



# SNAKEBITE IN CONFLICT SETTINGS

## As part of the Hub Communities' annual theme 2024: Global Health in Conflict Settings

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### INTRODUCTION

“Snakebite is the biggest public health crisis you have likely never heard of” – Kofi Annan [1]

- Snakebite envenoming is a climate-sensitive disease of poverty, and an occupational and disaster-related health hazard [2]
- Recognized by the World Health Organization (WHO) as the Neglected Tropical Disease (NTD) causing the highest number of deaths per year [3]
- Annual incidence is likely to be 5.4 million snakebites globally, with resulting mortality exceeding 150,000 deaths [3,4]
- Snakebites are most common in rural areas of tropical and subtropical low- and middle-income countries [2,4]
- Snakebite is a silent killer in war zones and refugee camps of West, Central and East Africa [5,6], Myanmar [6], and Yemen [5] where displaced people are more exposed and vulnerable to snakebite, and have even less access to treatment [5,6]



Rohingya people fleeing ethnic cleansing in Myanmar in 2016, seeking protection in Bangladesh.



Sudanese refugees stand around a bucket emptied of about 30 snakes in Maban Dorro camp, South Sudan. “These are from one day,” they say, adding that “they come every night.” Photo by Guy Peterson, courtesy of Al-Jazeera.



Capillary leak syndrome following envenoming by eastern Russell's viper (*Daboia siamensis*) during Cyclone Nargis in Myanmar in 2008. Note bilateral conjunctival chemosis with subconjunctival haemorrhages and epistaxis. Photo courtesy of Aniruddha Ghose.



Local edema with blistering and ecchymosis following a bite in the foot by an eastern Russell's viper (*Daboia siamensis*) in Myanmar. Photo courtesy of David A. Warrell.

### BEST PRACTICES & LESSONS LEARNED

- **Integrating snakebite envenoming** in NTD, One Health and zoonotic disease programs and rabies elimination activities can create major synergies [8]
- **Community-based and molecular epidemiology research and GIS modelling** can reveal snakebite burden, hot-spots and snake species involved [9-11]
- Prevention through **community education by trained health workers** is the most effective and economically viable strategy for reducing risk of bites and envenoming, and for encouraging people to seek access to modern medical treatment [3,4]
- Snakebite envenoming can be **treated highly cost-effectively** even in resource-poor, rural primary healthcare facilities [12]. Empowering health workers to diagnose and treat snakebite envenoming is key [3,4] – trainers, medicines and other tools exist and can be deployed if funded
- **Affordable point-of-care and other tests** to predict complications, guide treatment and resource allocation exist, some need clinical validation [13,14]
- **Antivenoms are unavailable** in many countries [4,5] – ensuring their quality, rational use and sustainable supply is possible with sufficient political will [15]
- **Improving antivenoms and evaluating new ideas** for interventions is feasible with more investment in international cooperation, interdisciplinary pre-clinical research including modern proteomics and genomics, and clinical trials [16,17]

### CONCLUSIONS & POLICY RECOMMENDATIONS

- Snakebite is a “litmus test” for health systems regarding Universal Health Coverage (UHC) and emergency & critical care
- Snakebite is a tool-ready NTD and a low-hanging fruit for reducing child mortality and achieving UHC and the Sustainable Development Goals
- WHO reduction target (50% less mortality and disability by 2030) [15] is feasible in various countries if adequately financed
- Donors and funding programs should include snakebite envenoming – so far often excluded for being non-infectious!
- Humanitarian organizations, other civilian and military healthcare providers need to provide geographically appropriate, effective antivenoms in countries at high risk – WHO and GHHG Snakebite Envenoming Community can advise

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