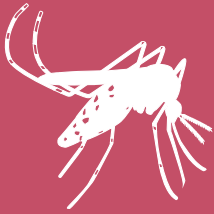


FACTS



3.9 billion
people at risk



About
390 million
infections
per year



Endemic
in **129**
countries
around the world

DENGUE

Leveraging global partnerships to tackle a rapidly spreading climate-sensitive disease

The World Health Organization (WHO) classifies dengue as one of the top 10 threats to global health, yet there is no cure. Caused by a virus that is spread by the bite of the Aedes mosquito, dengue symptoms can include fever, nausea, vomiting, rashes, fatigue, and intense eye, muscle, joint, and bone pain. For some, dengue infection can be severe due to plasma leakage – a serious complication that can result in shock, organ dysfunction, bleeding, and death. Pregnant women, children, the elderly, and people with comorbidities are most at risk.

The most common mosquito-borne viral disease in the world, dengue is spreading rapidly due to climate change, urbanization, and population growth. Now endemic in more than 100 countries from the Americas to Africa to South-East Asia, some estimates suggest 60% of the world's population will be at risk by 2080. Recent dengue outbreaks have been explosive, overwhelming hospitals in many regions. But despite its prevalence and severity, there is no specific treatment or cure for dengue. Medicines that can treat the disease – and prevent mild cases from becoming severe – are urgently needed.

The push for progress

We established the Dengue Alliance, a truly global partnership of leading public health institutes in endemic countries working with industry allies to develop new treatments that are effective against the disease. Our teams and partners are also carrying out much-needed research on the burden of dengue in African countries.

Our goal is now to complement vaccine and vector control strategies by delivering an affordable and accessible dengue treatment solution, completing our assessment of the dengue burden in Africa, and supporting the identification of better diagnostics and biomarkers that can accurately predict progression to severe dengue.

A global partnership led by endemic countries

The Dengue Alliance is a global partnership led by institutions from dengue-endemic countries that aims to develop affordable and accessible treatments for dengue. Members include the Translational Health Science and Technology Institute (THSTI), India; Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand; Ministry of Health, Malaysia; Oswaldo Cruz Foundation (Fiocruz), Brazil; Federal University of Minas Gerais, Brazil; and DNDi.

At meetings of Alliance members hosted by THSTI and Fiocruz in 2023 and the Ministry of Health of Malaysia in early 2024, experts and scientists explored recent progress in pre-clinical profiling, clinical trial design, and identification of biomarkers and better point-of-care diagnostics – and set objectives for the development of an affordable, effective treatment for dengue within the next five years.



“ I had dengue three times. The last time, the pain in my body was unbearable – in my joints, behind my eyes – all I could do was lie down. I was vomiting and had a fever. If there was a treatment, I would have taken it when my symptoms started. I wouldn’t have suffered so much.

Leticia is a project manager and a Master’s student in sociology from Rio de Janeiro, Brazil. She and her family have experienced numerous outbreaks of dengue in their community over the years.

Photo credit: Lucas Tabares-DNDi

Advancing innovation for millions at risk

Dengue Alliance partners continued to evaluate existing direct-acting antiviral (DAA) compounds in 2023, with prioritized compounds progressing in *in vivo* testing in India and Brazil. The Alliance is also collaborating with researchers at Duke-NUS Medical School, which will conduct pre-clinical evaluation of existing host-directed therapies (HDTs), including a compound identified by BenevolentAI’s artificial intelligence-driven drug discovery platform. With the nomination of DAA and HDT candidates expected in 2024, DNDi and partners also advanced preparations for clinical trials and initiated discussions with potential partners on integrating novel DAAs and HDTs into dengue treatment strategies alongside repurposed drugs.

Overcoming knowledge gaps to inform the global response

To help inform strategy and the design of clinical trials, DNDi joined with research partners on three continents in 2023 to initiate observational research studies to investigate disease characteristics and severity as well as healthcare-seeking behaviour in hospitals and outpatient facilities. Study results from Brazil, Burkina Faso, and India will help build evidence of patients’ experience of severe complications, knowledge of dengue warning

signs, motivations for seeking medical care, and other factors critical to developing treatments adapted to patients’ needs.

Although dengue has been reported in 34 African countries, its burden on the continent is unclear and reported case numbers are unlikely to represent true infection rates. New data on the prevalence of dengue in African countries is urgently needed to enable informed decision-making on the cost-effective use of vaccine and vector control strategies and future treatments.

Together with Imperial College London and our research partners in Africa, DNDi neared completion of a first-of-its-kind assessment of the prevalence of dengue in Senegal, the Democratic Republic of the Congo, and Ghana. Known as SERODEN, the retrospective study involves analysing blood samples from previous studies to determine the burden of dengue and several other arboviruses to enable global, regional, and country-level decision-making around prevention, treatment, and control. By December 2023, laboratory analyses of samples from the three countries were completed. The findings and a review of scientific literature from 2014-2023 will be used to generate new data on the global burden of disease, inform dengue strategies, and model their potential impact.