



The Global
Snakebite
Taskforce

PILLAR B

Access & Regulation

From Lottery to Lifeline

**A Solvable Crisis: The Global Investment
Case to End Snakebite Deaths and Disabilities**
A Four-Pillar Framework for Strategic Action by
Governments, Funders, and Global Health Partners



Access & Regulation From Lottery to Lifeline

This brief outlines how strengthening production, regulation, and procurement can turn antivenom from an unreliable commodity into a predictable, life-saving public good – supported by technical standards from the World Health Organization and regional regulators.

The Heavy Global Burden of Snakebite Envenoming

Too many snakebite victims die or suffer permanent disability because quality antivenom is unavailable, unaffordable, or unsafe. Strategic investments can stabilise supply, secure quality, and ensure every patient has a fair chance at survival.

Each year, an estimated **5.4 million people** suffer snakebites, resulting in **1.8–2.7 million envenomings** and **81,000–138,000 deaths** globally.¹ A further 400,000 individuals suffer lifelong injuries. These figures likely underestimate the true burden because of incomplete reporting, reliance on informal care systems, and the absence of comprehensive surveillance in many high-incidence regions.²

Snakebite disproportionately affects **rural, low-income communities** in Low- and Middle-Income Countries (LMICs), particularly those engaged in agricultural labour, seasonal fieldwork, or daily tasks that increase human–snake conflict.

Investing in snakebite response is not only a humanitarian imperative. It is a test case for global equity, resilience, and the future of Universal Health Coverage.

// The biggest public health crisis you have never heard of. //

Kofi Annan, Former United Nations Secretary General

The Heavy Human and Economic Burden

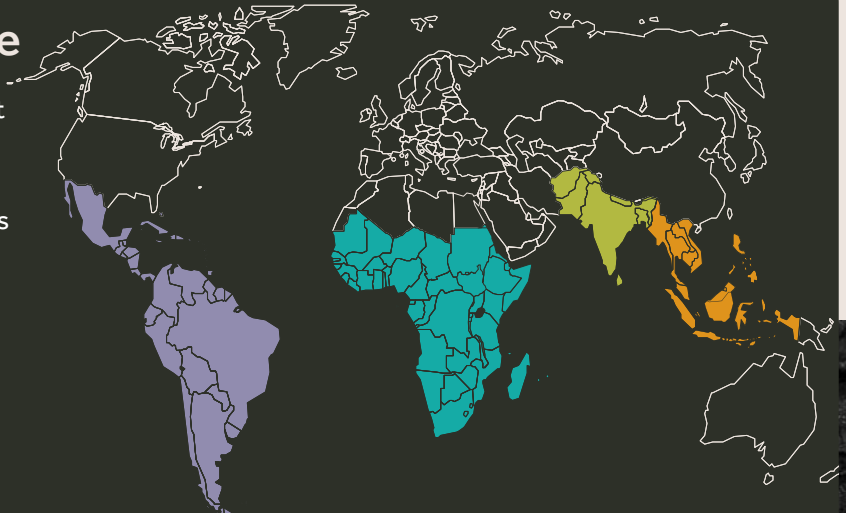
- **Death:** **138,000 deaths per annum** and this figure is undoubtedly underreported.
- **Severe Disability:** For every snakebite death, up to four survivors experience permanent disabilities such as amputations, contractures, blindness, or chronic neurological injury.³ Snakebite accounts for **up to 400,000 long-term disabilities** each year and more than **1 million Disability-Life Adjusted Years (DALYs)** across Africa and Asia.⁴
- **Mental Health Impacts:** Between **25-54%** of survivors show major depressive symptoms, and up to **43%** experience PTSD – yet these impacts rarely inform policy, planning or practice.⁵
- **Who Suffers Most:** Rural families, farmers, herders, seasonal labourers, women, and children in regions where poverty, climate change, and weak health systems intersect.
- **Economic Consequences:** Snakebite drives catastrophic expenditure, reduces household productivity, and strips assets – fuelling entrenched cycles of rural poverty and inflicting significant cost to national economies and health budgets.⁶

Why Snakebite Is Solvable

- **Proven tools already exist:** Antivenoms, supportive care, prevention, and trained clinical staff can dramatically reduce preventable mortality and life-changing injuries.
- **Science is advancing rapidly:** High throughput venom analyses, recombinant antibody technologies, repurposed small molecule inhibitors, and improved diagnostics provide unprecedented opportunities for innovation.
- **The route to impact is clear and investment pathways exist,** spanning R&D, access to quality antivenoms, public health systems, and market stability.
- **Advocacy builds alignment,** strengthens policy coherence, and mobilises multisectoral action.
- **Partnerships unlock financing,** accelerate technology adoption, and coordinate regulatory and manufacturing reforms.

Geography at a Glance

- **South Asia:** India alone may account for **up to 58,000 deaths annually.**⁷
- **South-East Asia:** Around **250,000 bites** and circa **16,000 deaths** across ASEAN countries.⁸
- **Sub-Saharan Africa:** Thousands of deaths each year, with 16 countries exceeding **4,500 deaths combined** annually.⁹
- **Latin America:** High burden in Brazil and other forested or rural agricultural regions.¹⁰



Antivenom Access & Regulation Cascade

VENOM SOURCING & IMMUNISATION
Venom banks, animal immunisation

- Limited standardisation
- Low Quality Assurance
- Inconsistent supply
- Investment in regulated venom banks
- Harmonised immunisation

PRODUCTION & PURIFICATION
Serum or recombinant platforms

- Suboptimal serum production methods
- Variability in quality
- Modernised purification
- Tech transfer
- Scaling

QUALITY ASSURANCE
GMP, stability, batch consistency

- Good Manufacturing Practice (GMP) gaps
- Inconsistent potency
- Variable stability
- Upgraded facilities
- Regional Quality Assurance labs

REGULATION & WHO PRE-QUALIFICATION
SRAs, harmonisation, PQ-ready


- Incomplete dossiers
- Fragmented national regulation
- Harmonised regional reviews
- WHO Pre-qualification support
- Expedited regulatory pathways


POOLED PROCUREMENT & DISTRIBUTION
Volume guarantees, national tenders

- Fragmented tenders
- Unpredictable orders
- Unstable prices
- Pooled procurement
- Long-term contracting
- Lower price

AVAILABILITY AT POINT OF CARE
Stock management, affordability

- Frequent stock-outs
- High out-of-pocket costs
- Zero stock-out systems
- Universal Health Care inclusion

 Current bottlenecks

 Where investment unlocks impact

Quality assurance and regional supply make lifesaving antivenom reliably accessible to every patient.

The Failures Access Fixes

The global antivenom market is fragile, fragmented, and underregulated:

- Supply is inconsistent and vulnerable to collapse.¹¹
- Quality varies widely between manufacturers.
- Stock-outs are common in hospitals and treatment centres.
- Prices are unpredictable and often unaffordable for the families of victims.

Clinicians lose confidence when faced with inconsistent products, leading to delayed or withheld treatment and further preventable mortality.

What Investment Enables

- **Regional Quality-Assured Manufacturing:** Facilities in LMICs producing high-quality antivenoms with predictable potency.
- **Stronger Regulation and Harmonisation:** Aligned standards for safety, efficacy, and quality assurance.
- **Pooled Procurement and Long-Term Contracts:** Stabilising prices and ensuring reliable forecasting.
- **Next Generation Distribution Systems:** Reducing delays and enabling equitable access to rural facilities.

Headline Impact

- Effective antivenom administration can reduce case fatality significantly when quality and availability are ensured.¹²
- Quality assurance eliminates unsafe or ineffective products from national markets.
- Predictable pricing protects from catastrophic health expenditure for the households of victims and healthcare systems.
- Effective antivenom can reduce case fatality substantially when available and administered in time.

Illustrative 10-Year Scenario

Sustained investment in access and regulatory infrastructure, would deliver:

- Regional production and/or fill-finish facilities producing WHO-quality compliant antivenom for priority species.
- Dramatic reductions in stock-outs in high-burden countries.
- Pooled procurement lowers prices and stabilises markets.
- Increased clinician confidence leading to earlier and more appropriate treatment.

**SNAKEBITE IS PREVENTABLE.
DISABILITY IS AVOIDABLE.
DEATH IS NOT INEVITABLE.**

A reliable, affordable, high-quality supply of antivenom transforms survival, equity, and trust in health systems – turning snakebite treatment from fatal lottery into a predictable lifeline.

CASE EXAMPLE 1

Snakebite-Focused: Market Restoration

Field and clinical evidence shows that substituting ineffective antivenoms with proven-effective, quality-assured products can markedly improve outcomes; conversely, introduction of ineffective antivenoms has been associated with sharp increases in case fatality (e.g., Nigeria: 1.8% to 12.1% mortality; Chad: 2.3% to 15.3%).^{13,14}

Investment estimates to secure consistent access to effective antivenom in Sub-Saharan Africa are modest relative to many global health programmes – on the order of **USD 30–50 million annually** – yet chronic underinvestment and weak Quality Assured procurement enables circulation of ineffective products.¹⁵

CASE EXAMPLE 2

Analogous Global Health Success: Vaccines and Antiretrovirals

Experience from pooled procurement in immunisation and HIV treatment suggests that antivenom markets could be stabilised with a comparatively modest but well-structured investment.^{16,17,18} Aggregating national demand into a pooled annual procurement volume of approximately USD 30–50 million, underpinned by 3–5-year framework contracts with quality-assured manufacturers, would provide the predictability required to improve supply reliability and pricing.^{19,20,21} Analysis suggests that a catalytic facility of roughly **USD 70–120 million** over five to seven years– combining volume guarantees, working capital, and regulatory and quality-assurance support– would enable de-risking of production and professionalise the market, consistent with market-shaping approaches used in vaccines, HIV medicines, and outbreak biologics.^{22,23,24,25}

This approach mirrors the market-shaping logic successfully applied in vaccines, HIV medicines, and outbreak biologics, while remaining proportionate to the scale of the antivenom market. The snakebite envenoming market requires the discipline of antiretrovirals but not the scale.

PROOF POINTS

What the evidence shows:

- **WHO's Pre-qualification and regulatory harmonisation improve quality and predictability of supply** increasing clinician confidence and treatment uptake.
- **Predictable and/or pooled procurement enables sustainable manufacturer business models** that reduce price and stabilise markets.²⁶
- **Regional manufacturing shortens supply chains, reduces supply vulnerability, and improves health sovereignty.**



What You Can Do Now

Governments

- Centralise and professionalise procurement.
- Remove tariffs, strengthen regulatory oversight, and develop efficient regulatory approval tracks for high quality products.
- Integrate antivenom into Universal Health Coverage benefit packages.
- Commit to zero stock-outs at district hospitals.

Foundations & Philanthropists

- Fund Quality Assurance systems, regulatory strengthening, and post-market pharmacovigilance.
- Support catalytic strategic stockpiles and buffer funds.
- Invest in volume guarantees for priority products.

Multilateral Development Banks & Global Agencies

- Finance capital upgrades for regional manufacturing and fill-finish facilities.
- Integrate antivenom supply chains into health-system investments including embedding antivenom into essential health benefit package.
- Support pooled procurement platforms and long-term contracting mechanisms.

Private Investors, Industry & Social Enterprise

- Co-invest in platform biotech with SBE-relevant Intellectual Property.
- Engage in milestone-based financing and early procurement commitments.
- Partner with LMIC manufacturers on technology transfer.

Strengthening regulation and regional production transforms antivenom from an unreliable commodity into a predictable, life-saving public good.

ENDNOTES

- 1 Kasturiratne, A. et al. (2008). *The global burden of snakebite: A literature analysis and modelling based on regional estimates of envenoming and deaths*. PLOS Medicine.
- 2 Chippaux, J.-P. (2011). *Estimate of the burden of snakebites in sub-Saharan Africa: A meta-analytic approach*. Toxicon.
- 3 Vaiyapuri, S. et al. (2015). *Snakebite and its socio-economic impact on the rural population of Tamil Nadu, India*. PLOS One.
- 4 Longbottom, J. et al. (2018). *Vulnerable populations: DALYs lost to snakebite*. Nature Communications.
- 5 Williams, D. J. et al. (2011). *Psychological trauma following snakebite*. Wilderness & Environmental Medicine.
- 6 Harrison, R. A. et al. (2009). *Snake envenoming: A disease of poverty*. Transactions of the Royal Society of Tropical Medicine & Hygiene.
- 7 Suraweera, W. et al. (2020). *Trends in snakebite mortality in India*. eLife.
- 8 ASEAN Biodiversity Centre (2019). *Snakebite incidence in ASEAN member states*.
- 9 Habib, A. G. et al. (2015). *Snakebite epidemiology in Africa: The challenge of filling data gaps*. African Journal of Emergency Medicine.
- 10 de Oliveira, S. S. et al. (2018). *Snakebites in Brazil: A national epidemiological profile*. Revista Panamericana de Salud Pública.
- 11 Gutiérrez, J. M. et al. (2017). *Challenges in improving antivenom quality*. Biologicals.
- 12 Gutiérrez, J. M. et al. (2015). *Efficacy of antivenom therapy*. Toxicon.
- 13 Visser LE, Kyei-Faried S, Belcher DW, Geelhoed DW, van Leeuwen JS, van Roosmalen J. *Failure of a new antivenom to treat Echis ocellatus snake bite in rural Ghana: the importance of quality surveillance*. Trans R Soc Trop Med Hyg. 2008 May;102(5):445-50. doi: 10.1016/j.trstmh.2007.11.006. Epub 2008 Jan 10. PMID: 18190937.
- 14 BMJ Editorial (2015) *Snake bite: a global failure to act*. *Vulnerable populations need urgent access to effective and affordable treatments*. BMJ 2015;351:h5378 2015 Nov 07, https://www.bmj.com/bmj/section-pdf/908594?path=%2Fbmj%2F351%2F8032%2FThis_Week.full.pdf&utm_source
- 15 Habib AG, Musa BM, Iliyasu G, Hamza M, Kuznik A, Chippaux J-P (2020) *Challenges and prospects of snake antivenom supply in sub-Saharan Africa*. PLoS Negl Trop Dis 14(8): e0008374. <https://doi.org/10.1371/journal.pntd.0008374>
- 16 Parmaksiz, K., Pisani, E., Bal, R., & Kok, M. O. (2022). *A systematic review of pooled procurement of medicines and vaccines: Identifying elements of success*. Globalization and Health, 18, 59. <https://doi.org/10.1186/s12992-022-00847-z>
- 17 Global Fund to Fight AIDS, Tuberculosis and Malaria. (2018). *New agreements with HIV drug suppliers to save US\$324 million*. <https://www.theglobalfund.org/en/news/2018/2018-07-16-new-agreements-with-hiv-drug-suppliers-to-save-usd324-million/>
- 18 UNICEF Supply Division. (2024). *UNICEF Supply Annual Report 2024*. <https://www.unicef.org/supply/reports/unicef-supply-annual-report-2024>
- 19 Brown, N. I. (2012). *Analysis of the sub-Saharan African snake antivenom market and the global context*. PLOS Neglected Tropical Diseases, 6(6), e1670. <https://doi.org/10.1371/journal.pntd.0001670>
- 20 Habib, A. G., Musa, B. M., Iliyasu, G., Hamza, M., Kuznik, A., & Chippaux, J.-P. (2020). *Challenges and prospects of snake antivenom supply in sub-Saharan Africa*. PLOS Neglected Tropical Diseases, 14(8), e0008374. <https://doi.org/10.1371/journal.pntd.0008374>
- 21 Global Fund to Fight AIDS, Tuberculosis and Malaria. (n.d.). *Pooled Procurement Mechanism (PPM): Sourcing and supply management*. <https://www.theglobalfund.org/en/sourcing-management/>
- 22 Cernuschi T, Furrer E, Schwalbe N, Jones A, Berndt ER, McAdams S. *Advance market commitment for pneumococcal vaccines: putting theory into practice*. Bull World Health Organ. 2011 Dec 1;89(12):913-8. doi: 10.2471/BLT.11.087700. Epub 2011 Oct 7. PMID: 22271949; PMCID: PMC3260895.
- 23 Gavi, the Vaccine Alliance. (2025). *How the pneumococcal AMC works*. <https://www.gavi.org/investing-gavi/innovative-financing/pneumococcal-amc>.
- 24 Policy Cures Research. (2021). *Neglected disease research and development: Where to now? (G-FINDER Report)*. https://policy-cures-website-assets.s3.ap-southeast-2.amazonaws.com/wp-content/uploads/2021/04/15055816/G-FINDER-2020_Final-Report.pdf
- 25 Médecins Sans Frontières Access Campaign. (2023). *Ensuring Access to New Treatments for Ebola Virus Disease*. <https://msfaccess.org/ensuring-access-new-treatments-ebola-virus-diseases-for-outbreak>
- 26 Houben, R. et al. (2020). *Market shaping for essential medicines*. Global Health Supply Chain Review.



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For more information on the Global Snakebite Taskforce go to:
www.linkedin.com/company/strike-out-snakebite-sos/

In support of the nation state endorsed WHO Snakebite Envenoming Strategy

