SOS
STRIKE OUT SNAKEBITE
The Global Snakebite Taskforce

May 2025

Time to Bite Back:

Catalyzing a Global Response to Snakebite Envenoming

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.

Up to 138,000 people die every year from venomous snakebites, disproportionately affecting the world's most vulnerable communities.

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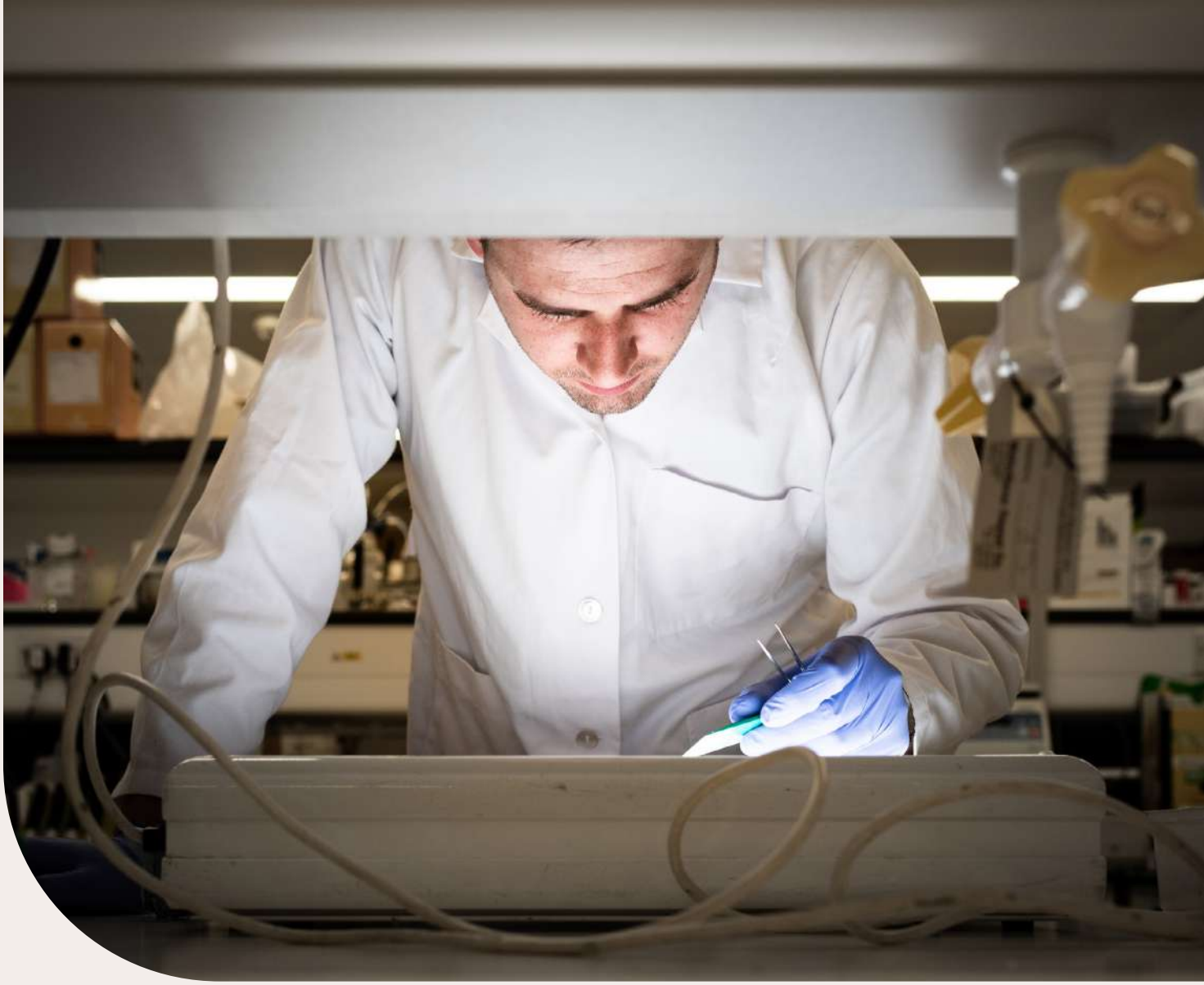

Benjamin Gilbert / Wellcome / Liverpool School of Tropical Medicine.

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Executive Summary

Snakebite: A preventable crisis, a shared responsibility

Former UN Secretary General Kofi Annan, whilst working to bring snakebite envenoming (SBE) on to the global health agenda in 2015, described it as 'the biggest public health crisis you have never heard of'.

Yet, today SBE is a preventable and persistently overlooked public health emergency that causes up to 138,000 deaths and over 400,000 cases of permanent disability every year. It primarily affects rural communities in low- and middle-income countries, disproportionately impacting agricultural workers, children, and Indigenous populations.

These are not just numbers - each case represents lives permanently altered, futures disrupted, and families plunged into economic hardship.

In 2017, the World Health Organization (WHO) formally classified SBE as a Category A Neglected Tropical Disease (NTD). In 2019, the WHO set out the goal to halve deaths and disabilities from snakebite by 2030, leading to renewed hope for global collaboration around a shared mission.

Six years on, despite pockets of hope, SBE remains a persistent, and silent, killer – and one of the world's deadliest and most overlooked health issues.

SBE is a crisis of inequality, where access to treatment is a privilege, not a right. In the most vulnerable regions, where the burden is highest, antivenoms are often inadequate, ineffective or unsafe. Meanwhile, effective treatments often remain inaccessible to rural communities.

But every death and disability caused by SBE is preventable with timely access to safe, effective treatment. However, SBE has slipped down the global agenda, compounded by fragmented, fragile health systems, and a broken antivenom market. Consequentially, crucial progress markers to 2030 goals have not been achieved.

As climate change increases the likelihood of human-snake encounters, the urgency of addressing this issue grows. With the clock ticking to meet WHO's 2030 goal, the time to tackle snakebite envenoming is now.

This report offers a global assessment of progress six years into the WHO strategy. By drawing on regional case studies, epidemiological data, stakeholder insights, and implementation analysis, it provides the global community with a framework for future collaborative action and evaluation.

Despite notable advancements in regulatory oversight, community education, and data harmonisation, the report highlights that progress has been inconsistent, underfunded, and insufficiently scaled. Many countries still lack national action plans, and global investment remains below the levels needed to achieve the WHO's 2030 target.

By pinpointing critical gaps and identifying promising opportunities across four strategic pillars – research and development; production, regulation, and accessibility of antivenoms; health system strengthening; and advocacy and funding – this report serves as a crucial guide for governments, donors, and implementing partners to accelerate effort, investment and impact.

Key Findings:

- **The true toll is hidden:** South Asia (especially India), Sub-Saharan Africa, and parts of Latin America bear the brunt of snakebite mortality. Weak surveillance systems and limited access to formal healthcare lead to many unreported cases of SBE. Mental health impacts and disabilities are widespread but also under-measured.
- **Antivenom access is a postcode lottery:** Antivenoms, the only proven treatment for envenoming, are often unaffordable, unavailable, or of questionable quality. A fragmented regulatory environment and geographically constrained manufacturing limit further limit their reach in high burden regions.
- **WHO strategic objectives partially realised:** The WHO roadmaps' four pillars – community empowerment; effective treatment; health system strengthening; and coordinated partnerships – have seen varied implementation levels. Successes include expanded data platforms e.g. SDIP (Snakebite Data and Information Platform), DHIS2 (District Health Information Software 2) surveillance rollout, and new Target Product Profiles (TPPs) for antivenoms. However, direct Member State funding to WHO has not been secured as hoped, and critical implementation milestones remain unmet.
- **Innovation is alive:** Investment in research and development (R&D) has grown, with over 190 therapeutic candidates in development, including biologics and small-molecule inhibitors. WHO has risk-benefit assessed multiple antivenoms, and new TPPs for next-generation products are underway. Yet, most pipeline candidates remain in preclinical stages, and regulatory harmonisation remains a barrier.
- **Communities are stepping up:** Case studies from Eswatini, Kenya, Brazil, and India show how community engagement, policy alignment, and decentralised systems can reduce mortality and increase resilience. Eswatini's record of zero deaths over 700 SBE cases demonstrate the potential of grassroots, cross-sectoral model.
- **Funding is critical:** The projected funding requirement for the WHO roadmap through 2030 is USD 136.8 million. To date, less than 15% of this has been secured, this entirely from non-state actors. The parallel significant investments made by governments, R&D institutes, and corporates directly to local, national and regional actions have proven difficult to quantify both in terms of scale and impact. What is clear is that without catalytic investment from governments, philanthropy, bilateral donors, and multilateral institutions, progress risks further stagnation.

Significant advancements can be achieved if the global community invests in safe and effective treatments, ensures antivenoms are accessible to all, phases out substandard and false antivenom products from the market, equips healthcare systems and professionals with the necessary tools and knowledge, and supports community prevention and education initiatives. The investment pathway to SBE prevention and control is both complex and mappable.

Globally, countries are adopting diverse strategies to address the burden of SBE. From health system reforms to community engagement and innovation in treatment, these case studies highlight both the systemic barriers and the solutions that are saving lives today. Eswatini's snakebite journey, in particular, serves as a beacon of hope – demonstrating that achieving zero deaths from SBE is not only possible but attainable through a collaborative whole system approach.

This report is therefore more than a scorecard - it is a call to action. A call for governments, donors and partners to accelerate progress. With bold leadership, international collaboration and data informed investment, we can transform snakebite from a test case of global equity into a triumph of global solidarity.

Snakebite is preventable. Disability is avoidable. Death is not inevitable.

To change the status quo and strive towards ending preventable deaths and disabilities from snakebites, we must shift the global dynamic. Working together through the Global Snakebite Taskforce (GST), we can establish a new, collaborative model for action and investment in SBE, and achieve our 2030 objectives.

The time for us to act is now.

Context

Snakebite envenoming as a Neglected Tropical Disease

Snakebite envenoming (SBE) was formally recognised as a Neglected Tropical Disease (NTD) by the World Health Organization (WHO) in 2017. This designation followed decades of advocacy by clinicians, researchers, and communities affected by the disproportionate burden of snakebites in low-resource settings. It reflects the disease's unique profile: high morbidity and mortality, strong geographic and socioeconomic disparities, and the availability of effective treatment that remains largely inaccessible to those most in need.

SBE predominantly affects rural populations in tropical and subtropical regions of Sub-Saharan Africa, South and South-East Asia, and Latin America – disproportionately impacting agricultural workers, children, and indigenous communities. Its link to poverty and remoteness reinforces structural health inequities, exacerbated by limited access to healthcare, education, and safe housing.

The inclusion of SBE on the WHO NTD list served as a pivotal moment. It created a mandate for global action, unlocked access to technical and strategic support from WHO, and positioned snakebite within broader frameworks of universal health coverage (UHC), essential medicines access, and health equity.

SBE exemplifies the challenges and opportunities of addressing an "orphaned" condition within global health – one with high mortality, low political visibility, and a fragile treatment market. As a result, tackling SBE is not only a humanitarian imperative but a litmus test for the effectiveness and inclusivity of global health agendas.

The Global burden of snakebite envenoming

Each year, an estimated 5.4 million people suffer snakebites, resulting in 1.8 to 2.7 million cases of envenoming and 81,000 to 138,000 deaths globally. These figures likely underestimate the true burden due to inconsistent and fragmented reporting, and persistent widespread reliance on informal care systems in high-incidence regions.

Snakebite disproportionately impacts low- and middle-income countries, with the highest burden recorded in:

- **South Asia: India alone accounts for up to 58,000 deaths annually;**
- **South-East Asia: Estimates of snakebite in the ASEAN group of seven countries amounted to around 250,000 per year, with almost 16,000 deaths;**
- **Sub-Saharan Africa: Countries like Cameroon, Nigeria, and Burkina Faso report thousands of deaths per year. With 16 countries in the region suffering upwards of 4,500 deaths per year; and**
- **Latin America: Particularly Brazil and countries with forested or rural agricultural zones.**

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For every death, up to four survivors may suffer long-term disabilities such as amputations, contractures, blindness, and disfigurement. SBE is estimated to cause **up to 400,000 cases of permanent disability annually and over 1 million Disability-Adjusted Life Years (DLAYs) across Sub-Saharan Africa and Asia combined.**

Mental health impacts, including depression and post-traumatic stress disorder (PTSD), are widely reported but rarely quantified. In one study, between 25–54% of survivors experienced major depressive symptoms, while PTSD affected up to 43%.

These consequences extend beyond individual health, imposing deep economic burdens on families and communities. Costs of treatment, long recovery times, and loss of productivity contribute to cycles of poverty and social marginalization.

WHO Snakebite Envenoming Strategy (2019 – 2030): targets and commitments

The World Health Organization (WHO) launched its strategy for the prevention and control of snakebite envenoming (SBE) in 2019, with an explicit target to halve the numbers of deaths and cases of disability by 2030. It was, and still is, a comprehensive and inclusive strategy that outlines four key aims for WHO, Member States, and the broad SBE community:

- **Empower and engage communities;**
- **Ensure safe and effective treatments;**
- **Strengthen health systems including surveillance: and**
- **Increase partnerships, coordination and resources.**

The strategy was originally planned as a three-phase development, with phase 2 scheduled to conclude in 2024. However, the COVID-19 pandemic significantly disrupted public health activities, including efforts to combat SBE. The pandemic's impact on resource mobilization and programme implementation for many diseases continues to reverberate through the international public health system today. Though it should be noted that the response to COVID-19 and subsequently pandemic preparedness resulted in new and effective forms of regional, national and local collaboration. Furthermore, recent global political events and upsurge in conflict, some of which have direct negative consequences for WHO and public health more generally, have created new barriers to improving the health of world's most vulnerable populations.

Despite the adoption of WHA resolution 71.5 on SBE in 2018, no WHO Member State has yet provided direct resource support for implementation of the WHO strategy. To date WHO's funding has come from non-state actors. The global implementation budget from 2019-2024 was estimated at USD 54.4 million, but WHO has received USD 6.2 million. WHO has pushed forward with several key initiatives from the 2019 strategy, demonstrating resilience and commitment. There is still much work to be done together.

Empower and engage communities

The WHO has actively engaged with Community Engagement (CE) stakeholders from various regions, establishing a database of organizations and individuals involved in SBE mitigation and community education to support future implementation activities. Additionally, WHO has developed a CE resource toolkit, soon to be published, providing stakeholders with essential information and tools for effective activity planning, implementation, monitoring and reporting. In collaboration with the CE community, WHO supports International Snakebite Awareness Day on 19 September each year to raise awareness and empower advocacy efforts.

Ensure safe and effective treatments

Globally, there is significant concern regarding the quality, efficacy and safety of many of the antivenom products currently available, especially in regions with the highest snakebite burdens. Whilst some jurisdictions have strong regulatory systems, many others require substantial improvements. WHO has expanded its risk-benefit assessment program to independently evaluate antivenoms marketed in Africa, the Middle East, and South Asia, with plans to extend this work globally between 2025-2027. Products recommended for procurement through this assessment will be included in the WHO Procurement Catalogue, allowing countries to source them at lower costs through long-term supply agreements negotiated with manufacturers by WHO. Participating countries will receive technical support from WHO to improve forecasting, distribution and post use surveillance to monitor safety and outcomes of products.

To guide regulators, manufacturers and researchers on market requirements and product specifications, WHO established a technical advisory group to prepare Target Product Profiles (TPPs) for animal plasma-derived antivenoms intended for use in Sub-Saharan Africa and South Asia, the regions with the highest snakebite burden. These documents provide new design frameworks for improved antivenom formulations to improve patient outcomes. An additional TPP for "next generation" treatments such as small molecule therapeutics, and engineered antibody therapeutics based on a variety of manufacturing approaches, is undergoing final public consultation.

Many current treatments for SBE have never been robustly evaluated in well designed, randomized control trials. Consequently, unsafe and ineffective products circulate in the market, alongside potentially useful products that perform poorly due to ineffective dosing. WHO is exploring adoption of a modified Monitored Emergency Use of Unregistered and Experimental Interventions (MEURI) Framework for rapid clinical evaluation of antivenoms. This framework will provide countries with a pragmatic methodology to evaluate products while cautiously introduction them in markets lacking clinically proven safe and effective treatments.

Strengthen health systems

Strategies for the effective prevention and control of SBE hinge on improved case reporting, data analysis, and translating results into effective policies and implementation plans. WHO is supporting Member States through the development of new data reporting tools, including:

- **The DHIS2 (District Health Information Software 2) epidemiological reporting tool:** Rolled out in 2022 in Sub-Saharan Africa, this tool has significantly enhanced data acquisition of snakebite cases and deaths. The number of countries reporting snakebites has risen from 40% to 60% in the WHO African Region (AFRO), and the geographical precision of those reports has improved from subnational boundary level to increasingly granular administrative levels.
- **Health facility-based reporting system (RHIS):** Expected to launch in 2025, this system will enable countries to collect, collate and report snakebite data to support national policy, resource allocation, and health program activities. Data shared with WHO will expand global epidemiological data, providing highly granular insights that can accurately inform resource allocation and policy setting.

Understanding the distribution, habits, and interactions of over 250 medically important venomous snake species worldwide is critical for effective interventions. WHO has undertaken species distribution mapping and habitat suitability modelling analyses for these snakes, as well as assessing the potential impacts of climate change on their distributions and the risks of human exposure to snakebites. The expectation is that some snake will expand in range, whilst others will reduce. This work aims to "future proof" antivenom distribution to the most appropriate health facilities.

By combining epidemiological data, with data from health systems and the human and snake populations, using geospatial analysis tools, WHO gains using geospatial analysis tools, WHO gains a better understanding of human-snake exposure risks, distances to healthcare for victims, and the optimization of antivenom distribution and community education. WHO hosts distribution data for these species, along with information on current antivenom products and case management guidelines, on the Snakebite Data and Information Platform (SDIP). Data on snakebite case numbers reported by countries using the DHIS2 template are also available from this platform. New resources, including habitat suitability models, climate change-driven future habitat and distribution models, and health care accessibility models for patients in specific countries, will be added to the SDIP platform in the near future.

Partnerships, coordination and resources

WHO has actively engaged with Ministries of Health in countries heavily impacted by snakebites, leading to the development and publication of a Regional Action Plan on SBE in the WHO South-East Asian Region (SEARO). A framework for a similar Regional Action Plan for the WHO African Region (AFRO) is also in progress, with further development planned through extensive consultations with countries and other stakeholders. Several African and Asian member states now have national action plans. Notably, India, which bears the highest individual burden globally, has launched and is implementing a National Action Plan for Prevention and Control of Snakebite Envenoming (NAP-SE). In the WHO Region of the Americas, the Pan-American Health Organization (PAHO) is spearheading efforts to establish regional clinical guidelines, improve antivenom manufacturing and quality control, among other initiatives. These regional approaches are crucial for driving the uptake of snakebite prevention and control activities by individual Member States in a sustainable manner, fostering strong local engagement with scientific, medical, community-based, funding partners, and other stakeholders.

As the WHO Strategy for Prevention and Control of Snakebite Envenoming reaches its midpoint, WHO itself identifies the greatest barrier to progress: direct commitment by countries to invest in implementation at local and regional levels. WHO will conduct a comprehensive review of the current strategy later this year, with the goal of publishing a renewed roadmap in 2026. The updated strategy will undergo extensive review within WHO and externally, involving numerous experts and a wide, transparent, public consultation process which will offer further opportunity for collaboration and action.

Global and regional trends in snakebite envenoming response

Global progress

Global progress against snakebite envenoming (SBE) remains uneven and fragile. While the World Health Organization (WHO) Strategy (2019–2030) has catalysed new commitments and technical advancements, its translation into national policies, operational systems, and community-level impact varies significantly by region and country. A major barrier is the lack of reliable, disaggregated epidemiological data, particularly from rural and remote areas where healthcare access and reporting are weakest.

Key global progress markers include:

- **WHO's prequalification initiative for antivenoms and enhanced regulatory oversight;**
- **Integration of snakebite modules into digital surveillance platforms like DHIS2;**
- **Growing investment in R&D: including for efficacy of current antivenoms, next generation biologics and small-molecule inhibitors;**
- **Expanded recognition of SBE within universal health coverage and essential medicines agendas; and**
- **Grassroots mobilisation, including survivor advocacy groups and community health worker networks.**

Despite these advancements, chronic underfunding, market fragility, weak supply chains, and insufficient cross-sectoral coordination continue to undermine scale-up efforts. Many countries still lack validated national snakebite action plans, and the procurement of quality-assured antivenoms remains highly inconsistent.

Regional insights

Sub-Saharan Africa

Sub-Saharan Africa bears one of the highest burdens of SBE globally, yet it faces significant access and treatment gaps. Rural agricultural workers and children are at particular risk, and health systems often lack trained staff, diagnostic capacity, and regulated antivenom supply chains.

WHO and its partners have supported several initiatives, including:

- **Creation of national action plans: Countries such as Kenya, Nigeria, Ghana, Cameroon, Eswatini have developed plans to address SBE;**
- **Development of Target Product Profiles (TPPs) for region-specific antivenoms; and**
- **Data harmonisation via DHIS2 in over 60% of countries.**

However, challenges persist:

- **Fragmented procurement systems and severely limited anti-venom production capacity result in inconsistent and unreliable supply processes;**
- **Weak regulatory oversight of imported antivenoms with continued use of ineffective or inappropriate products; and**
- **Constraints in healthcare systems response capacities, compounded by often limited engagement with traditional healers and community responders.**

Despite these hurdles, locally driven innovation is emerging. Countries like Eswatini, Kenya and Nigeria are piloting community-based education, real-time surveillance, programmatic integration, and stockpile management models that could be adapted regionally.

South Asia

South Asia, particularly India, accounts for the majority of global snakebite deaths. A 2020 study estimated 58,000 annual deaths in India alone, primarily due to the "Big Four" venomous species and significant variability in treatment-seeking behaviours.

Regional advances include:

- **Adoption of a regional SBE response plan under the aegis of WHO's South East Asia Regional Office (SEARO);**
- **India's national action plan and regulatory guidance on antivenom production informed by the SEARO strategy;**
- **Expanded training for rural clinicians on case management; and**
- **Initiatives to map snake distribution and align antivenom availability accordingly.**

Despite these advances, entrenched challenges persist:

- **Delays in treatment due to faith in traditional medicine;**
- **Lack of quality control among some domestic antivenom producers; and**
- **High out-of-pocket costs, especially in informal care settings.**

Bangladesh and Nepal are also making progress by piloting decentralised stockpiles, mobile clinics, and community health education initiatives to bridge access gaps.

Latin America

Latin America boasts a relatively strong infrastructure for SBE control, largely due to robust public-sector antivenom production facilities such as Instituto Butantan in Brazil and Clodomiro Picado Institute in Costa Rica. Many national health systems offer antivenoms through public healthcare.

However, disparities persist:

- **Remote areas like Amazonia remain critically underserved;**
- **Transport delays, logistical constraints, and staff shortages delay care; and**
- **Economic pressures threaten public sector R&D investment.**

The **Pan American Health Organization (PAHO)** is coordinating a regional platform to strengthen regulatory harmonisation, clinical guidelines, and joint procurement strategies. Initiatives led by the Latin American Network of Public Antivenom Manufacturing Laboratories (RELAPA, Spanish acronym) to improve the regional landscape of antivenom manufacture and quality control and initiated activities to improve epidemiological health surveillance are creating better alignment with WHO strategy.

Latin America serves as both a model and a cautionary tale, illustrating how public investment and regional cooperation can mitigate access challenges, yet also highlighting enduring geographic, cultural and systemic inequities.

Case studies: Spotlighting progress in affected countries

Across the globe, countries are adopting diverse strategies to address the burden of snakebite enenoming (SBE). From health system reforms and community engagement to innovations in treatment, these case studies highlight how different contexts are shaping unique solutions – and what others can learn from them.

Kenya: Building resilient systems amid fragmented supply

Kenya has emerged as both a regional leader and a cautionary example in snakebite response. While the country has integrated SBE into its national Masterplan for Neglected Tropical Diseases (NTD), it continues to face challenges with fragmented antivenom supply chains and limited rural healthcare access.

Recent impactful initiatives by the Ministry of Health include:

- **Precision targeting: County and ward-level hotspot mapping ensures antivenom and outreach reach those who need them most**
- **Programmatic integration: The 2023 Mass Drug Administration campaigns doubled as platforms for snakebite surveillance and preventive education.**
- **Local research and development investment: The Government of Kenya has committed direct financial support to accelerate domestic antivenom research, establish venom reference standards, and build local manufacturing capacity.**
- **Workforce empowerment: Hundreds of clinicians and Community Health Promoters have been trained locally and through strategic international exchanges to deliver evidence-based management and community engagement.**
- **Political engagement with multisectoral momentum: Legislators, regulators, and donors are now united in a shared pledge: snakebite will no longer be ignored.**

However, inconsistent funding and complex import regulations remain persistent barriers. Kenya's experience underscores the need for stable procurement pathways, regional manufacturing partnerships, and sustained investment in local emergency response capacity. Kenya's multisectoral commitment to providing an integrated response to SBE with clear government leadership provides an interesting model for country-wide engagement.

India: Tackling the world's highest snakebite death toll

India bears the highest burden of snakebite deaths globally, driven by high snake density, vast rural populations, and widespread reliance on traditional healers. The impact is especially severe among poor and indigenous communities, where access to quality healthcare remains limited.

A 2023 assessment revealed that most primary health centres (PHCs) and community health centres (CGCs) across India lack the minimum structural capacity required for effective snakebite care. In response, the government and academic partners have launched several key initiatives:

- **A National Snakebite Management Strategy with devolved state-level implementation;**
- **Development of region-specific antivenoms and venom variation mapping;**
- **Training for rural clinicians and first responders; and**
- **Integration of snakebite into digital health reporting systems.**

Despite this progress, challenges persist, including low public awareness, inconsistent antivenom quality, and poor transport infrastructure. Promising innovations such as low-cost biologics and AI-based snake identification tools are being piloted, but their success depends on broader health system strengthening. The Indian experience demonstrates the need in high-incidence countries for a comprehensive, system-wide approach to reduce the burden of snakebite.

Brazil: Public sector leadership and regional impact

Brazil excels in snakebite response due to its robust public sector leadership, spearheaded by the globally renowned Instituto Butantan. The country produces antivenoms domestically and distributes them free of charge through its universal health system, bolstered by state-funded research into venom ecology and diagnostics.

Key strengths of Brazil's approach include:

- **National production capacity and self-reliance in biologics;**
- **Mandatory case reporting and integrated surveillance systems;**
- **Collaboration with the Pan-Amazonian Health Network to support remote areas; and**
- **Investment in next-generation treatments and diagnostics.**

Despite these advances, Brazil faces logistical and cultural challenges in reaching remote and indigenous communities, where delays in treatment can be fatal. Ongoing reforms aim to enhance rapid deployment through drones and river ambulances, while also integrating indigenous knowledge systems into snakebite response strategies. Brazil's integration of treatment pathways for indigenous communities, combined with practitioner led planning provide important models of impactful practice.

In Focus: Eswatini A blueprint for zero deaths

Thea Litschka-Koen & Sara Padidar, Eswatini Antivenom Foundation

Between February 2022 and September 2024, Eswatini recorded over 700 snakebite cases without a single death.

This remarkable achievement, despite ongoing antivenom shortages, is the result of nearly two decades of grassroots action, community empowerment, and strategic partnerships led by the Eswatini Antivenom Foundation (EAF). Before EAF's interventions, snakebite victims in Eswatini often received ineffective or inappropriate antivenoms, with Black Mamba bites proving nearly universally fatal. **Eswatini's experience offers a powerful model for other countries seeking to eliminate preventable deaths and disabilities from snakebite.**

Building trust and access to treatment

Since 2006, EAF has collaborated with global experts to advocate for safe, effective antivenoms, donating over 5,000 vials and saving more than 1,000 lives. Its annual snakebite symposium, launched in 2009, has become a cornerstone for knowledge-sharing and policy influence.

EAF's innovative approach to antivenom access includes establishing local antivenom banks and rotating stock to ensure emergency availability. While affordability and reliance on a single manufacturer remain challenges, EAF is now collaborating with producers to develop region-specific antivenoms tailored to southern Africa's snake species.

Prevention through education and community action

Recognising the limitations of treatment alone, EAF pivoted in 2020 to prioritise prevention. With support from the UK Mission in Mbabane and the European Union, EAF expanded its network of trained community snake rescue volunteers from 15 to over 100 by 2024.

Through peer-to-peer outreach, volunteers teach safe snake handling, first aid, and bite response, as well as dispelling myths and superstitions that often delay treatment. Children and young people – who account for over 40% of snakebite victims – are a key focus, with engaging tools like songs and cartoons. In 2024, EAF reopened its reptile education centre, a hub for public learning and snake handling training, partially funded by the Government of Eswatini.

From survivors to advocates

To address the long-term impacts of SBE, EAF launched the Eswatini Snakebite Survivor Association in 2024. Bringing together over 100 survivors and their families, the association advocates for improved care and support, while raising awareness of the physical, psychological, and financial burdens of envenoming.

Data-driven policy change

EAF's collaboration with the Ministry of Health, Wellcome, and Liverpool School of Tropical Medicine has generated vital data on snakebite epidemiology, antivenom efficacy, and snake movement. These insights have led to snakebite being designated a notifiable condition, its inclusion in Eswatini's Neglected Tropical Disease Programme, and the development of national treatment guidelines.

> Eswatini's journey demonstrates that zero deaths from snakebite is not only possible – it is achievable through community leadership, education, data, and policy alignment.

Visibility as a catalyst for change

EAF has harnessed the power of media to shift public perception and policy. From documentaries to social media campaigns and podcasts, EAF uses storytelling to highlight the importance of snake conservation and the urgency of effective snakebite response, driving visibility and prioritizing the issue.

Scaling impact beyond borders

Despite its small size, Eswatini's model is influencing regional and international efforts. EAF's educational materials and treatment protocols have been adopted in South Africa, Botswana, Mozambique, and Namibia. The foundation also mentors partners in Francophone West Africa, providing training and resources in French to support safe snake handling and clinical care.

A blueprint for others

Eswatini's journey demonstrates that zero deaths from snakebite is not only possible – it is achievable through community leadership, education, data, and policy alignment. With just three full-time staff and a network of dedicated volunteers, EAF has built a sustainable, scalable model that other countries can adapt to their own contexts.

Lessons learnt

- The patient's wellbeing is the top and only priority;
- Listening to the community and understanding its needs enabled us to identify and priorities challenges;
- Working with integrity and dedication builts trust and support, encouraging others to join our efforts;
- Collaborate with diverse people and stakeholders is essential to saving lives;
- Peer-to-peer education particularly through live snake demonstrations in schools has the most significant impact;
- Generously sharing your knowledge and expertise ultimately benefits the patient;
- Do not wait for policy and legislation to change; start by taking ownership of the problems, acting, gathering data, and advocating for necessary change; and
- It starts with one individual and grows to something remarkable.

Pillars of intervention

Research and Development: Treatments and diagnostics

Since 2019, Impact Global Health (IGH) has been collecting data and analyzing various aspects of the snakebite envenoming (SBE) research and development (R&D) ecosystem. This includes tracking global investment into SBE R&D, curating a pipeline of therapeutic candidates and antivenom products, and uniting stakeholders to agree on common priorities for the sector.

To provide comparative benchmarks on the state of the SBE R&D landscape, IGH has utilized its robust impact assessment framework for global health R&D. Focused on product development, IGH has tailored four indicators to offer a snapshot of the current R&D landscape: funding focus, product development, pipeline progress, and normative R&D guidance. These indicators can be consistently tracked to measure progress towards achieving the World Health Organization's (WHO) 2030 strategy goals for SBE.

With ongoing support, the vision could expand to include a broader the set of indicators encompassing additional dimensions of the SBE R&D ecosystem, such as other R&D and access enablers, as well as health and economic impacts.

Amount of investment (USD) for Product-related SBE R&D (2018 to 2023)

The G-FINDER survey for global health R&D investment has tracked SBE funding since 2018, when it was first added to the WHO Neglected Tropical Disease (NTD) list. Starting at USD 9.2 million, annual investment has steadily grown each year, reaching a record-high of USD 31 million in 2023 (G-FINDER, 2023). Notably, SBE R&D has exhibited contrasting funding dynamics compared to other WHO NTDs, many of which have experienced stagnation or decline in R&D investment.

However, this trend is coming to an end. The initial increases in 2018 were driven by funders who have not sustained their investment (UK Foreign, Commonwealth and Development Office, Swiss National Science Foundation and the French National Research Agency). Recent growth has relied significantly on the Wellcome Trust and the US Department of Defense (DOD), neither of which is a guaranteed long-term funder.

Number of products approved as of September 2022

The SBE medicines database, published in September 2022, identified 127 approved antivenom products. However, no novel therapeutics, such as small-molecule therapy drugs or monoclonal antibodies (mAbs), have been approved for the direct treatment (toxin-neutralisation) of SBE. While the number of approved antivenom products may seem substantial, it does not indicate a healthy market. Many antivenoms are essentially the same product, with slight variations made by local manufacturers to meet regionally or nationally specific needs.

Moreover, there are inconsistencies in the clinical use status and preclinical/clinical evidence of some of these products. Some antivenoms are used in countries where they are not approved, and others lack publicly available preclinical results, despite this being the minimum standard. These issues reflect a fragmented regulatory system for antivenoms.

Number of pipeline candidates in active development as of September 2022

The SBE medicines database, published in September 2022, identified 196 therapeutic candidates in the development pipeline. There is a relatively even split between R&D into novel drugs (105, 54%), such as small-molecule therapies, and biologics (91, 46%). Given that all approved products are traditional animal-plasma derived antivenoms, this split, with a slight skew towards drugs, indicates a broadening SBE R&D landscape.

While the diversity is positive, nearly all of this research remains in discovery and preclinical stages, with only eight candidates in clinical development (two drugs and six traditional-type antivenoms).

Number of WHO target product profiles for SBE

Up-to-date, normative guidance documents on the design of safe and effective products are crucial for informing and coordinate R&D efforts, ensuring the delivery of appropriate and accessible products. As noted, WHO has addressed a critical gap by publishing two key TPPs for animal plasma-derived antivenoms for Sub-Saharan Africa (2023) and South Asia (2024). The focus on antivenoms underscores the sector's prioritization of antivenoms as a mainstay treatment. TPPs for "next-generation" biologics, such as monoclonal antibodies, as well

as small-molecule therapies and diagnostics, to be published in the near future will be essential for guiding progress in the development pipeline.

Regulatory, production, availability and accessibility

One of the most persistent obstacles in SBE response is the unstable, under-regulated antivenom market. Many countries rely on imported products that lack clinical efficacy validation in local contexts, with regulatory frameworks often weak, fragmented, or entirely absent.

Barriers include:

- **Lack of product-specific clinical trials and pharmacovigilance;**
- **Few WHO prequalified products despite demand;**
- **Volatile pricing, with costs ranging from USD 55 to over 600 per vial; and**
- **Limited infrastructure for pooled procurement mechanism or global stockpiling.**

WHO has stepped in with:

- **Risk-benefit assessment of 26 antivenoms;**
- **Development of TPPs;**
- **Regional capacity building for Good Manufacturing Practice (GMP) standards; and**
- **Proposal for a revolving stockpile system, akin to those used for cholera or meningitis vaccines.**

Sustainable supply hinges on strategic investment in regional manufacturing hubs, harmonized regulation, and donor-backed market-shaping mechanisms.

As noted, are unique compared to most drugs on the global market, as they have been tailored to the snake species present in different regions. For example, a product effective against Indian snakes will be ineffective in Africa, and vice versa. Consequently, the markets for specific antivenoms are geographically restricted, leading to smaller markets and the absence of major pharmaceutical companies, with antivenoms exclusively produced by smaller specialist companies.

Historically, the regulatory framework for conventional antivenoms has been weak, and in recent years, some markets have been flooded with cheaper sub-standard products. Since 2019, WHO has made substantial progress on two complementary fronts.

Firstly, TPPs have been published for conventional antivenoms for use in Sub-Saharan Africa and South Asia, the two areas of the world with highest burden of bites. These are the first TPPs to be produced for conventional antivenoms in the public sector, providing clear and transparent guidance for manufacturers, regulators, clinicians and others. A third set of TPPs for small molecule and engineered antibody products is currently open for public consultation, with the final version expected later this year.

Secondly, three antivenoms with positive risk-benefit assessments have been identified for use in Sub-Saharan Africa. These products are ratified as meeting the highest standards of safety and effectiveness. Some products that did not initially achieve a positive risk-benefit assessment are being re-engineered and reconsidered. Additionally, 23 products for use in the WHO Africa, South East Asia, and Eastern Mediterranean regions are currently under consideration, with outcomes to be made public later this year.

Public Health: Monitoring, prevention, management, healthcare system capacity

Effective SBE response is not just about antivenom – it involves comprehensive healthcare systems. Early detection, accurate diagnosis, transport logistics, facility readiness, and post-discharge rehabilitation are critical components of an integrated control system.

Key gaps include:

- **Delays in care due to poor community awareness;**
- **Lack of trained health personnel, especially in first aid and syndromic recognition;**
- **Stockouts and poor cold chain management for antivenom; and**
- **Absence of rehabilitation and mental health support for survivors.**

Best practices emerging globally include:

- **DHIS2 integration for real-time reporting;**
- **Training modules embedded into rural medical curricula;**
- **Community-based referral networks, including traditional healers and snake rescue teams; and**
- **Telemedicine consultation networks (e.g. in Amazonia and South Asia).**

Strengthening health systems is essential not just for SBE, but as a gateway to broader NTD and emergency care resilience.

Advocacy, funding and policy commitments

SBE has historically suffered from low political salience and very limited donor prioritization. However, momentum is growing, bolstered by survivor-led campaigns, scientific diplomacy and discovery, NTD advocacy coalitions and resurgent WHO Member State leadership.

Recent progress includes:

- **WHO's formal strategy and SBE's inclusion in SDG-linked Universal Health Coverage (UHC) goals;**
- **High-profile engagement by community members such as Wellcome, MSF, and the African Snakebite Alliance; and**
- **Policy attention drawn by success stories from Eswatini, Kenya and India amongst others.**

Yet, funding remains challenging. Total investment to meet WHO targets is projected at USD 136.8 million over 12 years – modest by global health standards – but still unmet. Whilst, as noted investment by governments nationally, R&D investment direct to research institutes or commercial actors, is not tracked for volume or impact. Though it is geographically fragmented.

Potential investment pathways to explore include:

- **Dedicated funding window for SBE in global health financing mechanisms (e.g. Gavi, Global Fund);**
- **Clear investment case with DALY-based cost-effectiveness (e.g., as low as USD 83/DALY averted in West Africa); and**
- **Cross-sector messaging, linking SBE to climate change, food security, and health equity.**

A unified advocacy front, combining data, community voice, and political narrative, is critical to unlocking investment and action at scale.

Benjamin Gilbert / Wellcome / Liverpool School of Tropical Medicine.

Impact pathways: on track to 2030

The WHO snakebite strategy sets out a clear and achievable vision: **a 50% reduction in deaths and disabilities by 2030.** Achieving this target requires coherent, country-led pathways supported by technical partners, donors, and communities. Here the aim is to highlight potential strategic investment pathways which can be developed to provide collaborative engagement across the SBE community.

2025 Milestone: End of phase II: WHO strategy

By the end of 2024, the WHO Roadmap anticipated:

- **Adoption of national snakebite action plans in all high-burden countries;**
- **Prequalification of at least 5 antivenom products with confirmed safety and efficacy;**
- **Full launch of the Snakebite Data and Information Platform (SDIP); and**
- **Activation of community engagement mechanisms active in at least 20 high-burden countries.**

This transition to Phase 3 (2025–2030) is critical for scaling successful models and closing access gaps.

Potential impact investment pathways for 2025–2030

Regional antivenom manufacturing and procurement hubs

- **Develop and scale antivenom production in Africa, Asia, and Latin America;**
- **Ensure Good Manufacturing Practice (GMP) compliance and WHO prequalification support; and**
- **Encourage technology transfer and pooled procurement.**

Health systems integration

- **Embed SBE management in primary health services and essential Universal Health Care (UHC) packages;**
- **Ensure consistent training of healthcare workers, especially in rural settings; and**
- **Integrate mental health, rehabilitation, and follow-up care for survivors.**

Community-centric prevention and response

- **Scale outreach to traditional healers, schools, and agricultural cooperatives;**
- **Institutionalise community-led surveillance and early response; and**
- **Support survivor networks for peer education and psychosocial support.**

Market shaping and investment mobilisation

- **Establish a revolving stockpile mechanism, with donor and government support;**
- **Strengthen regulatory harmonization across regions; and**
- **Position SBE within pandemic preparedness and climate-linked health funding streams.**

Research-to-policy translation

- **Build evidence on effectiveness and cost-benefit of new diagnostics and biologics;**
- **Fund implementation science on locally adapted prevention models; and**
- **Create a global repository for open-access data on envenoming.**

In Focus: Research and Development: Treatments and diagnostics

The SBE R&D ecosystem is at a pivotal moment: there has been a recent significant yet time limited upsurge in investment, the innovation pipeline is more developed than ever, and there is resurgent leadership and political will to bring SBE to the foreground of the global health agenda. To translate this momentum into tangible progress toward the 2030 goals of the WHO Strategy for Prevention and Control of Snakebite Envenoming, the community must redouble its commitment – mobilizing greater resources, sustaining long-term collaboration, and advancing multiple workstreams in concert. Several streams of activity need to be advanced in parallel to make the vision of an affordable and widely accessible suite of products for SBE a reality. Only by doing so can we turn today's promise into tomorrow's reality – a diverse, affordable, and universally accessible suite of SBE products that saves lives worldwide.

Amount of investment (USD) for product-related SBE R&D

The impact pathway to 2030 for R&D funding needs to include serious efforts for resource mobilization, which is impact-focused and evidence-backed. A high-level view of global funding for neglected disease R&D suggests that the situation has largely remained stagnant over the last five years. In 2025, striking ODA budget cuts have been announced by the US government, as well as European governments, including Italy, the Netherlands, France, Finland, Belgium, Germany, Switzerland and the UK. Although not yet captured in G-FINDER, drastic changes in budget and agendas across governments are being observed. The same narratives used to drive NTD and SBE funding 5-10 years ago will no longer work. We need to develop a new business case that includes the return on investment as well as the health and economic impact of SBE R&D. This is a model which can be translated to other pillars of intervention.

Number of products approved

The impact pathway to 2030 for product approvals must ensure better regulatory harmonization and standards for existing antivenoms on the market. Continued support of initiatives that seek to improve and further standardize reference venoms for product development, models for in vitro and in vivo preclinical testing for safety and efficacy, and clinical endpoints for clinical trials will help support regulators and developers to bring products to market. Collaboration and coordination across sectors, regions and themes will help accelerate progress – there are valuable lessons from the NTD community that can be adapted to the SBE context.

Number of pipeline candidates in active development as of September 2022

Prioritizing research is critical in a resource-constrained landscape like SBE, especially given the current political and economic climate. Developing a prioritization framework to assess the therapeutic potential and market readiness of investigational candidates and existing antivenoms will help narrow down a portfolio of viable and accessible products. With 196 candidates, almost exclusively in preclinical stages, it is important that the community has a prioritization tool to support their decision-making and support resource mobilization efforts. Coupled with improved preclinical standards and regulatory harmonization, this will support the de-risking of R&D for "next generation" candidates, enabling them to reach market.

Number of WHO target product profiles for SBE

The impact pathway to 2030 for WHO Target Product Profile (TPPs) for SBE would benefit from the publication of additional TPPs that cover not just regions but also the product spectrum – novel biologics, small molecule therapies and diagnostics. Comprehensive TPPs will guide prioritization decisions and foster coordinated and targeted R&D efforts, ultimately enhancing product pipeline productivity and impact.

Conclusion

A clear pathway can be seen: sustained funding, rigorous prioritization, and sharper regulatory alignment can transform today's surge of innovation into tomorrow's lifesaving therapies. Even within today's uncertain landscape, there are opportunities to demonstrate the impact of moderate-sized investments in R&D, which could yield large health and economic benefits. Seizing this moment will demand bold, coordinated action from funders, researchers, industry, and policymakers alike. The reward is profound: a future where no community is left without timely, effective, and affordable treatment from snakebite envenoming.

Global action to stop preventable death and injury

The snakebite envenoming (SBE) crisis is a test of global equity, health system resilience, and the world's ability to deliver on its commitment to leave no one behind. It is also a tractable challenge – a rare instance where a neglected health burden is **both measurable and preventable** within a decade.

Working collaboratively the following actions are immediately feasible:

- **Funding for impact and scale:** map costed investment pathways for R&D, community empowerment, effective treatments and strengthened health systems;
- **Build regional production:** Support technology transfer and pooled procurement;
- **Embed SBE in Universal Healthcare (UHC):** Make snakebite treatment an essential, subsidized service;
- **Scale innovation:** Fund and fast-track next generation antivenoms and diagnostics;
- **Support community leadership:** Recognize and resource grassroots champions;
- **Strengthen data systems:** Ensure real-time surveillance for adaptive response; and
- **Drive coordinated advocacy:** Position snakebite alongside climate, equity, and resilience agendas.

By aligning around a unified, data, and community-informed strategy, the world can turn the tide on one of its most preventable health crises. The investment pathways can be mapped and brought to the SBE community of multi-lateral agencies, governments, corporate interest and philanthropic funders.

Strike Out Snakebite: A global approach

Snakebite envenoming demands urgent attention – but, as shown, has been chronically overlooked on the global agenda. Despite causing up to 138,000 deaths and leaving hundreds of thousands more with life-altering disabilities each year, it remains one of the most neglected tropical diseases.

To change this, a new global initiative has been launched: Strike Out Snakebite (SOS).

SOS is a unifying programme designed to drive a step-change in international collaboration, visibility, and momentum around snakebite envenoming.

It brings together the global snakebite community and beyond around a bold, clear and inspiring mission: to end preventable deaths and disabilities from snakebite envenoming. By fostering shared purpose and amplifying proven solutions, SOS aims to elevate snakebite on the global health agenda and attract a more dynamic, diverse ecosystem of funders and partners. An ecosystem informed by data driven investment impact pathways.

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 tools to prevent death and disability from snakebite already exist. What is needed now is a shared understanding that these outcomes are avoidable, and a collective commitment to act.

Strike Out Snakebite (SOS) is a unifying programme designed to drive a step-change in international collaboration, visibility and momentum around snakebite envenoming.

By shifting the current dynamic – through leadership, collaboration, and community-driven solutions – Strike Out Snakebite will help transform snakebite from a neglected crisis into a solvable challenge.

The Global Snakebite Taskforce

The Global Snakebite Taskforce (GST) is the strategic arm of the Strike Out Snakebite (SOS) initiative – a dedicated, independent group working to spotlight effective strategies, catalyze action, and mobilize resources at national, regional, and international levels to achieve this aim.

Our vision is a future without preventable deaths and disabilities from SBE.

Our mission is to catalyze sustained effort, political will, and resource mobilization to drive the prevention of avoidable deaths and disability by SBE.

We believe SBE is a disease whose time has come. Snakebite has remained for too long a health crisis hiding in plain sight. It has been, and remains, one of the most overlooked NTDs, with a devastating burden that is disproportionate to the funding and attention it receives.

It is not a forgotten or unknown health challenge – it has largely been wilfully neglected.

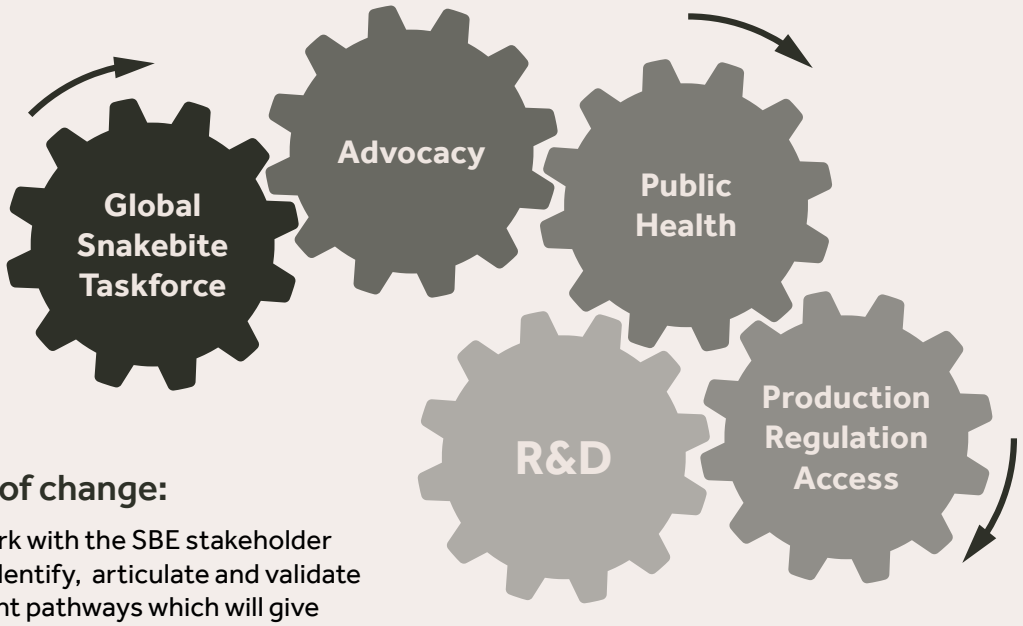
To change the status quo and strive towards ending preventable deaths and disabilities, we must change the global dynamic. Through the Global Snakebite Taskforce, we have an opportunity to do this, providing a new, collaborative model for action and investment in SBE. Creating the global conditions where preventable deaths and injuries from SBE are eradicated through safe and effective treatment pathways accessible to all.

Convened independently with the support of Wellcome, the Taskforce is co-chaired by Hon Aden Duale, Cabinet Secretary to the Kenyan Ministry of Health, and Elhadj As Sy, Wellcome Board Member and Chancellor of Liverpool School of Tropical Medicine

The clock is ticking to meet WHO's target of halving snakebite deaths and disabilities by 2030. Success hinges on global momentum, collaboration, and investment.

The GST objectives are to:

- **Galvanise political will to address SBE by driving the issue further up the global public health agenda and improving visibility and understanding of the issue;**
- **Articulate the investment case to support concrete, practical and immediate action; and**
- **Catalyse stakeholders to commit resources and action post 2026 to end preventable deaths and injury from snakebite.**



The wheels of change:

The GST will work with the SBE stakeholder community to identify, articulate and validate those investment pathways which will give momentum to the wheels of change.

Founding Members of the Global Snakebite Taskforce

The GST will also welcome members representing key multinationals, businesses, youth and the funding community.

Hon. Aden Bare Duale E.G.H (Co-Chair)

Cabinet Secretary, Kenya Ministry of Health

Honourable Aden Duale, EGH, MP, is the current Cabinet Secretary for the Ministry of Health in Kenya. He previously served as Cabinet Secretary in the Ministry of Environment, Climate Change and Forestry (2024 – 2025) and the Cabinet Secretary for Defence (2022 – 2024). He has served as a ranking Member for three consecutive terms of Parliament in the National Assembly of Kenya. He was the First Leader of the Majority Party in the National Assembly, serving in the 11th and 12th Parliament until July 2020. He was first elected into Parliament in the year 2007 and re-elected in 2013, 2017 and 2022. Hon. Duale is the incumbent Member of Parliament for Garissa Township Constituency.

Hon. Duale sponsored 101 Government Bills in the 11th Parliament as the Leader of the Majority Party. He is a founding member of various political parties including, the Orange Democratic Movement, the United Republican Party, the Jubilee Party and the United Democratic Alliance. Hon. Duale holds a Bachelor of Education Degree from Moi University which he undertook from 1988 to 1992. He also holds a Master of Business Administration from Jomo Kenyatta University of Agriculture and Technology.

Elhadj As Sy (Co-Chair)

Wellcome Trust Board Member, Chancellor Liverpool School of Tropical Mediciine, Chair Kofi Annan Foundation, Former General Secretary International Federation of the Red Cross and Red Cresent Societies (IFRC)

Mr. Sy, former Secretary General of the IFRC (2014–2019), is Co-Chair of the Global Preparedness Monitoring Board and Chair of the Kofi Annan Foundation Board. Previously, he served as UNICEF's Director of Partnerships, Regional Director for Eastern and Southern Africa, and Global Emergency Coordinator for the Horn of Africa. He has held leadership roles with UNDP, the Global Fund, and UNAIDS and directed health and development programs with Environment and Development Action in the Third World in Dakar. Mr. Sy holds degrees from the University of Dakar, University of Graz, the Diplomatic Academy of Vienna and a postgraduate diploma in Education from the Ecole normale supérieure in Dakar.

Dr John Amuasi

Executive Director, African Research Network for NTDs, Heads Global Health Department, Kwame Nkrumah University of Science and Technology, (MBChB. MS. MPH. PhD. FWACP.), Co-Chair of the Lancet One Health Commission

Dr Amuasi lectures at the Kwame Nkrumah University of Science and Technology, where he heads the Global Health Department. Dr Amuasi is also the Group Leader of the Global One Health Research Group at the Bernhard Nocht Institute of Tropical Medicine in Hamburg, Germany and at the Kumasi Center for Collaborative Research in Tropical Medicine in Ghana, which hosts the Secretariat of the African Research Network for Neglected Tropical Diseases (ARNTD) – which he leads. Dr Amuasi's research currently involves both clinical and field epidemiologic studies on neglected tropical diseases and antimicrobial resistance using a One Health approach. Dr Amuasi also co-chairs the Lancet One Health Commission and is the PI for some studies on COVID-19 in Ghana, including drug and vaccine clinical trials.

Dr Andreas Hougaard Laustsen-Kiel

Center for Antibody Technologies. Professor, Department of Biotechnology and Biomedicine. Center for Antibody Technologies, Microbes Initiative, Danmarks Tekniske Universitet

Andreas is specialized in antibody discovery, toxinology, and antivenom. He is a co-founder of the biotech companies Biosyntia, VenomAb, Antag Therapeutics, Chromologics, and Bactolife. Andreas is recognized as Denmark's Coolest Engineer, a Top 10 biotech entrepreneur under 30 in Europe 2016, he is on Forbes 30 under 30 list for 2017, and he is recognized as one of Europe's top 35 innovators under 35 in 2017 by MIT Technology Review. He writes the science blog ToxBlog for Denmark's leading science newspaper, Ingeniøren.

Andreas holds an M.Sc.Eng in Advanced and Applied Chemistry from the Technical University of Denmark and a PhD in Molecular and Cellular Pharmacology from the University of Copenhagen.

Dr Fan Hui Wen

Director and Clinician, Instituto Butantan, São Paulo, Brazil

Dr Fan Hui Wen is a Brazilian physician and public health expert who has dedicated over three decades to the Instituto Butantan in São Paulo, Brazil. Currently serving as a project director at the institute's Bioindustrial Center, she plays a pivotal role in the production and distribution of antivenoms across Brazil and Latin America. Recognizing the critical need for effective snakebite treatment, she has been instrumental in ensuring the availability of high-quality antivenoms, with the institute producing approximately 250,000 vials annually.

Dr Fan has also been a strong advocate for improving access to antivenom treatments in remote regions. She contributed to the development of the SAVING Program, which decentralizes antivenom treatment to indigenous community health centers in the Brazilian Amazon, addressing significant barriers to timely care.

Beyond her national efforts, Dr Fan has championed international collaboration. In 2018, she helped establish a network of 13 public antivenom manufacturing laboratories across Latin America, coordinated by the Pan American Health Organization. This initiative fosters shared expertise and resources to combat snakebite envenoming more effectively. Dr Fan Hui Wen's career reflects a deep commitment to public health, scientific innovation, and international cooperation in the fight against neglected tropical diseases.

Dr Yogesh Jain

Founder and CEO, Jan Swasthya Sahyog (People's Health Support Group) community health programme, India

Dr Yogesh Jain is a public health physician who earned his MD in Paediatrics from the All India Institute of Medical Sciences, New Delhi. He founded and runs the community health program Jan Swasthya Sahyog (People's Health Support Group) which operates in rural Bilaspur, India and Sangwari in northern Chhattisgarh. Indigenous people that call more than 2,500 of the most marginalised villages home access the services of Jan Swasthya Sahyog for their health care needs. Dr Jain helps address the technical, operational, economic or political issues that affect health care for the rural poor through clinical care, careful documentation, observational research studies, developing appropriate health-related technology, training, and lobbying. Since observing health and illnesses through the lens of hunger and extreme poverty, Dr Jain has become an advocate for the state as the primary provider of social services and believes that unbridled privatization while not rectify the inequities in global access to health care.

Dr David Lalloo

Vice Chancellor, Liverpool School of Tropical Medicine, MB BS MD FRCP FFTM RCPS (Glasg)

David Lalloo is a clinical academic in Tropical Medicine and Infectious Diseases with a particular interest in clinical trials and epidemiological studies in LMICs. Having undergone initial training in Newcastle upon Tyne, David trained in General (Internal) Medicine, Infectious Diseases and Tropical Medicine, spending three years in Papua New Guinea. He undertook clinical and laboratory research in Oxford before moving as Senior Lecturer to the Liverpool School of Tropical Medicine in 1999. Prior to taking up the Directorship of LSTM in January 2019, David was Dean of Clinical Sciences and International Public Health and was Director of the Wellcome Trust Liverpool Glasgow Centre for Global Health Research and the Liverpool Wellcome Trust Clinical PhD Programme. He holds an appointment as an Honorary Consultant at the Royal Liverpool University Hospital and remains clinically active.

His research has focused particularly on HIV-related infections, malaria and envenoming and he has also worked on COVID. He has active collaborations in a number of countries including Malawi, Uganda, Sri Lanka, Vietnam, Kenya, Nigeria, eSwatini, Ghana, Sierra Leone and South Africa. He has worked with the MLW Programme in Malawi for over twenty years and has a strong interest in identifying and supporting young UK and African clinicians interested in tropical research and strengthening scientific capacity in resource-poor settings.

David has held a number of national roles. He chaired the DHSC COVID-19 Prophylaxis Oversight group and was an advisor to a number of DHSC, FDCO/ DfID, NIHR and NICE COVID-19 groups. He currently chairs the NIHR Global Health Advisory Group, has been a member of the Medical Research Council Global Health group for over 10 years and was previously a member of SAGE for Ebola and Zika. He chaired the PHE Advisory Committee on Malaria from 2010-2019. He has sat on multiple funding committees and was Chair of the Wellcome Trust/ MRC/ DfID/DH Clinical Trials Panel from 2016-2019.

In May 2024, David was elected as a new Fellow of the Academy of Medical Sciences.

Andrea Lucard

Chief Corporate Strategy and Affairs,
Medicine for Malaria Venture (retired April 2025)

As Chief Officer of Corporate Strategy and Affairs, Andrea is responsible for resource mobilisation, internal and external communications, advocacy, travel, and events. She leads a diverse team of highly experienced professionals from India, the United States, the United Kingdom, the Philippines, Italy, Croatia, Colombia, France, Mauritius, and Canada. Andrea also spearheads MMV's fundraising strategy, which has successfully secured over USD 500 million from a range of international foundations, bilateral and multilateral organisations, corporate partners, and individual donors.

Prior to joining MMV, Andrea served as the first Director of Development for the International Baccalaureate, an international education program with schools in 140 countries and more than one million alumni–one of the largest alumni networks in the world. She began her career in External Relations at Colorado College, a liberal arts university in the United States, where she was responsible for all operations and fundraising efforts for a USD 300 million capital campaign. Andrea holds a Bachelor's degree in Art History from Oberlin College and a Master's degree in Writing from Warren Wilson College. She is a dual citizen of the United States and the United Kingdom.

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Framework and methodology

This report draws from:

- **WHO technical documents, including the WHO 2019 Snakebite Envenoming: A strategy for prevention and control;**
- **Peer-reviewed literature on epidemiology, burden, and treatment;**
- **Primary source interviews and data from country focal points and implementing partners; and**
- **Grey literature and policy documents from ministries of health and NGOs.**

Benchmarking was based on:

- **Review of national strategy implementation progress;**
- **Landscape analysis of antivenom regulation, procurement, and R&D;**
- **Case study collection using standardised impact and context templates; and**
- **Alignment with Sustainable Development Goals (SDGs), Universal Healthcare (UHC), and WHO Neglected Tropical Disease (NTD) frameworks.**

SOS

STRIKE OUT SNAKEBITE

The Global Snakebite Taskforce