



**Stop Preventable Deaths and Sufferings from Snakebites by
Improving the Availability of Antivenom in high-risk areas**

Key messages

- **Snakebite envenoming (SBE) is associated with significant morbidity and mortality and a cause of disabilities such as amputation, chronic pain, and blindness, which contribute to poverty.**
- **In Tanzania, each year, around 106 out of 100,000 people are bitten by snakes**
- **Use of antivenom can effectively treat SBE, increase rates of survival, and reduce complications.**
- **There is inadequate availability of antivenom in areas where it is most needed due to low purchase, inconsistent supply, high cost, and lack of equity in distribution of antivenom.**
- **This policy brief offers policy options to improve the availability of antivenom in areas in need by improving the availability of epidemiological information on SBE, procurement and distribution of adequate antivenom in the needy areas and improving accessibility and affordability of antivenom.**

Background

Snakebite envenoming (SBE) represents an important but neglected public health problem in many developing countries in sub-tropical and tropical regions. SBE causes significant morbidity and mortality and contributes to disability and poverty. Its long-term disabilities include amputation, deformity, blindness, and mental health issues like anxiety and post-traumatic stress disorders. The global burden of SBE is largely underestimated, partly due to the overreliance on health facility-based data and the lack of community-based data, owing to the fact that many patients receive care from traditional healers in their communities before seeking out medical care. Global data shows, each year 1.2–5.5 million snakebites occur worldwide, resulting in 841,000 envenomings and 94,000 deaths. In sub-Saharan Africa, it is estimated

that 314,078 envenoming snakebites occur each year, including 7,331 deaths; however, these figures are 3-5 times lower than the true burden of SBE in the region. Like in many countries in Africa, the true burden of SBE in Tanzania remains unknown. The current study estimates there are about 106 snakebites and 3 deaths per 100,000 people in a year.

Antivenom is the main effective treatment for SBE. It prevents deaths, improves survival, and reduces long-term disabilities and complications. However, antivenom is not widely available, especially in areas where it is most needed. Moreover, it is estimated that less than 10% of patients who are bitten by snakes in sub-Saharan Africa receive appropriate treatment, including antivenom. This observation was replicated in the recent study in Tanzania that assessed the burden of

SBE and found that only 7% of the snakebite victims received antivenom. Even when antivenom is available, the price, which ranges from TZS 160,000 to TZS 257,000 per vial, can place an already impoverished family under serious financial burden. Envenoming patients may occasionally need 2-4 vials of antivenom. Poor forecasting, inadequate procurement, inconsistent supply, high cost, and absence of equity in antivenom distribution are some of the contributing factors to the shortage of antivenom in Tanzania.

Policy options and implementation considerations

The Tanzanian government should improve antivenom procurement, delivery, and pricing in order to increase antivenom availability, particularly in places where it is most required. To realize these, we are proposing the following policy options:

1. Improve the availability of epidemiological information on SBE.

Ensure documentation and reporting of SBE in healthcare settings is correct and complete. Second, introduce a separate variable to capture snakebite data separately in HIMs tools (MTUHA registers), since currently snakebite data is combined with insect bites. In addition, introduce a community-based register to record and report snakebite cases that do not seek care at medical facilities. Moreover, funds should be allocated to support epidemiological research to determine the burden of SBE and mapping the snakebite-endemic areas. This information will inform the market size (demands), forecasting, and distribution of antivenom. This option is highly

feasible as its implementation can leverage the existing health information management systems in health facilities. In addition, the wider networks of community health workers and traditional healers that provide care to snakebite victims should be involved in implementing the recording and reporting of snakebite cases in the community.

2. Improve procurement and distribution of adequate antivenom in the need areas

The government should allocate funds to procure and distribute adequate antivenom, especially in SBE-endemic areas. The private sector, including faith-based hospitals and pharmacies, should be empowered and fully involved in the procurement and

distribution of antivenom. Snakebite endemic areas in remote and hard-to-reach areas should be prioritized during the distribution of antivenom. This will increase the availability of the antivenom and benefit those in need. Implementation of this option will require additional funding to meet the need. However, increasing distribution of antivenom to needy areas should leverage the existing logistics and cold chain supply management systems used in vaccination and other health commodities.

3. Improve accessibility and affordability of antivenom.

The government should include antivenom as one of the essential medicines. Subsidies for antivenom should be

introduced. In addition, National Health Insurance Fund (NIHF) should include antivenom as one of its benefit packages. These strategies will contribute to improving the accessibility and affordability of antivenom, especially for needy SBE victims who are poor. Implementation of this option will require additional funding for sustainability. However, the policy option resonates with the ongoing efforts to ensure health insurance for all,

and ultimately meets the goal of universal health coverage.

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References

1. Gutiérrez JM, Burnouf T, Harrison RA, Calvete JJ, Kuch U, Warrell DA, et al. A multicomponent strategy to improve the availability of antivenom for treating snakebite envenoming. *Bull World Health Organ*. 2014;92(7):526–32.
2. Chippaux JP. Estimate of the burden of snakebites in sub-Saharan Africa: a meta-analytic approach. *Toxicon*. 2011 Mar 15;57(4):586-99. doi: 10.1016/j.toxicon.2010.12.022. Epub 2011 Jan 9. PMID: 21223975.
3. NIMR-Dodoma Medical Research Centre. Determining Burden of Snakebite Envenoming and Quantifying supply of Antivenom in Tanzania. Research Report, 2022
4. Potet J, Beran D, Ray N, Alcoba G, Habib AG, Iliyasu G, et al. Access to antivenoms in the developing world: A multidisciplinary analysis. *Toxicon X*. 2021;12(April).
5. Dalhat MM, Potet J, Mohammed A, Chotun N, Tesfahunei HA, Habib AG. Availability, accessibility and use of antivenom for snakebite envenomation in Africa with proposed strategies to overcome the limitations. *Toxicon X* [Internet]. 2023;18(February):100152. Available from <https://doi.org/10.1016/j.toxcx.2023.100152>
6. Matafwali SK, Vlahakis PA, Daka V, Witika BA, Nyirenda HT, Chisompola NK, et al. Assessment of the availability of snakebite antivenom in health facilities in Ndola District, Zambia: a cross-sectional study. *Trans R Soc Trop Med Hyg*. 2022;116(6):592–4.
7. Scheske L, Ruitenberg J, Bissumbhar B. Needs and availability of snake antivenoms: Relevance and application of international guidelines. *Int J Heal Policy Manag* [Internet]. 2015;4(7):447–57. Available from: <http://dx.doi.org/10.15171/ijhpm.2015.75>

