

Snakebite Unit

One Health Centre | National University–Sudan



The Snakebite Unit at National University–Sudan is a pioneering centre of excellence dedicated to the prevention, management, and research of snakebite envenoming (SBE). Recognising SBE as a critical Neglected Tropical Disease (NTD), we employ a One Health framework to link clinical toxicology, snake ecology, and community safety to save lives and livelihoods across Sudan.

The Reality of Snakebite in Sudan

Snakebite represents a serious, yet under-recognised public health emergency in Sudan, particularly in agricultural regions like Gadarif.

- **The Scale of the Problem:** Over 63,000 cases were reported between 2014 and 2018, though many more go unrecorded as victims often rely on traditional healers.
- **Highly Venomous Species:** Sudan is home to at least 19 medically important snakes, including the Carpet Viper, Nubian Cobra, and Burrowing Asp, which cause devastating neurotoxic and haemotoxic effects.

- **The Burden of Disability:** Beyond mortality, snakebite leads to permanent disability, amputations, and severe economic hardship for rural families and young workers.

Our Goal: Reducing the Burden

Aim: To establish Sudan as a regional leader in snakebite prevention, management, and research, significantly reducing mortality and the socioeconomic impact of envenomation.

Our Objectives:

- **Clinical Excellence:** Strengthen the management of cases through standardised protocols and telemedicine support for rural areas.
- **Antivenom Access:** Improve the availability, distribution, and rational use of safe, effective antivenoms.
- **Surveillance:** Develop the first national snakebite registry and database to map incidence and snake habitats.
- **One Health Integration:** Study the environmental and ecological determinants of snake migration and human exposure.



Core Activities of the Unit

| Pillar | Priority Actions |
|-----------------------|---|
| Clinical Care | Specialised treatment, emergency resuscitation, and management of complications (necrosis, coagulopathy). |
| Research & Biobanking | Studying venom composition, collaborating on antivenom development, and exploring AI-assisted snake identification. |
| Training & Capacity | CPD programmes for doctors and nurses; fellowships in clinical toxinology and One Health. |
| Community Education | First aid training, prevention awareness for farmers, and promotion of early health-seeking behaviour. |
| Policy & Advocacy | Advising the Ministry of Health on national control strategies and equitable antivenom distribution. |

A One Health Perspective

We address snakebite at the Human–Animal–Environment interface:

1. **Human Health:** Providing life-saving clinical intervention and rehabilitation.
2. **Animal Health:** Understanding snake biology, venom diversity, and ecological patterns.
3. **Environmental Health:** Mapping how climate change and agricultural expansion affect human-snake encounters.

Governance & Strategic Partnerships

The Snakebite Unit is managed by a multidisciplinary team of clinicians, ecologists, and public health experts. Our Advisory Board includes representatives from the Ministry of Health, Ministry of Agriculture, and international academic partners.

Key Collaborations:

- National and international research institutions.
- Antivenom producers and global health NGOs.

- Local community leaders and agricultural cooperatives.



Expected Impact

- **Health:** Lower case-fatality rates and a significant reduction in long-term disability.
- **Socioeconomic:** Reduced financial ruin for rural households and improved productivity in the agricultural sector.
- **Scientific:** Establishing Sudan as a primary hub for toxinology research in Africa.

Sustainability Strategy

The unit ensures long-term viability through:

- **Institutional Integration:** Embedding protocols within the Ministry of Health and the National University's academic framework.
- **Workforce Development:** Mentoring a self-reliant generation of Sudanese toxinologists.

- **Diversified Funding:** Leveraging research grants, specialised training fees, and international donor partnerships.