ENDING the **NEGLECT** to **ATTAIN** the **SUSTAINABLE DEVELOPMENT GOALS**

A road map for neglected tropical diseases 2021–2030

World Health Organization

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ABBREVIATIONS and ACRONYMS

DALY	disability-adjusted life year
MDA	mass drug administration
NTD	neglected tropical disease
SDG	Sustainable Development Goal
WASH	water, sanitation and hygiene
WHO	World Health Organization

GLOSSARY

The definitions given below apply to the terms as used in this document. They may have different meanings in other contexts.

Control: Reduction of disease incidence, prevalence, morbidity and/or mortality to a locally acceptable level as a result of deliberate efforts; continued interventions are required to maintain the reduction. Control may or may not be related to global targets set by WHO.

Disability-adjusted life year (DALY): A measure of overall disease burden, expressed as the number of years lost due to ill health, disability or early death. Introduced in the 1990s to compare overall health and life expectancy in different countries. DALYs for a disease or health condition are calculated as the sum of the years of life lost due to premature mortality in the population and the years lost due to disability resulting from the health condition or its consequences.

Disability: Inability to adequately or independently perform routine daily activities such as walking, bathing and toileting; the negative aspects of the interaction between a person with a health condition and his or her context (environmental and personal factors).

Elimination (interruption of transmission): Reduction to zero of the incidence of infection caused by a specific pathogen in a defined geographical area, with minimal risk of reintroduction, as a result of deliberate efforts; continued action to prevent re-establishment of transmission may be required. Documentation of elimination of transmission is called verification.

Elimination as a public health problem: A term related to both infection and disease, defined by achievement of measurable targets set by WHO in relation to a specific disease. When reached, continued action is required to maintain the targets and/or to advance interruption of transmission. Documentation of elimination as a public health problem is called validation.

Equity: The absence of avoidable or remediable differences among groups of people defined socially, economically, demographically, geographically or by sex.

Eradication: Permanent reduction to zero of the worldwide incidence of infection caused by a specific pathogen, as a result of deliberate efforts, with no risk of reintroduction.

Extinction: Eradication of a specific pathogen, so that it no longer exists in nature or in the laboratory, which may occur with or without deliberate work.

Hygiene: Conditions or practices conducive to maintaining health and preventing disability.

Integrated vector management: A rational decision-making process to optimize the use of resources for vector control.

Mass drug administration (MDA): Distribution of medicines to the entire population of a given administrative setting (state, region, province, district, sub-district, village, etc.) irrespective of the presence of symptoms or infection; however, exclusion criteria may apply. (In this document, the terms mass drug administration and preventive chemotherapy are used interchangeably.)

Morbidity: Detectable, measurable clinical consequences of infections and disease that adversely affect the health of individuals. Evidence of morbidity may be overt (such as the presence of blood in the urine, anaemia, chronic pain or fatigue) or subtle (such as stunted growth, impeded school or work performance or increased susceptibility to other diseases).

Monitoring and evaluation: Processes for improving performance and measuring results in order to improve management of outputs, outcomes and impact.

Platform: Structure through which public health programmes or interventions are delivered.

Preventive chemotherapy: Large-scale use of medicines, either alone or in combination, in public health interventions. Mass drug administration is one form of preventive chemotherapy; other forms may be limited to specific population groups such as school-aged children and women of childbearing age. (In this document, the terms preventive chemotherapy and mass drug administration are used interchangeably.)

EXECUTIVE SUMMARY

Ending the neglect to attain the Sustainable Development Goals

A road map for neglected tropical diseases 2021–2030

DRIVING PROGRESS

Neglected tropical diseases (NTDs) are ancient diseases of poverty that impose a devastating human, social and economic burden on more than 1 billion people worldwide, predominantly in tropical and subtropical areas among the most vulnerable, marginalized populations. Since the first WHO road map for the prevention and control of NTDs was published in 2012, substantial progress has been made. Today, 500 million fewer people require interventions against NTDs than in 2010, and 40 countries, territories and areas have eliminated at least one disease. Dracunculiasis is on the verge of eradication, with 53 human cases reported in four countries in 2019; lymphatic filariasis and trachoma have been eliminated as public health problems in 16 and nine countries respectively; onchocerciasis has been eliminated in four countries in the Region of the Americas; the annual number of cases of human African trypanosomiasis has fallen from more than 7000 in 2012 to fewer than 1000 in 2018, halving the original target of 2000 cases by 2020; and the number of new leprosy cases reported globally has continued to decline at 2–3% per year after most endemic countries reached the goal of eliminating leprosy as a public health problem in 2010.

Progress against NTDs has alleviated the human and economic burden they impose on the world's most disadvantaged communities. It demonstrates the effectiveness of aligning the work of Member States with that of diverse partners, which has had two important results in the past eight years, notably the recognition that: (i) NTD interventions are one of the "best buys" in global public health, yielding an estimated net benefit to affected individuals of about US$ 25 per US$ 1 invested in preventive chemotherapy; and (ii) NTDs are important indicators of disparities in progress towards both universal health coverage and equitable access to high-quality health services, regardless of factors such as gender, age, disability and location.

RENEWING MOMENTUM

While substantial progress has been made since 2012, not all of the 2020 targets will be met. The new road map demonstrates critical gaps and the actions required to reach the 2030 targets, identified through global consultation. Experience from the past decade shows that further multisectoral action is required for all 20 diseases and disease groups, particularly in diagnostics, monitoring and evaluation, access and logistics, and advocacy and funding. Ambitious, impact-oriented targets are required to achieve the Sustainable Development Goals (SDGs) and accelerate control and elimination.

Concerted action in multiple dimensions and agile responses to challenges will be necessary to achieve the targets. For example, the emerging recognition that *Dracunculus medinensis* infection in animals could sustain transmission in humans shows how "last mile" challenges to eradication can manifest.

Circumstances such as political instability, migration, the consequences of climate change and antimicrobial resistance increase the complexity of the situation and will require additional action.

TARGETS AND STRATEGIES FOR THE NEXT DECADE

The road map for 2021–2030 sets global targets and milestones to prevent, control, eliminate or eradicate 20 diseases and disease groups. It also sets cross-cutting targets aligned with WHO's 13th General Programme of Work and the SDGs, with strategies for achieving the targets during the next decade.

The new road map was prepared by extensive global consultation. This process included regional workshops with national NTD programme managers, meetings with stakeholders in NTDs and related areas of work, more than 100 bilateral interviews with disease experts, donors and other partners and over 300 responses from two rounds of online consultations. The document therefore reflects the perspectives of Member States and a wide range of stakeholders.

INTEGRATING AND MAINSTREAMING APPROACHES

Continued programmatic action is called for, particularly in areas in which there are critical gaps for several diseases. Adequately structured operational and implementation investigations, including community-based and applied research, are also essential to build a solid foundation for effective NTD programmes.

More radical change is required to integrate and mainstream approaches into national health systems and coordinate action across sectors. Such cross-cutting concepts are not new; they are outlined in various NTD plans, but their operationalization has been problematic in some instances. The road map will renew momentum by proposing concrete actions within integrated platforms for delivery of interventions, to improve the cost–effectiveness, coverage and geographical reach of programmes. Strengthening the capacity of national health systems will ensure delivery of interventions through the existing infrastructure, improve the sustainability and efficiency of interventions and ensure that patients have equitable access to all aspects of treatment, care and support. Close coordination and multisectoral action within and beyond health, including vector control, water and sanitation, animal and environmental health and education, will maximize synergies.

DELIVERING RESULTS, ACHIEVING IMPACT

Countries are both the drivers and the beneficiaries of progress towards the 2030 targets for NTDs. National and local governments must therefore define and deliver an agenda, financed partly or fully from domestic funds. They must integrate and prioritize endemic NTDs in national health plans and dedicate a corresponding budget line. Multisectoral action must be fostered proactively at ministerial and higher levels to build the high-level political will required.

As countries define their national NTD plans, the support of partners will be essential for filling gaps, strengthening capacity and ensuring that targets are achieved. With the continued shift to cross-cutting approaches, structures and ways of working might have to be adapted accordingly, for example by making funding streams and reporting structures more flexible.

Much work will be required during the next decade to reach the at least 1.76 billion people who still require interventions against NTDs. These diseases of poverty must be overcome in order to deliver on the SDGs and ensure universal health coverage. The road map sets out global targets and actions to align and re-focus the work of stakeholders during the next decade. It encourages all actors to evaluate the efficiency and effectiveness of their contributions and approaches and seeks to foster greater collaboration and openness to lessen the global burden of NTDs.

CONTEXT and PURPOSE of the ROAD MAP

Chapter 1

The 2021–2030 road map is the second WHO blueprint for addressing NTDs. It follows the 2012 document, "Accelerating work to overcome the global impact of neglected tropical diseases" *(1)*, which set out global targets and milestones to 2020 for the 17 NTDs that were then in WHO's NTD portfolio. The aim of the second road map, like the first, is to facilitate alignment among Member States and other stakeholders and to accelerate progress towards the prevention, control, elimination and eradication of these diseases and reaching the SDGs.

This road map is a call to action for Member States, donors, implementing partners, disease experts and all other stakeholders to align their strategies and plans towards the prevention of infections and alleviation of the suffering of people affected by NTDs.

THE NTDs PRIORITIZED BY WHO ARE A DIVERSE SET OF 20 DISEASES AND DISEASE GROUPS WITH A SINGULAR COMMONALITY: THEIR DEVASTATING IMPACT ON IMPOVERISHED COMMUNITIES.

The 2030 road map covers 20 NTDs,[1] a medically diverse set of diseases and disease groups[2] that disproportionately affect populations living in poverty, predominantly in tropical and subtropical areas. NTDs impose a human, social and economic burden on over 1 billion people in all countries of the world, particularly in low-income countries and the most disadvantaged communities in middle-income countries (Fig. 1). More than 200 000 people die each year from snakebite envenoming, rabies and dengue alone, and lack of timely access to affordable treatment leaves hundreds of millions severely disabled, disfigured or debilitated, often resulting in social exclusion, stigmatization and discrimination.

NTDs cost developing communities billions of dollars each year in direct health costs, loss of productivity and reduced socio-economic and educational attainment *(2)*. NTDs also place considerable financial strain on patients and their families – human African trypanosomiasis in the Democratic Republic of the Congo costs affected households in a typical rural community over 40% of their annual household income *(3)*, and up to 75% of households affected by visceral leishmaniasis in Bangladesh *(4, 5)*, India *(6)*, Nepal *(7)* and Sudan *(8)*experience some type of financial catastrophe in obtaining diagnosis and treatment, even when tests and medicines are nominally free of charge.

[1] Buruli ulcer, Chagas disease, dengue and chikungunya, dracunculiasis, echinococcosis, foodborne trematodiases, human African trypanosomiasis, leishmaniasis, leprosy, lymphatic filariasis, mycetoma, chromoblastomycosis and other deep mycoses, onchocerciasis, rabies, scabies and other ectoparasitoses, schistosomiasis, soil-transmitted helminthiases, snakebite envenoming, taeniasis and cysticercosis, trachoma and yaws.

[2] All infectious diseases except snakebite envenoming.

Although the resources for NTDs are often not commensurate with the vast need, NTD interventions are one of the best buys in global public health. The end of NTDs is expected to result in an estimated net benefit to affected individuals of about US$ 25 for every US$ 1 invested in preventive chemotherapy, representing a 30% annualized rate of return, and to contribute significantly towards universal health coverage and social protection for the least well-off *(9)*.

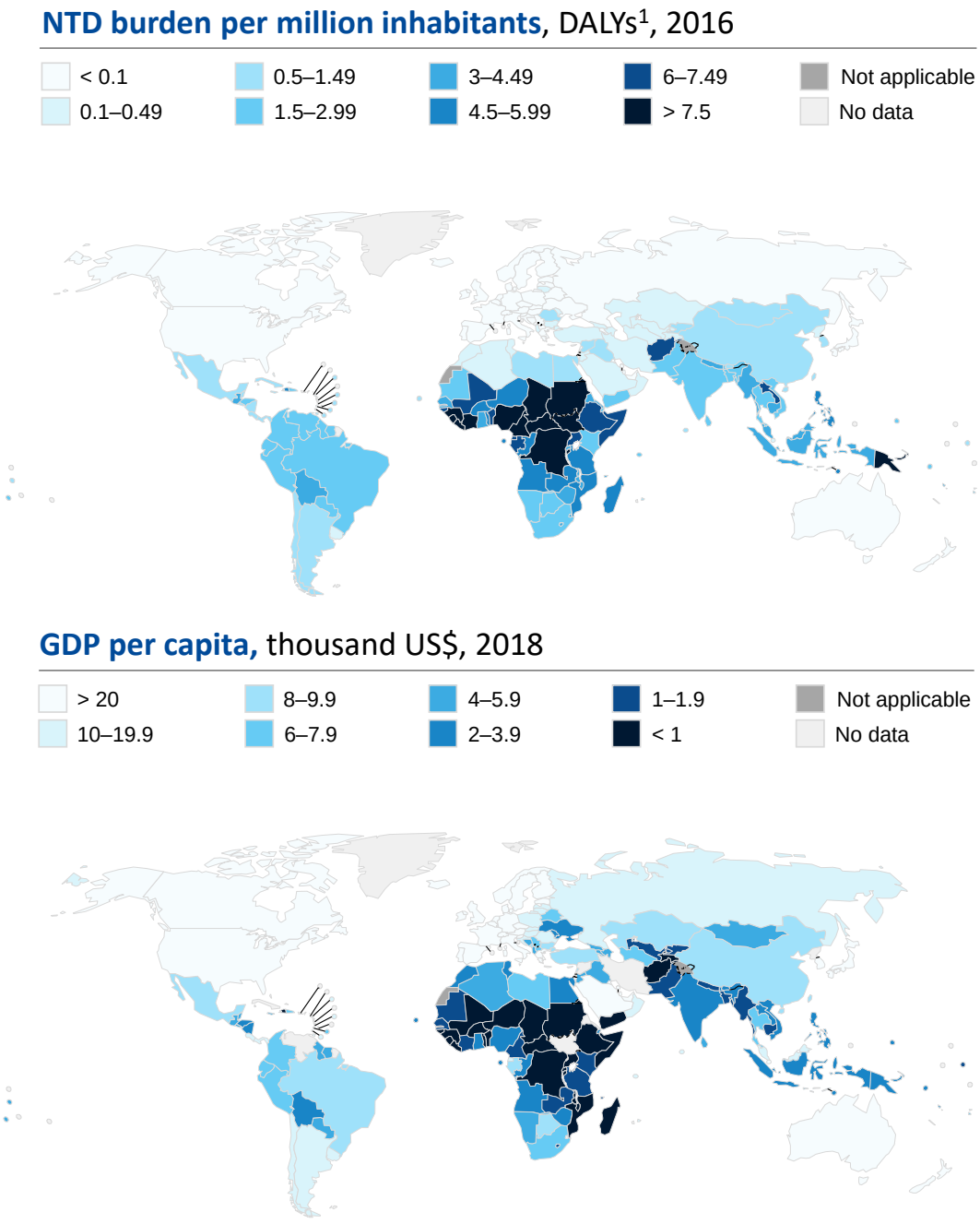


Fig. 1. Geographical spread of the NTD burden

Sources:

[1] Data for cumulative DALYs available only for human African trypanosomiasis, Chagas disease, schistosomiasis, leishmaniasis, lymphatic filariasis, onchocerciasis, cysticercosis, echinococcosis, dengue, trachoma, rabies, leprosy and soil-transmitted helminthiases.

Note: The number of NTD-related DALYs would be significantly higher if issues such as stigmatization, mental health (e.g. anxiety, depression) and co-morbidity were considered.

INTERVENTIONS AGAINST NTDs CONTRIBUTE TO ACHIEVEMENT OF THE SDGs.

NTDs are formally recognized as targets for global action in SDG target 3.3, which calls to "end the epidemics of … neglected tropical diseases" to "ensure healthy lives and ensure well-being for all at all ages". The SDGs can therefore be achieved only if the NTD goals are met. Successful interventions against NTDs contribute to meeting other SDGs, such as alleviating poverty (SDG 1) and hunger (SDG 2), enabling people to pursue an education (SDG 4) and lead productive working lives (SDG 8) and promoting equality, for example with regard to gender (SDGs 5 and 10). Progress against other SDGs can accelerate the achievement of NTD goals. For example, wider provision of clean water, sanitation and hygiene (WASH) (SDG 6) is believed to help eliminate or control NTDs; the availability of resilient infrastructure (SDG 9) should facilitate drug delivery and reaching remote communities; while sustainable cities (SDG 11) and climate action (SDG 13) can support the environmental management required to control disease vectors. The foundation for attaining all SDGs and NTD goals is strong global partnerships (SDG 17) (Fig. 2). This is expected to encourage the NTD community to think differently about the impact of interventions and to work proactively across sectors and disciplines to ensure progress towards sustainable development *(10)*. Ending the epidemic of NTDs could therefore have an impact on and improve prospects for attaining the SDGs *(10)*.

Fig. 2. Interactions among interventions against NTDs and the SDGs

ACTION AGAINST NTDs IS CORE TO THE VISION OF UNIVERSAL HEALTH COVERAGE.

Addressing NTDs supports the vision of universal health coverage, which means that all individuals and communities receive the health services they need without suffering financial hardship *(11)*. Universal health coverage is included in SDG 3.8 and is a cornerstone of WHO's 13th General Programme of Work. Tackling NTDs and monitoring and evaluation reinforce each other: NTD programmes reach some of the world's most remote communities and can thus improve the potential for equitable access to health care services for these populations. The endemicity of NTDs means that treatment can indicate the extent of universal health coverage *(12)*, which can be achieved only if people at risk of or affected by NTDs have equitable access to high-quality health services. Investment in NTDs can have important benefits for both health and economies.

CONSIDERABLE PROGRESS HAS BEEN MADE IN THE FIGHT AGAINST NTDs, WITH STRONG SUPPORT FROM MEMBER STATES AND THE GLOBAL NTD COMMUNITY.

The past decade saw significant progress in the battle against NTDs (Fig. 3), including new preventive measures and interventions, expanded donor support, new strategies and guidelines and strengthening of NTD-related structures, collaboration and country commitment. Establishment of public–private partnerships

has vastly facilitated progress towards the elimination and control of NTDs: pharmaceutical companies have donated nearly 3 billion tablets of safe, quality-assured medicines annually to support the control and elimination of NTDs in countries where they are endemic.

These achievements are a testament to the longstanding support and dedication of the global NTD community, from the first meeting of NTD global partners convened by WHO in 2007 to bring together various disease initiatives under the umbrella of the NTD "brand", to the pledges made in the 2012 London Declaration and the 2017 meeting of global partners. They demonstrate the immense potential that can be unlocked by working together to ensure that NTDs have a prominent position on the global health agenda.

CONCERTED ACTION AMONG ALL SECTORS IS REQUIRED TO SUSTAIN AND BUILD ON THE PROGRESS OF THE PAST DECADE.

While substantial progress has been made on various fronts, not all of the 2020 targets will be met, and the journey to eliminating and controlling NTDs is not over. The past decade showed that further action is required for all 20 diseases, including finding new interventions, diagnostic methods and tools; operational and implementation research; programme management and delivery; effective surveillance, monitoring and evaluation; and adequate financing mechanisms for each disease and for cross-cutting approaches. Sustained efforts are crucial with respect to diseases that are on the verge of eradication; the detection of dracunculiasis in other mammals shows that new challenges can emerge even towards the end. Efficiency could be improved with cross-cutting approaches, notably by integrating interventions for several NTDs and fostering greater collaboration among groups within and beyond the NTD community.

THE 2030 ROAD MAP OUTLINES DISEASE-SPECIFIC AND CROSS-CUTTING TARGETS AND STRATEGIES AND REPRESENTS THE VOICES OF THE ENTIRE NTD COMMUNITY.

The road map outlines specific, measurable targets for 2030 and also interim milestones for 2023 and 2025 for the eradication, elimination and control of each of the 20 diseases, as well as cross-cutting targets aligned with WHO's 13th General Programme of Work and the SDGs. The road map includes the strategies and approaches for achieving these targets, with cross-cutting themes for several diseases.

The road map and the 2030 targets are based on extensive consultation with over 400 respondents in the NTD community. The process included regional workshops[3] with NTD programme managers, and country workshops[4] with stakeholders in NTDs and related areas (e.g. WASH, education). The road map includes input from over 100 bilateral interviews with disease experts, donors and other partners, as well as over 300 responses gathered from an online consultation. This document therefore reflects the perspectives of Member States and a wide range of stakeholders. It was prepared by the WHO Secretariat under the guidance of the WHO Strategic and Technical Advisory Group for Neglected Tropical Diseases.

THE PURPOSE OF THIS DOCUMENT IS TO GUIDE WORK TO OVERCOME NTDs DURING THE NEXT 10 YEARS AND TO ENCOURAGE A FUNDAMENTAL SHIFT IN THE APPROACH.

The road map has two main objectives: to enable national governments to take the lead in delivering NTD interventions to reach SDG 3.3 by providing clear targets and disease-specific, cross-cutting approaches to reach them; and to encourage the global community of partners – donors, pharmaceutical companies, implementing partners, nongovernmental organizations and academia – to increase their commitments to overcoming NTDs in the coming decade.

Broadly, the road map is expected to encourage three fundamental shifts in the approach to tackling NTDs (Fig. 4). First, increase accountability for impact by using impact indicators instead of process indicators, as shown by the targets and milestones in section 2; secondly, move away from siloed, disease-specific programmes to cross-cutting perspectives centred on the needs of patients and communities, with monitoring and evaluation (section 3); and thirdly, ensure greater ownership of programmes by countries (section 4).

[3] In the African, Eastern Mediterranean and South-East Asian regions of WHO.

[4] In Egypt, Ethiopia and Indonesia.

Delivery of interventions and impact

- **65% preventive coverage** (2018) for populations at risk in endemic areas, up from 42% in 2012
- **500 million fewer people no longer require interventions against NTDs**
- **Close to 1 million surgical treatments provided** for trachomatous trichiasis since 2014
- **40 countries, territories and areas have eliminated at least one NTD**

New interventions, tools and diagnostics

- **New treatment approaches** e.g. ivermectin-diethylcarbamazine citrate-albendazole (IDA) for lymphatic filariasis, fexinidazole for human African trypanosomiasis, paediatric praziquantel (in the pipeline) for schistosomiasis, antibiotics for Buruli ulcer (instead of surgical treatment), azithromycin for yaws (instead of injected benzathine benzylpenicillin)
- **New diagnostics** e.g. rapid diagnostic tests and multiplex for onchocerciasis, lymphatic filariasis and human African trypanosomiasis; circulating cathodic antigen for *Schistosoma mansoni*; others in the pipeline, e.g. mycolactone rapid diagnostic test for Buruli ulcer
- **Novel vector control tools** such as sterile insect technique, incompatible insect technique, cytoplasmic incompatibility technique and population replacement techniques (by *Wolbachia* spp.), new traps and insecticides

Extension of overall scope and support for NTDs

- **Three new disease groups added to the portfolio of NTDs:** mycetoma, chromoblastomycosis and other deep mycoses), scabies and other ectoparasitoses and snakebite envenoming, increasing the total to 20 disease groups
- **New donor commitment of over US$ 1 billion** pledged since 2017
- **Drug donation commitments secured for six additional drugs**; 11 pharmaceutical companies annually donate a total of nearly 3 billion tablets of safe, quality-assured medicines worth hundreds of millions of US dollars

Creation of strategies, guidelines and resolutions

- **Resolution WHA66.12 adopted on NTDs (2013)**
- **WHA resolutions passed for two diseases:** mycetoma (2016) and snakebite envenoming (2018); additional resolution on the global vector control response (2017); in total, WHA resolutions have been passed for 17 of the 20 diseases.
- **15 NTDs with global disease strategies** in place
- **14 NTDs for which WHO disease guidelines and manuals** are available
- **Development of integrated strategies** e.g. for skin NTDs and vector control

Strengthening NTD structures and cross-sectoral collaboration

- **45 WHO collaborating centres** support WHO's activities on NTDs
- **Formation of the NNN (NTD NGO Network)** to coordinate the work of organizations engaged in the fight against NTDs, and other NTD-related alliances
- **Establishment of the Coalition for Operational Research on NTDs** as a leading scientific body focused on NTDs
- **Stronger multisectoral collaboration,** e.g. development of global 2015–2020 WASH strategy for NTDs, NTDs included in Global Vector Control Response, One Health approach
- **Creation of the ESPEN project** to strengthen WHO capacity to tackle five NTDs amenable to preventive chemotherapy in Africa

Increase in country ownership and commitment

- **Over 50 countries have national plans** related to NTDs.
- **An increasing number of countries include NTDs in their national health care budgets** and contribute domestic funding to tackle these diseases.

Fig. 3. Progress against NTDs since 2012

Dengue	▪ **Sustainable dengue vector control interventions established** in 10 endemic priority countries ▪ **Dengue control and surveillance systems established** in five of the six WHO regions
Dracunculiasis	▪ Currently on the verge of eradication with **53 human cases reported in four countries** (Angola, Cameroon, Chad and South Sudan) **in 2019**, down from over 500 cases in 2012; **187 Member States certified free of the disease**
Human African trypanosomiasis	▪ **Reduction in the annual number of cases from over 7000 in 2012 to fewer than 1000 today,** eclipsing the original target of 2000 cases by 2020
Leishmaniasis (visceral)	▪ **Reduction in the number of cases reported annually in South-East Asia from more than 50 000 cases to fewer than 5000 in 2018;** 93% of cases in 2018 were reported from India and 7% from Bangladesh and Nepal
Leprosy	▪ **21.4% reduction in number of cases with grade 2 disabilities**, with possibility to reach the target of reducing grade 2 disabilities to less than one case per million population ▪ Donation of multidrug therapy is assured
Lymphatic filariasis	▪ **36% (or 554 million) reduction in the population requiring MDA** since the beginning of the Global Programme to Eliminate Lymphatic Filariasis; **disease eliminated as a public health problem in 16 countries**
Onchocerciasis	▪ **Transmission eliminated in four countries in the Americas** (Colombia, Ecuador, Guatemala, Mexico)
Rabies	▪ **Elimination of dog-mediated human rabies in one country** (Mexico)
Schistosomiasis	▪ **71% preventive chemotherapy coverage rate achieved for school-aged children,** almost reaching 2020 target of 75%
Soil-transmitted helminthiases	▪ **70% of pre-school and school-aged children who require treatment are regularly treated,** almost reaching 2020 target coverage rate of 75% ▪ **68 countries with 75% treatment coverage in pre-school and school-aged children,** almost reaching 2020 target of 75 countries
Trachoma	▪ **Eliminated as a public health problem in nine countries** (Cambodia, China, Ghana, Islamic Republic of Iran, Lao People's Democratic Republic, Mexico, Morocco, Nepal, Oman)
Yaws	▪ **Elimination of transmission verified in one country** (India) ▪ Donation of azithromycin secured

Fig. 3. Progress against NTDs since 2012 (continued)

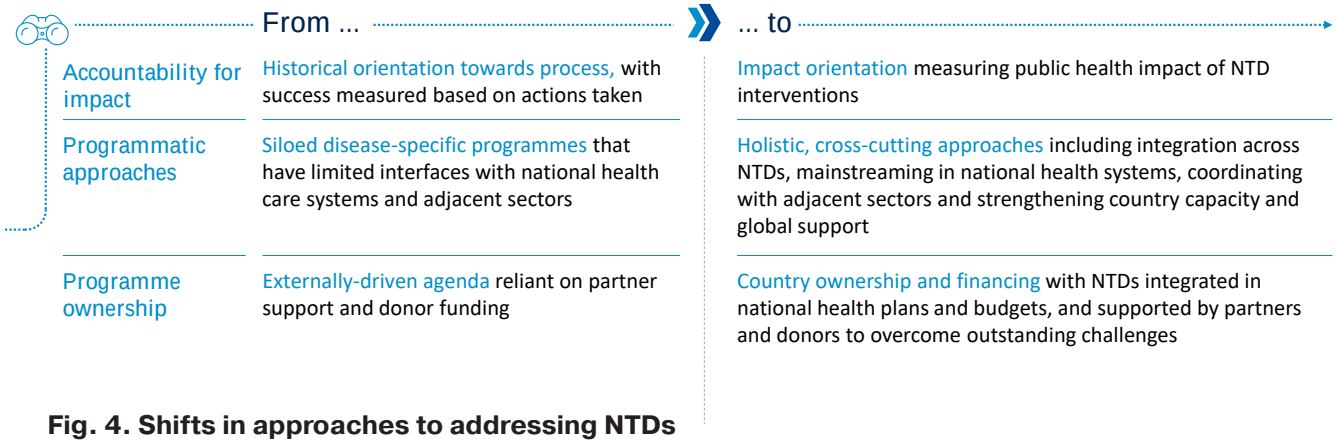


Fig. 4. Shifts in approaches to addressing NTDs

2030 TARGETS and MILESTONES

Chapter 2

This section provides an overview of the targets and milestones for NTDs, which were determined by extensive global consultation with Member States and with other organizations in the United Nations system, scientific and research groups, nongovernmental organizations, implementing partners, donors and private sector organizations (Annex 1). The process is summarized in Box 1.

The overarching and cross-cutting targets, derived from the SDGs and WHO's 13th General Programme of Work, are relevant for following progress in integration, coordination, country ownership and equity for several diseases. The targets for sectors such as WASH and vector control are based on established targets. Disease-specific targets for 2030 and milestones for 2023 and 2025 were set for each of the 20 diseases for one of the following:

- eradication, defined as permanent reduction to zero of a specific pathogen worldwide as a result of deliberate efforts, with no risk of reintroduction;
- elimination (interruption of transmission), defined as reduction to zero of the incidence of infection by a specific pathogen in a defined geographical area, with minimal risk of reintroduction;
- elimination as a public health problem, defined as achievement of measurable global and regional targets set by WHO for specific diseases; or
- control, defined as reduction of disease incidence, prevalence, morbidity and/or mortality to a locally acceptable level.

The targets for each NTD are shown in Table 1; additional sub-targets and summaries for each disease can be found in Annex 2. Annual reporting and a substantive review of progress against these targets will be conducted in 2024, 2026 and 2031, as well as in 2029, the year after the conclusion of WHO's 14th General Programme of Work. The reviews may result in updated targets in line with changing contexts.

Box 1. Process used to set targets for 2021–2030

2018

- The Strategic and Technical Advisory Group for Neglected Tropical Diseases requests a broad, evidence-based process to prepare the new road map.
- Disease-specific expert groups review global progress, national programme data and research outcomes and propose targets.

2019

- Targets and their determinants are reviewed through epidemiological models.
- Leads of disease programmes review and confirm targets, in consultation with relevant stakeholders.
  - Focus on outcome and impact indicators
  - Process and outcome indicators for control diseases or new NTDs
- Member States and WHO regions endorse targets and milestones.
- The Strategic and Technical Advisory Group for Neglected Tropical Diseases reviews and endorses the targets and milestones.

NTD targets for 2030

Overarching targets

Top-line targets for NTDs, in line with the Sustainable Development Goals and WHO's 13th General Programme of Work

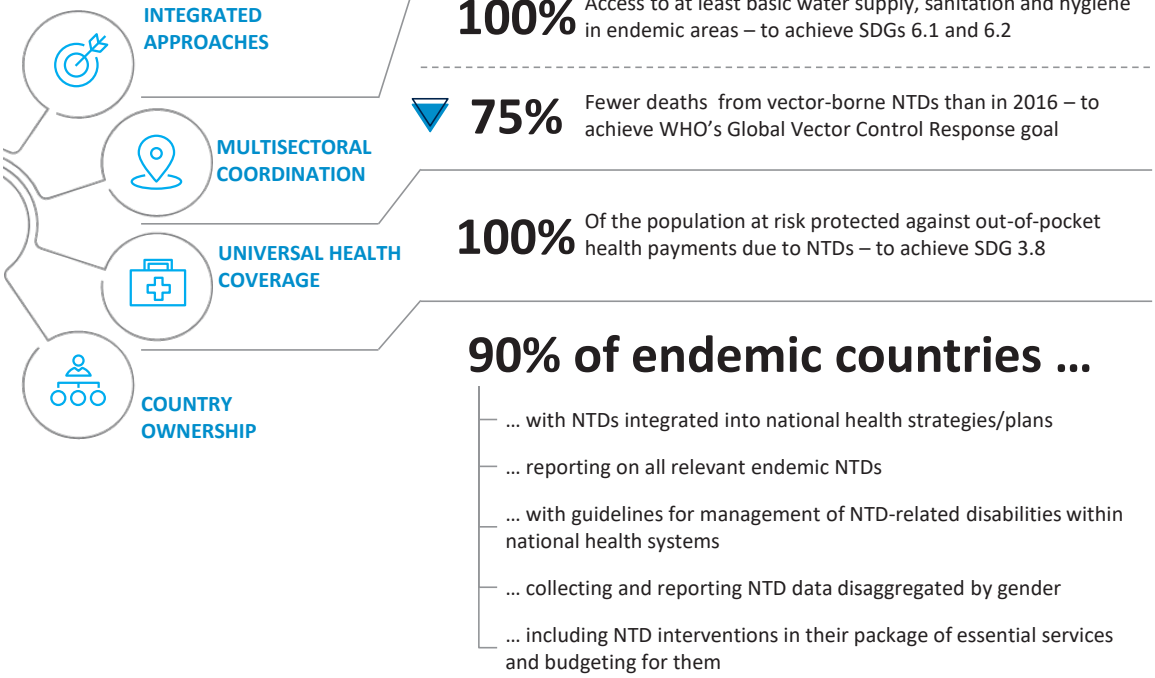
90% Fewer people requiring interventions against NTDs

75% Fewer NTD-related DALYs

100 Countries having eliminated at least one NTD

2 NTDs eradicated (dracunculiasis and yaws)

Cross-cutting targets



75% Integrated treatment coverage index for preventive chemotherapy

40 Countries that adopt and implement integrated skin NTD strategies *(four countries in 2020)*

100% Access to at least basic water supply, sanitation and hygiene in endemic areas – to achieve SDGs 6.1 and 6.2

75% Fewer deaths from vector-borne NTDs than in 2016 – to achieve WHO's Global Vector Control Response goal

100% Of the population at risk protected against out-of-pocket health payments due to NTDs – to achieve SDG 3.8

90% of endemic countries …

- … with NTDs integrated into national health strategies/plans
- … reporting on all relevant endemic NTDs
- … with guidelines for management of NTD-related disabilities within national health systems
- … collecting and reporting NTD data disaggregated by gender
- … including NTD interventions in their package of essential services and budgeting for them

Note: In certain cases, reference to "countries" should be understood as signifying countries, territories and areas.

Table 1. NTD targets for 2030

Disease-specific targets

Targets relevant to individual diseases

Disease	Indicator	2020	2023	2025	2030
TARGETED FOR ERADICATION					
Dracunculiasis	Number of countries certified free of transmission	**189** (97%)	**189** (97%)	**191** (98%)	**194** (100%)
Yaws	Number of countries certified free of transmission	**1** (1%)	**97** (50%)	**136** (70%)	**194** (100%)
TARGETED FOR ELIMINATION (INTERRUPTION OF TRANSMISSION)					
Human African trypanosomiasis (gambiense)	Number of countries verified for interruption of transmission	**0**	**0**	**5** (21%)	**15** (62%)
Leprosy	Number of countries with zero new indigenous cases	**50** (26%)	**75** (39%)	**95** (49%)	**120** (62%)
Onchocerciasis	Number of countries verified for interruption of transmission	**4** (12%)	**5** (13%)	**8** (21%)	**12** (31%)
TARGETED FOR ELIMINATION AS A PUBLIC HEALTH PROBLEM (public health problem)					
Chagas disease	Number of countries achieving interruption of transmission through the four transmission routes (vectorial, transfusional, transplantation and congenital), with 75% antiparasitic treatment coverage of eligible cases	**0**	**4** (10%)	**10** (24%)	**15** (37%)
Human African trypanosomiasis (rhodesiense)	Number of countries validated for elimination as a public health problem (defined as < 1 case / 10 000 people per year, in each health district of the country averaged over the previous 5-year period)	**0**	**2** (15%)	**4** (31%)	**8** (61%)
Leishmaniasis (visceral)	Number of countries validated for elimination as a public health problem (defined as < 1% case fatality rate due to primary disease)	**0**	**32** (43%)	**56** (75%)	**64** (85%)
Lymphatic filariasis	Number of countries validated for elimination as a public health problem (defined as infection sustained below TAS thresholds for at least 4 years after stopping MDA; availability of essential package of care in all areas with known patients)	**19** (26%)	**23** (32%)	**34** (47%)	**58** (81%)
Rabies	Number of countries having achieved zero human deaths from rabies	**80** (47%)	**89** (53%)	**113** (67%)	**155** (92%)
Schistosomiasis	Number of countries validated for elimination as a public health problem (defined as < 1% proportion of heavy intensity infections)	**26** (33%)	**49** (63%)	**69** (88%)	**78** (100%)
Soil-transmitted helminthiases	Number of countries validated for elimination as a public health problem (defined as < 2% proportion of soil-transmitted helminth infections of moderate and heavy intensity due to *A. lumbricoides*, *T. trichuria*, *N. americanus* and *A. duodenale*)	**7** (7%)	**60** (60%)	**70** (70%)	**96** (96%)
Trachoma	Number of countries validated for elimination as a public health problem (defined as (i) a prevalence of trachomatous trichiasis "unknown to the health system" of < 0.2% in ≥ 15-year-olds in each formerly endemic district; (ii) a prevalence of trachomatous inflammation—follicular in children aged 1–9 years of < 5% in each formerly endemic district; and (iii) written evidence that the health system is able to identify and manage incident trachomatous trichiasis cases, using defined strategies, with evidence of appropriate financial resources to implement those strategies)	**8** (13%)	**28** (44%)	**43** (68%)	**64** (100%)
TARGETED FOR CONTROL					
Buruli ulcer	Proportion of cases in category III (late stage) at diagnosis	**30%**	**< 22%**	**< 18%**	**< 10%**
Dengue and chikungunya	Case fatality rate due to dengue	0.80%	**0.50%**	**0.50%**	**0%**
Echinococcosis	Number of countries with intensified control for cystic echinococcosis in hyperendemic areas	**1**	**4**	**9**	**17**
Foodborne trematodiases	Number of countries with intensified control in hyperendemic areas	N/A	**3** (3%)	**6** (7%)	**11** (12%)
Leishmaniasis (cutaneous)	Number of countries having reached: 85% of all cases are detected and reported, and 95% of reported cases are treated	N/A	**44** (51%)	**66** (76%)	**87** (100%)
Mycetoma, chromo-blastomycosis and other deep mycoses	Number of countries where mycetoma, chromoblastomycosis, sporotrichosis and/or paracoccidioidomycosis are included in national control programmes and surveillance systems	**1**	**4**	**8**	**15**
Scabies and other ectoparasitoses	Number of countries having incorporated scabies management in the universal health coverage package of care	**0**	**25** (13%)	**50** (26%)	**194** (100%)
Snakebite envenoming	Number of countries with incidence of snakebite achieving reduction of mortality by 50%	N/A	**39** (30%)	**61** (46%)	**132** (100%)
Taeniasis and cysticercosis	Number of countries with intensified control in hyperendemic areas	**2** (3%)	**4** (6%)	**9** (14%)	**17** (27%)

Note: In certain cases, reference to "countries" should be understood as signifying countries, territories and areas.

Table 1. NTD targets for 2030 (continued)

PROGRAMMATIC and CROSS-CUTTING APPROACHES to MEETING the 2030 TARGETS

Chapter 3

Meeting the 2030 NTD targets will require concerted action in three areas (Fig. 5).

- Accelerate programme actions against NTDs, including interventions to reduce incidence, prevalence, morbidity, disability and death. This will require scientific advances, new interventions and tools and strengthening strategies, service delivery and enablers.
- Intensify cross-cutting approaches by integrating interventions for several NTDs and mainstreaming them into national health systems, coordinated with related programmes (e.g. WASH, vector control, other disease programmes).
- Change the operating model and culture by increasing country ownership, clarifying the roles of stakeholders, organizations, institutions, culture and perceptions and aligned to meet the 2030 targets.

3.1 ACCELERATE PROGRAMME ACTION

The disease-specific targets for each NTD are ambitious and will continue to require considerable work by countries and stakeholders. Each disease can be assessed with regard to the technical requirements, strategy, service delivery and programme capacity to determine where action is needed. Each of these dimensions is illustrated in Fig. 6.

Fig. 7 shows the results of assessments of these dimensions for each of the 20 NTDs. Red indicates that critical action is required to achieve the 2030 target, while green signifies that the dimension will probably not impede meeting the target, although action should be maintained to sustain gains. The colour scale is relative for each disease and category and should not be compared among diseases. See also the disease summaries (Annex 2).

The assessment shows that action is required for several diseases in certain dimensions, such as diagnostics, monitoring and evaluation, access and logistics and advocacy and funding (see “Strengthening health systems” in section 3.2 for further details). The greater density of red for diseases targeted for control than for those targeted for elimination reflects a poorer appropriate evidence base as well as the fact that programmes for diseases targeted for control are still largely in an early stage, implying that more action is required to address systemic issues, particularly strategy and service delivery.

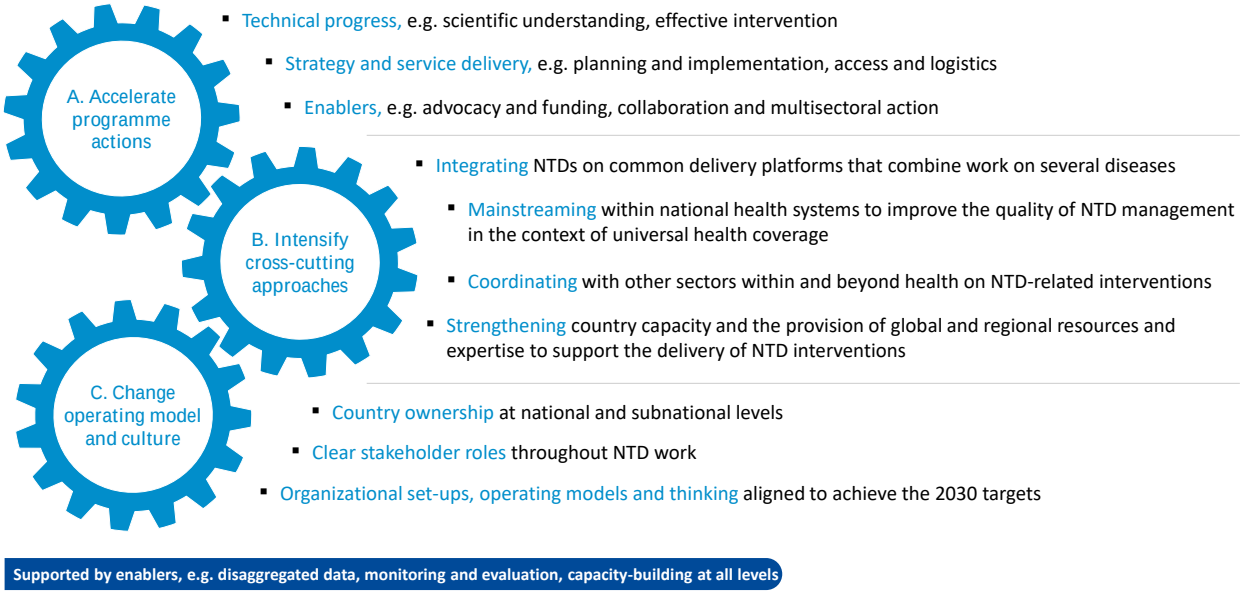


Fig. 5. Areas that require concerted action

RESEARCH AND INNOVATION ARE FUNDAMENTAL ENABLERS OF PROGRAMMATIC PROGRESS FOR ALL DISEASES.

For all the diseases, research and innovation are essential. Operational and implementation research are required to address various questions, from establishing a baseline for the prevalence of an NTD to determining when to stop mass drug administration (MDA). The research and development of new interventions, diagnostics, tools and treatment approaches must therefore be supported, in collaboration with other stakeholders including product development partnerships (e.g. the Drugs for Neglected Diseases initiative and the Foundation for Innovative New Diagnostics). Research is called for on the behavioural and social aspects of communities' needs and perceptions in enhancing treatment compliance and healthy behaviours in the context of NTDs. WHO's research and development observatory, the Special Programme for Research and Training in Tropical Diseases and the Coalition for Operational Research on NTDs provide leadership and direction on research priorities and support. Innovation may also include potential use of molecular epidemiology, mathematical modelling and new technologies such as "Big Data", artificial intelligence, digital health, satellite imagery and drones.

RISKS OF POLITICAL INSTABILITY, MIGRATION, CLIMATE CHANGE AND ANTIMICROBIAL RESISTANCE ARE ASSOCIATED WITH MANY DISEASES.

Common risks that have been identified for several NTDs include political instability, migration, urbanization, climate change and antimicrobial resistance. Political instability and conflict can be barriers to progress in NTD programmes, such as those for dracunculiasis, human African trypanosomiasis and cutaneous leishmaniasis. Political instability can also result in gaps in governance, diversion of NTD funding to other causes and difficulties for implementation, such as disruption of infrastructure, restricted access to local populations and risks for health care personnel. Migration and other population movement can result in the introduction or re-introduction of diseases, particularly when displaced populations live in temporary accommodation with inadequate sanitation, poor water storage practices and limited access to health care. Climate change alters the epidemiology of vector-borne diseases and the spread of NTDs such as dengue and chikungunya. Antimicrobial and insecticide resistance are emerging threats for certain NTDs, especially in view of the scaling-up of MDA and the widespread use of insecticides for vector control.

		Dimensions
Technical	Scientific understanding	▪ Thorough **understanding of disease epidemiology and pathology** ▪ **No "gaps** in research that would hinder progress towards achieving targets ▪ **Understanding** of **the non-target effects** of interventions (e.g. ancillary benefits, environmental effects)
	Diagnostics	▪ **Availability of effective, standardized, affordable diagnostics** for timely detection, assessment of end-points, surveillance ▪ **Availability of point-of-care diagnostics** (where appropriate) usable at community level and in low-resource settings
	Effective intervention	▪ **Effective, affordable interventions** for prevention, treatment, case management, rehabilitation and care ▪ **Continued innovation and adaptation** of interventions
Strategy and service delivery	Operational and normative guidance	▪ **Clear definitions of end-points and operational approach** to achieve and sustain them ▪ **Availability of technical guidelines,** e.g. for validation or verification ▪ **Equitable access to interventions** (e.g. by disadvantaged, vulnerable and inaccessible populations)
	Planning, governance and programme implementation	▪ **Alignment and coordination of work** among relevant stakeholders to achieve overall goals and milestones, based on a strategic plan ▪ **Appropriate country governance and commitment** for programme management and effective delivery ▪ **Clear stakeholder responsibilities** and effective, coordinated working processes to implement relevant interventions ▪ **Effective planning and implementation** at the country level
	Monitoring and evaluation	▪ **NTD monitoring and evaluation framework and mechanisms to monitor and report progress** towards stated goals ▪ **Standardized mapping and impact assessment** for detailed view of disease epidemiology and progression ▪ Continuous, systematic, institutionalized collection, analysis and interpretation of **health data disaggregated by age, gender, location**, supported by strong data management systems and tools to assist in data interpretation for informed decision-making at all levels ▪ **Strengthened and institutionalized surveillance** for the disease, including post-validation and elimination surveillance
	Access and logistics	▪ **Adequate supply of affordable, quality-assured medicines, diagnostics and other medical products** at all levels ▪ **Efficient supply chain** for effective allocation and distribution of medicines, diagnostics and other medical products where they are needed while minimizing wastage and loss, e.g. with modern online inventory management systems
	Health care infrastructure and workforce	▪ **Robust health systems and primary health care infrastructure** for delivering NTD interventions in models of integrated patient care ▪ **Laboratory capacity and network** to support NTD programmes ▪ **Aptly skilled health care workers, including community volunteers** and community healers, to meet clinical, entomological and community needs
Enablers	Advocacy and funding	▪ **Clear identification of funding gaps, and resource mobilization plans to address them** ▪ **Effective policy dialogue and advocacy** to mobilize support for interventions in national and district health care delivery plans ▪ **Adequate international and domestic funding** to ensure sustainability of programmes, deployed with adequate lead time and consistency
	Collaboration and multisectoral action	▪ **Collaboration among stakeholders** across levels and sectors with clear accountability to ensure an effective, synergetic approach to delivering interventions ▪ Involvement of communities at risk and affected communities e.g. in programme design
	Capacity- and awareness-building	▪ **Capacity-building** to ensure high-performing programmes, e.g. **pre-deployment** and **in-service training**, transfer of skills from vertical NTD programmes to primary health systems, plans to handle health worker attrition and retirement, sharing uptake of best practices ▪ **Awareness-generation activities** to educate and inform endemic communities e.g. on behaviour changes, MDA scheduling, treatment and care options

Fig. 6. Dimensions for assessing disease-specific actions

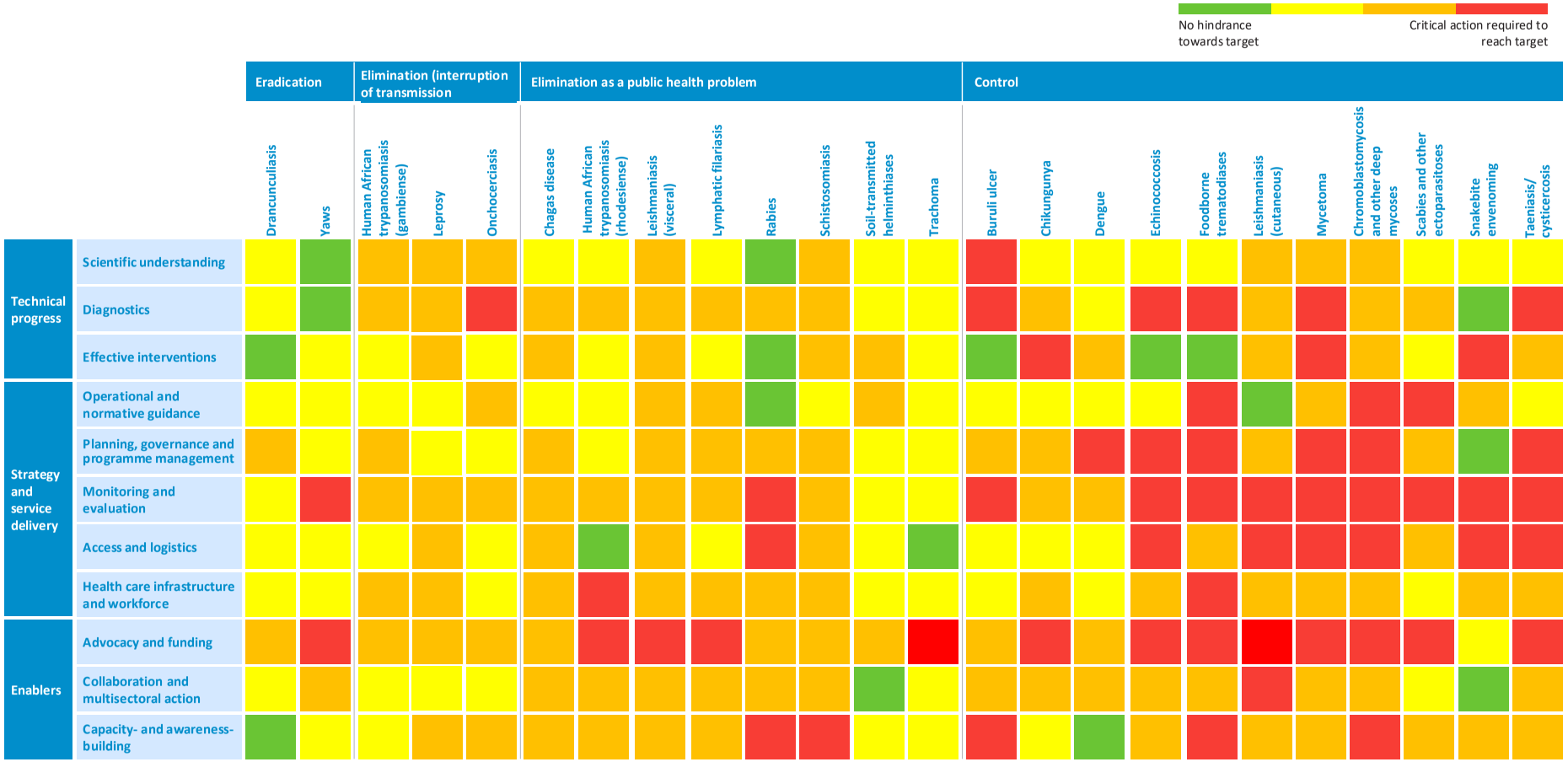


Fig. 7. Gap assessment for each NTD

	Critical action 1	Critical action 2	Critical action 3
TARGETED FOR ERADICATION			
Dracunculiasis	Develop a scientific and operational protocol for elimination of infections in animals	Investigate why dracunculiasis infection occurred in Angola to better understand the current challenges and take appro-priate measures to stop transmission.	Initiate certification in Democratic Republic of the Congo and Sudan to avoid missing targets.
Yaws	Strengthen active and passive surveillance for all NTDs, including in countries of unknown status	Ensure effective, efficient integration and/or co-implementation with other programmes and sectors (e.g. integrated management of skin NTDs).	Increase funding and advocacy for yaws eradication, including securing longer-term commitments and increasing the priority of yaws as suitable for preventive chemotherapy and a skin NTD
TARGETED FOR ELIMINATION (INTERRUPTION OF TRANSMISSION)			
Human African trypanosomiasis (gambiense)	Integrate control and surveillance activities in the peripheral health system; identify and prepare sentinel sites for surveillance post-elimination.	Develop a long-term funding plan, including campaigns for resource mobilization to meet needs.	Reinforce ownership of elimination and targets by endemic countries by advocacy to health authorities and heads of states in the context of decreasing numbers of cases.
Leprosy	Update country guidelines to include use of single-dose rifampicin for post-exposure prophylaxis for contacts); advance research on new preventive approaches.	Continue investment into diagnostics for disease and infection. Develop surveillance strategies, systems and guidelines for case-finding and treatment. Ensure resources for validation.	Ensure drug supply, including access to multi-drug therapy, single-dose rifampicin, second-line drugs and drugs to treat reactions. Monitor adverse events (pharmacovigilance) and resistance.
Onchocerciasis	Start MDA in all endemic areas after mapping, improve delivery of current MDA programmes, and implement alternative strategies where appropriate.	Develop improved diagnostics to facilitate mapping and decisions to eliminate transmission; develop improved diagnostic strategy for Loa loa; increase programme capacity to perform entomological and laboratory diagnostics.	Develop a macrofilaricide and diagnostic or other elimination strategies to accelerate interruption of transmission; design a case management strategy; develop and implement elimination strategies for *Loa loa* co-endemic areas where onchocerciasis is hypoendemic.
TARGETED FOR ELIMINATION AS A PUBLIC HEALTH PROBLEM			
Chagas disease	Advocate with high-level national ministries to recognize Chagas disease as a public health problem, and establish effective prevention, control, care and surveillance in all affected territories.	Improve medical care for Chagas disease, from training health care workers in-service to integrating training at all levels of health services.	Ensure that countries in which domiciliary vector transmission is still registered in certain territories comply with prevention, control and surveillance.
Human African trypanosomiasis (rhodesiense)	Develop new field-adapted tools to detect the disease (e.g. rapid diagnostic test) for use in primary health care facilities, and safe and effective treatment.	Integrate control and surveillance into national health systems, and strengthen capabilities through national plans for health care staff for training, awareness and motivation	Coordinate vector control and animal trypanosomiasis management among countries, stakeholders and other sectors (e.g. tourism, wildlife) through multisectoral national bodies to maximize synergies.
Leishmaniasis (visceral)	Enable early detection to ensure prompt treatment, through, for example, active case detection.	Ensure supply of drugs to ensure prompt access to treatment, especially during outbreaks, and especially for children and young adults, who make up 50-70% of the affected population.	Develop more effective and user-friendly treatment and diagnostics for VL and PKDL, especially for East Africa.
Lymphatic filariasis	Start MDA in all endemic districts. and strengthen MDA in all settings. Implement improved interventions where appropriate (e.g. three-drug treatment in settings that qualify; strategies for hotspots).	Improve capacity for morbidity management and disability prevention; prioritize in primary health care and as part of universal health coverage.	Improve diagnostics, strengthen criteria for stopping MDA, establish post-MDA and post-validation surveillance standards; update guidelines with new tools and strategies as appropriate.
Rabies	Improve forecasting of demand for rabies vaccine and immunoglobulin to ensure adequate supply in facilities, and develop innovative approaches for delivery to ensure timely access to post-exposure prophylaxis and dog vaccination.	Build national capacity of health workers (e.g. rabies exposure assessment, diagnosis, administration of post-exposure prophylaxis) and for dog management (e.g. mass dog vaccination).	Strengthen and institutionalize surveillance for rabies; improve country compliance with reporting to ensure data availability.
Schistosomiasis	Define indicator for measuring morbidity.	Implement effective interventions, including extending MDA to all populations in need and ensuring access to the necessary drugs; implement targeted snail control with updated guidelines; continue micro-mapping and targeting.	Develop diagnostic tests, including standardized point-of-care diagnostic, and develop new interventions, including alternatives to praziquantel and methods of snail control.
Soil-transmitted helminthiases	Increase political commitment to ensure sustainable domestic financing.	Develop more effective drugs and drugs combinations to improve patient outcomes and in case of drug resistance.	Develop comprehensive surveillance and mapping systems to target treatment and monitor drug resistance.
Trachoma	Improve access to high-quality surgery, tracking of outcomes and management of post-surgery trachomatous trichiasis; Immediately manage people with trachomatous trichiasis (about 2.5 million in 2019).	Increase knowledge through research, and extend partnerships to increase work, specifically on facial cleanliness and environmental improvement to reduce transmission.	Develop an efficient, cost–effective way to detect and monitor recrudescence of infection. which could be important for post-validation.

Fig. 8. Critical actions for each disease to reach the 2030 targets

Additional critical actions can be found in the disease summaries in Annex 2.

TARGETED FOR CONTROL			
Buruli ulcer	Build capacity of health workers to clinically diagnose and treat the disease and community health workers to detect and refer cases for early treatment, furthering integration among skin NTDs.	Develop rapid diagnostic tools for use in public health and community centres to ensure early diagnosis, reduce morbidity and confirm cases	Create comprehensive surveillance systems in all endemic countries, including micro-mapping, to improve targeting and integrating interventions with those for other NTDs in co-endemic areas to improve case detection.
Dengue and chikungunya	Develop preventive vaccines for all at-risk populations.	Further develop the evidence base on effectiveness of vector control strategies.	Collaborate with environmental sector and engineers to reduce mosquito habitats.
Echinococcosis	Map disease prevalence to establish baseline data, and strengthen integrated national surveillance.	Develop guidelines for effective prevention and control strategies, and implement them in the field.	Strengthen implementation of ultrasound diagnosis and effective interventions, and ensure access to albendazole.
Foodborne trematodiases	Develop accurate surveillance and mapping tools and methods, with information on environmental factors involved in infection.	Secure donations of praziquantel (after estimating number of tablets required for control).	Promote application and awareness of MDA, WASH and One Health interventions. Evaluate impact, and use the results in training health care staff.
Leishmaniasis (cutaneous)	Develop and scale up easy-to-administer oral or topical treatment that could be used in health centres.	Improve the affordability and sensitivity of rapid diagnostic test for detection of cases, and the availability of treatment.	Estimate the burden of the disease by improving surveillance, and establish a patient database to ensure effective monitoring of the impact of control interventions.
Mycetoma, chromo-blastomycosis and other deep mycoses	Develop differential rapid diagnostic test and effective treatment, and establish surveillance for case detection and reporting.	Develop a standardized field manual for diagnosis and treatment, and ensure proper training of health care workers.	Provide access to affordable diagnosis and treatment.
Scabies and other ectoparasitoses	Develop guidance and tools for mapping in endemic countries to estimate the burden of disease.	Develop guidance for implementation of MDA.	Create an advocacy and funding plan; secure financing for ivermectin and topical treatments; advocate for inclusion in universal health coverage.
Snakebite envenoming	Improve training of physicians in managing snakebite, and build awareness in communities on best practices in prevention and seeking treatment for snakebite.	Improve the quality of anti-venoms, and invest in research and development of new products.	Enhance overall production capacity for quality-assured products, and ensure their availability and accessibility in rural areas.
Taeniasis and cysticercosis	Develop a high-throughput test for evaluating control programmes in resource-limited settings, and map endemic areas.	Conduct targeted interventions in areas of high endemicity.	Increase advocacy from WHO, FAO and OIE to raise the priority of controlling the diseases.

Fig. 8. Critical actions for each disease to reach the 2030 targets (continued)

Additional critical actions can be found in the disease summaries in Annex 2.

These challenges highlight the importance of new and innovative approaches to NTDs, such as development of new antibiotics and systems to monitor antimicrobial resistance. Collaboration with sectors such as climate change groups and migration authorities will be essential to mitigate risks to achieving the 2030 targets.

EACH DISEASE WILL REQUIRE A UNIQUE SET OF ACTIONS TO MEET THE MILESTONES AND TARGETS.

While certain themes are relevant to many diseases, a unique set of actions will be required for each disease, as outlined in Fig. 8. An assessment for each disease is included in the summaries in Annex 2.

3.2 INTENSIFY CROSS-CUTTING APPROACHES

Given the breadth and diversity of the NTD portfolio, a siloed focus on each disease independently to achieve the 2030 targets will be neither cost–effective nor sustainable. These diseases and the necessary response must involve not only health systems but also broader public and private sectors. The psychosocial effects of NTDs cannot be managed without well-functioning mental health and social support structures. Strong data, monitoring systems and supply chains are essential for all NTD programmes. Strengthening links with national health information systems and among specialized programmes, such as those for vector control for malaria and polio for surveillance of dracunculiasis, will be essential. Cross-cutting approaches are also cost–effective: MDA for three diseases simultaneously is cheaper and more convenient for communities than in three separate visits. Cross-cutting approaches are also consistent with the vision of universal health coverage and with health systems strengthening in which patients are at the centre of the objectives and operating model.

The road map includes four categories of cross-cutting themes, as shown in Fig. 9: integration among NTDs; mainstreaming into national health systems; coordination with relevant programmes such as vector control and programmes for other diseases; and delivery through strong country health systems with robust regional and

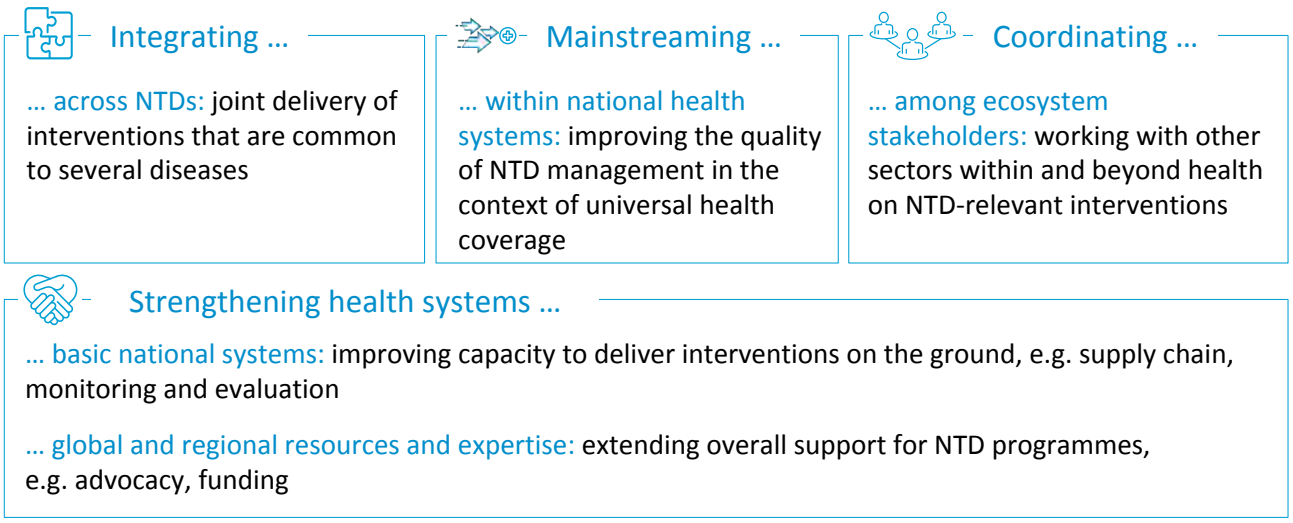


Fig. 9. Four categories of cross-cutting themes

global support. Although these cross-cutting concepts have been stated in various other NTD plans, such as the 2008–2015 Global plan to combat NTDs and the WHO resolution WHA66.12 on NTDs, programmes have so far remained largely disease-specific. One of the aims of the road map is to encourage a shift to cross-cutting work, by providing a clear framework (Fig. 9) and proposing concrete strategies and courses of action. Most of the recommended cross-cutting actions are based on best practices in countries. Not all will be applicable in every country, but, together, they represent a comprehensive guide for action.

A COMMON PLATFORM REQUIRES COMBINING ACTIVITIES FOR NTDs WITH SIMILAR DELIVERY STRATEGIES AND INTERVENTIONS.

In some countries, the NTD platform might be a formal programme or directorate within the ministry of health, while in others it might be represented by less formal structures such as a task force or national coordinating body. An integrated approach will bring the programmes for NTDs that are endemic in a country onto a single NTD platform, which will allow links among programmes, when practical. A single platform will also centralize planning, implementation and evaluation of interventions for several NTDs, such as for the so-called skin NTDs (Fig. 10) and delivery of NTD interventions in schools. Integration will change the focus from technical interventions in vertical disease silos to an approach based on the needs of patients and communities. An integrated platform will encourage a broader, more holistic approach to include not only prevention but also treatment, care, rehabilitation and health education. An integrated NTD platform can provide support for even the most neglected of the NTDs, ensuring that they are addressed systematically and that the action is commensurate with the need.

THERE ARE CONCRETE OPPORTUNITIES FOR JOINT INTERVENTIONS AMONG NTDs.

Fig. 11 outlines ways in which activities for several NTDs can be integrated to ensure more effective, efficient programming. Integration of planning and programme management allows coordinated monitoring and integration of implementation for NTDs with similar delivery strategies and interventions. A number of diseases can be grouped or “packaged”, depending on the burden of each in a country, for joint delivery of interventions such as MDA and multiplex diagnostics, shown by ticks on each row in the figure. Monitoring, evaluation and reporting should be integrated for all relevant endemic NTDs.

MAINSTREAMING

Mainstreaming NTDs within the national health system

NTDs are designated as “neglected” partly because they are frequently overlooked by health systems. Actions against NTDs both contribute to and benefit from strengthened health systems and especially primary and community health care. NTDs must be well positioned to benefit from and contribute to better monitoring and evaluation. Within national governance structures, the NTD platform should build on common and synergistic work for different diseases. Mainstreaming NTD activities into the health system and building capacity to deliver interventions through its infrastructure will contribute to sustainable, efficient NTD prevention and control and enable NTD patients to access all aspects of treatment, care and support. A common indicator and accountability mechanism should be defined to track progress in mainstreaming. These activities will contribute to overall health system strengthening, greater country ownership and poverty alleviation.

Integrated approaches to NTDs can be mainstreamed within various components of national health systems; for example, planning should be incorporated into overall national health planning and budgeting, data management should be included in health management information systems at all levels, and drug delivery should be coordinated through national medicines supply and logistics systems. Integrated NTD interventions, from prevention to diagnosis, treatment, care and rehabilitation, can be delivered through community or primary- or secondary-care facilities in the national health system (Fig. 12). Existing structures should be used; for example, NTD capacity-building could be part of a standard ministry of health training module or part of staff induction. Even when vertical interventions against NTDs, such as MDA, are required in settings with weak formal health systems, they should be integrated into informal and community health structures. Fig. 12 gives examples of how NTD programme components can be mainstreamed into health systems, although the details will differ by country.

About skin NTDs

Skin conditions are the 18th leading cause of ill health globally and one of top 10 causes of non-fatal disability (Global Burden of Disease, 2010).

Skin NTDs affect the skin and subcutaneous tissues and can result in disability, disfigurement, stigmatization and other socio-economic problems.

- Buruli ulcer
- Leprosy
- Onchocerciasis
- Scabies and other ectoparasitoses
- Leishmaniasis
- Lymphatic filariasis
- Mycetoma, chromoblastomycosis and other deep mycoses
- Yaws

Objectives and priorities

The goal of an integrated approach is to reduce morbidity, disability and the psychosocial impacts of debilitating skin NTDs. Progress will be measured primarily by the number of countries that adopt and implement an integrated approach to control skin NTDs:

Indicator	2020	2023	2025	2030
No. of countries that adopt and implement integrated skin NTD strategies based on local endemicity	4	15	20	40

Priorities in operational research and programme areas to achieve the 2030 targets on skin NTDs:

Operational research priorities:

- Research on the epidemiology of causes, transmission modes and risk factors for infection
- Studies on socioeconomic impact
- Development and assessment of better medicines for integrated case management
- Development of diagnostic platforms for multiple or integrated screening in the community and in clinics
- Design of integrated information systems to ensure reliable reporting and responses, including mapping to identify overlaps
- Evaluation of training and training materials to improve integrated case detection on the front line of health care

Programme priorities:

- Identification of pharmaceutical companies willing to consider donations or reduced medicine prices
- Development of guidance on an integrated framework, surveillance tools, case detection and management, control and prevention at global, regional and/or national levels
- Development of training materials for health workers with emphasis on integrated pathways for:
  - clinical care: diagnosis, treatment and morbidity management
  - mental health, reduction of stigmatization and discrimination and psychosocial support
  - Community interventions: prevention, disability management and rehabilitation

Integrated approaches in practice

Areas in which integrated approaches to skin NTDs are applicable. Some examples of addressing several locally endemic skin NTDs instead of several disease-specific programmes:

Epidemiological surveillance, including active and passive case-finding, detection and disease mapping	Social mobilization and community health education to build awareness about skin NTDs and encourage early reporting and treatment-seeking	Management and care of skin NTDs, e.g. referrals (e.g. mental health), training in self-care, provision of rehabilitation services (e.g. physical therapy, counselling), reducing stigmatization
Training and capacity-building for health workers and village volunteers on screening and treating skin NTDs	Integrated planning, monitoring and evaluation of skin NTD programmes	Promotion of implementation research and innovations to improve the efficiency of an integrated approach to skin NTDs

Integrated approaches to skin NTDs can have a number of benefits, such as:

- Greater ownership by national programmes and long-term sustainability
- Cost–effectiveness and efficient use of resources
- Extended coverage and earlier case detection
- Greater capacity of health workers to properly manage cases

Fig. 10. Integrated approaches to the management of skin NTDs

Fig. 11. Disease groupings for which joint interventions may be applicable

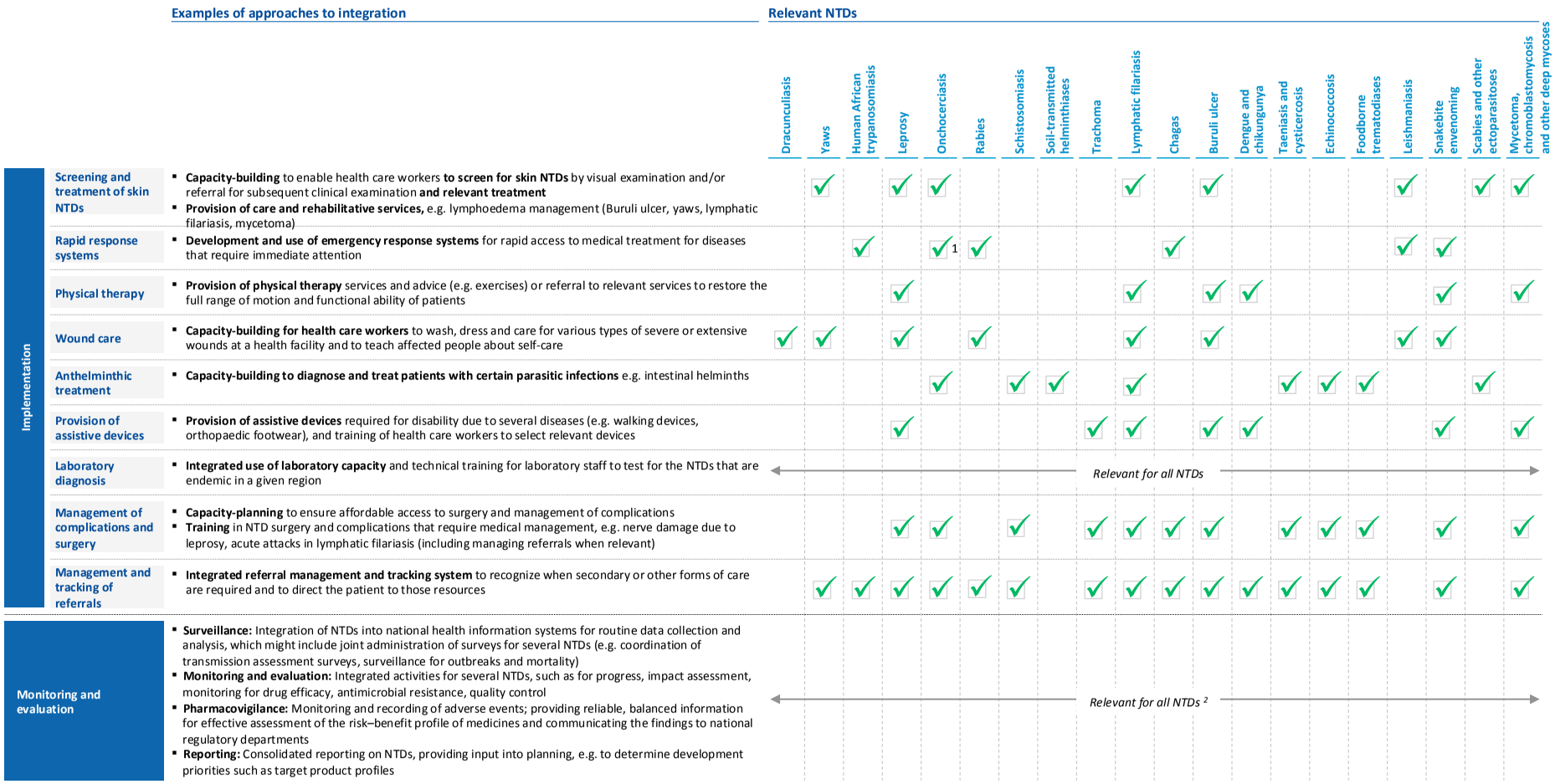


Fig. 11. Disease groupings for which joint interventions may be applicable (continued)

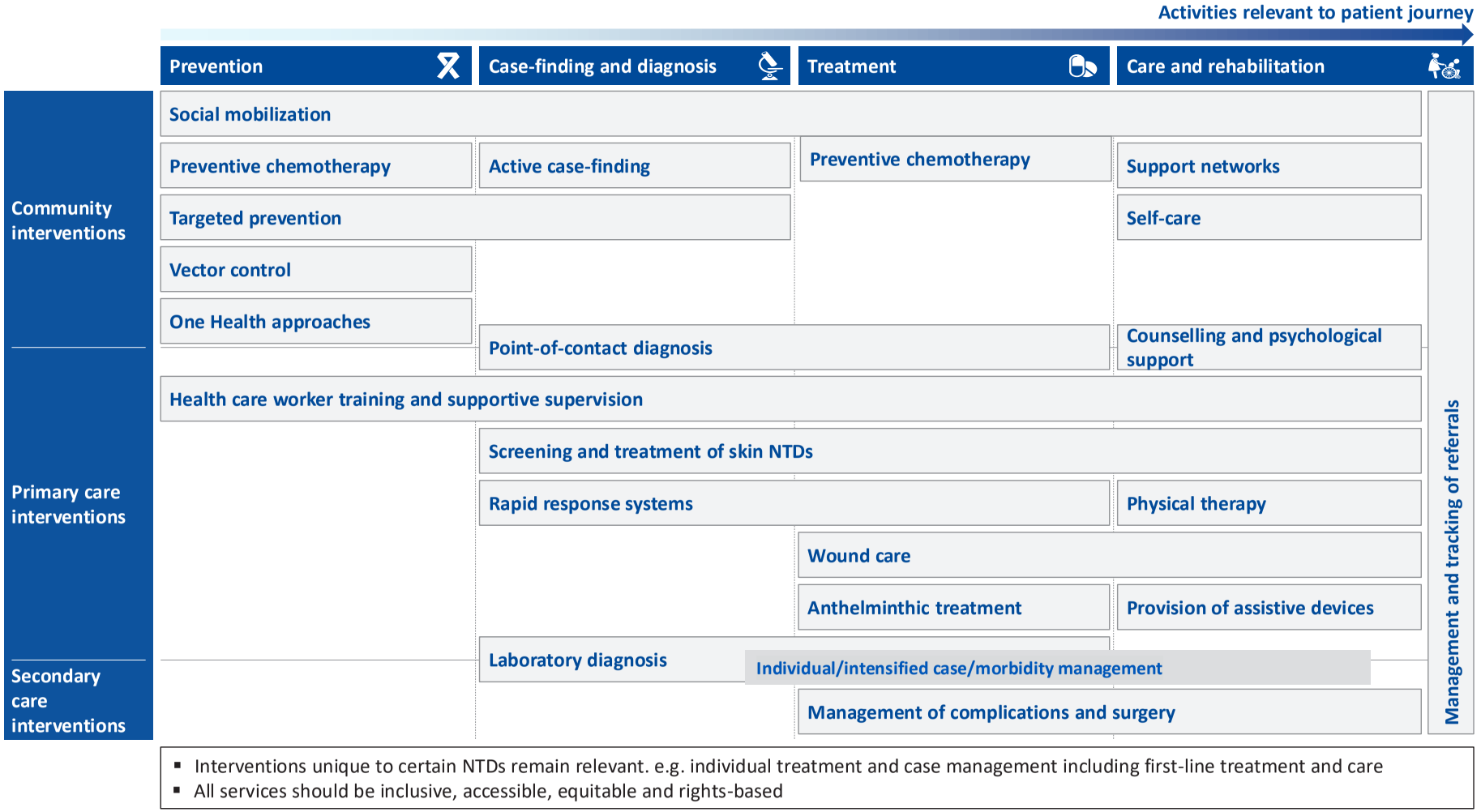


Fig. 12. Mainstreaming NTDs into national health systems

Benefits of integration and mainstreaming

An integrated approach to NTD activities is expected to result in better health outcomes, greater cost efficiency and effectiveness and better programme management (see Fig. 12). A gradual shift has been occurring towards integrated management of NTDs since 2006, when approaches for combined delivery of preventive chemotherapy were introduced. Additional work is now required to realize the full benefits of integration and mainstreaming. Diseases such as scabies and yaws should be included in existing integrated preventive chemotherapy programmes, which are usually limited to the group of five diseases.[5] Furthermore, more work is required to integrate operations against diseases with similar treatment measures, epidemiology and geographical distribution. NTDs can be integrated more effectively through existing systems and structures, such as vaccination programmes, cold chain, delivery, education and health worker training.

Some disease-specific focus will still be required, despite an overall transition to integration. Fig. 13 indicates considerations in achieving a balance between disease-specific and integrated approaches.

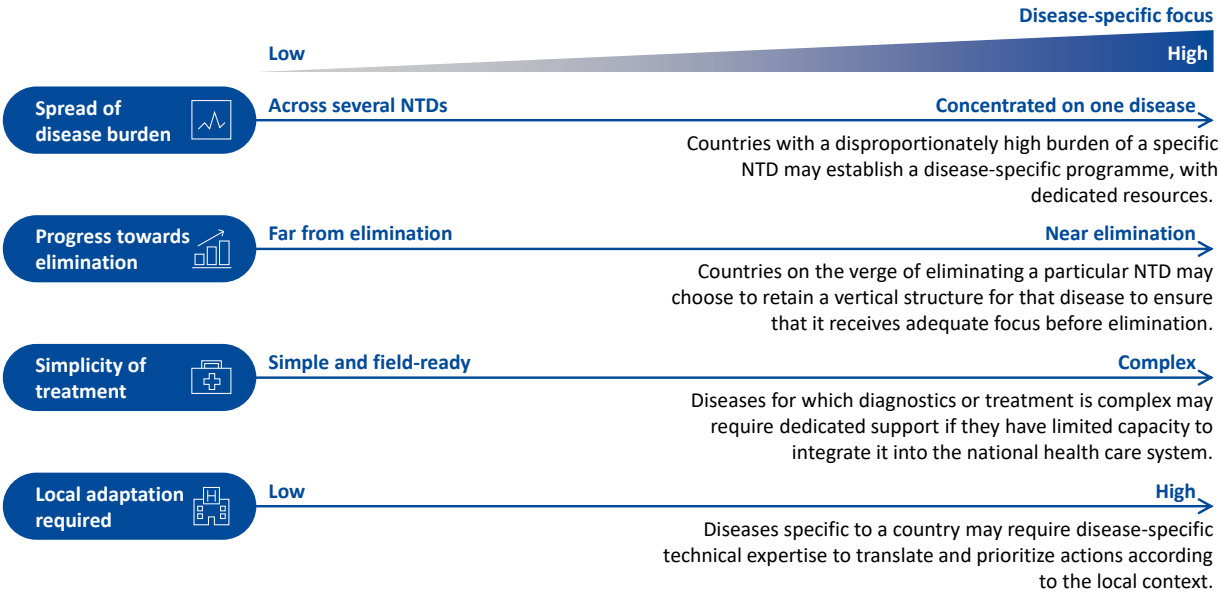


Fig. 13. Considerations for balancing disease-specific and integrated approaches

COORDINATION

Meeting the 2030 targets will require coordination, collaboration and cooperation among many sectors.

The SDGs show that there is no single development target. Meeting the 2030 targets for NTDs will require coordination among adjacent sectors and programmes, both within and beyond health, in the broader NTD network. Sectors such as vector control and WASH make critical contributions to progress on NTDs, and working together more effectively can accelerate and sustain progress towards disease elimination and control. Coordination is also necessary with the wide array of relevant NTD partners, including donors, academia, pharmaceutical companies, disease experts, multilateral organizations and implementing partners, to ensure effective service delivery.

Coordination is particularly important for the 12 NTDs targeted for elimination and eradication. Experience has shown that NTD interventions alone may be insufficient to eliminate a disease. For example, deworming to prevent schistosomiasis in the Mekong sub-region alone did not prevent reinfection but required parallel activities, including WASH, health education and One Health to address animal reservoirs. Furthermore, the burden of Chagas disease in southern cone of the American continent was reduced by vector control, particularly indoor residual spraying and house improvements, in combination with screening of blood donors to stop transmission via transfusion.

[5] Lymphatic filariasis, onchocerciasis, schistosomiasis, soil-transmitted helminthiases and trachoma.

Other sectors play critical roles in the prevention, treatment and care of patients with NTDs.

The activities of other sectors can significantly contribute to the prevention, treatment and care of many NTDs. Fig. 14 shows the roles that can be played by various health and non-health sectors, and Fig. 15 shows the NTDs for which the activities are relevant. Certain sectors may be particularly relevant; for example, schools may be the channel for health education on all NTDs.

The form of coordination depends on the sector and may range from action in NTD-endemic areas to use of the platforms of other sectors to deliver NTD interventions.

The purpose and scope of activities and the mechanisms used for coordination depend on the sector and national structures. While there is no standard approach to multisectoral collaboration, Fig. 16 outlines three broad categories of coordination at a high level. First, referral management comprises coordination primarily among health sectors for a smooth system in which NTD patients are referred to relevant services. Strategic input will ensure that other programmes are strategically oriented towards NTDs, with relatively little change in programming; for example, vector control for malaria is also beneficial against lymphatic filariasis or leishmaniasis. Operational collaboration ensures delivery of NTD interventions through other platforms (such as deworming in schools) or joint implementation (such as detection of paragonimiasis in examinations for tuberculosis). The activities that could be coordinated and the potential mechanisms for interaction with NTDs are shown for WASH in Fig. 17, for the global vector control response in Fig. 18 and for One Health in Fig. 19.

Effective intersectoral coordination facilitates concerted action towards attaining the SDGs.

A well-coordinated NTD network, with defined roles for stakeholders and clear mechanisms of interaction and exchange has several benefits. Through collaboration, NTDs can benefit from the resources and activities of other sectors. For example, sharing of micro-mapping data on the endemicity of WASH-related NTDs with WASH programmes can direct WASH activities to NTD hotspots. Collaboration may also improve the quality and cost–effectiveness of interventions by ensuring that they are delivered through the most suitable channel. For example, veterinary services would be better suited than an NTD programme to implement an intervention for animal health, such as vaccinating pigs. Effective coordination can also minimize duplication of work. For example, harmonized vector control for both malaria and lymphatic filariasis can reduce overlapping initiatives in countries that are endemic for both diseases.

Strong coordination also promotes clarity, from patients to donors. For patients and endemic communities, intersectoral coordination results in clearer, more cohesive communication. For example, one message can be delivered about the importance of hand-washing and face-washing in communities endemic for both soil-transmitted helminthiases and trachoma instead of one from the WASH sector on hand-washing and another from the trachoma programme on face-washing. For donors, clarification of roles and responsibilities among sectors facilitates the identification of the specific activities to be covered by funding for each sector.

Ministry of health

Activities of ministry of health departments that are relevant for NTDs

Global vector control response (may be under the ministry of environment in some countries)

- **Use of repellents and traps,** e.g. insecticide-treated bed nets, screens, insecticides or molluscicides, fogging
- **Environmental management** to minimize mosquito habitats, including
  - **Housing improvements** (in collaboration with ministry of infrastructure), e.g. plans to build vector-free housing, including safe storage of water, sanitation, window screens, and ensuring air flow to prevent vector entry and help keep houses cool
  - **Container management,** e.g. covering, emptying, cleaning and disposing of containers (e.g. old tyres)
  - **Draining or treating stagnant water** (in collaboration with ministry of water and WASH)
- **Behaviour change,** e.g. wearing long clothing
- **Use of other innovative approaches,** e.g. release of modified, transgenic or sterile vectors, spatial repellents to stop vector entry into households

Mental health

- **Psychological support and counselling** services for NTD patients
- **Routine assessment of mental health** for patients with specific NTDs, particularly those with chronic conditions

Disability and inclusion

- **Treatment of disability and morbidity management,** e.g. physical therapy
- **Provision of support services** and devices, e.g. walking devices, prosthetics
- **Training for self-management of disability** and self-care

Women's and child health

- **Awareness-building about diseases** for which women and children are disproportionately at risk or for which there are particular manifestations in women (e.g. female genital schistosomiasis)
- **Use of pre- and post-natal contacts, e.g. in maternal health clinics, to deliver interventions,** e.g. deworming tablets, supplements (e.g. iron) for pregnant women and children to prevent anaemia

Eye health

- **Promotion of eye care,** e.g. face-washing, protecting eyes, eye examinations
- **Provision of treatment** for eye conditions related to NTDs, including surgery when required

Nutrition

- **Access to better nutrition** to strengthen immune systems and reduce susceptibility to infection, e.g. for visceral leishmaniasis for which malnutrition is a risk factor
- **Provision of food and supplements** (e.g. iron, vitamin A) to combat common side-effects of NTDs, e.g. anaemia and nutritional impairment

Other disease programmes

- **Immunization programmes:** joint delivery of preventive chemotherapy to pre-school-age children
- **Tuberculosis:** joint detection of paragonimiasis (foodborne trematodiases), leprosy and other mycobacteria, e.g. yaws, Buruli ulcer
- **Malaria**: joint diagnosis with human African trypanosomiasis, vector control against *Anopheles* mosquitoes
- **HIV/AIDS:** education on risks, e.g. of coinfection with certain NTDs

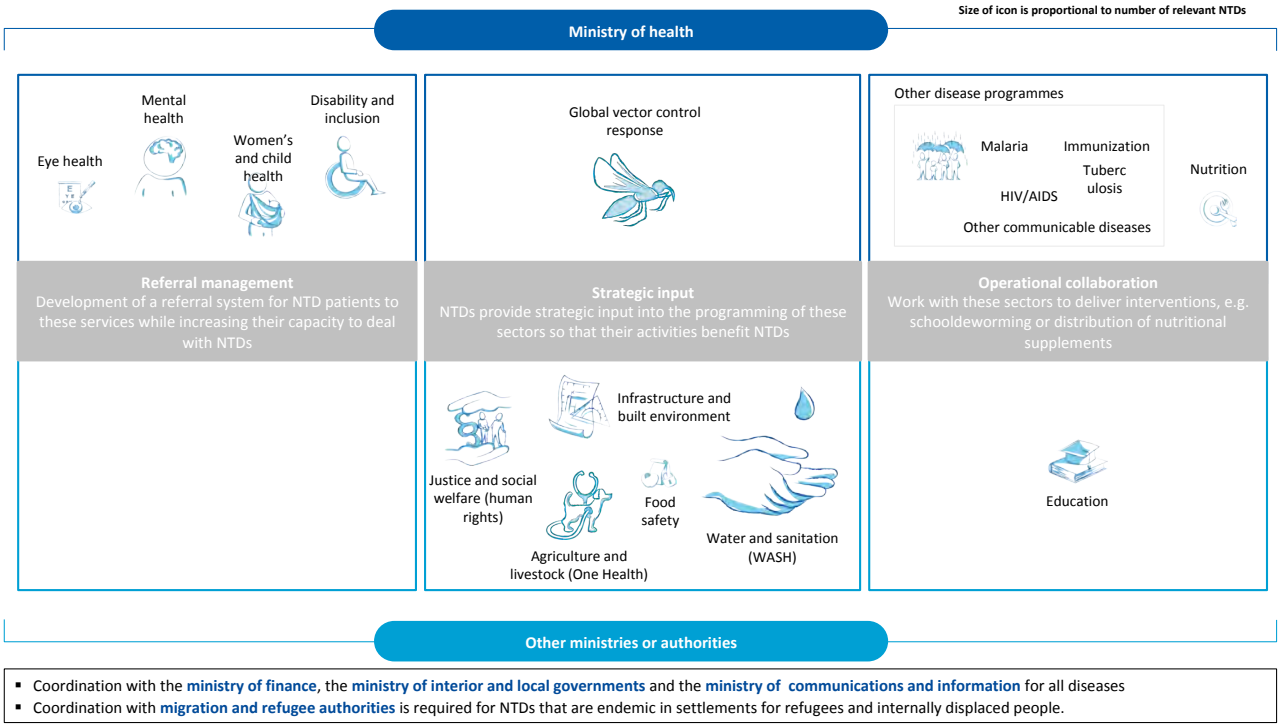
Fig. 14. Coordination with ministries of health and other ministries and authorities

Generic ministry names are shown, which may differ by country.

PRIMARY LINKAGES WITH NTDs SHOWN ONLY		Dracunculiasis	Yaws	Chagas disease	Human African trypanosomiasis	Leprosy	Onchocerciasis	Leishmaniasis	Lymphatic filariasis	Rabies	Schistosomiasis	Soil-transmitted helminthiases	Trachoma	Buruli ulcer	Dengue and chikungunya	Echinococcosis	Foodborne trematodiases	Mycetoma chromoblasto-mycosis and other deep mycoses	Scabies and other ectoparasitoses	Snakebite envenoming	Taeniasis/ cysticercosis
Ministry of Health	Global vector control response	✓		✓	✓		✓	✓	✓		✓		✓		✓						
	Mental health		✓		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓			✓		✓	✓
	Disability and inclusion			✓	✓	✓	✓	✓	✓		✓		✓	✓	✓			✓		✓	
	Women's and child health		✓	✓		✓		✓	✓		✓	✓	✓						✓	✓	
	Eye health					✓	✓						✓								
	Nutrition					✓		✓			✓	✓									
	Malaria				✓			✓	✓						✓						
	Tuberculosis		✓			✓								✓			✓				
	HIV/AIDS			✓				✓			✓	✓		✓							
	Immunization programmes	✓																			
Other ministries or authorities	Water and sanitation (WASH)	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
	Agriculture, livestock, wildlife, environment (One Health)	✓			✓			✓	✓	✓	✓				✓	✓	✓				✓
	Infrastructure and the built environment	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓		✓				✓	✓	
	Education (school delivery of interventions, e.g. MDA)		✓						✓		✓	✓	✓	✓	✓	✓	✓				✓
	Justice and social welfare (human rights)	✓	✓		✓	✓	✓	✓	✓		✓		✓	✓	✓			✓	✓		
	Food safety			✓												✓	✓				✓

- Coordination with the **ministry of finance**, the **ministry of interior and local governments** and the **ministry of Communications and Information** is critical for all diseases.
- Coordination with **migration and refugee authorities** is required for NTDs that are endemic in settlements for refugees and internally displaced people.

Fig. 15. Relevance of coordination for each NTD



Other ministries or authorities

Activities conducted by other ministries or authorities that are relevant for NTDs

Water and sanitation (WASH)

- **Providing access to improved water sources** (protected from external contamination)
- **Hygienic conditions for case management,** e.g. wound-washing (rabies), self-care and morbidity management (e.g. personal hygiene and wound care for lymphatic filariasis, leprosy, yaws), surgical procedures, e.g. surgery for hydrocoele and trichiasis
- **Sanitation – access to facilities and safe management of faecal waste** to prevent transmission, e.g. of soil-transmitted helminthiases, taeniasis, foodborne trematodiases
- **Promoting hygienic practices,** e.g. hand- and face-washing, prevention of open defaecation, food hygiene, filtering water from open water bodies before drinking
- **Proper storage and disposal/drainage of water** to reduce vector habitats

Agriculture, environment, livestock, wildlife (One Health)

- **Understanding animal reservoirs and zoonotic transmission**
- **Treating animals to prevent transmission**
  - **Vaccination,** e.g. mass dog vaccination (rabies), pig and sheep vaccination (taeniasis, cystic echinococcosis)
  - **Medical treatments,** e.g. deworming for pigs (taeniasis), dogs (cystic echinococcosis), foxes (alveolar echinococcosis)
- **Animal husbandry and management,** e.g. dog tethering (dracunculiasis), keeping domestic animals and livestock away from human dwellings (mycetoma), preventing pig contact with human faeces (taeniasis)

Education

- **MDA in schools**[1] against childhood diseases like soil-transmitted helminthiases, schistosomiasis, yaws
- **Awareness of practices to prevent NTDs** embedded in national curricula, e.g. hygienic practices and preventing mosquito breeding sites

Justice and social welfare (human rights)

- **Preventing structural discrimination** associated with high levels of stigma associated with NTDs (human African trypanosomiasis, leprosy, cutaneous leishmaniasis, lymphatic filariasis, neurocysticercosis), e.g. abolishing discriminatory laws
- **Promoting inclusive access** to resources and facilities, health and social services, education and employment opportunities
- **Conducting anti-stigmatization interventions,** e.g. community dialogue, engaging local leaders to share anti-stigmatization messages

Infrastructure and the built environment

- **Housing improvements** to minimize mosquito habitats, including safe storage of water, sanitation, window screens, constructing drains that do not provide breeding sites for mosquitoes and ensuring air flow to prevent vector entry and help keep houses cool

Food safety

- **Food safety practices and regulations**, including:
  - for households and food handlers, e.g. properly washing and cooking food before consumption, ensuring food quality
  - for farmers and livestock keepers, e.g. safe disposal of offal during slaughtering (echinococcosis)

- Coordination with the **ministries of finance**, interior **and local government** and **communications and information** for all diseases
- Coordination with **migration and refugee authorities** is required for NTDs that are endemic in settlements for refugees and internally displaced people.

[1] School is one venue for delivering MDA to school-aged children, but efforts should be made to ensure that school-aged children not in school also receive MDA.

Fig. 16. Examples of coordination with other disciplines and sectors

WASH and NTDs: activities and mechanisms for coordination

Purpose of coordination

Improve the targeting of WASH investment and activities to better support the prevention, treatment and care of NTDs

Examples of activities that should be coordinated

		NTDs	WASH
Planning	Programme planning	**NTD programme to share micro-mapping data** on endemicity of WASH-related NTDs with the ministry of water and sanitation	**WASH programmes to direct investment and interventions towards NTD hotspots**, where interventions are most needed.
Planning	Advocacy	**Joint building of evidence and awareness** on the mutual benefits of collaboration between WASH and NTDs, e.g.: ▪ **return on investment:** e.g. the return on every US$ invested in WASH in NTD-endemic areas as compared with the average return of about US$ 5 for WASH interventions overall; ▪ **health outcomes:** e.g. WASH is essential to limit or break the transmission cycle for 16 of the 20 NTDs.	
Implementation	Social mobilization	**Joint awareness-raising and behaviour-change promotion,** e.g. promoting WASH practices during MDA campaigns, including NTD-specific messages in WASH activities in households or schools.	
Implementation	Delivering interventions	**NTD programme to manage components of WASH-related diseases**, such as case management, surveillance and surgical care.	**WASH services to deliver interventions** (e.g. build sanitation facilities, provide access to improved water sources) and strengthen the environment for sustainable WASH service delivery.
Evaluation	Evaluation and reporting	**Sharing data and tracking progress** towards common targets, including: ▪ **Indicators** and goals that are relevant for both sectors and aligned with global cross-cutting targets on WASH and NTDs, e.g.:	

Impact indicator	Target year
0% of population practising open defaecation	2025
100% of population using at least basic sanitation	2030
100% of population using at least basic water supply	2025
100 % of population with hand-washing facilities, including soap and water	2030

▪ **Jointly tracking progress and impact** with harmonized monitoring and evaluation and frameworks to inform decision-making and joint planning; gauge effectiveness of interventions; document benefits for use in advocacy.
▪ **Share data and best practices,** e.g. by joint use of datasets, documenting experiences and lessons learnt.

Potential coordination mechanism

Dedicated committee or task team at national and/or local level (within cross-sector coordination platforms), with clear assignment of roles in coordinating activities among stakeholder groups

Case studies

Cambodia and Lao People's Democratic Republic CL-SWASH initiative: The two countries set up national task forces with representatives from NTD, WASH, nutrition and education sectors to develop community-led initiatives to eliminate schistosomiasis by combining deworming, nutrition and WASH interventions.

Ethiopia: Ethiopia has a national technical working group, a dedicated coordinator of WASH and NTDs at the Federal Ministry of Health, regional WASH and NTD coordinators and a national WASH and NTD framework that defines the process and responsibilities for joint planning, delivery and supervision.

See WASH/NTD strategy for further details: https://www.who.int/water_sanitation_health/publications/wash-and-ntd-strategy/en/

Fig. 17. WASH and NTDs: activities and mechanisms for coordination

Global vector control response: activities and mechanisms for coordination

Purpose of coordination

Promote integrated vector management for all vector-borne diseases, and improve the efficacy, cost–effectiveness and sustainability of vector control

Examples of activities to be coordinated

Planning

Developing interventions strategies

- **Develop interventions on human health**, e.g. prevention, treatment control and care of patients with vector-borne diseases
- **Develop vector control strategies** for vector-borne NTDs, e.g. plan of action based on the Global Vector Control Response strategy 2017–2030.

Programme planning

- Coordinate a **national assessment of vector control requirements** based on disease endemicity.
- **Strengthen inter- and intra-sectoral action and collaboration** (multi-sectoral approach).
- Prepare a **costed work plan in** which actions are prioritized according to available resources.

Capacity-building

- **Conduct cross-sectoral training;** e.g. staff of ministry of health and other relevant ministries trained in public health entomology and vector control.

Advocacy

- **Advocate about the importance of vector control** in disease elimination.
- **Jointly develop evidence and awareness** about the mutual benefits of coordination, e.g. the cost–effectiveness of vector control for preventing NTDs, e.g.:
  - For each US$ 1 invested in community activities, one person is protected against dengue for 1 year.
  - US$ 1.3 spent on insecticide-treated nets can protect one person for 1 year.
- **Promote reporting of all suspected cases** for timely action.

Implementation

Social mobilization

- **Joint community engagement:** working with local residents to improve vector control and build resilience against disease outbreaks, e.g.:
  - **Communication for behavioural impact** with targeted messages to reduce breeding sites (e.g. cover stagnant water) and exposure to mosquitoes (e.g. use of window screens, personal protection).
  - **Information** (e.g. use of media and other channels) **and education** (e.g. promotion of vector control by community health workers or schools).

Delivering interventions

- **NTD programmes to manage human health** related to vector-borne NTDs.
- **Vector control programmes to scale up interventions** such as insecticide spraying, environmental improvements, larval control.

Monitoring & evaluation

Surveillance

- **Coordination of clinical case-finding, laboratory confirmation and vector surveillance**, e.g.
  - Prevent and control outbreaks by early reporting and directing vector control activities to areas where dengue is suspected or detected.
  - Alert clinicians to prepare for cases after notification of a significant increase in the mosquito population.
  - Sustain vector surveillance, and integrate data into the health information system.

Evaluation and reporting

- **Monitor impact and track progress** in indicators of the impact of the Global Vector Control Response 2017–2030.
- **Assess impact** of coordinated interventions on the vector and human health.
- **Estimate burden.**
- **Assess environmental effects** of vector control, and monitor insecticide resistance.

Data management

- **Share databases** e.g. on vector dynamics and insecticide use to assess the impact of vector control interventions.

Potential coordination mechanism

- **A vector control working group or task force** under a national inter-ministerial task force on vector control that oversees, coordinates and strengthens vector control in line with the Global Vector Control Response strategy
- Membership could include high-level officers from relevant ministries, local authorities and communities and stakeholders such as development partners.
- Enabling factors include dedicated funding for task force activities and high-level leadership, e.g. the president convenes the task force when an outbreak is suspected.

Example

- **Inter-ministerial task force in Singapore** between Ministry of Health and Ministry of Environment. Convenes within 24 h of a report of a suspected dengue case. Adequate national funding is allocated to relevant ministries to cover vector control activities.
- **Integrated vector management task force in Sudan,** which implements a national action plan developed with stakeholder consultation, led to a significant increase incapacity at all levels.

See the Global Vector Control Response 2017–2030 for further details: https://www.who.int/vector-control/publications/global-control-response/en/

Fig. 18. Global vector control response: activities and mechanisms for coordination

One Health and NTDs: activities and mechanisms for coordination

Purpose of coordination	**Ensure a coordinated approach to disease hosts and environmental factors related to NTDs, with clear assignment of roles and responsibilities**

Example activities requiring coordination

Planning

Developing a One Health strategy for NTDs

- **Develop a One Health strategy for NTDs**, including case definition, common targets, strategies and mechanisms for collaboration among ministries of agriculture, livestock, wildlife, environment, food safety, health and others.
- **Integrate NTD into existing One Health platforms** and ensure that they are considered and included in local strategies and plans.
- **Create national operational plans to deliver interventions for NTDs with a human–animal–environment interface, with clear attribution of roles and responsibilities,** e.g. a coordinated plan outlining stakeholder accountability for humans-, animal-, food- and ecosystem-related actions.

Developing scientific understanding

- **Use a One Health approach to improve understanding of human–animal transmission** of NTDs, including social and economic implications.

- **Identify key hosts** for NTDs and **tailored control work.**
- **Develop diagnostics and interventions for animals** that are lacking, e.g. for cysticercosis, cystic echinococcosis
- **Investigate parasite evolution,** e.g. how movements of infected animals and people move parasites to new host species; e.g. evolution of zoonoses as more land is used for livestock production.

Programme planning

- **Share data on occurrence of NTDs** in various human and animal hosts among sectors to guide activities, e.g. surveillance in animals as a proxy for humans.
- **Develop plans for coordinated disease control,** e.g. simultaneous interventions for both humans and animals in a geographical area.

Advocacy

- **Jointly develop evidence and awareness** about the importance of a One Health approach for elimination and for maintaining the social and commercial value of animals for populations affected by NTDs.

Implementation

Social mobilization

- **Conduct joint awareness-raising and behaviour change promotion** with specific messages for targeted groups such as livestock keepers.
- **Provide education on animal husbandry and management,** e.g. tethering dogs, safe disposal of offal containing cystic stages.

Delivering interventions

- **NTD programme to:**
  - **manage human health** for NTDs with an animal interface, e.g. prevention, case management, palliative care, surveillance.
  - **Deliver animal interventions outside One Health activities,** e.g. dog tethering is unique to NTDs.

- **One Health stakeholders to use existing platforms to deliver interventions involving animals,** e.g. use other disease or livestock programmes to deliver animal interventions, such as deworming and pig vaccination (cysticercosis).
- **Explore opportunities for corporate social responsibility of pharmaceutical companies** to support animal aspects of programmes.
- **Explore opportunities to increase availability and use of human and animal health products for disease management and control,** e.g. regional stockpiles of drugs or vaccines.

Evaluation

Evaluation and reporting

- **Coordinate surveillance programmes among sectors,** e.g. surveillance in animals as a proxy for humans, monitoring antimicrobial resistance in humans and animals
- **Share data and track progress** towards common targets, including:
  - using harmonized indicators and monitoring and evaluation frameworks to inform decision-making and joint planning; gauge effectiveness of interventions; document benefits for use in advocacy.
  - **Share data and best practices,** e.g. by joint use of datasets, documenting experiences and lessons learnt.

Potential coordination mechanism	▪ Include NTDs in national, regional and global One Health working groups through partnerships with FAO and OIE.
Case study	▪ WHO, OIE, FAO and GARC use a comprehensive strategic plan to reach the target of ending human deaths from dog-mediated rabies by 2030.

Fig. 19. One Health: activities and mechanisms for coordination

STRENGTHENING HEALTH SYSTEMS

Strong health and related systems are essential for eliminating and controlling NTDs.

Strong health systems are essential to achieving the NTD goals. Robust national systems can deliver NTD interventions in the field, supported by global and regional stakeholders for aspects such as technical understanding of the disease. While overall health systems strengthening is the long-term goal, capacity-building in areas such as monitoring and evaluation is beneficial for NTDs. As shown in Fig. 7, some areas for critical action (highlighted in red) are common to many NTDs, including diagnostics, monitoring, evaluation, access, logistics, advocacy and funding. Strengthening in these areas over the next 10 years will be particularly important to ensure achievement of the 2030 targets.

(A) DIAGNOSTICS AND OTHER KEY INNOVATIONS

Effective diagnostics are critical to accelerating progress towards elimination, reducing morbidity and reducing programme costs.

Effective diagnostics are a prerequisite for reaching the 2030 disease targets, as they are essential for key components of NTD programmes, from confirmation of disease to mapping, screening, surveillance, monitoring and evaluation. Better diagnostics can accelerate progress toward elimination by ensuring the identification and treatment of cases so that they are not potential sources of infection (Fig. 20). Access to diagnostics can also reduce morbidity by ensuring early detection and management to reduce progression and disability, therefore minimizing programme costs. They can also help countries monitor disease trends, assess the effectiveness of control programmes, guide policy decisions on interventions and support verification of elimination.

	Details	Examples (non-exhaustive)
Accelerates elimination	▪ Use data to inform elimination strategies more rapidly	▪ **human African trypanosomiasis –** specific field diagnostic for screening and high-throughput, cost-effective tools for surveillance ▪ **leprosy** – A molecular test would allow earlier detection, to break transmission
Reduces morbidity	▪ Reduce morbidity by identifying cases to target treatment (or to not treat in cases of severe adverse effects)	▪ **Visceral leishmaniasis –** A more sensitive rapid diagnostic test would improve treatment in East Africa ▪ **Onchocerciasis and *Loa loa* –** In the absence of diagnostics for *Loa loa*, hypo-endemic areas (millions of people) are not treated because of fear of risk of severe adverse events
Reduces or optimizes cost	▪ Reduce costs to country programmes, pharmaceutical partners and international donors by targeting treatment more effectively or saving years of MDA	▪ **Lymphatic filariasis –** Because of lack of diagnostics, 5–6-year programmes have to be extended by 1–3 years, resulting in 15–50% excess use of drugs ▪ **Schistosomiasis –** A rapid test would allow targeted MDA, for more efficient control

Diagnostics are also critical for monitoring, evaluation and surveillance, e.g. to
- **guide policy decisions** on the necessary intensity, frequency and duration of intervention; and
- **monitor disease trends** and assess the effectiveness of interventions.

Fig. 20. Role of diagnostics

Considerable progress has been made in new point-of-care diagnostics.

New diagnostic tools and innovative solutions for NTDs are becoming available, with continued engagement of key partners. For example, Johnson & Johnson has donated resources for research and development of biomarkers for soil-transmitted helminthiases and schistosomiasis; the Novartis Foundation has invested in a molecular diagnostic test for leprosy; the Foundation for Innovative New Diagnostics (FIND) and the Institute of Tropical Medicine of Antwerp are developing diagnostic platforms, such as rapid diagnostic tests for human African trypanosomiasis (gambiense), and WHO has established a Technical Advisory Group on this topic.

Gaps remain, however, in the availability and accessibility of such tests.

Strengthening diagnostics is a critical priority for some NTDs (Fig. 21) for which diagnostic tools are either inexistent or inadequate. For example, no test is available to identify cases of early mycetoma (without visible lesions); no validated antigen-based rapid diagnostic test is available for leishmaniasis; and the diagnosis of Buruli ulcer requires polymerase chain reaction, which can often be performed only at a distance from endemic communities. Overall investment in new diagnostics has been limited, representing about 5% of research and development investment for NTDs, while about 39% is devoted to drugs and vaccines, about 44% to basic research and about 13% to other areas. Funding for NTDs has been essentially flat for the past decade and in fact at times has gone backwards: funding for NTDs was nearly 10% lower in 2018 than it was 2009, falling by US$ 34 million (−9.1%) *(13)*.

Even when accurate, effective diagnostic tools are available, they may not be affordable or accessible in a development context with limited laboratory infrastructure, equipment and trained personnel. Microscopy is the most widely used method for diagnosing NTDs, yet it requires a laboratory and trained technicians, and the sensitivity of microscopy is often relatively low. Other options such as culturing NTD pathogens or nucleic acid tests are highly specific but are also technically demanding, costly and time-consuming. Effective techniques should therefore not be abandoned until proven, better alternatives become accessible.

The priorities include more sensitive diagnostics, such as non-invasive diagnostics and field kits, for diseases for which elimination is near, multiplex diagnostic platforms and strengthening of basic systems such as laboratory network capacity.

Global resources and expertise in research and development are required to develop new and innovative diagnostic tests that are accessible in low-resource settings (i.e. tests that are low-cost, user-friendly, sensitive, highly specific, allow high throughput, are heat stable and require little equipment) and quality assured by a quality control mechanism. For diseases that are nearing elimination, with decreased prevalence and intensity of infection, high-sensitivity and specificity diagnostics are required to avoid false-negative results, to ensure that all true cases are detected and treated and to manage the larger number of samples that must be tested to ensure that transmission has been interrupted. Use of multiplex diagnostic platforms could be cost–effective for surveillance of diseases that are endemic in the same geographical area or that target the same population.

Further strengthening will also be required of basic systems such as diagnostic procurement and laboratory network capacity to meet operational needs and ensure access to diagnostics throughout the health system. For example, pooling of investments by donors to increase availability of diagnostics allowed coordinated procurement of more than 2 million diagnostic tests for lymphatic filariasis for 40 countries in the past 5 years.

The community of stakeholders can make direct investments and provide in-kind resources to strengthen basic systems, such as pooled procurement and building capacity in laboratory networks and health system workforces. Collective action can overcome technical and operational hurdles to ensure that effective diagnostics are available where they are needed to meet the 2030 goals. Improved diagnostic tools would lead to appropriate interventions or trigger innovation for better treatment.

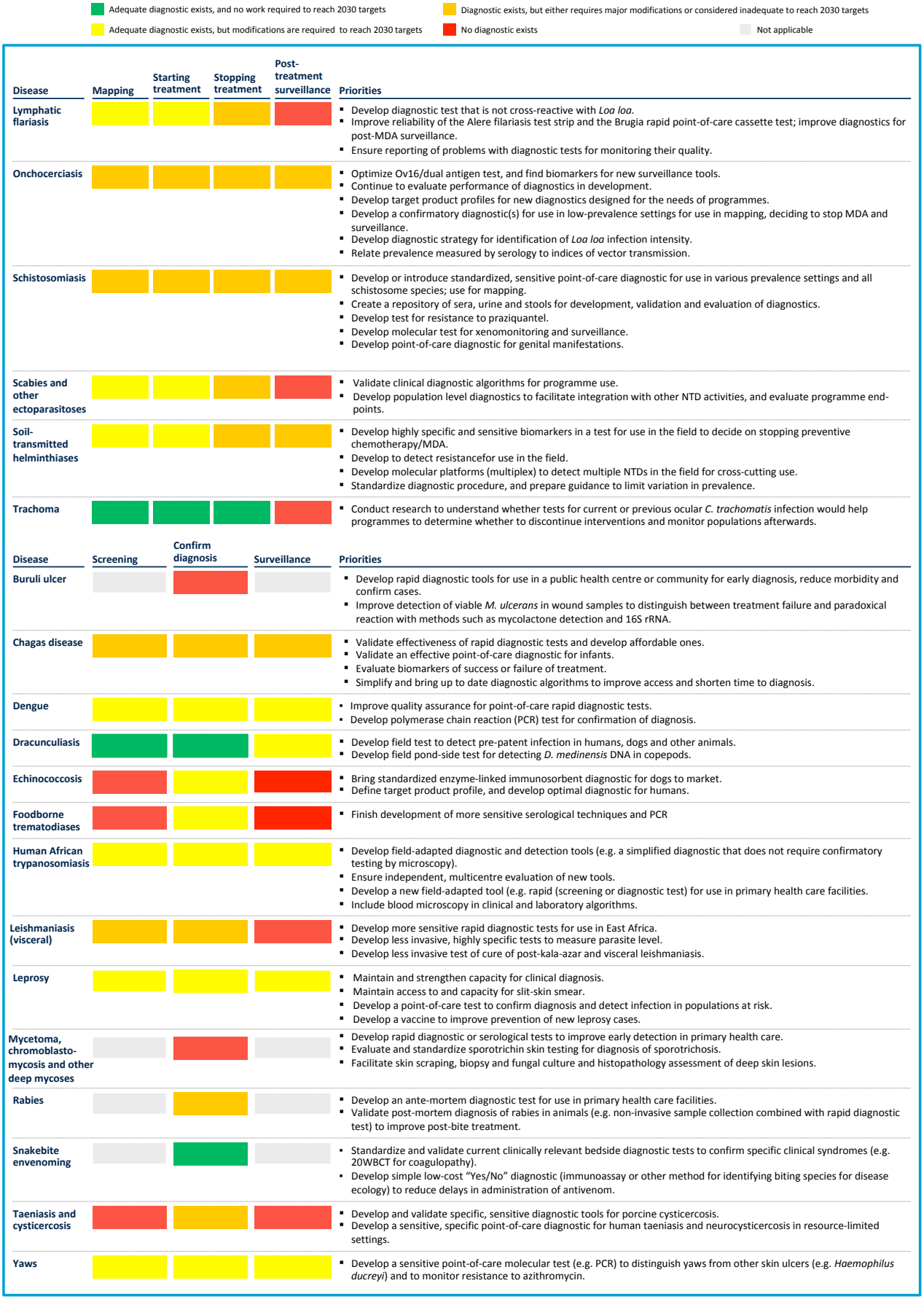
(B) MONITORING AND EVALUATION

Monitoring and evaluation are essential for tracking progress and decision-making to reach the 2030 goals.

Monitoring and evaluation are essential for correcting programmes when necessary. When work against NTDs was formalized 10–15 years ago, monitoring and evaluation were conducted to ensure access to drugs and treatment and therefore focused on process indicators such as population coverage. Now, indicators of impact are used in well-established programmes with cross-cutting approaches to obtain high-quality data for effective decision-making at all levels.

Recently, significant progress has been made in the development of tools and approaches for monitoring and evaluation.

In the past few years, WHO and a number of stakeholders have improved the quality of surveillance, monitoring and evaluation by standardizing indicators, publishing guidance, developing new tools and approaches and training programme managers, data managers and surveillance officers in endemic countries. For example,



Disease	Mapping	Starting treatment	Stopping treatment	Post-treatment surveillance	Priorities
Lymphatic filariasis					▪ Develop diagnostic test that is not cross-reactive with *Loa loa.* ▪ Improve reliability of the Alere filariasis test strip and the Brugia rapid point-of-care cassette test; improve diagnostics for post-MDA surveillance. ▪ Ensure reporting of problems with diagnostic tests for monitoring their quality.
Onchocerciasis					▪ Optimize Ov16/dual antigen test, and find biomarkers for new surveillance tools. ▪ Continue to evaluate performance of diagnostics in development. ▪ Develop target product profiles for new diagnostics designed for the needs of programmes. ▪ Develop a confirmatory diagnostic(s) for use in low-prevalence settings for use in mapping, deciding to stop MDA and surveillance. ▪ Develop diagnostic strategy for identification of *Loa loa* infection intensity. ▪ Relate prevalence measured by serology to indices of vector transmission.
Schistosomiasis					▪ Develop or introduce standardized, sensitive point-of-care diagnostic for use in various prevalence settings and all schistosome species; use for mapping. ▪ Create a repository of sera, urine and stools for development, validation and evaluation of diagnostics. ▪ Develop test for resistance to praziquantel. ▪ Develop molecular test for xenomonitoring and surveillance. ▪ Develop point-of-care diagnostic for genital manifestations.
Scabies and other ectoparasitoses					▪ Validate clinical diagnostic algorithms for programme use. ▪ Develop population level diagnostics to facilitate integration with other NTD activities, and evaluate programme end-points.
Soil-transmitted helminthiases					▪ Develop highly specific and sensitive biomarkers in a test for use in the field to decide on stopping preventive chemotherapy/MDA. ▪ Develop to detect resistancefor use in the field. ▪ Develop molecular platforms (multiplex) to detect multiple NTDs in the field for cross-cutting use. ▪ Standardize diagnostic procedure, and prepare guidance to limit variation in prevalence.
Trachoma					▪ Conduct research to understand whether tests for current or previous ocular *C. trachomatis* infection would help programmes to determine whether to discontinue interventions and monitor populations afterwards.

Disease	Screening	Confirm diagnosis	Surveillance	Priorities
Buruli ulcer				▪ Develop rapid diagnostic tools for use in a public health centre or community for early diagnosis, reduce morbidity and confirm cases. ▪ Improve detection of viable *M. ulcerans* in wound samples to distinguish between treatment failure and paradoxical reaction with methods such as mycolactone detection and 16S rRNA.
Chagas disease				▪ Validate effectiveness of rapid diagnostic tests and develop affordable ones. ▪ Validate an effective point-of-care diagnostic for infants. ▪ Evaluate biomarkers of success or failure of treatment. ▪ Simplify and bring up to date diagnostic algorithms to improve access and shorten time to diagnosis.
Dengue				▪ Improve quality assurance for point-of-care rapid diagnostic tests. ▪ Develop polymerase chain reaction (PCR) test for confirmation of diagnosis.
Dracunculiasis				▪ Develop field test to detect pre-patent infection in humans, dogs and other animals. ▪ Develop field pond-side test for detecting *D. medinensis* DNA in copepods.
Echinococcosis				▪ Bring standardized enzyme-linked immunosorbent diagnostic for dogs to market. ▪ Define target product profile, and develop optimal diagnostic for humans.
Foodborne trematodiases				▪ Finish development of more sensitive serological techniques and PCR
Human African trypanosomiasis				▪ Develop field-adapted diagnostic and detection tools (e.g. a simplified diagnostic that does not require confirmatory testing by microscopy). ▪ Ensure independent, multicentre evaluation of new tools. ▪ Develop a new field-adapted tool (e.g. rapid (screening or diagnostic test) for use in primary health care facilities. ▪ Include blood microscopy in clinical and laboratory algorithms.
Leishmaniasis (visceral)				▪ Develop more sensitive rapid diagnostic tests for use in East Africa. ▪ Develop less invasive, highly specific tests to measure parasite level. ▪ Develop less invasive test of cure of post-kala-azar and visceral leishmaniasis.
Leprosy				▪ Maintain and strengthen capacity for clinical diagnosis. ▪ Maintain access to and capacity for slit-skin smear. ▪ Develop a point-of-care test to confirm diagnosis and detect infection in populations at risk. ▪ Develop a vaccine to improve prevention of new leprosy cases.
Mycetoma, chromoblasto-mycosis and other deep mycoses				▪ Develop rapid diagnostic or serological tests to improve early detection in primary health care. ▪ Evaluate and standardize sporotrichin skin testing for diagnosis of sporotrichosis. ▪ Facilitate skin scraping, biopsy and fungal culture and histopathology assessment of deep skin lesions.
Rabies				▪ Develop an ante-mortem diagnostic test for use in primary health care facilities. ▪ Validate post-mortem diagnosis of rabies in animals (e.g. non-invasive sample collection combined with rapid diagnostic test) to improve post-bite treatment.
Snakebite envenoming				▪ Standardize and validate current clinically relevant bedside diagnostic tests to confirm specific clinical syndromes (e.g. 20WBCT for coagulopathy). ▪ Develop simple low-cost "Yes/No" diagnostic (immunoassay or other method for identifying biting species for disease ecology) to reduce delays in administration of antivenom.
Taeniasis and cysticercosis				▪ Develop and validate specific, sensitive diagnostic tools for porcine cysticercosis. ▪ Develop a sensitive, specific point-of-care diagnostic for human taeniasis and neurocysticercosis in resource-limited settings.
Yaws				▪ Develop a sensitive point-of-care molecular test (e.g. PCR) to distinguish yaws from other skin ulcers (e.g. *Haemophilus ducreyi*) and to monitor resistance to azithromycin.

Fig. 21. Assessment of diagnostic gaps and priorities

WHO issued the Joint Reporting Form for NTDs that are amenable to preventive chemotherapy, on which countries report annually on the distribution of medicines in a standardized format.

WHO has developed integrated data platforms to strengthen data collection and reporting on diseases that must be diagnosed and treated at a health facility, which can be used to make decisions at both national and regional levels. The platforms allow collection of individual and aggregated data both online through a web platform and offline on tablets and smartphones. The dashboards and reports are updated automatically and are available for all authorized users; some are also available on the WHO website. WHO-recommended indicators are packaged for integration into national health information systems, and training has been provided in data collection and use in peripheral health care centres in endemic countries.

WHO in collaboration with the Food and Agriculture Organization of the United Nations has prepared an atlas of human African trypanosomiasis for use by ministries of health, nongovernmental organizations and research institutions to monitor the impact of control activities, assess epidemiological trends and plan control and research activities. It is a repository of data provided since 2000 by national programmes on the numbers of cases detected and screened in villages, which were used to produce maps that are published regularly on the WHO website. Training has been provided in all endemic countries to map the main epidemiological indicators for inclusion in the atlas; the Democratic Republic of the Congo has used it for the past 3 years to better target control activities.

The WHO Strategic and Technical Advisory Group for Neglected Tropical Diseases' Working Group on Monitoring, Evaluation and Research is extending its operating model to ensure that it is commensurate with programme needs to meet the 2030 road map.

Despite advances, monitoring and evaluation for all NTDs are weak in many countries.

Control of all NTDs must be monitored and evaluated and is critical for at least 10 diseases in order to reach 2030 goals. For example, for onchocerciasis and schistosomiasis, more cost–effective mapping strategies are necessary for targeting MDA, and a system for tracking cases and outcomes is needed for trachoma. The need is greater for diseases targeted for control, for which investment has been limited, particularly for mapping and understanding their burden.

Monitoring and evaluation should be prioritized and strengthened by improving data collection and management, analysis, mapping, impact assessments, surveillance and reporting systems.

Strengthening the capacity of NTD programmes to collect and analyse data is key to effective monitoring and evaluation to measure the impact of intervention programmes and track progress towards the 2030 goals. Programmes should recognize the importance of monitoring and evaluation at all levels and be equipped with new data, tools and approaches to decision-making. Core components of monitoring and evaluation that should be strengthened are listed below.

- *Data management platforms*: Data systems should have complete, timely, systematic, accurate, disaggregated data (by age, gender, location), centralized in the ministry of health, shared with WHO and stored in a standard format on integrated platforms. Examples include WHO's Joint Application Package, the WHO Integrated Data Platform and the WHO Integrated Medical Supplies System, which facilitate application for medicines for preventive chemotherapy and patients, although they could be better harmonized and integrated. Centralized data can also be used for cross-cutting analysis and decision-making.
- *Data and analytics tools*: Platforms should also provide tools for data collection, analysis and interpretation to enable informed decision-making, complemented by other information such as on weather, landscapes and socioeconomic profiles. The tools should facilitate reporting, decision-making and policy direction for districts, sub-districts or villages, including digital health platforms to collect and monitor data.
- *Mapping and impact assessments*: New approaches and mapping tools are necessary to obtain a granular view of disease epidemiology and progression for targeted interventions. Mapping should be combined when possible, and sampling strategies could be adapted for several diseases. Data from mapping could be shared among programmes.
- *Surveillance*: New approaches and tools are required within routine systems for post-validation and elimination surveillance, through transmission assessment surveys, monitoring drug efficacy and resistance and pharmacovigilance. Post-validation surveillance will become more important as elimination is achieved

and, in some cases, may be combined with transmission assessment surveys. Monitoring of antimicrobial resistance will become more important as access to interventions increases.

- *Reporting*: National authorities should establish an accessible integrated reporting system, with a framework and mechanisms for monitoring and reporting progress against stated goals. Strong planning with timely reporting and high-quality outputs are required to avoid separate reporting by different stakeholders and donors. A combined reporting system could improve delivery of programmes not only today but in the future, such as for target product profiles.

WHO and the NTD community should monitor progress in achieving the goals of the road map during the coming decade.

This document describes the 2030 targets and approaches for reaching them. While the road map provides a long-term vision, progress should be measured over time in a standardized monitoring and evaluation framework. Monitoring will include periodic assessments of substantive progress in achieving both disease-specific and cross-cutting indicators. In addition to annual reporting, formal reviews will be conducted in 2024, 2026 and 2031 and also in 2029, the year after the WHO 14th General Programme of Work concludes. These reviews might indicate revision of targets if new information suggests that they should be more or less ambitious. For example, a breakthrough in research and development might increase the level of ambition for a particular disease, whereas identification of a previously unknown animal reservoir might decrease it.

(C) ACCESS AND LOGISTICS

Achieving the targets outlined in this road map will require consistent emphasis on the availability, accessibility, acceptability and affordability of NTD medicines and other health products and commodities of assured quality. Access to medicines and health products is a multidimensional challenge, which requires comprehensive strategies, from research and development to supply chain management, quality assurance, registration, pricing and rational use *(14)*.

Effective supply chain management is vital to ensuring access to quality-assured NTD medicines and other products.

A strong, responsive supply chain is necessary to ensure access to high-quality, affordable medicines and health products that are acceptable to the target populations. At least 1.5 billion treatments are mobilized every year. Forecasting, securing drug donations, coordinating delivery, reverse logistics, education and training can be particularly challenging, as these processes involve ensuring that medicines manufactured at various locations worldwide are accessible to patients and communities living in some of the places that are most difficult to access. Efficient management will optimize allocation of valuable donated or procured medicines and ensure that they are available at the right place and time, while minimizing wastage. National systems should invest specific resources for control of NTDs (see Fig. 7).

Since publication of the first road map, the NTD community has rallied to meet the logistical challenges of getting medicines to those in need, with a focus on the "first mile" of ensuring that medicines for preventive chemotherapy are sent from their site of manufacture to the central medicine stores of endemic countries. One component was the establishment of the NTD Supply Chain Forum in 2012, which is a public–private partnership between WHO, pharmaceutical companies, nongovernmental organizations, logisticians, donors and endemic countries. The Forum has enabled the donation and delivery of billions of treatments for five NTDs,[6] partly through initiatives such as the DHL "control tower", which coordinates shipments through customs clearance to national warehouses, and the NTDeliver tracking tool, which consolidates fragmented country information into a comprehensive database for planning and forecasting.

WHO continues to coordinate and liaise with national programmes on almost all donations of NTD medicines and diagnostics. It provides support ranging from ensuring timely submission of requests for medicines to providing technical support and capacity-building to resolving problems along the supply chain until the medicines reach the intended beneficiaries.

The challenges that remain include improving "last-mile" delivery, integrating provision of NTD medicines and products and improving the transparency of the supply chain.

Last-mile delivery should be a priority, including stock management and reverse logistics at sub-national levels (Fig. 22) to improve the supply chain, minimize wastage and reduce stock-outs.

[6] Lymphatic filariasis, onchocerciasis, schistosomiasis, soil-transmitted helminthiases and trachoma.

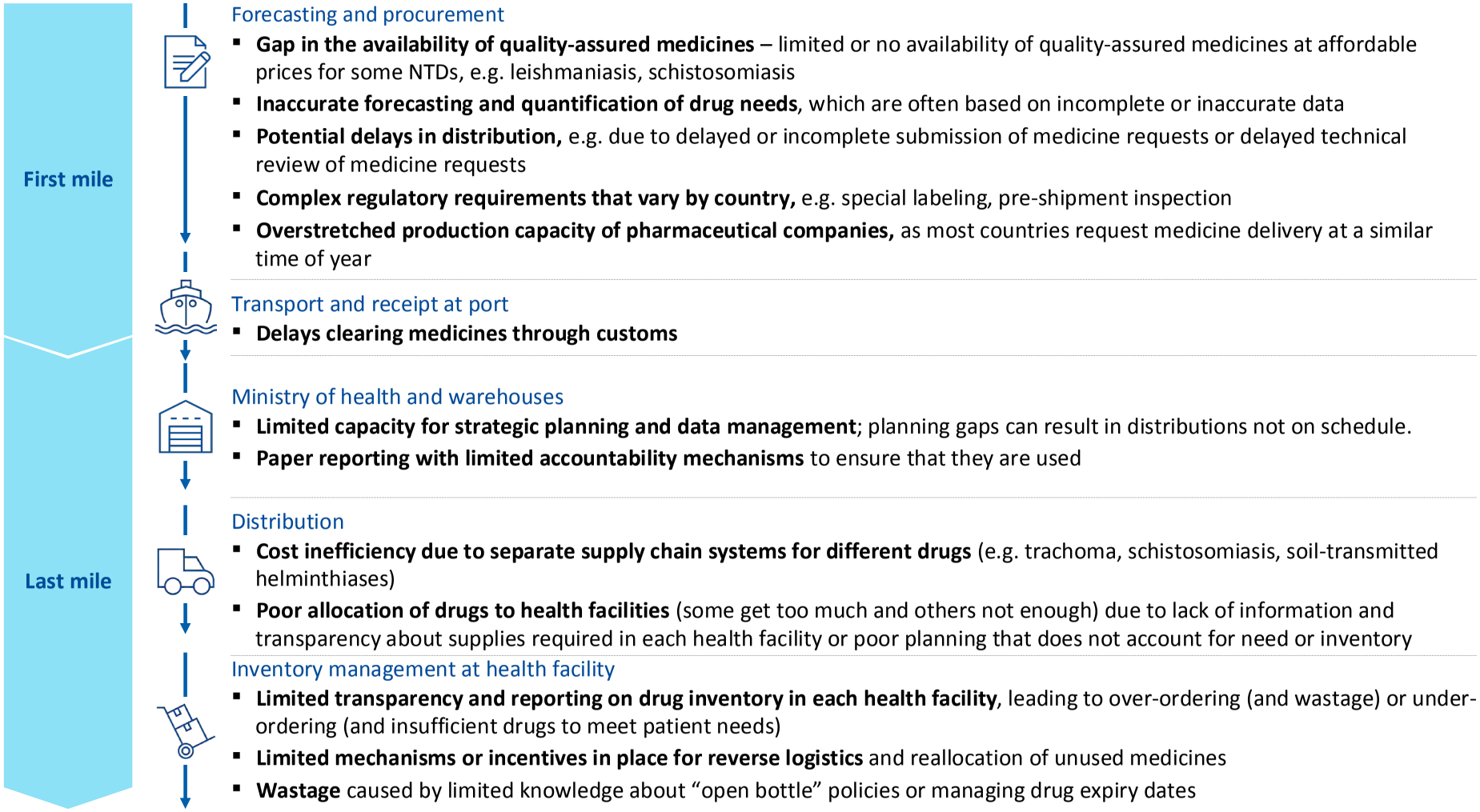


Fig. 22. Current challenges along the NTD supply chain

The priorities include extending access to quality-assured medicines for all NTDs in an integrated way and strengthening national planning and monitoring of the supply chain.

Closing the gap in the availability of medicines by securing access to quality-assured products at affordable prices for all NTDs is fundamental. Integrated supply and logistics can ensure efficient management, for example by reducing duplication and the costs of parallel supply chains and benefitting from pooled or coordinated procurement. An integrated platform might be set up to accelerate access to new NTD medicines.

Access to quality-assured products is being facilitated by promoting WHO prequalification of NTD products and collaborative registration with the WHO Department of Regulation of Medicines and other Health Technologies. Guidance on quality assurance in the procurement and donation of NTD products ensures access to safe, efficacious, affordable medicines and other health products.

At country level, integration with national medicine supply networks should be assured, including national medicine procurement and distribution systems and health management information systems. The tools and platforms that could be used include the WHO Supply Chain Management Tool for preventive chemotherapy and the Integrated Medical Supply System for diseases that require complex treatment of individual patients. A priority for countries is to improve the availability and quality of information on NTD treatments to ensure better decisions and more accurate forecasting. This can be facilitated by the use of tools and guidelines such as real-time online reporting on logistics and handling procedures for NTD medicines to minimize wastage and improve the return of unused drugs. Stronger monitoring is essential for quality assurance, which should be overseen by national regulatory authorities, to improve the accuracy of forecasting and thus ensure more effective allocation of medicines to meet patients needs beyond elimination targets.

(D) ADVOCACY AND FUNDING

The message that NTD treatments are a "best buy" in development can be used in advocacy for funding.

NTD treatments are considered one of the "best buys" in development, as they are donated, provide a high social return and are cost–effective. The United States Agency for International Development estimated that, for every US$ 1 spent on NTD programmes, US$ 26 in donated medicines are given through partnerships with pharmaceutical companies. In addition, for every US$ 1 invested in preventive chemotherapy for NTDs, the net benefit to individuals could be up to US$ 25 in averted out-of-pocket payment and lost productivity, representing a 30% annualized rate of return. Evidence in favour of including certain NTD interventions in the package of essential interventions for all low-income endemic countries is based on a cost per disability-adjusted life year (DALY) averted of 2012 US$ 250 or less *(9)*. The interventions include preventive chemotherapy for at least five NTDs, comprehensive control (including vector control) for visceral leishmaniasis and early detection and treatment of cutaneous leishmaniasis, human African trypanosomiasis and leprosy *(13)*. The cost of preventive chemotherapy, estimated to be US$ 0.4 per person, is low and could be lowered even further with cross-cutting approaches. As NTDs affect the most disadvantaged people in many countries, continued funding for NTDs is a sound investment with a significant social and long-term financial return.

Considerable progress has been made in advocacy and funding globally and nationally.

Advocacy and funding provide countries with the necessary support for delivering NTD interventions. Considerable progress has been made both globally and domestically. For example, Brazil, India and Indonesia contribute significant funding for leprosy and other NTDs. In some countries there were some increases in overall funding available for integrated NTD programmes, as a result of which geographical coverage and the number of people treated expanded and treatments targeted at new diseases were added *(15)*. The London Declaration in 2012 brought new energy, new partners and additional funding. Pharmaceutical companies donate an average of nearly three billion tablets of safe, quality-assured medicines annually, worth hundreds of millions of dollars, to support control and elimination in countries where NTDs are endemic. At the second meeting of global partners convened by WHO in 2017, more than US$ 800 million were pledged for 5–7 years, with new donors such as the END Fund, the Reaching the Last Mile Fund established by the Crown Prince Court of Abu Dhabi, the Government of Belgium and many others.

Continued attention and additional funding are still needed to fill gaps in financing.

Nonetheless, more advocacy and funding are required to continue towards the 2030 targets and to sustain progress, especially for diseases that are approaching elimination. A clear indicator of the proportion of domestic financing allocated to NTDs would allow quantification and tracking of such investments. While in 2016 up to US$ 300 million were donated annually, WHO estimated that NTDs could cost up to US$ 750 million a year by 2020 over and above the costs of vector control and drug donations, leaving a considerable gap. In 2016, at the annual meeting of the WHO Alliance for the Global Elimination of Trachoma by 2020 (GET2020), it was estimated that eliminating trachoma by 2020 would cost about US$ 1 billion, while only US$ 200–300 million had been pledged at the time *(14)*.

This road map will be supported by an investment case and a sustainability framework. Both governments and global stakeholders should help to close the funding gaps necessary to fulfil the 2030 road map targets.

Domestic financing and mainstreaming into the health system will be critical.

Domestic financing will have to be increased to meet the targets, especially in countries that are moving away from bilateral funding. If countries are to deliver their NTD programmes sustainably as part of universal health coverage, NTDs must be accounted for in national health, development and poverty alleviation strategies and budgets and not only in NTD strategic plans. Inclusion of NTDs in government policies is affordable, as it would require less than 1% of domestic expenditure to meet the 2030 targets *(2)*.

Unless NTDs receive adequate resources, they will continue to be neglected. It has been shown that countries procure rabies vaccine only if they have surplus budget, indicating the importance of initial budgeting for this important product. As national programmes for some NTDs close, countries should plan funding for some core activities supported by those programmes, such as sustained MDA for soil-transmitted helminthiases as programmes for lymphatic filariasis scale down. NTD leaders and ministers of health could inform finance ministries that NTD treatments are “best buys” in development. Thus, investing in NTDs will not only improve the health and well-being of populations but also benefit the most disadvantaged citizens financially and increase productivity.

Global stakeholders should continue to support and raise the profile of NTDs and ensure coordination and commitment at various levels.

The global fight against NTDs involves a diverse group of stakeholders united towards a common goal. One of the strengths of the global programme is collaboration among communities of practice, such as the supply chain forum, academia and various alliances, which support WHO in responding to countries’ needs Such partnerships can be strengthened with the continued support of global stakeholders in funding and in advocating for sustained commitment and increased support globally and nationally.

Advocacy and funding are essential for continued and increased access to effective interventions.

Access to effective interventions, often through the generosity of companies, has been the basis for progress in achieving the 2020 goals (Fig. 23). More companies are committing funds to areas such as vector control and diagnostics (e.g. General Electric and Abbott). In addition, countries are finding domestic funding and partners. Moving towards 2030 goals, ensuring equitable access to effective interventions will continue to be critical, such as renewed commitment to extend the timeframe of drug donations. Sustained advocacy and funding will be required from both global and domestic stakeholders.

Company	Medicine	Quantity donated	Disease	Commitment	Donation coordinator
Bayer	Nifurtimox	7 750 000 tablets total	Chagas disease	2016–2021	WHO
	Nifurtimox (120 mg)	300 000 tablets annually	Human African trypanosomiasis	2019–2021	WHO
	Nifurtimox (30 mg)	20 000 tablets annually	Human African trypanosomiasis	2019–2021	WHO
	Suramin	10 000 vials annually	Human African trypanosomiasis	Until 2020	WHO
	Niclosamide (400 mg)	2 800 000 tablets total	Taeniasis/cysticercosis	2020–2024	WHO
	Praziquantel (600 mg)	1 339 000 tablets total	Taeniasis/cysticercosis	2020–2024	WHO
Eisai	Diethylcarbamazine citrate	2 200 000 000 tablets total	Lymphatic filariasis	Until elimination	WHO
Gilead Sciences	Liposomal amphotericin B	380 000 vials total	Visceral leishmaniasis	2017–2020	WHO
Sanofi	Eflornithine	Unlimited	Human African trypanosomiasis	Until 2020	WHO
	Melarsoprol	Unlimited	Human African trypanosomiasis	Until 2020	WHO
	Pentamidine	Unlimited	Human African trypanosomiasis	Until 2020	WHO
	Fexinidazole	Unlimited	Unlimited	Until 2020	WHO
Novartis	Multidrug therapy[1]	Unlimited	Leprosy	2000–2020	WHO
	Clofazimine	Unlimited	Severe erythema nodosum leprosum reactions	2000–2020	WHO
	Triclabendazole	600 000 tablets total	Fascioliasis	2016–2022	WHO
EMS	Azithromycin	Up to 153 000 000 tablets	Yaws	2018–2022	WHO
Pfizer	Azithromycin	Unlimited	Trachoma	1998–2025	International Trachoma Initiative
Johnson & Johnson	Mebendazole	200 000 000 tablets annually	Soil-transmitted helminthiases (SAC)[2]	Until 2025	WHO
GlaxoSmithKline	Albendazole	600 000 000 tablets annually	Lymphatic filariasis	Until elimination	WHO
		400 000 000 tablets annually	Soil-transmitted helminthiases (SAC)[2]	Until elimination	WHO
Merck & Co	Praziquantel	250 000 000 tablets annually	Schistosomiasis (SAC)[2]	Unlimited	WHO
MSD	Ivermectin	Unlimited	Onchocerciasis	Until elimination[3]	Mectizan Donation Program
		Unlimited	Lymphatic filariasis in co-endemic countries	Until elimination[4]	Mectizan Donation Program
		100 000 000 treatments annually	Lymphatic filariasis for triple-therapy MDA	Until 2025	Mectizan Donation Program

[1] rifampicin, clofazimine, dapsone
[2] For school-aged children (SAC)
[3] In the African, Americas and Eastern Mediterranean regions
[4] In Yemen and African countries where lymphatic filariasis and onchocerciasis are co-endemic

Fig. 23. Current status of drug donation commitments

OPERATING MODEL and COUNTRY OWNERSHIP

Chapter 4

Roles and responsibilities must be clear at each level and sector of the global NTD community to define the appropriate operating model. Meeting the targets will also require shifts in organizational structures, ways of working and thinking. WHO remains committed to supporting countries in implementing their national NTD programmes for better overall global health outcomes and for monitoring and evaluation.

COUNTRY OWNERSHIP IS ESSENTIAL FOR MEETING THE 2030 NTD TARGETS WITH THE SUPPORT OF REGIONAL AND GLOBAL STAKEHOLDERS.

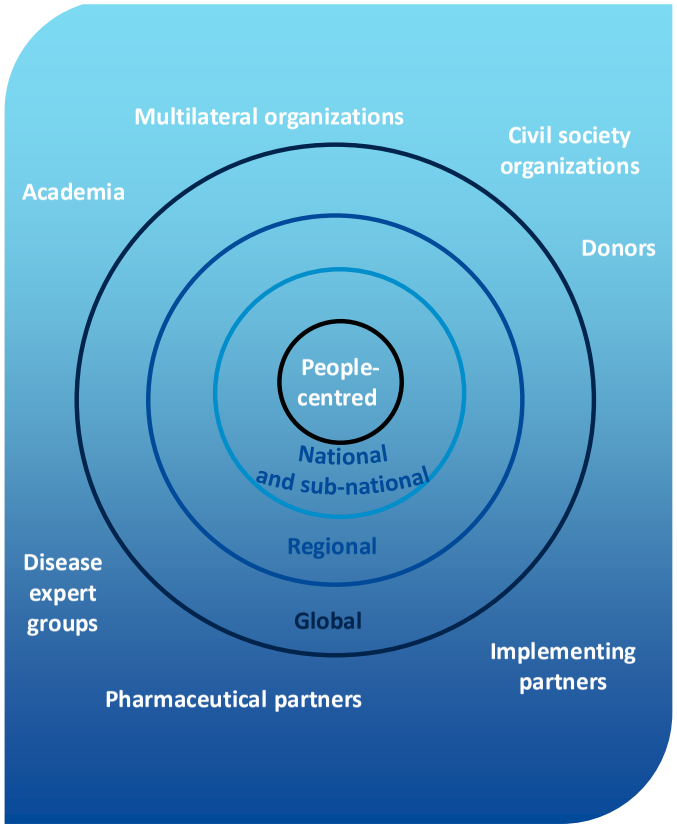
Countries are both the drivers and the beneficiaries of progress towards the 2030 road map targets. Eliminating at least one NTD in 100 countries and reducing the population that requires interventions against NTDs by 90% will require concerted action by national and local governments in endemic countries, which should increasingly assume the leadership in designing, delivering and evaluating their NTD programmes. Local governments (municipalities, districts) are also essential for successful implementation of interventions and coordination of multisectoral action. As national and local governments increasingly assume leadership, the role of regional and global stakeholders will primarily be one of support.

Global development of norms, guidance and tools and of technical progress will remain vital. WHO's NTD collaborating centres constitute a global network of expertise in activities such as target product profiles for new NTD products and diagnostics. Regional stakeholders play an important role as the interface between global and local levels, providing guidance to countries in translating global targets and in sharing best practices. While the specific activities conducted globally, regionally and nationally will vary and will evolve as the leadership of countries increases, the roles of the three tiers is broadly consistent (Fig. 24).

Partners play a pivotal role at all levels but particularly in countries. As countries define their goals in relation to the road map targets, partners can help to fill gaps that countries identify as requiring additional support. Clear delineation of responsibilities among partners will ensure geographic coverage, avoid duplication and ensure that no community is overlooked. The coordination of this extensive, diverse network will be supported by WHO, which will work with all stakeholder groups.

ORGANIZATIONAL STRUCTURES ARE NECESSARY TO SUPPORT STRATEGIES AND APPROACHES.

Meeting the 2030 NTD targets and benefiting from cross-cutting approaches will require effective alignment of organizational structures at all levels.



Planning and programme management

- Develop national NTD strategy, budget and structures
- Monitor, evaluate and report progress towards NTD targets
- Coordinate with relevant sectors, and direct resources, expertise and support where needed

Delivery of interventions

- Implement NTD programmes, including
  - access and logistics
  - social mobilization etc.

Country support

- Support countries to
  - translate global roadmap goals to national targets
  - identify national gaps and help build capacity to fill them and achieve targets

Sharing best practices

- Strengthen global and country links
- Facilitate sharing and exchange of best practices

Technical action

- Build scientific understanding
- Develop effective interventions
- Conduct operational research

Norms, guidance and tools

- Develop and share norms, guidelines and tools
- Provide guidance on transition to cross-cutting approaches
- Share best practices

Resource mobilization, advocacy and building support of development partners

Fig. 24. Roles of stakeholders at all levels and in all sectors

As countries set NTD targets, which may include several disease-specific and cross-cutting goals, they should consider whether their programme structure can support the strategies and their execution. Transition to cross-cutting approaches can be facilitated by moving along the four dimensions outlined in Fig. 25. This may include setting up a formal NTD unit or a virtual structure such as a task force or steering committee for all relevant NTDs and establishing formal mechanisms for multisectoral collaboration. The extent to which countries position themselves on the scale in Fig. 25 depends on factors including country size, ministerial structures and disease endemicity. The aim is to transition programmes towards the right-hand side of the scale to enable greater prioritization of NTDs and cross-cutting orientation.

Shifts in the ways that WHO and global and regional stakeholders work will facilitate the transition of countries towards cross-cutting activities. As countries integrate activities for several NTDs, global stakeholders might consider doing the same. Intersectoral collaboration beyond the health sector, notably for environmental and veterinary health, should be a priority.

THINKING AND CULTURE SHOULD ALSO BE ALIGNED WITH THE 2030 TARGETS.

National leadership in achieving the 2030 NTD targets will require a sense of ownership, commitment and accountability. It is envisaged that national and local governments will take a proactive approach in defining and delivering an NTD agenda, financed in part or fully from domestic funds. Countries should actively integrate and prioritize endemic NTDs in national and local government health plans, with a dedicated line in the national and local health budgets, ensuring that the amount is commensurate with the burden (e.g. in terms of US$ spent per DALY). Countries should also proactively foster multisectoral action and build the political will necessary to support NTD elimination and control. Fig. 26 gives an example of the activities a country may undertake to design a national NTD plan and to attract the necessary support.

Country ownership of NTDs is not confined to one national entity, as it is relevant at all levels of government. Health systems in many countries are become decentralized; therefore, the commitment and funding required to sustain progress towards 2030 should extend to local governments and authorities and also include civil and community leaders at all levels of society, given their critical role in raising awareness about endemic diseases, behaviour change and building local support for NTD interventions. For example, in trachoma-endemic communities, women who have undergone eye surgery are among the most effective groups for encouraging others with the disease to seek treatment. Additionally, involvement of patient groups and people living with NTDs in designing NTD programmes can empower them and ensure that interventions adequately cater to patient needs.

Changes in thinking in global and regional organizations can aid the transition towards the cross-cutting approaches proposed in this road map. They include moving away from a siloed disease-specific approach to consideration of areas for mutual benefit and collaboration with other organizations to progress towards elimination and control. As countries move towards stronger coordination and collaboration with other sectors critical for NTD control, such as WASH, the veterinary and agricultural sectors and vector control, stakeholders can initiate such links at global and regional levels, such as interactions between the NTD and WASH programmes within WHO. Connections will thus be formed at all levels to strengthen overall multisectoral exchange. Donors could make their funding more flexible to cover cross-cutting initiatives, for example by funding integrated programmes (e.g. capacity-building for skin NTDs, morbidity management and integrated MDA campaigns). They could also accept general reports on NTDs from countries rather than requiring separate reports for each funded programme. This will reduce the workload of countries and empower them to manage their NTD programmes.

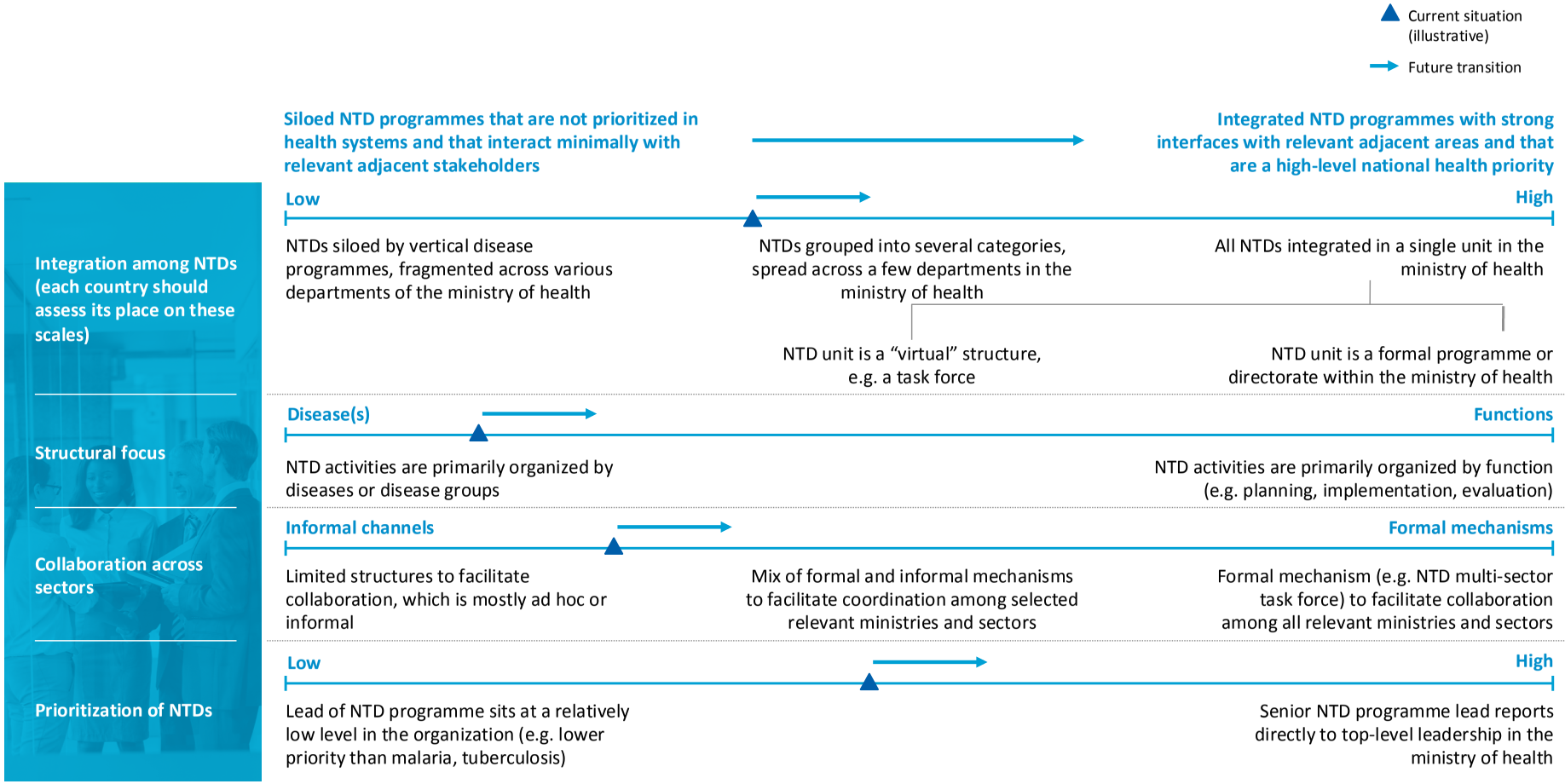


Fig. 25. Shifts in organizational structures in countries

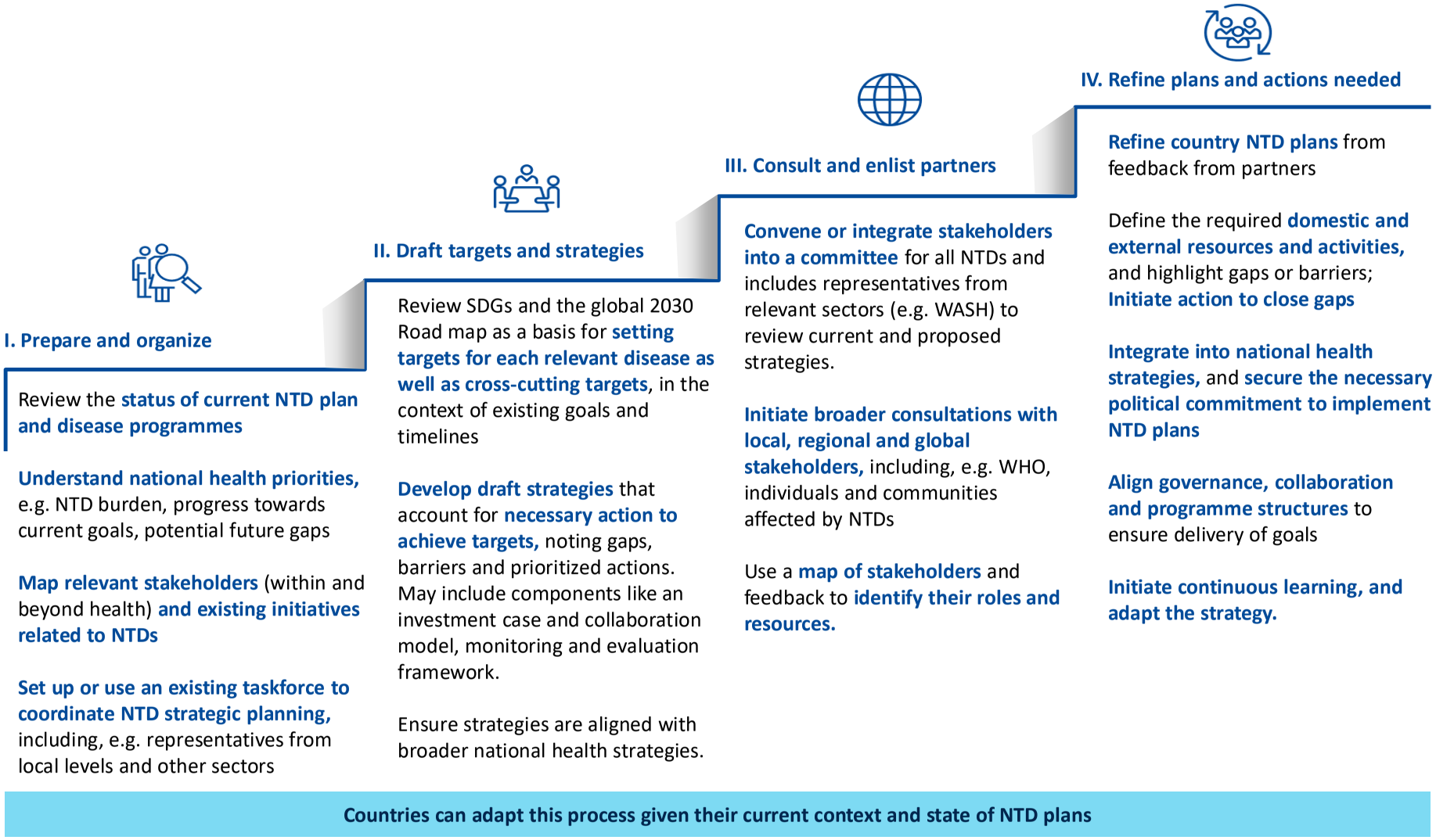


Fig. 26. Examples of steps in designing a national NTD plan

CONCLUSIONS

Chapter 5

While significant progress has been made, the burden of NTDs remains heavy for the population who carry it, who are some of the most vulnerable and marginalized people in the world. In view of the growing commitment of the global community to attaining the SDGs and universal health coverage, particularly in the decade of action for the SDGs, this road map builds on the experiences and lessons learnt as well as the momentum of the past decade. All actors are encouraged to evaluate their approaches to improve the efficiency and effectiveness of their contributions.

The road map will be revised in accordance with evolving disease epidemiology and emerging opportunities for concerted action. Formal global reporting on progress is planned in 2024, 2026, 2029 and 2031, so that adjustments can be made as required. The dynamism and openness are expected to foster greater collaboration within and beyond the NTD community in order to lessen the global burden.

This road map is a call to action for Member States, donors, implementing partners, disease experts and all other stakeholders to align their strategies and plans towards the prevention of infections and alleviation of the suffering of people affected by NTDs.

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