Innovation is vital for elimination of neglected diseases in South Asia

Despite some success in reducing the substantial mortality many challenges remain, say **Suman Rijal and colleagues**

The sustainable development goals set a target to end epidemics of neglected tropical diseases by the year 2030. The task can seem daunting. Equally, having a clear objective can steer global action towards this important health problem that disproportionately affects poor people. The World Health Organization prioritises neglected tropical diseases for control or elimination. Over a billion people worldwide are affected by these diseases, which are seen more commonly in tropical regions.

South Asia has substantial morbidity and mortality associated with infectious diseases, including numerous neglected tropical diseases, and bacterial infections such as neonatal sepsis and enteric fever are of growing concern. Until recently, the Indian subcontinent accounted for 60% of the global burden of visceral leishmaniasis.¹ Over 40% of the global population requiring mass drug administration for lymphatic filariasis elimination is in Bangladesh, India, and Nepal.² The number of people affected by snakebites is also highest in India and Bangladesh.³

This special collection of *The BMJ* highlights notable successes of public health programmes in neglected diseases in South Asia and identifies areas where research and supportive policy is needed to advance plans for control or elimination. A unifying theme of this collection is innovation in diagnostics, treatment, and prevention of neglected diseases to create solutions that are effective, relevant, locally feasible, and sustainable.

The collection draws on examples of elimination programmes for lymphatic filariasis, visceral leishmaniasis, and snakebite in South Asia. Authors from across South Asia and the world worked

together in teams to map the progress in specific disease areas, identify remaining challenges in elimination efforts, and propose solutions to meet this gap. The challenges and strategies on the path to elimination are likely to be similar for other neglected diseases. The articles on typhoid and neonatal sepsis highlight the growing problem of antimicrobial resistance in South Asia, which has greatly limited the available treatment options and leads to treatment failure and higher mortality.

Importance of collaboration

A few key lessons stand out. Firstly, partnerships and regional collaborations are vital to sustain momentum and foster transfer of knowledge and technology. Driven by a strategic regional collaboration under the kala-azar elimination programme, Nepal and Bangladesh have eliminated visceral leishmaniasis as a public health problem and India has considerably reduced the disease burden.⁴ A regional framework such as this can offer a mechanism to address challenges in other disease control programmes. For example, the antivenom used to treat snakebites across South Asia is sourced from India. However, shortages are common, resulting in much higher mortality from snakebites in South Asia than in other areas. Local studies also show the need for antivenoms effective against a wider range of locally prevalent venomous snakes.⁵ Scientists, policy makers, and health professionals must come together to tackle these issues, which cross borders.

A singular focus on disease elimination tends to yield wider action and have a greater impact, as seen with visceral leishmaniasis and lymphatic filariasis. Sri Lanka and the Maldives have successfully eliminated lymphatic filariasis through a combined approach of mass drug administration and robust disease surveillance under the Global Program for Elimination of Lymphatic Filariasis (GPELF).⁶ Over 60% of the population in endemic areas of South Asia received prophylactic chemotherapy as part of this programme. Political will and

continued community ownership will be crucial to successfully eliminate lymphatic filariasis from South Asia.

Need for new treatments

The strategies have had to evolve to sustain the momentum towards elimination, particularly in larger countries like India. An outlook of fostering continual innovation is critical to meet the changing demands of disease elimination programmes. For example, research conducted by the Drugs for Neglected Diseases initiative in India has shown that post-kala-azar dermal leishmaniasis, a skin condition that occurs in 3–5% of treated patients with visceral leishmaniasis, may be an important reservoir for transmission, as are patients coinfecting with HIV. Current treatment regimens are not optimal for these patients, making sustainable progress towards elimination difficult. New and improved treatments are needed, and for the first time, there is a rich portfolio of oral drug candidates for visceral leishmaniasis, which may result in a new therapy within the next decade.⁴

Similarly, the menace of growing antimicrobial resistance to most frontline drugs for typhoid has given impetus to vaccine discovery. A conjugate typhoid vaccine developed in India has been approved by WHO and is now recommended for routine immunisation of children in endemic countries.⁷

Better systems

A major challenge in disease control efforts in South Asia is the lack of robust surveillance data. In the absence of an understanding of true disease burden across geographies and changing trends in resistance patterns, it is difficult to design and deliver effective solutions. This is particularly seen with snakebite envenoming, which is a serious public health concern affecting mainly rural and poor populations. It has, however, been neglected until recently because under-reporting and absence of notification and surveillance mechanisms have resulted in a lack of data on its burden.⁵ WHO's recognition of snake-

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bites as a neglected disease by the WHO last year should help drive greater government engagement and regional cooperation to pool together scientific, technological, and financial resources and foster basic research, surveillance, antivenom development, and advocacy.

Disease elimination initiatives tend to function largely as focused vertical programmes, but the need for strengthening health systems in South Asia cannot be overlooked. Deficiencies in availability of drugs, trained staff, critical care support, and transport must be overcome to tackle the high mortality from snakebites, neonatal sepsis, and other diseases in South Asia. A robust primary care network will be important in the post-elimination stages of diseases such as lymphatic filariasis to support surveillance, morbidity management, and disability prevention in those affected. Furthermore, in some areas, population testing and treating may become more cost effective than continuing to scale up mass drug administration.⁶

Antimicrobial stewardship is urgently required across all levels of health facilities, and the paper on neonatal sepsis in this collection offers a simplified model for implementation.⁸ Improved treatment options and standard treatment guidelines are needed to help clinicians and improve outcomes for patients. As part of the Global Antibiotic Research and Development Partnership programme, India is one of 11 countries participating in studies on neonatal sepsis and current antibiotic prescribing practices with the objective of developing improved antibiotic regimens for newborns. The Indian Council of Medical Research is collecting data on antimicrobial resistance from collaborating centres in hospitals across the country part of an Antimicrobial Resistance Surveillance Research Network. The data generated

through this network will be useful to monitor trends in resistance and devise treatment guidelines. Similar surveillance mechanisms are needed across the region, alongside studies correlating prescription practices with drug resistance patterns in the community and investigating underlying mechanisms of resistance.

South Asia has a unique role in combating these diseases globally as well as regionally, given the high disease burden and regional expertise in end-to-end solutions, from drug discovery and clinical studies through to regulation, manufacture, and distribution. Such “bench to bedside” leadership could grow rapidly with supportive policy for research and development in neglected diseases.⁹ We are launching this collection at a meeting in New Delhi in January 2019, where stakeholders engaged in neglected diseases control, research, and advocacy in South Asia will come together to celebrate the successes so far and plan for further collaborative action. We call on the diverse communities in the readership of *The BMJ* to reflect on the issues brought forth in this collection and push for greater action on neglected diseases in their respective fields.

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