

Venom to Vision: Building South Africa's National Snakebite Database

Abstract 112



BUILDING HEALTH, TOGETHER.

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DECLARATION OF INTERESTS

Before I begin, I would like to declare that I have **no financial or commercial conflicts of interest** related to this presentation.

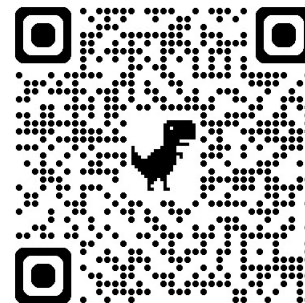
The **affiliations** and **collaborations** relevant to this work are disclosed.

This presentation is intended for scientific, clinical and educational purposes.

Introduction

Snakebite envenoming is a neglected tropical burden in South Africa, with true incidence, patterns and outcomes poorly described. Without reliable national data, health services, NSAG and policymakers struggle to plan antivenom stock, training, referral pathways and community education, leaving rural and vulnerable communities at disproportionate risk.

WHO estimating 4.5–5.4 million snakebites a year, 1.8–2.7 million envenomations, and roughly 81,000–138,000 deaths globally. With around 400,000 permanent disabilities annually.



Aim and Objective

South Africa needs better snakebite data to save lives and limbs.

This presentation introduces the country's first national snakebite database, built on a Medibank-modelled platform to capture real-world epidemiology, syndromic presentation and treatment patterns, and to support better clinical care, smarter antivenom use and stronger national advocacy for a neglected tropical disease.



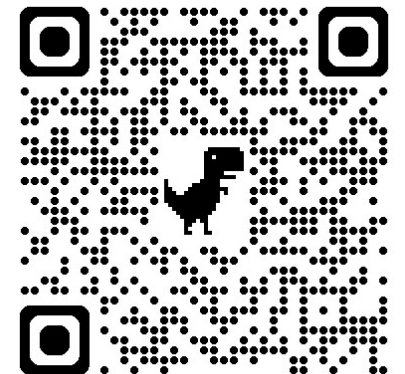
What Did We Do?

We developed a structured snakebite dataset and implemented it on a Medibank-derived digital platform, creating the first national snakebite registry spanning both public and private facilities.

Core variables include demographics, province, setting and activity at time of bite, body part bitten, syndromic presentation (for example painful progressive swelling versus progressive weakness or ocular exposure), suspected or confirmed species (for example Cape cobra, black mamba, rinkhals, night adder, harmless species), and snake danger level.

Time metrics capture bite-to-presentation interval, while treatment fields include previous bites, antivenom type and vials administered, adrenaline and antihistamine use, anaphylaxis, adverse reactions and late complications. Records from multiple provinces show bites across age groups, from children to older adults, in domestic, occupational and recreational settings.

Data are curated in collaboration with NSAG clinicians and toxicology experts to improve syndromic classification, species attribution and completeness, creating a dynamic platform for surveillance, clinical audit and research.



[Graphs](#)
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Your name and surname Your contact number
 Email address
 Designation: (Doctor, Nurse, Data capturer ...)

Patient details

First name Surname
 Date of birth Height (m)
 Age Weight (kg)
 Gender BMI
 Ethnicity

Snake Bite Info

Transport type
 Treatment facility name
 Date bitten Time bitten
 Country Province
 Incident suburb Type up to three words to search. You must make a selection from the list
 Incident site Add missing items to lists
 Activity when bitten
 Body part bitten
 Date of presentation Time of presentation Bitten to presentation days hhmm

Syndromic presentation

- ☐ Painful progressive swelling (PPs) ☐ Mixed painful progressive swelling and bleeding
☐ Progressive weakness (PW) ☐ Mixed painful progressive swelling and progressive weakness
☐ Bleeding (B)

Physical exam

HR BP RR
 GCS SATS MEWS

Blood results

FBC U and E Clotting studies

Antivenom No ☐ Yes ☐

Tourniquet applied No ☐ Yes ☐

TourniquetTime

Store this Flipper Chart in your Resuscitation Trolley or Emergency Department

SNAKEBITE

FLIPPER CARD



This Flipper Chart gives you all the general guidelines to treat a snakebite as an in-hospital provider

Guideline Only/Not a Substitute for Clinical Judgment

SASS® 2026

What Did We Do?

Global and regional snakebite databases track medically important snake species, envenoming cases, geographic distribution maps, and antivenom availability.

The incidence of snakebite in South Africa and the challenges associated with lack of reporting

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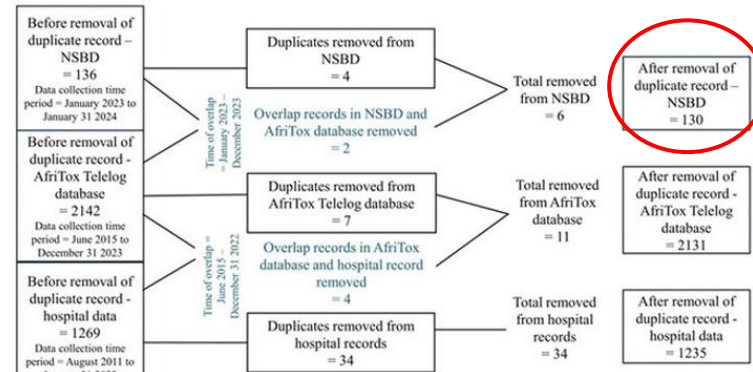
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Received 3 May 2024; revised 18 July 2024; editorial decision 22 October 2024; accepted 23 October 2024

Box 1. Process of removal of duplicate records from the datasets.

The only overlaps in data were across the AfriTox Telelog database and the NSBD and the AfriTox data and the hospital data. The records with the most information about the circumstances of the bite were chosen and both NSBD and the AfriTox records included more information than hospital records.

Total records before duplicates were removed = 3547



Total records after removal of duplicates = 3496

Fig.1

Combined dataset

The combined dataset showed that 3547 snakebite-related incidences were recorded between 2011 and 2024 from the three data sources. Fifty-one duplicates across the three sources were removed and a total of 3496 incidences were included in the study. Of the total incidences, 141 were spitting incidences that did not lead to bites. Based on the three available datasets, an average of 280 ($\pm$ SD=167.5) incidents of snakebite were recorded per year over 12.5 y. The majority of incidences were logged during 2023 (427 bites and 25 spitting incidences, Figure 1). Snakebite records were low from 2011 to 2015, but, since 2015, more than 150 bites were recorded per year (Figure 1). The prevalence was calculated as 5.63 for South Africa per 100 000 individuals of the population and provincially the rate was highest in KwaZulu Natal (8.89, Figure 2).

More males (65.9%) were bitten than females (33.9%, Figure 3a) and most records of incidences were in individuals aged 21–30 y (19.8%). The majority of incidents were recorded between midday and midnight (25%, Figure 3b) and between November and March (Figure 3c). For 92% of incidences, the activity at the time of the bite on the body, most occurred on the foot (16.5%, Figure 3d). Overall, snake species were listed for 32.1% of snakebite incidences and the top 10 were *B. arietans*, *N. mossambica*, *A. bibronii*, *N. nivea*, *Causus* spp., *H. haemachatus*, *D. polylepis*, *Boaedon capensis*, *D. typus* and *Bitis atropos*.

Discussion

This is the first study to assess the incidence of snakebite in South Africa using multiple data sources. The combined data sources revealed that the incidence of snakebite was much higher than expected with 3355 cases and 141 spitting incidences recorded from August 2011 to January 2024. We also detected an increase in the number of recorded cases from 2015, with more than 150



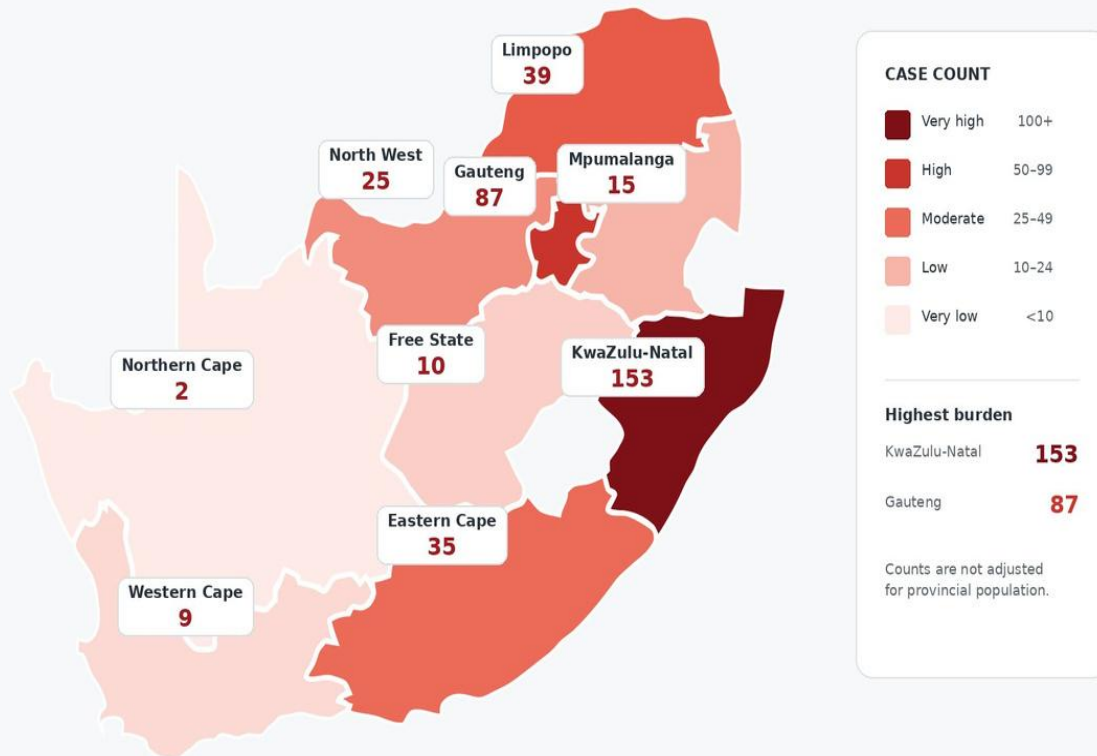
Figure 2. The prevalence of snakebite from the available dataset over 12.5 years was calculated per 100 000 individuals of the population in each province in South Africa with the highest rate in Zulu Natal (8.83).

bites recorded each subsequent year. However, it is not clear if this rise in reported cases is due to an increase in the number of snakebite incidents or improved reporting. Overall, the number of snakebite incidents reported in this study is clearly a significant underestimation of the actual snakebite incidence in the country as records were available from only 4.5% of hospitals in South Africa and only 51 of the snakebite incidents were recorded in more than one of the databases. This highlights the need for a more rigorous snakebite reporting system in South Africa.

We detected several consistent patterns in the different data sources for snakebite incidence in South Africa. For example, all datasets revealed that males made up the majority of snakebite cases, and most cases occurred during the summer months when snakes are most active and searching for prey.²¹ KwaZulu-Natal Province had the highest prevalence of snakebite in all

Reported Snakebite Cases in South Africa

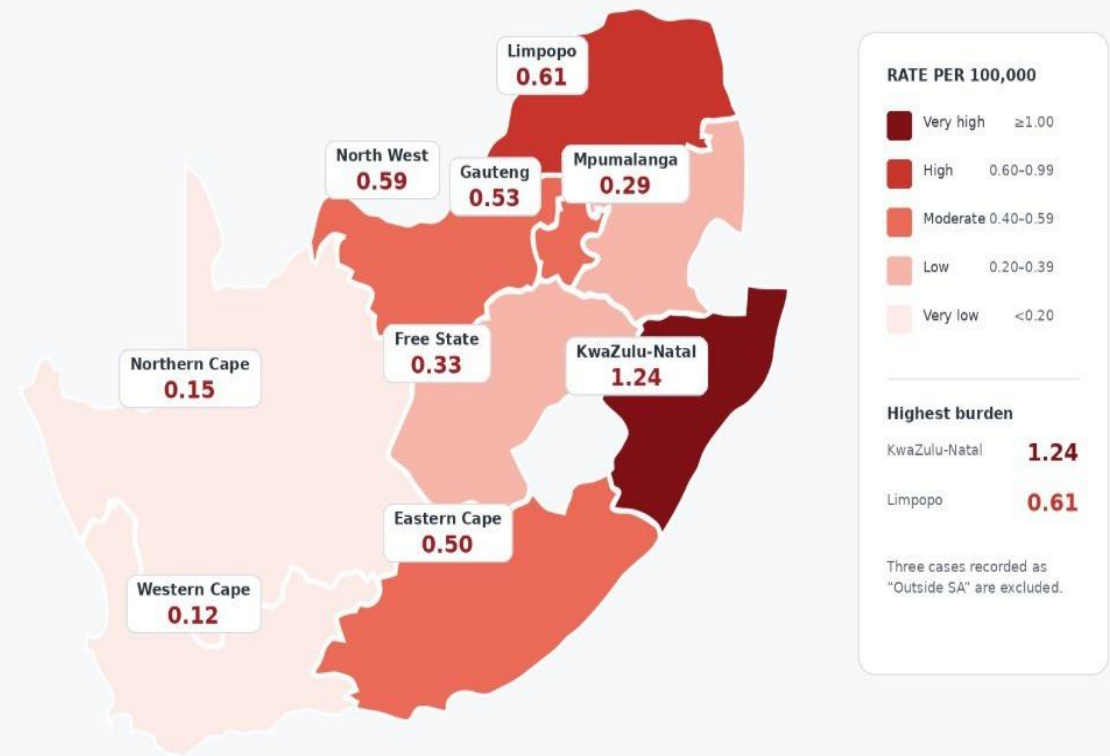
Distribution by province • Total cases: 378



Data: user-provided provincial chart | Base map: Wikimedia Commons, CC BY-SA

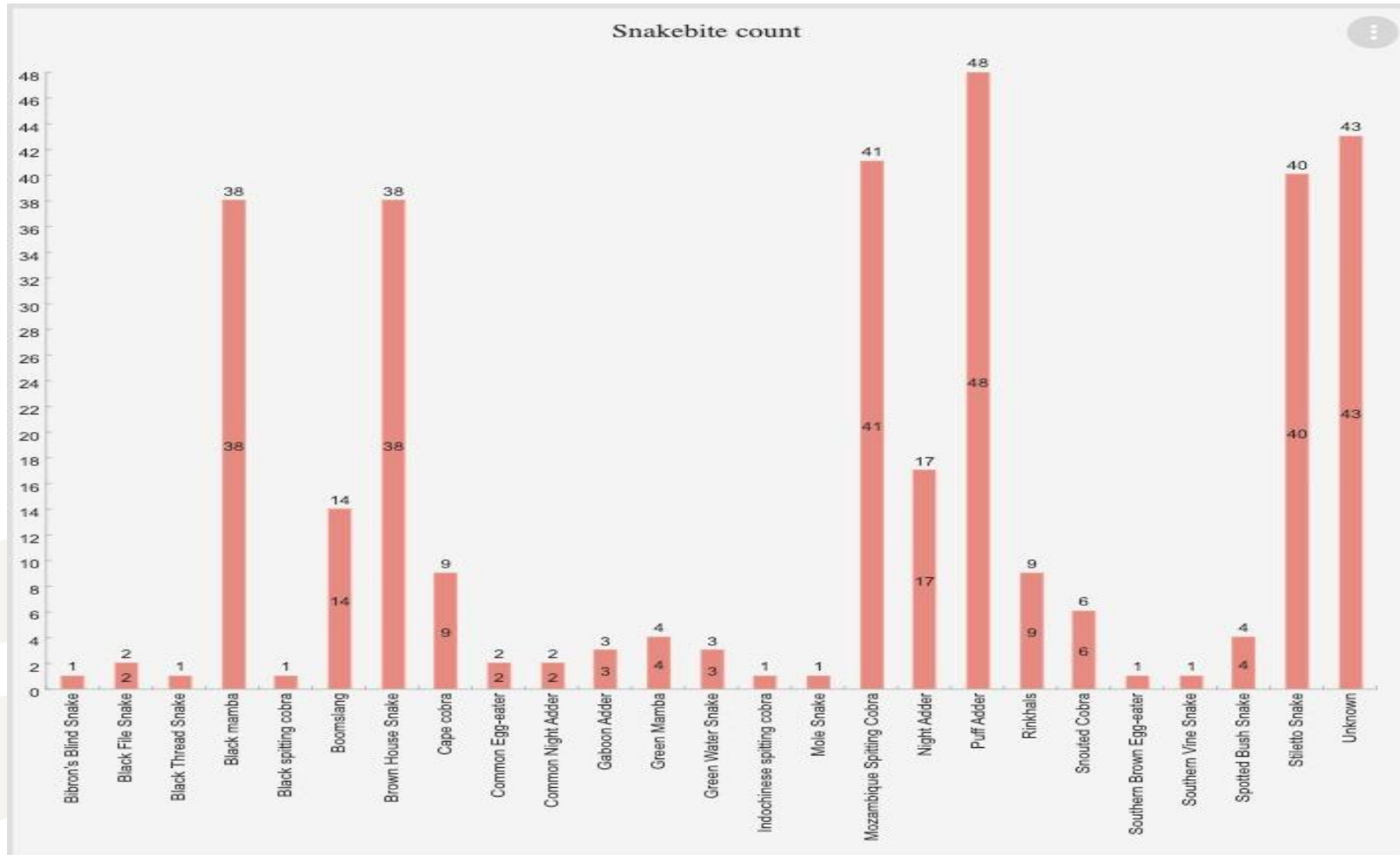
Snakebite Incidence in South Africa

Reported cases per 100,000 population • 2026 population denominator



Cases: user-provided chart | Population: Stats SA MYPE 2026 (P0302) | Base map: Wikimedia Commons, CC BY-SA

Data: Snakes that Bite in SA



5 TOP IDENTIFIED SNAKES

Recorded snakebite counts • South African dataset

n = 205
cases shown



Puff Adder

Bitis arietans

CYTOTOXIC

48



Mozambique Spitting Cobra

Naja mossambica

CYTOTOXIC

41



Stiletto Snake

Atractaspis bibronii

CYTOTOXIC

40



Black Mamba

Dendroaspis polylepis

NEUROTOXIC

38



Brown House Snake

Boaedon capensis

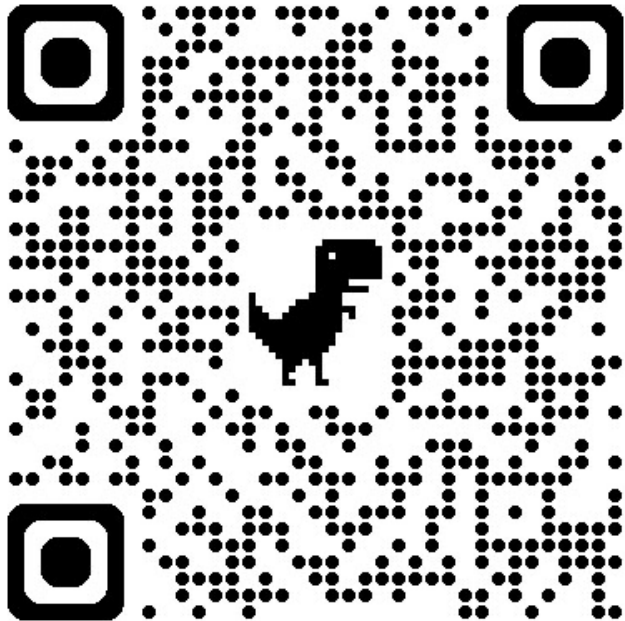
HARMLESS

38

Note: 43 records labelled 'Unknown' were excluded because they could not be assigned to a snake species.

Photographs: African Snakebite Institute / Johan Marais; SANBI; Tyronne Ping. Counts supplied by user.

Data: Where People are Bitten



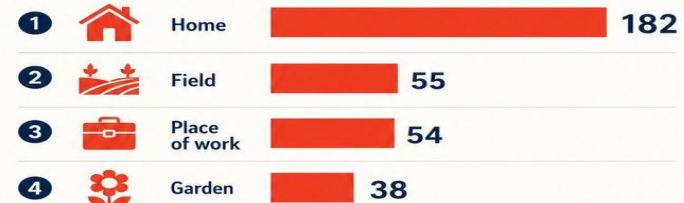
INCIDENTS BY SITE

375
TOTAL INCIDENTS



HOME
182
48.5% of all incidents

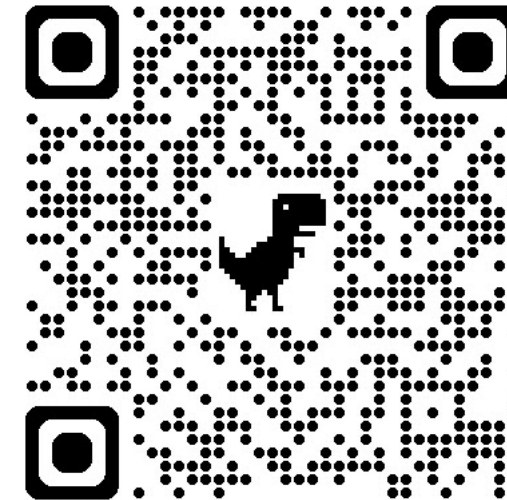
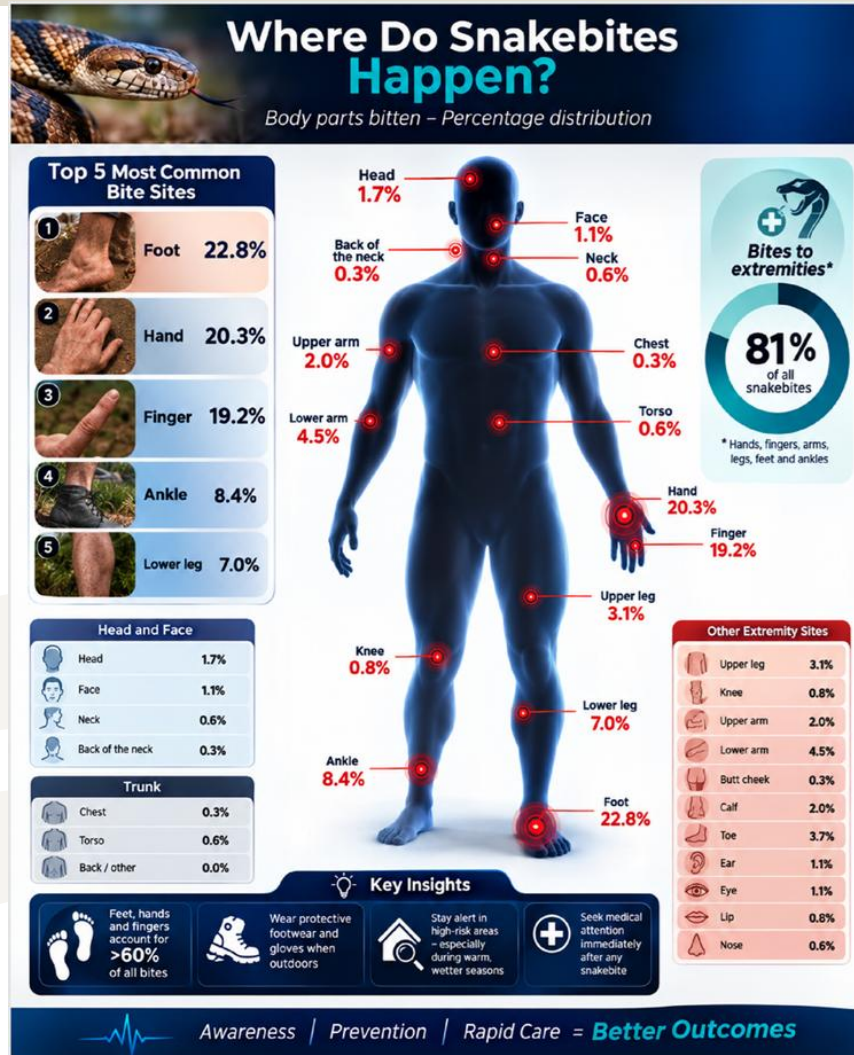
TOP REPORTED SITES



OTHER REPORTED SITES



Data: Where Do Snake Bites Happen?



From Venom to Vision the Way Forward



- South Africa cannot effectively prevent, treat or resource what it does not consistently measure.
- A national snakebite database creates the foundation for a coordinated response: revealing where bites occur, who is affected, how patients present, what treatment is provided and where preventable delays or inequities persist.
- By connecting health care sector data, clinical expertise and real-world outcomes, we can improve antivenom stewardship, strengthen referral pathways, target training and community education, and ultimately save lives and limbs.

From Venom to Vision the Way Forward



- **Data is an intervention.** Collecting consistent national data is the first step toward identifying avoidable delays, unsafe variation in care and gaps in antivenom access.
- **National collaboration is essential.** A meaningful picture requires participation from emergency departments, hospitals, toxicology services, clinicians, laboratories, public-sector services, private facilities and organisations such as the NSAG and gaps in antivenom access. (SAPRA section 21 for vital AV delaying care to snakebite victims across SA)
- **Equity must remain central.** Rural, remote and economically vulnerable communities may face the greatest delays in access to expert assessment, antivenom, referral and definitive care. A national registry can make these inequities visible and actionable.
- “Every snakebite record represents more than a case number. It represents a person, a family, a clinical decision and an opportunity to learn. If we capture these experiences consistently, share them responsibly and act on what they tell us, we can move from fragmented anecdotes to national intelligence—and from reactive treatment to safer, more equitable snakebite care in South Africa.”

NSAG NATIONAL SNAKEBITE DATABASE

EVIDENCE. ACTION. PREVENTION. SAVING LIVES.



EVIDENCE FOR PLANNING

Understand burden, hotspots & trends to plan services



GUIDELINES & BEST PRACTICE

Refine treatment guidelines with local real-world data



SECURE ANTIVENOM SUPPLY

Forecast demand, strengthen supply chains and ensure availability

A national, **Medibank-modelled** snakebite database will give NSAG and the health system the evidence needed to plan services, refine guidelines and secure antivenom. By converting fragmented cases into structured data, it will drive training, improve clinical decisions and prevent avoidable deaths and disability.



TRAIN & BUILD CAPACITY

Target training where it's needed most and strengthen skills



IMPROVE CLINICAL DECISIONS

Better data. Better decisions. Better outcomes.



PREVENT AVOIDABLE DEATHS & DISABILITY

Timely care, informed responses and lives saved



CAPTURE



STANDARDISE



INTEGRATE



ANALYSE



ACT

FRAGMENTED CASES → STRUCTURED DATA → BETTER OUTCOMES

NSAG National Snakebite Database is not simply a registry of snakebites— it has the potential to become South Africa's **NATIONAL SNAKEBITE SURVEILLANCE, CLINICAL GOVERNANCE & PREVENTION PLATFORM.**

EVERY BITE COUNTS.
EVERY RECORD MATTERS.
EVERY LIFE VALUED.



ONE NATION
One standard
One database



REAL-TIME
Timely data
Timely action



EVIDENCE-DRIVEN
Policies, protocols
& priorities



COLLABORATIVE
Hospitals, EMS, labs,
communities, NSAG



SUSTAINABLE
Stronger systems
Better outcomes



STRONGER DATA.
STRONGER SYSTEMS.
STRONGER SOUTH AFRICA.

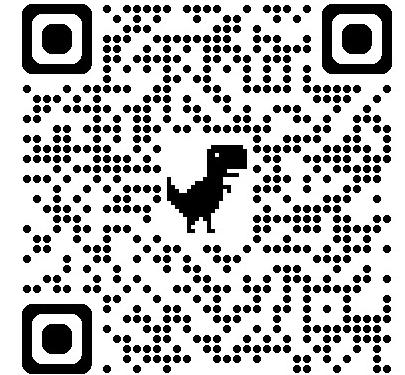


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Thank You!

Join the registry: contribute cases, improve data quality, share clinical learning and help build the evidence base that South Africa needs to save lives and limbs.

<https://www.nsbd.co.za/nsbd>

