

Elimination of measles from Bangladesh: progression and challenges ahead

Abstract

Measles is highly communicable and is one of the leading causes of death among young children globally. WHO set a regional goal in South–East Asian Region (SEAR) to eliminate measles by 2020. Bangladesh has taken several initiatives like introduction of second dose of measles vaccine in the national immunization program, strengthening the case–based surveillance system to reach the goal of elimination of measles. Though, Bangladesh has done well to reduce measles cases and measles–related deaths over the past decade but there are some issues that challenge to achieve the goal of elimination– small outbreaks that occur in Sylhet and Cox’s Bazar districts, in Sitakundu where 9 children died, and Rohingya refugees where 60% were children. However, as the deadline for achieving measles elimination is knocking at the door, Bangladesh will have to expand many of its programmatic components at a much quicker pace.

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Abbreviations: SEAR, South–East Asian Region; WHO, World Health Organization; MCV, Measles Containing Vaccine; JRF, Joint Reporting Form; HMIS, Health Management Information System

Mini review

Measles, a highly communicable disease, is one of the leading causes of death among young children globally. Despite the availability of safe and effective vaccines, it has been an issue of concern. Approximately, 134,200 people died globally from measles in 2015 of which most of them were children under the age of 5.¹ Measures to control measles first started in 1980 after the eradication of small pox.^{2,3} However, the World Health Organization (WHO) set a priority for eradication of poliomyelitis than that of measles. In 2000, the issue of eliminating measles was revisited again when the polio cases had decreased. Since then WHO has been setting targets to counter act the consequences of measles related morbidity and mortality.³ Elimination of measles from a country means the absence of endemic measles cases for a period of ≥ 12 months in the presence of a high–quality epidemiological surveillance (that is sensitive and specific enough to detect imported and import– related cases), which is supported by a laboratory network.⁴

In 2013, at the 66th session of the Regional Committee of WHO South– East Asian Region (SEAR), a regional goal was established to eliminate measles by 2020.⁵ Maldives and Bhutan have become the first two nations in WHO South–East Asia Region to be verified for having interrupted endemic measles virus transmission, ahead of the 2020. Maldives has not reported any case of indigenous measles since 2009, and Bhutan since 2012. Bhutan and Maldives launched their Expanded Program on Immunization in 1979 and 1976 respectively. Since then both of them worked diligently to increase access to immunization services.⁶

In 2014, Bangladesh adopted a national goal for measles elimination by 2018.^{7,8} Accordingly, the National Verification Committee for Measles was established in 2015, in agreement with the global framework for the verification for progression toward measles elimination.⁹ World health organization (WHO) recommended measles elimination strategies in SEAR countries to achieve this goal. Achieving and maintaining $\geq 95\%$ coverage with 2 doses of

measles containing vaccine (MCV) in every district, delivered through the routine immunization program or through supplementary immunization activities;

- i. Developing and sustaining a sensitive and timely measles case–based surveillance system that meets targets for recommended performance indicators.
- ii. Developing and maintaining an accredited measles laboratory network.⁷

In this review article, progress and challenges toward measles elimination goal have been highlighted. Bangladesh initiated the Expanded Program of Immunization on 7th April, 1979. Measles vaccine (MCV1) was introduced in immunization program in 1989. Single dose for children aged 9 months and second dose (MCV2) was administered at 15 months of age since 2012. In 2015, estimated measles routine vaccine national coverage increased up to 92% for MCV1 and 81% for MCV2.¹⁰

Apart from routine vaccine coverage nationwide, additional Supplementary Immunization Activities (SIAs) were carried out in 2005–2006, 2010 and 2014. During 2005–2006, 1.5 million children (first phase in 2005) and 34.2 million children (second phase in 2006) aged 9 months–10 years received measles vaccine with 100% administrative coverage. In 2010, 18.1 million children aged 9–59 months received measles vaccine with 100% administrative coverage. In 2014, a nationwide SIA using measles–rubella vaccine reached 53.6 million children aged 9 months–14 years and achieved 100% administrative coverage.¹⁰ Although these efforts protect millions of children from measles, Bangladesh still accounts for a number of measles cases.

In Bangladesh, incidence of measles cases decreased from 40.0 to 6.0 per million during 2000–2016 which constitutes to a reduction up 84%. After implementation of nationwide SIAs there was a drastic decline in the occurrence of the disease. In 2005–2006, confirmed measles cases dropped to 6 from 14,877 (2005). However, the rate of occurrence of the disease was varying in the subsequent years. In 2010, number of confirmed measles cases was 66 which increased to 5,329 in 2011. After introduction of routine second dose of measles in 2012 and nationwide measles–rubella catch–up campaign in 2014, confirmed measles cases declined from 1,793 (2012) to 250 (2015).

But in 2016, measles cases increased with 972 confirmed cases in our country.¹⁰

However, in 2016, a program assessment was conducted using WHO Programmatic Risk assessment Tool for measles¹¹ and, found that 8 districts were at very high risk for measles transmission, 13 districts at high risk, 24 and 19 districts at medium risk and low risk respectively. In 2016, 21 cases were recorded in Sylhet and Cox's Bazar districts and, have continued into 2017 revealing gaps in both routine and SIA coverage¹⁰. The national vaccination coverage conducted in 2015 found that the most common reasons for a child being unvaccinated or partially vaccinated were:

- i. Caregivers were too busy with their other priorities that they did not remember to bring the child for vaccination.
- ii. Lack of information or understanding about when to bring the child for vaccination.

In 2017, the best example was in Sitakundu, Chittagong where 9 children died of measles. These children were also suffering from malnutrition. There are 85 families living in Tripurapara and Madhyam Sonaichhari under Sitakundu upazila which were not brought under the coverage of immunization since they kept themselves away from modern facilities due to their customs. Nevertheless, one would certainly state that this small isolated pocket does not reflect the overall situation of measles in Bangladesh. The new challenge for measles elimination in Bangladesh is Rohingya refugees. Currently, there are more than 800,000 Rohingya refugees living in Bangladesh. About 480,000 have fled Rakhine since August 25, 2017 and thousands more are arriving every day. According to UNICEF, 60% of these new refugees are children below the age of 18. In the third week of September 2017, a vaccination campaign against measles, rubella and polio is underway to immunize 150,000 Rohingya children below the age of 15 in 68 refugee settlements close to the border with Myanmar. The seven-day campaign is led by the Ministry of Health of the government of the people's republic of Bangladesh with support from UNICEF and WHO. With the growing number of Rohingya refugees, UNICEF and WHO are supporting the Ministry of Health by— assisting the Ministry of Health to strengthen routine immunization program, assisting the Ministry to expand the number of doctors, nurses and lab technicians to reinforce maternal, newborn, child and adolescent health services, renovating the delivery and special new-born care units, antenatal and postnatal care corners, and adolescent corners, improving water, sanitation and hygiene in health facilities, strengthening health coordination for a better response at the field level, strengthening early warning system and surveillance for outbreak prone diseases and strengthening health data through supporting Health Management Information System.

In our country, a suspected measles case is defined with fever and maculopapular rash and cough, coryza or conjunctivitis or as an illness in any person that a clinician suspects of having measles infection.¹⁰ High quality sensitive case-based vigilance system for early detection of symptoms, recognizing high-risk locations and populations and, ascertaining improvement in achieving elimination is of paramount importance. Laboratory-supported case-based surveillance for suspected measles was implemented in 2003, by adapting the existing acute flaccid paralysis surveillance system for polio detection. Data are provided from 143 active and 625 passive surveillance sites spread over all 64 districts. Since 2000, national measles case data are reported annually to WHO South-East Asia Region Office through WHO/UNICEF Joint Reporting form (JRF). Bangladesh uses administrative data reported through the National Health Management Information

system (HMIS) to JRF. Measles case-based surveillance indicators reflected underreporting and low sensitivity of the suspected measles case. Key surveillance performance indicators include:

- i. ≥ 2 discarded non measles, non rubella cases per 100,000 population at the national level per year
- ii. ≥ 2 discarded non measles, non rubella cases per 100,000 per year in $\geq 80\%$ of sub national administrative units
- iii. An adequate investigation conducted within 48 hours of notification for $\geq 80\%$ of suspected measles cases
- iv. Adequate specimens for detecting acute measles and rubella infection collected and tested in a proficient laboratory from $\geq 80\%$ of suspected cases
- v. Receipt of $\geq 80\%$ of specimens at the laboratory within 5 days of collection
- vi. Laboratory reporting of $\geq 80\%$ of serology results within 4 days of specimen receipt
- vii. On-time reporting of measles and rubella data to the national level by $\geq 80\%$ of surveillance units.¹¹

Due to lack of awareness and absence of adequate measures for the patients, there could be an upsurge in the incidence of the disease. In addition, non-reporting of those cases that needs to be addressed also contributes to the enhanced occurrence and might substantially be higher than those reflected in the Surveillance data. One way of increasing case-based surveillance sensitivity would be case-based surveillance reporting sites from acute flaccid paralysis reporting units to all health facilities in the country and by using the broad definition of "fever and maculopapular rash".¹² In addition, measles virus genotyping began in 2014 and found that genotype B3 in 2014 and 2015.¹⁰

In order to attain improved track transmission pathway and increased identification of outbreak sources, it is suggested that specimens for genotyping might be collected from more chains of transmission. For preventing nosocomial infection, prevention and control practices to counter act the infection and isolation of measles cases in health care facilities should be strengthened.

Bangladesh has taken several initiatives like introduction of MCV2 in the national immunization program, strengthening the case-based surveillance system to reach the goal of elimination of measles by 2018. But there are some issues that challenge the goal. Outbreaks in Sylhet and Cox's Bazar districts, in Sitakundu, resulted in the death of 9 children and 60% among Rohingya refugees were children. Hence, Bangladesh will have to implement the following measures to overcome the challenges: carry out risk assessments on annual basis; prepare risk mitigation plans; carry out an immediate follow-up measles-rubella SIA all over in our country so that current immunity gap among children aged 9–59 months could be addressed effectively; develop capacity to conduct epidemiologic investigations; and develop outbreak preparedness and capacity to prompt response in identifying and containing outbreaks. However, as the deadline for measles elimination from our country is knocking at the door, Bangladesh will have to implement these measures at a much quicker pace.

Conflicts of interest

None.

Acknowledgments

None.

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