

Communicable Disease Report

PHLS overview of communicable diseases 1997: results of a priority setting exercise

A Rushdy, M O'Mahony, on behalf of the PHLS Overview of Communicable Diseases Committee

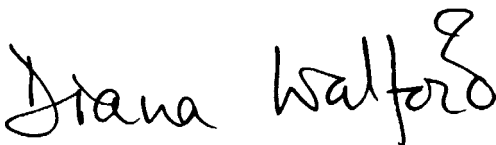
Dear Reader,

The defining and setting of priorities – and their use in determining resource allocation – is acknowledged to be one of the prime determinants of the effectiveness of an organisation.

When an organisation, in this case the PHLS, operates in an area such as the prevention and control of communicable diseases, where many other players participate and interact to bring about a beneficial outcome, the development of its priorities must be done in concert with these many partners and must command their respect.

The new *Overview of Communicable Diseases* – the PHLS's key policy document which sets the priority framework for all its work – has been developed through just such a cooperative and consensus-building approach, primarily between the PHLS and health authorities. The approach is described in detail in the document.

The exercise will be repeated every two years. Already, we have identified ways in which consultation can be developed and improved in the next round. Meanwhile, I commend this document to you as reflecting the outcome of widespread consultation and thoughtful analysis and I thank all those who participated in its development. I hope it will be of assistance to all those who work in the field of communicable disease.

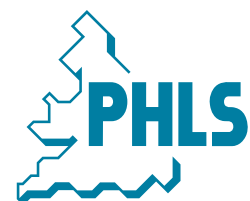


Director of the PHLS

PHLS overview of communicable diseases 1997: results of a priority setting exercise

A Rushdy, M O'Mahony, on behalf of the PHLS Overview of Communicable Diseases Committee (B Duerden (chair), M O'Mahony (secretary), C Bartlett, P Borriello, P Boseley, R Cartwright, G Evans, R George, N Gill, R Gross, T Jephcott, J Leese, L Miller, P Morgan-Capner, P Mortimer, S Palmer, D Ribiero, L Robinson, B Rowe, J Weinberg, A Rushdy (in attendance))

S1-12



Summary

In early 1997, the PHLS Overview of Communicable Diseases (OVCD) Committee carried out a consultation exercise to inform the development of PHLS priorities in communicable diseases for the years 1997 to 1999. The views of PHLS senior staff and scientific committees and consultants in communicable disease control in district health authorities were sought by postal questionnaire, and several organisations of health professionals were asked for their views on the initial findings. The main findings of the exercise are summarised in three areas of priority.

Priority 1 diseases – those of major importance to public health – included food poisoning, meningitis, tuberculosis, sexually transmitted diseases, vaccine preventable diseases, hospital acquired infections, and antimicrobial resistance.

Priority 2 diseases – those of moderate importance to public health - included respiratory syncytial virus and varicella zoster virus infections and emerging problems such as travel associated infections.

Priority 3 diseases included those whose prevalence is declining as a result of public health action, such as listeriosis, and diseases of low prevalence and/or associated morbidity.

The exercise identified four areas of possible future work for the PHLS: activities in prion diseases, helping to tackle inequalities in health, taking a more active approach to documenting the socioeconomic burden of disease, and engaging more with those consulted.

The PHLS has used the results of the priority setting exercise to guide major programme initiatives in tuberculosis, measles, mumps, and rubella, meningococcal and pneumococcal diseases, and in antibiotic resistance. In addition, they have helped to shape agenda in service delivery and research in hospital acquired infections, sexually

transmitted diseases, and gastrointestinal diseases.

This exercise of engaging corporately with key professionals in communicable disease has paved the way for a wider engagement with stakeholders in the setting of future priorities.

Introduction

Several national and international initiatives in recent years have attempted to set priorities for different aspects of communicable diseases¹⁻⁵. Some have formed part of wider health priorities^{1,2} and others have focused specifically on communicable diseases³⁻⁶. Most exercises have aimed to protect the public health by ensuring that the right things are being done and being done well within finite resources.

The Global Burden of Disease Study outlined the major causes of global morbidity, mortality, disability, and risk factors for disease to inform priority setting for their prevention and control^{2,7,8}. The study highlighted the importance of infectious disease globally and its 'ranking' in relation to other diseases. The focus in Canada³ and Europe, has been to set priorities for communicable disease surveillance. In Canada a national committee rated diseases to certain predetermined criteria, and in Europe experts in communicable disease surveillance used a consensus technique (J Weinberg, personal communication). In the United States (US), the focus has been to address emerging infectious disease threats in response to a series of reports at a national level^{4,5,9}. Priorities in the US have focused on disease prevention through four goal areas – surveillance, applied research, prevention and control, and infrastructure. The process used there for developing priorities consisted mainly of consecutive consultative meetings of committees of the Centres for Disease Control and Prevention and public health experts across the country.

Box 1 Criteria

- **Present burden of ill health**, assessed according to age and sex-related morbidity and mortality; and any data on quality adjusted life years.
- **Social and economic impact**, assessed by considering the costs of infection to individuals and organisations and to health care providers.
- **Potential threats** (next five to ten years), assessed by considering extrapolations of current trends including antibiotic resistance; known, suspected, or predicted gaps in vaccine coverage; changes in animal husbandry and food/water provision; changes in environment; developments overseas; and demographic changes and population movements.
- **Health gain opportunity**. Is there an opportunity to affect present and future burden of ill health by PHLS activities including diagnostic research and surveillance strategies?
- **Public concern and confidence**, assessed by considering numbers and types of parliamentary questions relating to infection(s); media and other calls to PHLS; media and public interest as revealed by the press cuttings service; special interest groups, e.g. the National Meningitis Trust.
- **PHLS 'added value'**. Can PHLS make a contribution that other organisations/researchers cannot? Consider PHLS network and communications; existing individual or collective expertise within the PHLS; standardised laboratory methods and surveillance strategies; demonstrably high laboratory standards and leading edge technology; efficient reporting to CDSC; reference expertise and epidemiological typing services; international collaboration, particularly in Europe.

In England and Wales, the PHLS plays a major role in communicable disease surveillance and prevention. The PHLS Overview of Communicable Diseases (OVCD) Committee has undertaken two priority setting exercises since the first OVCD internal document was produced by staff of PHLS Headquarters in 1992. The committee's underlying philosophy was to introduce a more explicit, corporate, and systematic approach to anticipating future directions of PHLS activities, based on selected criteria such as burden of disease, socioeconomic impact, and health gain opportunity⁶. The committee established guiding principles, selected diseases and areas of work in which to assess priorities, selected the criteria to be applied to classify diseases for future PHLS work, and devised methods of obtaining data for the priority setting process both from within and outside the organisation.

Why set priorities? Without explicit priority setting, lists of ill defined priorities may be generated that lack clarity over funding, corporate ownership, success factors or outcomes, and are unlikely to deliver effective public health measures. Criteria for such priorities may not be explicit or measurable and may have been affected by many internal and external influences¹⁰. Factors that have influenced priority setting include: views of professionals, politics, public perception, and scientific evidence. The last two have become increasingly important over the past decade^{10,11}.

A systematic approach to identify the potential for change within priority areas allows for a rolling programme in which priorities are identified, proposals for change are taken forward, and their contribution to the organisations strategic goals are monitored (Penny Lock, personal communication).

This paper describes the most recent PHLS OVCD exercise in setting priorities, highlighting the methods used and the results obtained, showing how they have been incorporated into the work of the PHLS, and indicating the issues raised by the process.

Methods

Four methods were used in the 1997 priority setting exercise.

Survey

A questionnaire was used to elicit individual responses from all senior staff in the PHLS, all consultants in communicable disease control (CCDCs) in England and Wales, senior staff at the Department of Health (DH), and members of the PHLS Board. A collective response was requested from each of the PHLS Standing Scientific Committees (SSCs).

The questionnaire used was modified from that used in the 1995 OVCD exercise⁶. Respondents were asked to consider certain infectious diseases and to assign scores to each of six criteria (box 1) for each disease, and then allocate each disease to one of five pre-defined priority categories (box 2). A continuous scale was used to assign scores of one to five for increasing degrees of importance of particular criteria for each disease/area. For categories, a comparative approach was used - each category was defined and assigned a score before the survey. Respondents were asked to choose only one category for each disease/area. The OVCD Committee reviewed the 39 diseases and areas chosen for the 1995 OVCD exercise by an OVCD subcommittee of experts in communicable diseases. Two additional diseases/areas were added for the 1997 OVCD: Creutzfeldt-Jakob disease and hospital acquired infections.

In addition to 33 specific infections, there were five general groups of communicable diseases (such as food poisoning) and three areas of surveillance and control (such as measles, mumps, and rubella (MMR) vaccination). Additional spaces were provided for respondents to add other diseases and areas they considered important and for specific or general comments.

Responses were collated, entered, and analysed on an

Box 2 Categories for future PHLS work

1. **Communicable diseases requiring development** and therefore the allocation of additional resources are those in which there has been a sudden increase of potential importance, even if the increase is small, and those for which there is an imminent possibility of important new treatment or preventive strategies such as the availability of a vaccine.
2. **Communicable diseases requiring continued high priority** are those causing large outbreaks, or a large number of sporadic cases, and those producing clinically serious diseases, especially if numbers of cases are increasing.
3. **Communicable diseases requiring a moderate level of priority** include those which are causing some outbreaks or for which there is a significant number of sporadic cases and those for which (although they may be of less epidemiological importance) new scientific opportunities, new treatments, or preventive strategies have developed.
4. **Communicable diseases of declining importance** include those for which the methods of prevention or treatment have improved, or which have become less common for various reasons, some of which may be ill understood.
5. **Communicable diseases not included in the first four categories, and in which major changes have not occurred and are not currently foreseen**, still requiring the provision of diagnostic testing and general surveillance, yet requiring continuing research and development. Individual communicable diseases within this category are mentioned specifically as an indication that some degree of *increased* attention is required.

Epi Info¹² database by respondent, OVCD criteria, and categories. For each disease, the mean of individual responses for each criterion, and then the sum of the means for all six criteria, were used in the analysis of the criteria results. The overall criteria means for each disease were then ranked (higher rank = higher importance). Diseases were placed into the priority category selected by a minimum of 50% of respondents. If no single category was selected by 50% of respondents, the responses to categories 1 and 2 or 4 and 5 were combined. This allowed category ranking for all the diseases/areas. Within each category, diseases and areas were ranked on the highest percentage of responses.

The influence of certain criteria on priority responses, such as public concern, were removed from responses to examine the effect this had on the ranking of certain diseases. Collective responses for priority categories from SSCs were used in the analysis. Responses from individuals and from the SSCs were compared.

Standing scientific committees

SSCs were asked to consider the diseases and areas within their remit and comment on these in terms of current or future priorities and explain for each disease/area their reasons for allocating them to a particular priority category.

Review of surveillance data

Summary information on the current known or estimated burden of diseases, their epidemiology, current problems, and the availability of preventive interventions was obtained by reviewing surveillance data and consulting experts within the PHLS.

Information from SSCs and surveillance data were collated and incorporated in the discussion of individual diseases.

Priority setting

The OVCD committee considered all the responses obtained and used them to set priority of work categories for each disease/area. Views on the initial findings were sought from several organisations of health professionals.

Results

Survey

Three hundred and thirty-eight questionnaires were sent to 215 PHLS staff and 123 CCDCs. The response rate for individuals overall was 57% (194/338). Response rates varied in different PHLS sites (31%-85%, 4-22) and among CCDCs in different regions (33%-72%, 2-14). Most respondents completed all 41 diseases/areas of the questionnaire. The average response rate for each disease/area was 94% (range 91%-99%). Nine of the 11 SSCs responded, covering 39 of the 41 diseases/areas on the questionnaire.

Criteria

The top 15 diseases/areas ranked on criteria were similar to those in the top 15 categories, although the individual ranking varied. Three diseases/areas, however, did not make the top 15 on category ranking but were in the top 15 on criteria ranking – influenza, sexually transmitted diseases (STDs), and travel associated illness.

Removing the effect of public concern affected five diseases in the top 15 criteria ranking. The biggest change

in rank was a fall for Creutzfeldt Jakob disease (CJD)/transmissible spongiform encephalopathy (TSE) from 13th to 24th on criteria ranking. A smaller fall occurred for meningococcal disease (from 5th to 12th) and influenza rose from 11th to 4th. Changing PHLS added value did not appear to affect the criteria rankings.

Categories

Responses from PHLS staff and CCDCs were initially analysed separately. There was no significant difference between the responses in the two groups for either criteria or categories and thus the combined results are presented here. Fifteen diseases/areas received 50% or more responses in categories 1 and 2 and five diseases/areas received 50% or more responses in categories 4 and 5 (table 1). The top 15 ranked diseases in categories 1 and 2 and the diseases ranked in categories 4 and 5 from responses to the questionnaire received similar rankings from the SSCs, with few exceptions (table 1). Other disease areas that the SSCs placed in categories 1 and 2 were viral gastroenteritis,

Table 1 Fifty per cent or more responses to categories 1,2,3, and 4 compared with the criteria ranking and SSC category responses – OVCD 1997

| Disease | Categories 1 and 2 | | |
|----------------------------------------------------|--------------------------|------------------|-------------------------|
| | Individual responses (%) | Criteria ranking | SSC # category response |
| Vero cytotoxin producing <i>E. coli</i> O157 | 95 | 3 | 1 |
| Antibiotic resistance surveillance | 89 | 6 | 1 |
| Meningococcal disease | 87 | 4 | 2 |
| Hospital acquired infections | 87 | 2 | 1 and 2 |
| Tuberculosis | 83 | 7 | 1 |
| CJD/TSE | 80 | 12 | 1 |
| Food poisoning | 79 | 1 | 2 |
| MRSA | 78 | 8 | 1 |
| Salmonella infections | 70 | 5 | 2 |
| HIV/AIDS | 64 | 9 | 2 |
| Hepatitis C | 59 | 16 | 2 |
| <i>Campylobacter jejuni</i> and <i>C. coli</i> | 58 | 14 | 1 and 2 |
| <i>Helicobacter pylori</i> | 53 | 15 | 1 |
| <i>Clostridium difficile</i> | 50 | 19 | 2 |
| | Categories 4 and 5 | | |
| <i>Haemophilus influenzae</i> type b | 73 | 38 | 5* |
| Group A β haemolytic streptococcal infection | 73 | 39 | 2 |
| Listeriosis | 65 | 37 | 4 |
| Pertussis | 58 | 33 | 1 |
| Parvovirus B19 | 53 | 40 | 5 |

where more than one SSC has commented on the same disease giving different categories, both categories are listed

* changes not foreseen but continued surveillance essential

Streptococcus pneumoniae, cryptosporidiosis, hepatitis B, pertussis, *Chlamydia trachomatis*, influenza, STDs, varicella zoster, gonorrhoea, MMR vaccination, group A β haemolytic streptococcal infection, and travel associated illness.

Additional comments

Most additional comments from respondents related either to specific diseases or to the consultation exercise.

Thirty-eight per cent of PHLS staff mentioned additional diseases, the commonest being vancomycin resistant enterococci (VRE), non-O157 Vero cytotoxin producing *Escherichia coli* (VTEC), human herpesviruses, and human papillomaviruses. Seventeen per cent of CCDCs mentioned additional diseases, the commonest being infestations with headlice and scabies. SSCs added 15 other diseases/areas, nine to category 1, namely – polio, genital herpes and human papilloma viruses (viral STDs), VRE, non-O157 VTEC, *Mycobacterium paratuberculosis*, Q fever, *Chlamydia psittaci*, and external quality assurance schemes for food microbiology. Infectious diseases in vulnerable groups in the population such as elderly people, those with impaired immunity, and members of particular ethnic groups were also highlighted.

Comments on the consultation exercise suggested that more information about the socioeconomic burden of disease and the benefit of public health interventions was needed to inform priority setting. Many commented that they hoped that their views would be heeded, given that they worked ‘in the field’ and could perceive important gaps in areas of work at local, regional, and national levels.

Comparison with 1995 OVCD

The 1997 OVCD contained two areas not included in the 1995 OVCD, namely hospital acquired infections and CJD/prion disease. The exclusion of these two from the top 15 diseases/areas on category ranking leaves the remaining 13 top ranked areas in 1997 identical to those in 1995, although with some differences in rank order.

OVCD committee prioritisation and review of individual diseases

OVCD priorities

Taking into account the responses from PHLS staff, SSCs, and CCDCs, the OVCD Committee reduced the number of priority of work areas from five to three. Priority I diseases are of major importance to public health, priority 2 diseases are of moderate importance to public health, and priority 3 diseases are of declining prevalence as a result of public health action or of low prevalence and/or associated morbidity (box 3).

Within these three priority categories, disease areas that required more work to be done were highlighted (*). Individual diseases, if possible and appropriate, were grouped into disease areas (e.g., ‘food poisoning’, ‘vaccine preventable diseases’) with a brief description of the current burden of disease, recent trends, preventive interventions, and areas of research and development. Diseases considered to be of declining importance were also highlighted (#).

Box 3 Revised OVCD priority categories (1997)

| | | |
|-----------------------------------------------|----------------------------------------------|----------------------------------------------------|
| Priority 1 | | Priority 2 |
| Food poisoning | *Viral gastroenteritis | Travel associated illness |
| *Vero cytotoxin producing <i>E. coli</i> O157 | *Rotavirus | *Malaria |
| <i>Campylobacter jejuni/coli</i> | *SRSV | Hepatitis A |
| Salmonella infections | *CJD\Prion disease | Cryptosporidiosis |
| *Meningococcal disease | *Hepatitis B | Respiratory syncytial virus |
| *Antimicrobial resistance | Surveillance of vaccine preventable diseases | Varicella zoster |
| *MRSA | *Measles, mumps, and rubella | Congenital infections |
| *VRE | *Polio | Toxoplasmosis |
| *HIV | *Pertussis | Legionnaires’ disease |
| *MDRTB | Influenza | Group A β haemolytic streptococcal infection |
| *pneumococci | Diphtheria | Zoonoses |
| <i>Salmonella typhimurium</i> DT104 | <i>Haemophilus influenzae</i> type b | Q fever |
| multidrug resistant Gram negative bacilli | * <i>Streptococcus pneumoniae</i> | <i>Chlamydia psittaci</i> |
| *Hospital acquired infections | HIV\AIDS | <i>Staphylococcus aureus</i> |
| <i>Clostridium difficile</i> | Tuberculosis | |
| * <i>Helicobacter pylori</i> | | Priority 3 |
| *Hepatitis C | | Shigellosis |
| STDs | | <i>Chlamydia pneumoniae</i> |
| * <i>Chlamydia trachomatis</i> | | # Listeriosis |
| *Gonorrhoea | | # Parvovirus B19 |
| Syphilis | | |
| * requiring development | | |
| # declining importance | | |

PHLS priorities

Priority 1

Food poisoning

Formal notifications of food poisoning rose from 38 086 in 1989 to 54 233 in 1997. The inclusion of otherwise ascertained cases brought the 1997 total to 93 901. This is only the tip of the iceberg as significant undernotification occurs. Farming practices, food production technology and social practices have an impact on food poisoning. Food hygiene and food safety remain very important issues.

Vero cytotoxin producing *Escherichia coli* O157*. Vero cytotoxin producing *E. coli* (VTEC) O157 is an important cause of food poisoning and the commonest cause of haemolytic uraemic syndrome (HUS) in children in England and Wales. In 1997, 1087 isolations of this organism were reported by laboratories in England and Wales, part of an increasing trend. Information from outbreaks has shown that 10% of people infected with VTEC O157 develop HUS and 10% of these die in the acute phase. A recent large outbreak in Scotland linked to contamination of products prepared from a butcher's shop led to a government inquiry chaired by Professor Hugh Pennington. The PHLS is coordinating a case control study in England to improve understanding of the organism's epidemiology and its transmission and to identify strategies for prevention and control. More knowledge is also needed on the diagnosis of non-O157 VTEC.

Salmonella infections. Laboratory reports of salmonella isolates have numbered around 30 000 each year since 1989 with *Salmonella enteritidis* accounting for over 60% of them. Resistant strains of *S. typhimurium* have been increasing and a case control study in England and Wales has begun to describe its epidemiology and risk factors to guide future prevention. Outbreak investigations continue to highlight food contaminated with salmonella manufactured locally, nationally, and internationally. The European surveillance network, Salm/Enter Net¹³, has enabled epidemiologists and microbiologists from many countries to collaborate in the investigation of outbreaks.

***Campylobacter jejuni* and *C. coli*.** *Campylobacter* spp. remain the commonest cause of food poisoning in England and Wales. The numbers of isolates reported rose to exceed 44 000 in 1994 and remained around that level until 1997, when they exceeded 50 000. Less is known about the population and molecular epidemiology of campylobacter than about salmonella. PHLS work on typing of *Campylobacter* spp. is underway as well as consideration of epidemiological studies to inform prevention and control policies.

Meningococcal disease*. Notifications of meningococcal disease rose to 2646 in 1997, with a 9% case fatality rate, and an increase in the proportion of cases caused by *Neisseria meningitidis* of serogroup C. *N. meningitidis* is now the commonest cause of bacterial meningitis in England and Wales. Many cases develop permanent neurological sequelae and the disease generates

considerable public anxiety. Current vaccines effective against serogroups A and C provide limited protection and are of no value in infants, in whom the incidence is highest. New vaccines are undergoing trials and recent advances have been made in diagnostic methods, such as the application of polymerase chain reactions to identify and characterise meningococcal DNA.

Antimicrobial resistance*

Increasing resistance of microorganisms to available antimicrobial agents raises questions about the cause of antimicrobial resistance, its effects, and the factors that may prevent the development and transmission of resistant organisms. Accurate and comparable determinations of resistance patterns depend on the implementation of standard operating procedures in public health laboratories. Factors that influence the development of antimicrobial resistance include the organism itself, antimicrobial prescribing, the use of antimicrobials in farming, and compliance with treatment regimens. Few truly novel antimicrobials have been developed in recent years, although variations on existing molecules continue to appear. The emergence of VRE in the United Kingdom and case reports from Japan and the US of vancomycin resistant *Staphylococcus aureus* highlight the need for surveillance to monitor incidence, trends, and the burden of disease, on which to base clear policies for future prevention and control. The development and use of antimicrobial prescribing guidelines is also an important aspect of preventing resistance.

- Methicillin resistant *Staphylococcus aureus* (MRSA)*
- Vancomycin resistant enterococci* (increasing in hospital in patients in the UK. Its emergence may be related to the use of antibiotics in farming.)
- HIV*
- Multidrug resistant tuberculosis (MDRTB)*
Pneumococci*
- *Salmonella typhimurium* DT 104
- Multiresistant Gram negative bacilli

Hospital acquired infections*

Infections acquired in hospitals increase morbidity and mortality for individual patients, cause outbreaks in hospital and other institutional settings, increase risks for health care workers, and are often associated with antimicrobial resistant organisms. The wider community is also affected as individuals are discharged from hospital. Surveillance of hospital infections, providing both local and national information for prevention, and guidelines on hospital infection control contribute to reducing the illness associated with these infections. Current developments in this area includes the PHLS Nosocomial Infection Surveillance Unit with its Nosocomial Infection National Surveillance Scheme, a recent joint publication by the DH and the PHLS on hospital infection control, and the development of surveillance programmes for MRSA and hospital acquired infection in Wales.

***Clostridium difficile*.** *Clostridium difficile* infection continues to cause problems in elderly patients in hospitals and in residential care. Reports of difficile toxin rose to over 12 000 in 1997. Control of this infection in these settings relies on effective infection control mechanisms.

Helicobacter pylori*

It is estimated that half the world's population is infected with *Helicobacter pylori*. It is associated with gastric/peptic ulcers and gastric carcinoma and has been associated with coronary heart disease. Its role in acute and chronic disease is still not clearly established and the PHLS is conducting research in this area.

Hepatitis C*

Hepatitis C virus (HCV) was identified in 1989. Its prevalence in England and Wales is estimated at 0.5% to 1% of the general population, in a proportion of whom it causes chronic active hepatitis and cirrhosis. The natural history of HCV disease is not well known and the PHLS is developing surveillance and molecular diagnostic tests. Reports of HCV infections doubled each year from 1992 to 1995. The total rose to over 3000 in 1997, due at least in part to increased ascertainment and knowledge of the disease.

Sexually transmitted diseases

STDs cause a significant burden of disease associated with acute and chronic infections, long term sequelae, and congenital infections. HIV/AIDS, gonorrhoea*, *Chlamydia trachomatis**, viral hepatitis, and congenital infections are considered separately. Other significant viral STDs are infections with the human papillomavirus*, which is implicated in cervical cancer, and herpes simplex virus*. Opportunities exist for prevention, especially targeted intervention programmes for 'at risk' groups.

Chlamydia trachomatis*. This is the commonest bacterial STD. Reported rates of infection exceed 100/100 000 in those aged 15 to 59 years. Infections are often asymptomatic and it is estimated that only 10% of cases are identified. Chlamydia is an important cause of pelvic inflammatory disease and infertility from untreated infection in women. Screening for infection in targeted high risk groups has been recently recommended by the chief medical officer's Expert Advisory Group on Chlamydia. The new Genitourinary Infection Reference Laboratory (GUIRL) and the PHLS Communicable Disease Surveillance Centre (CDSC) are currently planning research projects for this infection to inform preventive strategies.

Gonorrhoea*. After a falling trend, reports of gonorrhoea increased by 20% in 1996, with the largest rise being seen in teenage women in the Thames regions. Gonorrhoea is an important indicator of the level of high risk sexual behaviour. Enhanced surveillance is needed in order to collect data on behaviour and risk factors as well as ethnic group, and to develop ways of measuring sequelae. The main burden of morbidity falls on women, with pelvic inflammatory disease and late complications such as infertility and ectopic pregnancy. The PHLS now processes 'KC60' data on behalf of the DH. Together with laboratory reporting and surveillance of antibiotic resistance, a clearer picture of this infection is emerging, which helps to ensure that it is treated appropriately.

Syphilis. On average 300 new cases and 1000 late cases of syphilis are reported each year in England and Wales. The disease is re-emerging in the former Soviet Union and

related cases are being seen in the UK and elsewhere in Europe. The PHLS is monitoring KC60 returns and GUIRL laboratory reports for any localised increases in disease. The PHLS is also reviewing national antenatal syphilis screening to inform national policy.

Viral gastroenteritis*

Viral gastroenteritis is a significant cause of morbidity and outbreaks. Rotavirus and small round structured virus (SRSV) are the commonest infections reported.

Rotavirus*. Reports of rotavirus infection increased from 8170 in 1986 to about 15 000 in 1997. Thirty per cent of reports are of infection in infants and 75% in children under 5 years of age. A vaccine against rotavirus (group A) is expected soon. The PHLS will be required to assess the burden of infection to inform a cost-benefit analysis for vaccine policy and to provide enhanced surveillance mechanisms and serotyping to monitor the impact of a vaccination programme.

SRSV*. Reports of SRSV infection are also increasing (provisionally 2049 in 1997), due in part to better ascertainment. SRSV infections mainly affect people at the extremes of age. They are also responsible for most outbreaks of gastroenteritis in institutions and the community. Development of enhanced surveillance and molecular microbiological techniques are vital to monitor the emergence of new strains.

CJD/TSE*

The emergence of new variant CJD (29 cases since 1995) has prompted much research into its aetiology and epidemiology coordinated by the CJD Surveillance Unit in Edinburgh. The emergence of TSE (bovine spongiform encephalopathy) in other animals raised concerns about possible links with the food chain. Epidemiological expertise needs to be applied to CJD and diagnostic tests require further development and evaluation.

Hepatitis B*

Knowledge about the epidemiology of hepatitis B in the UK provides an incomplete picture of the burden of acute and chronic disease. The World Health Organization (WHO) recommended that all countries institute universal vaccination against hepatitis B by 1997. The UK's current vaccination policy is selective. Should universal vaccination be recommended, enhanced surveillance and vaccine uptake monitoring would be needed. Potential future developments make preparedness for enhanced surveillance an important issue. Universal antenatal screening for hepatitis B has been recommended and the PHLS role in evaluation needs to be developed.

Surveillance of vaccine preventable diseases

Evaluation of vaccination programmes and the surveillance of vaccine preventable diseases provide information on which to develop vaccine policy. The potential use of new vaccines now being developed and changing applications of existing vaccines require enhanced surveillance of vaccine preventable diseases to be developed. The PHLS is ready to increase surveillance activities in these areas, and both WHO and the European Union have set targets for vaccine preventable diseases, which therefore remain a high priority.

Mumps, measles, and rubella vaccination*. Notifications of measles, mumps and rubella have fallen since routine MMR vaccination was introduced in 1988. Since the MR vaccination campaign in 1994, measles and rubella notifications have fallen further, and very few measles cases are laboratory confirmed. Evaluation of childhood immunisation programmes through enhanced surveillance is vital as the elimination of vaccine preventable diseases approaches. UK policy on MMR vaccination is evaluated with the help of salivary diagnosis and age specific serosurveillance. WHO's European Region has developed an elimination strategy for measles, the fulfilment of which requires further developments in surveillance and improvements in coverage*.

Poliomyelitis*. WHO's global eradication programme for poliomyelitis requires countries wishing to be pronounced polio free to institute certain environmental and clinical surveillance programmes. The PHLS is playing a leading role in this area for the UK. Enhanced surveillance through public health laboratories will require development and maintenance until polio has been eradicated*.

Pertussis*. Whooping cough notifications have fallen as vaccination coverage has improved since the late 1970s, with about 3000 notifications in 1997. As the new generation of acellular pertussis vaccines have the potential for boosting immunity in older age groups, enhanced surveillance and serological diagnostic methods for confirming infection in adults are required to inform future vaccine policy.

Influenza. Influenza causes ill health and absence from work in people of all ages in winter. Elderly and debilitated people are particularly vulnerable, and influenza is responsible for between 5000 and 20 000 excess deaths each year. Influenza is a vaccine preventable disease, although the vaccine does not protect all who receive it. Current policy is to vaccinate those at greatest risk due to chronic disease and impaired immunity, and people who live in institutions. People aged 75 years and over have recently been added to the list of target recipients. Better data on vaccine coverage in these target groups are needed to evaluate and inform future policy. PHLS epidemiology and virology contributes to national immunisation policy.

Diphtheria. The PHLS has supported international efforts to control the recent resurgence of diphtheria in countries of the former Soviet Union. Very few confirmed cases of infection with toxigenic *Corynebacterium diphtheriae* are reported in England and Wales associated with travel to endemic areas. The recent introduction of a booster dose of diphtheria vaccine for school leavers, based on seroepidemiological data collated by the PHLS, must be monitored to ensure that the population continues to be protected. The PHLS assists in this area by continuing to test the population nasopharyngeal swabs submitted to laboratories for diphtheria.

Haemophilus influenzae type b (Hib). The introduction of Hib vaccine into the routine immunisation schedule of infants and a catch-up programme in children in 1992 has led to a 95% reduction in the incidence of the disease in the

vaccinated cohort. As for any vaccine preventable infection, continued surveillance and investigation of vaccination failures evaluates the vaccination programme and informs future public health policy on the most appropriate vaccination policy.

Streptococcus pneumoniae*

Around 4000 laboratory reports of invasive pneumococcal disease have been reported each year since 1990. *S. pneumoniae* is the commonest cause of community acquired pneumonia requiring admission to hospital and of bacterial respiratory tract infection presenting to general practitioners. Pneumococcal pneumonia in elderly people has a case fatality rate of 20% to 40%. Pneumococci also cause about half of all cases of acute otitis media in children. Significant antibiotic resistance now exists and is rising in invasive infections. A vaccine exists, and conjugate vaccines are in development or on trial that may improve primary prevention for target populations. Enhanced surveillance studies are in progress.

HIV/AIDS

Each year about 2500 cases of HIV infection are newly diagnosed and about 1500 deaths from AIDS occur in the UK. There is currently no cure or vaccine and HIV and AIDS mainly affects young people. The use of therapeutic regimens is expected to increase survival and postpone the AIDS defining event in a significant proportion of patients. The long term efficacy of the new antiretroviral drugs is currently unknown as viral resistance is already developing. Falling death rates in people with HIV infection on new drugs will increase the prevalence of HIV infection and the total costs of care may rise even though inpatient costs may fall. The numbers of new infections and indicators of high risk behaviour in young gay men continue to be unacceptably high. Unlinked anonymous seroprevalence monitoring in genitourinary medicine clinic attendees shows that HIV infected gay men are continuing to acquire new STDs. New developments in surveillance include monitoring of post-exposure prophylaxis for occupational exposures to individuals known to be HIV infected.

Tuberculosis

Tuberculosis notifications have remained fairly stable in the past decade, before which they had been falling gradually. Five thousand six hundred and eight cases were notified in 1996 and about 400 deaths. Outbreaks of multidrug resistant tuberculosis have occurred in the UK. Immunisation of schoolchildren with BCG vaccine continues to be recommended. The PHLS continues to monitor the disease and provide information for public health prevention programmes. CDSC is undertaking the 1998 National Survey of Notifications of Tuberculosis and is developing national enhanced surveillance.

Priority 2 diseases

Travel associated illness

Increasing international travel has highlighted the risk of travel associated illness for individuals and as part of larger outbreaks. One of the main aspects of the prevention of travel associated disease is the provision of advice on avoiding infection abroad.

Malaria*. About 2000 cases of malaria and five to ten deaths among travellers from the UK are reported to the Malaria Reference Laboratory each year. Avoiding mosquito bites and complying with appropriate antimalarials in malarious countries reduces the risk of infection. Prescribing policies and use of antimalarials need to be monitored to improve control. Improving advice on chemoprophylaxis for malaria prevention guidance is an area for development*.

Hepatitis A

Hepatitis A notifications have remained stable at about 2000 per year since 1995. Vaccines are available and are used mainly for travellers and high risk groups. There is currently no national vaccination programme for hepatitis A although this may be considered in the future. Enhanced surveillance may be required to improve estimates of the burden of disease and costs to the health service.

Cryptosporidiosis

Cryptosporidium parvum has been responsible for the majority of outbreaks associated with water supplies in England and Wales in the past decade. Children are the most likely to have symptomatic infection, but infants, elderly people, and those with impaired immunity can have severe disease. Recent large outbreaks associated with drinking water have emphasised the importance of cryptosporidium in public health.

Respiratory syncytial virus (RSV)

Epidemics of RSV infection, associated with an average of 10 000 laboratory reports each year occur every winter in the UK. They affect infants mainly, in whom they cause bronchiolitis. Recent studies have shown that RSV causes considerable morbidity in older people too, and may be responsible for as many deaths in elderly people as influenza. The development of vaccines against RSV could have a considerable impact on illness caused by this infection.

Varicella zoster

Varicella zoster can cause considerable morbidity in pregnant women, neonates, elderly people, and those whose immunity is impaired. Enhanced surveillance in this area may be needed for the development of vaccine policy and its evaluation.

Congenital infections

The ongoing Confidential Enquiry into Stillbirths and Deaths in Infants estimate that about 4% of these deaths are related to infection from the mother. Death certificates suggest that 200 to 300 deaths in infants each year may be related to congenital infections. Viral infections such as cytomegalovirus and parvovirus B19 represent 'gaps' in vaccine coverage. HIV is probably the biggest threat. Antenatal screening activities are currently being reviewed: important decisions have to be made about rubella, syphilis, hepatitis B, hepatitis C, toxoplasmosis, HIV, and group B streptococci.

Toxoplasmosis. The numbers of cases reported nationally have not risen markedly in recent years. Public concern about the effects of toxoplasmosis in pregnancy was raised a few years ago, with demands for antenatal testing and some groups pressing for a screening programme.

Preventive programmes have been devised, targeting vulnerable groups such as pregnant women (health promotion) and people with impaired immunity (health promotion ± prophylaxis).

Legionnaires' disease

Cases of legionnaires' disease continue to occur. Many cases are associated with foreign travel, and outbreaks are reported each year both in the UK and abroad. International collaboration through the European Working Group on Legionella Infections, coordinated at CDSC, has enabled travel related outbreaks to be detected swiftly, providing information on which to base immediate and long term control measures.

Group A β haemolytic streptococcal infection

An enhanced surveillance system for invasive group A β haemolytic streptococcal infection was set up in response to the necrotising fasciitis scare in 1994. In two years of surveillance, 1118 cases were reported, with an overall mortality of 27%. Analysis and interpretation of the information collated from this scheme will assist in forming policy on prophylaxis and the management of clusters and outbreaks of infection.

Zoonoses

The burden of disease from zoonoses may not appear to be high nationally, but their impact is substantial in some geographical areas and particular groups, occupational and otherwise.

Q Fever. An average of 80 laboratory reports of *Coxiella burnetii*, the organism responsible for Q fever, are made each year, but asymptomatic infection is common. Farm workers are particularly at risk but so too are those who travel overseas. *C. burnetii* infection may cause endocarditis with long term heart valve damage. Ascertainment of regional trends and identification of outbreaks is essential for prevention. A vaccine available on a named patient basis is being evaluated.

Chlamydia psittaci. An average of 410 laboratory confirmed *Chlamydia psittaci* infections are reported each year, with four deaths. Cases may acquire infection from their pets, or in the context of work. Pregnant women are at particular risk if in contact with sheep at lambing time. It is important to educate the public to avoid these risks.

Priority 3 diseases

Shigellosis

Laboratory reports of shigella isolates rose from 2313 in 1991 to peak at 18 069 in 1992 but have since fallen to 1991 in 1997 (provisional). The increase in 1992 was mostly in *Shigella sonnei*, mainly in children.

Chlamydia pneumoniae

This organism causes respiratory infections and has been linked to the development of coronary artery disease. Symptomatic infection is seen most often in young adults but all ages can be affected. Diagnostic and epidemiological research may help us to understand the disease burden of this infection.

Listeriosis[#]

The number of cases of listeriosis increased between 1987

and 1989, peaking at 278 cases, with at least 40% associated with pregnancy. Expectant mothers and other vulnerable groups (such as the very young, very old, and those with impaired immunity) were therefore warned to avoid pâté and soft ripened cheeses. Laboratory reports fell by over 60% to 116 in 1990, with the fall in pregnancy associated cases being even greater (86%). The number of reported cases has changed little since 1990.

Parvovirus B19*

Parvovirus B19 causes epidemics of fever and rash in children ('slapped cheek syndrome') and arthritis in adults every two or three years. Ten per cent of infections in pregnancy are associated with fetal loss and immunocompromised patients may develop persistent anaemia. Diagnostic testing is now widespread in laboratories and is no longer a reference function.

Discussion

The overall aim of the PHLS is to protect the population from infection. The key principles to consider in achieving this aim are the needs of the population, in terms of communicable disease, and their ability to benefit from existing or future interventions. Consultation and priority setting exercises are needed in order to choose the course of action that will yield the greatest benefit within resource constraints. Ideally, decisions would be made on the basis of established facts using agreed principles, discussed with a unity of purpose. Often, however, facts are few and principles and purpose may be ill-defined. Priorities and resources are linked inextricably and it is seldom possible to meet all priorities within finite resources. This exercise suggests that work priorities can be set using an open process of communication and consultation.

The results were endorsed and approved by the PHLS Board and by the Research and Scientific Strategy Committee (which accounts for PHLS expenditure on research and development (R&D) to DH and advises and oversees the planning and outputs of R&D). These results have been used in the past 18 months to guide PHLS service developments of programmes¹⁴ in the key areas of meningococcal and pneumococcal disease, measles, mumps, and rubella; antimicrobial resistance; and tuberculosis as well as in PHLS business and corporate plans, R&D strategies, and surveillance protocols. Sharing the results of this exercise more widely has forged links within the PHLS and between the PHLS and its customers, partners, and international and other agencies.

What strategic issues did this exercise highlight? Firstly, the exercise identified diseases in which the PHLS had not traditionally engaged. CJD/TSE were mentioned by both PHLS staff and CCDCs as requiring development and by CCDCs as an area in which the PHLS had a clear contribution to make. Although the PHLS is now taking part in some aspects of the work on CJD, the extent of its role may need to be reviewed in the light of this exercise.

Secondly, several respondents identified infectious diseases in vulnerable groups within the population and their particular needs as meriting special attention by the PHLS. These groups included people from ethnic minorities, elderly people, and people with impaired immunity. This raises issues of equity and ethics within

priority setting, as the distribution of disease within the population and the ability to benefit from interventions are unequal. Is it better to provide modest benefits for the majority or substantial benefits to a minority? One way of resolving these issues may be to consider health economics when setting priorities. The government is committed to tackling inequalities in health, and these are prominent in communicable diseases.

Thirdly, the PHLS has undertaken little work on the socioeconomic burden of disease. Such work as has been carried out suggests that the PHLS contribution to the prevention and control of communicable disease has been a substantial hidden asset to the nation's wealth (J Roberts, personal communication). It appears that the PHLS might be wise to evaluate socioeconomic benefits of its work more actively.

Fourthly, many respondents took the opportunity to comment on the OVCD exercise and hoped that their views on priorities would be heeded, given that they were working 'in the field' and could perceive gaps at local, regional, and national levels. Comments from CCDCs in particular indicated that they wished to take a more active role in setting priorities. This view raises the question of how much input our external public health customers could have on PHLS activities.

Has the the exercise actually improved the public health?

The outcomes of the priority setting exercise need to be evaluated before the process is repeated. Accountability for decisions made on the basis of priority setting falls into three areas: medical outcomes (e.g., surveillance of risk factors leading to interventions that have prevented cases of disease), the scientific basis of decision making (e.g., explicit criteria in prioritising, evidence-based decision making), and the decision process itself (e.g., the extent of the consultation exercise). Improvements and progress in areas highlighted as priorities for development will be monitored explicitly and accounted for.

How often should priorities be set? Priorities may change rapidly and any organisation concerned with the public health needs to maintain flexibility to respond to these between formal priority setting exercises. It takes time, however, to develop areas of a service whose resources are committed. This exercise has shown that, with few exceptions, areas of high priority and those requiring development have not changed substantially since the 1995 exercise. These findings provide reassurance about the need for certain continuing and substantial public health requirements yet provide sufficient leeway to respond to urgent demands. The OVCD Committee has recommended that an OVCD exercise should be carried out every two years.

How appropriate were the methods used? The questionnaire method chosen for this exercise has been used previously⁶. It provided a quantitative measurement that could be applied simply and was practical and reproducible¹⁵. Published reports of existing tools for such exercises could not be found. The questionnaire's validity and its appropriateness as a tool was assessed by experts in communicable diseases to ensure that it covered the main areas and criteria needed for the priority setting

exercise. The questionnaire's reliability, (i.e., whether repeated measures could produce the same or similar results) was tested in both the 1995 and 1997 exercises. Consistency was found in the responses given within questionnaires, between the two exercises, and within different groups of professionals in the current exercise.

The importance of a disease for a particular criterion was measured using subjective interval scales. The differences between one scale level and the next were not necessarily equal and respondents more often chose central than extreme values. The mean responses, therefore, dilute the potential effect of individual responses somewhat. Testing the effect of certain criteria helped to distinguish their possible impact on the overall 'importance' of a particular disease. Similarity was observed between mean criteria responses and assigned priority category.

Response rates were similar within and outside the PHLS. The response rate could probably have been improved by reminding respondents and by issuing advance warning of the exercise.

What influenced priority categories, and could priorities within priorities be distinguished? Respondents overall tended to place diseases and areas in higher priority categories. This may be due to real priorities or bias in the response for special interests. We tried to reduce bias by asking the SSCs to be explicit about specific priority areas and to supply the evidence to support their response, and by objectively obtaining summary information on the criteria for each disease. This information was not always available, and a clearer picture of available prevention and control measures, their costs and information on their effectiveness, and the outcomes of interventions is needed. We chose an arbitrary cut-off of 50% for priority categories from the questionnaires. This may have led to more diseases being given a higher priority: the exercise placed many diseases and areas within the Priority I category.

How does this OVCD compare with the results from other such exercises internationally? The Global Burden of Disease Study placed communicable diseases as one of the three leading contributors to the burden of disease worldwide². Tuberculosis, respiratory tract infections, and diarrhoeal diseases were the three infectious diseases in the top ten causes of mortality. Vaccine preventable diseases, tuberculosis, AIDS, hepatitis B, salmonellosis, meningococcal infection and STDs made up the top 15 diseases for surveillance in Canada³. In the US, within the four goal areas already mentioned, specific high priorities included antimicrobial resistance, foodborne (such as salmonellosis and *E. coli*O157) and waterborne infections, zoonoses, surveillance of vaccine preventable and potentially vaccine preventable diseases, emerging infections, and infections in immunocompromised people⁵. The US exercise also emphasised enhancing and strengthening surveillance networks at the local, sentinel, national, and international levels, developing the microbiological infrastructure, and assessing the impact of current practices – such as guidance on antimicrobial prescribing and food hygiene – on disease. The PHLS approach mirrored the US model most closely in terms of informing programmes of work, although it focused mainly on prioritising diseases rather than on goal areas of work.

The results from this OVCD in terms of priority diseases and areas of work compare quite well with these international findings and show an international unity of thought in communicable disease undertakings.

The apparent success of the current approach to priority setting suggests that the PHLS has a secure foundation on which to build. This, together with the increasing collaboration of services in infection, encourages us to widen the consultation in the next round to include National Health Service microbiologists and clinicians and other clinical and public health professionals. The increasing importance of patient and consumer input should be acknowledged and the PHLS role in protecting vulnerable populations from infection should be defined. European and international priorities will need to be reviewed to define the PHLS input to European priorities in communicable disease.

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*A Rushdy, senior registrar
M O'Mahoney, deputy director
PHLS Communicable Disease Surveillance Centre*

Members of the OVCD Committee

Professor Brian I Duerden (chair), Dr Mary O'Mahony (secretary), Professor Chris Bartlett, Professor Peter Borriello, Professor Paul Boseley, Professor Rodney Cartwright, Professor Glynn Evans, Dr Robert George, Dr Noel Gill, Dr Roger Gross, Dr Tony Jephcott, Dr Jane Leese, Dr Liz Miller, Professor Peter Morgan-Capner, Dr Philip Mortimer, Professor Stephen Palmer, Dr Donald Ribiero, Dr Lena Robinson, Dr Bernard Rowe, Dr Julius Weinberg, Dr Amal Rushdy (in attendance)

Address for correspondence:

*Dr Amal Rushdy
PHLS Communicable Disease Surveillance Centre
61 Colindale Avenue
London
NW9 5EQ
tel: 0181 200 6868 ext 4454
fax: 0181 200 7868
email: ARushdy@phls.co.uk*