Getting ahead of the curve: a new strategy for infectious diseases

Although infectious diseases have been one of the major problems affecting mankind throughout history, during the latter part of the 20th century an air of complacency seemed to emerge. It was felt that the combination of improved sanitation, availability of vaccines, and the development of powerful broad spectrum antimicrobials would allow us to permanently conquer the threats posed by serious life-threatening infections. Recent events have shown that these optimistic predictions are unlikely to be achievable, and in recent years major infectious disease scares both nationally and internationally have repeatedly hit the headlines.

There are a number of reasons that mankind continues to become victims of microbial diseases, including both new or previously unrecognized problems and those that have been threats for many hundreds of years. Improved availability of transport has not only allowed individuals to dramatically increase the way they travel but has also encouraged remarkable movement of goods, including foodstuffs. This means that an infection that might previously have been restricted to a very limited area of the world could now be spread internationally within hours or days.

Although technological advances would normally be considered most likely to result in protection from infection, this is certainly not always the case. A most striking example is the likely association between changes in the animal and human food chains and the development of new variant Creutzfeldt–Jakob disease. Even where technology has been used directly to combat infection by the development of antimicrobial drugs, micro-organisms have rapidly responded by developing drug resistance and some of these drug-resistant agents have been able to spread easily through human or animal populations.

Mass immunization has been a major advance in the prevention of a number of major infections, but there have been scares about the safety of some vaccines which have threatened our ability to protect populations. The association between the controversies over the safety of the measles, mumps and rubella vaccine and outbreaks of measles in children is a timely reminder of the impact of a fall in vaccination coverage. Efforts to improve and prolong life have resulted in an increasingly large pool of individuals who are particularly vulnerable to infection, including those at the extremes of life or people who are receiving immunosuppressive therapy for a variety of underlying diseases. Finally, the events surrounding the terrorist attacks on 11 September 2001 and the subsequent deliberate release of anthrax with the deaths of a number of individuals has been a stark reminder of the potentially dramatic effects that could result from bioterrorism (Lightfoot et al, 2001).

A NEW STRATEGY FOR COMBATING INFECTIOUS DISEASES

Against this background, the professional organizations working to diagnose, prevent and treat infectious disease in England have welcomed the recent publication of a report by the Chief Medical Officer (CMO) entitled *Getting Ahead of the Curve: A strategy for combating infectious diseases* (including other aspects of health protection) (Department of Health, 2002) which puts the problems of infection high on the government's agenda.

In the report the CMO pays tribute to the excellent work and many success stories around management and prevention of infection in this country, but draws attention to the new challenges that are likely to be faced, the gaps in the current provision of services, and the benefits to be gained from a more coherent and integrated approach to all aspects of health protection, including not only infectious diseases but also chemical and radiation hazards. He proposes a new strategy that attempts to draw all these different strands together to coordinate action and link in with other current changes in the organization of the NHS.

To enable these changes he defines a number of key actions which will be required, including:

1. A new agency to coordinate the different elements of health protection and infectious disease control
2. Strengthened and integrated systems for surveillance
3. Intensified action for a number of key infectious disease problems
4. Rationalization and standardization of microbiology services.

A new agency

The CMO notes the number of organizations and bodies currently working in the area and suggests that a new agency (to be called the Health Protection Agency) be set up to act as a source of national expertise and to provide some key services relating to various aspects of health protection. This agency will take over the work of a number of organizations currently dealing with various aspects of health protection – the Public Health Laboratory Service, the Centre for Applied Microbiology and Research, the National Radiological Protection Board and the National Focus for Chemical Incidents. The vision is for an agency with staff and responsibilities at national, regional and local levels, working with central government, the NHS and local authorities, acting to preserve the strengths and reputations for excellence of the four organizations while reducing the scope for fragmentation or duplication of activity.

This element of the strategy is consistent with the changes in the organization of the NHS, details of which were set out in *Shifting the Balance of*

Power within the NHS – Securing Delivery (Department of Health, 2000) and which has resulted in the abolition of district health authorities and their replacement by a much smaller number of strategic health authorities.

The agency field staff as envisaged in *Getting Ahead of the Curve* will mainly be drawn from existing consultants in communicable disease control and their staff who had previously largely been based in district health authorities. In the future precise local arrangements for such functions will be determined locally, with regional directors of public health being directly responsible for the health protection function and liaising and coordinating activities of primary care trusts, local authorities and agency field staff.

Strengthened and integrated surveillance

Surveillance remains the cornerstone of any system to detect, manage or prevent incidents, outbreaks or emerging problems, regardless of whether they involve infectious or other hazardous agents. Currently there is a diversity of data collection systems as well as a range of agencies or officers to whom data may be sent. The new strategy proposes a number of new measures aimed at strengthening, simplifying and supporting what is already in place. These will include developing clearer definitions for what needs to be reported, harmonising surveillance systems for infection with those currently in place for chemical and radiation hazards, and creating a single point for coordinating analysis and reporting of all systems.

Intensified action for key problems

Four particular areas which are considered major problems in the UK will be targeted by specific action plans:

Health-care-associated infection: Around 9% of patients present with an infection in or shortly after discharge from hospital (National Audit Office, 2000), but 15–30% of these could be prevented by implementing basic infection control policies including hand hygiene, appropriate environmental cleaning and disinfection or sterilization of equipment.

Antimicrobial resistance: Almost all important pathogens now show some resistance to major classes of antimicrobials. Examples of concern include infections caused by methicillin-resistant *Staphylococcus aureus*, multiply resistant enterococci and *Klebsiella*, and resistance in *Salmonella typhi* and *Campylobacter*. Important areas for further action will include enhanced surveillance and strategies to influence and educate all involved in developing, prescribing or using antimicrobials.

Tuberculosis: Tuberculosis is a major problem worldwide, and notifications of new infections in the UK have increased since the early 1990s. The reasons for this are complex and multifactoral, and vary in different areas of the country. Intensified action will be required to renew awareness of the problem, maintain effective screening and case finding as well as rapidly detecting possible outbreaks, and promoting research into improved diagnosis, treatment and prevention.

Bloodborne and sexually transmitted viruses: Both human immunodeficiency virus (HIV) and viral hepatitis remain of major concern despite programmes to contain their spread. Improved understanding of these infections and targeted programmes to identify cases and reduce the risk of transmission will be important aspects of the new strategy.

Rationalization and standardization of microbiology services

The strategy envisages simplifying the current differing management arrangements of microbiology laboratories by requiring most laboratories providing clinical diagnostic work to operate in networks under the management of the NHS, while those providing reference or specialist public health microbiology to be commissioned or provided by the new agency. There will be a requirement on all microbiology laboratories to operate to common reference standards and standard operating procedures as well as making mandatory reports of infection for surveillance purposes. An Inspector of Microbiology post will be established in England to ensure that laboratories meet their public health requirements.

CONCLUSIONS

This new strategy provides an ambitious and challenging agenda for infection and related subjects. Its implementation will require a great deal of coordination, cooperation and flexibility in outlook from all those working in the area. Objective measures of improvements in our ability to protect the health of the population will be required to assess whether we have been successful in meeting the challenge. HM

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KEY POINTS

- Infectious diseases remain a major cause of morbidity and mortality in both developed and developing countries.
- Recent events including the deliberate release of biological agents have shown the need to integrate control of infectious diseases with that of chemical and radiation hazards.
- A new strategy for infectious diseases and other aspects of health protection has recently been published which sets out a vision for a coordinated approach to the problem.
- Implementation of this strategy will entail significant change to the current approach to service provision.