

**MEETING OF THE STATES PARTIES TO THE  
CONVENTION ON THE PROHIBITION OF  
THE DEVELOPMENT, PRODUCTION AND  
STOCKPILING OF BACTERIOLOGICAL  
(BIOLOGICAL) AND TOXIN WEAPONS AND  
ON THEIR DESTRUCTION**

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**Prevention, Investigation and Control of Human Infectious Disease**

**Submitted by the United Kingdom**

**Healthcare in the UK: recent organisational changes**

1. In the UK, a National Health Service (NHS) funded by the taxpayer was set up in 1948 to provide health care to all citizens without charge at the point of delivery. This included vaccination, and provision of community and hospital based medical services and support services. The Public Health Laboratory Service (PHLS) provided some of the routine microbiology services as well as the reference and surveillance services for infectious diseases.
2. By 1995, most health care was provided to local communities by NHS Trusts. These provided a number of services including microbiology diagnostic laboratories to deal with samples from patients in the community, from hospital patients, and from other sources (food, water, and the environment).
3. The management of routine microbiology services was transferred to the Trusts in April 2003, and, at the same time, the Health Protection Agency (HPA) was set up to provide the specialist and reference services, surveillance of infectious diseases, and emergency planning support to the Department of Health, in a new integrated approach to protecting public health and reducing the effect of infections, poisons and chemical and radiation hazards on human health.
4. The new strategy recognises concerns about the increase in some diseases, such as TB, HIV and other sexually transmitted diseases, and about the increasing resistance of bacteria and viruses to drug therapy. The ease of rapid international travel increases the likelihood of rapid global spread of new infectious diseases (eg SARS) or re-emerging infectious diseases, including pandemic influenza. The UK must be prepared to address such problems. There is also a need to ensure that

the healthcare system can respond to any deliberate release of a chemical, biological or nuclear weapon in a rapid, coherent and co-ordinated way.

5. The HPA covers England and Wales. Parallel arrangements have been set up in Scotland and Northern Ireland.

### **The role of the Health Protection Agency**

6. The HPA in England and Wales has brought together a number of different organisations, including

- (a) the Public Health Laboratory Service;
- (b) the Centre for Applied Microbiology and Research, at Porton Down;
- (c) the National Focus for Chemical Incidents;
- (d) the Regional Service Provider Units that support the management of chemical incidents;
- (e) NHS public health staff responsible for control of communicable disease, emergency planning and other health protection support.

7. The functions of the HPA, working with the National Radiological Protection Board, are to:

- (a) advise government on public health protection policies and programmes;
- (b) deliver services and to support the NHS and other agencies in protecting people from infections, poisons, chemicals and radiation hazards;
- (c) provide an impartial and authoritative source of information and advice to professionals and the public;
- (d) respond to new threats to public health and to provide a rapid response to health protection emergencies;
- (e) improve knowledge about health protection through research and development, education and training.

8. The HPA covers all infectious diseases, but work is prioritised by guidance from the Chief Medical Officer and other government programmes and agencies. In the HPA Corporate Plan for 2003-2008, health priorities are:

- (a) tuberculosis
- (b) HIV, other sexually transmitted infections (STIs) and blood-borne diseases
- (c) healthcare –associated infections
- (d) antimicrobial resistance
- (e) gastrointestinal infections
- (f) vaccines

9. Anticipating and preventing the adverse effects of acute and chronic exposure to hazardous chemicals and other poisons is another of the HPA goals. The HPA is developing close working links at local, regional and national level between the different bodies that have responsibility in this area. It will strengthen national systems and link into international equivalents to detect potential toxic threats as quickly as possible, evaluating the health risks and alerting government, the NHS and local authorities. It provides clinical advice on antidotes and medical treatment, personal

protective equipment, decontamination, and advice on likely health effects for the public. It also provides advice to the public and the media.

### **Specialist and Reference Microbiology Services**

10. The HPA has responsibility for management of reference and specialist laboratory services for England and Wales. The reference microbiology services support the evidence base for surveillance through the diagnosis of unusual or rare infections that have implications for public health. Cutting edge molecular technologies are used for strain characterisation and differentiation, studies of pathogenicity and virulence and microbial epidemiology in support of outbreak investigations and national surveillance. These resources can be applied to natural emergencies or emergencies caused by the deliberate release of infectious agents.

11. Most of the national specialist and reference functions are located at HPA Colindale, with four national reference laboratories located in regional HPA centres and one for some special pathogens at HPA Porton Down. The Colindale and Porton Down facilities support extensive research programmes, contain five WHO Collaborating Centres (hospital infections, enterobacteria, diphtheria and streptococci, virus reference and research, and special pathogens), as well as providing diagnostic services. They have strong international links, participating in many global and regional laboratory networks (eg GHSAG, IHSLN, Global Salm Surv, Flunet, Global Polio Laboratory Network, Global Measles Laboratory Network, ENIVD, EuroP4, Euroanthrax) and providing global (eg measles) or European (eg polio) reference facilities. Both facilities have BSL4 containment laboratories able to work with pathogens in Hazard Group 4. Malaria and parasitology services are commissioned from the London School of Hygiene and Tropical Medicine and University College Hospital London respectively. There are joint arrangements with the Veterinary Laboratory Agency for specialist and reference work on brucellosis, botulism, rabies and leptospirosis. The provision of a single point of overall management within the HPA will facilitate a coherent, coordinated strategy and the adoption of common standards and reporting formats, improved data analysis, and linkage to surveillance databases in HPA CDSC (the Communicable Disease Surveillance Centre).

12. Important objectives of these HPA services include: the hosting and curatorship of type culture collections and molecular-based typing databases, with an international role; and provision of training to UK routine diagnostic laboratories to improve familiarisation with the pathogens that might be encountered if biological weapons were used in the UK. As an adjunct to this training, it is intended to distribute, through the existing National External Quality Assurance Scheme, safe variants of likely bioterrorist agents or their component antigens or nucleic acid.

### **Surveillance of infectious diseases**

13. In the UK, there are two main sources of surveillance data on infectious diseases: statutory notifications of infectious diseases; and reports from laboratories of laboratory confirmed infections.

14. A statutory requirement for the notification of certain infectious diseases came into being towards the end of the 19<sup>th</sup> century. Originally the head of the family of the landlord was

responsible to reporting disease to a local official, but now this is the duty of the attending doctor, whether in the patient's home or at a surgery or hospital. The prime purpose of the Notification of Infectious Diseases (NOIDS) system is *speed* in detecting possible outbreaks and epidemics; accuracy of diagnosis is secondary, and since 1968 clinical suspicion of a notifiable infection has been all that is required. If a diagnosis proves to be incorrect the notification can be changed or cancelled. The list of notifiable diseases has increased steadily and now stands at about 30. Separate lists, each differing slightly, are in place for England and Wales, Scotland, and Northern Ireland. The lists now include SARS, using the case definition proposed by the WHO.

15. The mandate for HPA CDSC is to deliver surveillance to inform local, regional, national and international health protection activities. To do this it manages broad based surveillance and alarm systems, based on NOIDS and laboratory reporting, to detect significant incidents, outbreaks and general trends. It has enhanced surveillance systems that can inform specific health protection programmes and can action plans and clinical practice, such as in the area of vaccine preventable disease, gastrointestinal disease, and antimicrobial prescribing. HPA CDSC collects data for England and Wales; similar reporting arrangements are in place in Wales, Scotland and in Northern Ireland.

16. NOIDS data are reconciled at HPA CDSC with laboratory reports received either electronically in encrypted form, or on various forms. The laboratory reporting instructions differentiate the reporting of single cases of infection, different organisms reported as co-infections in the same patient, and cases believed to be part of an outbreak. For certain types of infections, patient names and other details are required. Patient data are handled in confidence and in conformity with data protection legislation and guidelines. Patient identifiers are needed to identify duplicate reports, for follow up with the reporting laboratory, for geographic mapping in outbreak investigations, and for linkage with reference laboratory data.

17. For some organisms, clinical data (symptoms, signs, or disease process) and epidemiological data (patient characteristics, disease process or events associated with an altered risk of infection) are regarded as essential to the interpretation of surveillance data, and must therefore be included with the laboratory report.

18. In this way, the national surveillance centres at HPA CDSC and in Wales, Scotland and Northern Ireland maintain surveillance on nearly 4000 species, subspecies and subtypes of pathogens.

19. There are also national surveillance schemes for general outbreaks of infectious intestinal disease. CDSC and its equivalents in Scotland, Wales and Northern Ireland receive preliminary reports of general outbreaks from laboratories, health authorities or boards and local authority environmental health departments.

20. Symptoms reported to NHS Direct, a nurse-led 24-hour telephone helpline, and diagnoses made by general practitioners form the basis of the surveillance of infectious disease in primary care. The NHS Direct Symptom Surveillance Project is an ongoing collaboration between NHS Direct and the Health Protection Agency. Data on ten selected symptoms are received electronically

from the 22 call centres and are analysed on a daily basis. The RCGP Weekly Returns Service is a network of 78 general practices that voluntarily participate in a scheme to collect information on consultations and episodes of illness diagnosed in general practice on a weekly basis. Alerts may be issued from either source, and the routine bulletins from both NHS Direct and the RCGP are published electronically each week in the CDR Weekly

21. The HPA is working to improve collaboration with other organisations and government agencies that carry out health protection surveillance. For example, for several years a number of government departments and agencies have collaborated to provide an annual, UK-wide overview of zoonoses (defined by the WHO as 'diseases and infections which are transmitted naturally between vertebrate animals and man'). The 'UK Zoonoses Group' includes professionals from central government, the devolved administrations, and local enforcement and health organisations involved in animal and public health aspects of zoonoses, and their control. One of the participants is the Food Standards Agency, set up in April 2000 to protect public health from risks which may arise in connection with the consumption of food and otherwise to protect the interests of consumers in relation to food. Four main sources of data contribute to the picture of the burden of zoonotic infection in the human population:

- (a) NOIDS;
- (b) National surveillance schemes for laboratory confirmed infections;
- (c) National surveillance schemes for general outbreaks of infectious intestinal disease;
- (d) Enhanced surveillance for specific zoonoses.

22. The most recent UK zoonoses report, for 2002, notes a fall in reports of *Campylobacter* species, to 52,500 from over 65,000 in the UK in 1998. Cases of non-phage type 4 *Salmonella enteritidis* in England and Wales increased, partly due multiple outbreaks associated with the use of raw eggs in commercial food production. Cases involving vero-cytotoxin producing *Escherichia coli* continued to decline, as did the number of confirmed BSE cases in cattle.

23. The UK recognises the importance of international collaboration on disease surveillance and response, in order to be able to provide early warnings of impending threats such as the next influenza pandemic, bioterrorist threats or emerging pathogens such as SARS and West Nile virus. HPA CDSC is therefore involved in collaborative, international projects, coordinating a number of formal European public health infectious disease networks (EWGLI, ESEN-2, EBMSP, EU-BIS, Enter-Net, and strep-Euro) which are funded by the European Commission, and collaborating in others ( eg EPIET, designed to provide training in field epidemiology), and with WHO and WHO-CSR's Global Outbreak and Response Network (GOARN).

### **Emergency planning and responses to major incidents**

24. An important strategic objective of the HPA is to improve preparedness of responses to health protection emergencies, including those caused by deliberate release. The Emergency Response Division (ERD) provides the HPA lead in taking forward the policies of the Department of Health and the Welsh Assembly Government on emergency planning. A key ERD role is to improve the speed and effectiveness of the overall response both locally and nationally in any future incident or threat, including the provision of positive and authoritative messages about health

protection measures in order to reduce public anxiety. ERD works with other HPA divisions to consider and address best practice and bench marking, gaps in national provision, inequalities in regional provision, competencies and training requirements, and research requirements to enable effective responses to be mounted. It will build on the systems of other HPA divisions to develop national alerting and reporting systems to identify major incidents and hazards. ERD will develop a central source of authoritative scientific and medical and other specialist advice on both the planning and operational responses to major incidents and wider public health emergencies. The HPA works with the National Health Service (NHS), local authorities and emergency services to further develop emergency plans through audit and dissemination of best practice. Plans will be regularly tested at local level by uses of exercise scenarios: lessons learned will be disseminated and gaps identified will be built into training materials.

25. ERD HPA makes significant contributions with the Department of Health to international collaboration on risk management and co-ordination in case of biological, chemical or radiological incidents. In September 2003, the UK participated in an international exercise organised by GHSAG, Exercise Global Mercury, to evaluate communication protocols between national health ministries in response to a simulated smallpox outbreak.

## **Vaccination**

26. In addition to the above procedures for surveillance, diagnosis and response to infectious disease, prevention by means of an effective vaccination programme has long been a priority for the UK.

27. In 1984, when the WHO set a target of 90% primary vaccination cover for Europe by 1990 against the six common infections of childhood (measles, poliomyelitis, neonatal tetanus, congenital rubella and diphtheria), coverage for measles and pertussis vaccination in England and Wales fell well short of this target. By taking advantage of computerised medical data for children, and by establishing new co-ordination arrangements for local vaccination programmes, a new evaluation system called COVER (Cover of Vaccination Evaluated Rapidly) was established to improve vaccination coverage by providing rapid feedback of accurate information and to enable changes in coverage to be detected quickly.

28. Maintenance of high levels of coverage in the childhood vaccination programmes remains a priority, and there are mechanisms to consider the introduction of newly available vaccines according to both epidemiological needs and cost-effectiveness. (Examples are hepatitis B, hepatitis A, varicella (chicken pox) and pneumococcal conjugate). Improved integration of expertise in the HPA, the National Institute for Biological Standards and the Institute of Child Health has created opportunities for faster and better focused vaccine R&D, including accelerated research and investment in bringing forward new vaccines.

29. An example of studies on the impact and value of vaccination is the investigation of the increasing disease rate caused by *Haemophilus influenzae* type B (Hib) since 1999, despite an initial fall in disease rate after the introduction of conjugate vaccines in the UK in 1992. Investigation of these, and of the rates of carriage of the organism and the level of community protection led to the

decision to mount a one-off vaccination campaign for all children aged from 6 months to four years. To determine whether boosters will be needed, the HPA has initiated a national case control study in collaboration with local health protection units, and a series of studies to determine antibody response and persistence after boosting at various ages.

### **Case studies**

30. Two case studies are presented to illustrate how unusual infectious diseases are dealt with. These are:

- (a) a Q fever outbreak in Wales in an industrial setting, in 2002;
  - (b) the continuing occurrence of clostridial infections in illegal narcotics users.
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