For more details, please visit:
https://www.who.int/buruli/en/

HIGHLY PRELIMINARY

Buruli Ulcer

Overview

Disease and epidemiology

- Buruli ulcer is caused by *Mycobacterium ulcerans,* a bacteria belonging to the family which causes tuberculosis and leprosy
- The disease causes ulcers (mostly on limbs) which affect the skin and sometimes bone, and can lead to permanent disfigurement and long-term disability.
- The mode of transmission is not known and there is no prevention against the disease. BCG vaccination appears to provide limited protection.
- The bacteria produces a unique toxin – mycolactone – which causes tissue damage and inhibits the local immune response suppressing pain

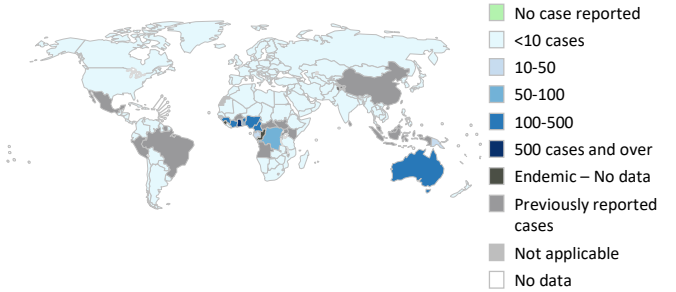
Burden of disease

~2,700
New cases in 2018

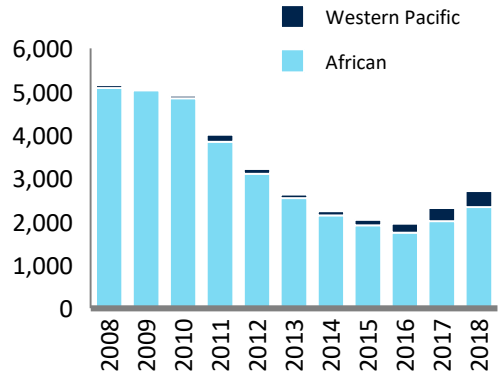
28%
Disability at diagnosis, 2018

- Buruli ulcer is endemic in 33 countries in Africa, Latin America and Western Pacific

Number of reported cases



Buruli ulcer cases reported to WHO, by region, 2008-2018



Strategic interventions

Preventive chemotherapy	N/A
WASH	N/A
Vector control	N/A
Veterinary public health	N/A
Case management	▪ Combination of antibiotics including rifampicin + clarithromycin and rifampicin + moxifloxacin used in Australia
Other	▪ Early diagnosis is essential ▪ Morbidity management includes surgery, wound and lymphoedema management, physiotherapy, and long-term rehabilitation

Selected efforts to overcome NTD

- Total of USD ~3 million in global funding is dedicated to R&D for fighting Buruli ulcer: ~1.3m basic research, ~1.2m drugs, ~0.3m diagnostics[1]
- Contribution of many different organizations and countries is essential for the fight against Buruli ulcer. Some of the organizations and institutions are members of the overarching Global Buruli ulcer initiative

Progress against WHO 2020 targets

Impact indicator	2012	2020 target	Current status
Completed clinical trial and incorporated results into control and treatment	Not started	Completed	Completed
% of cases detected and cured at an early stage (category I and II)	75%	70%	66%

1 G-Finder report 2018
SOURCE: All data sourced from WHO unless otherwise indicated

Buruli Ulcer

Target: disease control

HIGHLY PRELIMINARY

WHO 2030 target

Impact indicator	2020 (Baseline)	2023	2025	2030
Proportion of cases reporting with disability upon diagnosis[1]	25%	<22%	<20%	<15%
Proportion of cases in Category III (late stage) at presentation	30%	<26%	<23%	<18%

1 Defined as a presence of joint limitation

Assessment of actions required to meet 2030 targets

Summary of key actions to achieve targets

For effective morbidity control, it is essential to discover the disease early and to be able to treat it effectively. For this reason, the following three areas are critical to reach the targets:

- Build capacity of health workers to clinically diagnose and treat the disease and community health workers to detect and refer cases for treatment, furthering integration across skin NTDs
- Develop rapid diagnostic test for use at levels of the healthcare system closer to the patient
- Create comprehensive surveillance systems in all endemic countries including micro-mapping

No bottleneck towards target — Critical action required to reach target

Category	Current Assessment	Current status	Actions required
Technical progress			
Scientific understanding		▪ Mode of transmission is unknown	▪ Improve understanding of the epidemiology - modes of transmission and its drivers ▪ Understand environmental reservoirs to allow for designing preventive public health interventions ▪ Relate environmental studies to human disease distribution by studying whole genome sequences of *M. ulcerans*
Diagnostics		▪ Diagnosis done clinically or using laboratory techniques (direct microscopy, histopathology, culture, PCR, f-TLC) ▪ Early detection is essential in reducing severe disease ▪ RDT LAMP test and RPA test are currently being piloted in selected countries	▪ Develop rapid diagnostic tools for use at the public health centre and community levels to enable early diagnosis, reduce morbidity and confirm cases ▪ Improve detection of viable M. ulcerans in wound samples to distinguish between treatment failure and paradoxical reaction through methods such as mycolactone detection and 16S rRNA
Effective intervention		▪ There is currently no prevention against the disease ▪ Combination of rifampicin and clarithromycin is recommended for 8 weeks; in Australia, combination rifampicin and moxifloxacin is used ▪ Surgery particularly skin grafting is used to speed up healing in extensive lesions. ▪ Effectiveness of vector control and protective wear is currently being assessed in Australia	▪ Evaluate new promising drugs to provide new treatment options including reduction in duration of treatment ▪ Evaluate new wound-care approaches (e.g. new dressings that can be changed less frequently) ▪ Develop innovative strategies to improve adherence (e.g. community health workers check-ups, SMS reminders)
Strategy and service delivery			
Operational and normative guidance		▪ Buruli ulcer global strategy and national plans are in place ▪ WHO Diagnosis and treatment guidelines exist	▪ Update treatment guidelines based on results of clinical trial assessing oral treatment course
Planning and governance		▪ WHO Technical Advisory Group on Buruli ulcer exists ▪ National Buruli ulcer Control Programmes are in place ▪ National NTD coordination bodies exist but are weak (in some countries only on paper or coordinating PC only)	▪ Strengthen national NTD coordination bodies to effectively carry out their remits across full range of NTDs ▪ Consistently include Buruli ulcer in NTD package
Monitoring & Evaluation		▪ 14 out of 33 known endemic countries report data in 2018	▪ Mandate reporting of Buruli ulcer and start reporting data in all endemic countries ▪ Enhance surveillance in countries that are not reporting cases through integrated skin-NTD reporting system ▪ Initiate micro-mapping of Buruli to identify overlaps with other NTDs ▪ Monitor resistance to antibiotics phenotypically and through genetic markers
Supply and logistics		▪ WHO procures Buruli ulcer medicines and provides them to countries at no cost ▪ Governments and partners provide dressings and other supplies	▪ Secure donation of medicines ▪ Ensure adequate supplies of dressings
Healthcare infrastructure and workforce		▪ Decentralization of care within the PHC to move care closer to the patient in progress ▪ Sufficient national laboratory capacities to confirm cases	▪ Strengthen health care system at all levels through capacity development to increase access to early detection care, and surgery, to ensure access to oral treatment at sub-district level, and to enable management of other chronic skin conditions
Enablers			
Advocacy and funding		▪ Political commitment through Yamoussoukro Declaration (1998) and Cotonou declaration (2009) ▪ Donors and partners supporting implementation at country level ▪ Research community provides visibility and advocacy through mobilizing research resources	▪ Enhance political commitment among endemic countries and partners to mobilize funds and manpower ▪ Community engagement and mobilization to support programme implementation ▪ Engage research community for knowledge generation and advocacy to mobilize resources for research
Collaboration and multisectoral action		▪ Collaboration with other skin-NTDs to reach populations affected by these diseases ▪ Collaboration with education and social sectors for case detection and awareness	▪ Continue roll-out of integrated approach across skin-NTDs to increase coverage of case detection and treatment, and improve monitoring and reporting ▪ Collaboration with tuberculosis and leprosy programmes in supply chain, treatment, follow up, and laboratories ▪ Collaborate with academic and healthcare institutions in endemic countries on developing knowledge for skin-NTDs
Capacity building		▪ Integration of training across skin-NTDs is in progress ▪ Ongoing trainings for laboratory diagnosis, skin-grafting, and woundcare ▪ Essential community education for reducing stigma is currently not sufficient	▪ Capacity development of health workers at the community, health center and district levels for integrated skin-NTD detection, treatment, and surgery ▪ Develop online training packages which can be easily adapted by countries

Additional risks that require mitigation

For more details, please visit: https://www.who.int/neglected_diseases/diseases/mycetoma-chromoblastomycosis-deep-mycoses/en/index1.html

Mycetoma, Chromoblastomycosis & other deep mycoses

Chromoblastomycosis & other deep mycoses

HIGHLY PRELIMINARY

Overview

Disease and epidemiology

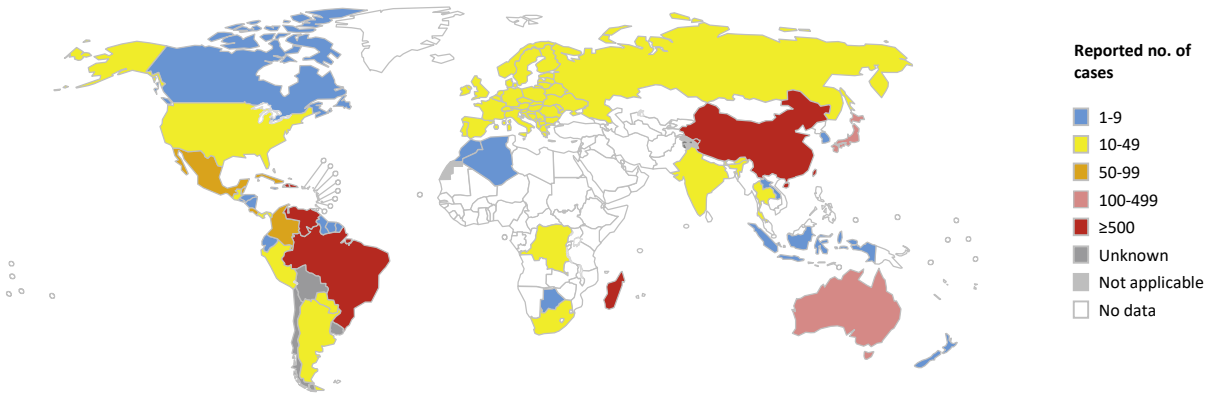
- A chronic fungal infection of the skin and subcutaneous tissue caused by a group of fungi; the three most common species are *Fonsecaea pedrosoi, Cladophialophora carrionii* and *Phialophora verrucosa*
- Causes lesions which are clinically polymorphic, the most frequent are nodular, verrucous and tumoral
- Transmitted through traumatic inoculation through the skin
- Deep mycoses also include different widely distributed fungal infections such as sporotrichiosis, paracoccidiodomycosis and others

Burden of disease

Exact burden of the disease unknown

- The highest prevalence of the disease is in tropical and subtropical regions, mostly in the Amazon region of Brazil, the northern part of the Bolivarian republic of Venezuela, and in Madagascar

Number of reported cases of Chromoblastomycosis from surveys[1]



Strategic interventions

Preventive chemotherapy	N/A
WASH	▪ Personal hygiene
Vector control	N/A
Veterinary public health	N/A
Case management	▪ No "gold standard" treatment for chromoblastomycosis exists; treatment options include antifungals, physical therapies and immune adjuvants ▪ When the initial lesions are detected early, surgical resections can be applied ▪ Management of other deep mycoses depends on the specific disease and causative organisms; antifungals are mainstay of treatment for most
Other	▪ Wearing protective cloths, gloves & shoes

Selected efforts to overcome NTD

- Various international organization and professional societies including GAFFI, international league of dermatological society, International Society of Dermatology and others are making significant efforts in advocacy, capacity building and policy and strategic push for skin diseases control

Progress against WHO 2020 targets

Impact indicator	2012	2020 target	Current status
N/A	N/A	N/A	N/A

SOURCE: All data sourced from WHO unless otherwise indicated
1 Gaffi fact sheet; http://www.gaffi.org/wp-content/uploads/chromobastomycosis-briefing-document-Nov-2014.pdf

Mycetoma, Chromoblastomycosis & other deep mycoses

HIGHLY PRELIMINARY

Chromoblastomycosis & other deep mycoses

WHO 2030 target

Impact indicator	2020 (Baseline)	2023	2025	2030
Number of countries where chromoblastomycosis & priority deep mycoses included in national control programs and surveillance system	TBC	TBC	TBC	TBC

Assessment of actions required to meet 2030 targets

No bottleneck towards target — Critical action required to reach target

Category	Current Assessment	Current status	Actions required
Technical progress			
Scientific understanding		▪ Transmission pathways of the disease are well understood	▪ Determine the exact magnitude, trend and distribution of the disease and associated causative species
Diagnostics		▪ Diagnosis based on clinical manifestation, epidemiological link and demonstration of etiologic agents from skin scrapings or biopsies ▪ No rapid diagnostic test or any serologic test ▪ Early detection improves outcomes	▪ Develop rapid diagnostic or serological tests to improve early detection at primary health care level
Effective intervention		▪ Case management with antifungals and local treatment has low cure rate and require several months of treatment ▪ Protective shoes, gloves or garments help prevention ▪ Improved nutrition and hygiene	▪ Improve therapeutic regimens (shorter duration and increased efficacy to reduce refractoriness to treatment) ▪ Develop innovative preventive tools based on local understanding of the transmission
Strategy and service delivery			
Operational and normative guidance		▪ No global guidance on case management, surveillance, prevention and control	▪ Develop global guidance on case management, surveillance, prevention and control needs.
Planning and governance		▪ There is no information on any country having a national control plan	▪ Include chromoblastomycosis and other deep mycoses in control programmes against NTDs or communicable diseases in endemic countries
Monitoring & Evaluation		▪ No surveillance protocol or system, no standard indicators ▪ No M&E system	▪ Develop a surveillance guide with standard indicators ▪ Establish M&E system or integrate with national health information system
Supply and logistics		▪ No donation of medicines ▪ Countries procure and manage their supply system	▪ Secure donations of medicines or significantly reduced prices
Healthcare infrastructure and workforce		▪ Health systems are not prepared to provide control services or run control programmes	▪ To be confirmed
Enablers			
Advocacy and funding		▪ Some organization and groups such as GAFFI, ISHAM etc. are making advocacy, awareness raising and capacity building efforts.	▪ Ensure political commitment from endemic countries and partners to mobilize funds and human resources ▪ Engage community and mobilize support for programme implementation
Collaboration and multisectoral action		▪ Collaboration with various professional societies, NGOs, research and academic institutes initiated	▪ Initiate collaboration with various research institutes, drugs and diagnostics developers, manufacturers and donors
Capacity building		▪ Most health workers in endemic areas may not be able to recognize most of the deep mycoses at early stage ▪ In many endemic countries the majority of health workers lack the required knowledge and skills to manage cases ▪ No standard & structured training programs for health professionals	▪ Train health professionals and community health workers across priority skin NTDs to improve early detection based on local epidemiological contexts ▪ Improve the diagnostic and managing capacities of health care system in the endemic regions of the countries

Additional risks that require mitigation

For more details, please visit: https://www.who.int/foodborne_trematode_infections/en/

Food-borne trematodiases

HIGHLY PRELIMINARY

Overview

Disease and epidemiology

- Caused by trematode worms ("flukes") - *Clonorchis sinensis, Opisthorchis viverrini, Opisthorchis felineus, Fasciola hepatica, Fasciola gigantica, Paragonimus* spp.
- Causes severe pain in abdominal region, general malaise, inflammation and fibrosis of the liver (clonorchiasis and opisthorchiasis, fascioliasis), fatal bile duct cancer (clonorchiasis and opisthorchiasis), blockage, colic pain and jaundice (fascioliasis), chronic cough with blood, chest pain, dyspnea, and fever (paragonimiasis).
- Transmitted through raw or undercooked food (fish, aquatic vegetables, crabs and crayfish) infected with larvae

Burden of disease

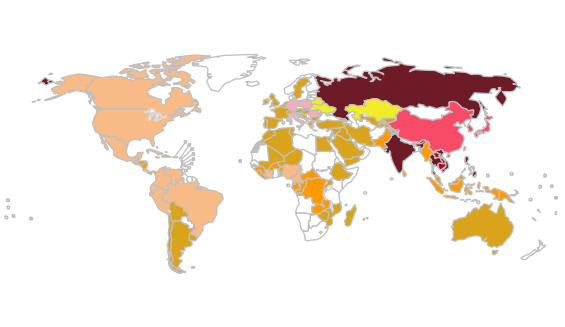
200,000
People infected annually

~7,000
Annual deaths

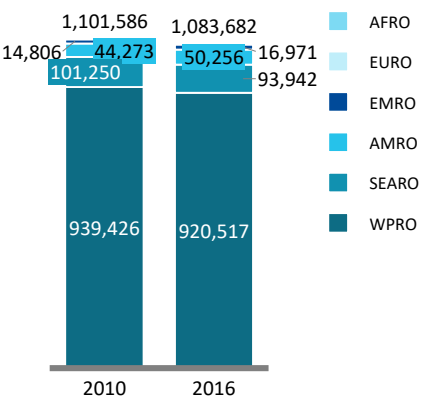
~2m
DALYs, 2016

- Accurate data on incidence and prevalence are not available

Endemicity of trematodiases globally



DALYs per region[1] in 2010, 2016



1 Data in AFRO unavailable. Other regions are likely underestimated due to lack of reliable data.

Strategic interventions

Preventive chemotherapy	MDA of anthelminthic medicines (praziquantel, triclabendazole) in endemic areas
WASH	Sanitation and fecal waste processing
Vector control	N/A
Veterinary public health	N/A
Case management	Anthelminthic medicines (praziquantel, triclabendazole)
Other	Safe food preparation and storage

Selected efforts to overcome NTD

- Limited to no funding for fighting food-borne trematodiases
- Triclabendazol donation by Novartis secured until 2022 (600,000 tablets/year)
- Contribution of many different organizations and countries is essential for the fight against food-borne trematodiases. Some of these organizations include: [TBD]

Progress against WHO 2020 targets

Impact indicator	2012	2020 target	Current status
Trematode infections included in mainstream preventive chemotherapy strategy	N/A	N/A	N/A
Population at risk reached by preventive chemotherapy	N/A	75%	N/A
Morbidity due to foodborne trematode infections controlled in all endemic countries	N/A	100%	N/A

SOURCE: All data sourced from WHO unless otherwise indicated

Food-borne trematodiases

HIGHLY PRELIMINARY

WHO 2030 target

Impact indicator	2020 (Baseline)	2023	2025	2030
# countries with intensified control in hyperendemic areas	*NA*	*2*	*5*	*10*

Assessment of actions required to meet 2030 targets

No bottleneck towards target — Critical action required to reach target

Category	Current Assessment	Current status	Actions required
Technical progress			
Scientific understanding		▪ Good understanding of the parasites lifecycle	▪ Conduct eco-epidemiology studies including use of new technologies for field studies (drone mapping, environmental DNA, etc.) as tools for providing local information for education based practices ▪ Understand the mode of transmission and the process/pathway involved in the cause of disease
Diagnostics		▪ Clinical diagnosis or parasitological techniques (e.g. detection of eggs in stool) are usually used ▪ More sensitive serological techniques and molecular techniques (PCR) are at experimental stage	▪ Increase access to imaging diagnostics, which can be used in resource limited settings ▪ Evaluate and implement diagnostics developed in recent years in endemic regions ▪ Associate FBT with Tuberculosis programme in Paragonimiasis high-endemic areas for case detection
Effective intervention		▪ Preventive effective measures (PC + education+ sanitation) are known but rarely applied	▪ Develop detailed map of FBT distribution, promote the application of effective measures, evaluate the impact and disseminate the results
Strategy and service delivery			
Operational and normative guidance		▪ No manuals on public health approach to FBT control	▪ Develop guidance to FBT control
Planning and governance		▪ Evaluation of the number of individuals at risk in each endemic country is not available	▪ Estimate the number of individuals at risk by country
Monitoring & Evaluation		▪ Disease burden not well understood	▪ Accurate surveillance and mapping is urgent – particularly layered with information on the environmental factors involved in infection ▪ Produce reports on coverage of individuals at risk ▪ Report future reduction in liver cancers associated with control of these diseases
Supply and logistics		▪ Difficult to reach remote and marginalised communities ▪ Donations of triclabendazole are in place but only in 1 country	▪ Secure donations of praziquantel (number of tablets in need for FBT control should be estimated)
Healthcare infrastructure and workforce		▪ Poor knowledge of the disease among health staff	▪ Develop manual for public health intervention in high risk areas
Enablers			
Advocacy and funding		▪ No strong advocacy group able to voice a global vision on these diseases ▪ Limited to no funding for FBT	▪ Create and sustain advocacy group for FBT ▪ Secure funding to tackle critical actions required to reach 2030 targets
Collaboration and multisectoral action		▪ WHO promotes the inclusion of flukes among the targets of preventive chemotherapy interventions	▪ Focus on effort to rally action / mobilise across FBTs ▪ Excellent examples of multi-sectoral control of *O. virerrini* in Thailand can be used to prompt other countries to develop their own actions
Capacity building		▪ To be completed	▪ Training for health staff on FBT diagnosis and treatment

Additional risks that require mitigation

▪ No comments thus far

For more details, please visit:
www.who.int/trypanosomiasis_african/en/

HIGHLY PRELIMINARY

Human African trypanosomiasis (HAT)

Overview

Disease and epidemiology

- Caused by Trypanosoma brucei gambiense (gHAT; 98% of HAT cases) and rhodesiense (rHAT; 2% of HAT cases)
- gHAT causes chronic infection in two stages: in haemo-lymphatic stage, it causes bouts of fever, headaches, joint pains and itching; in neurological stage when the parasite crossed the blood-brain barrier, disturbance of sleep cycle, changes of behavior, confusion, sensory and motor disturbances take place
- rHAT causes an acute infection with similar symptoms which rapidly develops and invades the central nervous system
- Transmitted primarily by the bite from tsetse fly previously infected; other ways of transmission include mother-to-child.

Burden of disease

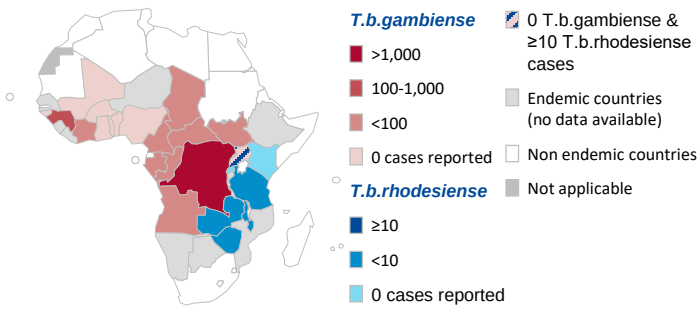
36
Endemic countries

57,000,000
People at risk[1]

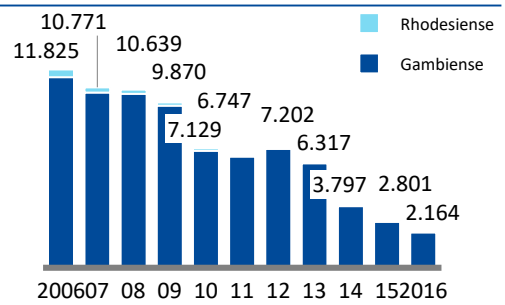
<1,000
People reported suffering in 2018

- HAT is endemic in sub-Saharan Africa,

Number of HAT cases in 2017 (T. b. gambiense)



Number of HAT cases 2006-2016



Strategic interventions

Preventive chemotherapy	N/A
WASH	N/A
Vector control	Reduction of tsetse flies by insecticide spraying, sterile insects release, baits and traps including impregnated screens
Veterinary public health	Treatment of animals (cattle, pigs), restricted application of insecticides
Case management	Control of disease is based on case detection and treatment Diagnosis includes screening with serological tests (in gHAT), parasite confirmation (in blood, lymph nodes or cerebrospinal fluid) and determining stage of progression by examining cerebrospinal fluid from lumbar puncture Medicines used for rHAT: suramin (haemo-lymphatic stage) and melarsoprol (neurological stage) Medicines used for gHAT: pentamidine (haemo-lymphatic stage) eflornithine and nifurtimox (neurological stage), fexinidazole (haemo-lymphatic and not severe neurological stage)
Other	Detection of cases is done by active (mobile units visiting villages in endemic areas and screening the whole population) or passive screening (clinical suspects attending to health facilities)

Selected efforts to overcome NTD

Total of USD ~38 million in global funding is dedicated to R&D for fighting HAT: ~20.5m general research, ~16m drugs, ~1m preventive vaccines, ~1.2m diagnostics, ~0.3m unspecified[2]
Contribution of many different countries, organizations and institutions is essential for the fight against HAT.

Progress against WHO 2020 targets

Impact indicator	2012	2020 target	Current status
Number of HAT cases declared (Global elimination of HAT as a public health problem)	7,211	< 2,000	<1,000

1 Franco, J. R. et al. (2018). Monitoring the elimination of human African trypanosomiasis: Update to 2016. PLoS neglected tropical diseases, 12(12), e0006890
2 G-Finder report 2018
SOURCE: All data sourced from WHO unless otherwise indicated

Target: Elimination of transmission

Human African trypanosomiasis (Gambiense; gHAT)

HIGHLY PRELIMINARY

WHO 2030 target

Impact indicator	2020 (provisional estimate)	2023	2025	2030
Number of gHAT cases declared	<1000	TBC	TBC	0 (100%)

Assessment of actions required to meet 2030 targets

No bottleneck towards target — Critical action required to reach target

Category	Current Assessment	Current status	Actions required
Technical progress			
Scientific understanding		▪ There are key gaps in the knowledge about transmission of the disease (e.g. latent infections in humans, role of animal reservoirs) ▪ Epidemiological situation is not well known in some geographical areas.	▪ Evaluate role of epidemiological elements (e.g. latent infections in humans, assessment of the role of the skin as a reservoir, understanding the role of animal reservoirs) ▪ Understand prevalence of infection in regions with low or limited surveillance
Diagnostics		▪ Screening tools available but imperfect. Current confirmation tools are cumbersome ▪ Lack of tools to assess absence of the disease ▪ Different initiatives (DiTECT, FIND, IRD, ITM…) are developing and evaluating new tools and protocols for screening and diagnosis ▪ Case-finding (active and passive) is the main activity for control and surveillance.	▪ Develop field-adapted diagnostic/detection tools (e.g. a simplified diagnostic that does not require confirmatory testing by microscopy) ▪ Ensure independent, multicenter evaluation of new tools
Effective intervention		▪ Current intervention are effective but need to be adapted to new epidemiological situations ▪ Tools for vector control have demonstrated utility in reducing disease transmission when strategically deployed and coordinated with medical intervention. ▪ Trials for new simpler medicines (e.g. acoziborole) are ongoing.	▪ Adapt interventions to a new epidemiological scenario of low and very low prevalence and integration in health system to ensure sustainability ▪ Develop safe and efficient single oral dose for both stages (e.g. acoziborole) to help integration of treatment into primary health system. Diagnostic algorithms with a lower specificity could be considered if safer treatments become available
Strategy and service delivery			
Operational and normative guidance		▪ There is a global strategy defined to achieve elimination ▪ Operational guidelines are defined for different settings	▪ Develop and adopt guidance for assessing elimination as interruption of transmission (how to measure HAT as truly eliminated.) ▪ Create guidance for targeting vector control activities
Planning and governance		▪ HAT control and surveillance is led by National Sleeping Sickness Control Programs with the support of WHO network for HAT elimination which coordinates stakeholders on HAT control and surveillance ▪ The ownership of the elimination process and targets by endemic countries is weak	▪ Reinforce ownership of the elimination process and targets by endemic countries through advocation to health authorities and heads of states (e.g. PATTEC) in a context of dropping cases ▪ Participate in efforts advocating for UHC. Efforts from countries are needed to integrate control and surveillance into strengthened national health systems
Monitoring & Evaluation		▪ HAT Atlas is a helpful tool for planning and monitoring control and elimination activities ▪ Global indicators and methods for validation of HAT elimination as PHP are available ▪ The verification of HAT elimination is not developed and tools are limited	▪ Use data distribution and case mapping tools to improve targeting of case-finding activities ▪ Better understand the coverage of the population screened to help focus on the population at risk (e.g. develop assessment methodology, transfer the process to country surveillance programmes) ▪ Secure financial and technical support for validation and verification ▪ Develop high-throughput test to assess elimination and post-elimination surveillance on samples in a reference laboratory
Supply and logistics		▪ Access to treatment is 100% ensured by donation of manufacturers and distribution is ensured by WHO. ▪ Access to screening and diagnosis is not ensured and distribution of diagnostic tools is not systematic	▪ Ensure availability and access of HAT diagnostic tools through involvement of manufacturers and securing donations
Healthcare infrastructure and workforce		▪ Decrease of HAT-skilled staff and decrease in prevalence makes it difficult to gain experience ▪ Challenging integration of control and surveillance activities in a weak health system	▪ Develop national plans for staff training, awareness and motivation within the national health systems ▪ Integrate HAT control and surveillance activities into health systems where health systems are strengthened (including peripheral)
Enablers			
Advocacy and funding		▪ Important funding (Belgian Government, Sanofi, Bayer and BMGF) is guaranteed for next 2-5 years but extension for long term support is required	▪ Maintain current support to ensure the sustainability of the current gains (e.g. lobbying to avoid donor fatigue) ▪ Develop a long term funding plan, including a campaign to mobilize resources to meet needs
Collaboration and multisectoral action		▪ The WHO network for HAT elimination provides a framework in which activities conducted by its members are coordinated, facilitating HAT control and surveillance ▪ Interface with animal trypanosomiasis (One Health approach trough the PAAT initiative. ▪ Collaboration with some other NTD programmes (e.g. leprosy, guinea worm for case finding)	▪ Enhance cross-border collaboration for elimination of transboundary foci ▪ WHO coordination of countries and other stakeholders must be ensured to maximize synergies. ▪ Establish collaboration with malaria programme on diagnosis
Capacity building		▪ International Course on African Trypanosomiasis (ICAT) covers key aspects to underpin the capacity of the programmes. ▪ Efforts of multiple partners (IRD, ITM, FIND, DNDI, MakUniv,...) in coordination with SSNCP	▪ Capacity-building e.g. cascade training/retraining for treatment services ▪ Develop training to transition HAT expertise from specialized HAT programs into national health systems.

Additional risks that require mitigation

- **Inability to screen and treat due to conflict and political instability in the most affected country**
- **Lack of integration of activities into a weak health system**
- **Asymptomatic infections and animal reservoirs** as elimination is approached could lead to resurgence
- **Reduction in surveillance once zero cases are reported locally**, or cessation of activities in low prevalence settings

Human African trypanosomiasis (Rhodesiense; rHAT)

HIGHLY PRELIMINARY

WHO 2030 target

Impact indicator	2020 (provisional estimate)	2023	2025	2030
Areas with > 1 HAT case per 10 000 people per year (average of 5 years)	10 000 sq km	TBC	TBC	0 (100%)

Assessment of actions required to meet 2030 targets

No bottleneck towards target — Critical action required to reach target

Category	Current Assessment	Current status	Actions required
Technical progress			
Scientific understanding		▪ A zoonotic disease in which wildlife and domestic animals are the main reservoirs and play a central role in transmission to humans. ▪ There are grey geographical areas were the epidemiological situation is not well known. ▪ No serological screening tools, and highly toxic medicines available. A clinical trial for fexinidazole is ongoing	▪ Understand prevalence of infection in regions with low or limited surveillance.
Diagnostics		▪ No serological tests available and no research going on ▪ The spread of use of RDT for malaria has decreased the use of blood smear diagnostic technique required for rHAT	▪ Develop a new field-adapted tools to detect rHAT (e.g. RDT) to use in primary healthcare facilities (screening or diagnostic) ▪ Include blood microscopy into clinical and laboratory algorithms
Effective intervention		▪ The main interventions are vector and animal reservoirs control (e.g. treatment of animals, insecticide application in cattle) ▪ Early case detection and treatment reduces the impact of the disease in humans ▪ Available treatment is toxic. Trials for new simpler medicines (e.g. fexinidazole) are ongoing.	▪ Reinforce human case detection activities ▪ Integrate treatment into health system to ensure sustainability ▪ Develop safe and efficient treatments (e.g. fexinidazole, acoziborole) replacing arsenic based treatments (melarsoprol) ▪ Develop strategies on One health approach to reduce trans-mission from animals (livestock and wild animals) to humans
Strategy and service delivery			
Operational and normative guidance		▪ There is a control global strategy in place	▪ Develop guidelines to ensure good use of vector control tools tailored to different environments as needed ▪ A multi-sector approach should be developed
Planning and governance		▪ HAT control and surveillance is led by National Sleeping Sickness Control Programs; the WHO network for HAT elimination coordinates stakeholders on HAT control and surveillance ▪ The ownership of the elimination as PHP process by endemic countries is weak	▪ Reinforce ownership of the elimination process and targets by endemic countries ▪ Contribute to efforts advocating for UHC, strengthening peripheral health systems (leadership from countries is needed) ▪ Integrate control and surveillance into national health systems
Monitoring & Evaluation		▪ HAT Atlas is a helpful tool for planning and monitoring control and elimination activities. ▪ Global indicators and methods for validation of rHAT elimination as PHP are available. ▪ Under-detection remains a concern	▪ Use data distribution and case mapping tools to improve targeting of case finding activities ▪ Secure financial and technical support for validation process ▪ Reinforce surveillance through setting up sentinel surveillance sites with trained staff and equipment
Supply and logistics		▪ Access to treatment is 100% ensured by donation of manufacturers and distribution by WHO	▪ No bottleneck towards the target
Healthcare infrastructure and workforce		▪ Decrease of HAT-skilled staff and prevalence makes it difficult to gain experience ▪ Challenging integration of control and surveillance activities in a weak health system ▪ Widespread use of malaria RDTs reduces possibilities of microscopy for rHAT	▪ Develop national plans for staff training, awareness and motivation within the national health systems ▪ Integrate HAT control and surveillance activities into health systems where health systems are strengthened (including peripheral)
Enablers			
Advocacy and funding		▪ Considering low prevalence, there is a significant funding gap for control and research activities.	▪ Develop a long term funding plan, including a campaign to mobilize resources to meet needs. ▪ Advocate for external donors and national appropriation
Collaboration and multisectoral action		▪ The WHO network for HAT elimination provides a framework in which activities conducted by its members are coordinated, facilitating rHAT control and surveillance	▪ Build an inter-sector body to address trypanosomiasis ▪ Enhance cross-border collaboration for elimination of transboundary foci ▪ Coordinate vector control and animal trypanosomiasis management across countries, stakeholders and other sectors (e.g. tourism, wildlife) through multisectoral national bodies to maximize synergies ▪ Coordinate with malaria program to use microscopy in some cases
Capacity building		▪ International Course on African Trypanosomiasis (ICAT) covers key aspects to underpin the capacity of the programs. ▪ Efforts to maintain diagnostic and treatment capacities supported by WHO and SSNCP, (and DNDi in Malawi and Uganda),	▪ Reinforce capacity-building including training to transition HAT expertise from specialized HAT programs into national health systems. ▪ Develop guide materials and manuals for improvement of patient management in endemic areas

Additional risks that require mitigation

- **Challenged with integration of activities in a weak health system**
- **Cessation of activities in low prevalence settings**

For more details, please visit:
www.who.int/leishmaniasis/visceral_leishmaniasis/en/

Leishmaniasis – visceral (VL)

HIGHLY PRELIMINARY

Overview

Disease and epidemiology

- Caused by protozoan *Leishmania* parasite which is transmitted by the bite of female phlebotomine sandflies; only 10-25%, of those infected by the *Leishmania* parasite will develop the disease
- Causes irregular bouts of fever, weight loss, enlargement of the spleen and liver, and anaemia; if left untreated, VL is fatal in over 95% of cases
- Post-kala-azar dermal leishmaniasis (PKDL) is a sequel of VL where 5–10% of patients develop a rash up to 2-3 years after VL was treated; people with PKDL are considered a potential source of VL infection
- Associated with malnutrition, population displacement, poor housing, a weak immune system and lack of financial resources

Burden of disease

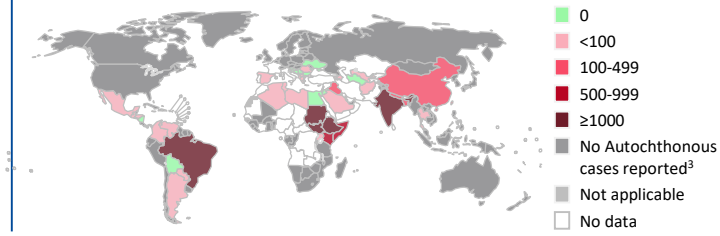
~22,270
New VL cases reported in 2017

~510,000
deaths reported among VL patients in seven countries[1] in 2017

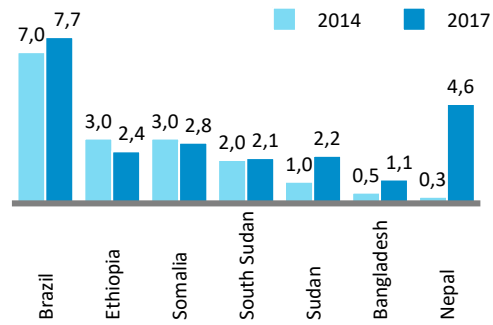
~570
DALYs, 2017[2]

- 75 countries are endemic for VL (2016)
- In 2017, more than 95% of new reported cases occurred in 10 countries: Bangladesh, Brazil, China, Ethiopia, India, Kenya, Nepal, Somalia, South Sudan, and Sudan

Number of new VL cases reported in 2017



Case fatality rate, percent



Strategic interventions

Preventive chemotherapy	N/A
WASH	N/A
Vector control	Insecticide spraying, insecticide-treated nets, and environmental management
Veterinary public health	N/A
Case management	The treatment of leishmaniasis depends on several factors including type of disease, concomitant pathologies, parasite species and geographic location. Medicines include pentavalent antimonials, amphotericin B, paromomycin, among others
Other	Early diagnosis (rapid diagnostic tests combined with clinical signs) and prompt treatment

Selected efforts to overcome NTD

- ~USD 44 million in global funding is dedicated to R&D for eliminating all types of leishmaniasis: ~USD 17m for general research, ~USD 14 million for drug development, ~USD 13 million for other areas (e.g. development of preventive vaccines and diagnostics)4
- The contribution of many different organizations and countries is essential for the fight against leishmaniasis. Organizations active in fighting VL at the global level include MSF, DNDi ,FIND, Gilead Sciences, Sanofi, and the Probitas Foundation

Progress against WHO 2020 targets

Impact indicator	2012	2020 target	Current status
Percentage of districts/sub-districts on Indian subcontinent (Nepal, Bangladesh and India) reported as having reached the elimination as PHP threshold (<1 case/10,000 pop)	Bangladesh 88%, India 54%, Nepal 100%	100%	Bangladesh 100%, India 92%, Nepal 100%
Number of countries validated as having eliminated VL (as a PHP)	0	Bangladesh, India and Nepal	Further validation action required

1 Bangladesh, Brazil, Ethiopia, Nepal, Somalia, South Sudan and Sudan 2 IHME Global Burden of Disease 3 Also referred to as non-endemic country 4 G-Finder report 2018 5
Assessment of endemicity in some districts in Nepal and sub-districts in Bangladesh has to be carried out; relapses and HIV-VL patients are not regularly included in the denominator in India which deflates the prevalence in India compared to other countries
SOURCE: All data sourced from WHO unless otherwise indicated

Leishmaniasis – visceral (VL)

HIGHLY PRELIMINARY

WHO 2030 target

Impact indicator	2017 (Baseline)	2023	2025	2030
# of endemic countries achieving target case fatality rate (3% for New World, 0% for Old World) due to primary VL1	0/75 (0%)	38/75 (50%)	56/75 (75%)	75/75 (100%)

1 New World regions include Americas. Old World regions include Europe, Western Pacific, Eastern Mediterranean, Africa, South-East Asia

Assessment of actions required to meet 2030 targets

Summary of key actions to achieve targets

The most devastating consequence of visceral leishmaniasis is death. There are currently patients dying who could be saved if early diagnosis and prompt treatment would be implemented. VL is a complex disease which manifests differently in various geographies and thus the response may need to be adapted to local context. Nevertheless, there are three key areas to be addressed:

- Early detection is essential in order to ensure prompt treatment, through, for example, active case detection
- Endemic areas have to remain well-supplied due to the epidemic nature of VL
- More user friendly treatment is needed, especially for East Africa

No bottleneck towards target — Critical action required to reach target

Category	Current Assessment	Current status	Actions required
Technical progress			
Scientific understanding		▪ Factors linked to a fatal prognosis have been described in some settings	▪ Improve understanding of parasitic and patient factors linked to a fatal prognosis ▪ Deepen understanding of the vector lifecycle for more effective vector control
Diagnostics		▪ A second line serological test (DAT) available in case rapid tests show a negative result in a VL suspected patient ▪ Time between onset of symptoms and treatment is too long -in most cases up to 3-6 months ▪ Sensitivity of diagnostic rapid tests differs in different areas	▪ Develop more sensitive rapid diagnostic tests for VL in East Africa ▪ Reduce time elapsed between onset of symptoms and treatment by ensuring prompt diagnosis and early treatment (e.g. through conducting active case finding - fever camps)
Effective intervention		▪ Effective treatment is available but costly, access is challenging and requires specific skills to be administered ▪ In addition to the antileishmanial medicines, some patients require blood transfusion, antibiotics and/or therapy against severe malnutrition ▪ Complex treatment for immunosuppressed patients (e.g. HIV, cancer, elderly) ▪ Rising resistance in South-East Asia (only one drug effective as 1st line treatment; 2 drugs not effective anymore)	▪ Develop a preventive vaccine ▪ Develop new, cheaper oral drugs, not requiring cold chain ▪ Assess shorter regimen for first line treatment in East Africa ▪ Pursue further research on combination therapies to increase the number of treatment options
Strategy and service delivery			
Operational and normative guidance		▪ Guidelines for case management are in place ▪ Guidelines for disease surveillance and vector control are planned to be published in 2019	▪ No bottleneck towards target
Planning and governance		▪ National guidelines for VL control are in place	▪ Fully implement diagnostic and treatment algorithms in the field level
Monitoring & Evaluation		▪ Some countries do not have a single national electronic patient-based database to allow effective M&E ▪ Insecticide Residual Spraying (IRS) activities are not conducted according to international quality standards in many instances	▪ Establish an electronic national databases with patient-based data for analysis ▪ Implement independent M&E of IRS to ensure quality and measure impact
Supply and logistics		▪ Some countries do not report regularly and on time on medical supplies consumption which causes stocks out sometimes ▪ Some countries do not use WHO quality-assured medicines	▪ Develop reporting system on monthly basis for stocks at health facility level to anticipate and avoid stocks out ▪ Ensure WHO quality-assured medical supplies closely accessible to population at risk and patients
Healthcare infrastructure and workforce		▪ There is shortage of properly trained health personnel in several high endemic areas.	▪ Maintain awareness within health systems and community to ensure detection and treatment of cases
Enablers			
Advocacy and funding		▪ Key interventions such as provision of medical supplies or M&E are fully dependent on external donors in several countries	▪ Increase domestic funding to procure quality-assured medical supplies for diagnosis and treatment
Collaboration and multisectoral action		▪ Regular coordination meetings in-country and regionally occur although there is need for better dissemination of the minutes of those meetings to all stakeholders ▪ Cross-border meetings are not held	▪ Establish regular coordination mechanism in-country, regional and cross-border with dissemination of minutes to all stakeholders
Capacity building		▪ Although capacity building is done regularly, high turnover of staff causes gaps in training and some personnel is assigned to tasks without specific training	▪ Train community health workers and national health personnel for timely and adequate diagnosis and treatment ▪ Train newly deployed health personnel upon arrival to an endemic area on diagnosis and treatment of VL

Additional risks that require mitigation

- Outbreaks may overwhelm the capacity of existing health infrastructure/workforce
- Single manufacturers of medicines which are difficult to produce at the required quantity and quality
- Limited availability of treatments for concomitant diseases (e.g. anemia, malnutrition, co-infections) may increase case fatality rate

1 Defined as an immunocompetent patient with no other concomitant condition which is not the result of VL (e.g. transplantation, HIV, cancer, immunosuppressive medicines, diabetes, renal failure, etc.)

For more details, please visit:
www.who.int/leishmaniasis/cutaneous_leishmaniasis/en/

Leishmaniasis – cutaneous (CL)

HIGHLY PRELIMINARY

Overview

Disease and epidemiology

- Caused by the protozoan Leishmania parasite which is transmitted by the bite of female phlebotomine sandflies; only 10-25% of those infected by the Leishmania parasite will develop the disease
- Causes skin lesions (mostly ulcers), leaving life-long scars and serious disability and stigma
- Associated with malnutrition, population displacement, poor housing, a weak immune system and lack of financial resources

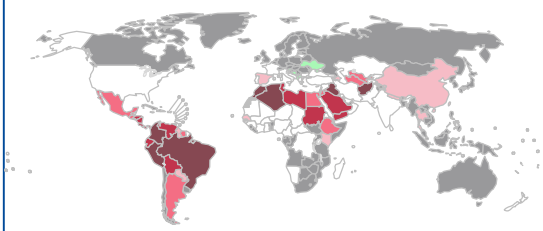
Burden of disease

~143,000
New CL cases reported in 2017

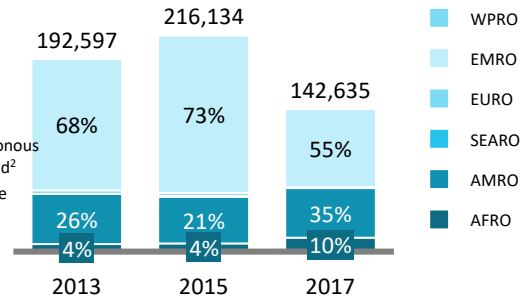
~260,000
DALYs, 2017[1]

- 87 countries are endemic for CL (2016)
- In 2017 over 95% of new reported CL cases occurred in six countries: Afghanistan, Algeria, Brazil, Colombia, Iran (Islamic Republic of), Iraq and the Syrian Arab Republic

Number of new CL cases reported in 2017



Number of new CL cases reported by WHO region in 2017



Strategic interventions

Preventive chemotherapy	N/A
WASH	N/A
Vector control	Insecticide spraying, insecticide-treated nets, and environmental management
Veterinary public health	N/A
Case management	The treatment of leishmaniasis depends on several factors including type of disease, concomitant pathologies, parasite species and geographic location. Medicines include pentavalent antimonials, amphotericin B, and others
Other	Early diagnosis and prompt treatment are important

Selected efforts to overcome NTD

- ~USD 44 million in global funding is dedicated to R&D for eliminating all types of leishmaniasis: ~USD17m for general research, ~USD 14 million for drug development, ~USD 13 million for other areas (e.g. development of preventive vaccines and diagnostics)3
- The contribution of many different organizations and countries is essential for the fight against leishmaniasis. Organizations active in fighting VL at the global level include MSF, DNDi, FIND, Gilead Sciences, Sanofi, and the Probitas Foundation

Progress against WHO 2020 targets

Impact indicator	2012	2020 target	Current status
Percentage of cases detected in the Eastern Mediterranean Region	Unknown	70%	Estimated ~20%
Proportion of all detected cases treated/managed according to guidelines	20%	≥ 90%	Unknown

1 IHME Global Burden of Disease 2 Also referred to as non-endemic country 3 G-Finder report 2018
SOURCE: All data sourced from WHO unless otherwise indicated

HIGHLY PRELIMINARY

Leishmaniasis – cutaneous (CL)

WHO 2030 target

Impact indicator	2018 (Baseline)	2023	2025	2030
# of CL endemic countries having reached 85% of all cases detected[1] are reported and 95% of reported cases were treated	unknown	44/87 (50%)	66/87 (75%)	87/87 (100)

1: Detected through active case search and/or strengthened passive surveillance

Assessment of actions required to meet 2030 targets

Summary of key actions to achieve targets

The precise burden of CL remains to be calculated. The treatment is complex. The key actions towards controlling the disease include:

- Develop and scale up easy-to-administer oral/topical treatment which could be used at a health centre level
- Improve the affordability and sensitivity of rapid diagnostic test for easy detection of cases
- Understand the burden of the disease through improving surveillance and establishing a patient database to ensure effective monitoring of the impact of the control interventions

No bottleneck towards target — Critical action required to reach target

Category	Current Assessment	Current status	Actions required
Technical progress			
Scientific understanding		▪ Incomplete understanding of barriers and factors linked to low diagnosis, treatment and reporting rates	▪ Identify challenges to improving diagnosis, treatment and/or reporting rates through research ▪ Improve understanding of the vector lifecycle for more effective vector control
Diagnostics		▪ Current diagnosis based on parasitological tests and/or clinical features lacks adequate sensitivity in several endemic areas and laboratory diagnosis is not always available	▪ Develop affordable and more sensitive rapid diagnostic tests at species level which can be used at the health centre and community level (especially important in foci where several *Leishmania* species co-exist)
Effective intervention		▪ CL is mainly treated with pentavalent antimonials, difficult to obtain and to administer, including painful injections for patients. ▪ Better therapies, such as cryotherapy or thermotherapy are rarely implemented in highly endemic areas due to high price	▪ Develop oral/topical treatment that can be used at the health centre and community level is needed ▪ Include care for all skin NTDs in an integrated approach regardless of the specific causative agent ▪ Develop a preventive vaccine
Strategy and service delivery			
Operational and normative guidance		▪ Guidelines for case management are in place ▪ Guidelines for disease surveillance and vector control are planned to be published in 2019	▪ No bottleneck towards target
Planning and governance		▪ National guidelines for case management of CL are in place	▪ Distribute national guidelines at the local level to ensure implementation ▪ Reduce time elapsed between onset of symptoms and treatment by implementing activities aimed at early diagnosis and prompt treatment
Monitoring & Evaluation		▪ Most countries use aggregate data which does not allow for in-depth analysis or struggle to accurately report ▪ Most countries lack comprehensive databases including disease and vector surveillance and control interventions data	▪ Establish electronic national databases with patient-based data for analysis, including vector surveillance and control interventions data ▪ Ensure cutaneous leishmaniasis is made notifiable and decouple roles dedicated to managing cases and reporting
Supply and logistics		▪ Several high burden countries lack the necessary medicines or physical treatment options for case management	▪ Ensure availability of medicines and/or physical treatment for case management (procured or donated) in all countries ▪ Improve access to diagnosis and treatment for rural populations
Healthcare infrastructure and workforce		▪ There is shortage of properly trained health personnel in several high endemic areas. ▪ High turn over of health personnel poses a challenge to consistently have trained personnel	▪ Maintain awareness within health systems and community to ensure detection and treatment of cases
Enablers			
Advocacy and funding		▪ Key interventions such as provision of medical supplies or M&E are fully dependent on external donors in several countries	▪ Increase domestic funding to procure quality-assured medicines
Collaboration and multisectoral action		▪ Regular coordination meetings in-country and regional occur although there is need to better dissemination the minutes of those meetings with all stakeholders ▪ Cross-border meetings not held	▪ Develop regular coordination mechanism in-country, regional and cross-border with dissemination of minutes to all stakeholders
Capacity building		▪ Although capacity building is done regularly, the high turn over causes some gaps and some personnel is assigned to tasks without being specifically trained for	▪ Train community health workers and national health personnel for timely and adequate diagnosis and treatment

Additional risks that require mitigation

- In the absence of a topical, not painful treatment it is very challenging to get patients with minor lesions willing to get diagnosed/treated
- Getting medical supplies/devices to treat some 150,000 new cases per year will cost some USD 7-8 million. Until now domestic funding or external donors have not committed that level of financial support

Lymphatic filariasis (elephantiasis)

For more details, please visit:
www.who.int/lymphatic_filariasis/disease/en/

HIGHLY PRELIMINARY

Overview

Disease and epidemiology

- Caused by infection with the filarial parasites *Wuchereria bancrofti, Brugia malayi, Brugia timori*
- Transmitted by mosquito species from genera *Aedes*, *Anopheles*, *Culex*, *Mansonia*
- Causes morbidity due to damage by adult parasite nests in the lymphatic vessels and microfilaria released in the blood
- Impaired lymphatic function leads to chronic, overt manifestations of lymphedema and hydrocele as well as acute episodes of adenolymphangitis
- Persons with physical impairment due to LF live with physical disability and are often socially excluded

Burden of disease

~50 million
People infected with LF 2017[1]

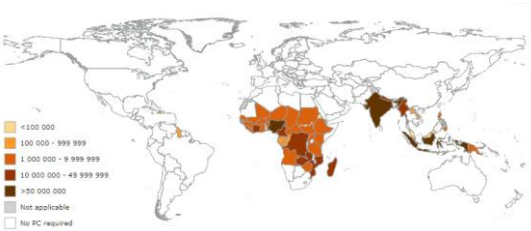
~890 million
People living in endemic areas requiring mass drug administration 2017[2]

~1.2 million
DALYs, 2016[3]

- Lymphatic filariasis is endemic in 72 countries across Africa, the Americas, Eastern Mediterranean, South-East Asia and the Western Pacific region

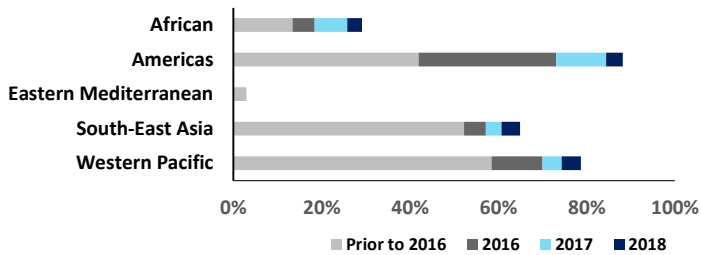
Current status

Population requiring MDA in 2017



Progress in scaling down

Proportion of known endemic implementation units (IUs) that have completed transmission assessment surveys (TAS) and no longer require MDA



Strategic interventions

Preventive chemotherapy
- Mass drug administration to stop the spread of infection using recommended regimens of ivermectin, diethylcarbamazine, and albendazole (in different combinations depending on co-endemicity with loiasis and onchocerciasis)

WASH
- Hygiene of affected limbs is essential for LF morbidity management
- Sanitation improvements can reduce vector breeding habitats

Vector control
- Vector control to supplement MDA depends on parasite-vector species and local ecology, e.g. the use of insecticide-treated nets in areas where *Anopheles* is the primary vector for filariasis

Veterinary public health
- Efforts to prevent transmission of *Brugia malayi* among animals and humans

Case management
- Surgery cures hydrocele
- Skin care, exercises and elevation prevent severity and progression of lymphedema
- Treating acute attacks
- Doses of albendazole with diethylcarbamazine and/or ivermectin to treat infected persons

Selected efforts to overcome NTD

- WHO launched the Global Programme to Eliminate Lymphatic Filariasis (GPELF) in 2000 which represents the aggregate effort of all individual stakeholders towards LF elimination. Advocacy and fundraising is supported by The Global Alliance to Eliminate Lymphatic Filariasis (a public-private partnership of over 150 partners committed to supporting GPELF).
- Currently, USD ~15 million in funding is dedicated to R&D for fighting LF: ~5m general research, ~6m drugs, ~4m unspecified

Progress against WHO 2020 targets

Impact indicator	2012	2020 target	Current status
Global elimination as a public health problem (% endemic countries)	3%	100%	23%

1 IWER 9344HME Global Burden of Disease
2 WHO Global Health Estimates

Lymphatic filariasis (elephantiasis)

HIGHLY PRELIMINARY

WHO 2030 target

Impact indicator	2020 (provisional estimate)	2023	2025	2030
# countries that meet WHO criteria for validation of elimination as a public health problem	***19***	**23**	**34**	**58 (81%)**
# countries implementing post-MDA or post-validation surveillance	*26*	37	40	72 (100%)
Population requiring MDA	*TBC*	330mn	180mn	0

Assessment of actions required to meet 2030 targets

No bottleneck towards target — Critical action required to reach target

Category	Current Assessment	Current status	Actions required
Technical progress			
Scientific understanding		▪ Good understanding of transmission and parasite lifecycle ▪ Uncertainty of the impact of zoonotic *B. malayi* on efforts to interrupt transmission	▪ Continued research around correlation of biological markers of infection and exposure with transmission interruption
Diagnostics		▪ Diagnostic tests are available for recommended M&E ▪ *Loa loa* infection can create a false positive result of the recommended LF antigen test.	▪ Develop diagnostic test which is not cross-reactive with *L. loa* ▪ Improve reliability of the Alere Filariasis Test Strip (FTS) and the Brugia Rapid point-of-care cassette test (BRT) ▪ Ensure reporting of issues with diagnostic tests for quality monitoring
Effective intervention		▪ Multiple rounds of annual MDA are effective at reducing infection prevalence below target thresholds with high coverage ▪ The new, triple-therapy regimen of ivermectin, DEC and albendazole is more effective at clearing mf for longer periods of time than two-drug regimens ▪ Surgery cures hydrocele ▪ Management of lymphedema reduces acute attacks	▪ Start MDA in all endemic districts and sustain high coverage ▪ Implement IDA and other alternative MDA regimens where warranted ▪ Ensure accessible and inclusive care for lymphademia as part of the package (setting a target for effective "affected people" platform/ IU and stigma/mental wellbeing) to ensure more holistic NTD programming and better health outcomes
Strategy and service delivery			
Operational and normative guidance		▪ Guidelines are available for MDA, M&E, and morbidity management ▪ Specific guidance for post-validation surveillance is needed ▪ Criteria for elimination of transmission are not defined	▪ Update Aide Memoire with new targets, indicators and link to UHC ▪ Specify the minimum standards for post-validation surveillance and how to set up and maintain activities ▪ Define criteria to achieve verification of interruption of LF transmission ▪ Develop policies and strategies for treatment specific to urban settings
Planning and governance		▪ Lack of prioritization	▪ Countries to develop or update national NTD strategic plan including potential changes with alternative MDA strategies and focus on UHC ▪ Ensure robust post-validation activities to avoid risk of countries closing programmes after validation by WHO
Monitoring & Evaluation		▪ Lack of resources for M&E implementation ▪ Identification of focal, residual infection can be challenging ▪ Limited areas where endemicity was not determined when programmes started ▪ Health workers and/or programme managers at different levels may be incentivized to report inflated coverage figures	▪ Map areas with uncertain occurrence of the disease to determine need for MDA ▪ Identify epidemiological settings where current thresholds for stop MDA surveys may not be sufficient, define new thresholds and develop survey methodology ▪ Determine the combination of indicators to best evaluate impact of IDA ▪ Develop clearer guidance on the standard of surveillance and interventions that need to be sustained post-MDA ▪ Establish integrated surveillance platforms ▪ Develop alternative M&E strategy for new MDA regimens
Supply and logistics		▪ Remote, rural areas and islands are difficult to reach ▪ Inconsistent delivery of MDA and impact surveys in some countries	▪ Improve planning, request sufficient medicines and diagnostic tests well in advance of programme activities ▪ Make contingency plans for failed impact assessments or emergencies
Healthcare infrastructure and workforce		▪ Limited capacity within Primary Health Care to deliver the minimum package of care for morbidity management	▪ Include LF morbidity management modules in health workforce training curriculums ▪ Include LF interventions in essential UHC packages
Enablers			
Advocacy and funding		▪ Limited prioritisation and resourcing for LF MDA in some countries	▪ Advocate the success and cost effectiveness of LF interventions to facilitate government support and mobilize resources
Collaboration and multisectoral action		▪ Limited collaboration and coordination with: — Environmental sector and vector control — Primary Health Care system — Deworming and onchocerciasis elimination programmes	▪ Integrate vector management and surveillance (where feasible) through the Global Vector Control Response to supplement MDA ▪ Strengthen integrated management of skin NTDs ▪ Create link with Global Surgery Initiatives to ensure availability of surgery in IUs with known hydrocele burden, and with Social services, rehabilitation and mental health to build capacity for assessment and referral for psychosocial support ▪ Coordinate with STH and onchocerciasis programmes for evidence based planning when IUs implement TAS and stop MDA ▪ Expand local partnerships to sustain morbidity management and surveillance post-validation
Capacity building		▪ Lack of technical and operational capacity in some countries	▪ Build capacity for quality pre-TAS and TAS implementation ▪ Increase awareness and reduce stigma associated with LF in the community ▪ Disseminate existing morbidity management and disability prevention toolkit tools (situation analysis, patient estimation methods, DIP, MMDP modules) ▪ Build capacity in social mobilization, microplanning, and supervision

Additional risks that require mitigation

- Risk of countries shutting down their programs when validated by WHO and potential for resurgence of the disease without robust post-validation activities in place
- Systematic non-adherence could impact effective coverage and MDA programme success

Mycetoma, Chromoblastomycosis & other deep mycoses

Mycetoma

HIGHLY PRELIMINARY

Overview

Disease and epidemiology

- Caused by several microorganisms of bacterial or fungal origin, and based on its causative agent is classified as actinomycetoma (bacterial mycetoma) or eumycetoma (fungal mycetoma).
- Causes chronic infection of skin and subcutaneous tissues characterized by large deformities, disabilities, and is associated with severe morbidity and increased mortality. It affects the skin, connective tissue, muscle and bone
- The mode of transmission is currently not well understood

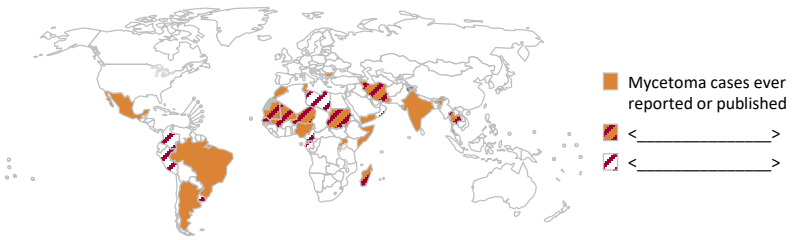
Burden of disease

840 cases

Reported in a WHO survey in 2016. This most likely underestimates the actual burden

- The causative organisms are distributed worldwide but are endemic in tropical and subtropical areas in the 'Mycetoma belt' which includes the Bolivarian Republic of Venezuela, Chad, Ethiopia, India, Mauritania, Mexico, Senegal, Somalia, Sudan and Yemen.

Number of reported Mycetoma cases by the systematic review 2013 and WHO Survey 2014 – 2016



Strategic interventions

Preventive chemotherapy	N/A
WASH	▪ Personal hygiene
Vector control	N/A
Veterinary public health	▪ Keeping domestic animals far from human dwellings has been shown to reduce risk of mycetoma

Case management	▪ Treatment depends on the causative organisms:
	  ▪ bacterial - long term antibiotics combination
	  ▪ fungal - combined antifungals (mainly itraconazole) and surgery
	▪ Wound care

Other	▪ Protective clothes and shoes

Selected efforts to overcome NTD

- The WHO has supported efforts through burden assessment, organization of consultative meetings to identify priority areas, and through support of international trainings to build national capacities in selected countries
- The Mycetoma Research Center in Khartoum (a WHO collaborating center) is a lead on the research and control efforts against mycetoma. Other organization and partners are also involved mainly in research
- An informal global working group on mycetoma coordinated by CDC Atlanta is facilitating a forum to address various aspects of the disease.

Progress against WHO 2020 targets

Impact indicator	2012	2020 target	Current status
N/A	N/A	N/A	N/A

SOURCE: All data sourced from WHO unless otherwise indicated

Mycetoma, Chromoblastomycosis & other deep mycoses

HIGHLY PRELIMINARY

Mycetoma

WHO 2030 target

Impact indicator	2018 (Baseline)	2023	2025	2030
Number of countries where mycetoma is included in national control programs and surveillance system	1	4	8	15

Assessment of actions required to meet 2030 targets

No bottleneck towards target — Critical action required to reach target

Category	Assessment	Current status	Actions required
Technical progress			
Scientific understanding		• The mechanism of transmission of mycetoma to be fully understood which limits the development of a sound preventive strategy.	• Understand transmission pathways
Diagnostics		• The diagnosis is largely based on clinical presentation • Causative organisms are identified through direct examination, microscopy or culture of the grains, or through PCR of biopsies.	• Develop diagnostic test (preferably point-of-care)
Effective intervention		• Health promotion to increase use of protective clothes and wearing of shoes is ongoing • Separation of animals from human dwellings decreases incidence • Current treatment is either antibiotics, antifungals or a combination delivered for several months.	• Improve dwellings and living conditions • Develop better treatment (shorter duration and high efficacy)
Strategy and service delivery			
Operational and normative guidance		• No global guidance on case management, surveillance, prevention and control	• Develop global and national guidance on case management, surveillance, prevention and control
Planning and governance		• Only Sudan has a national control plan	• Include mycetoma in their strategic plans against NTDs or develop specific plans in endemic countries
Monitoring & Evaluation		• No surveillance protocol or system, no standard indicators • No M&E system	• Develop guidance on surveillance with standard indicators • Establish M&E system or integrate data collection with national health information system
Supply and logistics		• No donation of medicines • Countries procure and manage their supply system	• Secure donations of medicines or significantly reduced prices
Healthcare infrastructure and workforce		• Health systems are not prepared to provide control services or run control programmes	• To be confirmed
Enablers			
Advocacy and funding		• Partners and various mycetoma research institutions are exerting maximum efforts to bring attention to mycetoma • Some partner and government engagement, however, increase is needed	• Ensure and sustain political commitment from endemic countries and partners to mobilize funds and human resources • Increase commitment for drug donation or reduced price • Engage and mobilize community to support programme implementation
Collaboration and multisectoral action		• Collaboration with various research institutes, drugs and diagnostics developers initiated	• Establish collaboration with various research institutions, drugs and diagnostics developers, manufacturers and donors required
Capacity building		• Continuing integration across skin NTDs • Peripheral health workers in many areas may not be able to recognize mycetoma early • In many endemic countries the majority of health workers lack the required knowledge and skill to manage cases	• Train health workers and community health workers across skin NTDs to improve early detection • Improve the diagnostic and managing capacities of health care system in the endemic regions of the countries

Additional risks that require mitigation

For more details, please visit:
https://www.who.int/onchocerciasis/en/

HIGHLY PRELIMINARY

Onchocerciasis (river blindness)

Overview

Disease and epidemiology

- River blindness is caused by the parasitic worm Onchocerca volvulus
- Causes severe itching, disfiguring skin conditions and visual impairment, including permanent blindness
- Transmitted to humans through repeated bites of infective Simulium blackflies which breed mostly along fast-flowing water
- By 2017, 1.8 million people no longer required treatment (post-treatment surveillance completed) and 4 countries have been verified by WHO as having eliminated transmission

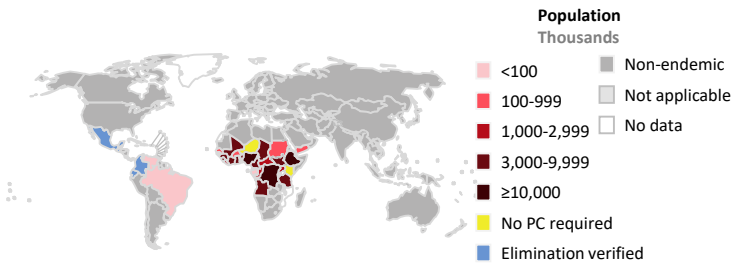
Burden of disease

~21 million
Existing cases estimated in 2017[1]

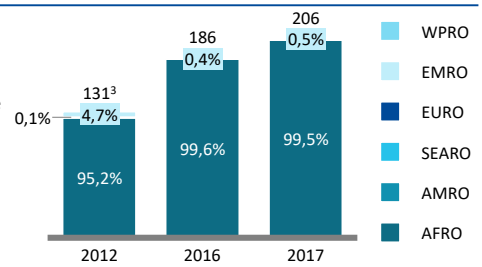
~1.3 million
Population at risk in 2017

205 million
DALYs lost, 2017[2]

Population at risk in 2017



Population at risk worldwide in millions



Strategic interventions

Preventive chemotherapy	Once to twice yearly community-based mass drug administration of ivermectin with adequate coverage for 10 or more years
WASH	N/A
Vector control	Environmentally safe insecticide spraying of blackflies
Veterinary public health	N/A
Case management	Ivermectin treatment
Other	Where Loa coexists, systems to manage severe adverse events have to be in place

Selected efforts to overcome NTD

- Total of USD 12 million in global funding dedicated to R&D for eliminating Onchocerciasis: ~1m general research, ~9m new drugs, ~1m preventive vaccines, ~1m diagnostics[4]
- Contribution of many different countries, organizations and institutions is essential for the fight against onchocerciasis. Some of these organizations include: Onchocerciasis Control Programme (closed), African Programme for Onchocerciasis Control (closed), Expanded Special Project for the Elimination of NTDs (Africa), and Onchocerciasis Elimination Program for the Americas, NGDO Coordination Group and Bilateral Donors

Progress against WHO 2020 targets

Impact indicator	2012	2020 target	Current status
# of countries eliminating transmission – Americas	0	6 (2022)	4
eliminating transmission in Yemen	0	1 (2015)	0
eliminating transmission in Africa where possible	0	Undefined	0

1 IHME, global burden of disease
2 GBD 2017 Lancet 2018; 392: 1859-922
3 In 2013, South Sudan with 5.7m cases was transferred from EMRO to AFRO
4 G-finder report 2018
SOURCE: All data sourced from WHO unless otherwise indicated

Onchocerciasis (river blindness)

HIGHLY PRELIMINARY

WHO 2030 target

Impact indicator	2018 (Baseline)	2023	2025	2030
# countries verified for achieving elimination of transmission	**4**	**4**	**6**	**10**
# countries which stopped MDA for ≥ 1 focus	9	20	21	34
# countries which stopped MDA for ≥ 50% of population	6	8	13	>14
# countries which stopped MDA for 100% of population	4	4	9	> 10

Assessment of actions required to meet 2030 targets

No bottleneck towards target — Critical action required to reach target

Category	Assessment	Current status	Actions required
Technical progress			
Scientific understanding		▪ Good understanding of the transmission and parasite life-cycle	▪ Develop understanding of transmission and transmission thresholds in hypo-endemic areas to inform guidelines
Diagnostics		▪ Serological test available, but suboptimal	▪ Continue to evaluate performance of diagnostics ▪ Develop target product profiles for new diagnostics designed for the needs of the programs ▪ Develop a confirmatory diagnostic for use in low-prevalence settings and for stopping MDA decision ▪ Relate prevalence with serology to vector transmission indices
Effective intervention		▪ Once-to-twice-yearly ivermectin MDA is effective at breaking transmission but takes 10-15 years or more ▪ Ivermectin cannot be used safely in MDA settings in Loa loa/hypoendemic onchocerciasis co-endemic areas	▪ Develop a macrofilaricide to accelerate interruption of transmission. ▪ Develop macrofilaricide that could be used in Loa loa co-endemic areas ▪ Demonstrate effectiveness and safety of use of moxidectin in children (moxidectin would theoretically replace the need for 2x per year ivermectin)
Strategy and service delivery			
Operational and normative guidance		▪ Guidelines for stopping MDA and post-treatment surveillance are available ▪ Better guidance for steps required to achieve interruption of transmission is needed	▪ Provide clear guidance on strategies in areas that are hypo-endemic for onchocerciasis and co-endemic for Loa loa ▪ Update entomological guidance ▪ Update manuals for programme managers with strategy for elimination and elimination verification process
Planning and governance		▪ Good coordination among stakeholders (through NTD NGO network, ESPEN and OEPA) ▪ National onchocerciasis elimination committees and national laboratories are needed to provide guidance to programs on onchocerciasis response ▪ Country ownership of and investment in their programmes is variable	▪ Include Onchocerciasis in country UHC packages ▪ Scale up national onchocerciasis committees in countries where these are currently not present and support their functioning ▪ Develop an onchocerciasis partner forum
Monitoring & Evaluation		▪ Mapping of hypoendemic areas in Africa is incomplete ▪ M&E strategies are being updated for current tools ▪ Strategy for post-elimination surveillance needs to be developed	▪ Design operationally feasible elimination mapping ▪ Develop and disseminate protocols for standardization of mapping to ensure consistency of data ▪ Improve mapping and sampling in Loa-loa co-endemic areas to allow for granular treatment approaches ▪ Close data gaps in hypoendemic areas through development of more easy-to-use tools
Supply and logistics		▪ Strong supply chain for medications donated by Merck ▪ Ensuring supply of diagnostics in-country is challenging	▪ Develop a plan to decrease the logistical burden of obtaining needed diagnostics ▪ Develop a plan to facilitate the addition of new medications to the supply chain as they become available
Healthcare infrastructure and workforce		▪ Not all countries have in-country capacity to perform laboratory testing in quality assure manner	▪ Continue effort to ensure in-country capacity for the performance of quality assured diagnostics
Enablers			
Advocacy and funding		▪ Most programmes dependent on external donor support	▪ Develop advocacy plan ▪ Continue to ensure donor support ▪ Seek cost-effective interventions ▪ Develop a partner forum
Collaboration and multisectoral action		▪ To be confirmed	▪ Strengthen integrated management of skin NTDs and use common indicators ▪ Increase collaboration with vector management
Capacity building		▪ Many countries with limited capacity to perform needed laboratory-based tests ▪ Shortage of entomological capacity	▪ Continue efforts to develop entomological and laboratory capacity

Additional risks that require mitigation

- Goal may not be feasible with current tools in hyper- and holoendemic areas
- Cost of mapping and Loa loa strategies
- Resurgence if MDA is stopped prematurely

For more details, please visit:
https://www.who.int/rabies/en/

Rabies

HIGHLY PRELIMINARY

Overview

Disease and epidemiology

- Caused by the rabies virus (RABV) and other lyssaviruses
- Causes progressive and fatal inflammation of the brain and spinal cord; there are two types of rabies:
  - Furious rabies (80% of cases) - people exhibit hyperactivity and excitable behavior with death occurring within few days
  - Paralytic rabies (20% of cases, often misdiagnosed) - muscles gradually become paralyzed, leading to eventual coma and death
- Transmitted to humans mainly through the bites and scratches of dogs (up to 99%), though rabies can also be transmitted by various other mammals
- ~40% of rabies victims are children under 15 years of age

Burden of disease

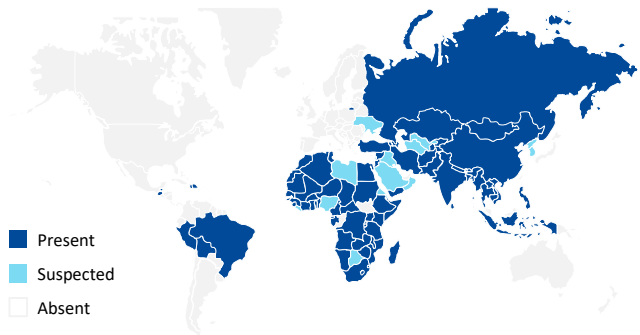
~851,000
People receiving post-exposure prophylaxis, 2017

~59,000
Deaths, 2015

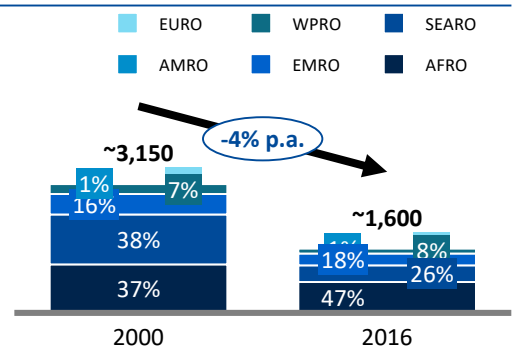
~1.6 million
DALYs, 2016

- Dog-transmitted human rabies is present or suspected in 89 countries, mostly in Africa and Asia

Endemicity of dog-transmitted human rabies, 2016



DALYs by region ('000)



Strategic interventions

Preventive chemotherapy
- Preventive vaccines are recommended for people at high risk of exposure to rabies e.g. laboratory staff working with the rabies virus, veterinarians, animal handlers

WASH
- Access to water for wound washing (e.g. with soap and water) post-exposure can significantly decrease the viral load in the wound

Vector control
- N/A

Veterinary public health
- Mass vaccination of dogs (vaccinating 70% of dog populations in high-risk areas) is a cost-effective measure to break the rabies transmission cycle

Case management
- Post-exposure prophylaxis (with the rabies vaccine as well as immunoglobulin for severe category 3 exposures) is needed immediately after exposure to a rabid animal
- Thorough wound washing

Other
- Timely diagnosis and accurate risk assessment of wound and bite circumstances are important (rapid diagnostic tests combined with clinical signs)
- Education, especially for children, on how to avoid being bitten and what to do in the event of a bite is crucial to prevent deaths from rabies

Selected efforts to overcome NTD

- Organizations and institutions involved in the fight against rabies include the Global Alliance for Rabies Control (GARC), FAO, OIE, WHO (Rabies Consultative Group), Partners for Rabies Prevention

Progress against WHO 2020 targets

Impact indicator	2012	2020 target	Current status
Regional Elimination	TBC	Elimination in: ▪ Latin America (2015) ▪ South-East Asia (2020) ▪ Western Pacific (2020)	 ▪ Postponed ▪ Timeline under revision ▪ Timeline under revision

SOURCE: All data sourced from WHO (e.g. Global Health Estimates) unless otherwise indicated

Target: elimination as a public health problem

Rabies

HIGHLY PRELIMINARY

WHO 2030 target

Impact indicator	2020 (provisional estimate)	2023	2025	2030
# endemic countries having eliminated canine rabies as a public health problem – defined as having achieved zero deaths from rabies	**89 (2015)**	**TBC**	**TBC**	**TBC**
# endemic countries having reduced mortality due to dog transmitted rabies by 50%	TBC	13	47	TBC
# endemic countries having reached 70% vaccination coverage of dogs in high risk areas	TBC	TBC	TBC	TBC

Assessment of actions required to meet 2030 targets

Summary of key actions to achieve targets

- **Monitoring & Evaluation:** TBC
- **Supply & Logistics:** TBC
- **Capacity building:** TBC

No bottleneck towards target — Critical action required to reach target

Category	Current Assessment	Current status	Actions required
Technical progress			
Scientific understanding		▪ Good understanding of disease pathology ▪ Gavi learning agenda available to drive research progress	▪ Model with a ratio of the number of persons bitten/number of doses of vaccine administered and calculation of loss between first and last dose ▪ Improve understanding of vaccination safety
Diagnostics		▪ Comparative assessments of various diagnostics ongoing	▪ Develop field-deployable ante-mortem diagnostic test for use in primary healthcare facilities ▪ Simplify postmortem diagnosis of rabies in animals (e.g. non-invasive sample collection combined with RDT) to improve post-bite treatment
Effective intervention		▪ Effective preventive and post-exposure vaccines	▪ Adapt mass dog vaccination methods to the setting
Strategy and service delivery			
Operational and normative guidance		▪ Guidelines in place include: — WHO guidance on rabies prevention, vaccines, laboratory diagnostics and case management in humans and animals available (TRS No 1012) — OIE standards on prevention/control, stray dog population control, diagnostic methods, international movement of dogs and cats originating from rabies infected countries ▪ Global strategic plan for rabies "Zero by 30" (by WHO, OIE, FAO, GARC)	▪ Continue dissemination of guidance to accelerate country uptake
Planning and governance		▪ Global Strategic Plan 'Zero by 30' with operational plan how to achieve zero deaths by 2030	▪ Strengthen rabies control framework by the WHO resolution taking into account the One Health approach ▪ Improve country-level coordination of relevant activities, including who pays
Monitoring & Evaluation		▪ DHIS2 module on rabies has been finalised	▪ Improve country compliance with reporting and data availability ▪ Introduce surveillance indicator of suspicious death after bite - would be investigated in the same mode as the PFA
Supply and logistics		▪ Country studies on logistics of PEP completed ▪ OIE dog vaccine bank operational ▪ Weak vaccine demand forecasting results in stock-out issues	▪ Strengthen anti-rabies services with the EPI vaccines (same cold chain, stock management) ▪ Improve monitoring of vaccine/RIG use and forecasting of demand ▪ License monoclonal antibody products as an alternative to RIG ▪ Ensure availability of quality-assured human and animal PEP vaccines ▪ Develop innovative technologies to improve access to treatment e.g. drone delivery of post-exposure prophylaxis
Healthcare infrastructure and workforce		▪ TBC	▪ Ensure health facility equipment for wound washing and vaccine storage ▪ Enhance lab capacity ▪ Develop anti-rabies services with trained staff for the intradermal vaccine administration route and wound infiltration with RIG ▪ Maintain the workforce for diagnosticians
Enablers			
Advocacy and funding		▪ UAR donor landscaping ongoing ▪ Potential investment of Gavi in rabies vaccines ▪ World Rabies Day helps raise awareness	▪ TBC
Collaboration and multisectoral action		▪ One Health approach (WHO, OIE, FAO) ▪ UAR collaboration established ▪ OIE Rabies Vaccine Bank supports the implementation of dog vaccination campaigns	▪ Support countries in developing multi-sectoral plans for rabies through collaboration between United against Rabies and partners ▪ Understand potential for cost-effectiveness in combining rabies interventions with other diseases (e.g. leishmaniasis, echinococcosis)
Capacity building		▪ TBC	▪ Train health workers on rabies exposure assessment, intra-dermal administration of PEP (more cost effective than intramuscular) ▪ Enhance information, education and communication (IEC) among non-health organizations

Additional risks that require mitigation

- TBC

For more details, please visit:
www.who.int/neglected_diseases/diseases/scabies/en/

Scabies

HIGHLY PRELIMINARY

Overview

Disease and epidemiology

- Caused by a microscopic mite Sarcoptes scabiei var hominis that is transmitted person-to-person through close skin contact
- The female mite burrows in the skin and lays eggs, triggering an immune response that causes intense itching and rash.
- Bacterial infections can complicate the disease leading to serious consequences such as severe soft tissue infections, septicaemia, kidney disease and rheumatic fever.

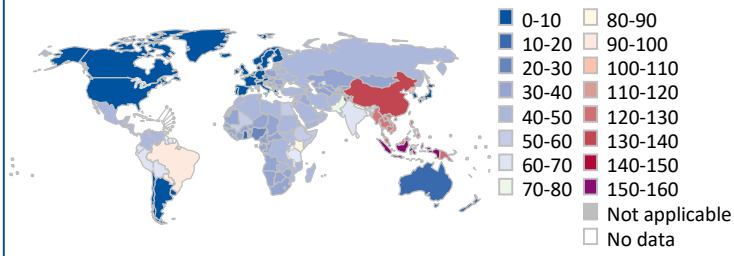
Burden of disease

455 million
People affected by scabies at any time

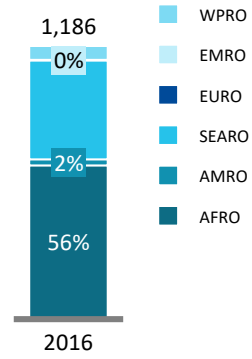
~5.6m
DALYs, 2016[1]

- Accurate data on incidence and prevalence are not available

Age-standardised disability-adjusted life-years per 100 000 people1



Cases per region in 2016



Strategic interventions

Preventive chemotherapy	MDA is effective using oral ivermectin and topical scabicides
WASH	N/A
Vector control	N/A
Veterinary public health	N/A
Case management	Topical scabicides such as permethrin, benzyl benzoate, malathion, & Sulphur ointment Oral ivermectin Importance to treat all household contacts Specialist case management of crusted scabies cases.
Other	N/A

Selected efforts to overcome NTD

- Contribution of many different countries, organizations and institutions is essential for the fight against scabies. Some of these organizations include: International Alliance for the Control of Scabies and the International League of Dermatological Societies
- Mass drug administration with ivermectin for lymphatic filariasis or onchocerciasis has had some impact on transmission, though these strategies miss some children at risk for infection

Progress against WHO 2020 targets

Impact indicator	2012	2020 target	Current status
N/A	N/A	N/A	N/A

1 https://www.sciencedirect.com/science/article/pii/S1473309917304838#fig3
SOURCE: All data sourced from WHO unless otherwise indicated

HIGHLY PRELIMINARY

Scabies

WHO 2030 target

Impact indicator	2020 (Baseline)	2023	2025	2030
# of countries incorporated scabies management in the UHC package of care	*0*	*TBC*	*TBC*	*TBC*
# of countries using MDA intervention nationwide	*0*	*3*	*6*	*TBC*

Assessment of actions required to meet 2030 targets

No bottleneck towards target — Critical action required to reach target

Category	Current Assessment	Current status	Actions required
Technical progress			
Scientific understanding		▪ Understand the life cycle and impact of treatments on individuals ▪ Significant research has been performed to define the impact of mass drug administration strategies on the transmission of scabies	▪ Evaluate epidemiological burden globally ▪ Improve understanding of rebound of transmission in settings where MDA with ivermectin for other NTDs has stopped
Diagnostics		▪ Good methods for individual diagnosis ▪ New international consensus criteria 2019 will facilitate programmatic screening	▪ Validate clinical diagnostic algorithms for programmatic use ▪ Develop population level diagnostics to facilitate integration with other NTD programme activities
Effective intervention		▪ Strong evidence for effectiveness for ivermectin MDA in combination with topicals for those who cannot take ivermectin	▪ Determine if ivermectin-based single-dose MDA rather than 2 doses 7 days apart, is effective for programmatic use ▪ Identify alternative strategies that require only a single dose or application in MDA
Strategy and service delivery			
Operational and normative guidance		▪ Provisional framework in development	▪ Develop guidance for mapping endemic countries ▪ Develop guidance for programmatic implementation of MDA
Planning and governance		▪ Informal bodies exist to support coordination	▪ Include scabies and impetigo in national UHC and IMCI guidelines ▪ Incorporate scabies into national NTD programme planning documents in known highly endemic countries
Monitoring & Evaluation		▪ Burden of the disease and its prevalence are poorly understood	▪ Design operationally feasible mapping ▪ Develop and disseminate protocols for standardization of mapping to ensure consistency of data ▪ Develop system for tracking scabies outbreaks
Supply and logistics		▪ Work in progress towards adding ivermectin to Model List of Essential Medicines	▪ Identify potential generic manufacturers of ivermectin that might be able to obtain WHO pre-qualification ▪ Ensure good quality prescribing practices in skin neglected tropical diseases
Healthcare infrastructure and workforce		▪ WHO skin NTDs manual provides some guidance on diagnosis and management in the primary healthcare setting	▪ Develop national plans for staff training in diagnosis and management of scabies
Enablers			
Advocacy and funding		▪ Currently minimal donor support	▪ Develop a global advocacy plan and partner forum ▪ Aim to secure low-cost or donated access to both oral ivermectin and topical scabicidals
Collaboration and multisectoral action		▪ To be confirmed	▪ Strengthen integration of management of skin NTDs. Use indicators common to other (co-endemic) skin NTDs.
Capacity building		▪ Needs have not been assessed	▪ To be confirmed

Additional risks that require mitigation

- No comments thus far

For more details, please visit:
www.who.int/schistosomiasis/en/

HIGHLY PRELIMINARY

Schistosomiasis

Overview

Disease and epidemiology

- Parasitic disease caused by the schistosoma trematode worms
- There are two main types of the disease:
  - Intestinal schistosomiasis results in abdominal pain, diarrhoea, blood in the stool; in advanced stages also enlargement of liver and spleen, fibrosis, portal hypertension, and accumulation of fluid in the peritoneal cavity.
  - Urogenital schistosomiasis results in blood in urine; in advanced stages also fibrosis of bladder and ureter, and kidney damage. Genital forms could manifest in pain of the testicle and blood in the sperm in men, abdominal and pelvic pain in women, pain during intercourse, ectopic pregnancies, and infertility; association with HIV transmission has been demonstrated in co-endemic areas.
- Transmitted to humans through contact with infested water (e.g. swimming, washing clothes, fishing); Inadequate hygiene increases risk of transmission
- The disease affects poor rural communities but has been spreading to urban areas and to tourists visiting endemic areas

Burden of disease

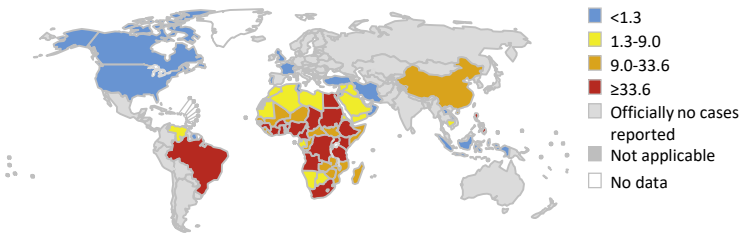
~143 million
People suffering from Schistosomiasis in 2017[1]

~24,000
Deaths in 2016

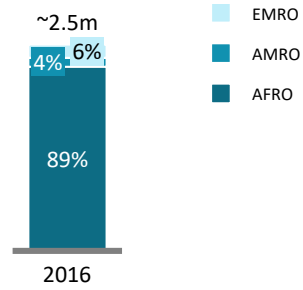
~2.5 million
DALYs, 2016

- Majority of people requiring treatment live in Africa

Number of DALYs in 2016, thousands



Number of DALYs per region in 2016



Strategic interventions

Preventive chemotherapy	Regular treatment with praziquantel of at-risk groups (school-aged children, pre-school aged children, adults, communities in highly endemic areas, people in occupations involving contact with infested water)
WASH	Access to safe water Improved sanitation
Vector control	Snail control
Veterinary public health	Treatment of animals, keeping animals out of transmission sites
Case management	One dose treatment with praziquantel
Other	Behavioral change and environmental management interventions

Selected efforts to overcome NTD

- Total of USD ~18 million in global funding (2018) is dedicated to R&D for fighting schistosomiasis: ~9m general research, ~5.5m drugs, ~5.5m preventive vaccines, ~1m diagnostics, ~2.5m unspecified[1]
- Contribution of many different countries, organizations and institutions is essential for the fight against schistosomiasis. Some of these organizations and institutions include: Global schistosomiasis Alliance and its members, NGOs organized in the NNN, Merck, and donors

Progress against WHO 2020 targets

Impact indicator	2012	2020 target	Current status
Regional Elimination	TBC	2015 – multiple regions[2] 2020 – multiple regions[3]	TBC TBC
Percentage of school-aged children covered with PC	TBC	75%	71%

1 IHME Global Burden of Disease 2 Eastern Mediterranean Region, Caribbean, Indonesia and the Mekong River basin 3 Americas, Western Pacific Region, Selected African countries
SOURCE: All data sourced from WHO unless otherwise indicated

Schistosomiasis

HIGHLY PRELIMINARY

WHO 2030 target

Impact indicator	2020 (provisional estimate)	2023	2025	2030
# countries which have eliminated SCH as a public health problem[1]	5	18	38	52
# countries where interruption of transmission has been verified	2	10	19	25

1 Defined as: proportion of heavy intensity schistosomiasis infections <1%

Assessment of actions required to meet 2030 targets

No bottleneck towards target — Critical action required to reach target

Category	Current Assessment	Current status	Actions required
Technical progress			
Scientific understanding		▪ Research ongoing regarding indicators of morbidity	▪ Understand of zoonotic transmission ▪ Better understand the implications of egg-negative but worm positive SCH for transmission ▪ Develop strategies to maintain EPHP once achieved and prevent bounce back ▪ Develop vaccination to prevent re-infection
Diagnostics		▪ Kato-Katz and urine filtration employed for measuring prevalence and intensity ▪ Intensity results vary greatly base on diagnostic used ▪ More sensitive and specific RDT under development by FIND	▪ Develop field-deployable diagnostic to evaluate pre and post-intervention prevalence for areas with low infections ▪ Create biorepository of SCH samples for assay development, validation and comparison between diagnostic tests ▪ Develop test for PZQ resistance ▪ Develop molecular test for xenomonitoring ▪ Validate and standardize diagnostic techniques for *S. japonicum* and *S. mekongi*
Effective intervention		▪ 250m tablets of PZQ available for MDA in SAC ▪ Research on improved formulation of praziquantel ▪ Some children may not receive MDA as they do not attend school; girls may be kept out of school for social or religious reasons ▪ Snail control implemented in some countries, however, environmental concerns exist	▪ Develop new safer molecules to complement PZQ in case of resistance ▪ Effectively implement WASH strategies in communities, schools and health facilities in all endemic areas ▪ Expand treatment to include adults according to the guidelines ▪ Implement MDA in community in order to reach other age groups and SAC not attending school. ▪ Overcome environmental challenges for snail control through specific guidelines on appropriate strategies in different settings minimizing environmental impact ▪ Implement test & treat strategies in countries striving for elimination of transmission
Strategy and service delivery			
Operational and normative guidance		▪ Process for verification of elimination of transmission developed ▪ WHO Manual on indicators of morbidity published	▪ Create guidance on how to sustain the depression of the disease to avoid bounce-back (e.g. WASH interventions in place before MDA is stopped) ▪ Develop methodological guidance for reaching target: diagnostic to be used and sampling strategy ▪ Update the criteria for elimination as a public health problem if diagnostic is changed (the level of infection is heavily reliant on the diagnostic used)
Planning and governance		▪ New guideline includes treatment of all at risk groups ▪ Process for verification of the transmission of schistosomiasis developed ▪ Snail control plans developed by many countries	▪ No bottlenecks towards the target
Monitoring & Evaluation		▪ Working group established to provide new guidance for M&E and micromapping and impact assessment	▪ Collect M&E data from per-SAC, SAC and adults to inform optimal treatment strategy ▪ Implement strategies/precision mapping to support targeted MDA at lower administrative/ community levels ▪ Utilize environmental mapping through eco-epidemiology studies using new technologies (drone mapping, environmental DNA, etc.) ▪ Actively monitor MDA impact for potential strategy adjustment
Supply and logistics		▪ New guideline include treatment of all at risk groups ▪ Lack of PZQ for adults is a barrier to achieving interruption of transmission	▪ Ensure there is enough praziquantel to treat all in need and that it is available for access ▪ Advocate for donated pediatric formulation of PZQ when available for the PC in PSAC
Healthcare infrastructure and workforce		▪ Weak lab capacity ▪ Low availability of skills in malacology and snail control ▪ Low level of integration	▪ Build capacity building in malacology and snail control ▪ Build lab capacity in surveillance ▪ Integrate activities in the Health system
Enablers			
Advocacy and funding		▪ Need of country financial contribution to the programme	▪ Mobilize extra resources for progress towards the ultimate goal of elimination of transmission which would allow for stopping MDA ▪ Donate molluscicides and PZQ
Collaboration and multisectoral action		▪ Manuals on WASH and NTD published ▪ Advocacy document on schistosomiasis and HIV published	▪ Coordinate interventions with ministries and WASH organizations in ensuring access to clean water and behavioural change interventions to prevent bounce-back ▪ Coordinate MDA activities with other NTDs for efficiencies ▪ Include effective and accessible/inclusive referral systems to specialized disease management capacity
Capacity building		▪ Manual on use of molluscicide published ▪ FGS atlas published to help in diagnostic ▪ Manual on morbidity management under development ▪ Manual on malacology and web training platform and app under development	▪ Support training of health staff in lab diagnostic, clinical management of cases and FGS, malacology, and snail control

Additional risks that require mitigation

- **Potential decline in the role of big pharma due to clear desire to transition to national financing which may become a threat to MDA if national financing fails**
- **Zoonotic reservoirs could continue transmission**
- **Reintroduction of disease by migration**
- **Bounce-back of the disease if MDA is stopped without sustainability interventions in place (e.g. WASH)**

For more details, please visit: www.who.int/health-topics/snakebite#tab=overview

Snakebite Envenoming

HIGHLY PRELIMINARY

Overview

Disease and epidemiology

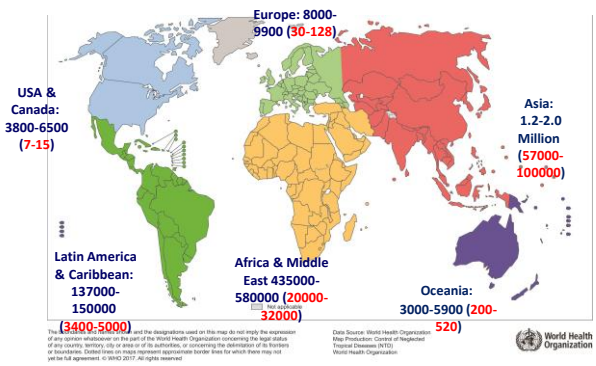
- Caused by the injection of a mixture of different toxins ("venom") following the bite of a venomous snake or having the venom sprayed into the eyes by certain species of snakes
- The toxins can cause paralysis that may prevent breathing, cause bleeding disorders that can lead to a fatal hemorrhage, or cause other effects such as irreversible kidney failure and tissue damage that can lead to permanent disability, limb amputation and other sequelae.
- Risk factors include walking barefoot at any time, sleeping on the ground without a tucked-in mosquito net, and walking outside at night without a light

Burden of disease

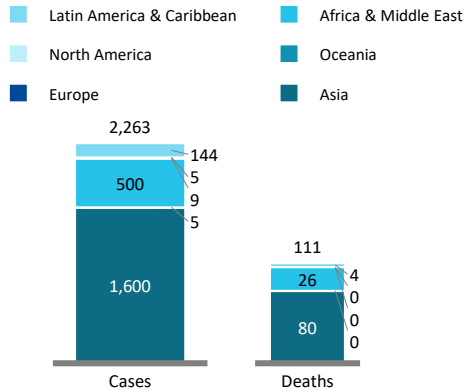
~2.7 million	~80,00 – 140,000	~6-8 million
People are bitten by snakes with envenoming annually	Annual deaths	DALYs, 2015[1]

- Global/regional incidence and prevalence incomplete; country level data is of variable quality/completeness

Prevalence of snakebite



Cases and deaths per region, '000s, 2016



Strategic interventions

Preventive chemotherapy	N/A
WASH	▪ Improved sanitation and access to drinking water helps eliminate risky behaviours
Vector control	N/A
Veterinary public health	▪ Education of local communities to prevent snakebite envenoming of livestock and companion animals
Case management	▪ High quality snake antivenoms ▪ Ancillary treatments such as mechanical ventilation, wound care, infection control and surgery
Other	▪ Housing improvements including beds with bed nets to prevent sleeping on the floor, improved sealing of gaps in walls, roofs and around doors ▪ Behavioural changes e.g. use of footwear, use of lights outdoors from dusk to dawn ▪ Community education to reduce risk and to seek health care

Selected efforts to overcome NTD

- USD 100 million in funding is dedicated to fighting snakebite by Wellcome Trust, USD3.8 million by Hamish Ogston Foundation, USD11.3 million by DFiD and USD4.0 million by the Lillian Lincoln Foundation
- The expected cost between 2021-2030 to achieve the 2030 goals is ~USD137M, including: ~USD27M for empowering communities, ~USD50M for treatments, ~USD37M for strengthening health systems, and ~USD23M for increasing coordination and resources
- Organizations involved in the fight against snakebite include: Global Snakebite Initiative (GSI), Médecins Sans Frontières (MSF), Health Action International (HAI), International Society of Toxinology (IST), African Society of Venimology (ASV) and Wellcome Trust. Additional comprehensive stakeholder mapping is needed
- Improving the safety, effectiveness and quality of existing antivenoms and ensuring affordable access by all who need then can lead to achievement of key target of 50% reduction in deaths and disabilities by 2030.

Progress against WHO 2020 targets

N/A – snakebite envenoming was only categorised as a WHO neglected tropical disease in 2017

1 Habib et al. (2015), Wellcome Trust

Target: disease control

HIGHLY PRELIMINARY

Snakebite Envenoming

WHO 2030 target

Impact indicator	2020 (Baseline)	2023	2025	2030
# endemic countries achieving reduction of mortality and morbidity by 50%	**N/A**	**39**	**61**	**132**
% new antivenom producers joining market by 2030	N/A	5%	15%	25%
# effective treatments for snakebite envenoming available worldwide	50,000	300,000	500,000	3 million
# WHO-recommended polyspecific antivenom products in each region	N/A	2	3	6

Assessment of actions required to meet 2030 targets

No bottleneck towards target — Significant effort required to reach target

Category	Current Assessment	Current status	Actions required
Technical progress			
Scientific understanding		▪ Substantial knowledge of disease pathology caused by various species but improvement needed ▪ Epidemiology, ecology and disease burden requires greater resolution globally, regionally and nationally ▪ Clinical evidence for safety and effectiveness of specific antivenoms is lacking; hampered by cost, logistics and lack of available expertise in countries ▪ Other scientific gaps exist and require prioritization	▪ Encourage investment in broad range of SBE research questions related to WHO strategy needs ▪ Blind spots include sociocultural, toxinological, clinical, economic, ecological and epidemiological research areas ▪ Balance demand for stronger clinical evidence against high costs and other barriers; need for rapid & pragmatic approach (a) is it safe? (b) is it effective? (c) is it cost-effective? ▪ Encourage investment in broad range of SBE research questions
Diagnostics		▪ Species-specific immunodiagnosis not essential for effective treatment but valuable for disease ecology ▪ Introduces additional costs to patients without funds ▪ Yes/No diagnostic to confirm envenoming would reduce delays in administration of antivenom	▪ Standardization and validation of current clinically relevant bedside diagnostic tests that confirm specific clinical syndromes (e.g.: 20WBCT for coagulopathy) in specific populations ▪ Immunoassay, AI-based or PCR-based identification of biting species for disease ecology; simple low-cost “Yes/No” diagnostics
Effective intervention		▪ Availability of substandard antivenoms = loss of confidence among users = reduced demand = declining production = higher cost (Vicious Cycle) ▪ Need for R&D and technology modernization to sustain and expand current antivenom production ▪ Poor quality venoms and poor quality hyperimmune plasma are major barriers to high quality, efficacious antivenoms especially in Africa and Asia	▪ Invest in the modernization of current production capacity and incorporation of new technology, collaboration with academia and support for increased GMP compliance ▪ Increase current production and stimulate investment in new manufacturing capacity and development of new products ▪ Improve production of venoms and hyperimmune plasma ▪ Rational preclinical and clinical testing pathways with accelerated market deployment that includes post-marketing surveillance
Strategy and service delivery			
Operational and normative guidance		▪ A global strategy for prevention and control of snakebite envenoming has been launched by WHO ▪ WHO antivenom assessment results being released ▪ Need for additional regulatory guidance & controls	▪ Integrate effective prevention, treatment and snakebite envenoming management into national health systems through uptake of strategy by countries ▪ Undertake additional regional assessments; strengthen N&S
Planning and governance		▪ Work plan with measureable outcomes required ▪ Need for coordination of implementation efforts ▪ Donors request business/investment case from WHO	▪ Develop detailed workplan and business case ▪ Establish coordination framework and implement ▪ Set up small technical working group of experts to support WHO
Monitoring & Evaluation		▪ Baseline epidemiological and Burden of Disease (BoD) data is deficient, fragmented or incomplete ▪ Lack of socioeconomic data ▪ Need for clear common definitions of parameters	▪ Implement mandatory reporting to improve disease burden data ▪ Improve quality and extent of epidemiological surveillance for accurate BoD measurement and resource planning ▪ Integrated solutions to facilitate NTD data collection and reporting
Supply and logistics		▪ Vicious cycle of weak confidence driving demand and supply down, raising prices and reducing availability ▪ Weak regulatory environments facilitate spread of ineffective products and counterfeits ▪ Poor procurement, supply and distribution policies and practices and need for education and training	▪ Create a virtuous cycle: requires quality-assured products, market stimulus, monitoring and surveillance ▪ Ensure effective national/regional regulation to stop spread of ineffective, inferior or fake products ▪ Establish a revolving stockpile of effective antivenoms ▪ Complete global risk-benefit assessment: need WHO QA products
Healthcare infrastructure and workforce		▪ Poor training of health workers in both basic clinical and SBE specific clinical skills ▪ Lack of basic medical equipment, consumables and other essential medicines ▪ Substandard infrastructure, amenities and services	▪ Develop core training materials for deployment; update guidance ▪ Develop resources to support HSS activities such as equipment, drug and consumables lists for various levels of health facility, treatment flowcharts, antivenom selection charts ▪ Identify, and activate resources and implementation partners
Enablers			
Advocacy and funding		▪ Advocacy and fund-raising limited by need to identify and map donors and their interests ▪ WHO funding limited ($500K LLF, $100K Germany) ▪ Country funding needs stimulation	▪ Donor mapping and engagement strategy + business case needed ▪ Increase resource mobilization to WHO; need to overcome donor reluctant to support HR and administrative costs ▪ Mobilise domestic financing at country level for projects
Collaboration and multisectoral action		▪ Stakeholder map and network development required ▪ WHO strategy calls for action in 10-12 African/Asian countries in 2019-20	▪ Establish a stakeholder database to build a collaboration network ▪ Multi-stakeholder engagement meetings in Africa and Asia to initiate implementation of projects in pilot phase countries
Capacity building		▪ Countries need increased regulatory, MoH, health work force and antivenom producer capacity building ▪ Community partners need capacity building ▪ Need for monitoring and evaluation	▪ Develop and deploy capacity building training packages, resources and implementation guidance across all sectors in need ▪ Develop and implement M&E framework to measure outcomes and outputs

Additional risks that require mitigation

- No comments thus far

For more details, please visit:
www.who.int/intestinal_worms/disease/en/

HIGHLY PRELIMINARY

Soil-transmitted helminthiases (STHs)

Overview

Disease and epidemiology

- Caused by intestinal parasites: *Ascaris lumbricoides, Strongyloides stercoralis, Trichuris trichiura,* and hookworms *Necator americanus and Ancylostoma duodenale*
- Cause anemia, malnutrition, impaired growth and cognitive development[1], delayed development, abdominal pain, diarrhea and hyperinfection syndrome which can lead to death
- Transmitted by eggs and larvae (*S. stercoralis, A. lumbricoides*) present in human faeces which contaminate areas with poor sanitation

Burden of disease

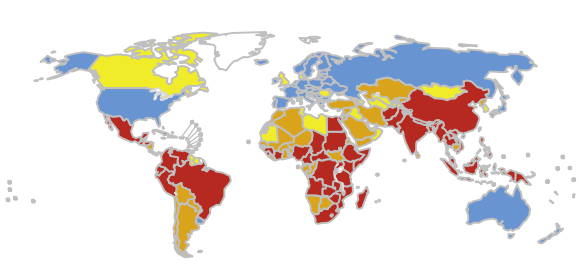
~1.5 billion
People infected with STH, 2003

~6,300
Deaths in 2016

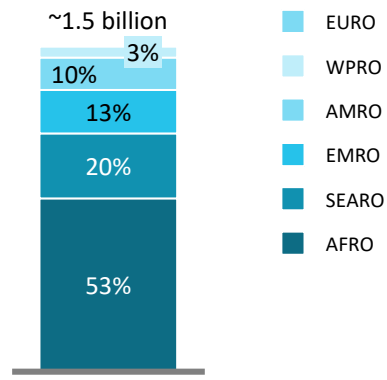
~3.5 million
DALYs, 2016

- Widely distributed in tropical and subtropical areas; greatest in sub-Saharan Africa, the Americas, China and South East Asia

DALYs due to STHs, 2016[2]



Number of cases



Strategic interventions

Preventive chemotherapy	▪ WHO recommends deworming with albendazole, mebendazole for *A. lumbricoides*, *T. trichiura* and hookworms and ivermectin for *S. stercoralis* in all at-risk people in endemic areas ▪ PC 1x/year where STH prevalence is >20%; 2x/year where prevalence is >50%
WASH	▪ Prevention of open defecation ▪ Adequate sanitation facilities ▪ Faeces management and improved hygiene practices at the household level and beyond (e.g. in schools)
Vector control	N/A
Veterinary public health	N/A
Case management	N/A

Selected efforts to overcome NTD

- The main priorities for STH R&D for in recent years have been: improved diagnostics, new combinations of existing drugs and new drugs
- Contribution of many different countries, organizations & institutions is essential for the fight against STH.

Progress against WHO 2020 targets

Impact indicator	2012	2020 target	Current status
Percent of preschool and school-aged children in need of treatment are regularly treated	32%	75%	~70%
Number of endemic countries in which 75% coverage achieved in preschool and school-aged children	10	75	68

SOURCE: All data sourced from WHO unless otherwise indicated
1 Pabalan et al., (2018) Soil-transmitted helminth infection, loss of education and cognitive impairment in school-aged children: A systematic review and meta-analysis. PLoS Negl Trop Dis 12(1): e0005523.
2 There are large regional differences in STH burden within countries

Target: Elimination as a public health problem

HIGHLY PRELIMINARY

Soil-transmitted helminthiases (STHs)

WHO 2030 target

Impact indicator	2020 (Baseline)	2023	2025	2030
# endemic countries with proportion of STH infections of moderate and heavy intensity <2%	7 (2017)	60	70	96 (out of 101)

Assessment of actions required to meet 2030 targets

No bottleneck towards target — Critical action required to reach target

Category	Current Assessment	Current status	Actions required
Technical progress			
Scientific understanding		▪ Good understanding of epidemiology ▪ Good understanding of pathology	▪ No bottleneck towards target
Diagnostics		▪ Current Kato-Katz diagnostic method uses samples of stool for examination under microscope ▪ The method has relatively low sensitivity	▪ Develop biomarkers with high specificity for a highly sensitive, field-deployable test ▪ Develop field-applicable tests for resistance ▪ Develop field-deployable molecular platforms (multiplex) to detect multiple NTDs (e.g. LF, SCH) to allow for cross-cutting use ▪ Standardize diagnostic procedure and develop guidance to limit variation in prevalence
Effective intervention		▪ Antihelmintics are effective but number of available drugs is limited ▪ New medicines and novel combinations of existing drugs are needed in case of rise of resistance ▪ WASH strategies are essential for sustainable improvement of situation	▪ Add ivermectin to PC programmes to enhance efficacy of treatment for T. trichiura and S. stercoralis ▪ Develop more effective treatments and drug combinations
Strategy and service delivery			
Operational and normative guidance		▪ Guidelines on preventive chemotherapy to control STH in at–risk population group are in place ▪ Manual on indicators and procedures to measure the reduction of morbidity due to STH exists ▪ Initial estimation of the need of ivermectin, prequalification of a generic ivermectin and pilot interventions are underway for control of strongyloidiasis	▪ Include strongyloidiasis in the group and develop guidelines for the disease ▪ Prioritize control efforts against strongyloidiasis ▪ Develop practical guidelines for interventions for women of reproductive age (WRA)
Planning and governance		▪ STH control is currently integrated into child health days (with vitamin A and vaccination) for preSAC and into school health programme for SAC	▪ Utilize new technologies (drone mapping, environmental DNA, etc.) to decrease cost of surveillance and mapping ▪ Adopt policies for effective quality control of diagnostics and drugs by countries based on WHO global guidance including control procedures
Monitoring & Evaluation		▪ Limited funding dedicated to monitoring of STH and consequently limited scope of activities	▪ Develop a surveillance guide with standard indicators ▪ Establish M&E system or integrate with national health information system ▪ Monitor efficacy of drugs and resistance
Supply and logistics		▪ Albendazole and mebendazole for school-aged children are donated and distributed through WHO ▪ Effective school-based programmes ensuring access for SAC	▪ Improve access to drugs for women of reproductive age and pre-school children
Healthcare infrastructure and workforce		▪ PC is implemented through schools and community using teachers and community health workers as drug distributors	▪ Integrate with others health programmes (e.g. use of facilities, health workforce distributing drugs for women of reproductive age) to ensure sustainability ▪ Increase number of testing facilities for routine lab testing of STH
Enablers			
Advocacy and funding		▪ Many countries depend on drug donations and external funding for the programme implementation ▪ Number of donated tablets needed is expected to substantially decrease as large countries become self-sufficient and as PC frequency decreases after successful intervention; number of individuals in need of treatment is expected to remain similar	▪ Increase domestic financing to ensure sustainability ▪ Secure drug donations for women of reproductive age and pre-school aged children
Collaboration and multisectoral action		▪ Collaboration with Ministry of Education for school-based programme ▪ Sustainability of STH control programmes is not ensured due to potential funding challenges	▪ Integrate MDA with other programs (e.g. nutrition, WASH) to increase cost effectiveness and coverage ▪ Integrate surveillance and mapping across diseases (e.g. lymphatic filariasis, schistosomiasis, onchocerciasis, polio) ▪ Ensure effective WASH strategies to prevent resurgence
Capacity building		▪ Teachers and community health workers are trained ▪ Lab technicians are trained on diagnostics ▪ Training manuals available	▪ Integrate training in the routine activities of health facilities

Additional risks that require mitigation

▪ No additional risks identified so far

For more details, please visit:
https://www.who.int/yaws/en/

HIGHLY PRELIMINARY

Yaws

Overview

Disease and epidemiology

- A childhood chronic disease caused by spiral bacteria *Treponema pallidum* subspecies *pertenue*
- Affects skin, bones and cartilage and causes disfigurement and debilitation
- Transmitted from human to human by skin to skin contact through scrapes or cuts
- One of the first diseases targeted for eradication in 1950s; renewed eradication efforts started in 2012

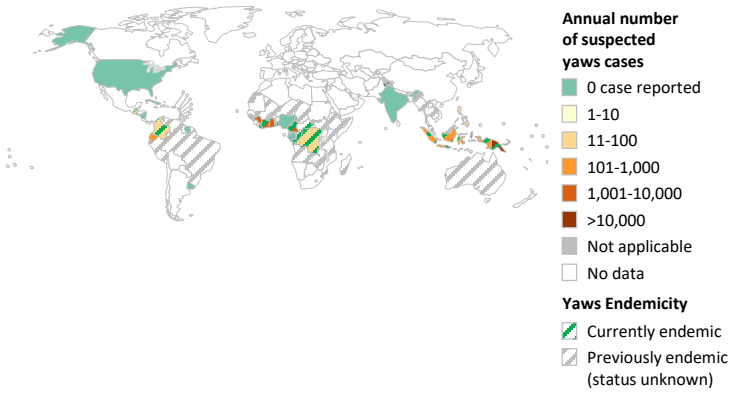
Burden of disease

~80,000
Suspected yaws cases reported, 2018

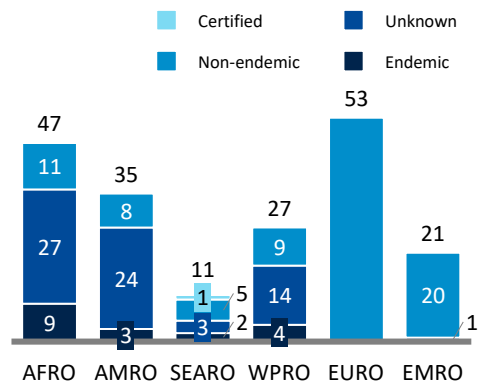
0
countries certified free of yaws, 2018

- Endemic mainly in Africa, Americas, South-East Asia and Western Pacific regions

Number of reported suspected cases, 2018



Number of Countries by Endemicity Status as of 2018



Strategic interventions

Preventive chemotherapy	Oral azithromycin used for Total Community Treatment (TCT)
WASH	Personal hygiene and wound care are important
Vector control	N/A
Veterinary public health	N/A
Case management	Azithromycin used as 1st line treatment Patients should be examined after 4 weeks – in over 95% cases, complete healing will take place Intramuscular benzathine penicillin for 2nd line treatment and for those with proven resistance to azithromycin
Other	N/A

Selected efforts to overcome NTD

- Contribution of many different organizations, institutions and countries are essential for the fight against yaws. There is currently no global umbrella initiative for fight against yaws

Progress against WHO 2020 targets

Impact indicator	2012	2020 target	Current status
Global eradication	0 certified countries	194 countries	1 certified; 106 non-endemic

1 G-Finder report 2018
SOURCE: All data sourced from WHO unless otherwise indicated

Yaws

HIGHLY PRELIMINARY

WHO 2030 target

Impact indicator	2020 (Baseline)	2023	2025	2030
# Member States certified free of Yaws transmission	1	97 (50%)	136 (70%)	194 (100%)

Assessment of actions required to meet 2030 targets

Summary of key actions to achieve targets

To eradicate yaws, the key question to resolve is assessment of the current prevalence of the disease and to ensure access to diagnostics and medication. The following actions are key to achieve this:

- Strengthen active surveillance system integrated across NTDs
- Ensure effective and efficient integration and/or co-implementation with other programs and sectors
- Ensure uninterrupted availability to quality assured oral treatment at sub-district level

No bottleneck towards target — Critical action required to reach target

Category	Current Assessment	Current status	Actions required
Technical progress			
Scientific understanding		▪ Thorough understanding of epidemiology ▪ No prominent negative effects of treatment known other than potential onset of drug resistance	▪ No bottleneck towards target
Diagnostics		▪ Disease is diagnosed using rapid PoC tests and serological laboratory-based tests ▪ The diagnosis is confirmed from swabs using PCR in labs	▪ Develop sensitive point of care molecular test (e.g. PCR) to distinguish yaws from other skin ulcers (e.g. *Haemophilus ducreyi*)
Effective intervention		▪ TCT treatment is aiming for at least 90% coverage of endemic areas ▪ Total targeted treatment (TTT) is used for immediate treatment if cases are discovered in-between scheduled TCT rounds	▪ Develop new antibiotics as a back up option in case antimicrobial resistance develops against azithromycin
Strategy and service delivery			
Operational and normative guidance		▪ The Morges strategy outlines way towards eradication of yaws by 2030 ▪ Programme managers guide, AFRO integrated guidelines, and verification and certification documents are available ▪ Technical guidance from WHO on monitoring and evaluation is underway and will be finished by 2020	▪ Provide technical guidance on establishing country committees on yaws (and other NTDs)
Planning and governance		▪ Ad-hoc global advisory Group can be convened ▪ NTD programmes and master plans exists in some countries ▪ National Yaws Eradication Programmes	▪ Establish national technical committees or include yaws within existing National NTD Technical Committees ▪ Expand the membership of guinea worm global certification commission to include yaws eradication
Monitoring & Evaluation		▪ PCR can be used for assessment of antimicrobial resistance ▪ Surveillance systems are working well in some endemic countries	▪ Establish active integrated surveillance and response in all endemic and previously endemic countries (status unknown) and upgrade frequency of reporting ▪ Assess 76 previously endemic countries to confirm the current status of the disease ▪ Monitor drug resistance
Supply and logistics		▪ Availability of azithromycin for TCT is assured ▪ In remote areas, access to medicines and RDTs may be lacking ▪ Availability of antibiotics within primary health care facilities to treat cases and contacts (TTT) in between TCT	▪ Improve access to RDTs and medication in endemic locations including isolated pockets (as part of UHC) ▪ Ensure that drugs for MDA are of assured quality
Healthcare infrastructure and workforce		▪ Yaws is currently treated through verticalized mass drug administration programme ▪ TTT carried out through primary healthcare system	▪ Identify and strengthen lab infrastructure for yaws surveillance (using PCR} ▪ Consider integration of yaws TCT with other PC diseases
Enablers			
Advocacy and funding		▪ Limited political and donor/partner support ▪ Good community engagement ▪ Good support from research community	▪ Increase commitment among endemic countries, donors, and partners to mobilize funds and manpower ▪ Sustain community engagement to support programme implementation ▪ Sustain research community engagement for knowledge generation and advocacy to mobilize resources for research
Collaboration and multisectoral action		▪ MDA TCT presents challenges in terms of costs and coverage ▪ Relatively effective integration with school health programmes exists in case detection	▪ Integrate with other programmes to increase surveillance (immunization, nutrition, MCH, skin NTDs) ▪ Collaborate with ministry of education school health programmes on case finding, screening and treatment ▪ Strengthen integrated management of skin NTDs and integrate TCT with other PC NTDs where applicable ▪ Strengthen collaboration with WASH providers and local government
Capacity building		▪ Health workers and community health workers in rural areas trained to recognize and report yaws ▪ Some integration across skin NTDs ▪ Health workers trained to use RDTs/DPP and to collect samples for PCR	▪ Develop capacity of health workers and community health workers for integrated skin-NTD detection and treatment, and reporting

Additional risks that require mitigation

- Total targeted treatment (TTT) may not be effective as latent and active infections are often in different households
- The eradication goal demands enormous resources which may be difficult to sustain

Dimensions for assessment – disease-specific

		Dimensions
Technical progress	**Scientific understanding**	▪ Thorough **understanding of disease epidemiology and pathology** ▪ **No "blind spots"** in research that would hinder progress toward achieving targets ▪ **Understanding** of **unintended consequences** of intervention (e.g. ancillary benefits, environmental effects etc.)
	Diagnostics	▪ **Existence of effective diagnostic tools** to enable timely detection, assessment of endpoints, surveillance ▪ **Availability of point-of-care diagnostic** usable at community level and in low-resource settings
	Effective intervention	▪ **Existence of interventions** for prevention, treatment, case management & rehabilitation ▪ **Continued innovation and adaptation** of interventions to new developments & opportunities.
Strategy and service delivery	**Operational and normative guidance**	▪ **Clear understanding of end points and operational approach** to achieve and sustain these ▪ **Availability of technical guidelines** e.g. validation or verification guidelines
	Planning and governance	▪ **Alignment and coordination of efforts** among relevant stakeholders towards overall goals and milestones ▪ **Appropriate country-level governance** for programme management and effective delivery ▪ **Clarity of stakeholder responsibilities** and effective, coordinated working processes
	Monitoring & Evaluation	▪ **Framework and mechanisms to monitor and report progress** against stated goals ▪ **Mapping and impact assessments** to show granular view of disease epidemiology & progression. ▪ Continuous, systematic and institutionalized collection, analysis and interpretation of **disaggregated health data (by age, gender, location)**, supported by strong data management systems and tools to assist in data interpretation ▪ **Strengthened and institutionalized surveillance** for the disease, including post-validation/elimination surveillance
	Supply and logistics	▪ **Effective supply chain that ensures timely access to and availability** of quality-assured medicines, products and pharmaceutical supplies at all levels and avoiding e.g. stockout, wastage, loss of tablets
	Healthcare infrastructure and workforce	▪ **Robust health systems/primary health care infrastructure** delivering NTD interventions in integrated patient care models ▪ **Existence of laboratory capacity/network** to support NTD programme needs & monitor drug efficacy ▪ **Availability of aptly skilled healthcare workers** to address clinical and community-based needs related to the disease
Enablers	**Advocacy and funding**	▪ **Effective policy dialogue and advocacy** to mobilise support for required interventions included in the national and district health care delivery plans ▪ **Domestic and international funding** deployed with adequate lead time and consistency
	Collaboration & multisectoral action	▪ **Collaboration between stakeholders** across levels and sectors with a clear accountability framework to enable an effective, synergetic approach to delivering interventions
	Capacity building	▪ **Capacity building** to enable high-performing programmes, e.g. **pre-deployment** and **in-service training**

World Health Organization