

Emerging Infections: Why We Must Be Concerned

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Emerging infections may be defined as new, re-emerging or drug-resistant infections whose incidence in humans has increased within the past two decades or whose incidence threatens to increase in the near future. Few public health concerns carry the urgency and impact of communicable diseases, especially so if they are emerging infections. They have caught the attention not only of concerned public health officials but also of the lay press. In recognising the importance of emerging infections, the World Health Organization (WHO) has formed a new division of Emerging and Other Communicable Diseases Surveillance and Control or EMC.¹ In addition, WHO had designated "Emerging Infectious Diseases-Global Alert, Global Response" as the theme of this year's World Health Day 1997.

Many would ask why we should be in this situation in the year 1997; we have never been better equipped than before in terms of medical facilities, medical technology, clinical diagnostic testing and the range of antimicrobials in our therapeutic armamentarium. The many forces or combination of forces that have contributed to the appearance of these new diseases and the resurgence of previously "controlled" infections encompass biological, ecological, demographic and socioeconomic factors. The changes or evolution of existing microorganisms including the development of antimicrobial resistance; the spread of known diseases to new geographic areas or new human populations; breakdown in public health measures and infrastructure; international travel and human migration; deforestation or reforestation that increases exposure to insects, animals or environmental sources that may harbour new or unusual infectious agents have been cited as important factors.*

We are fortunate that in this issue of the *Annals* devoted to Emerging Microbial Infections, many local and international authors have taken time to share and contribute their research and clinical experience on some aspects of these infections that we must all now face. Papers describing the role of international agencies, a US Navy initiative on emerging infections in Southeast Asia and the Australian experience with emerging infections are featured.

In the past 2 decades, more than 30 new disease-causing microbial pathogens have been identified including viruses such as human immunodeficiency virus (HIV), hepatitis C and E, Ebola, *Sin Nombre* virus, parasites such as *Cryptosporidium parvum*, *Cyclospora cayetanensis*, and bacteria such as *Escherichia coli* 0157:H7, *Ehrlichia* species, *Bartonella henselae* and *Borrelia burgdorferi*, to name but a few. Many of these newly identified pathogens have caused major outbreaks in developing and developed countries; in some, the mode of transmission has been through food and water; in others, the exact mode of transmission remains to be elucidated. The spectrum of diseases caused by infections due to *Cyclospora cayetanensis*, *Helicobacter pylori* and the newer hepatitis viruses are discussed in this issue.

The tremendous growth of international travel, especially air travel, has allowed infections to cross international borders with impunity. In this issue, Lam and Wong describe the emerging problem of travel-related infections. It is also important for readers to appreciate that international travel is not only confined to tourist traffic; in Singapore, a considerable proportion of our blue-collar workforce originate from developing countries and may serve as reservoirs of infection which reactivate and cause local transmission. Some notable examples include recent cases of visceral leishmaniasis in Bangladeshi workers diagnosed in Singapore and the problems of local transmission of malaria in Singapore.

The rapid growth of mega-cities with high population densities is associated with almost unavoidable problems of inadequate safe water and sanitation. Globalisation of trade and changes in production, handling and processing of food have been blamed for many foodborne diseases, and the outbreaks of *E. coli* 0157:H7 in the United States and Japan are examples where thousands of persons were infected. The trend for global trade pacts/agreements have aggravated the situation as it makes monitoring of food processing and handling more difficult. The greater geographic distribution of food products from large centralised food processors carries the risk of dispersed

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outbreaks.³ In Singapore, in spite of the high population density, we have been fortunate to have good sanitation, a safe water supply and comprehensive control measures governing food production and importation. Despite these measures, we have not been completely spared, and illustrated in this issue are two outbreaks of foodborne infections - *Salmonella paratyphi* A fever and non-typhoidal *Salmonella* enteritis.

Environmental factors such as deforestation, migration of non-immune human population and their settlement in remote animal/insect habitats have resulted in unusual vector-borne and zoonotic infections such as yellow fever and the haemorrhagic fevers due to Ebola and Lassa viruses. This has implications both for our sophisticated adventure travellers who wish to explore remote and exotic destinations as well as Singapore's drive in regionalising business concerns. Closer to home, the control of vector-borne dengue virus continues to vex our public health authorities and Goh describes the paradoxical situation that we are in: a decreasing *Aedes* mosquito house index coupled with a rising dengue incidence.

Over-use of antimicrobials and prescription of such drugs on demand are critical factors leading to the rapid development of drug-resistant bacteria.⁴ Drug-resistant bacteria and nosocomial infections have always been major problems in institutional practice with outbreaks of methicillin-resistant *Staphylococcus aureus* and resistant gram-negative organisms such as *Pseudomonas aeruginosa*, *Klebsiella* and *Acinetobacter* species.⁵ Added to this list in recent years have been vancomycin-resistant *Enterococci* and, more recently, the emergence of methicillin-resistant *Staphylococcus aureus* with reduced vancomycin susceptibility.⁶ In this issue, Ang and Lee report the changing pattern of infections seen in the Singapore National Burn Centre. Perhaps much more worrisome are the problems that we now face in community acquired infections such as those due to penicillin-resistant pneumococci, multidrug-resistant gonococcal infections, multidrug-resistant *Salmonella typhi*, drug-resistant tuberculosis and most recently, multidrug-resistant *Yersinia pestis*.⁷ Koh and Lin et al describe our current problems with penicillin-resistant pneumococci and report a significant rise in these resistant bacteria over a short period of 4 years. Notably, poor compliance with therapy and prescription of sub-optimal therapy have contributed to the emergence of drug resistance. In this issue, Boudville et al report that drug-resistant tuberculosis continues to be with us in Singapore, while Alcaide and Telenti review the recent advances in the diagnosis of drug-resistant tuberculosis.

The increasing population of immunocompromised patients due to HIV infection, cancer chemotherapy and organ transplantation has led to a proliferation of "new infections" resulting from bacteria, fungi and viruses that were previously thought to be simple commensals or to cause mild and self-limited diseases. The recently identified non-tuberculous *Mycobacterium* species including *M. genavense* and *M. haemophilum* illustrate the impact of these microorganisms, previously unrecognised, and now regarded as important pathogens in the immunocompromised hosts. As our greying population continues to increase, the article by Ismail et al is a timely reminder of the problems of infections in the elderly and is, in a sense, an emerging issue.

The first case of HIV infection was diagnosed in Singapore in 1985 and the cumulative numbers in Singapore residents has increased steadily to 631 by June 1997. Three articles by local authors address the lesser appreciated aspects of HIV infection: clinical presentation of those who were diagnosed in institutional practice; the ophthalmological manifestations in HIV-infected patients; and the knowledge, attitudes, beliefs and practices regarding HIV among doctors and dentists in Singapore.

Rapid and reliable information forms a major pillar for the recognition, prevention and control of emerging infections. The regular issues of US *Morbidity and Mortality Weekly Reports* and WHO *Weekly Epidemiological Record* have traditionally been the source of much of our information on outbreaks and emerging infections. Since 1995, a quarterly journal dedicated to and aptly entitled *Emerging Infectious Diseases* has been published by the Centers for Disease Control and Prevention, US Department of Health and Human Services. More importantly, much of this information may now be accessed very rapidly on the Internet. Some useful web sites include <http://www.cdc.gov/>, <http://www.who.ch/> and <http://www.eurosurv.org/>. In Singapore, medical practitioners are regularly updated on the infectious disease situation through the monthly *Epidemiological Bulletin* published by the Committee on Epidemic Diseases, Ministry of Health.

We hope that this issue of the Annals will provide readers with valuable international and local information on emerging infections. The Director-General, WHO had appropriately stated in April 1997 during World Health Day that "we have to face the fact that infectious diseases pose a common threat that demand urgent attention, especially at a time when people all over the world are being brought closer together by international travel and trade. Communicable diseases respect no frontiers." In this age of rapid international travel, we can no longer consider such infections with passing academic interest; these infections are with us, whether we like it or not; we need to become interested in, be aware of and be involved in the battle against the problem of emerging infections.

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