A Killer NAILED

A reconstruction of Maldives’ triumph over measles
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“Immunization is a basic right of children in the Republic of Maldives. The government regards children as one of the most important assets of the nation and therefore every effort should be made, without discrimination of a person’s gender and socioeconomic status, to promote welfare and full development of their potential.”

—from the Immunization Policy Statement of Maldives
Foreword

Maldives has once more shown us that when dedicated men and women come together under committed leadership, they can achieve their goals, surely and convincingly. Through visionary leadership and strategic planning, the country has built a strong edifice of immunization against measles, far in advance of the targets set in September 2013, when Member States of the South-East Asia Regional Committee, during the Sixty-sixth Meeting of the Committee, resolved to eliminate measles by 2020.

Close to four decades ago, Maldives, in collaboration with WHO, started its programme of immunization, with the introduction of MCV 1 as part of the Expanded Programme on Immunization. At that time, people would hide in the jungles to escape from being immunized. Today, Maldives has over 95% immunization coverage, with an informed population that understands the need for and benefits of immunization. This journey itself is a tribute to the sustained efforts made at country and local levels to establish effective health systems, gain the confidence of the people, and make initiatives such as the elimination of measles a success. But this is not the end of the tale. Maldives has sharpened its surveillance and response systems to ensure that every suspected case of measles is reported within 48 hours of presentation. In any situation, this would be commendable but, given the challenges of a dispersed population spread over close to 200 inhabited islands, it is truly a testament to the visionary leadership and passionate, well-trained and hard-working health staff that have overcome such odds. Maldives has not seen a case of endemic measles since 2009 and in April 2017, the WHO South-East Asia Regional Verification Commission was convinced that endemic measles transmission has been interrupted throughout the country, making Maldives one of the first two countries of the Region to achieve this success.

Certainly, it is a time to celebrate and I extend my hearty congratulations to the people of Maldives on this remarkable achievement.

Dr Poonam Khetrapal Singh
Regional Director
WHO South-East Asia Region
Population
340,000

Islands
1,192

Administrative atolls
20

Became a republic in
1968

Tourists in 2016
1,286,135
INTRODUCTION

Measles – a killer disease. The virus hides in the air or on infected surfaces, waiting for as long as two hours to attack an unprotected host. Considered an almost inescapable life event in the age before vaccination, measles, the manifestation of infection by the minuscule, hardy, often deadly paramyxovirus, remained unchallenged, plaguing generation after generation.

When did measles first occur? We do not know for sure, but as early as the 11th century CE, Abu Bakr Mohammad ibn Zakariya al-Razi, court physician and director of a large hospital in Baghdad, described measles as a disease “more dreaded than smallpox”.

In the 1950s, a quarter of the children in Maldives did not survive to celebrate their first birthday. Measles was a major killer. Cases of measles in the Maldives gradually decreased after the measles vaccine was introduced in 1981, but this did not sufficiently rein in the virus and in 2002 and 2005, it showed its strength in outbreaks that affected 926 and 1395 people, respectively.

Clearly, business as usual was not effective at keeping the virus at bay.

An ancient myth from Maldives tells of Bihidhaitha, the dhevi whose appearance causes smallpox and measles. Her preferred victims are young and growing girls. She sometimes appears dressed in bright red robes and, at other times, in the avatar of a bent, old crone. But in either case, she brings misery and suffering in her wake.

Adapted from *Folk Tales of the Maldives* by Hasan Ahmed Manik
PICKING UP THE CHALLENGE

Faced with the recurrent threat of measles, Maldives decided to build a house. Not a brick and mortar house, of course, but a complex structure of immunization protection that would shelter all its citizens and keep the pernicious measles virus at bay. No easy task, this, given a population scattered over 198 inhabited islands separated by large tracts of a restive ocean! Adding to this complexity is the varying number of people on the different islands, from a mere handful of families living on remote islands such as Felidhoo (pop 506; 2014) to over 130 000 people living in the approximately 5 sq.km. Malé city, all of whom have to be provided protection. You can imagine how complex this house was to build. Yet, through careful planning and meticulous execution, the master craftsmen leading this initiative set about their task and, with the support and cooperation of an entire nation, build it they did.

Before the measles vaccination was introduced globally, close to 90% of all children under the age of 15 years were infected with measles. Treatment did not, and still does not, exist. Once infected, the disease took its course, leaving its victim to suffer a troublesome rash, fever, runny nose, red eyes and other such ills, malnutrition or even death. In 2000, WHO estimated that globally, 5% of all under-five deaths were caused by measles. Reducing this number was closely linked to the vision of Millennium Development Goal 4 and aimed to fight against measles in the WHO South-East Asia Region.
LAYING THE FOUNDATION

Leadership

A strong foundation gives an edifice the strength to withstand onslaughts and protect its inhabitants. In 2008, the Constitution of Maldives, under Article 23, guaranteed every citizen the right to universal and quality health care. This right was strengthened by the introduction of universal health insurance in December 2011 and further in 2014 with the launch of Husnuvaas Aasandha – health insurance without ceiling. All vaccine and routine immunization costs are borne by the Government of Maldives. Political commitment, combined with high budgetary allocation, ensured that immunization delivery functioned splendidly in the country. The present leadership wears the mantle of commitment to measles elimination and sustainability with determination.

On 26 February 2017, the President of Maldives, Mr Abdulla Yameen Abdul Gayoom, launched the Catch-up Vaccination Campaign from his office in the presence of the Vice President, Mr Abdulla Jihad and the Minister for Health, Mr Abdullah Nazim Ibrahim, and the WHO country representative, Dr Arvind Mathur. Mr Ibrahim has been a vital force in energizing the measles elimination effort, not only by coordinating the multisectoral response, but by personally engaging with people and encouraging those left out to get immunized.

It is a matter of great satisfaction that Maldives achieved the status of measles elimination well before the regional target of 2020. This achievement is the result of the strong political commitment and dedication of our health-care workers at every level of the health system, combined with the collaboration and cooperation of UN agencies and other partners. I congratulate each Maldivian for this remarkable success and thank every citizen for playing their part to ensure that we maintained measles vaccination coverage above 98% since several years. Maldives is committed to sustaining a measles-free status by maintaining high vaccination coverage status amid the challenges of the unique geography and limited human resources.

Mr Abdullah Nazim Ibrahim
Health Minister
Planning

Protecting a nation against disease requires multiple layers of planning to ensure a coordinated and effective response. When the nation comprises close to 1200 scattered islands, the complexity of the task multiplies. Realizing this, Maldives put in place multilayered plans, such as the Health Master Plans of 1996–2005 and 2006–2015, and more recently 2016–2025, which provided information, ranging from wider national-level strategies to detailed community-level plans, to ensure the successful execution of its immunization programme.

The Ministry of Health is at the helm of planning and provision of health care in the country. It is ably assisted by the Maldives Technical Advisory Group on Immunization (MTAGI) in planning activities for immunization and surveillance in the country, including the development of a comprehensive multi-year plan (cMYP) for immunization. Periodic EPI programme reviews in 1994, 2006 and 2013 allowed for continuous improvement and accelerated actions to achieve the desired results.

The Maldivian health establishment focuses on close coordination for achievement of results, using not only traditional means but also innovative technology and social media platforms, such as conducting regular teleconferences, and using Viber, Twitter, Instagram and Facebook for social mobilization and awareness to overcome the challenges inherent in the country setting.

With a primary health centre (PHC) on every inhabited island, our task of eliminating measles by 2020 became easier. We mobilized the entire system, built a detailed elimination strategy and ensured that the guidelines therein were followed all the way down to the microplan for each island.

Permanent Secretary
Ministry of Health
Infrastructure

A dispersed population presents a conundrum in providing shelter from disease. In earlier times, when few islands had health facilities, hospital boats, such as the Golden Ray, were the lifeline for health care to the islands. Subsequently, with the expansion of the public health-care system, the human and material capacities also expanded.

Each inhabited island is now provided with a health facility, permanently manned by at least one medical doctor, who also provides support for the diagnosis and management of vaccine-preventable diseases (VPDs) such as measles or rubella. In addition, surveillance activities or an outbreak response are reinforced. Trained nurses are available on the islands and it is their responsibility to administer vaccines.

Each island has a health facility for basic health services, equipped with a pharmacy that provides prescribed drugs free of cost. Atolls also have adequate facilities for maintaining the cold chain when transporting vaccines, medicines or samples for testing to the laboratory. Specialty hospitals, catering to 5000–15 000 people, are available for groups of 2–4 atolls, while tertiary care and a WHO-accredited laboratory are available in Malé.

Health infrastructure in Maldives is largely the domain of the public sector, although the private and voluntary sectors do play a role, especially in Malé, where more than 70% of the 65 registered private health-care facilities are located!
We are pleased to share that the National Immunization Programme has contributed to the good health of the Maldivians. Importantly, the programme is exclusively funded by the Government of the Maldives. Polio has been eradicated, and neonatal tetanus and measles have been eliminated. The country has maintained near 100% coverage for vaccines in its programme during a decade or more. The programme has added hepatitis B, rubella, mumps and Haemophilus influenzae B vaccines in its package. Further, the Maldives also provides traveller’s vaccine, e.g., influenza, yellow fever, meningitis, and vaccination for Hajj and Umrah pilgrimages.

Director General of Public Health
Number of cases of measles

- 1995: 3070 cases
- 2002: 926 cases
- 2005: 1395 cases
- 2006: 47 cases
- 2008: 2 cases
- 2009: 6 cases
- 2010-2016: 0 cases
In 1976, with a partnership between Scout Aid Denmark and WHO, the National Programme on Immunization and Travel Health (NPITH) started in Maldives. However, measles vaccine was not part of this immunization programme. In 1981, another big measles outbreak was reported in Maldives, where 1479 people were affected. This was a major eye-opener for the government.

Measles vaccine was introduced in parts of the country and in 1983, the vaccine was included in the NPITH, and continued as part of the National Expanded Programme on Immunization (EPI) in 1985. This marked the official beginning of the fight against measles in Maldives.

The National Immunization Programme, with technical support from WHO and Maldives Technical Advisory Group on Immunization (MTAGI), conceptualized, planned and implemented activities that resulted in the decline of measles cases in the country.

As a result of the massive public health response to the goal of eradication of poliomyelitis, set during the Forty-first World Health Assembly in 1988, a blueprint was established against vaccine-preventable diseases. This provided the framework for the measles elimination campaign.
Vaccination

In Maldives, the 12 years between 1976 and 1988 saw intense activity in immunization. The immunization programme, or pillar, started in 1976 as the NPITH combating five vaccine-preventable diseases – diphtheria, whooping cough, tetanus, poliomyelitis and tuberculosis. Measles vaccine was introduced in Malé in 1981. In 1985, the EPI took immunization to all the 198 then-inhabited islands. Since 1994, it has been made compulsory to have all childhood vaccines completed for entry of children to schools, thus increasing the felt need for vaccination in the community.

The second dose of measles vaccine was introduced as MMR in 2007.

I always ensure that vaccines are properly handled, maintaining the appropriate temperature and hygiene standards from the time the vaccine is received till the child gets vaccinated. I also always ensure that each and every one is given full information about the importance of maintaining immunization coverage by getting his/her child vaccinated at regular intervals.

A vaccinator
“My grandmother had 12 children – 4 of them are alive; my mother had 5 children but 2 died. I had 9 children and all of them are alive and healthy.”

Jeeza, 34-year-old mother of 9 children, Nilandhoo, South Maldives
Immunization Campaigns

The early years of the measles immunization campaign are a testimony to the grit and determination of the Maldivian health force, which faced insurmountable odds to deliver vaccinations to populations across the country. Vaccinators would set sail for the islands, in water taxis and boats, to carry out supplementary immunization activities during 1995–1997, armed with cold boxes and other equipment. They travelled as much as 8–10 hours between islands, staying away from home and family for extended periods of time, struggling against all sorts of hazards – turbulent seas, fire on board, long walks inland carrying their precious cargo of vaccines, and poor communication facilities. But however bad the experiences they faced, the vaccinators never gave up. Through their valiant efforts, the number of measles cases reduced over the years, although the disease never quite went away.

And then, in 2002 and 2005, measles raised its head, reminding the health authorities that it was still there.

After the campaign of 2017, Maldivians could proudly say, “I got my dose!” as the country was ready to achieve a measles elimination status.
Community participation

When community involvement in a government-led activity is high, the results tend to be spectacular. As Maldives waged its challenge to keep measles out, it ran special campaigns to increase coverage of the vaccine, including among men up to the age of 25 years and women up to the age of 35 years. The campaign in 2005 achieved 82% coverage, but this was not enough. The follow-up campaign in May 2006 targeted 144,997 people. Although this may not seem large, it included more than a quarter of all Maldivians. The coverage crept up to 85%. When one additional dose of MMR vaccine was introduced in the national immunization schedule at the age of 18 months in 2007, Maldives was on the home stretch. The incidence of measles reduced to zero and no case of measles has been reported since 2009.

In Maldives, communities are highly committed and participate in the immunization campaigns. Atoll-level staff works closely with the island-level health staff who, in turn, work with the community to identify timings and locations that suit local needs. Care is also taken to ensure that the routine work of the health facility is not disrupted. Widespread publicity campaigns on TV, FM radio, social networking sites such as Facebook, Viber and others, ensure that people are informed of the activity well in time. Groups of volunteers go from house to house, distributing invitation cards to members of the target group and urging people to participate in the campaign. At one time, in the 1980s and 1990s, when people heard there was to be an immunization campaign, they would run and hide in the jungles, but today, thanks to effective information-sharing and education, people come out voluntarily to participate in the activity, helping to achieve the >95% target coverage.

Volunteers play an active role to ensure community participation and make vaccination drives effective, such as the Catch-up Vaccination Campaign for measles. They also assist in spreading information about vaccination events, managing vaccination booths and allaying fears among people regarding vaccination. Photo opportunities and camaraderie lend immunization campaigns in Maldives an almost celebratory tenor!
Partnerships

Partnerships lie at the heart of the successful health structure in Maldives. As early as the 1950s, the World Health Organization (WHO) started working in the country. The first UN agency to open its office in Malé in 1965, its active engagement has helped align the country’s health programme with ongoing developments in the world. As its engagement expanded, WHO, together with other UN agencies such as UNICEF and international partners such as Centre for Disease Control (CDC) and Federation of Red Cross and Red Crescent, provided significant technical assistance for the EPI and other public health initiatives. WHO, playing a guiding role in building the island’s capacity for strengthening the surveillance and immunization systems, provided guidance and inputs on formulation of the National Development Plans and Health Master Plan, addressed equity concerns as well as specific health problems, and integrated health and human development issues into public policies.

The WHO Country Office in Maldives has played a crucial and diverse role in the fight against measles. Through provision of technical and financial resources at all levels of planning, review, training and operations, it has helped the Ministry of Health to establish a robust framework for measles elimination. WHO’s assistance has accelerated efforts to rid Maldives of measles in 2017, well before the regional target of measles elimination by 2020. WHO helped to develop key strategies, providing expertise in conducting training on the EPI and vaccine-preventable diseases, establishing surveillance protocols, reviewing the programme, building laboratory capacity and logistics management, creating community awareness, and supporting programme-related activities.
In Maldives, leading from the front, the Health Minister coordinated efforts to make measles elimination a multisectoral triumph with many ministries joining hands with the Ministry of Health to ensure the success of the most recent MR vaccination drive. The Ministry of Education provided assistance in reaching out to schools, the Ministry of Tourism facilitated vaccination in resort islands through mobile teams of vaccinators, as did the Ministry of Housing and Infrastructure, and the Ministry of Economic Development for the industrial islands. Ministry of Tourism, including private resorts too, did their bit, working with local hospitals on health issues as required, providing resources when there was a shortfall and, of course, at the most basic level, cooperating to ensure their workers were sent for immunization. At the local level, the councils worked closely with the local health authorities on immunization and other basic health services. The adage “many hands make light work” has been truly effective in the context of Maldives.

It is enthralling to be part of Maldives’ quest for eliminating measles. In the fight against diseases, it is important to dream of victories that benefit the nation but more importantly, her people. The Republic of Maldives dared to dream of such victories. It has not reported any cases of measles since 2009, maintained high immunization coverage and, with the MR Campaign in 2017, it surely has fast-tracked elimination of measles within this year – well before the regional goal of measles elimination. At the heart of this achievement lies the collaboration and partnership of several stakeholders – be it with the UN and international agencies, different ministries, private or public sector, schools or civil society, but most importantly, with the people who are committed to make Maldives a healthy nation with healthier generations.

Dr Arvind Mathur
WHO Country Representative
Measles elimination means that for 36 months, there has not been a single reported case of indigenous measles. Not a single case in the entire inhabited islands! How do we track this? It sounds akin to looking for a needle in a haystack. Who has the authority to decide this question and how would they know that the virus that held sway for many years has now lost its teeth?
Surveillance

Surveillance is a complex activity involving detection, notification and investigation of suspected cases using standard case definitions (a set of criteria that define a disease). In Maldives, due to an efficient surveillance system, detecting even a single case of measles anywhere in the country within a mere 48 hours has become a matter of course.

Since 1 January 2017, and in keeping with WHO guidelines, Maldives widened its surveillance activities to include all cases of fever and rash as “suspected measles cases”, an effective step in ensuring that measles does not sneak back into the country.

Every public health facility is a reporting site for measles. Within 48 hours of presenting, a suspected case of measles is evaluated using the standard case format. Throat swabs and blood samples are collected for transportation to the central laboratory at the Indira Gandhi Memorial Hospital (IGMH) in Malé, maintaining the cold chain, of course. All positive measles cases are immediately notified to the Health Protection Agency. This rolls out the response plan to detect any evidence of transmission of disease and to stop transmission. In addition, registers and records are actively searched at the health facility to ensure that no case has been overlooked prior to filing their weekly report. Weekly reports are filed regularly and meticulously, despite carrying the happy status of “zero cases”.
Laboratories

Every modern edifice needs an alarm system to ensure early warning and rapid response to an emergency, whether it is external, like a burglary, or internal, like a fire. Laboratories sound the alarm when there is a confirmed case. At the same time, a virology profile is run on the blood sample that detects the type and source of the virus.

Molecular epidemiology analyses the unique genetic profile of the virus in an infected person. Like fingerprints, these are unique. But when the laboratory finds a pattern that is close, it can draw linkages between the cases and track its origin and movement across borders, atolls and islands. This helps surveillance track the movement of the virus from place to place.

The Indira Gandhi Memorial Hospital (IGMH) in Malé was first accredited by WHO in 2010. Since then, it has been the only centre for measles testing in the entire country. With its comprehensive database of all suspected cases of measles, and as a part of the global measles–rubella network of laboratories that share information, the laboratory plays a significant role in measles elimination, not only in Maldives but also in the South-East Asia Region.

The IGMH laboratory is the national reference laboratory for measles. It started measles testing in 2000. It performs measles serological testing and supports case-based surveillance. The lab technologists have been trained to do measles testing according to the WHO protocols and are using kits provided by WHO. WHO accredited the measles lab in 2010 and 2014. We are also using the WHO proficiency panel for measles serology and molecular panel, and performing well.

Dr Milza Abdul Muhusin
Laboratory head
No house can be occupied without being certified as safe and habitable. Maldives worked hard to achieve the status of “no measles”, but it needed an independent “pass” certificate before it could be sure it had eliminated the measles virus.

Verification Committee

In 2015, the National Certification Committee for Polio Eradication metamorphosed into the National Committee for Verification of Measles, Rubella and Congenital Rubella Syndrome, based on the WHO South-East Asia Region Resolution of 2013 that called for measles elimination from the Region by 2020. This independent, three-member committee tracked the progress being made in elimination of measles and other diseases, collecting, analysing and validating national data, with the assistance of a national secretariat. Strong coordination was maintained between the National Verification Committee (NVC) and other branches of the initiative, such as immunization, surveillance, laboratory, atolls and islands, and school health, to pursue the goal of measles elimination.

In 2017, the NVC’s satisfaction with the results paved the way for Maldives to approach WHO for the final touch – verification that it had successfully eliminated endemic measles.

We have not had a reported case of measles since 2009. The members of the National Verification Committee, with the combined mandate of measles and polio elimination and rubella control, worked hard to ensure that the National Verification met the standard of Regional Verification requirement set by the WHO Regional Office for South-East Asia. All the documents of fever with rash cases were scrutinized, field visits made and awareness programmes conducted for health professionals. The final push was given to monitoring of the MR campaign and political advocacy. I appreciate the committed high professional work of the NVC members in successfully eliminating measles from Maldives ahead of the regional target of 2020. Now that polio, neonatal tetanus and measles have been eliminated, we hope to be able to eliminate rubella ahead of regional rubella control date set by the Regional Office.

Dr Abdul Azeez Yoosuf
Chairman, National Verification Committee
Closing the door on measles

And so, on 20 April 2017, the South-East Asia Regional Verification Commission for Measles Elimination and Rubella/CRS Control (SEA-RVC), an independent body of WHO, verified that Maldives is now free of measles. This spirited nation has shown that it is capable of reinventing itself, finding new ways of dealing with old problems. It has the ability to protect its people and take them from the backwaters to the forefront of development, overcoming myriad challenges – whether related to climate change or disease.
Lessons learnt

When quality building materials are crafted by experts, the results are bound to be remarkable. In building the edifice of measles elimination, leadership, planning and implementation worked together to energize the entire nation in fighting the measles virus.

Leadership invigorates a programme. The commitment and involvement of the leadership of the country, bolstered by a strong immunization policy and strategic vision, brought focus to the measles elimination effort and gave it the stature of a national campaign.

Planning pays dividends. Detailed plans made for every level ensured that there was alignment with the national plan. It enabled efficient use of resources – human, financial and material – and prevented both overlap of responsibilities and “falling between the gaps”. Clarity of roles was ensured.

Returns on investment in health systems and infrastructure are high. Complete elimination of diseases such as malaria, polio, filariasis and measles is a testimony to how complete government financing can deliver and sustain achievements in the health sector.

Human capital is priceless. A highly motivated, passionate and incentivized team of programme and surveillance managers and health staff are pivotal to the delivery of health services. Good human resource practices must be continued, such as the appreciation awards given to health facilities, acknowledging the contribution of health workers to the National Immunization Programme in 2012.

Coordination is the key. The strong coordination among various ministries and departments, local government bodies, partners and with the Maldives Technical Advisory Group on Immunization, former National Committee on Immunization Practices (NCIP) and the National Programme ensured that every arm of the system worked together in a seamless fashion.

Information-sharing ensures appropriate responses. No matter how well individual components work, systems fail when they work in vacuums. In Maldives, the swift flow of information has been pivotal to the successful elimination of measles in the country.
Protecting the future

The measles virus survives. Hidden in the shadows, this hardy antagonist waits for the door to be left ajar to slip in and spread its malaise once more. Vigil has to be maintained to hold this tiny tyrant at bay. Generations later, when Maldives has been measles-free for many years, the high coverage of measles vaccine must be maintained – always above 95%; but the closer to 100% coverage, the better. Hawk-eyed surveillance and continued testing of suspected cases, combined with an aggressive and well-managed response to import-related cases, are crucial to preventing the disease from jumping back into the system.

The house must remain protected. Not only today, or tomorrow, but for generations to come.
I took my shot!

I am proud to do my part to eliminate measles from Maldives.

This is a gift to the future generations, to be treasured.