

Reducing suffering, disability and death caused by snakebite envenoming

Recommendations for the WHO, governments and donors

Background

Médecins Sans Frontières (MSF) witnesses the devastating impact that snakebites have on victims and their families and communities in many of the places we work. In hospitals in countries such as Ethiopia, South Sudan, Central African Republic and Yemen, MSF treats several thousand victims of snakebite annually. Worldwide, snakebite envenoming kills an estimated 100,000 people every year,¹ making it one of the deadliest neglected tropical diseases (NTDs).

MSF strongly welcomed the WHO's classification of snakebite as a highest priority NTD in June 2017 and welcomes the inclusion of NTDs as a priority in the WHO Draft thirteenth general programme of work. Rapid improvements in the prevention and treatment of snakebite and other high-burden NTDs are essential to achieving the Sustainable Development Goal (SDG) 3.8 universal health coverage (UHC) target and ensuring the health and well-being of the world's poorest and most vulnerable people.

MSF also welcomes the adoption of resolution WHA71.5 on 'Addressing the burden of snakebite envenoming' by 194 countries at the 71st World Health Assembly in May 2018. This resolution should provide a strong mandate for the WHO Secretariat to implement an ambitious roadmap that mobilises governments and donors to respond to snakebite with the urgency and attention this neglected public health crisis demands.

Multiple factors contribute to the neglect of snakebite envenoming. Improving the availability of antivenoms - the only validated treatment for the disease - requires a multicomponent response.² **MSF would like to highlight six of the key actions that the WHO Secretariat, governments and donors should take to protect people's health and reduce the suffering, disability and death that result from this preventable disease.**

Addressing snakebite and saving lives: summary of MSF recommendations

1. Governments and donors must increase resources against snakebite envenoming, especially through pledging funds for the WHO roadmap.
2. Access to quality antivenom products must be improved:
 - a) The WHO Secretariat must intensify work to control the quality of antivenom products, including the allocation of additional resources for quality assessment by the WHO Prequalification Programme. In 2015, the Programme began assessing antivenom products intended for use in sub-Saharan Africa, with financial support from MSF. However, adequate and sustainable funding must be allocated to ensure access to safe, effective treatment for snakebite victims in all highly endemic regions.
 - b) Governments must adapt their procurement policies to the recommendations and listings of the WHO Prequalification Programme, and to phase out products that have not been listed.

3. The WHO Secretariat and governments should work swiftly to develop an international financing mechanism that subsidises procurement and supply of antivenoms to make them available free-of-charge for victims, or at a price all can afford. A person's inability to pay for quality snakebite treatment should not have deadly and disabling consequences.
4. Global health R&D funders should prioritise the development of new and better tools against snakebite envenoming, and ensure they are affordable and accessible to those who need them.
5. Governments of countries with high burdens of snakebite should incorporate specific courses on snakebite envenoming management and prevention in their medical and paramedical curricula, and invest in community awareness and prevention programmes.
6. Governments should implement epidemiological studies to explore the true incidence and distribution of snakebite. Furthermore, MSF urges the WHO Secretariat and governments to seek to estimate the number and proportion of victims that currently receive appropriate care and treatment, so that appropriate targets for treatment coverage can be agreed.

MSF recommendations: in more detail

1. Provide adequate financing for the WHO roadmap on snakebite envenoming

The WHO Secretariat has established a working group on snakebite envenoming to develop a roadmap for preventing and controlling the disease. The domestic resources and international funding that governments and donors currently allocate to the global response against snakebite are insufficient. As detailed below, financing of snakebite care and treatment predominantly relies on the out-of-pocket expenditure of victims themselves. Scale-up of effective interventions to address the global burden of disease will require increased funding and resources. The WHO will be holding a stakeholder meeting for fundraising and resource mobilisation to meet these needs.

MSF urges governments and donors to increase resources against snakebite envenoming, especially through pledging funds for the WHO roadmap.

2. Improve access to quality antivenom products

Prompt treatment with quality antivenom dramatically reduces the risk of mortality from snakebite envenoming, especially when accompanied by supportive care, including assisted ventilation for victims suffering from neurotoxic envenoming.

Antivenom products are prepared with the venoms of snake species found in specific geographical regions. As a result, many different products exist globally, and it is critical to ensure appropriate antivenoms are available in a given region. As antivenom products are preparations derived from animal plasma, there is a risk of adverse reactions if products are not optimally purified.

In certain markets, antivenoms of substandard quality are found. For example, the unscrupulous marketing of geographically inappropriate antivenoms in sub-Saharan Africa has been documented on many occasions.³ Quality products have also been withdrawn from the market,⁴ which has led to an antivenom supply crisis in Africa.⁵ In South Asia, the quality of the venoms used to prepare antivenoms needs to be improved in order to increase the potency of the antivenoms.⁶

Systematic improvements are needed to ensure that efficient referral systems are in place to make quality antivenoms accessible for emergency cases. As a medical emergency, successful snakebite treatment requires

prompt referral and functioning ambulance services available close to where victims are bitten. In Paoua, Central African Republic, three-quarters of victims are admitted to the MSF hospital less than 12 hours after being bitten, which significantly reduces risk of mortality.

MSF urges the WHO Secretariat to intensify work to control the quality of antivenom products, including the allocation of additional resources for quality assessment by the WHO Prequalification Programme. In 2015, the Programme began assessing antivenom products intended for use in sub-Saharan Africa, with financial support from MSF. However, adequate and sustainable funding must be allocated to ensure access to safe, effective treatment for snakebite victims in all highly endemic regions.

Furthermore, MSF urges governments to adapt their procurement policies to the recommendations and listings of the WHO Prequalification Programme, and to phase out products that have not been listed.

3. Eliminate or dramatically reduce out-of-pocket expenditure for snakebite victims

Out-of-pocket expenses for antivenom treatment are often a matter of life and death for snakebite victims, the vast majority of whom live in rural communities in the developing world and have limited financial resources.

In settings where out-of-pocket payments are required to access quality treatment, people often avoid or delay seeking care for lack of resources alone. Other victims are unable to pay for all of the doses of antivenom required for successful treatment. Conversely, in settings where communities know treatment is available free of charge, such as in MSF hospitals, victims are far more likely to promptly seek treatment and care, and have a far greater chance of recovery and survival.

A person's inability to pay for quality snakebite treatment should not have deadly and disabling consequences. MSF urges the WHO Secretariat and governments to work swiftly to develop an international financing mechanism for procurement and supply of affordable, quality-assured antivenoms. Procurement and supply of these lifesaving essential medicines should be subsidised by governments and/or donors so that they are available free-of-charge for snakebite victims, or at a price that all victims can afford.

4. Support research and development (R&D) for affordable, quality treatment and diagnostic tools

There is now a promising R&D agenda for snakebite. The rapid development of proteomics (the study of proteins) is leading to critical improvements in venom characterisation. This paves the way for the development of new treatments – such as monoclonal antibodies and oral medications – that are safer, more effective and easier to administer, and that can either complement or replace conventional antivenom therapy. Rapid diagnostic tests for identification of the snake species that bite patients are also being evaluated. A robust global response that ensures access to quality snakebite treatment will also provide market incentives to encourage the development of novel tools against snakebite.

MSF urges global health R&D funders to prioritise the development of new and better tools against snakebite envenoming, and to ensure they are affordable and accessible to those who need them.

5. Improve training for healthcare professionals and community awareness of snakebite first aid and prevention

There is a lack of trained healthcare professionals able to respond to snakebite. The vast majority of victims live in rural settings, where shortages of trained healthcare workers are most acute. Training courses should be organised at national and regional levels for frontline health workers, and be adapted to the snake species and clinical presentations that are found locally.

Health promotion also has a major role to play: Improving community awareness of snakebite first aid measures and prevention tools (such as flashlights and boots) can have a significant and durable impact on snakebite mortality and morbidity.⁷

MSF urges governments of countries with high burdens of snakebite to incorporate specific courses on snakebite envenoming management and prevention in their medical and paramedical curricula, and to invest in community awareness and prevention programmes.

6. Improve epidemiological data on snakebite

There is a striking absence of reliable epidemiological data on snakebite. Large disparities between the number of cases reported in health facility records and the true magnitude of the problem result from the high proportion of victims who do not seek treatment in formal healthcare settings. Community retrospective surveys, in particular, are critical for identifying the most affected areas and distributing antivenoms accordingly.

MSF urges governments to implement epidemiological studies to explore the true incidence and distribution of snakebite. Furthermore, MSF urges the WHO Secretariat and governments to seek to estimate the number and proportion of victims that currently receive appropriate care and treatment, so that appropriate targets for treatment coverage can be agreed.

¹ Gutiérrez JM, Calvete JJ, Habib AG, et al. Snakebite envenoming. *Nat Rev Dis Primers*. [Online]. 2017 Oct [Cited 2017 Dec 19]; 5;3:17079. Available from: <https://www.nature.com/articles/nrdp201779>.

² Gutiérrez JM, Burnouf T, Harrison RA, et al. A multicomponent strategy to improve the availability of antivenom for treating snakebite envenoming. *Bull World Health Organ*. [Online]. 2014 Jul [Cited 2017 Dec 19]; 1;92(7):526-32. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/25110378>.

³ Warrell DA. Unscrupulous marketing of snake bite antivenoms in Africa and Papua New Guinea: choosing the right product—'what's in a name?'. *Trans R Soc Trop Med Hyg*. [Online]. 2008 May [Cited 2017 Dec 19]. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/18359053>.

⁴ MSF. How Sanofi slithered its way out of the neglected antivenom market. [Online]. 2015 Jul [Cited 2017 Dec 19]. Available from: <https://www.msfaaccess.org/content/sanofi-out-of-neglected-antivenom-market>.

⁵ Brown NI. Consequences of neglect: analysis of the sub-Saharan African snake antivenom market and the global context. *PLoS Negl Trop Dis*. [Online]. 2012 Jun 5 [Cited 2017 Dec 19];6(6):e1670. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/22679521>.

⁶ Whitaker R, Whitaker S. Venom, antivenom production and the medically important snakes of India. *Current Science*. [Online]. 2012 Sep 25 [Cited 2017 Dec 19]; 103;6: 635-643. Available from: <http://www.jstor.org/stable/24088795>.

⁷ Gutiérrez JM, Calvete JJ, Habib AG, et al. Snakebite envenoming. *Nat Rev Dis Primers*. [Online]. 2017 Oct [Cited 2017 Dec 19]; 5;3:17079. Available from: <https://www.nature.com/articles/nrdp201779>.