Chapter 11
Leveraging Health System Gains Towards Eliminating Mother-to-Child Transmission (EMTCT) of HIV and Syphilis: How Maldives Became the Second Country in WHO South-East Asia Region to Achieve This Feat

Ibrahim Nishan Mohamed, Abdul Hameed, Abdulla Muaaz Adam, and Shushil Dev Pant

Abstract Maldives eliminated mother-to-child transmission of HIV and syphilis in 2019, joining the first few countries in the world to ensure a generation free of these deadly diseases. Maldives was the second country in the WHO South-East Asia Region to achieve this feat, after Thailand. Maldives has a low-level HIV epidemic with very few known cases of HIV infection among Maldivian citizens living in the country. The elimination of mother-to-child transmission (EMTCT) programme exceeded the 95% targets set for process indicators, in particular, ANC coverage, testing for HIV and testing for syphilis. Maldives' success is attributed to its proactive, persistent and long-term public health measures, initiated even before the first case of HIV infection was detected in the country in 1991. The country's AIDS Control Programme, launched in 1987, prioritized creating awareness, preventing HIV transmission with a focus on the at-risk population, while also providing quality care, support and treatment to people living with HIV/AIDS and syphilis. A unique feature of the country's AIDS control programme has been the total integration of all health services, including preventive services, into the general health system. Prevention of mother-to-child transmission has been a major component of the National Strategic Plan for Prevention and Control of HIV/AIDS 2014-18. All public and private hospitals and health centres in the country offer a range of health services, such as universal access to antenatal care and screening for HIV and syphilis. These

I. N. Mohamed (✉)
Health Protection Agency, MoH, Male, Maldives
e-mail: nishan.ahmed@health.gov.mv

A. Hameed
National HIV Program, Health Protection Agency, MoH, Male, Maldives

A. M. Adam
RMNCAH Program, Health Protection Agency, MoH, Male, Maldives

S. D. Pant
Public Health, WHO, Male, Maldives

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concerted and consistent efforts had ensured low transmission of HIV and syphilis for several years.

11.1 Background

The Republic of Maldives has a unique geography with 1192 coral islands that are grouped as a chain of 26 atolls. Dispersed over 187 of these small islands is the population of 402 071. While 51 of these islands have less than 500 people, only four islands have a population more than 5000. More than 65% of the population lives in or close to the capital city in Greater Malé region. Maldives has made significant progress in human and social development over the past decades, moving from low- to upper-middle-income status. For the past two decades, the tourism sector has accounted for nearly 19.9% of the gross domestic product (GDP) [1]. The total number of tourist arrivals for the year end of 2019 were 1.7 million, a 14.7% increase on the previous year [2].

A four-tier referral system is followed for health-care service delivery in Maldives. A public health unit has been established in each atoll and island health facility to provide basic services, like immunization, directly observed treatment, short-course (DOTS) for tuberculosis (TB), health awareness and advice, and reproductive and child health services. The island-level health facilities refer those patients who require more advanced or specialized care to higher-level health facilities in the atolls, regions and central levels. The health system in Maldives faces several challenges, including due to geographical and extreme weather-related events. Despite such challenges, through a primary health care approach, high-level commitment to health, sustained high investment of more than 9% of GDP for health [3] and systematic reforms to the health sector, Maldives ensured significant progress towards improving the health of its people.

11.2 How EMTCT is Organized Within Maldives' Health System

The Health Protection Agency (HPA) is the central public health agency of the Government of Maldives. The Director-General of Public Health leads the HPA. Mandated by the Public Health Act of 2012 [4], HPA functions as a department within the Ministry of Health (MoH) and has five divisions—Public Health Preparedness and Surveillance; Communicable Disease Control; Population and Reproductive Health; Environmental and Occupational Health and Health Promotion and Chronic Disease Control; and a Public Health Inspectorate.

The National HIV Control Programme is placed within the Communicable Disease Control Division and is responsible for developing programmes for those

at high risk, collection of programmatic data and providing services for patients, including antiretroviral (ARV) drugs. The Programme has also developed and trained people to provide voluntary counselling and testing (VCT) services and coordinates the provision of VCT services across the country. The National Strategic Plan for the Prevention and Control of HIV/AIDS (2014–2018) [5] guides national efforts to maintain the low prevalence of HIV in Maldives. The AIDS programme is fully integrated within the health system, including preventive services for PLHIV. Equity and rights-based approaches helped ensure universal health coverage enabled by a universal health insurance system. In addition to HIV, the programme also coordinates activities for prevention of sexually transmitted infection (STI), including reporting and standards of treatment. Since elimination of mother-to-child transmission (EMTCT) is a cross-cutting issue, EMTCT work is assigned within HPA to a working group from the HIV programme and the maternal and child health (MCH) programme and includes heads of Communicable Disease Control and Population Health divisions as well as the senior leadership of HPA. Prevention of MTCT of HIV and syphilis infection is given special attention within the reproductive health programme. This mechanism for overseeing the EMTCT work at field and HPA levels lays a strong foundation for elimination work.

11.3 Leaping to EMTCT from a Springboard of Maternal and Child Health Services

Maldives has a strong health system, particularly the MCH services. Over the past few decades, the health status of people in Maldives has improved significantly. Life expectancy was 75 years for females and 73 years for males in 2016 [6]. There is at least one health facility in every inhabited island in Maldives. In each of these island-level health facilities, health-care provision is ensured by at least a qualified doctor, nurse and public health worker. Other than an outpatient department (OPD) and pharmacy, a delivery room and inpatient beds are part of a minimum infrastructure in these facilities. Services for reproductive health issues and STIs are inbuilt in these facilities.

As a result of its health system investments, Maldives has demonstrated significant progress in reducing maternal and child mortality rates. The infant mortality rate had dropped significantly to 8 per 1000 live births by 2014 [7], with most of the infant deaths occurring in the neonatal period (Fig. 11.1). Similarly, the maternal mortality ratio (MMR) in Maldives had also fallen from 69 per 100 000 live births in 2006 to 44 per 100 000 live births in 2016 [7]. The declining trends of HIV and syphilis in Maldives are depicted in Fig. 11.2 and 11.3, respectively.

According to the Maldives Demographic Health Survey, 2016–2017 [8], nearly all mothers register in ANC services in the first trimester itself, give birth at a health facility, and all deliveries are assisted by skilled attendants or providers. Existing policies and organizational structures in the country support good integration of health

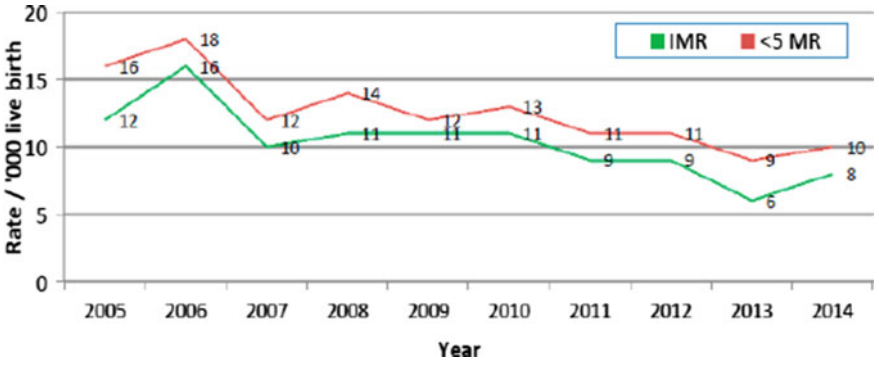


Fig. 11.1 Infant mortality rate (IMR) and under-five mortality in Maldives, 2005–2014. *Source* Maldives health profile, 2016

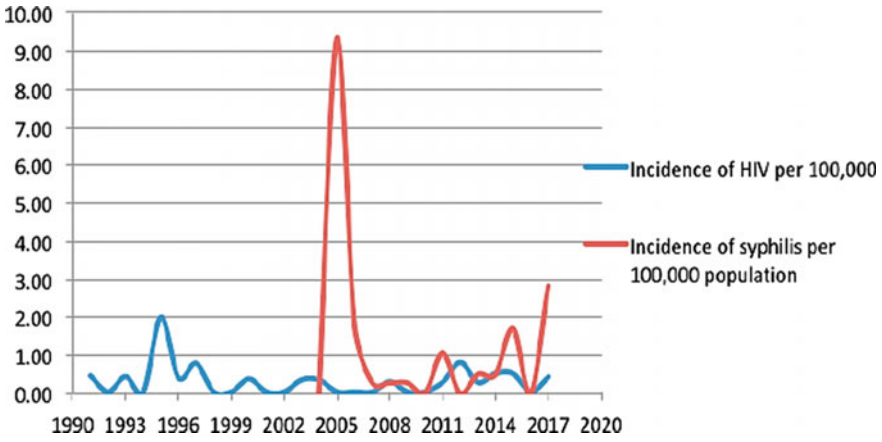


Fig. 11.2 Incidence of HIV and syphilis per 100 000 population in Maldives. *Source* National programme data, HPA, as presented in the National Validation Team (NVT) report

services and, in particular, reproductive health and HIV services. Functional linkages also exist between public and private health facilities. Despite some variability in how antenatal care (ANC) services are organized at different service delivery levels, and how screening is conducted, overall coverage was noted to be very high. Of the estimated 7000 annual pregnancies in Maldives, 98% attend ANC, and deliver in hospital [8].

Maldives was gearing up preparedness to deal with HIV at least four years before the first person tested positive for HIV in 1991. Since then, the number of new infections has consistently stayed low and there is very low prevalence of HIV. Since Maldives conducts nearly 100% of deliveries in institutional settings, they indicated readiness and, as advised, constituted a National Validation Committee (NVC) for EMTCT of HIV and Syphilis in 2015 [9].

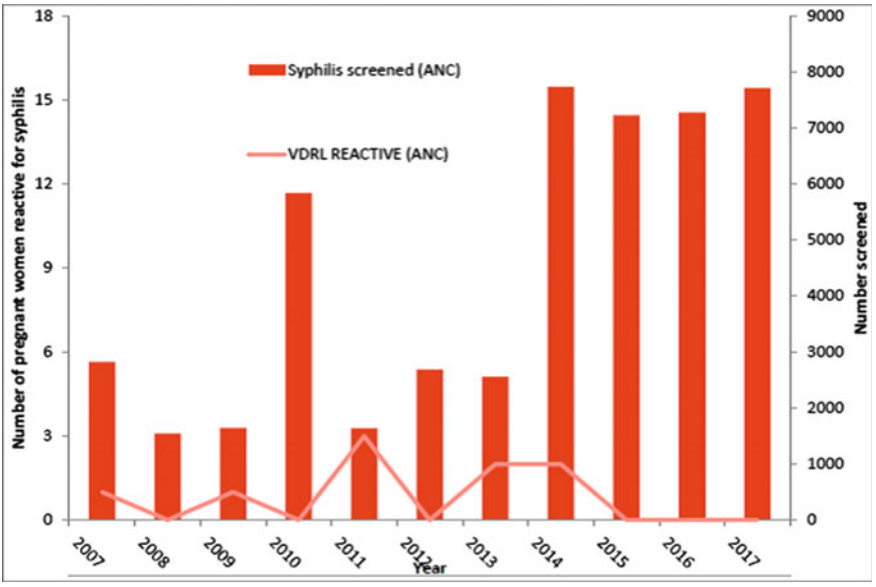


Fig. 11.3 Syphilis screening and declining syphilis positivity trends among antenatal care (ANC) attendees, 2004–2017. *Source* National programme data (monthly surveillance report) as presented in the NVT report

After verification of the data and its sources, the NVC analysed it against the EMTCT global criteria and submitted a formal request along with the Committee's report to the Regional Director of the WHO Regional Office for South-East Asia in August 2018 to facilitate the validation process for Maldives. Accordingly, a Regional Validation Team (RVT)—an independent body of experts—was convened by the Regional Validation Secretariat (RVS), supported by the Regional Office. The RVT undertook its review mission to Maldives during 8–14 September 2018 and submitted their report to the RVS on 23 September 2018.

The mandate of the RVT was to look at progress according to global guidelines for validation of elimination of mother-to-child transmission of HIV and syphilis [10]. As such, several issues pertaining to EMTCT efforts in Maldives featured in the RVT mission, including strength of the health system, populations covered, epidemiology of HIV and syphilis, and the quality and comprehensiveness of programme responses to HIV and syphilis. Sustainability of EMTCT being one of the main areas under consideration, the RVT also assessed the availability of data systems for monitoring of ongoing EMTCT, as well as broader HIV and syphilis prevention efforts and early identification of problems.

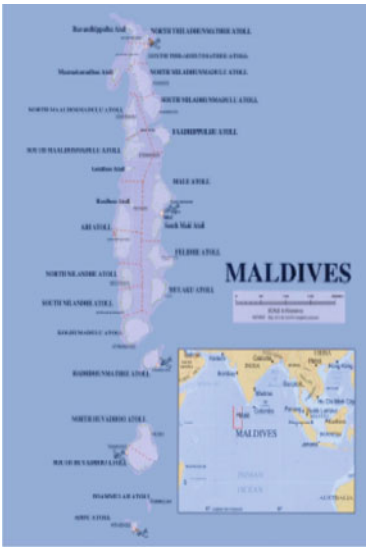
The validation process was well deliberated over 4 years and is depicted in Table 11.1.

Table 11.1 Timelines of the validation process in Maldives

Dates	Activities
November 2015	NVC was formed with a few members representing important areas and first meeting held (decision, plan and time line endorsed)
December 2016	Four national validation teams formed (Date, Programme management, Laboratory and Human rights)
January 2017	Second meeting of the NVC held to review progress and provide guidance
February–March 2018	National data audit conducted in 20 Atolls
1 August 2018	NVC meeting to endorse the final draft national report
6 August 2018	Formal request to the Regional Director, WHO Regional office for South-East Asia to facilitate the validation process
8–14 September 2018	Regional validation team mission to Maldives
23 September 2018	Regional validation team report submitted to Regional validation secretariat
12 June 2020	Review by GVAC and validation

11.4 Addressing Challenges by Capitalizing on Opportunities

1. *Overcoming health challenges due to geographical diversity.* The population of Maldives is small but is geographically dispersed over the archipelago, raising considerable logistical and organizational hurdles for the delivery of health services to all its inhabitants. The Government of the Republic of Maldives has taken on this challenge and put in place an extensive physical health infrastructure that reaches all the inhabited islands. A strong commitment to universal health coverage (UHC) came up through the introduction of the *Aasandha* national health insurance system in 2012, which ensures that free health care is available to meet most of the health needs of Maldivian citizens [11]. Good links have also been developed between the public and non-public health-care systems towards this objective.



***Aasandha* ó Maldives National Health Insurance system**

Aasandha, the universal health insurance scheme, under the Health Insurance Act, provides free medical services to all Maldivian citizens. This scheme covers common health conditions for all nationals. The national ID card is used to access services. At inception, the scheme applied an MVR 100 000 annual coverage limit for each person. There are no copayments or deductibles. However, this limit/cap was scrapped in 2014. Several private facilities empanelled with *Asandha* provide health-care services *both in Maldives and overseas*. It also covers the cost of transport for emergency referrals. In such cases, transport is provided for the patient, bystander and medical escorts.

2. *Collecting and collating paper-based data across the country.* Another major challenge was the lack of an electronic database that records all deliveries; HIV and syphilis testing of mothers; and testing for infants born to positive mothers. At the behest of the national programme, the WHO Country Office, with support from the Regional Office, developed a system for 100% verification of data obtained from different sources. Accordingly, field visits were conducted to all public health facilities in the country to observe ANC/postnatal care (PNC) recording and reporting mechanisms and verify data sent to HPA at the central level. A sample of ten ANC cards from currently pregnant women was verified during each field visit by visiting the women at home. Complete (100%) screening for HIV and syphilis of these women was confirmed. ANC/PNC records for randomly selected months of 2016 were counterchecked against laboratory registers. Records from individual institutions were counterchecked with the vital registry system (VRS) data made available by the MoH.
3. *Inadequate external quality assurance for diagnostics.* Other challenges encountered in the roadmap towards EMTCT included issues related to the external quality assurance (EQA) of laboratory testing; and policy on mandatory testing of foreign nationals as a condition for entry, employment and residence, and subsequent deportation of those found to be HIV positive. Working in close coordination with WHO and other partners, the MoH in Maldives ensured that required decisions and actions were adopted on each of these issues. It was decided to work closely with the Ministry of Economic Development to review the migrant policy in Maldives. The MoH also decided to provide continued access and availability of essential services to all migrants, including pregnant women. Further, it was also agreed that Maldives would work closely with key populations on prevention and testing issues.

4. *Lack of public health definitions for surveillance of congenital syphilis.* The MoH also worked towards making minor adjustments in case definition to align with global guidance; improving the capacity of health-care providers at decentralized levels; adolescents' access to HIV and STI testing and care without parental consent, especially if they are pregnant; and involvement of people living with HIV in Maldives, to include key populations and migrants within the ambit of HIV- and STI-related services. Maldives was able to enrol in the US Centers for Disease Prevention and Control (CDC)-based EQA process and get the quality assurance certified.

11.5 Key Highlights of Maldives' Successful Validation of EMTCT

Maldives had resolved to achieve dual EMTCT of HIV and syphilis as one of the public health priorities that it pursued with great commitment. These commitments were reflected in a number of global plans, strategies and targets that relate to achieving the EMTCT goals. These include the Sustainable Development Goal (SDG) targets of ending preventable deaths of newborns and children under 5 years of age, ensuring universal access to sexual and reproductive health-care services and achieving UHC, and the 2016 global health strategies on HIV and STIs. Member States have adopted these strategies and have committed to work towards achieving the goals of eliminating new HIV infections among infants by 2020 and congenital syphilis as a public health threat by 2030.

Maldives has a low-level HIV epidemic with very few known cases of HIV infection among Maldivian citizens living in the country. Similarly, the prevalence of syphilis has been low and is steadily declining in the country. Seven out of the 11 (64%) Maldivian residents living with HIV in the country are believed to have acquired the infection abroad. In terms of overall targets for EMTCT, the RVT observed that achievements reported by the Maldives' EMTCT programme meet the criteria specified for global certification of EMTCT for the required timeframes—i.e. one year for meeting the target for impact indicators and two years for meeting the target for process indicators.

The EMTCT programme exceeded the 95% targets set for process indicators, in particular, ANC coverage (98% for both 2016 and 2017); testing for HIV (98% for both years); and testing for syphilis (100% for both years). Since almost all pregnant women attend public sector ANC services, often on multiple occasions, and testing for HIV and syphilis is routinely offered to all of them in the ANC setting, rates of MTCT for both diseases are well below the global elimination targets—consistently less than 2 per 100 000 live births for HIV and less than 50 per 100 000 live births for syphilis. The elimination parameters were also met at the lowest performing unit as per guidelines. The RVT did not find any evidence of geographical or population-based inequities in the delivery of PMTCT services, with consistently high levels of coverage with essential PMTCT interventions at all the sites visited, despite income

and other disparities reported. The key recommendations to maintain the validation are given below:

1. Strengthen the package of services for EMTCT of HIV and syphilis, including the regulatory framework for laboratories.
2. Expand capacity for the delivery of a full package of care, treatment and support for people living with HIV to ensure viral suppression and well-being among all affected persons (those who are infected as well as their partners, families and caregivers).
3. Strengthen the package of services for most-at-risk populations and expand service delivery options in collaboration with civil society organizations and communities.
4. Develop the capacity of HPA to collect and analyse strategic information to inform programme planning.
5. Put in place a comprehensive policy with respect to the health needs and rights of migrant workers.

The Global Validation Advisory Committee (GVAC) in June 2019 observed that the findings of the NVT and RVT and our review confirmed that the impact and process indicators for the validation of EMTCT of HIV and syphilis had been met, with no case of vertical infection reported during the past 2 years.

11.6 Sustaining the Achievement of EMTCT—The Way Forward for Maldives

The validation reflects the strong political commitment of the Government of Republic of Maldives, efforts by health workers coupled with active engagement of community, and sustained support by WHO.

Current investments in PMTCT of HIV and syphilis in Maldives have been significant and well-directed. The efforts were built on a robust network of reproductive health services. However, in order to sustain its EMTCT status, additional efforts are required in Maldives, particularly in primary prevention. This would provide additional protection against the possibility of HIV infection among women. If new infections continue to occur among women of childbearing age, it can potentially lead to transmission to their infants in case of late detection or unsuccessful treatment in pregnant women. Primary infections in women can also occur during pregnancy, delivery or breastfeeding.

The fertility rate in Maldives is low at 2.1 per woman and is expected to further decline in coming years. However, demographic trends indicate that in the immediate future, the number of young people under 25 years and the number of women in the reproductive age group (15–49 years) is steadily increasing. The need to maintain high coverage and uptake of antenatal services is key to the way forward. Similar attention is also required in the areas of laboratory systems and health management

information systems. The reforms towards addressing human rights-related barriers in access to services must continue as well.

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