International Journal of Research in Medical Sciences
Rahman M et al. Int J Res Med Sci. 2026 Dec;14(12):6008-6021
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20264521

Review Article

The resurgence of measles in Bangladesh: a narrative review

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Received: 16 September 2026
Accepted: 18 November 2026

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ABSTRACT

Background: Despite progress toward measles control, Bangladesh has experienced recurrent outbreaks associated with vaccination gaps, health-system disruption, and inequitable access. This narrative review synthesized evidence on epidemiological trends, clinical characteristics, geographical distribution, drivers, high-risk populations, responses, and remaining gaps.

Methods: PubMed/MEDLINE, Scopus, and Google Scholar were searched on 21 July 2026 and updated on 22 July 2026 for English-language sources published from 1 January 2015 to 22 July 2026. Earlier Bangladesh-specific evidence was included for historical context. WHO, UNICEF, EPI-DGHS, and CDC, Atlanta, provided additional data. After deduplication, 35 unique sources (16 peer-reviewed and 19 institutional/surveillance/survey/program sources) were narratively synthesized across six domains; statistical pooling was not performed because of heterogeneity.

Results: Reported incidence declined approximately 84% from 2000 to 2016 but increased in 2017 and 2019, followed by major resurgence in 2026. By 28 June 2026, 99,207 suspected cases, 11,710 laboratory-confirmed cases, 619 suspected deaths, and 93 confirmed deaths were reported. Children <5 years accounted for 79% of cases, <2 years 66%, and infants <9 months 33%. MCV1/MCV2 coverage declined to 90%/86% in 2025; survey-based MR1/MR2 coverage was 86.0%/80.7% in 2023. Major burdens occurred in Dhaka, Rajshahi, Chattogram and Khulna, with vulnerability in informal settlements, refugee camps, char areas and hard-to-reach communities. Emergency vaccination targeted >17.8 million children.

Conclusions: Resurgence reflects accumulated immunity gaps, incomplete two-dose vaccination, service disruption, and inequalities. Sustained control requires ≥95% two-dose coverage, catch-up vaccination, reliable supplies, strengthened surveillance, digital tracking, community engagement, nutritional support, and equitable outreach.

Keywords: Measles, Measles resurgence, Measles-rubella vaccination, Immunization coverage

INTRODUCTION

Measles remains one of the most transmissible human viral infections, with an estimated basic reproduction number of 12–18 and a population-immunity threshold requiring approximately 95% coverage with two doses of measles-containing vaccine.[1,2] Despite the availability of a safe and highly effective vaccine, outbreaks continue where susceptible children accumulate through missed, delayed, or incomplete vaccination. Globally, progress toward elimination has stalled because first-dose coverage has remained below the level required to interrupt transmission, while second-dose coverage is often lower and more unequal.[1,2] Approximately 136,000 measles-related deaths occurred worldwide in 2022, predominantly among children.[3] During the COVID-19 pandemic, local studies from low and lower-middle-income countries showed median reductions of 23.3% in first-dose measles vaccination and 48.2% in second-dose delivery, demonstrating how rapidly service disruption can create

outbreak-prone cohorts.[1] Within South Asia, dense populations, rapid urbanization, migration, humanitarian emergencies and uneven primary healthcare access increase the consequences of these immunity gaps. In Pakistan Sindh Province, an analysis of an electronic registry containing more than 6.2 million children found that 80.6% received the first measles dose, but only 58.1% received the second; timely administration was even lower.[3] In five Indian districts, supplementary measles–rubella immunization substantially reduced the proportion of zero-dose children, supporting campaigns as an important complement to routine services.[4] Across urban slums in low and middle-income settings, lower coverage has been associated with insecure residence, weak infrastructure, population mobility, limited-service availability and difficulties maintaining vaccination records.[5]

Within Bangladesh, earlier control efforts produced major gains. Between 2000 and 2016, reported measles incidence declined by approximately 84%, while estimated first-dose coverage increased from 74% to 94% and second-dose coverage reached 93% after its introduction.[6] However, national averages have concealed persistent geographical and socioeconomic inequalities. Recent analyses have linked incomplete childhood vaccination with maternal education, household wealth, healthcare utilization, place of delivery and regional performance.[7,8] In addition, targeted assessments in haor, hill, char, coastal, urban and other underserved settings identified population migration, transport barriers, health-worker shortages, weak microplanning and poor identification of missed communities as continuing causes of zero-dose and under-immunized children.[9]

Clinically, measles is not a benign childhood rash. Following an initial febrile respiratory illness, infection may cause pneumonia, severe diarrhea, otitis media, encephalitis, blindness, prolonged immune suppression, and death. Risks are greatest among infants, unvaccinated children, displaced populations and those with malnutrition or limited access to timely care.[10,11] A conceptual review of measles case fatality identified vaccination coverage, household crowding, nutritional status, healthcare availability and socioeconomic conditions as important population-level determinants.[10]

Similarly, modelling indicated that treating childhood wasting alongside vaccination could further reduce measles infections and mortality, emphasizing the interaction between immunization and nutrition programs.[11] From a health-system perspective, pandemic-related disruption magnified pre-existing weaknesses rather than creating them de novo. Multi-country modelling that included Bangladesh showed that reductions in routine vaccination and delays in supplementary campaigns could produce substantial preventable measles morbidity and mortality.[12] A broader analysis across 112 low and middle-income countries projected that catch-up activities could avert approximately 79% of excess deaths associated with disrupted vaccination for selected pathogens, with measles contributing much of the avoidable burden.[13] Moreover, Bangladesh-specific modelling suggests that increasing only one intervention is insufficient; combining high first- and second-dose coverage with improved case detection and treatment is more effective than isolated measures.[14] Nevertheless, the available evidence remains fragmented. Much of the Bangladeshi literature focuses on national coverage, selected districts, mathematical projections or program reports, while comparatively little recent peer-reviewed evidence describes laboratory-confirmed incidence, age-specific susceptibility, clinical severity, outbreak geography, vaccination status among cases or surveillance performance during resurgence.

Differences between administrative estimates, household surveys, facility records, and outbreak notifications further complicate interpretation. Therefore, a consolidated review is needed to connect epidemiological trends with immunity gaps, social vulnerability, service disruption, clinical consequences, and policy responses. Accordingly, this narrative review aims to synthesize recent evidence on the resurgence of measles in Bangladesh, describe its epidemiological and clinical characteristics, identify principal drivers and high-risk populations, evaluate existing control measures, and define priorities for strengthening two-dose vaccination, catch-up activities, surveillance, laboratory confirmation and equitable access.

METHODS

Study design

This narrative review was conducted to synthesize available evidence on the resurgence of measles in Bangladesh, with particular attention to epidemiological trends, vaccination coverage, affected populations, geographical clustering, contributing factors, clinical outcomes and public health responses. Because the objective was to integrate evidence from heterogeneous sources, including peer-reviewed studies, surveillance databases, outbreak reports, vaccination surveys and program documents, a narrative rather than a systematic review approach was adopted.

Search strategy and information sources

Literature searches were completed on 21 July 2026 and updated on 22 July 2026. PubMed/MEDLINE, Scopus, and Google Scholar were searched for English-language publications issued between 1 January 2015 and 22 July 2026. Earlier Bangladesh-specific publications were also considered when they provided essential historical information on measles incidence, surveillance, vaccination coverage, or elimination progress. In addition, reports and datasets were obtained from the World Health Organization, WHO Regional Office for South-East Asia, United Nations Children's Fund, Directorate General of Health Services of Bangladesh, Expanded Program on

Immunization, Gavi, the Vaccine Alliance, and the United States Centers for Disease Control and Prevention.

Using combinations of Medical Subject Headings and free-text terms, the search included: "measles," "measles resurgence," "measles outbreak," "measles incidence," "measles vaccination," "measles-containing vaccine," "MR1," "MR2," "MCV1," "MCV2," "zero-dose children," "immunization coverage," "vaccine hesitancy," "COVID-19 disruption," "Bangladesh," "South Asia," "Rohingya," "refugee camp," and "low- and middle-income countries." Through reference-list screening, additional relevant publications and reports were identified. Although evidence published mainly between 2015 and 2026 was prioritized, earlier Bangladesh-specific studies were included when they provided important historical or surveillance context.

Eligibility criteria

Included sources comprised peer-reviewed studies, surveillance analyses, outbreak investigations, coverage surveys, epidemiological bulletins, modelling studies, programme reports, and policy documents reporting information relevant to measles epidemiology, vaccination, clinical outcomes, associated barriers, or outbreak response in Bangladesh. Regional or international evidence was included only when it directly supported interpretation of the Bangladesh context.

Excluded sources were unrelated to measles epidemiology or vaccination, lacked identifiable data or reporting periods, duplicated more complete sources, contained insufficient numerical or methodological information, or were unavailable in English.

Following removal of 11 duplicated entries from the original 46-reference bibliography, 35 unique sources were included, comprising 16 peer-reviewed publications and 19 surveillance, survey, programme, or institutional sources. Because the original database exports and screening log were unavailable, initial retrieval and exclusion counts could not be reconstructed reliably.

Study selection and data extraction

All potentially relevant titles, abstracts, executive summaries, and complete reports were assessed against the eligibility criteria. Duplicate references were identified by comparing authors or issuing organizations, titles, publication years, reporting periods, and web addresses. The manuscript bibliography initially contained 46 reference entries. Eleven entries were duplicates of sources already cited elsewhere in the reference list. Following removal of these duplicated references, 35 unique sources were retained in the evidence base. These comprised 16 peer-reviewed publications and 19 surveillance datasets, vaccination surveys, outbreak reports, epidemiological bulletins, program documents or other institutional sources.

The original database-export files and contemporaneous screening log were not retained. Consequently, the total numbers initially retrieved from each database, removed before screening, excluded during title and abstract assessment, and excluded following full-text assessment could not be reconstructed reliably. For this reason, hypothetical screening numbers were not reported, and a PRISMA-style flow diagram was not prepared.

Data synthesis and interpretation

Through thematic narrative synthesis, findings were organized under six domains: characteristics of the included evidence; temporal trends in measles cases, incidence, and vaccination coverage; epidemiological, demographic, and clinical features of the 2026 outbreak; geographical distribution and high-risk clusters; multidimensional drivers of resurgence; and public health responses and remaining gaps.

Annual Joint Reporting Form cases, suspected cases, laboratory-confirmed cases, incidence estimates, administrative coverage, modelled WHO/UNICEF estimates and survey-based vaccination coverage were treated as distinct measures. Because their definitions, denominators, reporting periods and methods differed, they were not statistically pooled. Instead, numerical findings were compared descriptively, and inconsistencies between sources were interpreted in relation to surveillance sensitivity, laboratory confirmation, denominator accuracy, recall bias, vaccination-card availability and differences between hospital-based and population-based data. No meta-analysis was performed because of substantial heterogeneity in study design, populations, outcomes, case definitions, and reporting methods. Formal risk-of-bias scoring was also not undertaken, although greater interpretive weight was given to nationally representative surveys, peer-reviewed studies, laboratory-supported surveillance reports and official WHO, UNICEF and government sources. Findings were summarized using six tables and two figures. Annual reported cases, suspected notifications, laboratory-confirmed cases, incidence estimates, modelled coverage, and survey-based coverage were treated as separate measures and were not statistically pooled. No meta-analysis, formal risk-of-bias assessment, or evidence-importance grading was performed because of substantial heterogeneity. Accordingly, reported barriers were interpreted as factors plausibly associated with resurgence, rather than as confirmed causal determinants. The principal epidemiological cutoff for the 2026 outbreak was 28 June 2026.

RESULTS

Across the included evidence, national surveillance datasets, immunization coverage estimates, household surveys, hospital-based studies, outbreak reports, and vaccination programme documents were synthesized. Although measles incidence declined by 84% between

2000 and 2016, recurrent increases occurred in 2017 and 2019; by 28 June 2026, 99,207 suspected and 11,710 laboratory-confirmed cases had been reported (Table 1).

Between 2015 and 2019, reported measles cases increased from 240 to 5,827, while incidence rose from 1.5 to 35.3 per million population. After declining to 132 cases and 0.8 per million in 2025, the burden increased sharply in 2026, reaching 99,207 suspected and 11,710 confirmed cases by 28 June. Meanwhile, estimated MCV1 and MCV2 coverage declined to 90% and 86% in 2025, respectively (Table 2).

By 28 June 2026, the outbreak had resulted in 99,207 suspected cases, 11,710 confirmed cases, 619 suspected deaths, and 93 confirmed deaths, with a confirmed case-fatality rate of 0.8%. Among early outbreak cases, 79% occurred in children younger than five years, 66% in children younger than two years, and 33% in infants younger than nine months. Within the Chattogram hospital study, fever and rash were present in all patients, Koplik spots in 56%, and incomplete or absent vaccination in 69% (Table 3).

During the initial outbreak phase, Dhaka recorded the highest burden with 8,263 suspected cases, followed by Rajshahi with 3,747, Chattogram with 2,514, and Khulna with 1,568 cases. Later, Barishal recorded the highest weekly incidence, 8.7 per 100,000, while Sylhet had the highest cumulative case-fatality rate, 1.5%. Within Cox's Bazar and Bhasan Char, 865 suspected cases, 105 confirmed cases and five deaths were reported (Table 4).

As shown in Table 5, several factors were plausibly associated with the resurgence of measles in Bangladesh, particularly suboptimal vaccination coverage, incomplete second-dose uptake, and the persistence of zero-dose and under-immunized children. In 2023, MR1 and MR2 coverage were 86.0% and 80.7%, respectively, while WHO and UNICEF estimates for 2025 showed MCV1 coverage of 90% and MCV2 coverage of 86%. Approximately 70,000 children remained zero-dose, and 400,000 were under-immunized, while one-third of early 2026 cases occurred among infants younger than nine months. Additional reported barriers included health-system disruption, urban inequality, humanitarian and geographical access constraints, misinformation, and inconsistencies across surveillance and coverage data.

Through routine immunization, Bangladesh provides MR1 at nine months and MR2 at 15 months, although coverage remained below the recommended 95% level. During 2020–2021, approximately 34 million children were targeted through a national catch-up campaign, while the 2026 emergency response initially targeted more than 1.2 million children and was later expanded to over 17.8 million children aged 6–59 months. Despite extensive outreach, important gaps remained in post-campaign effectiveness, case-level vaccination status, clinical complications, hospital resource use, and long-term surveillance.

Between 2015 and 2019, measles incidence increased from 1.5 to a peak of 35.3 per million population before declining to 0.8 per million in 2025. However, MCV1 and MCV2 coverage subsequently fell to 90% and 86%, respectively, and a major outbreak occurred in 2026, with 99,207 suspected and 11,710 confirmed cases reported by 28 June (Figure 1).

Across Bangladesh, the map demonstrates widespread outbreak involvement, with the largest early case burdens concentrated in Dhaka, Rajshahi, Chattogram and Khulna divisions. In addition, high weekly incidence was observed in Barishal, elevated mortality was reported in Sylhet and distinct high-risk clusters were identified in Dhaka's informal settlements, Rohingya refugee camps, Bhasan Char and hard-to-reach river-island communities (Figure 2).

Table 1: Characteristics of selected principal sources included in the narrative review.

Author/ organization	Reporting period	Design/document type	Geographical coverage	Population/ dataset	Principal findings
WHO/UNICEF JRF[15]	2000–2025	Annual national surveillance dataset	Bangladesh	Reported cases and incidence	Recurrent increases, particularly in 2017 and 2019, followed by low final annual reporting during 2021–2025.
Khanal et al[6]	2000–2016	National surveillance review	Bangladesh	Vaccine-preventable disease surveillance and immunization data	An 84% reduction in measles incidence was reported between 2000 and 2016, although surveillance and immunity gaps persisted.
WHO Bangladesh[16]	2018	Programme and surveillance summary	Bangladesh	Outbreak and vaccination programme data	Among 113 suspected outbreaks, 36 were measles-positive; more

Continued.

Author/ organization	Reporting period	Design/document type	Geographical coverage	Population/ dataset	Principal findings
					than 2,000 confirmed cases were reported.
WHO[17]	2019	International outbreak update	Bangladesh, including Cox's Bazar	Confirmed measles cases	A total of 4,181 confirmed cases had been reported by 18 November 2019, including substantial transmission in Rohingya camps.
WHO disease outbreak news[18]	15 Mar–14 Apr 2026	National outbreak report	58 of 64 districts	Suspected and laboratory-confirmed cases	Reported 19,161 suspected cases, 2,897 confirmed cases, 12,318 hospital admissions, and 166 suspected deaths.
WHO SEARO epidemiological bulletin[19]	Mar–Jun 2026	Regional epidemiological update	All eight divisions	National surveillance and hospital data	Reported 99,207 suspected cases, 11,710 confirmed cases, 619 suspected deaths, and 93 confirmed deaths by 28 June 2026.
WHO/UNICEF WUENIC[20]	2015–2025	Modelled national coverage estimates	Bangladesh	Routine MCV1 and MCV2 coverage	Estimated MCV1 declined from 96% in 2024 to 90% in 2025; MCV2 declined from 93% to 86%.
Expanded programme on immunization, DGHS[21,22]	2019 and 2023	National household coverage surveys	Bangladesh	Children aged 12–23 months and 24–35 months	Valid MR1 coverage declined from 88.6% in 2019 to 86.1% in 2023, while valid MR2 coverage declined from 89.1% to 80.7%.
Sabia et al[23]	2020–2021	Hospital-based descriptive cross-sectional study	Chattogram	100 children aged ≤5 years	Incomplete or absent measles vaccination was recorded in 69%; fever and generalized rash occurred in all patients.
WHO and UNICEF campaign reports[24-29]	2020 and 2026	Programme and campaign reports	National and humanitarian settings	Children targeted by supplementary vaccination	Documented national catch-up, outbreak-response, urban, hard-to-reach, and refugee-camp vaccination activities.

Table 2: Annual measles cases, incidence and vaccination coverage in Bangladesh, 2015–2026.

Year	Reported cases	Incidence per million	MCV1/MR1 coverage (%)	MCV2/MR2 coverage (%)	Epidemiological interpretation
2015[16,15,20]	240	1.5	97	90	Relatively low reported transmission.
2016[6,15,20]	972	6	97	92	Increasing transmission.
2017[15,20]	4,001	24.7	97	93	Major resurgence, including transmission among displaced populations.

Continued.

Year	Reported cases	Incidence per million	MCV1/MR1 coverage (%)	MCV2/MR2 coverage (%)	Epidemiological interpretation
2018[15,16,20]	2,263	13.8	97	93	Persistent outbreaks in multiple locations.
2019[15,17,20,21]	5,827	35.3	97; CES MR1: 88.6	93; CES MR2: 89.0	Highest annual JRF burden during 2015–2025.
2020[15,20,30,31]	2,410	14.5	97	93	Continued transmission during COVID-19-related service disruption.
2021[15,20]	203	1.2	97	93	Marked reduction in reported cases.
2022[15,20]	311	1.8	96	93	Low reported annual incidence.
2023[15,20.21]	281	1.6	96; CES MR1: 86.0	93; CES MR2: 80.7	Low final JRF classification, but widening survey-based immunity gaps.
2024[15,20,21]	247	1.4	96	93	Low annual reporting, with persistent subnational coverage concerns.
2025[15,20]	132	0.8	90	86	Lowest annual JRF figure in the period; routine coverage declined markedly.
2026, to 28 Jun[19,23-29]	99,207 suspected; 11,710 confirmed	Not comparable with annual JRF incidence	NR	NR	Nationwide high-intensity outbreak; emergency vaccination campaign implemented.

Table 3: Epidemiological, demographic and clinical characteristics of the 2026 outbreak.

Indicator	Findings	Interpretation
Suspected cases[19]	99,207 by 28 June 2026	Extensive nationwide transmission.
Laboratory-confirmed cases[19]	11,710	Substantial confirmed outbreak burden.
Suspected deaths[19]	619	Considerable mortality burden.
Confirmed deaths and CFR[19]	93 deaths; CFR 0.8%	Confirmed fatal outcomes remained substantial.
Hospital admissions[18]	12,318 by 14 April 2026	Major pressure on hospitals and paediatric services.
Average daily admissions[19]	855 per day during 22–28 June	Continued severe hospital burden during epidemiological week 26.
Infants aged <9 months[18]	33% of early cases	A substantial proportion became infected before routine MR1 eligibility.
Children aged <2 years[18]	66% of early cases	Very young children were disproportionately affected.
Children aged <5 years[18]	79% of early cases	Principal outbreak population.
Vaccination status of deaths[18]	Deaths occurred mainly among unvaccinated children aged <2 years	Most reported deaths occurred among unvaccinated children younger than two years
Clinical presentation[23]	Fever and generalized rash: 100%; Koplik spots: 56%	Earlier hospital-based clinical evidence was documented in the Chattogram hospital study.
Incomplete or no vaccination[23]	69% of hospitalized children	Most hospital cases lacked complete vaccine protection.

Table 4: Geographical distribution and high-risk clusters.

Area/population	Reporting period	Epidemiological findings	Risk interpretation
Dhaka division[18]	15 Mar–14 Apr 2026	8,263 suspected cases	Highest early cumulative divisional burden; dense urban settlements were prominent clusters.
Rajshahi division[18]	15 Mar–14 Apr 2026	3,747 suspected cases	Second-highest early outbreak burden.
Chattogram division[18,28]	15 Mar–14 Apr 2026	2,514 suspected cases	Substantial burden, including risks within Cox's Bazar humanitarian settings.
Khulna division[18]	15 Mar–14 Apr 2026	1,568 suspected cases	Significant early transmission.
Barishal division[19]	22–28 Jun 2026	Weekly incidence approximately 8.7 per 100,000	Highest weekly divisional incidence during epidemiological week 26.
Sylhet division[19]	To 28 Jun 2026	Cumulative CFR 1.5%	Highest reported cumulative divisional case-fatality rate.
Dhaka informal settlements[18]	To 14 Apr 2026	Clusters in Demra, Jatrabari, Kamrangirchar, Korail, Mirpur and Tejgaon	Overcrowding and reduced access to routine immunization increased risk.
Cox's Bazar and Bhasan Char[19,28]	To 25 Jun 2026	865 suspected cases; 105 confirmed cases; 5 deaths	Continuing transmission in refugee and humanitarian settings.
Char and hard-to-reach areas[26,29]	2026 campaign	Missed children required boat-based and temporary services	Geographical barriers contributed to persistent local immunity gaps.

Table 5: Multidimensional drivers of measles resurgence.

Domain	Principal driver	Bangladesh-specific evidence	Likely epidemiological effect
Immunization programme[21]	MR1 and MR2 coverage below the recommended level	The CES 2023 reported MR1 coverage of 86.0% and MR2 coverage of 80.7%.	Coverage below 95% may permit the accumulation of susceptible children and continued transmission.
Dose completion[21]	Lower uptake of the second measles-containing vaccine dose	MR2 coverage declined by 8.3 percentage points between CES 2019 and CES 2023.	Lower second-dose completion may increase the number of partially immunized children.
Recent national coverage[20]	Decline in estimated routine vaccination coverage	WHO and UNICEF estimates showed that MCV1 coverage declined to 90% and MCV2 coverage to 86% in 2025.	Declining coverage may have widened population immunity gaps.
Missed children[22]	Presence of zero-dose and under-immunized children	Approximately 70,000 children were reported as zero-dose and about 400,000 as under-immunized in 2025.	Missed and incompletely vaccinated children may form susceptible clusters.
Age eligibility[18]	Infection before eligibility for routine MR1 vaccination	Approximately one-third of early 2026 cases occurred among infants younger than nine months.	Infants who are not yet eligible for routine MR1 may remain vulnerable during periods of intense transmission.
Health-system disruption[30,31]	COVID-19-related interruption of routine immunization services	MR1 service use in April 2020 was almost 50% lower than in April 2019, and the national vaccination campaign was postponed.	Service disruption may have contributed to the accumulation of susceptible birth cohorts.

Continued.

Domain	Principal driver	Bangladesh-specific evidence	Likely epidemiological effect
Supplementary immunization[24-27]	Extended interval between major national vaccination campaigns	A large national campaign was conducted in 2020–2021, while the next nationwide emergency campaign was implemented in 2026.	Children missed by routine services or previous campaigns may have remained unprotected.
Urban inequality[22]	Lower immunization coverage in urban populations	Full childhood immunization coverage was reported as 79% in urban areas and 85% in rural areas.	Unequal urban coverage may contribute to localized immunity gaps, particularly in informal settlements.
Humanitarian and access barriers[19,28,29]	Crowding, population mobility, river-island residence, and difficulty accessing vaccination services	Continued transmission was reported in Cox's Bazar and Bhasan Char, while boat-based vaccination was required in char communities.	Mobility, crowding, and geographical isolation may make routine vaccination and follow-up more difficult.
Behavioural factors[21]	Misinformation, parental concern, and delayed vaccine acceptance	UNICEF identified misinformation and vaccine hesitancy as reported barriers to vaccination uptake.	These barriers may delay or prevent timely vaccination among some children.
Surveillance and data quality[15,18-21]	Differences among surveillance, survey, administrative, and modelled estimates	Case definitions, denominators, reporting periods, and methods varied across data sources.	Data inconsistencies may delay the identification of immunity gaps and complicate interpretation of epidemiological trends.

Note: The factors presented in this table were identified from descriptive, surveillance, survey, modelling, and programmed evidence. They should be interpreted as reported barriers or factors plausibly associated with measles resurgence, rather than as independently established causal determinants. No formal grading of evidence certainty or relative importance was undertaken.

Table 6: Public health responses and remaining gaps.

Intervention	Target population/setting	Reported achievement	Remaining limitation or research need
Routine EPI MR vaccination[16,20,21]	Infants and young children; MR1 at 9 months and MR2 at 15 months	Established national two-dose schedule.	Coverage remained below the 95% target, particularly for the second dose.
National MR campaign, 2020–2021[24,31]	Approximately 34 million children aged 9 months–9 years	Large-scale catch-up campaign completed after postponement.	Susceptible cohorts accumulated following the campaign.
Initial outbreak-response vaccination[25]	More than 1.2 million children aged 6–59 months in high-risk areas	Started in 30 upazilas across 18 districts from 5 April 2026.	Initial geographic scope did not include all susceptible children.
Nationwide emergency MR campaign[26,27]	More than 17.8 million children aged 6–59 months	Free additional MR dose offered regardless of prior vaccination status.	Post-campaign impact and vaccine effectiveness require evaluation.

Continued.

Intervention	Target population/setting	Reported achievement	Remaining limitation or research need
Urban outreach[26-28]	Children in city corporations and informal settlements	Evening, preschool, madrasa, transport-hub, and door-to-door vaccination used.	Continued follow-up is required for missed urban children.
Char-area outreach[29]	Children in river islands and mobile communities	Boat-based delivery and temporary vaccination sites introduced.	Routine service continuity remains difficult.
Rohingya camp vaccination[19,28]	Children aged 6 months–<5 years	More than 166,000 children vaccinated; high campaign coverage reported in camps.	Population mobility and new arrivals may recreate immunity gaps.
Surveillance strengthening[18,19,27,28]	All affected districts	Case investigation, laboratory confirmation, and real-time monitoring intensified.	Standardized case-level vaccination, complication, and denominator data remain limited.
Hospital preparedness and case management[18,19]	High-burden facilities and suspected cases	Isolation, infection prevention, supplies, clinical capacity, and vitamin A provision strengthened.	National data on ICU use, complications, length of stay, and costs remain incomplete.
Research priorities[18,23]	National and subnational evidence systems	The outbreak created an opportunity for vaccine-effectiveness, mortality, seroprevalence, and post-campaign analyses.	Genomic surveillance, adult susceptibility, vaccine hesitancy, and subnational coverage require further study.

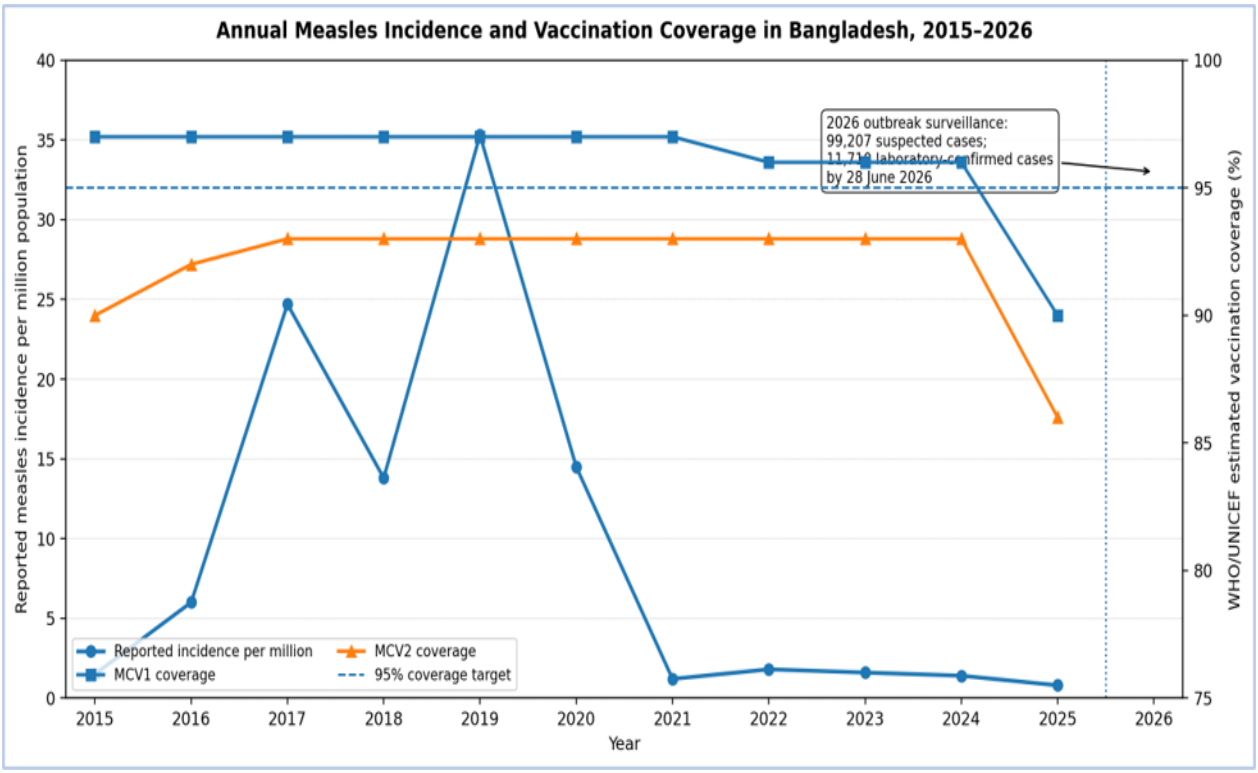


Figure 1: Annual reported measles incidence and estimated vaccination coverage in Bangladesh (2015–2025) with annotation of the 2026 outbreak.

Source: WHO JRF incidence data, WHO/UNICEF immunization coverage estimates, Bangladesh CES findings, and WHO 2026 outbreak surveillance.[15,19-21]

Note: The 2026 annotation presents suspected and confirmed case counts through 28 June; these counts are not directly comparable with annual JRF incidence and are therefore not plotted on the incidence axis.

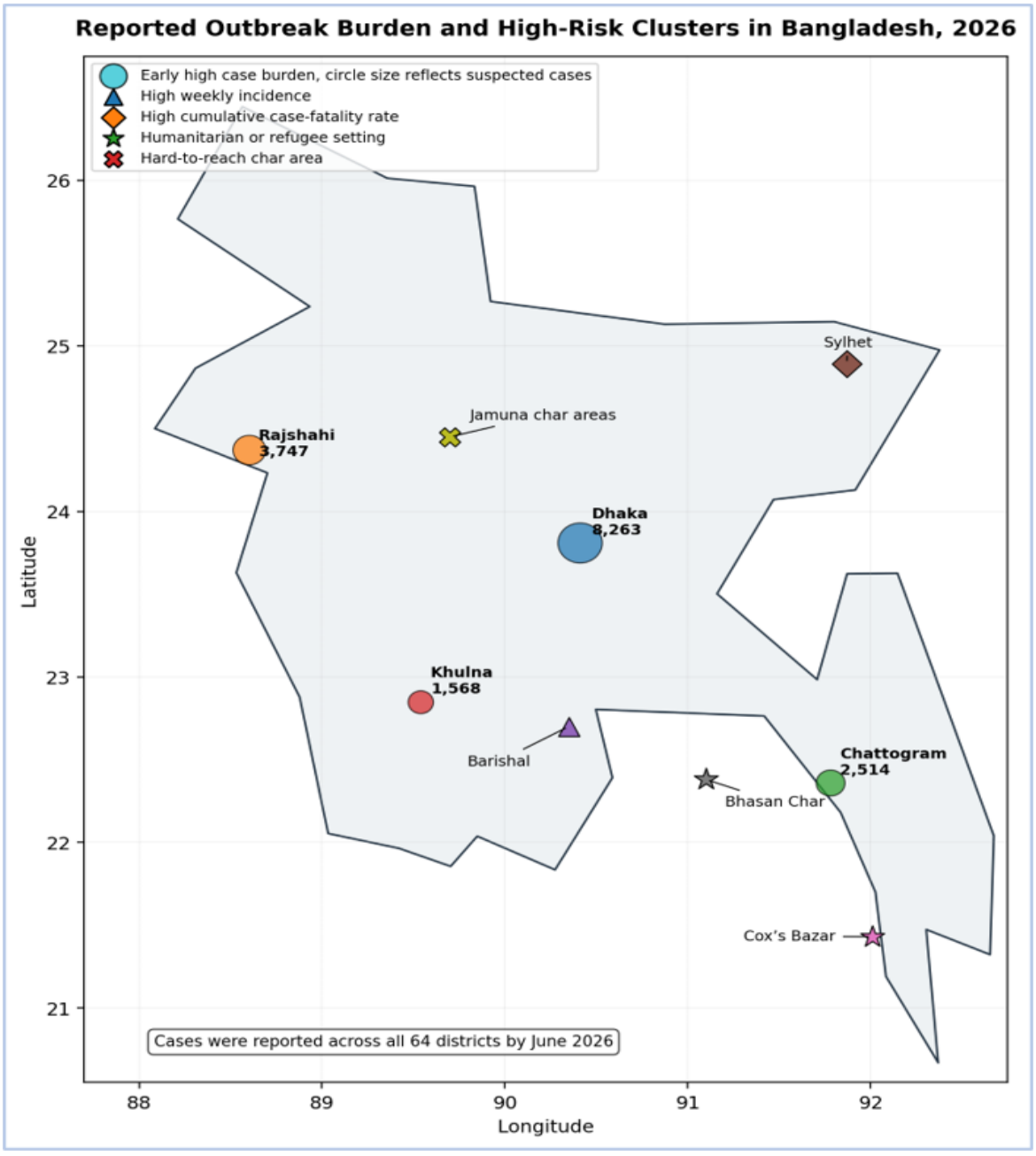


Figure 2: Map of outbreak-affected and high-risk areas in Bangladesh (2026).

Source: Outbreak and campaign reports[18,19,26,28,29]; base country boundary from Natural Earth.[32]

Note: This is a schematic map. Circle size reflects early suspected case counts for four divisions; other symbols identify high weekly incidence, high cumulative case-fatality, humanitarian settings, and hard-to-reach char areas. Marker locations are approximate and do not represent district-level case density.

DISCUSSION

Overall, the present review indicates that the resurgence of measles in Bangladesh represents a reversal of earlier elimination progress rather than a single, isolated outbreak. Historically, measles incidence declined by approximately 84% between 2000 and 2016.[6] Nevertheless, recurrent increases were subsequently observed, including 113 suspected outbreaks in 2018, of which 36 were measles-positive, and 4,181 confirmed cases reported by November 2019.[16,17] Following comparatively low annual Joint Reporting Form figures during 2021–2025, transmission accelerated sharply in 2026. By 28 June 2026, Bangladesh had reported 99,207 suspected cases, 11,710 laboratory-confirmed cases, 619 suspected deaths, and 93 confirmed deaths.[19] Because annual JRF cases, suspected notifications, and laboratory-confirmed outbreak cases represent different surveillance classifications and reporting periods, these figures cannot

be compared directly. However, widespread transmission across all divisions, continued hospital admissions, and substantial mortality confirm a major national resurgence.

Accumulated immunity gaps appear to have been an important factor plausibly associated with the resurgence. According to WHO and UNICEF estimates, MCV1 coverage declined from 96% in 2024 to 90% in 2025, while MCV2 coverage declined from 93% to 86%.[20] Survey-based estimates were lower; MR1 coverage decreased from 88.6% in 2019 to 86.0% in 2023, whereas MR2 coverage declined from 89.0% to 80.7%.[21] Differences between modelled, administrative, and survey estimates may reflect denominator inaccuracies, vaccination-card availability, parental recall, valid-dose definitions and statistical adjustment. Nevertheless, the consistently suboptimal coverage estimates suggest that susceptible children may have accumulated over time. During 2025, approximately 400,000 children were reported as under-immunized and 70,000 as zero-dose, while full childhood immunization coverage was lower in urban than rural populations, 79% versus 85%.[22] Nationwide vaccine shortages, routine service gaps and interruptions associated with the COVID-19 pandemic may also have contributed to delayed or missed vaccination.[18,30,31] However, because the reviewed evidence did not include individual-level causal analyses or formal comparison of the relative contribution of each factor, their independent effects on the 2026 outbreak cannot be determined. Further, the age distribution supports the importance of missed, delayed, or age-ineligible vaccination.

During the initial 2026 outbreak, 79% of cases occurred among children younger than five years, 66% among those younger than two years, and 33% among infants younger than nine months.[18] Within an earlier Chattogram hospital study conducted during 2020–2021, the mean age was 12.2±5.7 months; incomplete or absent vaccination was recorded in 69%, while fever and rash occurred in all children and Koplik spots in 56%.[23] Although these hospital-based findings were not obtained from the 2026 outbreak, they provide relevant earlier clinical evidence regarding measles among young and incompletely vaccinated children in Bangladesh. Clinically, younger age, pneumonia, diarrhea, dehydration, vitamin A deficiency and malnutrition increase the risk of complications and death.

Across low- and middle-income countries, measles case-fatality varies substantially according to age, nutritional status, vaccination coverage, access to care and health-system quality.[33] In addition, modelling suggests that nutritional interventions targeting childhood wasting may complement vaccination and further reduce measles-related mortality.[11] Geographically, the early burden was concentrated in Dhaka, Rajshahi, Chattogram and Khulna divisions, while clusters within Dhaka occurred in densely populated informal settlements, including Demra, Jatrabari, Kamrangirchar, Korail, Mirpur and Tejgaon.[18] By late June, Barishal recorded the highest weekly incidence, approximately 8.7 per 100,000, whereas Sylhet had the highest cumulative case-fatality ratio, 1.5%.[19] Within Cox's Bazar and Bhasan Char, 865 suspected cases, 105 confirmed cases, and five deaths illustrated the continuing vulnerability of humanitarian populations.[19,28]

In urban slums, refugee camps, border areas, transport corridors, and river-island communities, overcrowding and frequent population movement facilitate rapid transmission, while temporary residence and weak continuity of care make vaccination histories difficult to verify. Although misinformation and vaccine hesitancy were also identified, their independent contribution has not been quantified.[21] Similarly, differences between suspected and confirmed case counts suggest limitations in specimen collection, laboratory capacity, reporting completeness and real-time data reconciliation. Regionally, comparable outbreaks have followed immunity gaps and pandemic-related service disruption. In Nepal, the 2022–2023 outbreak resulted in 690 cases and one death, with 86% of cases occurring among children younger than 15 years.[34] Compared with Nepal, the substantially greater burden in Bangladesh may reflect its larger population, broader susceptible cohorts, denser settlements, differences in surveillance definitions, and a longer observation period. Across five Indian districts, a supplementary immunization activity reduced the prevalence of measles zero-dose children from 7.3–28.1% before the campaign to 1.1–6.4% afterward, demonstrating the ability of well-targeted campaigns to reach children missed by routine services.[4]

Globally, measles cases increased by 18% and deaths by 43% between 2021 and 2022.[35] Furthermore, modelling across 112 countries estimated approximately 49,119 additional deaths from COVID-19-related vaccination disruption during 2020–2030, mostly attributable to measles; catch-up activities could prevent nearly 79% of these excess deaths.[13] Consistently, routine MR1 service use in Bangladesh during April 2020 was almost 50% lower than during April 2019 because of lockdowns, workforce disruption, transport restrictions, and fear of infection.[30,31]

Appropriately, Bangladesh rapidly expanded its outbreak response. Initially, more than 1.2 million children aged 6–59 months were targeted across 30 high-risk upazilas in 18 districts.[25] Subsequently, the emergency campaign was expanded nationwide, targeting more than 17.8 million children and using fixed EPI sites, evening sessions, preschools, madrasas, transport hubs, door-to-door visits and outreach services.[26,27] In the Rohingya refugee camps, more than 166,000 children were vaccinated.28 Boat-based vaccination and temporary vaccination sites were also used to reach children living in Jamuna char communities.[29]

Operationally, these measures demonstrate substantial mobilization capacity and attention to underserved

populations. Nevertheless, reactive campaigns cannot substitute for reliable routine immunization. Continued transmission requires assessment of campaign timeliness, denominator accuracy, cold-chain reliability, missed settlements, dose validity and whether children vaccinated before nine months subsequently receive both routine doses.

Limitations

This review has several limitations. Although multiple surveillance reports, coverage estimates, outbreak updates, and clinical studies were included, differences in case definitions, reporting periods, and data sources limited direct comparison. In addition, incomplete laboratory confirmation, possible under-reporting, evolving 2026 outbreak data, and limited nationally representative clinical evidence may have affected the accuracy of burden and severity estimates. Because the review was narrative rather than systematic, selection bias and incomplete retrieval of relevant studies cannot be excluded.

CONCLUSION

Overall, the resurgence of measles in Bangladesh reflects accumulated immunity gaps, declining two-dose vaccination coverage, missed children, and disruption of routine services. Disproportionately, infants, young children, urban slum residents, refugees, migrants, and populations in hard-to-reach areas experienced the greatest risk. Although emergency vaccination campaigns have reached millions of children, reactive measures alone cannot ensure sustained control. Therefore, achieving and maintaining at least 95% coverage with both measles-containing vaccine doses is essential. Alongside catch-up vaccination, stronger laboratory-supported surveillance, digital immunization records, reliable vaccine supplies, community engagement, nutritional support, and equitable outreach are required. Ultimately, durable measles control will depend on a resilient routine immunization system capable of identifying and reaching every missed child.

Recommendations

To prevent future measles resurgence, Bangladesh should maintain at least 95% coverage for both MR1 and MR2 through strengthened routine immunization and regular catch-up campaigns. To reach missed children, mobile, school-based, evening, boat-based, and camp-based vaccination services should be expanded in urban slums, char areas, refugee settlements, and other hard-to-reach communities. Through digital immunization records, unique child identification, reminder systems, defaulter tracing, and real-time vaccine-stock monitoring, delayed and missed doses should be reduced. For outbreak control, rapid case reporting, laboratory confirmation, viral genotyping, and geographical mapping should be strengthened. Within clinical care, early identification of infants, malnourished children, and severe cases should be prioritized, with timely vitamin A, nutritional support, isolation, and referral. To reduce hesitancy, trusted healthcare workers and community leaders should deliver clear, culturally appropriate communication.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Rahman M, Rania SA. The resurgence of measles in Bangladesh: a narrative review. Int J Res Med Sci 2026;14:6008-21.