



Neglected tropical diseases (NTDs) are a group of infectious diseases that exert a crushing burden in poor and vulnerable communities around the world. Named for the limited attention they've historically received, NTDs are inextricably linked to poverty and inequality. These diseases exact a heavy toll, causing chronic illness, severe disfigurement, blindness, or even death. They can also exacerbate malnutrition and delay cognitive development, as well as reduce economic productivity, trapping families and communities in poverty. Increased attention in recent years has brought new resources to the fight against NTDs and fueled research breakthroughs. Yet very significant gaps remain in the arsenal of tools needed to control and eliminate these diseases, underscoring the need for research and development (R&D) of new tools.

1 in 6 people

worldwide are infected with one or more NTD

149 countries

in which NTDs are endemic

<1% of new drugs

approved between 1975–2011 were for NTDs

🔍 Research successes

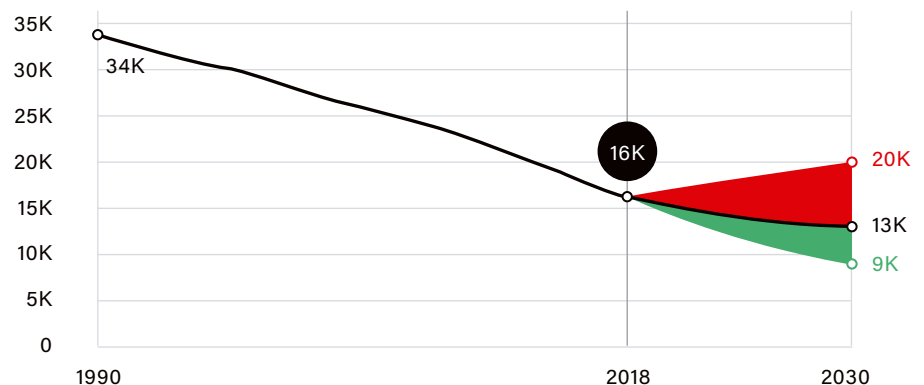
New tools are advancing control and elimination of NTDs:

- The **first all-oral cure for sleeping sickness**, a fatal neurological disease, was approved in 2018. This new drug, fexinidazole, cures all stages of the disease in ten days, replacing previous treatments that involved two weeks of intravenous injections at a hospital.
- The first **new treatment for river blindness** in 20 years, moxidectrin, was approved in 2018, adding ammunition to the fight against this disfiguring and blinding disease.
- A dissolvable, easy-to-use **child-friendly Chagas drug**, pediatric benznidazole, was approved in 2011 to combat this parasitic disease that can cause heart failure.
- New shorter, more effective **combination therapies for visceral leishmaniasis**—a disease that causes spleen and liver damage—that were introduced in the 2000s, are improving treatment and slowing the rise of drug resistance.
- Several **diagnostics**, including **rapid tests for river blindness and elephantiasis**, developed using NIH research, and a **test that detects all four types of dengue**, developed by the CDC, were introduced in the last decade.

📈 Continued progress is possible, not inevitable

Prevalence rate of 15 NTDs per 100,000 people

○ Current projection ○ If we progress ○ If we regress



🔑 Key missing tools

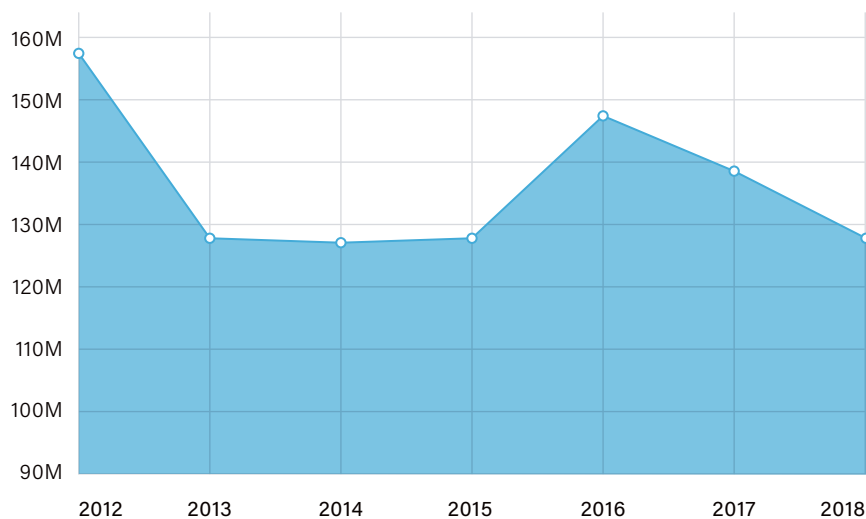
To eliminate NTDs, we need new and improved tools including:

- **New and improved diagnostics**, to rapidly detect infection at point of care in low-resource settings, and in some cases, to distinguish between different strains or stages of a disease.
- **New and improved treatments and cures** including therapies designed for children and shorter, simplified regimens with fewer side effects. Only seven NTDs are considered “tool-ready”—meaning we have low-cost, effective interventions to combat them—but in many cases these available treatments are still lengthy and burdensome to take with significant side effects.
- **Vaccines** to prevent and treat infection. No vaccines exist for 20 of the 21 NTDs prioritized by the World Health Organization, and the existing vaccine for dengue is recommended for use only in select populations.
- **New vector and biological control tools**, like space spray insecticides and *Wolbachia* bacteria that disrupts reproduction, in order to reduce mosquito and other vector populations.
- **Antivenoms** to treat snakebites.

💡 Breakthroughs on the brink

- Several **chikungunya vaccine candidates** are in late-stage development, including one NIH-supported candidate ready to enter phase 3 clinical trials and a second NIH-supported candidate in phase 2 trials, bringing new hope that in the coming years we will have a vaccine against this disease that causes debilitating joint pain and fever.
- Several **diagnostic tests for Buruli ulcer**—a disease that causes painful ulcers and swelling—are in development, including an instrument-free, point-of-care test and other tools for remote health care settings. Today diagnosis is typically done by appearance, which leads to high rates of misdiagnosis and delayed treatment.
- **New tools to control schistosomiasis**—a disease that causes liver damage or kidney failure if left untreated—are being developed, including an oral dispersible formulation of the medicine **praziquantel designed for children** soon entering phase 3 trials and a **vaccine candidate Sm14** that has completed a phase 2 trial.
- Phase 2/3 clinical trials are underway for fosravuconazole, a **potential new treatment for eumycetoma**, a fungal disease that can cause severe deformity of the limbs. Existing treatments for this disease are toxic, costly, only cure a fraction of patients, and require 12 months of treatment.
- Two NIH-funded **vaccine candidates against hookworm infection** are in clinical development, including one in phase 2 trials. This parasitic infection causes gastrointestinal issues and protein deficiency and is linked to impaired learning in children.
- **Mosquitoes infected with *Wolbachia***, a bacterium that impacts their reproduction and reduces population size, have been released to fight dengue and other mosquito-borne diseases in locations ranging from Indonesia to the Florida Keys, with early results showing promise. NIH and USAID have funded research into this approach.

US government investment in NTD R&D (in 2018) US\$ millions



🇺🇸 US Government R&D efforts

The US government is advancing R&D to control and eliminate NTDs through a whole-of-government approach:

- **US Agency for International Development** has supported development of new drugs and diagnostics for a select group of NTDs as part of its flagship NTD Program.
- **National Institutes of Health** conducts R&D for new treatments, vaccines, diagnostics, and vector control products to combat NTDs.
- **Centers for Disease Control and Prevention** advances research to develop new and improved diagnostics and interventions to strengthen NTD control and elimination efforts.
- **Department of Defense** undertakes R&D to create vaccines, drugs, diagnostics, and vector control products for NTDs that threaten US service members stationed abroad.
- **Food and Drug Administration** administers the Tropical Disease Priority Review Voucher Program to incentivize investment in products for neglected diseases.

