

Foreword

Emerging and re-emerging infections in India

Advances in sanitation and the discovery of antibiotics have given humanity a respite from the ravages of infectious diseases. But many epidemiologists now fear that this period is drawing to a close as urban growth outruns the installation of sanitation in the developing world and resilient microbes discover opportunities in the stressed immune systems of the urban poor.

Eugene Linden: *Exploding Cities of the Developing World* 1996

Communicable diseases account for nearly 45% of adult disease burden and deaths in Southeast Asia despite the epidemiological transition to an increasing burden of chronic non-communicable diseases and notwithstanding the developments in medical science and technology. Thus, they are of great concern.

What is more disturbing is that in recent times, the pattern and profile of infectious diseases have undergone a sea change in India and other Southeast Asian countries. Re-emerging infections contribute substantially to morbidity and mortality from infectious causes. While tuberculosis, hepatitis, malaria and HIV/AIDS continue to dominate the disease incidence rates, we in India have in addition to cope with the re-emergence of influenza, plague, malaria, dengue, leptospirosis and chikungunya. On top of that we are confronted by novel viral infections such as SARS and and multi drug-resistant/extensively drug-resistant tuberculosis. These diseases adversely impact families, workforce productivity and economic development. They also present a formidable challenge to already resource-limited health systems, and call for an approach based on prevention and health promotion.

What are the reasons for the resurgence of infections once under our control? There are several contributory factors. They comprise climatic changes, effects of urbanization, industrialization and globalization, unconventional host behaviour, microbial adaptation and changes in their form as well as a breakdown in public health measures. Conventional approaches to containment or eradication of infectious agents, strategies for immunization of the host, early detection of illnesses and measures for vector control seem to be insufficient.

This special issue on emerging and re-emerging infections is an attempt to discuss the burden of selected communicable diseases in India and analyse the causes for the changing pattern of these infections in this country. The causes include genetic mutations in the infectious agent, ecological factors and factors that promote the transmission of infections. Other reasons may be poor surveillance, inadequate understanding of the dynamics of spread of infections, insufficient use of available tools for infection control and inappropriate policy response to epidemics.

The articles in this issue cover a wide spectrum of bacterial, viral and parasitic infections and delineate the challenges for their prevention and control. The authors are experts in their domains and share their opinions on strategies that might hold promise for prediction and control of epidemics, and deliberate on measures for appropriate health system reforms.

In the initial article, Lalit Kant introduces the factors common to the emergence of novel infections and re-emergence of known diseases. He also delineates the five-pronged strategies suggested to combat the challenge of emerging infections and the achievements of Indian Council of Medical Research in providing leadership for the fight. He has suggested certain measures to strengthen the current activities, networking various agencies involved in the study and control of communicable diseases.

The subsequent nine essays concern viral infections. They detail several aspects, which include the biology, epidemiology, clinical presentation, and measures for control of infections caused by dengue, chikungunya, hepatitis E and C, influenza, metapneuma virus, hanta virus, Japanese encephalitis and human immunodeficiency virus. The absence of adequate knowledge about pathogenesis of many of the viral infections is evident from the reviews. U C Chaturvedi and R Nagar have presented the mammoth problem of dengue virus infection that is compounded by the huge population affected, poor medical and

diagnostic facilities, absence of vaccine, inadequate animal model and poorly understood pathogenesis. S Jameel and colleagues opine that the absence of small animal models of infection and efficient cell culture systems has precluded studies on pathogenesis of hepatitis E virus infection. S Chandy and colleagues in their article on hanta virus draw attention to the considerable research required to characterize the circulating species and identify rodent reservoirs in India. Vandana Saxena and T N Dhole discuss the strategies for development of therapeutics as well as safe and efficacious vaccines against Japanese encephalitis virus infections; and to that end, the requisite for elucidation of immune mechanisms that lead to the infection. The impact of the converging dual infection of tuberculosis and human immunodeficiency virus is the theme of Soumya Swaminathan and G Narendran. They draw attention to the need for co-ordination between tuberculosis and AIDS control programs.

The articles on viral infections are followed by reviews on brucellosis, bacterial infections, leptospirosis, cysticercosis and malaria. D Raghunath in his review compares the pattern of antibacterial resistance in India with the global scenario. He has enumerated the factors that contribute to the high prevalence of antibiotic resistance and highlights the impact of wide use of antibiotics in animals.

Another major emerging problem is multidrug resistant tuberculosis (MDR-TB). Amita Jain and Pratima Dixit discuss the mechanism of development of MDR-TB as well as, the challenges and issues with respect to its appropriate management.

In the concluding article M M Parida deliberates on the development of sensitive techniques for rapid diagnosis of emerging and re-emerging viral infections. He hopes that real time assays would be advantageous not only for precise diagnosis of infections but also to embark on pertinent control measures and to effectively manage patients.

We hope that this compilation would be a valuable companion for public health professionals as well as biomedical researchers engaged in microbiology.

The expeditious production of this volume was the result of generous cooperation from authors and reviewers of articles. We are thankful to all of them.

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