

Editorial

Challenges in Infectious Diseases in Low and Middle-Income Countries

Infectious diseases are widespread in low and, albeit to a lower extent, in middle income countries. Ironically, the overwhelming majority of published papers and reviews deal with high income countries, where these diseases are far less important. The aim of this unique Supplement is to cover in depth some of the most relevant challenges in infectious diseases in low and middle income countries.

Diarrhoeal diseases due to infections are extremely common and cause almost two million deaths every year, most of which occur in children under 5 years of age. Jill W. Ahs and colleagues from the Karolinska Institute discuss prevention, diagnosis and treatment and argue that with immediate and sustained actions the burden of this prominent public health threat could be dramatically reduced.

Pneumonia is also a leading cause of death in young children. Diane Gray and Heather Zar from the University of Cape Town review the burden, prevention and management of the disease with particular reference to HIV-infected children, and advocate for further research to delineate the burden of specific pathogens, to develop better diagnostic tests and to improve current management and preventive strategies.

Epstein-Barr virus-related malignancies are among the main tumours in low and middle income countries. Sunday Ocheni and colleagues from the University of Nigeria, Obafemi Awolowo University and the University Cancer Center Hamburg, review recent data on the possible role of Epstein-Barr virus in several cancers and call for further trials aimed at optimising various treatment protocols.

Hospital-related infections are the topic of countless manuscripts from high income countries, whereas the problem is overlooked in low and middle income countries. What can be done in the very countries where the poor hygienic conditions of most hospitals favour health-associated infections? Lul Raka from the University of Prishtina and National Institute of Public Health of Kosova, outlines that lack of financial funds, inadequate infrastructure and management, improper use of antimicrobials and shortage of trained staff are key constraints for effective infection control in hospitals of low income countries, favouring higher rates of hospital infections, frequent outbreaks, unsafe care and spread of infections in the community. Raka advocates for introduction of prevention bundles, greater governmental commitment, prudent use of antimicrobials and upgrading of microbiology laboratories as keys to limiting hospital-related infections in developing countries.

Antimicrobial resistance has received attention almost exclusively in high income countries, in spite of a widespread and inappropriate use of antimicrobials in low and middle income countries. Jordi Vila Estape from the University of Barcelona and Tibor Pal from the United Arab Emirates University at Al Ain, stress that antimicrobial resistance has increased drastically in recent years in developing countries, rapidly becoming a leading public health concern, and that a trend to the increase of the resistance to those antimicrobial agents more often used in those countries has been observed. They review the current antimicrobial resistance in different microorganisms and from different countries and call for improved education among health care providers concerning prudent use of antibiotics.

The number of people newly infected with HIV is still very high in low and middle-income countries, where HIV prevention strategies have not succeeded in limiting significantly virus spread. Therefore there is an urgent need to reinforce strategies in place and explore new ones to prevent HIV transmission. Annabel Desgrées du Loû and colleagues from Paris Descartes and Victor Segalen Bordeaux 2 Universities reviews current knowledge about “traditional” and new HIV prevention strategies and outline the importance of tailoring HIV prevention efforts to the socio-cultural and economic contexts, the local type of epidemic and the needs of local population.

Antiretroviral therapies for HIV infection are being increasingly provided in low and middle income countries: how to make provision more affordable to all those in need in the long term and limit the risk of unbearable costs for countries with limited resources? In a provocative paper, Andrew Hill and colleagues from Liverpool University, the Thai Red Cross AIDS Research Centre and Chulalongkorn University, and Medecins Sans Frontieres Access Campaign and Geneva University Hospital, advocate dose reduction and optimisation as a strategy to improve tolerability and lower antiretroviral drug prices in low and middle income countries. Indeed re-optimisation of doses could dramatically lower costs of first and second-line treatment for low and middle income countries.

Prisons are ideal settings for the spread of both airborne and blood-borne infectious diseases the world over, and are even more so in developing countries. Oscar Simooya, Director of the IN BUT FREE Prisons Project in Kitwe, Zambia, reminds us all that prisons are not closed worlds, and that providing prisoners with adequate treatment for infectious diseases is of public health benefits for the community at large. He therefore asks for stronger linkages between prison health services and national health services. In addition, Simooya outlines that prison overcrowding is a major problem in developing countries and non-custodial sentences must be considered in order to decongest prisons.

Metazoan and protozoan parasites are major causes of human and animal disease and cause extensive morbidity and mortality, particularly in tropical and sub-tropical regions. Hence, parasite vaccines are urgently needed. David Knox from the Moredun Research Institute in Penicuik, Midlothian, reviews in depth the topic and outlines that there is unlikely to be a commercial market for anti-parasitic vaccines in developing countries. He suggests that vaccine production is carried out on a regional basis and funded by local governments, international aid agencies or by philanthropists.

Finally, plant based vaccines have long been proposed as a suitable and affordable solution to infectious diseases prevention in developing countries: where are we now? Will these promises finally be fulfilled in the foreseeable future? Evangelina Gómez and colleagues from the Instituto de Biotecnología and the Consejo Nacional de Investigaciones Científicas y Técnicas, Buenos Aires, review the state of the art in the development of plant-based vaccines for parenteral or oral delivery against diseases of concern in low and middle income countries.

I hope that the readers of *The Open Infectious Diseases Journal* will enjoy this Supplement and will find inspiration for further studies that will hopefully favour new solutions to the continuing challenges of infectious diseases in the very countries where they are widespread.

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