

Snakebite—emerging from the shadows of neglect

Every year, snakebites kill between 81 000 and 138 000 people and cause long-lasting disabilities in another 400 000 people. This disease burden is likely to be an underestimate given snakebite is rarely notifiable, and many bites and deaths go unrecorded. The burden of snakebite death and disability is equal to that of prostate or cervical cancer, and is greater than any other neglected tropical disease. Yet investment into snakebite has been just £30 million between 2008 and 2017, with limited research, stagnating development of treatments, and declining access to antivenoms in many countries.

Antivenom designed to treat one snake species rarely works against another, and has been developed against only about 60% of the world's venomous snakes. Less than half the antivenom needed is currently produced worldwide, and many are ineffective, unaffordable, inaccessible, or cause serious side-effects. With prompt access to the right antivenom, snakebite is rarely fatal, but in countries without strong health systems and without antivenom stockpiles, every 5 mins someone dies of snakebite and another four people will be permanently disabled. Despite antivenom being on WHO's Essential Medicines List, few African governments provide or subsidise antivenom. Most often, it is agricultural workers, women, and children living in poor, rural, and remote areas of Africa, Asia, and South America who are exposed to venomous snakes but have little or no access to health-care facilities. The breadwinners of families—coconut pickers, rice farmers, animal herders—are most at risk. Survivors are often left disfigured, destitute, and stigmatised.

In 2017, snakebite envenoming was classified by WHO as a high-priority neglected tropical disease, and in May, 2018, WHO formally resolved to combat snakebite. Last week, on May 23, at the World Health Assembly, WHO launched its roadmap, which aims to halve death and disability from snakebite by 2030. The strategy focuses on prevention of snakebite; provision of safe and effective treatment; strengthening health systems; and increased partnerships, coordination, and resources. Community education is key to prevent bites and to encourage seeking early and appropriate treatment. Accelerating development of antivenom, stockpiling antivenoms, and stabilising the market for snakebite treatments are also important.

Working closely with WHO, on May 16, Wellcome launched a new £80 million programme for snakebite,

aiming to transform research to produce effective, safe, and accessible treatments for all. Over the next seven years, Wellcome commits to work with producers to make antivenoms better, safer, and cheaper; to jumpstart the development of innovative treatments tested in clinical trials; to build policy and regulatory systems that get treatments to patients; and to build and sustain snakebite as a global health priority. Wellcome will work with partners from across regions to establish an Antivenom Research Accelerator, which will include a clinical trial platform, enable testing of antivenoms and other potential treatments, and will align with an existing WHO prequalification process.

On May 17, funding for a global research consortium, the Scientific Research Partnership for Neglected Tropical Snakebite, was announced. £9 million will be given by the UK's Department for International Development over 3 years to support the consortium, which involves researchers in the UK, Nigeria, Kenya, India, and the USA. The aim is to develop novel monoclonal antibody therapies for snakebite envenoming in India and Africa, and cross-neutralising antibodies that can be used in a wide variety of snake envenomings.

Alternative approaches to monoclonal antibodies include small molecular inhibitors, such as the phospholipase inhibitor varespladib, which has shown some preclinical efficacy in neutralising venom lethality. Combating snake venom metalloproteinases might offer another route to preventing haemorrhage and coagulopathy after snakebite.

With its triad of high mortality, marked disability, and substantial psychological morbidity, snakebite warrants major investment in research. In June, 2018, shortly before his death, Kofi Annan wrote that snakebite is "the biggest public health crisis you have likely never heard of". After decades of relative neglect, snakebite is now firmly on the global health agenda. With a strategy and substantial funding now in place, the stage is set. Will all actors play their parts? Testing and then implementing WHO's strategy requires long-term commitment by governments of countries with a high burden of snakebite envenoming, in addition to further investment by donors. Only then will snakebite victims, who are often the poorest of the poor, have a better chance of survival. ■ *The Lancet*



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For more on the burden of snakebite envenoming see *Articles Lancet* 2018; 392: 673–84

For WHO's snakebite strategy see <https://www.who.int/snakebites/resources/9789241515641/en/>

For the *Comment on WHO's snakebite strategy* see *Online/Comment Lancet Glob Health* [http://dx.doi.org/10.1016/S2214-109X\(19\)30225-6/fulltext](http://dx.doi.org/10.1016/S2214-109X(19)30225-6/fulltext)

For the *podcast on WHO's snakebite strategy* see <https://www.thelancet.com/doi/story/10.1016/audio.2019.05.23.107864#.XOaUDudRWdl.twitter>

For the *Wellcome announcement* see <https://wellcome.ac.uk/what-we-do/our-work/snakebites>

For more on *SRPNTS* see <https://www.lstmed.ac.uk/news-events/news/iavi-and-liverpool-school-of-tropical-medicine-to-partner-in-scientific-0>