Recent Publications

Infectious disease: an ominous and unpredictable threat

Over the past six years, this journal has been pointing to the threats posed by infectious disease in an ever more densely populated world. Complacency induced by the development of successive generations of novel antibiotics and insecticides has allowed governments to cut back on the staple surveillance and reporting mechanisms that are the foundations of public health medicine. The emergence of AIDS has jolted this complacency and unleashed a frenzied effort to develop drugs and vaccines to combat this particular disease. But, perhaps because it is not transmitted by casual contact or sneezing, its appearance has failed to sensitize policy-makers to the possibility of further — and perhaps more devastating — pre-emptive microbial attacks. Far less has it established awareness of an urgent need for worldwide monitoring of patterns of infective disease and the spread of antibiotic-resistant organisms.

The warning signals are clear enough. Notwithstanding contrary trends in some developed countries, and impressive developments in methods of contraception (1), the world population has continued to grow at a rate that exceeds predictions (2). Civilizations are venturing into environments and risking contact with viruses and other microorganisms previously existent only in animal populations. The genetic variability of retroviruses and other microorganisms increases their ability to adapt to new environments and new hosts. These microorganisms possess the potential to develop resistance to widely-used antimicrobial drugs. In many cases the genetic apparatus responsible for these changes can be transferred from species to species by plasmids which have the ability to encode for resistance to several antibiotics. Longer-term climatic trends may encourage the spread and enhance the transmissibility of diseases endemic in tropical climates (3, 4). The mosquitos and other vectors responsible for the transmission of many of these diseases have similarly developed resistance to widely available insecticides. Modern international travel provides for rapid spread of both pathogens and vectors.

These concerns, as perceived from within the USA, are starkly reflected within a report on "Emerging Infections" published by the Institute of Medicine which emphasizes the immediacy of the risks and calls for a sense of urgency within governments (5). It points to the current resurgence of tuberculosis and measles within the USA; the speed with which Lyme disease has become the most common vector-borne disease within the country; and the vulnerability of the population to an influenza pandemic of the scale that killed 20 million people worldwide in 1918–19. Further afield it looks to a plethora of threats to human populations from microbial diseases that have until now been effectively controlled or localized.

It calls for the national and international disease surveillance activities of the Centers for Disease Control to be upgraded as a matter of highest priority. As yet, State and local health officials are required by law only to report tuberculosis and other diseases for which quarantine measures are enforced. But surveillance alone can never be sufficient. The report, more speculatively, calls for fresh thinking on means for responding efficiently to urgent community needs for new vaccines and drugs; for central government to maintain stockpiles of selected vaccines; and for manufacturers to develop — subject to government purchase guarantees — "surge capacity" for vaccine production to assure adequate supplies at the earliest phase of an epidemic. The very scale of the problem inhibits realistic discussion of their redressment in a global context. But global approaches there must be, if secure protective strategies are to be developed against these potentially catastrophic threats.

References

1. *Reproductive health: a key to a brighter future.* Special Programme of Research, Development and Research Training in Human Reproduction. Biennial Report 1990 – 1991. Ed. Khanna, J., van Look, P., Griffin, P. World Health Organization, Geneva 1992.

2. World Resources Institute, International Institute for Environment and Development and United Nations Environment Programme. *World Resources 1988–89.* Basic Books, New York (1988).

2. Mason, J. *The greenhouse effect and global warming. Monitoring the Environment*: the Linacre Lectures 1990-1991, ed. Cartledge, B. Oxford University Press, 1992.

3. Climate and disease: the deadly hitch-hikers. *The Economist*, **325**: 93-95, 31 October 1992.

4. *Emerging Infections: microbial threats to health in the United States*. Committee Chairmen: Lederberg, J., Shope, R., Institute of Medicine, Washington, D.C., 1992.