The Global Snakebite Taskforce

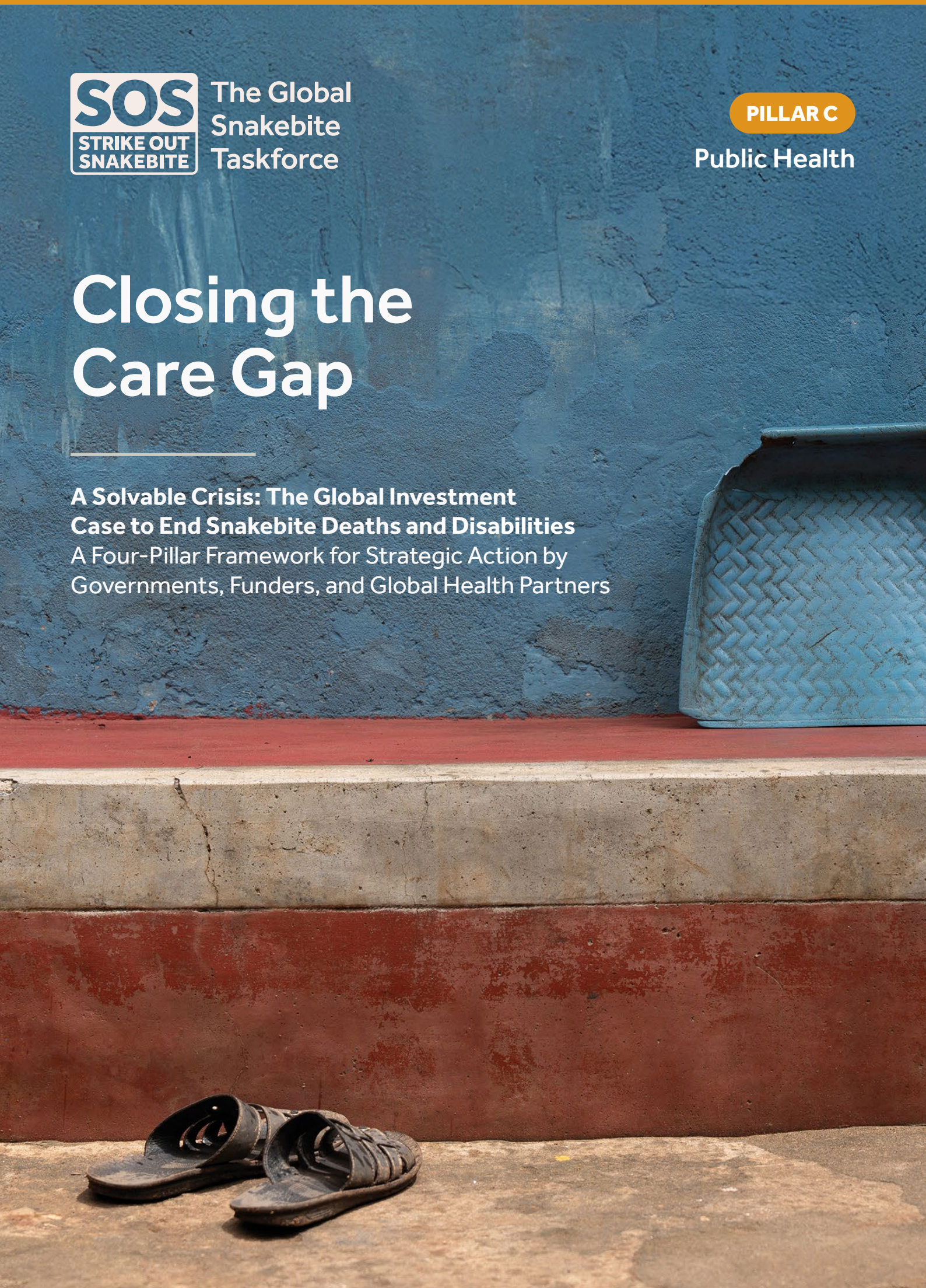
PILLAR C

Public Health

Closing the Care Gap

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



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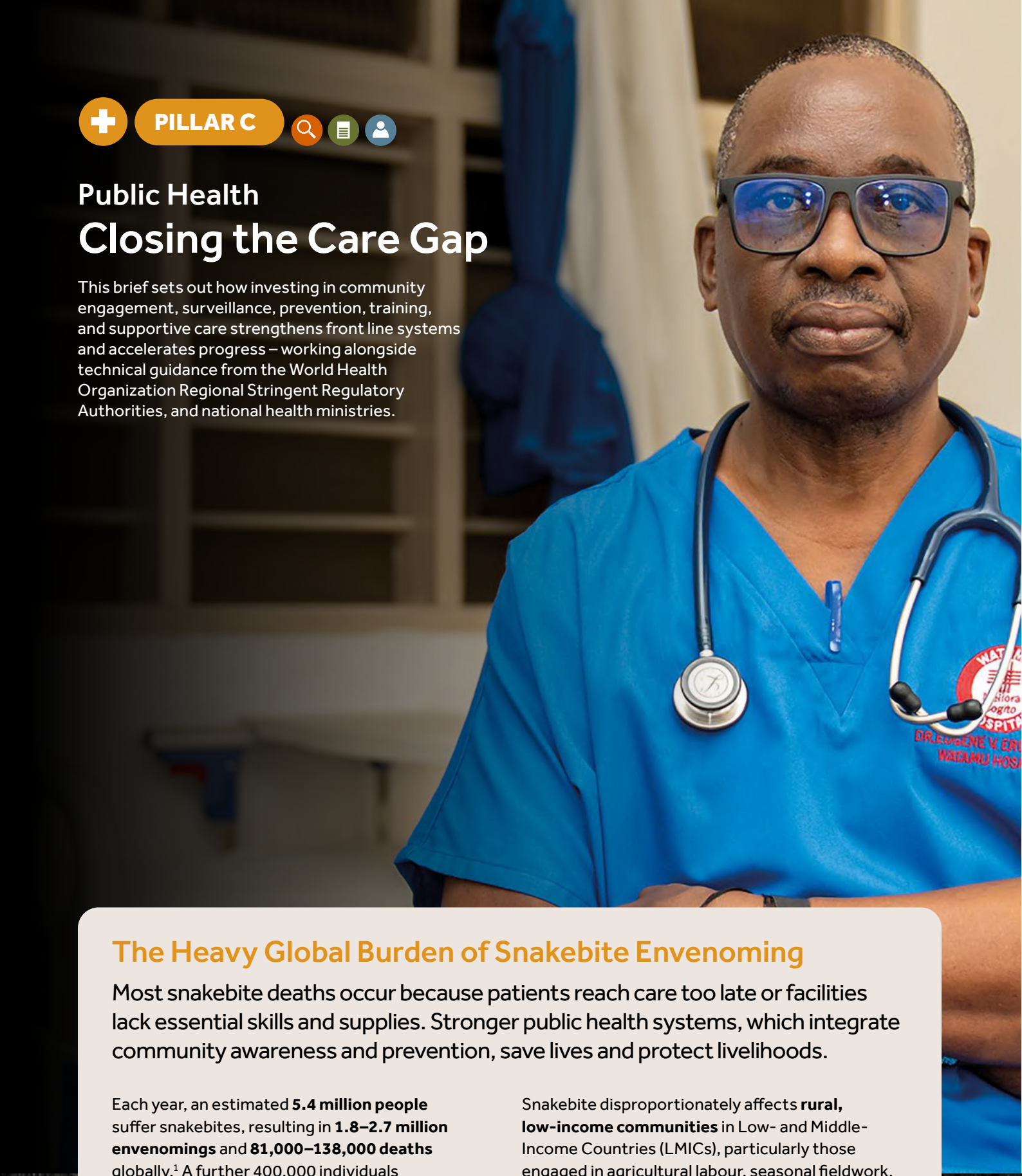
This brief sets out how investing in community engagement, surveillance, prevention, training, and supportive care strengthens front line systems and accelerates progress – working alongside technical guidance from the World Health Organization Regional Stringent Regulatory Authorities, and national health ministries.



The Heavy Global Burden of Snakebite Envenoming

Most snakebite deaths occur because patients reach care too late or facilities lack essential skills and supplies. Stronger public health systems, which integrate community awareness and prevention, save lives and protect livelihoods.

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

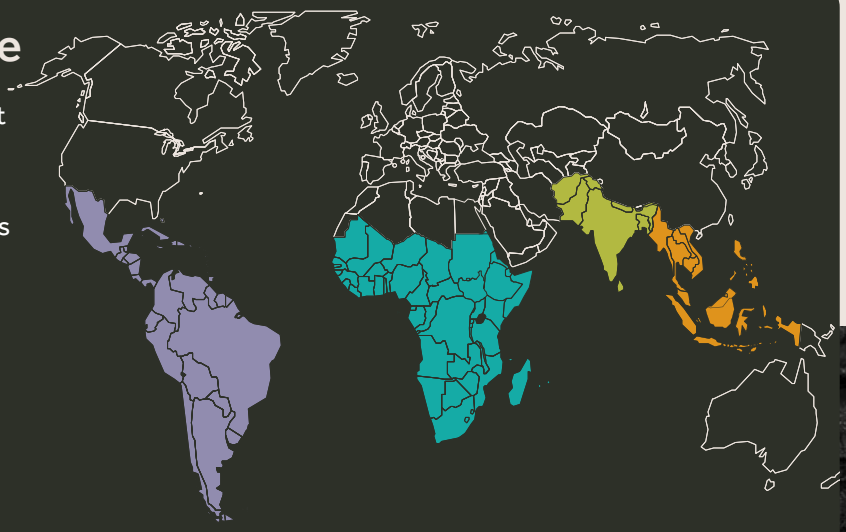
- **Death:**
  138,000 deaths per annum and this figure is undoubtedly underreported.
- **Severe Disability:**
  For every snakebite death, up to four survivors experience permanent disabilities such as amputations, contractures, blindness, or chronic neurological injury.[3] Snakebite accounts for **up 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

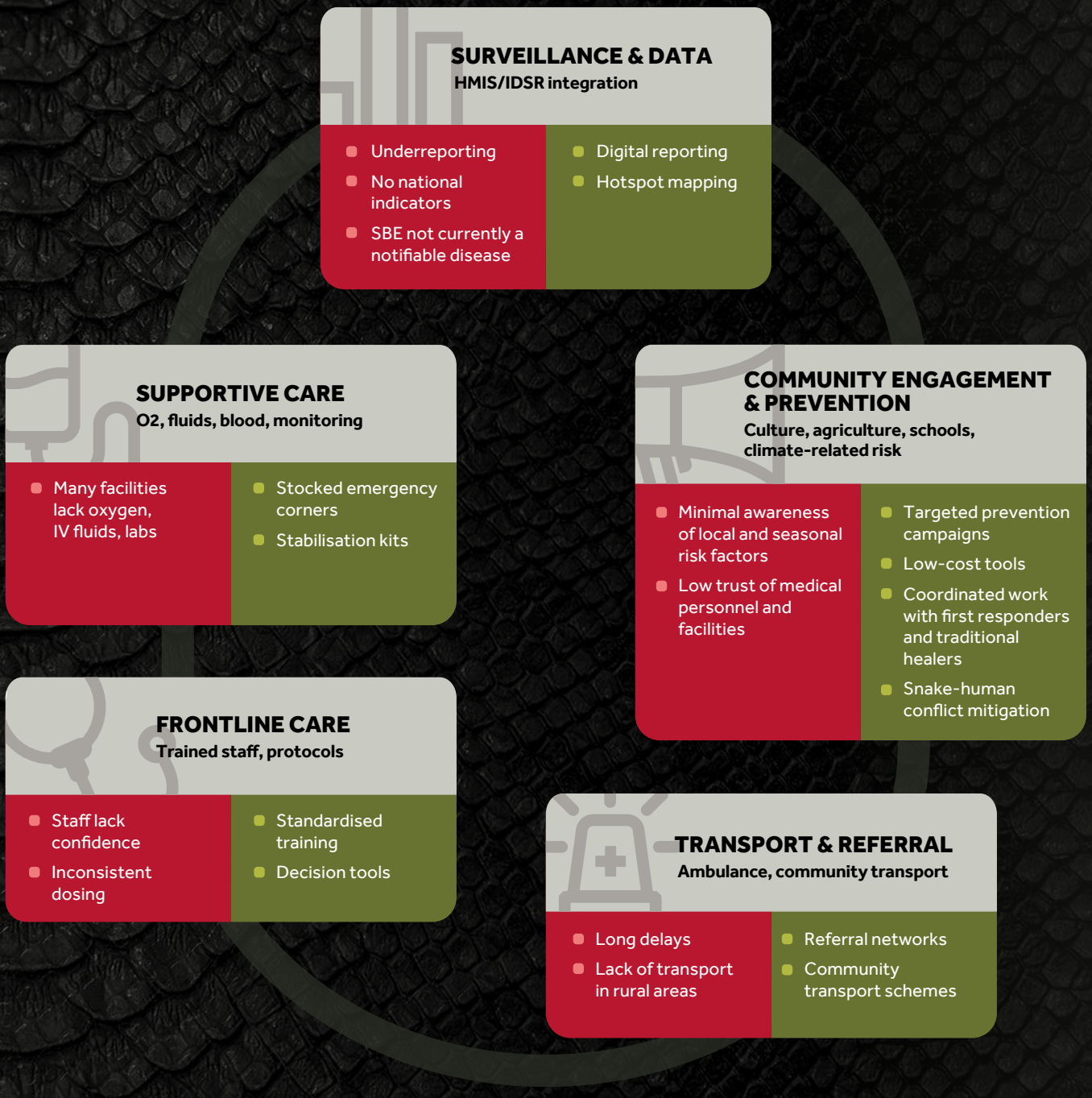
- **Proven tools already exist:**
  Antivenoms, supportive care, prevention, and trained clinical staff can dramatically reduce preventable mortality and life-changing injuries.
- **Science is advancing rapidly:**
  High throughput venom analyses, recombinant antibody technologies, repurposed small molecule 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]



The Public Health Loop for Snakebite Survival



Better data, prevention, and front line care dramatically cut deaths and disability.

The Failures Strong Public Health Fixes

Snakebite mortality is driven not only by antivenom shortages but by delayed care and weak systems:

- Underreporting hides true burden, distorting resource allocation.[11]
- Poorly functioning referral chains delay treatment.
- Inconsistent clinical training leads to inappropriate dosing or mismanagement.
- Low levels of community awareness and frequent failure to engage with traditional healers.
- Environmental and climate shifts increase human–snake conflict.[12]

Many deaths occur before the patient reaches a facility capable of delivering effective care.

What Investment Enables

- **Integrated Surveillance:** Snakebite indicators routinely captured through DHIS2 platforms for real-time monitoring.
- **Community Prevention:** Education aligned with agricultural cycles, climate patterns, and local ecology and culture.
- **Strengthened Referral Systems:** Transport, communication, and triage systems enabling rapid movement to definitive care.
- **Supportive Care Capacity:** At district hospitals: oxygen, fluids, monitoring, and the ability to stabilise patients prior to antivenom administration.
- **Trained Health Workforce:** Clinicians using standardised national protocols reduce morbidity and mortality.[13]

Headline Impact

- Early presentation improves survival dramatically.
- Health-worker training reduces complications and improves clinical decision-making.
- Community engagement programmes increase referrals to treatment centres and reduce bite incidence among high-risk groups.[14]
- Stronger public health systems accelerate adoption of new tools (diagnostics, improved antivenoms).

Illustrative 10-Year Scenario

With sustained investment in our public health systems for snakebite envenoming:

- National systems routinely tracking snakebite incidence, integrate data to DHIS2 reporting and use the information to target investment in healthcare.
- District hospitals have trained staff, traditional healers and first responders involved in first aid and referral, functioning referral systems, and essential supportive care.
- Community campaigns based on reliable research of local risk factors, engaging traditional healers that reduce bite incidence during high-risk seasons are systematically implemented and confidence in anti-venom treatment increases.

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

Strengthened public health systems ensure timely, high-quality care that saves lives and livelihoods – closing the care gap that turns potentially fatal bites into survivable emergencies.

CASE EXAMPLE 1

Snakebite-Focused: Health-System Strengthening Reduces Case Fatality Rates

Where structured clinical protocols, staff training, and compliance monitoring have been introduced – alongside strengthened referral and earlier presentation – case fatality rates have fallen markedly in real-world settings, demonstrating that systems inputs can rapidly improve outcomes when embedded in a broader case-management package. In Yeji (Ghana), WHO summarises a programme where a standard protocol with staff training and compliance monitoring (and effective antivenoms) were introduced; case fatality fell from 11.1% to 1.3%, admissions increased, and time-to-admission decreased.[15, 16, 17]

Costed global and national strategies indicate that these gains are achievable with relatively modest, targeted investment in training, supervision, and health-system strengthening, reinforcing the role of clinical capacity and referral systems as high-impact levers for reducing snakebite mortality. WHO's global strategy budgets explicitly include health-worker training and case-management strengthening, estimating USD 136.76 million in WHO direct support for 2019–2030, including USD 6.37 million (2021–2024) for first-aid and hospital treatment improvements and health-worker training/support.[15, 16, 17, 18]

CASE EXAMPLE 2

Analogous Global Health Success: Trauma Systems & Rabies Post-Exposure Prophylaxis

Trauma systems. Experience from trauma care systems shows that relatively modest, system-level investments can deliver large reductions in mortality in time-critical conditions. Across Low- and Middle-Income Countries, the introduction of structured triage, standardised treatment protocols, basic prehospital care, and defined referral pathways – supported by front line clinical training – has been associated with substantial declines in preventable trauma deaths, even in the absence of advanced technologies. WHO guidance demonstrates that essential trauma care packages, centred on organisation, protocols, and training rather than capital-intensive infrastructure, are achievable at low per-capita cost and represent one of the most cost-effective approaches to reducing injury-related mortality.[19, 20, 21]

Rabies post-exposure prophylaxis (PEP). Rabies programmes provide a closely analogous example of how clear clinical protocols, decentralised service delivery, and reliable referral and patient-navigation systems can transform outcomes in rural and resource-constrained settings. When timely PEP is accessible through organised delivery pathways, survival following exposure approaches 100%, with programme costs driven primarily by training, logistics, and supply coordination rather than complex technology. Global strategies to end dog-mediated human rabies estimate that sustaining effective prevention and PEP access requires investments on the order of hundreds of millions of US dollars annually worldwide, translating into relatively modest per-country and per-capita expenditures in endemic settings.[22, 23, 24]

Together, these models demonstrate that national or regional investments in the tens of millions of dollars – focused on clinical training, referral systems, and service organisation – can unlock disproportionate survival gains. This systems-first investment logic provides a compelling and cost-effective blueprint for strengthening snakebite envenoming care alongside, but not dependent on, product innovation.

PROOF POINTS

What the evidence shows:

- Underreporting is a major barrier to investment; **digital surveillance** improves resource targeting and procurement decisions.
- **Supportive care** saves lives before antivenom is administered.
- **Community interventions** are highly cost-effective and culturally adaptable.
- **Training and protocols** deliver immediate improvements without major capital investment.

What You Can Do Now

Governments

- Integrate snakebite envenoming indicators into DHIS2.
- Standardise national training and treatment protocols.
- Strengthen referral networks, ambulances, emergency care, particularly in rural areas.
- Integrate culturally appropriate community awareness and prevention programmes based on reliable research of local risk factors.

Foundations & Philanthropists

- Fund demonstration districts for integrated snakebite envenoming Public Health Systems.
- Support digital surveillance platforms.
- Back community prevention aligned with climate adaptation and cultural norms.
- Fund research on local snake-human conflict and snakebite risk factors.

Multilateral Development Banks & Global Agencies

- Integrate SBE into health-system strengthening loans.
- Finance rural emergency care and supply chains.
- Invest in community health worker mobilisation, including support for climate adaptation programmes with SBE components.

Private Investors, Industry & Social Enterprise

- Innovate low-cost referral transport tools.
- Deploy telemedicine and digital decision-support tools.
- Support prevention innovation for wearable or environmental sensors and protective equipment for high-risk settings.

Stronger public health systems turn snakebite from a fatal emergency into a survivable event – especially in rural, climate-stressed settings.

ENDNOTES

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In support of the nation state endorsed WHO Snakebite Envenoming Strategy