Neglected Tropical Diseases

In WHO South-East Asia Region
Neglected Tropical Diseases

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World Health Organization
Regional Office for South-East Asia
“Through my flagship on elimination of Neglected Tropical Diseases we bring those neglected and worst affected to the front of the queue, ensuring Universal Health Coverage truly benefits people left behind”.

- Dr. Poonam Khetrapal Singh, Regional Director
Neglected tropical diseases include some of the oldest and most debilitating and stigmatizing diseases, affecting the poorest of the communities in the developing world. Being diseases of the poor who are hidden in the remote rural villages or overlooked urban slums, these diseases had long been forgotten and largely neglected.

However, in the recent past we have seen a major change in the NTD landscape. By bringing this diverse group of diseases under the umbrella of NTDs, WHO played an important advocacy and catalytic role in generating a renewed interest, commitment and support to eradicate, eliminate and control them. Much has been done to accelerate progress towards the control, elimination and eradication of NTDs over the last decade.

More recently, the Sustainable Development Goals also provided an effective framework for successful elimination of NTDs. SDGs emphasize the interrelated nature of health and development and encourage a broad, multidimensional approach that is essential to uproot NTDs, whose persistence is related to a variety of biological and social factors. Importantly, the SDG framework ensures that our commitment to leaving no one behind outlasts these targets, and stimulates a mindset attuned to the needs of the society’s most vulnerable.

The WHO South-East Asia Region, home to one fourth of the world’s population, carries the second highest burden of NTDs globally. Every country in the Region is endemic to at least one of the 18 NTDs. We are also fully committed to the time-bound elimination of NTDs endemic in our Region. With strong support and commitment from leaders of our Member States, we have made this a regional health priority and a Flagship Programme of the WHO Regional Office. By bringing those marginalized to the front of the queue, we are committed to see that no one is left behind. And we want to see our future generations leading a healthy and economically productive life, free from these debilitating conditions.

We have made significant progress in the achievement of these NTD targets. In 2016, India became the first country to be verified and formally acknowledged to have eliminated yaws and achieving yaws-free status. In the same year Maldives and Sri Lanka have been validated for elimination of lymphatic filariasis as a public health problem. Thailand and Bangladesh are under post-MDA surveillance for LF. Nepal has maintained the kala-azar elimination target of less than 1 per 10 000 populations at the subnational level for three consecutive years. We achieved the target of bringing down the prevalence of leprosy to less than one case per 10 000 populations at the Regional level in the year 2000 and at the national level in all Member States by the year 2005.

Although we have made good progress, the job is far from being done. While efforts to overcome existing operational and programmatic challenges continue, new and emerging issues are being noted as some of the programmes enter into the last mile of elimination. The Region continues to report a large number of leprosy cases. In 2015, the Region contributed 74% of the global new leprosy cases and 75% of the new child leprosy cases reported to WHO. Failure to achieve the desired outcome and sustain the low transmission in several districts that have completed MDA is being observed as an emerging challenge in the Region. Some of the elimination programmes are at risk of missing the target. These are related to management and operational barriers with some limitation on the available tools.

We must be creative to see through these challenges and emerge with fresh thinking and innovative ideas to accelerate progress towards NTD elimination in the Region. The Region is committed to work together to achieve its time-bound targets on NTDs through the implementation of poverty reduction and other Sustainable Development Goals. NTD elimination is an important yardstick to measure the quality and efficacy of this investment. Bringing those neglected ahead in the queue through the elimination of NTDs will only accelerate the progress towards universal health coverage.

We thank the strong partnership we have and the support we receive from donors, including the pharmaceutical industry. We hope that this partnership would grow stronger and the generous support would increase further to enable us to reach our targets sooner.

Dr Poonam Khetrapal Singh
Regional Director
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More than a billion people across the world, mostly living in the lower- and lower-middle-income countries, are affected by neglected tropical diseases (NTDs), and an estimated 500,000 die each year due to an NTD. At least one NTD is endemic in each of the 11 Member States of the South-East Asia (SEA) Region of the World Health Organization. NTDs represent a major cause of morbidity and mortality, undermine development, and place the heaviest burden on the most vulnerable communities.

NTDs are typically seen among the poorest of the populations, those whose voices aren’t heard. They are diseases of the socially marginalized and, as part of their cruel aftermath, they create even more marginalization. While some of the NTDs are fatal if not treated, others lead to deformities and disabilities that are linked to social stigmatization, emotional and psychological deprivation, challenge in the way of income generation, and thereby also push the affected communities further into the vicious cycle of disease and poverty.

By their very name, it is evident that NTDs have failed to receive the attention they deserve. The most disconcerting aspect of the historic leadership deficit over NTDs is that inexpensive and highly effective tools and strategies do indeed exist to end NTDs as a serious health threat. These include preventive chemotherapy; intensified case detection and case management; control of key vectors (such as mosquitoes); provision of safe water, sanitation and hygiene; and veterinary interventions that minimize health risks from the interaction of humans and animals (as in the case of rabies).

In spite of the overall low disease burden in society, NTDs remain a priority because they:

- Are easy to prevent and treat
- Can be prevented and eliminated with access to basic water sanitation and primary treatment facilities
- Yet the marginalized and those left behind continue to suffer from these diseases across generations making them even more marginalized
Regional share of global NTDs: Disproportionately high

NTDs are a diverse group of 18 communicable diseases. *Globally, at least 1.7 billion people, including 1.1 billion in low- or middle-income countries, required mass or individual treatment for an NTD in 2014. 2,3

Seven NTDs are of particular public health importance in the WHO South-East Asia Region:

- Lymphatic filariasis (LF), a mosquito-borne parasitic disease that causes permanent disability, social stigma and mental distress and also deepens poverty.
- Leprosy, a chronic infectious disease transmitted from person to person primarily through the respiratory route; left untreated causes visible deformities and social stigma.
- Soil-transmitted helminth infections (STH), or various parasitic worms transmitted by eggs present in human faeces, which then contaminate the soil in areas where sanitation is poor.
- Schistosomiasis, a disease caused by parasitic worms that are transmitted through contact with contaminated water.
- Trachoma, which causes irreversible blindness and is most common in rural areas with overcrowding and poor hygiene.
- Visceral leishmaniasis (kala-azar), wherein protozoan parasites are transmitted to humans by the bites of infected female sandflies.
- Yaws, a chronic disfiguring and debilitating childhood infection transmitted primarily through direct skin contact with an infected person.

Although NTDs continue to impose a substantial health burden on vulnerable communities, the WHO South-East Asia Region – and indeed the entire world – now has a historic opportunity to end NTDs once and for all. Striking gains in the prevention and treatment of these conditions in South-East Asia have generated new optimism that we can dramatically reduce NTD-related illnesses, hardship and death. And this new optimism has led to concrete political commitments to end NTDs.

The WHO South-East Asia Region bears the second highest burden of NTDs and contributes the highest burden globally for lymphatic filariasis, kala-azar, leprosy and soil-transmitted helminths. All this leads to very high rates of morbidity. Elimination of NTDs are hence a regional priority.

**FIGURE 1 - Regional Contribution to the Global burden of NTDs (2015)**

<table>
<thead>
<tr>
<th>Disease</th>
<th>Population Requiring MDA*</th>
<th>Reported Cases</th>
<th>New cases with grade 2 disability</th>
<th>Children estimated to be in need preventive chemotherapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lymphatic Filarisis</td>
<td>53%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visceral Leishmaniasis</td>
<td>41%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leprosy</td>
<td>61%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soil Transmitted Helminthias</td>
<td>42%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Mass drug administration

Source: WHO Data Observatory
Unless we focus on marginalized people and bring them to the front of the queue, we cannot ensure equity and social justice to our people. With a strong political commitment, allocation of adequate resources and right package of intervention, most of the NTDs can be eliminated. This is an investment that is not only morally correct but will also ensure that our future generations remain free from these age-old scourges and the stigma attached to them, thereby creating healthier and more productive societies. These are the reasons why WHO-SEARO has made this a regional health priority and a Flagship Programme of the WHO South-East Asia Region.

Without addressing NTDs, the principles of universal health coverage (UHC) and the Sustainable Development Goal (SDG) 3.3 will remain an unachievable dream. Hence NTDs have essentially become a litmus test for UHC.
DISEASE BURDEN AND TRENDS

Although substantial progress has been made across the Region in reducing the incidence of NTDs and associated morbidity and mortality, NTDs remain endemic in South-East Asia and continue to contribute to cause significant morbidity.

FIGURE 2 - Endemicity of NTDs in SEA Region

Source: WHO SEARO (2016)

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Lymphatic filariasis (LF)

South-East Asia has the largest population in the world living in LF endemic areas, accounting for 63% of the global population at risk for the disease. LF is endemic in nine countries in the Region and is home to 60 million of the 120 million people globally estimated to be infected with LF. India is the most populous country in the region bearing the brunt of LF with the at-risk population having increased from 370 million in 2005 to 604 million in 2010. As a result of mass drug administration (MDA), important gains have been made in fighting LF in South-East Asia. Maldives and Sri Lanka have been officially validated as having eliminated LF as a public health problem, and Thailand will likely soon receive validation.
**FIGURE 3 - Population requiring MDA for LF**

- **INDIA**
  - 2005: 553,680,000
  - 2010: 604,113,435
  - 2015: 370,626,634

- **NEPAL**
  - 2005: 23,113,351
  - 2010: 25,000,000
  - 2015: 15,981,384

- **BANGLADESH**
  - 2005: 70,000,000
  - 2010: 75,960,000
  - 2015: 3,211,000

- **MYANMAR**
  - 2005: 43,200,000
  - 2010: 46,994,323
  - 2015: 38,896,362

- **INDONESIA**
  - 2005: 150,000,000
  - 2010: 130,488,888
  - 2015: 71,241,075

- **TIMOR-LESTE**
  - 2005: 924,624
  - 2010: 1,047,632
  - 2015: 1,167,242

Source: WHO Data Observatory

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**FIGURE 4 - District level progress of MDA in SEA Region**

(MDA Status in 2017 by Country in SEAR)

- **BANGLADESH**
  - 100%

- **INDIA**
  - 35%

- **INDONESIA**
  - 77%

- **MALDIVES**
  - 100%

- **MYANMAR**
  - 15%

- **NEPAL**
  - 49%

- **SRI LANKA**
  - 100%

- **TIMOR-LESTE**
  - 100%

- **THAILAND**
  - 100%

Legend:
- Green: No Longer Required
- Yellow: Ongoing
- Red: Not Started

Source: WHO SEARO
An estimated 100 000 cases of kala-azar occur each year in the South-East Asia Region, resulting in the loss of 780 498 disability-adjusted life years (DALYs) annually. India, Nepal and Bangladesh account for 60% of the estimated 200 000 to 400 000 annual kala-azar cases globally, and sporadic cases have also been reported in Bhutan and Thailand. Since 1992, when kala-azar cases peaked, the regional burden of kala-azar has fallen by 92%.

Mortality related to kala-azar across the Region has also steeply fallen (Fig. 6). Figure 7 shows a progressive decline in the number of kala-azar cases in three main endemic countries of SEA Region. The disease remains endemic in 54 districts in four states in India, in 18 districts in Nepal, and in 100 upazilas (sub-districts) in 26 districts in Bangladesh. However, the number of districts in these countries where elimination of kala-azar has been achieved has substantially increased.
FIGURE 6 - Reported cases of kala-azar and death in SEA Region

<table>
<thead>
<tr>
<th>Year</th>
<th>Deaths</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>224</td>
<td>24,583</td>
</tr>
<tr>
<td>2001</td>
<td>241</td>
<td>18,472</td>
</tr>
<tr>
<td>2002</td>
<td>216</td>
<td>22,235</td>
</tr>
<tr>
<td>2003</td>
<td>269</td>
<td>26,556</td>
</tr>
<tr>
<td>2004</td>
<td>194</td>
<td>31,786</td>
</tr>
<tr>
<td>2005</td>
<td>194</td>
<td>41,269</td>
</tr>
<tr>
<td>2006</td>
<td>224</td>
<td>50,088</td>
</tr>
<tr>
<td>2007</td>
<td>230</td>
<td>50,898</td>
</tr>
<tr>
<td>2008</td>
<td>172</td>
<td>39,619</td>
</tr>
<tr>
<td>2009</td>
<td>112</td>
<td>29,440</td>
</tr>
<tr>
<td>2010</td>
<td>106</td>
<td>33,706</td>
</tr>
<tr>
<td>2011</td>
<td>94</td>
<td>37,449</td>
</tr>
<tr>
<td>2012</td>
<td>30</td>
<td>23,235</td>
</tr>
<tr>
<td>2013</td>
<td>26</td>
<td>15,622</td>
</tr>
<tr>
<td>2014</td>
<td>15</td>
<td>10,559</td>
</tr>
<tr>
<td>2015</td>
<td>9</td>
<td>8,138</td>
</tr>
<tr>
<td>2016</td>
<td>9</td>
<td>6,939</td>
</tr>
</tbody>
</table>

Source: WHO Country reports (2000-2016)
**Leprosy**

Leprosy is endemic in all 11 Member States in the South-East Asia Region. Although the Democratic People’s Republic of Korea has reported zero cases for several years the data has not been validated. The Region accounts for 74% of new cases of leprosy worldwide and for 61% of the globally reported new cases with visible deformity. India accounts for the overwhelming majority of new cases of leprosy across the Region (Fig. 8).\(^9\)

By 2000, the Region had achieved the elimination of leprosy as a public health problem, defined as a reduction of prevalence to less than one case per 10 000 populations (Fig. 9).\(^{10}\) However, celebrations of the elimination target may have led some to believe that leprosy had been conquered in the South-East Asia Region when in fact considerable leprosy transmission and morbidity persist. Six countries in the Region reported more than 1000 new annual leprosy cases in 2015, and there are reasons to believe that many more cases remain hidden and unreported to health officials. Often broad regional gains against infectious diseases do not get reflected in several subnational settings and among vulnerable populations. Moreover, regional trends often mask intra-regional and subnational disparities (Fig. 10).
**FIGURE 8** - Number of new cases of leprosy detected (2015)

Number of cases in Bhutan, DPR Korea, Maldives, Thailand and Timor-Leste were 14, 0, 3, 187 and 111 respectively.

Source: WHO Weekly epidemiological record (September 2016)

**FIGURE 9** - Trend of prevalence & annual case detection rate for leprosy (2001 to 2015)

Source: National Informative Council (2015)
Soil-transmitted helminth infections

STH is endemic in all 11 Member States, but eight countries are considered to have a high burden requiring preventive chemotherapy, provided free by the pharmaceutical industry through WHO.

An estimated 371 million children (42% of the global burden) in the SEA Region require regular preventive chemotherapy.\textsuperscript{11}

By 2016, seven of eight high-burden countries in the Region had achieved the target of providing chemotherapy to at least 75% of pre-school and school-age children.
Schistosomiasis

Schistosomiasis prevalence is restricted to Indonesia, in only two districts in Central Sulawesi. It is estimated that about 25,000 people are at risk. The elimination programme in this Indonesian province is challenged by difficult geographical terrain, lack of safe water supplies, and insufficient snail control.

However, to eliminate the disease and make Indonesia free from schistosomiasis, multisectoral interventions to effectively manage the environment in a sustainable manner and eliminate intermediate host snails are critical.

Trachoma

An estimated 362 million people in the South-East Asia Region live in trachoma-endemic areas, accounting for nearly one third of the global at-risk population.

Trachoma is endemic in India, Myanmar and Nepal. Endemicity in Timor-Leste needs to be established as there is some evidence that the disease may also be endemic in the country.

Trachoma control includes surgery to treat the blinding stage of the disease, antibiotics to clear infection (especially mass drug administration of azithromycin, which is available free through the International Trachoma Institute), and promotion of facial cleanliness and environmental improvements (notably access to water and sanitation).

All three endemic countries in the Region have national trachoma elimination programmes.

Yaws

Globally, 2.5 million people have yaws, with children under the age of 15 accounting for about 75% of those affected.

In 2016, India was declared free of yaws. However, yaws persists as a public health problem in Indonesia and Timor-Leste. While mass drug administration has been initiated in Indonesia, Timor-Leste is in the process of conducting a national survey to properly map the disease endemicity in the country. There had been historical cases of yaws in Sri Lanka. However, there have been no reported cases in the recent past and an assessment is required to verify the current yaws status.
Concern about NTDs is not new and actually goes back to the days of the origin of the World Health Organization. But for decades, the extent and toll of NTDs were seriously under-estimated, impeding efforts to generate robust political commitment and sufficient resources to address these diseases.

Over the last decade, however, a sea change of commitments on NTDs occurred at the global, regional and national levels. As the impact of NTDs – especially among the very poor – became clearer, global attention on NTDs increased. Led by WHO, diverse stakeholders – multilateral and bilateral donors, national governments, international and national organizations, health professionals and affected communities – have united in recent years in a common effort to end NTDs.

NTDs and the Agenda for Sustainable Development

Although the Millennium Development Goals (MDGs) did not expressly mention NTDs, the architecture of the new global commitment on NTDs was built during these years, in part from the spill-over effects of the MDGs’ broader focus on infectious diseases. In September 2015, the new global energy to tackle NTDs was given concrete shape in the form of the Sustainable Development Goal (SDG) 3, which includes a target to “end the epidemic of NTDs by 2030”.

Efforts to realize the goal of ending NTDs will draw on as well as support the achievement of other SDGs. For example, mass drug administration or the programmatic integration of NTDs and water, sanitation and hygiene activities (SDG 6) will rely on effective global partnership (SDG 17). Accelerated progress towards ending NTDs will contribute to the reduction of poverty (SDG 1) and hunger (SDG 2), improve educational attainment (SDG 4), strengthen labour productivity and economic growth (SDG 8), and help alleviate inequalities (SDG 10).

People left behind: Reaching the most vulnerable

The SDGs prioritize reaching the poorest and most vulnerable. As NTDs primarily affect the poorest of the poor, the quest to end NTDs represents a central test for the broader agenda for Sustainable Development. NTDs proliferate in less developed areas, where large numbers of people have little or no access to adequate health care, clean water, sanitation, housing, education, transport and information. Among low-income countries generally, 60% of the population requires treatment for one or more NTDs.

The SDGs’ commitment to the most vulnerable is reflected in its pledge to achieve universal health coverage by 2030. Extending health coverage to all, including the poorest and most marginalized communities, will not only aid in addressing a host of health challenges but also will be essential for achieving and sustaining gains against NTDs.
After the historic advances in human health and development made in the MDG era, adoption of the SDGs represented a marked elevation in global aspirations for our world. If the global community is serious about addressing the needs of the most vulnerable, the commitment to end NTDs represents a litmus test. If we can end NTDs, it will show that we can meet the needs of the most marginalized and address the key factors that drive social, economic and health inequalities.

**Commitments**

A growing drumbeat of commitments to address NTDs in recent years has led to the global community embracing of ending NTDs in the SDGs. In a series of resolutions, the World Health Assembly urged Member States to mobilize resources to eliminate LF, trachoma, leprosy, schistosomiasis and control STH. Eight years of global discussions, and of persuading governments and international donors of the urgent need for investments in NTD prevention and treatment programmes, culminated in the 2020 Roadmap on NTDs, which outlines targets and milestones to end NTDs by 2020 – a decade earlier than the SDG deadline.

A similar increase in political commitment to end NTDs has been apparent at the Regional level. In 2006, the WHO Regional Committee for South-East Asia called on Member States to “ensure that the safe and cost-effective interventions are scaled up and made accessible to all affected populations, particularly the vulnerable groups”. The Regional Committee requested the Regional Director of the WHO South-East Asia Region to assist Member States in the planning, implementation and monitoring of initiatives to eliminate NTDs.

Growing momentum to combat NTDs catalysed greater cooperation on NTD control activities among countries in South-East Asia. In 2014, the Health Ministers of Bangladesh, Bhutan, India, Nepal and Thailand signed a memorandum of understanding to collaborate on the elimination of kala-azar from their countries.17 Over 50% of the cases in the countries where kala-azar transmission is greatest occur in areas close to international borders, underscoring why regional collaboration is so vital to hopes for ending NTDs in South-East Asia. Areas for collaboration among the five countries include mutually agreed mechanisms of resource mobilization, information exchange, and research, capacity-building and technical support.

In 2014, the WHO Regional Director for South-East Asia, in consultation with Member States, declared the elimination of NTDs a Regional Flagship Priority. This step dramatically elevated the profile of NTD elimination efforts within the Region, helping NTD control take its place alongside regional efforts to address HIV, tuberculosis, malaria and other serious public health challenges.

A broadening array of partners has also stepped forward to pledge commitment to the fight to end NTDs – in South-East Asia and globally. In 2012, a gathering of some of the world’s largest pharmaceutical companies, Bill & Melinda Gates Foundation, the United States Agency for International Development (USAID) and the World Bank endorsed the “London Declaration on Neglected Tropical Diseases”. The London Declaration committed these stakeholders to ensure the necessary supply of drugs and other interventions to eliminate NTDs, including through heightened commitment, coordination and collaboration between public and private sectors. In support of its commitment in the London Declaration, the pharmaceutical industry donated US$ 2.5 billion worth of NTD treatments in 2012–2013. In 2015 alone, over 1.5 billion treatments were administered reaching over a billion people at risk of at least one of the diseases amenable to preventive chemotherapy.18

International donors have also taken action to support efforts to end NTDs. USAID, for example, increased its assistance for NTD control activities by eight-fold from 2006 to 2016, including support for NTD treatment...
and prevention programmes in Bangladesh, Indonesia and Nepal. The Bill & Melinda Gates Foundation has similarly prioritized grants for programmatic implementation and research on the most serious NTDs, including LF, kala-azar, STH, trachoma and schistosomiasis.

While global and regional actors play a central role in the quest to end NTDs, leadership is most important at the national level and in the communities where NTD control efforts are implemented. In South-East Asia, national leaders have followed through on their commitments on NTDs, saving millions of lives.

Gains against LF highlight how strong national leadership has transformed the NTD agenda from one of neglect to one of results. Beginning in 2001, Bangladesh, India, Myanmar and Sri Lanka launched annual mass drug administration of recommended, highly protective drug combinations for 5–6 years duration, complemented by morbidity management and disability prevention through patient care. Other countries, including Indonesia, Nepal and Thailand, soon came on board to deliver mass drug administration. From 2002 to 2007, the number of people targeted for mass drug administration rose from 82 million to 661 million, with the reach of MDA increased further still through 2012, when 731 million people received the treatment. The incidence of LF, the microfilaria rate has fallen below threshold levels, allowing four countries (Maldives, Sri Lanka, Bangladesh and Thailand) to end mass drug administration. As a result of such strong national leadership and regional cooperation, it is estimated that through 2012, 61 million cases of LF were prevented – equivalent to a 75% reduction in the disease burden. Successful MDA for LF in South-East Asia, the region’s contribution to the global burden of LF declined from 63% to 53% by 2015.

With such powerful momentum at the global, regional and local levels to end NTDs, now is the time to follow through on the many NTD-related commitments that have been made. Figure 11 outlines these commitments, targets and associated milestones in the quest to end NTDs.

**FIGURE 11 - NTDs Targeted for Elimination in SEA Region**
FROM NEGLECTING TO DEFEATING

The big wins ...

A Nation Goes Beyond the Road: Elimination of Yaws in India
A Nation Unburdened: Elimination of Lymphatic Filariasis in Maldives
A Nation Rejoices: Elimination of Lymphatic Filariasis in Sri Lanka

Nearly there ...

A Long Journey Draws to a Close: The Elimination of Lymphatic Filariasis in Thailand
Seeing Light at the End of the Road: The Elimination of Trachoma from Nepal
Elimination of YAWS in India

It is often said of yaws that “where the road ends, yaws begins”. Yaws is a disfiguring and debilitating disease that affects the poorest and most marginalized of communities, often in geographically remote areas with very limited, or nonexistent, access to health services. Yaws mostly affects young children, who end up disabled, stigmatized and often unable to complete their schooling if they remain untreated. It is curable with a single dose of antibiotic (either oral azithromycin or, in previous decades, an injection of long-acting benzathine penicillin).

In 2016, the World Health Organization formally acknowledged India to be the first endemic country in the world to become yaws-free. This momentous achievement in eliminating a disfiguring disease of the most marginalized of the marginalized represents a significant political and programme achievement towards attaining millennium and sustainable development goals. It took decades of unwavering political commitment, technical support from WHO and UNICEF, the determination and tireless efforts of the Yaws Eradication Programme, community health workers and social mobilization in some of the most isolated of communities to achieve an India free of this terrible disease.

The strategies that eliminated yaws from India were pre- and-post-monsoon active-case search; treatment of cases and contacts (with benzathine penicillin); health education; strong surveillance system; advocacy; and social mobilization in the affected communities. In 2015 alone, over 1.5 billion treatments were administered. A disease that was once the cause of much physical and psychological suffering for the poorest communities has been eliminated from India.
The Game Changers

- Establishment of an anti-yaws campaign with support from WHO and UNICEF in 1952, which actively identified and treated approximately 200,000 patients until 1964 (with benzathine penicillin), and reduced prevalence to approximately 1% in the targeted states. As a result of the success, the remaining foci were considered to be manageable by general health services. The disease re-emerged in the 1970s in hidden pockets in endemic areas.

- Launch of a restructured yaws elimination strategy in 1996 relying on active case search and treatment with benzathine penicillin, health education and social mobilization.

- Involvement of community health workers to identify, treat, and educate and mobilize communities in combating the disease and the introduction of cash-award schemes for cases and communities for early case reporting and referrals.

- Continuous surveillance, mechanism of independent appraisals and creation of a task force at the highest level for monitoring and programmatic decisions.

Key Challenges Encountered in Eliminating Yaws in India

- Geographically remote nature of yaws endemicity created significant challenges in terms of identifying and treating yaws-endemic areas.

- Combating yaws was left to the general health services of the states, once the disease burden became low by 1964. Resulted in loss of focus on the last mile of yaws elimination.

- Re-emergence of yaws in 1970s confirmed need for a renewed commitment and focus. Subsequent restructuring of the yaws elimination strategy, focusing it on active search and treatment, health education and social mobilization through a national programme.

- Surveillance in remote areas necessary to identify any remaining yaws cases and verify the interruption of transmission was challenging. This was done through serological surveys, rumour reporting and checking, and incentives for any people who identified any confirmed cases.
WHO formally acknowledges that India has become a yaws-free country.

National yaws programme submits a Country Dossier to WHO, following which WHO brings an international expert team to India to verify the interruption of transmission.

Serological surveys in formerly yaws-endemic villages and in villages not endemic for yaws. Zero cases were found.

With zero yaws cases for three consecutive years, the Government of India declares elimination of yaws. Following expert group recommendations, the government institutes the following: i) incentives introduced for confirmed cases of yaws in the communities; ii) rumour reporting and verification of suspected yaws cases; and iii) a plan to carry out serological surveys in children aged 1 to 5.

The last reported case of yaws in India is diagnosed and treated.

The Government of India targets yaws for interruption of transmission by 2005, in its National Health Policy.

Reported yaws cases decline from 3,571 cases in 1996, to 664 cases in 2000.

The programme was scaled up to 51 districts in 10 states that had previously reported cases of yaws in the past.

Yaws Eradication Programme launched as a central (national government) health scheme with a pilot in one district in Odisha. Expanded to four more states: Andhra Pradesh, Gujarat, Madhya Pradesh and Maharashtra.

National Institute for Communicable Diseases (now the National Centre for Disease Control), restructures its yaws eradication strategy in light of re-emergence of the disease. Strategy based on: i) active search and treatment with benzathine penicillin and ii) health education and social mobilization.

The government attempts to understand the status of yaws in the country by collecting information from all states and union territories in India.

Yaws begins to re-emerge in different parts of the country, often because yaws-endemic regions had limited access to health facilities. It became clear that "where the road ends, yaws begins."

India, with WHO and UNICEF support, launches a yaws active case search and treatment programme in Odisha, Madhya Pradesh, Maharashtra and Andhra Pradesh. By 1964, approximately 6 million people examined, 200,000 cases and their contacts treated, and prevalence fell to approximately 1% in targeted states. Remaining cases of yaws to be combatted through general health services of the states.
The Gameplan for Success

The Political: The government’s unwavering commitment to eliminate yaws was a key determinant of its elimination from India. The initial campaign to eliminate yaws from India was so successful in reducing the yaws burden to low levels that combating yaws was turned over to general health services of the state. Once the disease began to re-emerge in the 1970s, it became clear that a renewed national focus on the disease was necessary. The National Centre for Disease Control (formerly the National Institute of Communicable Diseases) took up the mantle to eliminate the disease completely from India. The National Centre for Disease Control began training and sensitizing states on yaws to generate awareness and focus. District-level advocacy meetings were organized to further raise awareness about the disease at the subdistrict level. The restructured national yaws strategy was launched in 1996, and even after the last confirmed case in 2003, the Government of India continued its commitment and support to the extensive surveillance necessary to sustain elimination of the disease.

A high-level task force was constituted to review the progress of the programme in 2000. In the National Health Policy 2002, the Government of India renewed its commitment to interrupting transmission of yaws by 2005, giving renewed impetus to the last mile of the elimination programme.

The Technical: The dedicated and uncompromising effort to identify and treat yaws in geographically remote and extremely marginalized communities was critical to the success of the programme. Novel and localized methods of raising community awareness encouraged self-reporting of the disease. Extensive training was given to medical officers, health workers and community level functionaries from other departments on yaws identification, treatment and health education.

House-to-house visits covering at least 90% of the population in endemic areas were carried out biannually by trained paramedical workers and community-level functionaries, and suspected cases and their contacts were treated. Protocols were put into place to deal with any adverse events, and bio-safety measures were strictly followed. Serological surveillance was simultaneously carried out on children aged 1 to 5, between active search campaigns, and also after the last reported case in 2003, to verify the interruption of transmission. Independent experts were hired to monitor the programme and ensure its quality.

The Social: The involvement of the communities was a critical success factor for yaws elimination. The government provided support for the mobilization of the community-level health volunteers to raise awareness, identify cases and follow up on treatment. Prior to active search campaigns in a yaws-endemic area, the programme generated awareness through posters/bill boards in local languages, messages during weekly markets in tribal areas, messages passed by word of mouth from community leaders and functionaries, and traditional methods such as folk songs. This increased awareness resulted in a greater reporting of suspected cases.

The Financial: The Government of India has provided all the necessary financial support for the training, awareness raising and implementation costs of the yaws programme since 1952. From 2006 onwards, the government also provided incentives for reporting any confirmed cases of yaws and funding for additional serological surveys to verify the interruption of transmission.
Maintaining the Achievement

The elimination of the disease from India, its geographically focal nature and the fact that humans are only known reservoir suggests that yaws is unlikely to re-emerge post-elimination. However, the government continues to remain vigilant to any re-emergence. Yaws training has been integrated into general health services.

The Government of India, and indeed other yaws programmes around the world, may use the lessons learned from this programme for the elimination of persistent and neglected diseases around the world.
“The elimination of yaws in India demonstrates the Government of India’s continued commitment to the health of marginalized people. This is yet another significant achievement in India’s drive to eliminate and eradicate communicable diseases.”
– Shri Jagat Prakash Nadda, Minister of Health & Family Welfare, India
A NATION UNBURDENED

Elimination of Lymphatic Filariasis in Maldives

In 2016, Maldives was validated by the World Health Organization as one of the nine endemic countries in the WHO South-East Asia Region to have successfully eliminated lymphatic filariasis as a public health problem. This achievement was the result of the collaboration between WHO and the Ministry of Health that began in 1951, the political commitment of the Government of Maldives, intensified efforts of the National Filaria Control Programme that began in 1968, and the unflagging determination of frontline health workers.

The success of Maldives testifies to the effectiveness of the strategies recommended under the Global Programme to Eliminate Lymphatic Filariasis (GPELF). The achievements were possible due to sustained commitment to case finding, monitoring implementation and coverage, and the effectiveness of mass drug administration (MDA), integrated vector control, morbidity management and preventive chemotherapy.

Children of Maldives can now look forward to a future free from this debilitating and stigmatizing Neglected Tropical Disease.

The Game Changers

- Unswerving political commitment and allocation of dedicated financial resources for case detection and treatment since 1968.

- Intensified case detection, treatment, and vector control activities since 1984 reducing the number of endemic islands in Maldives to just one by the time MDA began in 2004.

- Continued antigenemia surveillance on all islands in Maldives and among foreign migrants since 2007 to monitor and detect any LF transmission.

- Systematic elimination of breeding habitats of the vector Culex quinquefasciatus.
The National Filaria Control Programme was launched in collaboration with WHO. Activities included: passive case detection and treatment; larvicide-based (Abate 500EC) vector control; and treatment of all positive cases of LF with a weekly dose of diethylcarbamazine (DEC) for 12 weeks. A night blood survey conducted in Malé in 1968 showed a Microfilaria (Mf) rate of 5.5%. A further 9 islands in 5 atolls surveyed in 1969 recorded an Mf prevalence greater than 1% in only one atoll.

With support from WHO, 34 islands were surveyed for lymphatic filariasis (LF). About 37% of the population was found to be either infected with W. Bancrofti or showing clinical manifestations of LF.

Microfilaria (Mf) rate in Malé falls from 5.5% in 1969 to 1.3% in 1973.

A staggering 0.56 million blood samples (approximately 1.6 times the population of Maldives) analysed for filaria.

National Filaria Night Blood Survey in 41 islands and 10 atolls, covering the southern part of the country, indicates Mf prevalence as less than 1% in seven islands, and between 1% and 21% in the remaining 34 islands.

WHO validates Maldives as having eliminated LF as a public health problem.


Transmission Assessment Survey (TAS) carried out in children aged 2–8 on the endemic island (Fonadhoo), all other islands in the atoll (Laamu), and all islands on a non-endemic atoll (Gaafu Alif Atoll), indicated zero Mf prevalence. Clinical surveillance indicated no new indigenous cases of filariasis since 2004 in all of Maldives, though a few imported cases reported among foreign migrants.

Endemicity mapping for suspected endemic atolls indicates that only one island (L. Fonadhoo) was endemic.

Five rounds of annual mass drug administration (MDA) implemented in Fonadhoo Island. Antigenemia surveys in 12 of 19 non-endemic atolls and Malé in 2007 indicate zero Mf prevalence.

National Filaria (Mf) rate in Malé falls from 5.5% in 1969 to 1.3% in 1973. Filaria clinic established in Malé together with TB and leprosy clinics.

The National Filaria Control Programme strengthened with WHO support, and LF services are integrated with malaria activities to intensify and extend their reach to all parts of the country. The LF and Malaria programmes subsequently merged in 2000 to form the Vector-Borne Disease Control Unit (VBDCU).

The National Filaria Control Programme was launched in collaboration with WHO. Activities included: passive case detection and treatment; larvicide-based (Abate 500EC) vector control; and treatment of all positive cases of LF with a weekly dose of diethylcarbamazine (DEC) for 12 weeks. A night blood survey conducted in Malé in 1968 showed a Microfilaria (Mf) rate of 5.5%. A further 9 islands in 5 atolls surveyed in 1969 recorded an Mf prevalence greater than 1% in only one atoll.

With support from WHO, 34 islands were surveyed for lymphatic filariasis (LF). About 37% of the population was found to be either infected with W. Bancrofti or showing clinical manifestations of LF.
The Gameplan for Success

- The Political: Sustained leadership and commitment of the Ministry of Health and its Health Protection Agency, and support from partners such as WHO GPELF, the Maldives Red Crescent Society, and a network of health centres and health workers across the islands drove the game-changing agenda. This included the launch of the National Filaria Control Programme in 1968; the intensification of integrated Malaria and LF activities since 1984; the launch of the Programme for Elimination of LF in 2002; ensuring the availability of Morbidity Management and Disability Prevention (MMDP) services in all the regions of the country; and making LF a notifiable disease under 2012 Public Health Protection Act.

- The Technical: A cadre of highly trained frontline health workers linked to the WHO-supported LF surveillance system was instrumental in catalysing case-finding and treatment services across the whole country. Through a 1996 regulation, all recruits for national security services and sailors, as well as students visiting from abroad, were required to undergo blood screening for Mf. Endemic areas were systematically mapped out for the implementation of five annual rounds of MDA from 2004–2008. Aggressive and ongoing vector control, and continuous post-MDA surveillance since 2011 in domestic and foreign migrant populations, were implemented to validate the elimination of LF. MMDP was fully integrated into the free health services offered in Maldives.

- The Social: Following the very first LF survey in 1951, a strong recommendation was made to abandon the practice of segregation, isolation and relegation of people living with LF to camps in uninhabited islands. This set the stage for mitigating stigma and mobilizing communities to fight LF, through the Island Chiefs and cadres of dedicated frontline health workers. Social mobilization and door-to-door awareness campaigns resulted in widescale and active public participation in vector control measures and increased compliance with the MDA campaigns, which ultimately resulted in the elimination of LF.

- The Financial: The entire LF elimination programme (PELF) in Maldives was financially supported by the government through domestic resources, ensuring that there were no constraints to systematically implementing the elimination process since 2002.

Key Challenges for Eliminating LF in Maldives

- Case-finding and management activities were enormously affected in the initial years by the lack of health facilities and staffing across the islands.

- Lack of systematic mapping of endemic areas and the location of patients was a barrier to service outreach, treatment completion, and ensuring access to MMDP services to all chronic LF patients across Maldives.

- Multiple vector breeding sites due to poor environmental sanitation, and sociocultural and livelihood practices.

- Continuous risk of migrants and visitors bringing in the disease from neighbouring countries that are endemic for LF.
**Sustaining the Elimination**

**Maldives plans to continue post-validation surveillance to ensure that no new instances of the disease emerge: Five atolls have been scheduled for post validation surveillance in 2016.**

Migrants to the country continue to be screened for LF, an important strategy to prevent reintroduction of infection. Regular entomological monitoring, including reduction of mosquito breeding sites, will require constant involvement of health workers and strong community participation. Initiatives to promote personal protection from mosquito bites to prevent multiple diseases, including LF, must be sustained well into the foreseeable future.

All regional hospitals have facilities for hydrocele surgeries, and all 34 health centres and 21 hospitals (Level 1, 2 and 3) are accessible for morbidity management. An action plan has also been prepared to assess the quality of care for lymphedema, acute dermatolymphangioadenitis (ADLA), and hydrocele surgery. These will ensure that post-validation, chronic LF patients will continue to receive high-quality care in Maldives.

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**Microfilaria (Mf) rate among vulnerable populations as per surveys on various islands across Maldives**

![Graph showing Microfilaria (Mf) rate over the years]

- **First ever epidemiological assessment of LF in Maldives:** 18.48%
- **Launch of PELF in 2002:**
- **Last identified indigenous clinical case of LF in 2004:**
- **Mass Drug Administration (MDA) 5 Annual Rounds 2004 – 2008:**
- **Transmission Assessment Surveys (TAS):**
  - TAS-1: 0%
  - TAS-2: 0%
  - TAS-3: 0%
By eliminating lymphatic filariasis as a public health problem, we have gifted our people a future free from a debilitating and deeply stigmatizing disease. It is testimony to what can be achieved when science and society fully embrace each other. This staggering achievement is a result of the unrelenting persistence of hundreds of frontline workers, the steadfast technical support of WHO, and our own unswerving commitment to the people of Maldives.

– H.E. Abdulla Nazim Ibrahim, Health Minister, Maldives
Elimination of Lymphatic Filariasis in Sri Lanka

In 2016 the World Health Organization formally acknowledged elimination of lymphatic filariasis as a public health problem in Sri Lanka. This marks a momentous step in combating and eliminating neglected tropical diseases (NTDs) from the WHO South-East Asia Region.

This goal was realized through the contribution of many: the unwavering political will of the Government of Sri Lanka, the commitment and untiring efforts of the Anti-Filariasis Campaign, technical support from WHO and other international partners, and the hard work of health care workers of the country over the decades.

The strategies that enabled elimination of lymphatic filariasis (LF) as a public health problem were intensified parasitological surveillance and vector control efforts, increased access to health services with disability management for the affected, and mass drug administration (MDA) campaigns in endemic districts.

A debilitating disease, which was once the cause of much physical and psychological suffering for its citizens, is no longer a public health problem.

The Game Changers

- Establishment of a dedicated campaign for the control of filariasis nearly 60 years ago in 1947 – the Anti-Filariasis Campaign.
- Decentralization and delegation of filariasis control activities directly to the provinces.
- Implementation of high-quality mass drug administration (MDA) campaigns in endemic districts, supported by intensive social mobilization interventions.
- Sustained efforts drove the microfilaria (Mf) rate, which gauges the level of LF transmission, down to 0.03% by 2015, allowing the country to systematically work towards elimination status.
WHO certifies Sri Lanka as having eliminated LF as a public health problem.

Transmission Assessment Surveys (TAS) to detect filarial antigen among school children, and special night blood film surveys in highly endemic ‘hot spots’ conducted.

Sri Lanka declared by WHO as one of the first countries of the South-East Asia Region qualified to initiate the validation process for having eliminated LF as a public health problem.

Post-MDA surveillance conducted using ICT kits among grade-1 schoolchildren in endemic areas using Lot Quality method. Results indicate no LF transmission.

Following the launch of WHO’s Global Programme to Eliminate Lymphatic Filariasis (GPELF), Sri Lanka embarked on a targeted campaign, with MDA campaigns in all endemic districts (2002–2006), achieving over 80% coverage.

Disability Management Programme introduced by WHO to enable proper home management of lymphoedema by patients, and hospital-based management of hydrocele by surgeons.

The average Mf MF rate in endemic districts was less than 1%.

Case detection, treatment with di-ethyl carbamazine (DEC), parapsychological surveillance, and vector-control measures continued.

Anti-Filariasis Campaign (AFC) established in 1947, and the first clinic enabling contact between filariasis patients and health authorities established in Dehiwela in 1948.

The first island-wide survey conducted indicating an Mf rate ranging from 20%-24%.

The introduction of the health unit system of health administration in Ceylon leads to the intensification of primary health care services and environmental sanitation.

Earliest epidemiological study of filariasis conducted in the Southern, North Western, Western and Eastern provinces of the country reported as foci of filariasis infection.
**Key Challenges Encountered in Eliminating LF in Sri Lanka**

- Although the overall Mf rate for the country was <1%, at the sub-national level, there were a few areas in Galle district with Mf rate >1% for Wuchereria bancrofti, higher than the elimination target.
- The finding of Brugia malayi, another LF parasite in the country, needed specific monitoring and the technical feasibility of detection through night blood slides.
- The attention and priority given to dengue, which causes massive epidemics in Sri Lanka, tended to divert human resources away from LF elimination activities without adequate planning.

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**The Gameplan for Success**

- **The Political:** The unswerving national commitment to eliminate LF was the primary driver for eliminating LF as a public health problem in Sri Lanka. Systematic endemicity mapping across the whole country, ensured that interventions remain targeted and steadfast. Ensuring the domestic production and procurement of the drug DEC, and cooperation with WHO for the import of Albendazole for the MDA campaigns, defined a visionary leadership. The declaration of ‘National Filariasis Days’ during the MDA campaigns ensured that the full government and administrative machinery was mobilized to ensure robust campaigns.

- **The Technical:** An uncompromising commitment to technical excellence and attention to scientific evidence has underpinned the LF control and elimination programme. Collaboration and partnerships with WHO, the Liverpool School of Tropical Medicine (UK), the Washington University in St. Louis (USA), and others, ensured strong technical support for the LF programme. Systematic surveys and surveillance, including active searches, routine surveillance, sentinel and special surveillance, generated rich datasets for precise endemicity mapping and the design of strategies and interventions. Differential strategies for urban and rural settings were developed and fine-tuned. Rigorous analysis and independent coverage evaluations of MDA, post-MDA and TAS surveys, as well as systematic entomological and parasitological studies provided robust epidemiological evidence for characterizing disease dynamics and decline. A strong commitment to the social and communication sciences, including substantial investments in evidence-based social mobilization campaigns, ramped up coverage and uptake of services during the MDA campaign in a quantum manner.

- **The Social:** The critical interface between communities and the drug distribution chain during the MDA campaigns were the highly trained cadre of Public Health Midwives (PHMs), who also recruited an army of local volunteers – the Filariasis Prevention Assistants (FPAs). Using a mix of house-to-house and booth-based strategy, and a WHO-supported intensive, evidence-based social mobilization campaign using the Communication for Behavioural Impact (COMBI) methodology, over 50 000 frontline workers and volunteers ensured a resoundingly high-quality and high-impact implementation of the MDA campaign in the targeted endemic areas. Furthermore, highly committed health functionaries trained patients for home-based care of lymphoedema, distributing implements and utensils to enhance motivation and compliance.

- **The Financial:** Since the very first filariasis study conducted over a hundred years ago in 1914, and the inception of the Anti-Filariasis Campaign in 1947, the programme has been financed largely through domestic funding, including the provision of free medicines and preventive services.
Maintaining the Achievement

- Sri Lanka intends to maintain the success of eliminating LF as a public health problem, and prevent its resurgence. A few ‘hot spots’ remain in the country which necessitates continued vigilance; especially in Galle which is located in the southern part of the country and has remained an area of high endemicity for decades. Treatment interventions ensuring high population coverage would be carried out as necessary, with patients taking their drugs under directly observed supervision.

- Regular parasitological and entomological monitoring activities, elimination of breeding sites, continued special and routine surveillance activities, and ongoing awareness campaigns for the community were instrumental in achieving elimination. They will continue to play a pivotal role in sustaining the elimination status.


*MDA – Mass Drug Administration
The elimination of lymphatic filariasis as a public health problem in Sri Lanka is a major public health achievement, made possible by our strong commitment, dedication of our health workforce, and active participation and support of the community.

– Dr Rajitha Senaratne, Minister of Health, Sri Lanka
A LONG JOURNEY DRAWS TO A CLOSE

The Elimination of Lymphatic Filariasis as a Public Health Problem in Thailand

Thailand now stands on the threshold of eliminating lymphatic filariasis (LF) as a public health problem; its third and final transmission assessment surveys (TAS) to validate the elimination were conducted in 2017. If these surveys establish no recrudescence of lymphatic filariasis, the World Health Organization can begin the process of officially validating the elimination, making it the third country in the region to eliminate LF as a public health problem.

The road to the elimination of LF as a public health problem began in 1949, with the first surveys that identified LF infection in the country. Periodic surveys and control efforts followed, and in 1994, a national survey was carried out to identify all endemic areas in the country, with a view towards control efforts. Following the launch of the Global Programme to Eliminate Lymphatic Filariasis in 2000, and a renewed commitment to identifying and eliminating this debilitating disease wherever it was found, Thailand is now nearly at the end of its long journey to eliminate this neglected tropical disease as a public health problem.

In order to achieve this incredible public health success, the Government of Thailand needed the contribution of many: the political will and commitment within the government to universal healthcare and to eliminating this disease of the poor and marginalized, the tireless efforts of the Division of Lymphatic Filariasis in the Department of Health to first control and then eliminate this disease, technical support from WHO and other partners, and the hard work of health care workers of the country over the decades.

The strategies that have brought Thailand to the threshold of elimination were: the early surveillance and identification of endemic IUs and at-risk populations; the entomological surveillance and vector control efforts integrated with other disease control programmes; the high quality mass drug administration (MDA) campaigns in endemic areas and targeting of at-risk populations such as migrants; the careful post-MDA surveillance in endemic areas and at-risk populations to establish the elimination; and the provision of free morbidity management and disability prevention services at government hospitals throughout the country.

The long journey to end this debilitating disease of the poorest and most marginalized of communities, now draws to a close in Thailand.
Key Challenges Encountered in Eliminating LF in Thailand

- Lymphatic filariasis in Thailand is caused by two species of parasite: *Wuchereria bancrofti* and *Brugia malayi*. This in itself was challenging, since *B. malayi* has proven resistant to elimination in some other countries in the Region, and the primary vectors for the two parasites were different species of mosquitoes. Initial surveys indicated prevalence was primarily in rural areas, with the primary vectors being *Aedes* and *Mansonella*, respectively. However, further surveys indicated the disease was endemic in many areas of the country.

- Although there were great reductions in microfilaria rates in Thailand as a result of early control measures, large-scale migration from neighboring LF endemic countries due to rapid economic growth in Thailand in the 1990s, brought millions of migrants into Thailand. In-migration within Thailand further spread the disease from rural border areas to urban areas.

- Vector control for the indoor residing *Mansonella* benefited from integrated vector control in the malaria programme. However, vector control efforts for the forest dwelling *Aedes*, were more challenging and not as cost-effective.

Overcoming the Obstacles

- The Political: Economic growth and migration saw the spread of lymphatic filariasis to 11 provinces. A strong sustained political commitment was necessary to ensure that the resources were allocated for a national survey to identify the endemic areas, followed by integrated vector control efforts, continuous entomological and parasitological surveillance efforts, repeated annual rounds of high coverage MDAs, MDAs targeted to at-risk groups such as migrants, and the provision of free morbidity management and disability prevention services through Tambon Health Promotion Hospitals. Without this political will to sustain the efforts towards elimination, Thailand would not be standing at the threshold of elimination today.

- The Technical: Thailand has been committed to technical excellence since the first surveys in 1949. It has collaborated and partnered with organizations such as WHO and national universities such as Mahidol University. It has systematically surveyed the whole country, identified the parasites and vectors, conducted entomological, animal and human surveillance to identify prevalence and risks of transmission, and generated rich datasets for precise endemicity mapping to design strategies and interventions. Differential strategies for at-risk groups such as migrant populations have been implemented. It has conducted evaluations of MDA, conducted post-MDA and TAS surveys, as well as entomological and parasitological studies to characterize disease dynamics. Vector control has focused on integration with other disease control programmes, limiting and eliminating breeding sites, and efforts to reduce man-vector contact through health education and promotion of the use of repellents and bed nets.

- The Social: An army of community level health care workers have facilitated the surveillance and high coverage of MDA necessary to achieve elimination. These armies against filariasis have been trained through training cascades that reached village level health volunteers, who spread messages on prevention and care in their communities, in addition to facilitating the MDAs that have made elimination possible in Thailand.

- The Financial: Since the very first filariasis study conducted in 1949, and the birth of the Division of Lymphatic Filariasis in 1961, the programme has been financed largely through domestic funding, reflecting the commitment of the Government of Thailand to eliminating this terrible disease.
In Nepal, trachoma was the second leading cause of preventable blindness during 1980s and was endemic in many areas of the country where prevalence rates were as high as 23% in several districts. (Source: 1981 Epidemiological Survey of Eye in Nepal)

In the 1990s, Nepal Netra Jyoti Sangh (NNJS) has successfully reduced trachoma prevalence in endemic areas through the implementation of a community-based trachoma control programme. While progress was made in disease reduction, there was still a tremendous amount of work to be accomplished. To this end, NNJS and the Ministry of Health and Population (MoHP), with support from International Trachoma Initiative (ITI), initiated the “National Trachoma Programme” (NTP) in 2002 with the goal to eliminate trachoma from Nepal. In this initiation, NTD Integrated programme of RTI is also on board to support NTP to eliminate blinding trachoma from Nepal since 2011.

After the establishment of National Trachoma Programme, it was estimated from the national-level workshop conducted in 2004 that 40 000 people were suffering from advanced stages of the disease and require sight-saving surgery, and 8% (or 2.16 million people) of the nation’s population were suffering from active infection. In 10 years of SAFE strategy (surgery, antibiotics, facial cleanliness and environmental change) implementation in the trachoma endemic districts of Nepal, the programme has achieved great success in combating trachoma. Active trachoma prevalence now has been reduced by more than 90% in 12 programme districts where SAFE was implemented, and blinding trachoma has been prevented in 18 000 people through Trichiasis surgery. The ultimate goal of the NTP is the elimination of blinding trachoma from Nepal by 2017.

Source: 1981 Epidemiological Survey of Eye in Nepal
**Major milestones**

- 100% of Nepal mapped for trachoma, 20 districts endemic.
- MDA with zithromax conducted in all endemic districts.
- Surveillance survey shows that active trachoma is less than 5% in the endemic districts.
- 14.7 million people treated over the life of the programme.
- More than 30 000 patients received TT surgery.
- Trachoma messages were incorporated in the school curriculum for grades 1–5.
- Eye health education (face washing and environmental improvement) provided to the community during MDA campaigns.

**Obstacles faced and how they were overcome**

- TT patients are reluctant to come for surgery/awareness programme was launched at the community level.
- Train governmental health paramedicals to identify active trachoma and treatment and referral of TT patients to eye hospitals for surgery/future programme to train health-care personnel.
- NTP is concerned about possible recrudescence following elimination, due to free movement of people across the border/Nepal will begin advocating for regional approaches on cross-border cooperation between the two countries.
There is powerful momentum on which to build on the efforts in South-East Asia to end NTDs. Leprosy prevalence has fallen to below 1 per 10,000 people in every country in the Region; new cases of kala-azar in the four endemic countries in the Region fell by 83% from 2007 to 2015; elimination of LF as a public health problem has been achieved in Maldives and Sri Lanka; and yaws has been eliminated in India. The region has also shown impressive progress on NTDs amenable to preventive chemotherapy as seen in figure 12.

But now we must follow through on our commitment to fully navigate the “endgame” of these diseases. As the report explains, while progress to date against NTDs has been nothing short of inspiring across the Region, we are not on track to eliminate all NTDs in all Member States by the agreed deadline and are at risk of falling behind on few. This reality underscores the need for intensified political commitment to end NTDs, more strategic use of data to target programmes to those most in need, and effective leveraging of innovative, community-driven service models to reach the hardest-to-reach.

This report addresses this challenge, highlighting both opportunities to be seized and challenges to be overcome. Victory is within our grasp, but now we must take the essential steps needed to end the threat posed by NTDs.

Recent years have seen a remarkable surge in commitment from international organizations, governments and health professionals to achieve the ambitious goal of eliminating and eradicating NTDs.

The United Nations, regional groupings and individual governments in many parts of the globe have resolved to commit resources and tackle NTDs with renewed vigour. Large pharmaceutical companies and multilateral agencies have come together in one of the largest ever public-private partnerships to deliver the funding, drugs and technical assistance required for treatment of NTDs. The inclusion of the NTDs as part of the Sustainable Development Goals has given further impetus to global efforts.

These developments are already having an impact, with a growing number of endemic countries achieving their elimination goals, increasing coverage of affected populations, and greater mobilization of domestic resources for funding NTD programmes.
As a result, Lymphatic filariasis and trachoma have been eliminated or are under surveillance for elimination in 18 and eight countries, respectively.²²

Nonetheless there are several challenges that we face in meeting WHO’s ambitious set of targets for the elimination and eradication of NTDs by 2020, as outlined below.

**Inadequate prioritization and resourcing at point of delivery**

Although elimination of NTDs has been embraced as a national priority across the Region, NTD-related prevention and treatment is often poorly resourced in the highly decentralized settings where these services are delivered. Stronger supply chain management and more careful targeting of finite resources among decentralized service sites are also needed, as some service sites are oversupplied with NTD-related drugs and diagnostics while others go without.

**Evidence gaps**

Although the evidence base for core NTD interventions is robust, there are gaps that impede swifter progress towards the elimination targets. For example, while preventive chemotherapy is clearly effective for LF, no validated, effective treatment exists to kill adult filarial worms. Likewise, drugs to treat post-kala-azar dermal leishmaniasis (an important reservoir of infection) are cumbersome to administer, and kala-azar diagnostics currently available are not suitable as a test of cure. No new treatments or diagnostics for leprosy have emerged for several decades.

In addition to new technologies, research is also needed to inform delivery strategies and policy frameworks, including operational research on integrated strategies that link mass drug administration with water and sanitation interventions or other initiatives. Given the urgency of the NTD elimination agenda, learning by doing (rather than waiting for the completion of complicated, years-long clinical and implementation research trials) will be essential. Regulatory reform is also required to expedite the review, approval and roll-out of new innovations as soon as they emerge, and policymakers and programme implementers also need to remain sufficiently flexible to adapt programmes as implementation insights emerge.

**Organizational leadership, management, coordination and workforce issues**

Because of their nature, their impact on the most vulnerable and hard-to-reach, and their reliance on multiple interventions, prevention and treatment of NTDs rely on close collaboration of diverse sectors. For example, multiple ministries and sectors urgently need to work together to make potable water available, improve living standards and ensure sanitary measures at the village level.

Unfortunately, organizational challenges often undermine these synergistic, collaborative arrangements – at both the national level and at the level of programme intervention. Frequent changes in leadership positions and lack of essential orientation and trainings for programme managers may impede the effectiveness of local programmes, leading to gaps in planning and execution of regular mass treatment interventions. Empanelling multisectoral national coordination bodies at the national level specifically focused on NTD elimination can help improve national-level organization and, if linked with rigorous performance monitoring and reporting systems, can also help improve organizational management for village-level programmes.

A distinct kind of collaboration is needed to address the persistence of NTDs in international border areas.
Nepal and Thailand have shown the way on how to maximize disease control efforts at the border, sharing data and interventions tailored to the need of migrants or people crossing the national boundaries.

Shortages of trained and skilled health workers, especially in remote endemic pockets, hinder efforts to link vulnerable communities with essential services. Some countries in the Region have among the lowest health workforce penetration in the world – 5.7 health professionals per 10 000 population in Bangladesh, and 6.4 in Nepal, or well below the minimum threshold of 22.8. While working to educate and develop new cadres of skilled health professionals, innovative approaches are needed to leverage community health workers to help close these workforce gaps. In addition to providing essential manpower for health service delivery and health promotion activities, community health workers also have an unparalleled ability to build trust with vulnerable communities and to reach those most at risk of being left behind.

Suboptimal treatment access and adherence

Poor community awareness of the availability of treatment hinders efforts to bring mass drug administration programmes to scale. In many cases, social factors slow treatment uptake, especially as many NTDs (such as leprosy or kala-azar) are highly stigmatized, deterring many people from seeking the services they need. In many settings where drugs are available, treatment adherence is poor, as seemingly healthy people who are not adequately educated on the programmatic interventions do not perceive a reason to take the medicines.

**Insufficient use of data to drive policy and programmes**

Public health initiatives are only as strong as the evidence on which they are based. Weaknesses in data systems contribute to an underestimation of disease burden, incorrect forecasting of needs for drugs and diagnostics, failure to recognize emerging drivers of new infections, and inaccurate reporting of the coverage and results of mass drug administration.

**Data limitations can undermine health officials’ spatial and population-based understanding of unmet need for prevention and treatment services, resulting in the waste of finite resources and suboptimal impact of programme investments.**

Due to data limitations, important trends are not recognized in a timely manner and operational decisions (such as conducting mop-up treatment to close treatment gaps following rounds of MDA) are not made. In some cases, these issues can be missed for years due to deficiencies in data systems.

To achieve the elimination of NTDs, investments in strategic information systems that are optimally aligned and focused are essential. In particular, strategic information systems must be sufficiently granular to enable decision-makers to understand trends and patterns of unmet need in specific communities.

**Investments in community education and peer-based adherence support help increase community literacy about NTD treatments, build demand for services, and improve treatment outcomes.**
Globally, WHO estimates that US$ 18 billion is needed to fully implement the NTD Roadmap in 2015–2020. Worldwide, medicines alone will require US$ 4.5 billion in 2015–2020, with annual investments peaking in 2017 at US$ 810 million. In South-East Asia, investments in preventive chemotherapy in 2015 were US$ 81 million below the amount needed in 2017 to ensure delivery of preventive chemotherapy to all those who need it. Although medicines account for a substantial portion of needed NTD investments through 2020, vector control is projected to account for a growing proportion of investment needs, due to continued, rapid unplanned urbanization, population movement and environmental change.

To mobilize the resources that will be needed to eliminate NTDs in the South-East Asia Region, domestic resources will need to serve as a pillar of these efforts. As endemic countries in the Region graduate to middle-income status, a portion of the fruits of increased national prosperity should be reserved for health programmes to benefit the most vulnerable segments of society.

The domestic investments required to eliminate NTDs are manageable, especially if these are considered integral components of national health plans and budgets to achieve universal health coverage and the SDG health targets. WHO estimates that the domestic resources needed to achieve universal coverage against NTDs represent less than 0.1% of projected domestic expenditure on health among low- and middle-income countries in 2015–2030. Even for low-income countries, where domestic fiscal space is most limited, needed investments for NTD control activities are still well below 1% of domestic expenditure on health.

In making decisions on domestic spending priorities, decision-makers should bear in mind the extraordinary returns on investments in NTD control.

Achieving the WHO 2020 targets for NTD elimination would avert 600 million DALYs

While NTD control is an imperative in its own right, especially for the most vulnerable communities who bear the brunt of these diseases, investments in NTD prevention and treatment also contribute to eliminating severe poverty, the most fundamental of development goals. Although severe poverty is sometimes thought of as a problem primarily for low-income countries, the bulk of the severely poor actually live in middle-income countries. Indeed, the gap between the number of people requiring preventive chemotherapy for NTDs and the number receiving the therapy is largest in middle-income countries (notably lower-middle-income countries). By lessening NTDs, both the cause and effect of severe poverty and deprivation, through focused investments in NTD control, long-lasting economic and development benefits will be generated for countries in the Region.

In moving to close the resource gap for the elimination of NTDs, countries should fully leverage assistance available from the private sector, notably the pharmaceutical industry. Pharmaceutical companies have committed to provide free medicines for mass drug administration, but countries will need to mobilize resources associated with the delivery of these medicines to people who need them.
In addition, there is growing momentum towards the use of innovative financing mechanisms for the control of NTDs and other diseases that primarily affect low- and middle-income countries. In response to the misallocation of global resources – with only 0.5% of global pharmaceutical research and development focusing on the NTDs that affect more than a billion people worldwide – the United Nations High-Level Panel on Access to Medicines has recommended a series of options to de-link the cost of research and development from the final cost of a product. Possible innovative financing mechanisms include priority review vouchers that offer awards for innovative discoveries, advance market commitments (for the purchase of a priority drug, vaccine or diagnostic, once it is developed), and prize mechanisms that incentivise needed research on development in the field of NTDs and other under-prioritized health problems. Experts believe that these approaches can help close the global resource gap for NTDs – estimated at US$ 200 million to US$ 300 million annually.\textsuperscript{25}

At the national level, countries should fully leverage momentum towards universal health coverage to drive progress towards elimination of NTDs. Analyses indicate that achieving 80% health coverage is consistent with coverage targets for prevention of NTDs.

In addition to enabling the expansion of health coverage for the most vulnerable, universal health coverage also has the potential to alleviate burdens on public health budgets by offloading expenditures to broader, more sustainable sources of financing.

\textbf{FIGURE 13: Yearly financial costs for MDA to eliminate LF SEA Region}

![Graph showing yearly financial costs for MDA to eliminate LF SEA Region]

\textit{Source: WHO (2017)}
These are exciting times for those working on neglected tropical diseases, a group of 18 diseases that have long been the scourge of some of the poorest people in the world. Nearly 1 in 6 people worldwide require treatment for at least one NTD.25

Although three countries of the Region have already achieved verification or validation of elimination of one or more NTDs and several countries have achieved important milestones, current trends indicate that few Member States are either not on track to end all NTDs or are at risk of missing the elimination targets (Fig. 14). For example, Indonesia, one of the most populous countries on the planet, is not presently on track to eliminate LF and schistosomiasis, which persist as major sources of morbidity and mortality. For leprosy, most countries (six of 11) are either not on track or at risk of getting off track to reach the target.

Three countries of the Region have already achieved verification or validation of elimination of one or more NTDs and several countries have achieved important milestones, current trends indicate that few Member States are at risk of missing the elimination targets
FIGURE 14: Are we on Track?

Source: WHO SEARO (2017)

Disclaimer: © World Health Organization. The boundaries and names shown and the designations used on this map do not imply the expression of an opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.
Achieving the 2020 LF elimination target in Indonesia and India is at risk. Achieving the 2017 kala-azar elimination target in all endemic blocks in India may be a challenging task unless we change the way we work.

Nonetheless, these uncertainties and challenges can be turned into opportunities to bring in new thinking and innovative solutions. Two major challenges to achieve the 2020 LF elimination are the long duration of MDA based on the current treatment regimen and poor treatment coverage. Early adoption and national roll-out of triple-drug MDA, for example, is expected to shorten the total duration of treatment significantly, saving few additional years for countries lagging behind. This would mean that Indonesia and India can still achieve the 2020 LF elimination target. Likewise, a new approach and communication strategy for community mobilization and re-energizing the programme could help in improving treatment coverage. Bringing management solutions like real-time monitoring and smart visual dashboards would enable closer monitoring of the kala-azar elimination bringing all the partners on the same page. This would enable frequent joint monitoring and immediate course correction. Leprosy elimination programmes require fresh ideas and new thinking. Updating the leprosy prevalence maps and hot stops and wider use of modern IT solutions would allow a more focused intervention and bring efficiency to the national leprosy programmes. The 2020 elimination target is still within reach in the Region if we bring in innovations like these on an urgent basis.

To seize the historic opportunity to end NTDs once and for all, Member States should focus on leveraging potential “game-changers” to accelerate NTD-related gains and to lay the foundation for sustainable efforts to prevent the re-emergence of these diseases. These specific steps are needed:
Focus first on the most marginalized

As mainstream health services are inadequate to the challenge posed by NTDs, determination and innovation will be required to reach the most vulnerable and marginalized populations. By gearing health services to the needs of those most difficult to reach and engage, countries can ensure that health programmes reduce inequality and also reach those who are already more amenable to service uptake.

Know your epidemics and response

Traditionally, the collection, analysis and reporting of disease trends have occurred at the national level. Given the heavy concentration of the NTD burden in remote settings, a more granular understanding of variations in disease burden and unmet need is required. Steps are needed to build the capacity of local and other subnational actors to understand local disease patterns and to monitor outcomes along the cascade of steps required to achieve the desired health outcomes. As needed, epidemiological and programmatic performance data should be used to adapt programmatic approaches to overcome implementation bottlenecks, improve efficiency and maximize public health impact.

Adapt health delivery to the needs of people

While secondary and tertiary care facilities are fixed in place, with the expectation that those in need of health services will take the steps needed to access them, elimination of NTDs among the most vulnerable will occur only if health services are specifically adapted to their needs and circumstances. Urgent efforts are needed to recruit, train and deploy community health workers and to organize clinical tasks in a manner that empowers community workers to help drive service uptake for remote communities. Involving communities in the response to NTDs will support the efforts of community health workers and aid in reaching those most in need of services.

Implement national coordinating bodies for elimination of NTDs

In the response to HIV and tuberculosis, national multisectoral bodies have helped increase awareness of these diseases, coordinated diverse actors, and identified challenges or bottlenecks that need to be addressed. A similarly focused coordinating effort is needed for the elimination of NTDs. Specific efforts are needed to ensure that the work of these new NTD coordinating bodies supports and draws from broader efforts to move towards universal health coverage.

Translate technology into concrete health gains

Even as ongoing research moves towards the validation of new, potentially transformative prevention and treatment tools for NTDs, regulatory, implementation and financing bottlenecks have the potential to delay the rapid use of these critical new technologies. Regulatory systems need to be strengthened and streamlined to expeditiously evaluate, approve and licence new health technologies, and budgetary systems must be sufficiently flexible to ensure swift purchase and distribution of new health tools.

Invest now or pay much more down the road

Investments in the control of communicable disease have magnified benefits, in that they avert future medical costs and help communities improve health over time. By contrast, the failure to make needed investments in NTD control will merely allow these diseases to rebound, substantially increasing future human and financial costs. Overall public sector investments in health must increase, and overall funding for NTD control activities must grow as well. These investments need to be frontloaded, in order to capitalize on the unique historic opportunity to end these epidemics once and for all.
Countries validated for elimination as a public health problem: Maldives, Sri Lanka
Post Validation surveillance to continue
Completion of Dossier for Validation of Elimination Thailand
Bangladesh to continue post MDA surveillance and retain elimination status

Countries continuing MDA and reached 100% geographic coverage and recommended compliance: Myanmar, Nepal, Timor-Leste
Continue MDA and surveillance with current strategy, consider alternate MDA strategies

Achievement possible with revised plan

Countries under post MDA surveillance: Thailand and Bangladesh
Countries requiring full geographic coverage with improved compliance to MDA: Indonesia

Countries requiring improved compliance to MDA: India, Indonesia
Revised plan: Early adoption and roll out alternate MDA strategies as soon as available
New communication and community mobilization approach to ensure compliance
Achievement possible with revised plan
Annual MDA with three drugs (ivermectin, DEC and albendazole) or twice a year MDA with albendazole and DEC that are currently under review.
Kala-azar

Current Status

Elimination target achieved, pending validation: Nepal

Elimination remain to be achieved at Sub district level: Bangladesh, India

Implementation Plan (current and revised) by end of 2017

Address identified gaps to ensure validation

Plan and supplies in place. Close monitoring of interventions for time bound result

Achieving the Target

Likely achievement by 2017

First milestone achievable in Bangladesh by 2017. Mid-year assessment in India required

Trachoma

Current Status

Preparing for validation: Nepal

Assessment ongoing to validate achievement of targets: India, Myanmar

Implementation Plan (current and revised) by end of 2017

Complete and submit the dossier

To plan next steps following assessment

Achieving the Target

2020 target feasible

2020 target feasible
Elimination verified: India
Post verification surveillance to continue (WHO to provide guidance)

MDA in progress: Indonesia
Revise current plan to ensure elimination on time and close joint monitoring

Mapping survey planned: Timor-Leste
Finalise local plan following analysis of survey results

Assessment required to validate non reporting of cases : Sri Lanka
To prepare for likely verification following assessment

Achieved
2020 target feasible
To assess after the survey results
2020 target feasible
Global leprosy strategy 2016-2020; Accelerating towards a leprosy-free world

Current Status

Elimination as a public health problem achieved in all countries

Low burden countries: Bhutan, DPRK, Maldives, Thailand and Timor-Leste

High burden countries: Bangladesh, Myanmar, Nepal and Sri Lanka

High burden: India and Indonesia

Implementation Plan

Accelerated case finding activities ensuring high compliance of MDT

Intensified case detection campaigns are taken up

Intensified case detection campaigns, improve coverage, improved management of contacts of leprosy patients

Achieving the Target

2020

Target (G2D) likely achievable by 2020

2020 target (G2D) feasible

Subnational assessment awaited

Endemicity confirmed: Two districts in Indonesia with low prevalence

Switch from a “control” to “interruption of transmission” strategy. Multisectoral approach with focus on environmental management and snail control

Suspected endemicity: Myanmar

Need to be confirmed including the species of schistosomiasis and type of snails involved in the transmission

International assessment awaited

2020 target likely with intense efforts
Schistosomiasis

Current Status

Endemicity confirmed: Two districts in Indonesia with low prevalence

Suspected endemicity: Myanmar

Implementation Plan

Switch from a “control” to “interruption of transmission” strategy. Multisectoral approach with focus on environmental management and snail control

Achieving the Target

Need to be confirmed including the species of schistosomiasis and type of snails involved in the transmission

2020 target likely with intense efforts

International assessment awaited

Global leprosy strategy 2016-2020; Accelerating towards a leprosy-free world

Low burden countries: Bhutan, DPRK, Maldives, Thailand and Timor-Leste

Accelerated case finding activities ensuring high compliance of MDT

High burden countries: Bangladesh, Myanmar, Nepal and Sri Lanka

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Implementation Plan

Achieving the Target

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REFERENCES


7World Health Organization. Health Statistics and information system. Global Health estimates: DALYs by age and sex and cause. 2015


16Bangert M, Molyneux DH, Lindsay SW et al. The cross-cutting contribution of the end of neglected tropical diseases to the sustainable development goals. Infect Dis Poverty. 2017; 6: 73.


22WHO. Investing to Overcome the Global Impact of Neglected Tropical Diseases. Third WHO Report on Neglected Tropical Diseases 2015. WHO


