmed measles cases, with 166 suspected measles-related deaths (CFR 0.9%) and 30 confirmed measles-related deaths (CFR= 1.1%). A total of 12318 hospital admissions and 9772 hospital discharges have also been reported.¹

Multiple reasons may be considered responsible for this outbreak. Of these, stockout of the MR vaccine between 2024-2025, has been suggested as an important, albeit not the exclusive reason for the outbreak. In September last year, the then Bangladesh government transitioned from GAVI-supported procurement to an open tender system, despite concerns raised by UNICEF, who warned of potential disruption in the immunisation system and a subsequent outbreak.² The vaccine procurement procedure is itself complicated and often results in delay leading to stockouts. Additionally, systemic logistics challenges, such as demand forecasting, cold-chain storage capacity, transport delays, and sub-national inventory management, may have compounded these stock-outs.

Supplementary Immunization Activities (SIAs), also called the Measles-Rubella Campaigns are additional, time bound vaccination campaigns to reduce the population of accumulated susceptible children through additional vaccination/ outreach sessions. Supplementary measles-rubella campaigns were not being undertaken in Bangladesh since 2020.¹ The high birth rate of Bangladesh (19.99/ 1000 population/ year; 2024), the lack of SIA, along with routine immunization gaps resulted in the build-up of a large cohort of children susceptible to the infection. Once introduced, the disease spreads rapidly among the unvaccinated because of its high secondary attack rates.

Measles has a R0 of 12-18 (one case of measles can infect 12-18 vulnerable individuals), which means that a herd immunity threshold (HIT = $1-1/R_0$) of 93% to 95% immunity is necessary to block community transmission. The India coverage figures (98% for the first dose and 95% for both doses) correspond to the 2025 WUENIC estimates released in 2026, which nominally meets or exceeds the calculated herd immunity threshold.³ In 2025, for the first time, India pushed itself out of the list of countries with the highest number of unvaccinated children. The report by WHO/UNICEF on national immunisation applauded India "*underscoring outstanding progress over the last decade*."⁴ Usually, these figures should provide justifiable reasons for celebration. However, the recent outbreak of measles in Bangladesh, which had previously attained comprehensive levels of herd immunity, warrants a careful look at the vulnerabilities that might trigger measles outbreaks in India, despite achieving high immunity levels.

India has several advantages when compared to Bangladesh. While Bangladesh relies heavily on external procurement of vaccines including vaccines for measles for their National Immunisation program, MR (also MMR) vaccines have long been manufactured domestically in India and can be supplied on a large scale. India's CDSCO (Central Drug Standard Control Organisation) lists MR vaccines from Zydus and Human Biologicals, as well as MMR products.⁵ Serum Institute's MR vaccine has also been WHO-prequalified since 2000. This makes procurement easy and early with minimum delay in transportation.

An additional safeguard is the eVIN, a mobile/web application with temperature-monitoring devices and cloud-based data. This platform ensures real time monitoring of vaccine doses, consumptions,



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transfers, wastage and expiry, enabling programme managers to identify and respond to potential stock and distribution problems. In addition, it provides real time monitoring of the storage temperatures at all the cold chain points, ensuring proper storage conditions for the vaccines. However, neither the easy availability nor proper stocks and distribution chain alone can eliminate immunisation gaps. It needs to be complemented by good RI microplanning, accurate denominators, timely replenishment, high-quality coverage monitoring and action on identified gaps. Inadequate SIAs and improper surveillance pose potential vulnerabilities, that if breached could trigger widespread localized resurgence.

Given India's massive population, even with 95% coverage for both doses, the absolute number of children left unvaccinated remains high. In 2025, there were 4.53 lakh children in India who could not be immunised against measles.³ Although the national averages may look excellent, these figures hide the inequalities in vaccination rates between rural, urban and slum areas or between children of migratory or poor socioeconomic households. This large population of children missed by routine measles-rubella immunisation present a susceptible cohort that remains extremely vulnerable to future outbreaks.⁶ Although public health services would prioritise the immunisation of these "Zero dose" vaccinees, it is important to remember that the large population of children that are vaccinated with a single dose of MR still remain vulnerable, given the protection provided by a single dose of vaccine is approximately 80%.

India and Bangladesh share a porous border with substantial population movement between the countries, particularly through the remote and geographically difficult to access areas. These areas are particularly prone to have lower rates of immunisation and access to healthcare, resulting in pockets of susceptible individuals. Any outbreak in Bangladesh, thus, has the potential to cross-over and spread diseases like measles, among the susceptible population, in these remote areas. From there disease may progress to a larger population if an immunity gap exists. To counteract this threat, the WHO-SEARO Strategic Plan (2024-2028) emphasises cross border co-ordination, emphasizing real-time case notifications, sharing of molecular sequencing data, and synchronizing outbreak response microplanning across porous border districts.⁷

Initiated in 2017, the MR-SIA campaign was one of the largest public health vaccination strategies in the world. It administered a single dose of the MR vaccine targeting all children aged 9 months to 15 years, regardless of previous immunisation or disease status, in phases across schools, Anganwadi centers, mobile outreach posts to reach out-of-school, nomadic, and high-risk populations. It attempted to reduce the number of "zero dose vaccinees", and played an important role in reducing the immunity gap and rapidly boosting herd immunity. With the successful integration of 2 doses of the MR vaccine into the NIS, the SIAs have now been modified into the targeted "Zero Measles-Rubella" elimination frameworks under the Mission Indradhanush Program, a shift from population-based drives to risk-based, periodic catch-ups.

Following the elimination of polio in India, the massive infrastructure for polio surveillance was transitioned to support the Measles-Rubella surveillance. A sensitive, case-based monitoring of acute fever and

maculopapular rash is routinely undertaken to identify clusters in densely populated slums, migratory pockets, and disadvantaged populations. To achieve adequate surveillance, a discarded non-measles, non-rubella rate of at least 2 per 100,000 population annually at national and sub-national levels needs to be achieved. Furthermore, at least 80% of suspected cases must undergo detailed epidemiological investigation within 48 hours of notification and have adequate diagnostic specimens collected within 28 days for accredited laboratory testing. A verified outbreak needs to be followed by Outbreak Response Immunisation (ORI) in the form of ring vaccination around the cases, administered irrespective of the children's prior vaccination status, plus immediate administration of therapeutic Vitamin A (2 age-appropriate doses 24 hours apart) to all cases to reduce complications and case-fatality rates.

In summary, the Bangladesh experience should not be viewed merely as a consequence of vaccine stock-out, but as a critical reminder of India's vulnerabilities to measles outbreaks despite achieving high levels of routine measles vaccine coverage. It should prompt the authorities to examine if immunization surveillance and logistics systems can detect and correct emerging pockets of susceptibility before they become large enough to sustain measles transmission. To sustain elimination, equitable two-dose immunity of at least 95% at the national and subnational levels, with focused attention on susceptible pockets and highly sensitive fever-and-rash surveillance ($\geq 2/100,000$ population) are needed.

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Footnote

These are administrative/WUENIC-type estimates and values $>100\%$ can occur because the numerator and denominator are derived from different data sources or because the estimated target population is inaccurate. WHO explicitly distinguishes administrative/official coverage from WUENIC estimates and notes that the latter incorporate country-reported data and other contextual information.

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