Controlling Rubella

A reflection of how Bangladesh overcame rubella and congenital rubella syndrome
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Investing in immunizations means investing in the world’s future.

— Ban Ki-moon, Former Secretary-General, United Nations
Bangladesh has made commendable strides in overcoming the scourge of rubella and saving large numbers of unborn children from the life-long disabilities congenital rubella syndrome (CRS) is responsible for.

The country has shown leadership and determination, achieving the goal of controlling rubella and CRS two years ahead of the target set by Member States at the Sixty-sixth session of the Regional Committee in September 2013.

Through concerted and steadfast commitment to these aims, and by working with the World Health Organization and other development partners, cases of rubella have decreased from well over 1000 cases in 2009–2010 to 299 cases in 2017.

The country now seeks to better the Regional goal: It aims at complete elimination of rubella. Given the many steps Bangladesh has taken to strengthen health systems, I am confident of its success. Its effective data systems, rapid response mechanisms, and committed health staff have created the framework for the country to consolidate and build on the many gains it has made.

It is, therefore, with great pleasure that I extend my warmest congratulations to the Prime Minister of Bangladesh, H.E. Sheikh Hasina, officers and staff of the Ministry of Health and Family Welfare, as well as the people of Bangladesh for their noteworthy achievements.

Dr Poonam Khetrapal Singh
Regional Director
WHO South-East Asia Region
163 038 357
TOTAL POPULATION

7
DIVISIONS

3 327 304
LIVE BIRTHS

49 824 794
UNDER-15 POPULATION

46/1000
LIVE BIRTHS
UNDER-5 MORTALITY
A highly contagious disease transmitted through airborne droplets when an infected person coughs or sneezes, rubella is an acute viral infection that generally affects children and young adults. Although usually mildly symptomatic in children, in pregnant women rubella can be devastating.

At first sight, the symptoms of rubella may not seem to be too unbearable. A red rash appears in the face and neck area, and then spreads across the rest of the body, typically lasting between one and three days. The patient will have a low-grade temperature, and may also experience nausea, swollen lymph glands and mild conjunctivitis.

If rubella occurs just before conception or during early pregnancy, however, it is far more serious, and can cause miscarriage, fetal death or congenital defects known as congenital rubella syndrome (CRS). CRS may manifest as a defective heart, hearing and sight impairments, thyroid dysfunctions and type 1 diabetes. And yet, these devastating conditions can be easily avoided. A simple vaccination can prevent the lifelong suffering that CRS brings.

Rubella was not recognized as a distinct disease until 1814, when George de Maton, a German physician, suggested that it was separate from mumps or measles. Initially, identified cases were all in Germany, which led to the common name of German measles, while the name rubella comes from Latin, meaning “little red”, and was first used in 1866.

This booklet tells the story of how Bangladesh has risen to the challenge of controlling this preventable disease.
The water lily is the national flower of Bangladesh and is representative of the many rivers that run through the country. Known for its glorious and pristine beauty, the water lily here is a harbinger of a vibrant and healthy future for Bangladesh.

MR: Measles–rubella  
RCV: Rubella-containing vaccine  
MCV: Measles-containing vaccine

*There is no rubella-specific surveillance. Rather all measles IgM negative samples are tested for rubella IgM as per the National Guideline.
PICKING UP THE CHALLENGE

Bangladesh is amongst the 10 most densely populated countries in the world, with an estimated population of 163,038,357. Of these, nearly 15.8 million are under five years of age\(^1\) and therefore must be covered under the routine immunization (RI) programme, in addition to the 50 million under-15s who are within the target age group for the supplementary immunization activities (SIAs). The scale of the challenge confronting the government was indeed considerable.

High population numbers are not the only challenge: Bangladesh also periodically faces the wrath of nature. More than 80% of the population is potentially exposed to floods, earthquakes and droughts, and more than 70% to cyclones. Annual floods, with about a quarter of the land mass inundated with flood waters, combined with high population density mean that a substantial number of people are affected by such disasters. To root out our rubella, the government had to confront the forces of nature in the delivery of its immunization programme.

Cross-border migration, with some estimates showing the Rohingya refugee influx as being close to 1,000,000 arrivals, 60% of which are children, adds to the pressure on the health services. Nonetheless, the government’s swift response in containing a measles outbreak in Cox’s Bazaar in the early part of 2018 and subsequent administration of the measles and rubella vaccine show the strength of the public health response in the country.

Considerable though the challenges are, Bangladesh is meeting them head-on, and has certainly won the battle against rubella and CRS.

\(^1\)Population estimate using cohort component method, with 2011 census as base year
What people want is their basic needs. So I am trying to help people ensure their basic needs: that means food, security, health care, education and job opportunity and a better life.

– Sheikh Hasina, Prime Minister of Bangladesh
LEADING THE EFFORT

The Prime Minister of Bangladesh has strongly supported the efforts of the Ministry of Health and Family Welfare to meet the goal of eliminating measles and controlling rubella and CRS by 2020, which was set at the Sixty-sixth session of the Regional Committee in 2013. Wasting no time to step-up its efforts, Bangladesh launched a measles and rubella catch-up campaign in 2014 to increase the reach of its immunization programme. The Prime Minister herself launched this campaign, reiterating her determination that measles and rubella vaccination coverage should be increased to 95%. During the launch, a little girl, some three years old, impulsively climbed onto the Prime Minister’s lap, thereby becoming a young ambassador for the effort with the words, “I’ve been vaccinated. You should also take the vaccine. Don’t be afraid of the shot. Together, we’ll all be healthy.”
Planning

Planning is the cornerstone of every public health programme and Bangladesh ensured that comprehensive plans were in place to counter the challenge of rubella from the very beginning. Control of rubella and CRS was one of the six objectives of the comprehensive multi-year plan (cMYP) 2014–2018, but going beyond that, Bangladesh is now working towards elimination. Launched in July 2017, the ‘National Strategic Plan for the Elimination of Measles, Rubella and CRS by 2020’ sets out the objectives needed to achieve this goal – by achieving and maintaining at least 95% coverage with two doses of the MR vaccine through routine and supplementary immunization; establishing elimination standard surveillance and programme performance monitoring; maintaining an accredited laboratory; preparing for, responding to and preventing outbreaks; and continuing to inform and educate the populace through advocacy and social mobilization to create a demand for immunization services.

Government of Bangladesh and Ministry of Health and Family Welfare are committed to elimination of measles, rubella and CRS from our country. We will work tirelessly until we know that our children are free of these diseases.

– Mohammad Nasim, MP
Hon’ble Minister, Ministry of Health and Family Welfare
Partnerships

No human endeavour can succeed in isolation. Collaboration between government, international agencies, the private sector, NGOs and volunteers greatly assists the delivery of an effective health care system, to the greater benefit of the people. The Government of Bangladesh fully understands this.

Partnering with international organizations provides a valuable source of knowledge and expertise, ensuring that the government’s health programme is aligned with global developments, and providing vital funds to undertake the delivery of health care. WHO has been working in Bangladesh since 1972, and has collaborated with the government in a number of initiatives, including the current drive to eliminate measles and control rubella and CRS in the country by 2020. The government’s Expanded Programme on Immunization (EPI) is supported by WHO, UNICEF and Gavi, the Vaccine Alliance.

As important as external assistance is intra-government collaboration. The Ministry of Health and Family Welfare receives the support of several other ministries for its programme of immunization. The ministries for home, woman and child, religious affairs, education and agriculture all extend their resources and their expertise, while responsibility for delivery is shared between the Ministry of Health and Family Welfare and the Ministry of Local Government and Rural Development.

Private medical facilities augment those provided by the government, increasing the choice available to people and lessening the pressure on government resources. NGOs and volunteers have a vital role to play in the delivery of the government’s EPI, providing trained vaccinators to carry out the programme.

All these successful collaborations have helped the government to meet its goal of controlling rubella and CRS in Bangladesh.
WHO has a long history of working with the Government of Bangladesh to assist them in delivery of their health-care goals. Although we are able to assist with technical expertise, training and some funding, the execution of the programme is in the hands of the Ministry of Health and Family Welfare. They have shown agility and commitment in overcoming challenges and ensuring that the goals for rubella elimination are met. I extend my heartiest congratulations to the government on the great strides made over the past few decades.

– Dr Bardan Jung Rana
WHO Country Representative
Delivering immunization services to every corner of the country

From 14,074 cases of rubella in 2007 to 299 cases in 2017, Bangladesh has shown remarkable progress in controlling the rubella virus. How did a country with multiple challenges and limited resources manage this, not only within the target time-frame but actually considerably in advance of it?

A key aspect of effective delivery of health-care services is good infrastructure. Bangladesh has a multi-level health structure that is adapted to cater to the needs of urban and rural populations, ensuring that the benefits penetrate right down to the last mile. In rural areas, health-care services are delivered through hospitals at the seven administrative areas, called divisions, and 64 districts. Each district is divided into upazilas (total 491), which in turn are divided into a varying number of unions – there are a total of 4,553 unions in the country, each of which has a health facility. Each union is made up of three wards, and each ward is further divided into eight sub-blocks. In rural areas, in addition to being available at hospitals and clinics, immunization is provided at EPI outreach sites within the sub-blocks on a monthly basis, for a catchment population of approximately 1000 people. Vaccination is administered by government employees – health assistants and family welfare assistants – and trained volunteers.
In urban areas, on the other hand, the delivery of primary health care, including the EPI, is the responsibility of the Ministry of Local Government and Rural Development, which delivers this in collaboration with NGOs and the private sector.

City corporations are administratively divided into wards, where vaccinations take place according to a pre-planned schedule. In urban areas, vaccinations are mainly administered by employees of the municipal and city corporation, and by NGO volunteers.

In both urban and rural areas, the Immunization Coordination Committee oversees the delivery of the EPI and ensures that no child is left behind.

The EPI currently delivers antigens against 10 vaccine-preventable diseases with rubella vaccine being introduced into RI in 2012. A second dose of MR vaccine at 15 months was introduced in 2015.

**Campaigns**

In addition to the RI activities, the country conducted an SIA in 2014 for children aged 9 months to 14 years. Known as a “Catch-up campaign” the activity covered over 53 million children in the target age group, achieving 102% reported coverage. The influx of Rohingya migrants since 25 August 2017 also required a proactive response from the government: Two rounds of MR supplementary immunization were conducted for the high-risk refugee children aged between 6 months and 15 years in different spontaneous settlements/camps. To consolidate these gains and strengthen herd immunity in the vulnerable population, the country is planning to conduct another MR campaign in 2019.
Bangladesh is making good progress in the delivery of its health goals. We are training people to ensure delivery of immunization programmes in all parts of the country.

– Professor Dr Abul Kalam Azad
Director General, DGHS, Ministry of Health and Family Welfare
September 2017 saw a campaign jointly initiated by the Ministry of Health and Family Welfare, WHO and UNICEF to vaccinate all children from the Rohingya camp at Cox’s Bazaar, 135,519 in all, aged between 6 months and 15 years against measles and rubella. By November, however, it was clear that this was not enough, as by 4 November 2017 one death and 412 suspected cases of measles had been reported. Swinging into immediate action, the Ministry of Health and Family Welfare, along with its international partners, stepped up their immunization efforts, targeting some 354,982 children aged between 6 months and 15 years. The measles and rubella vaccine was administered irrespective of the immunization status of the child, at fixed health facilities, through outreach vaccination teams and at entry points into Bangladesh. This swift action, made possible by the robust surveillance system, prevented many deaths amongst Rohingya children.
The rubella vaccine was developed by Maurice Hilleman, an American microbiologist working for an American pharmaceutical firm. Hilleman’s work was licenced in 1969, and then two years later, in 1971, the rubella vaccine that he developed was combined with the measles and mumps vaccine to become the MMR – measles-mumps-rubella vaccine.

Rubella and measles vaccinations are a routine part of the immunization programme of many countries, either as MR (measles rubella) or else as MMR. Bangladesh has been using the MR vaccine in its immunization programme since 2012.
The goal is clear – to have achieved rubella control, Bangladesh must show a 95% reduction in incidence of rubella when measured against the base year (2008). The country achieved the ≥95% reduction in rubella cases in 2014 (381 cases, 97% reduction) which it has since been able to maintain and in fact marginally improve.

To find out if this goal is met, two things are needed – reliable data, and independent verification of this data to see if the goal has been achieved, Bangladesh has taken some innovative steps in these areas. Read further to know about them!

**Confirmed cases of rubella, 2008–2017**

<table>
<thead>
<tr>
<th>Year</th>
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<tr>
<td>2008</td>
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</tr>
<tr>
<td>2009</td>
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<td>2016</td>
<td>165</td>
</tr>
<tr>
<td>2017</td>
<td>299</td>
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</tbody>
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It is critical to vaccinate all children... as living conditions are dire and children are at risk of dying because of crowded living conditions and poor hygiene condition.

– Maya Vandenent
Chief of Health, UNICEF Bangladesh
DATA ACQUISITION AND MANAGEMENT

Bangladesh can be justifiably proud of its robust vaccine-preventable disease (VPD) surveillance programme, the efficacy of which was demonstrated by the swift and effective response to the outbreak of measles in Cox’s Bazaar.

Although CRS reporting was only integrated in 2012, Bangladesh has long understood the importance of data, and the keeping of health records in the country goes back several years. Mandatory reporting of measles and rubella was introduced as early as 2003, and in 2008 case-based measles and rubella surveillance was introduced. CRS surveillance began in 2012.

Data is collected at community, **upazila** and tertiary levels. To ensure that the data is actionable, weekly reports, even if they are of zero cases, are filed for every week, which spans from Sunday to Saturday. Every Tuesday, this report is filed to district and city corporations which further report to the national level. The requirement for zero reporting reduces the possibility of cases going unreported. WHO surveillance and immunization medical officers support this effort at both district and national levels.

Bangladesh has 787 reporting facilities across the country, including 143 active surveillance sites. Data is integrated into a national database, and is accessible via a user-friendly dashboard that provides detailed information for every **zila** at the click of a button. In 2017, rubella cases were reported from only seven districts, with Khulna, Dhaka and Chittagong having the most cases.
Given the quantity of data that is collected on a daily and weekly basis, there is great potential for human error to produce flawed statistics, but thanks to the synergy of the combined efforts of the Ministry of Health and Family Welfare and WHO, an efficient system has been established with clarity on roles and responsibilities and constant monitoring of the system to maintain the integrity of the data. This ensures that the data shows a true and reliable picture.

Surveillance data is shared with officers of the EPI at the Ministry of Health and Family Welfare, and the government and WHO work together, meeting periodically with national and sub-national health managers to discuss the surveillance data, which is also cross-checked on the WHO network. Weekly review meetings of the Technical and Data Team maintain the quality of the data, and monthly WebEx meetings keep open two-way communication across the surveillance network, with information accessible online using the MR Dashboard.

“A state-of-the-art system indeed!”

I think my job is very important in controlling rubella in Bangladesh. This is because I interact with the community and know all about their homes, families and well being. So, when I suspect someone in the community is infected, I bring them to the health facility. Here medical officers carry out complete investigation. They take verbal consent to collect samples and then send these samples to the national lab for confirmation.

“A field worker"
A good system of data collection needs a reliable laboratory where data can be analysed swiftly and accurately, so that action, both preventive and curative, can be quickly implemented. There is one WHO accredited measles rubella laboratory in the country, the National Polio and Measles Laboratory (NPML), located in Dhaka. First accredited by WHO in 2003, it remains the only centre for measles and rubella testing in the country, and is a vital cog in the surveillance machinery. At this laboratory, those samples that are not found to be measles are tested for rubella as per the national guideline.

In addition to confirming or rejecting suspected cases of rubella, the laboratory also plays the role of a virus detective.
Bangladesh has shown a rapid and dramatic decline in the number of confirmed rubella cases since 2010. As the country stands poised to take the next step forward in achieving its immunization goal, there is anticipation to see if the National Verification Committee for Measles and Rubella/Congenital Rubella Syndrome, more commonly referred to as the NVC, would consider that the country has met its target.

The NVC is an independent, stand-alone committee whose 10 members are senior officials in the field of public health. It is responsible for reviewing information and data to monitor progress towards achieving the goal of controlling rubella and CRS. In addition to organizing meetings and workshops, it also conducts periodic field visits to assess the quality of data and validate analysis and assessments, ensuring that these meet the standards set by the Regional Verification Commission (RVC) on Measles Elimination and Rubella/Congenital Rubella Syndrome Control.

The committee was established on 29 October 2015 and is mandated to verify the country’s progress towards the elimination of measles and the control of rubella and CRS.
The Regional Verification Commission, at the third SEA-RVC conference, held in New Delhi in August 2018, certified that Bangladesh has achieved its goal of controlling rubella and CRS well ahead of the target date of 2020.
LESSONS LEARNT

Bangladesh has shown remarkable dedication and determination in rooting out rubella. Some lessons that have emerged from this journey are worth emulating.

**Leadership sets the tone.** Committed leadership that prioritizes the programme spurs its success. By providing support at campaign launches, ensuring adequate funding, providing the resources to execute the programme and fostering partnerships to strengthen it, the leadership has played a positive role in controlling rubella.

**Good data recording is essential.** Improved data quality required a huge effort on the part of the administration to ensure a viable system was in place and all stakeholders were trained to use it. The robust surveillance system in Bangladesh alerted the government to a measles outbreak in time for it to take preventive action, thereby saving countless lives.

**A dedicated workforce makes programme delivery efficient.** Bangladesh is fortunate to have a dedicated and motivated team of trained health-care professionals and volunteers to implement its programmes and deliver health care to its people.

**Every cog in the wheel is important.** In a densely populated country with a vast client base, detailed planning and organization is needed to ensure that every child is covered. Adequate stock levels must be maintained and available at the point of delivery, people must be trained to perform their functions and adequate resources must be available. In Bangladesh, coordinated functioning ensured success.

**The power of technology should be harnessed.** In the age of the mobile phone, SMS messaging is inexpensive, instant and the surest method of getting messages across. The Government of Bangladesh has used it effectively to communicate with parents about vaccination schedules.
Containing the rubella virus is a great achievement, but constant vigilance is needed if it is not to reappear amongst the people of Bangladesh. The government is committed to maintaining a vigorous immunization programme, working towards the goal of 95% coverage of all eligible children. The excellent surveillance system in operation must be maintained and nurtured.

Through timely immunization against rubella and other preventable diseases, the Government of the People’s Republic of Bangladesh will continue to protect its people, now and in the future.
A rubella-free future -
A gift to the children of Bangladesh