



## Editorial

### Improving Access to Treatment of Poisonings in Asia: Challenges beyond Availability

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Although NCD emerged rapidly and became the major contributors to the burden of disease in most of low and middle-income countries; governments cannot under-estimate certain communicable diseases which remain a serious public health threat; all of which require robust core competencies as required by the 2005 International Health Regulation. This OSIR issue highlights five articles related to key public health challenges. A chronological evolution of migrant policy in Thailand describes how the country responds to labour shortage while protects health of migrants. Four others are evaluation of malaria surveillance; Indonesian animal brucellosis surveillance; multiple cholera clusters; and investigation of scabies outbreak among prisoners. All these articles address the communicable diseases which continued to pose significant public health threats to countries in Southeast Asia.

In addition poisoning, snake bites and access to antidote and antivenom are among public health challenges that have not been widely discussed in public health communities. It is hoped that future OSIR issues will present articles on toxin and poisoning from the lens of outbreak investigation or public health response.

#### **The burden of poisoning**

Poisoning is one of the global health challenges. In 2012, an estimated 193,460 people died from unintentional poisoning worldwide<sup>1</sup>, where about 84% of these fatalities occurred in low- and middle-income countries. Deliberate ingestion of pesticides causes 370,000 deaths each year. Despite all-age mortality from unintentional poisoning had reduced to 72,400 in 2017 (95% uncertainty interval 52.7 to 79.4), a -20.8% changes (-28.4 to -12.5) between 2007 and 2017<sup>2</sup>; challenges remain on addressing these preventable deaths by inadequate availability of and access to highly toxic pesticides, clear and uniform policy response is lacking in most countries in the Asia Pacific<sup>3</sup>; and essential life-saving antidotes are not included in National List of Essential Medicines.<sup>4</sup> Access to antidotes was further complicated by challenges in procurement and supply management to maintain minimum stock of antidotes for immediate life-saving interventions.

Snake envenoming is a major health issue affecting remote and rural regions of the tropics.<sup>5</sup> It causes considerable morbidity and mortality worldwide. The highest burden exists in South Asia, Southeast Asia, and sub-Saharan Africa.<sup>6</sup> The need to improve access to antivenoms is a major challenge in these affected countries including South Asia.<sup>4</sup>

In 2017, after intense advocacy by concerned stakeholders including Médecins Sans Frontières, the Global Snakebite Initiative, Health Action International, and advocacy by more than 20 countries, WHO listed snakebite envenoming a priority neglected tropical disease.<sup>7</sup> This was followed by a resolution on the burden of snakebite envenoming adopted in the World Health Assembly in 2018.<sup>8</sup>

#### **Antidotes, antitoxins and antivenom: challenges of availability and accessibility**

Given the economic burden and death tolls<sup>9</sup> and global commitment towards improved access to antivenom, its critical shortage remains and technology not dissimilar from early vaccines is still used to manufacture antivenom. This questions quality and safety of these antivenoms.<sup>10,11</sup> There has been

little incentive for innovation or investment in new production technology of antivenom due to lack of purchasing power in low income countries.<sup>9</sup>

“With nearly 46,000 deaths a year, India’s antivenom problems center around quality. Four antivenom manufacturers produce upwards of 1.5 million vials a year, but the collection and processing of venoms – used in the making of antivenom – lacks standards and quality control”.<sup>12</sup>

Treatment of life-threatening poisoning includes supportive care and specific treatment. For certain poisoning, antidotes are the only choice. They reduce mortality rate, minimize disability, shorten clinical course or minimize the total expenditure of treatment.

Shortage of antidotes is a global challenge, where low and middle-income countries suffer most. An availability survey of antidotes, antitoxin and antivenom in New Zealand hospitals in 2014 showed that, only N-acetylcysteine and octreotide held in adequate quantities by all hospitals to manage a single patient for 24 hours.<sup>13</sup> The average replacement cost for expiring drugs was 171,024 USD, where smaller and isolated facilities face the greatest expense and difficulty in achieving timely resupply. However, another study from New Zealand reports that antidotes are adequately available.<sup>14</sup> Similar situation was reported by Thailand.<sup>15</sup> Pharmaceutical company has no incentive to produce antidote due to the lack of a profitable market.<sup>16</sup>

Despite the 15 essential antidotes proposed in the 2017 WHO Model Essential Medicine List<sup>17</sup>, there is no assurance that these antidotes are made available at health facilities throughout the countries in particular in remote and hard-to-reach areas.

### **Solutions to availability: Thailand’s National Antidote Program**

The shortage of certain antidotes hampering treatment outcome brought several agencies to establish National Antidote Program in 2011 to ensure nationwide availability and immediate access to antidotes, antitoxins and antivenom. A common essential list of antidotes with difficulties of sourcing was developed, for which domestic production and global search of reliable suppliers and procurement are conducted. A national and sub-national stockpiling of different products is guided by epidemiologic profile, incidence and cost of products. Ensuring access is supported by web-based real time search and request by hospitals having index cases. A 24-hour phone consultation is offered for proper clinical diagnosis, management and monitoring. All these functions are coordinated by Poison Centers<sup>15</sup> The Program is supported financially by National Health Security Office, while the Government Pharmaceutical Organization is responsible for procurement of antidote and antivenom. Multi-agency collaboration ensures long term sustainability.

Since the launch of the Program in 2011, no shortage was reported. There are 16 antidotes including antivenom, all of which have sourcing challenges. The Program contributed to better clinical outcome of severe cases and cost savings from mismatched overstock and un-used medical products.<sup>15</sup> The program also provides emergency supply to other countries within and outside the Region, such as recent botulism outbreak in Nigeria through the facilitation of WHO Country Office.

### **Accelerating availability and access in Asia: inter-country collaboration**

The Program has extended its support to Member States of the WHO South East Asia region where common priority list is agreed upon. Countries can benefit, on a voluntary basis, from two components of the Program: emergency supply of antidotes and payment based on cost, and collective bargaining of price and quantity while countries are responsible to procure based on their procurement rules and regulations. In 2019, with the initiation by the Minister of Public Health, Thailand, the Program is in the process of exploring an opportunity to extend collaboration with ASEAN member states, on a voluntary basis to improve availability and access; so that people in ASEAN can benefit from the collaboration and improve access to these medical products; in an ASEAN spirit of caring and sharing.<sup>18</sup>

## Challenges beyond improved availability

Availability alone is not sufficed; affordable, quality products, training of health workforce for diagnosis and clinical management are equally important<sup>9</sup>. Government should strengthen primary health care capacity to prevent, diagnose, treat and refer to hospitals; improve surveillance and reporting<sup>19</sup>; and optimize stockpiling based on a formal antidote hazard vulnerability assessment.<sup>20</sup> Although the opportunities exist as ending Neglected Tropical Diseases was committed by SDG3.3 which includes snake bites as discussed by Ravikar et al<sup>21</sup>, there are more aforementioned challenges to be overcome the ambitious goals of ending deaths from snake bites in South Asia and ASEAN.

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