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Introduction

The Government very much welcomes the Committee's thorough and wide-ranging report. It has done much to stimulate the increased national and international attention this subject is now rightly receiving. Antimicrobial resistance is a major public health threat. Antimicrobial agents have revolutionised medical care in the twentieth century: they have contributed to a dramatic reduction in morbidity and mortality from infectious disease and made possible many major technological advances in treatment which depend in part on our ability to cope with infection. Antimicrobial resistance jeopardises many of these successes. The Government is already doing a great deal, and is determined to continue to play a leading part in tackling the problem.

As the evidence presented in the Committee's report shows, resistance is to some extent an inevitable consequence of antimicrobial use. However, much can and needs to be done to slow or delay its emergence and limit its spread.

The Government's strategy to address the problem of antimicrobial resistance is based on the three key elements of:

- surveillance - to provide the information base for action;
- prudent antimicrobial use - to limit unnecessary pressure for the emergence of resistance;
- infection control - to limit the spread of infection in general, and thus some of the need for antimicrobial agents, and of antimicrobial resistant infection in particular.

These key activities are underpinned by education, communication, research, the necessary infrastructure (including information technology) and where necessary, regulation or legislation. They also require commitment - and a sense of ownership of the problem and the necessary action - from a wide range of individuals and organisations, including the general public. The Government cannot do this alone - but it intends to provide the leadership required.

A number of initiatives contributing to the overall strategy are underway, many of which were in hand when the Committee undertook its Inquiry and have progressed, in particular:

- Surveillance:
 - The Public Health Laboratory Service (PHLS) has made considerable progress in developing a five year antimicrobial resistance programme and is also addressing weaknesses in surveillance in a number of other related areas;

proposals that emerged from a brainstorming meeting held in July 1998 are being taken forward by the Department of Health in consultation with other key players.

- Optimising antimicrobial use:
 - In September 1998, the Standing Medical Advisory Committee (SMAC) published its report and recommendations on antimicrobial resistance in relation to clinical prescribing practice entitled “*The Path of Least Resistance*” (details of which are at Annex A). The main report is a comprehensive scientific source document which, with summary and synopsis versions, has been widely distributed to health professionals and others in the UK and made available on the internet. The Government has accepted its recommendations for encouraging optimal use of antimicrobials and reducing unnecessary and inappropriate clinical prescribing, including a recommendation for parallel professional education and public information campaigns.
 - The investigation into microbial resistance in the food chain, carried out by a working group of the Government’s Advisory Committee on the Microbiological Safety of Food (ACMSF), has progressed. A full report from ACMSF is expected early next year, but the Chairman has already advised that the use of certain antimicrobial growth promoters should be phased out at the earliest opportunity. The Government has also received advice from the Veterinary Products Committee (VPC) on the phased withdrawal of certain antimicrobial growth promoters, as well as recommendations on responsible use of antimicrobials authorised as veterinary medicinal products.

- Infection control:
 - The “*National Priorities Guidance for 1999/00-2001/02*” (which sets out the Government’s national priorities for health and social services for local action over the next three years) includes a clear commitment to give priority to the issues of antimicrobial resistance and infection control.
 - The NHS Executive is preparing an action plan which identifies those areas that need to be addressed and strengthened in the NHS.
 - A survey of communicable disease control arrangements at Health Authority level throughout England was commissioned by the NHS Executive in the summer of 1997. The findings have been acted upon through NHS performance management arrangements.

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- Earlier this year, the NHS Executive asked Regional Epidemiologists to conduct a further survey, this time of hospital infection control arrangements in all acute NHS Trusts. The results will be available early in 1999 and will be the basis for further action where improvements are needed.
 - In its White Paper “*The New NHS: Modern, Dependable*” the Government has put new emphasis on quality of care, clinical governance and performance management, through which improvements in antimicrobial resistance and hospital acquired infection control will be sought.

- In addition:

Communicable Disease Strategy

- Ministers have asked the Chief Medical Officer to lead work on a communicable disease strategy to ensure that all activity in this area is properly focused and co-ordinated and complements the work in hand on the modernisation of the NHS and the improvement of public health. It is hoped that this strategy will be completed by Autumn 1999.

Interdepartmental Steering Group

- A multi-disciplinary interdepartmental steering group has been established in order to continue to develop, co-ordinate and monitor the Government’s strategy on antimicrobial resistance. This Group has already met four times.

Multi-disciplinary Expert Group

- The Government agrees with the Committee’s view that there is a need for a multi-disciplinary committee to provide expert advice on antimicrobial resistance and is setting up such a group. Details of its membership will be announced as soon as possible.

Research

- The Government fully recognises the importance of antimicrobial resistance research and is working closely with the Medical Research Council (MRC) to ensure that needs are identified and addressed through the MRC’s own research programme, the NHS Research and Development Programme and the Department’s Policy Research Programme.

Publicity

- The Government is making £0.5 million available this year to fund national publicity to increase public awareness and understanding of the need to preserve the usefulness and effectiveness of antibiotics.

Information Technology

- On 24 September 1998 the new Information Strategy for the NHS for 1998-2005 “*Information for Health*” was launched. This £1 billion investment to put information to work for NHS patients and staff will offer opportunities to relate individual patient prescribing to incidence of infection, antibiotic use, and treatment outcomes, both in general practice and hospitals.

Growth Promoters

- The Government supported a European Commission proposal to ban the use of certain antimicrobial growth promoters in animals with effect from 30 June 1999.

International Issues

Antimicrobial resistance recognises no boundaries and the Government will continue to play its part in keeping the key issues on the international agenda. With UK support, the World Health Assembly adopted a resolution in May 1998 which urged Member States to take measures, which are broadly in line with the planned UK strategy, and called on the Director General to promote international cooperation. The World Health Organisation (WHO) Regional Committee for Europe subsequently endorsed, in September 1998, a new policy framework for international cooperation which includes the need to monitor changing antimicrobial resistance patterns.

In parallel, the European Commission, in its communication of April 1998 on the development of public health policy in the European Community, identified the growing problem of resistance to antibiotics as one of a number of new risks to health. Subsequently, the Commission’s Scientific Steering Committee set up a multi-disciplinary working group to examine all aspects related to the use of antimicrobials and the development of resistance. Its report is expected early in 1999. Separately, prompted by concerns voiced by the Chief Medical Officers of EU Member States, the Danish Ministries of Health and of Food, Agriculture and Fisheries organised a successful international conference in September this year on “*The Microbial Threat*”. There was a strong UK contingent. The conference made a number of recommendations to the European Union and

Member States, again broadly in line with the action planned in the UK. Details of the recommendations are at Annex B.

In addition to the support given by the Department of International Development (DFID) to WHO, DFID is also involved in the development of new drugs to combat resistance through the formation of public/private partnerships with the pharmaceutical industry, particularly with regard to low cost drugs for the treatment of malaria and tuberculosis.

The Government is determined to give constructive support to these international initiatives, taking a leading role, where that is helpful, to ensure effective systems for monitoring antimicrobial resistance are set up without delay. The Government will press for this to be given priority in the WHO's next global and regional biennial work programmes and in the future framework for European Community action in the field of public health.

Summary

Tackling antimicrobial resistance is not a short term activity; it is a long haul task requiring partnerships between Government(s) and a wide range of organisations and individuals across many disciplines both in the UK and internationally.

The Government's response to the specific recommendations in the Committee's report follows.

Prudent use in human medicine

Recommendation 11.6. We recommend that the Education Committee of the General Medical Council and the medical Royal Colleges should review the evidence presented to us (paragraph 2.31) that undergraduate curricula give insufficient emphasis to infectious diseases and antimicrobial therapy.the Royal Colleges should increase the attention paid to antimicrobial therapy in their programmes of postgraduate education and vocational training.

The Government has brought the Committee's recommendations to the attention of these bodies. The recommendations have also been brought to the attention of the Department for Education and Employment and the Higher Education Funding Council because of their interest in funding undergraduate education. Responsibility for the content, standards, management and delivery of medical education is shared between regulatory bodies (eg the General Medical Council (GMC) and the Specialist Training Authority), professional bodies (notably the medical Royal Colleges), universities, the Department of Health and the NHS, where postgraduate deans have a pivotal role. The Education Committee of the GMC has statutory responsibility for the undergraduate medical curriculum; the Royal Colleges are responsible for the content of their Membership and Fellowship examinations; the four National Boards are responsible for the curricula for nursing pre- and post-registration education programmes.

The GMC has indicated that "*Tomorrow's Doctors*", which contains its latest recommendations on undergraduate medical education, intentionally makes no reference to individual subjects and disciplines. However, it does make clear that, at the point of graduation, students should have a sound knowledge of diseases and their presentation (including relevant environmental issues) and of therapeutic interventions. The GMC has assured the Government that this should include awareness of the issues raised by the Committee. The GMC will consider the Committee's comments in its review of "*Tomorrow's Doctors*" and will see whether the Committee's concerns can be more specifically accommodated without compromising the generic approach it has, to date, taken to curricular matters.

The Academy of Royal Medical Colleges has signalled its support for the Committee's recommendations.

The English National Board for Nursing, Midwifery and Health Visiting (ENB) ensures that infection control is included in all pre- and post-registration education programmes. The ENB recognises the increasing importance and significance of antimicrobial resistance, and has agreed to highlight this in the Board's national publication "*The ENB News*". This is sent to the heads of nursing and midwifery education departments in all universities, and reaches over 20,000 of the practising profession. Antimicrobial resistance will also be included, together with an assessment of curricula

content, on the agenda of all forthcoming meetings with Heads of Education Facilities. Additionally, a national overview will be undertaken to monitor inclusion of infection control and antimicrobial resistance within curricula. A report on the findings will be disseminated.

Recommendation 11.7. We recommend that Health Authorities should step up their efforts in the[se] areas [of professional development of doctors in the area of prescribing, particularly through audit and feedback (paragraph 2.34) and by educational outreach (paragraph 2.35)].

The Government strongly encourages professional development of doctors' prescribing skills. It also expects Health Authorities and hospitals, and will in future (subject to legislation) expect Primary Care Groups (PCGs) and, in Wales, Local Health Groups (LHGs) and in Scotland Local Health Care Cooperatives (LHCCs) to take an active role in professional development in this area. The "*National Priorities Guidance 1999/00-2000/01*", issued jointly to the NHS and Local Authority Social Services Departments on 30 September 1998, specifies that action should be taken to improve the clinical effectiveness (and cost) of prescribing against locally set targets.

Health Authority prescribing advisers

Health Authority prescribing advisers have a key role and have been very active in reducing the volume of inappropriate antibiotic usage and in improving antibiotic choice. Many local prescribing incentive schemes, established to improve the quality of prescribing in general practice, already include antibiotic prescribing targets.

Prescribing guidelines

A significant number of Health Authorities have already developed policies and published guidance (usually in the form of booklets) on the management of infections in the community. Such guidance is often developed through area prescribing committees in collaboration with local microbiologists and general practitioners (GPs), and includes advice on the use of antimicrobial drugs. Within hospitals, local multi-disciplinary drug and therapeutics committees advise on the use of antimicrobials. These committees, with input from medical microbiologists, the infection control committee and pharmacists, develop local antimicrobial drug prescribing policies which take account of local antimicrobial resistance patterns, and monitor adherence to them. The NHS Executive will ensure that all Health Authorities, PCGs and NHS Trusts develop, implement and review (at least annually) policies and guidelines on the management of infections and the appropriate use of antimicrobial drugs.

Other initiatives

Work in PHLS South West has shown that prescribing workshops for GPs backed up by continued support from the consultant microbiologists and re-enforced through the laboratory reporting system can reduce the amount of antibiotic prescribing. The recent publication “*GP Prescribing Support*”, published jointly by the Department of Health and the National Prescribing Centre, provides a range of examples of other initiatives - such as ways in which community pharmacists can help to influence prescribing - plus information to assist Health Authorities and PCGs set up their own support arrangements.

Monitoring performance, audit and feedback

Regional Directors of Performance Management will encourage the use of the clinical governance framework set out in the White Paper “*The New NHS: Modern, Dependable*” and the consultation document “*A First Class Service: Quality in the New NHS*” to improve antimicrobial prescribing in all settings and ensure that local mechanisms for controlling the use of antimicrobials are appropriate and effective. PCGs will continue to receive professional advice on prescribing and the associated clinical and financial information necessary to support clinical governance and audit. (Work is underway to make PACT¹ prescribing data available at PCG level.) Antibiotic prescribing is one of a range of indicators on overall NHS performance available to senior NHS managers. These prescribing targets and other tools (such as the policies and guidelines mentioned above) will be used to monitor Health Authorities’ use of antimicrobials. Antibiotic prescribing also forms part of a package of specific tools developed to enable Health Authority Advisers to follow changes over time and target individual practices whose prescribing patterns appear inappropriate. This package will be available in electronic format shortly.

Scotland has its own arrangements involving a set of 12 indicators, 2 of which relate to antibiotic prescribing. In Scotland modified SPA² (level 2) data is available electronically to Health Boards using Prescribing Information System for Scotland (PRISMS). This allows aggregation of individual practice data at a variety of levels and can support Local Healthcare Cooperative Information (LHCI). In addition a system is being piloted called PRISMS FP (For Practices) which provides individual practices with their SPA data electronically and which can be analysed using the PRISMS system. Similar arrangements apply in Northern Ireland. Examples of good prescribing practice in the use of antimicrobials in primary and secondary care will be identified and disseminated through Health Authorities, LHGs, LHCCs, PCGs, NHS Trusts and postgraduate educational networks.

¹ PACT - Prescribing Analysis and Cost

² SPA - Scottish Prescribing Analysis

Recommendation 11.8. We recommend that industry and the grant-giving bodies should give priority to work on rapid affordable systems for diagnosis and susceptibility testing (paragraphs 2.16-18); where promising developments emerge, they should be quick to move them towards the market.

The Government is keen to see improvements in microbiological diagnosis and susceptibility testing which enable reliable information to be provided more rapidly to prescribers.

Both the Public Health Laboratory Service (PHLS) and the diagnostics industry are active in developing rapid, more affordable diagnostic and susceptibility tests. The PHLS also evaluates such tests in clinical practice. The Department of Health funded research and development programme at the Centre for Applied Microbiology and Research (CAMR) has included research to assess the diagnostic potential of antigen detection in urine for a variety of infections. DH also funds a reference and diagnostic capability at CAMR which produces non-infectious, reliable and reproducible diagnostic reagents for specific pathogen detection. CAMR is well placed to contribute to this research area as it has both appropriately skilled staff and the range of laboratory facilities required. The Medical Research Council (MRC) recognises the overall subject of antimicrobial resistance as a high priority research topic (expanded in the response to recommendation 11.48). The Government's Chief Scientific Adviser and the Chief Medical Officer have discussed antibiotic resistance with the Association of the British Pharmaceutical Industry (ABPI) and representatives of the pharmaceutical industry.

In the meantime, the Government believes that much can be done to optimise the use of the more expensive polymerase chain reaction (PCR) based tests - the identification of organisms from minute quantities of their genetic material - and through improved reporting of bacteriological results, for example, electronically.

“Near-patient” testing is one aspect of rapid diagnosis. The benefits of this form of testing need to be weighed against the possible risk of some missed diagnoses because the full range of tests has not been set up, and the loss of valuable surveillance data from laboratories. The Government recognises the need for coordination across laboratory and clinical services so that the introduction of new near-patient tests is achieved with a high level of quality assurance and without detriment to overall surveillance.

Recommendation 11.9. We recommend that the Medicines Control Agency should consider whether the drug licensing system could be used more effectively to encourage prudent use in the interest of public health (paragraph 2.23).

The UK drug licensing system is now based on European legislation. As in the UK, licensing depends on an assessment of safety, quality and efficacy. The UK must comply with this legislation and any changes must be pursued by concerted action across Europe. The increasing harmonisation of the presentation of medicinal products on the market in a number of Member States of the European Union (EU) further limits the scope for individual Member States to act unilaterally on licensing requirements.

Within these parameters however the Government recognises that the licensing process could be used to greater effect in helping to slow down the rate at which resistance emerges by requiring the pharmaceutical industry to take additional measures in certain areas of antimicrobial drug development. For example, the Government accepts that the pharmaceutical industry should be asked to investigate appropriate dosage regimens and the impact of the product in relation to its potential to select for resistance more closely before presenting a product for marketing authorisation. Accordingly, the Government is already seeking, through the Medicines Control Agency's (MCA) representation at the relevant EU scientific committee (the Committee on Proprietary Medicinal Products) a revision of the European-wide guidance given to the pharmaceutical industry.

In addition, the MCA will seek to ensure that documents from manufacturers which give information about antimicrobial products (for instance, summaries of product characteristics and patient information leaflets) continue to be kept fully up to date with best current evidence-based practice. Furthermore, should robust data on the epidemiology of resistance become available, this would be taken into account when marketing authorisations are considered for renewal. The MCA will also seek to improve the consistency of the information provided for similar groups of antimicrobials.

Recommendation 11.10. We commend the work of the WHO, through its Division of Emerging and other Communicable Diseases Surveillance and Control, to equip professionals and regulators in the developing world to respond appropriately to pharmaceutical promotions (paragraph 9.3).

The Government, through the Department for International Development, has been a major contributor to the budget of the World Health Organisation's (WHO) Division of Emerging and Other Communicable Diseases Surveillance and Control. This is in addition to the Government's contribution to the overall WHO budget. The Government has been impressed both with the

achievements of this Division under Dr David Heymann, and with the direction of the work on antimicrobial resistance that is being taken forward within it by Dr Rosamund Williams. The Department of Health maintains a keen interest in the progress being made by the Division and the Government will continue to work closely with them.

Recommendation 11.11. We commend the Government and the ABPI for their firm stand against over-the-counter antibiotics, and urge them not to give way.we recommend that the Government should engage in active diplomacy to ensure that, should the issue be raised in the Council of Ministers, their position is understood and their allies are in place; and, in the long-term, to induce those Member States which are currently more relaxed about over-the-counter antibiotics to introduce more control (paragraph 2.26-30).

Directorate General XXIV of the European Commission (EC) has established a number of scientific committees to provide independent scientific advice in the field of consumer health and food safety. A subgroup of the overarching Scientific Steering Committee is currently looking at all aspects of antimicrobial resistance and is expected to provide a draft Opinion to the Commission by the end of 1998 based on its findings.

Under the European licensing system, the legal status of medicines - whether they are available with or without prescription, in a pharmacy or on general sale - is currently a decision for each Member State. In the UK, no systemic antibacterial agents are currently available without prescription, although some antimalarial, antiviral and antifungal agents are. The Medicines Control Agency (MCA) will review the legal status of this latter group of medicines taking into account the best interests of the patient and the possibility that they might contribute to the development of resistance. The Government will continue strongly to promote adherence to “prescription only” status for all antibacterials within the EC and elsewhere.

In June 1998, with the introduction of new Medical Devices Regulations³, all surgical dressings, including those containing antibiotics acting ancillary to the dressing, have moved from the scope of medicinal product to medical device regulatory control. The regulation of medical devices is governed by the EC Medical Devices Directive⁴ which was transposed into UK law by the Medical Devices Regulations 1994. These Regulations currently do not contain provision to control the point of sale of devices; there is therefore no concept of a prescription-only device.

³ Medical Devices Regulations 1994 (SI No 3017)

⁴ EC Medical Devices Directive 93/42/EEC

Member States and the Commission have agreed to a suitable amendment to the Medical Devices Directive to give Member States the power to prohibit, restrict or make subject to particular requirements, the availability of a product or given range of products to ensure protection of health and safety or for public health requirements. Provision for this amendment is made in the In-Vitro Diagnostic Medical Devices Directive⁵ and will be enacted into UK law by the end of 1999.

The Government is not aware that any dressings containing antibiotics are currently being placed on the UK market. Should the free circulation of dressings containing antibiotics become an issue in the UK then the Government believes that these measures will enable appropriate legislative controls to be introduced. The Government is committed to educating both professionals and the general public as to the potential dangers of such dressings in terms of antibiotic resistance. The Government will continue to monitor the situation closely and stands ready to raise any concerns at the appropriate working Ministerial level.

Recommendation 11.12. The increased education for doctors which we recommend above should include education in communication skills (ie how to explain the reasons for refusing a prescription) and other ways to avoid prescribing on demand (eg delayed-action prescriptions) (paragraph 2.3-7, 2.37).

The Government recognises the importance of communication skills among health care professionals, and of greater doctor-patient understanding in the area of antimicrobial prescribing.

In January 1998, after consultation with the medical profession, the Government introduced new regulations requiring all doctors completing training for general practice to pass an assessment before they can receive the certificate that entitles them to practice. The assessment includes tests of a doctor's ability to communicate effectively, both orally and in writing, and to consult to a satisfactory standard with general practice patients.

The Government funds a number of regular sources of information to help GPs prescribe appropriately. These include the British National Formulary (BNF) - which sets out the basics of prescribing, specific advice from the Committee on the Safety of Medicines and information on the appropriateness, selection, dose and recommended duration of courses of antimicrobials - the Drug and Therapeutics and Medicines Resource Centre (MeReC) Bulletins and the "*Prescriber's Journal*".

⁵ In-Vitro Diagnostic Medical Devices Directive 98/79/EC

In England, PRODIGY - the electronic prescribing support system for GPs, which the Select Committee highlighted as an example of good practice - aims to support the GP in decision-making and to involve the patient. The user is led through a series of decision pathways to a recommended course of action. The package contains information fields which can be shared with patients and can be used to generate specific “no antibiotics needed” patient information. This system could be used to support the issue of deferred action prescriptions and will provide a natural platform for disseminating guidance from the National Institute for Clinical Excellence (NICE) and as a basis for prescribing audits. Baroness Hayman, Parliamentary Under Secretary of State for Health, announced at the Royal College of General Practitioner’s (RCGP) Quality Conference on 10 November 1998 that PRODIGY Release 1 will be available free of charge to any GP. Expansion and development of telephone advice through “NHS Direct” will provide another source of help to patients.

The Government is currently spending £2.4 million on centrally-commissioned research into prescribing. This includes several projects on doctor and patient pre-conceptions and the effect these have on prescribing, and on ways to improve communication between doctor and patient so that decisions on prescribing can be matched to the patient’s needs more effectively. Some results of this research will be available shortly, other projects have a further two years to run. Further research, particularly on implementation, may be necessary, as it is likely to take time to change doctors’ underlying practice skills and the public’s perceptions and health beliefs.

The Standing Medical Advisory Committee (SMAC) in its report, “*The Path of Least Resistance*” recommend four simple messages “four things you can do to make a difference” be promoted in primary care to influence doctors’ prescribing:

- no prescribing of antibiotics for simple coughs and colds;
- no prescribing of antibiotics for viral sore throats;
- limit prescribing for uncomplicated cystitis to three days in otherwise fit women;
- limit prescribing of antibiotics over the telephone to exceptional cases.

The Departments of Health support these recommendations and commended them to health professionals in the letter from the Chief Medical, Nursing and Dental Officers and the Chief Pharmacist which accompanied copies of the SMAC report. SMAC acknowledged the importance and influence of patients’ expectations and demands on doctors’ prescribing habits, which they described as two sides of the same coin. They therefore recommended that a national Campaign on Antibiotic Treatment (CAT) in primary care along the lines outlined above be complemented by

a National Advice to the Public (NAP) campaign giving the same messages. The Government's plans for a public awareness campaign are expanded in the response to recommendations 11.13 and 11.14.

The Government is contributing £250,000 towards a research and development programme designed to establish shared goals between pharmacists and other health care professions on the taking of medicines. This is being taken forward by a multi-disciplinary co-ordinating group under the auspices of the Royal Pharmaceutical Society of Great Britain (RPSGB). The pharmaceutical industry is also contributing. The programme builds on a multi-disciplinary report "*From compliance to concordance: Achieving shared goals in medicine taking*" previously led by the RPSGB.

Recommendation 11.13. In many cases doctors prescribe unnecessarily under pressure - or perceived pressure - from their patients, and under pressure of time. There is an urgent need for public health education in this area. ...we urge the Government and Health Authorities to do more. In particular, we recommend a campaign targeted at mothers of young children (paragraph 2.36-39).

Recommendation 11.14. ...nothing must be done to deter people from visiting their GP promptly, or from taking their medicine when necessary. But there is evidence (paragraphs 2.40-45) that unnecessary antibiotics not only have public health consequences, but also increase the risk to the individual patient that any subsequent infection will involve a more resistant strain.... The Government and the Health Authorities should present this evidence to the public.

The Government accepts the need, as also recommended by the Standing Medical Advisory Committee (SMAC), for a public information campaign to complement a multi-professional educational campaign. The two must run alongside each other and give the same messages: the SMAC report suggested a Campaign on Antibiotic Treatment in primary care (CAT, see 11.12 above) complemented by a National Advice to the Public (NAP) campaign. The Department of Health plans such a campaign, with a probable launch in the Spring of 1999. The Department agrees that targeting parents and carers of young children will be important and that one conduit for messages on this subject is women's magazines that are likely to be read by mothers with young children. The campaign needs to be carefully planned to ensure that members of the public do not delay seeking their GPs' advice on any concerns they might have so that serious conditions - for example, suspected meningitis - are not missed or exacerbated. The Government fully agrees that the campaign's messages must not put people off taking antibiotics or completing the course when they are necessary. The key messages are being discussed further but are likely to be along the lines of:

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- antibiotics used properly are a useful and important treatment for **certain** conditions;
 - antibiotics are not magic bullets for every infection - they are a valuable commodity which must be used judiciously;
 - taking them unnecessarily does no good and puts their long term usefulness at risk;
 - do not expect antibiotics for trivial infections;
 - your GP knows when to prescribe them;
 - if you are prescribed antibiotics you should take them as prescribed and finish the course;
 - the benefits of preserving the normal bacterial flora in the gut and on the skin.

For some low grade illnesses the public could be advised to visit their pharmacist in the first instance.

Some Health Authorities already have, or have had, such campaigns (for example, posters) and have issued advice leaflets to GPs' surgeries. The expansion and development of "NHS Direct", which provides 24 hour telephone advice, will be another source of help. "NHS Direct" offers clinical advice to support self-care and appropriate self-referral to NHS services, as well as access to more general advice and information, such as that provided by the Health Information Service. The first wave of "NHS Direct" pilot sites have been running since March 1998; the second wave will be set up between January and April 1999 by when about 40 per cent of the country will be covered in total.

While the message of prudent use needs to be taken out to the public at large, rather than waiting until the patient is in the surgery, an information leaflet which GPs can give to patients when discussing whether an antibiotic is indicated will be produced as part of the campaign. These should assist GPs in managing cases and help patients accept an alternative to antibiotic treatment in cases where they are not indicated.

Additional strategies, such as shared patient information delivered by computer-based decision support systems such as PRODIGY, are being developed and assessed. PRODIGY aims to involve the patient as well as supporting the GP in decision-making. (PRODIGY is described in more detail in the response to recommendation 11.12 above.)

The Chief Nursing Officer has recently completed consultation on the development of a new strategy for nursing, midwifery and health visiting which will be launched in the New Year. This strategy points to the potential for developing the future role of nurses, midwives and health visitors in advising, educating and supporting patients and clients in the appropriate use of antibiotics and other antimicrobial agents.

The Government will consider whether there will be opportunities to use the “Healthy Schools Initiative” between the Department of Health and the Department for Education and Employment, to promote understanding of these issues among the whole school community.

Recommendation 11.15. The NHS should work with the relevant professional bodies to see that courses of antibiotics are defined according to the best available current information (paragraphs 2.46-47).

The Government accepts that optimal regimens for antimicrobial therapy need to be better defined. The Joint Formulary Committee, under whose authority the British National Formulary (BNF) is published, recently reviewed the available evidence on dosing and duration and, in the absence of research evidence, could add little additional advice to that already provided. The Government intends to fund further research to define optimum dosing and duration for antimicrobial therapy and will consider the place for further clinical guidelines and guidance on how best to monitor implementation. It is also giving careful consideration to the issues of dose and duration, as well as to when antibiotics should be used and appropriate antibiotic choice, as part of the development of the PRODIGY guidelines. In the future, the National Institute for Clinical Excellence (NICE) will be charged with producing robust clinical guidance (including clinical guidelines). The Scottish Intercollegiate Guidelines Network (SIGN), applies strict evidence-based criteria to development of their guidelines. In the near future, the Scottish Health Technology Assessment Centre (SHTAC) will be established to carry out health technology assessments. SHTAC and SIGN will undertake in Scotland similar functions to those of NICE in respect of guidelines and health technology assessments. In Northern Ireland, the Clinical Resource Efficiency Support Team (CREST) has responsibility for development of clinical guidelines.

The Medical Research Council (MRC) is giving the general area of antimicrobial resistance priority in its future work programme (see also the response to recommendation 11.48).

Recommendation 11.16. We welcome the news that new TB guidelines from the Department of Health are to recommend more rapid diagnostic tests, and more stringent infection control, in cases of suspected MDR-TB; the Department must find the necessary resources.

The development of more rapid diagnostic and drug susceptibility tests for tuberculosis has been highly important in the management of drug-resistant tuberculosis. Rationalising the use of both rapid diagnostic tests and isolation facilities, as recommended in the new guidance from the Interdepartmental Working Group on Tuberculosis⁶, referred to by the Select Committee, is likely to lead to the most cost-effective use of resources. The costs involved in following good practice guidelines on the management of tuberculosis need to be viewed against the gains in reducing the number and length of hospital admissions, preventing the emergence of further (more expensive to treat) drug resistances and avoiding outbreaks.

Recommendation 11.17. ...we have heard much about the lack of data on antimicrobial use in hospitals (paragraphs 10.4-7). We draw this to the attention of those responsible for the NHS Information Technology Strategy.all hospitals should install computer systems for patient-specific prescribing information at ward level.

The Government accepts that hospital pharmacy computer systems have developed largely to meet local needs. They are currently designed primarily to record medicines dispensed by the pharmacy as a means of monitoring drug expenditure, although the data are also used to inform local antimicrobial prescribing policies.

Many hospitals are planning to introduce ward level computerised prescribing systems. Such systems, already operating successfully in a handful of hospitals, enable the physician to prescribe directly through the computer. The systems employ some form of decision-support for doctors, give computerised information on medicines ordered or used, and generate and record prescriptions. Bringing together these data with information on the hospital pharmacy supply and the administration of drugs will provide an audit trail for medicines used in hospitals. The use of shared information screens will enable patients to be involved in decisions on prescribing. Whilst more practical in the out-patient setting, this would also be feasible for in-patients, through the use of suitable portable technology.

⁶ Interdepartmental Working Group on Tuberculosis. UK guidance on prevention of the transmission of 1) HIV-related and 2) Drug-resistant, including multiple drug-resistant, tuberculosis. London: Department of Health, 1998.

The new health information strategy “*Information for Health - An information strategy for the modern NHS 1998-2005*” will ensure that the relevant issues are addressed in a systematic way. With funding of £1 billion over the next 7 years, the strategy provides for 35 per cent of NHS Trusts to have installed electronic patient record systems (including the reporting of results and prescribing) by 2002, and all NHS Trusts by 2005. The Information Technology (IT) strategy for the NHS in Scotland (NHSiS) will give the potential for significant improvements in the collation and transmission of information about disease in individuals and populations principally through the networks (already largely installed) linking GP surgeries with hospitals and other parts of the NHSiS; the integration of existing and new IT systems between the different parts of the NHSiS; and the development of a single lifelong health record for each individual. The Welsh Information Management and Technology strategy is to be published in the next few months.

Drug therapy will form an important part of the electronic patient record. Compatibility of record keeping across primary and secondary care will be pursued so that once the necessary electronic data interchange can be achieved it will be possible to collect integrated antimicrobial prescribing data. Such data would not only help to inform local and national prescribing strategies, but if linked with surveillance data on resistance, would also increase the potential to monitor the effectiveness of interventions aimed at controlling resistance through reduced and appropriate prescribing.

An Information and Communications Technologies research initiative is being established to optimise the benefits of the new information strategy. Research on the use of decision support systems to improve patient-specific prescribing information at ward level was invited in an open competitive call for research, published on 25 September 1998.

Prudent use in animals

Recommendation 11.18. The evidence we have heard (paragraphs 3.7-13) strongly suggests that **there is a continuing threat to human health from imprudent use of antibiotics in animals.**

The Government set up an investigation into microbial resistance in relation to the food chain which is being carried out by a working group of the Government’s Advisory Committee on the Microbiological Safety of Food (ACMSF). The working group is expected to report to ACMSF before the end of the year and the Committee will offer advice to the Government on a range of issues concerning the responsible use of antimicrobials as veterinary medicines and growth promoters. The Veterinary Products Committee (VPC) held an open meeting in June and has submitted its advice to the Government.

The industry is playing its part in encouraging responsible use of antimicrobials in animals. A Code of Practice, developed by the British Veterinary Association, is intended to help guide the profession on the treatment of individual species, including approaches to treatment and the selection and administration of antimicrobials. The National Farmers' Union is looking to develop a Code of Practice with the aim of reducing the amount of antimicrobial usage in farming, including use for growth promotion. Both the ACMSF and the VPC are likely to make recommendations on the need for such codes of practice, and these may include the requirements of such codes and the development of formularies by individual veterinary practices.

Recommendation 11.20. On the evidence before us (paragraphs 3.20-24), we recommend that **antibiotic growth promoters such as virginiamycin, which belong to classes of antimicrobial agent used (or proposed to be used) in man and are therefore most likely to contribute to resistance in human medicine, should be phased out, preferably by voluntary agreement between the professions and industries concerned, but by legislation if necessary.**

The Government agrees that the principles of the Swann⁷ report remain valid and will work through EU regulatory procedures to secure the withdrawal of antimicrobial growth promoters which may impair the efficacy of prescribed therapeutic antibiotics used in human medicine through the development of resistant strains of organisms.

The Chairman of the working group of the ACMSF gave advanced notice of recommendations that antimicrobial growth promoters should be split into two categories: those where there was a medical equivalent antimicrobial in current or planned use; and those where there is currently no medical equivalent or where medical use is rare. The Chairman recommended that antimicrobials in the former category - virginiamycin, spiramycin and tylosin phosphate - should be phased out as growth promoters at the earliest opportunity. In addition, the Chairman recommended that the use of other growth promoters should be kept under close review and if medical equivalents were being developed their use as growth promoters should be phased out. The Chairman's letter also indicated particular concern about possible developments in the use of avilamycin and bacitracin zinc for clinical use, and that no new growth promoters should be developed which utilise substances that have possible application in human clinical treatment. The advice from the VPC supports this view and recommends the phasing out of bacitracin zinc as well as the three antimicrobial growth promoters specified by the ACMSF. The Medicines Commission has also offered advice in support of this approach.

⁷ "Joint Committee on the use of Antibiotics in Animal Husbandry and Veterinary Medicine." Cmnd 4190 HMSO: London 1969.

Regulatory action to phase out the use of antimicrobial growth promoters rests with the EU Commission, which originally proposed a ban on the use of bacitracin zinc, virginiamycin, spiramycin and tylosin phosphate with effect from 1 January 1999 with a subsequent three month period to clear stocks from the supply chain. The Government is in favour of the phased withdrawal of the four growth promoters identified in the proposal. However, in accordance with advice from the Swedish Government on their own experience of banning growth promoters in 1986, UK representatives in Brussels argued for a rather longer period to phase in the ban in order to avoid any unnecessary increase in the use of antimicrobial veterinary medicines which would be needed to deal with health and welfare problems likely to arise from too abrupt a withdrawal of antimicrobial growth promoters. Commission officials accepted these arguments and submitted a revised proposal to the Standing Committee on Animal Nutrition on 2 December 1998. The revised text allows member states to permit the use of the four antimicrobial growth promoters until 30 June 1999, at which point they should be clear of the animal feed chain (ie stocks of the additives, premixes and compound feeds containing the additives should have been used up). The UK supported this proposal but it did not command a qualified majority in the Standing Committee because of the abstention or opposition of other member states. The proposal was agreed by qualified majority in the Council of Agriculture Ministers on 14 December. The Commission and the Council confirmed the importance of acting on the basis of scientific advice, having regard to the need to take a precautionary approach on the issue of antibiotic resistance. The Council has asked the Commission to examine how to ensure that third countries comply with rules for additives in animal feeding stuffs - in particular antibiotics - which are at least equivalent to those laid down at Community level.

Recommendation 11.21. Potent agents important for human medicine, such as the fluoroquinolones, deserve extreme economy of use in veterinary practice (paragraphs 3.15-19, 25-26). It is right for large animals and companion animals to receive such agents on an individual basis for short-term therapy; but mass-treatment of herds of pigs and flocks of poultry with such agents cannot be best practice from the point of view of human public health. **The veterinary profession must address this problem, by introducing rapidly a Code of Practice on when such compounds should be prescribed ... and how; we recommend self-regulation in preference to legislation.**

The Government will encourage the development of guidelines for each species (as recommended by the British Veterinary Association), which will help to ensure the responsible use of fluoroquinolones and other potent agents important for human medicine. The Government welcomes the National Office of Animal Health's (NOAH) industry statement on the responsible use of fluoroquinolones as veterinary medicines.

The Medicines Commission has advised Ministers that marketing authorisations for existing antimicrobial veterinary medicines should be critically assessed by the Veterinary Medicines

Directorate (VMD) at the time of renewal to ensure that “Data Sheets Summaries of Product Characteristics” fully reflect appropriate clinical practice. The Government accepts this advice and has asked the VMD to proceed with this review.

The Veterinary Products Committee has recommended that, in the authorisation process for therapeutic antimicrobials, the development of optimised dosing rates and strategies should be based on recent advances in pharmacokinetic and pharmacodynamic data. For currently authorised antimicrobials, where necessary, new dose rates and strategies should be developed. The Government has asked the VMD to implement these recommendations.

Recommendation 11.22. Surveillance of resistance patterns in animals is very limited (paragraph 3.12). **We draw this to the attention of MAFF, and of the new Food Standards Agency,** since the Minister told us that it will have surveillance as an “important function”.

The Ministry of Agriculture, Fisheries and Food (MAFF) is committed to improve the collection and reporting of data on antimicrobial resistance of a number of pathogens of livestock and further surveillance work is under consideration.

The Government recognises that surveillance of resistance patterns in animals is currently limited. Recommendations made by the Copenhagen Conference on “*The Microbial Threat*” emphasised the importance of co-ordinated surveillance of humans and animals throughout Europe in order to monitor patterns of resistance.

This year MAFF is planning to start surveillance of foodborne pathogens, including their antibiotic resistance, in cattle, sheep and pigs at the point of harvesting for human consumption, at abattoirs. It is intended that this should be an ongoing programme covering all livestock species. MAFF has, for a number of years, collated published information on antimicrobial sensitivity of salmonella isolated from livestock and reported under the Zoonoses Order 1989⁸. This is now to be extended to other livestock pathogens isolated by MAFF laboratories.

MAFF will work in cooperation with the Department of Health to co-ordinate surveillance programmes. The White Paper “*The Food Standards Agency - A Force for Change*” proposed that a cross Departmental Committee be formed to co-ordinate surveillance programmes. This body is likely to include representatives of the Agency, Agriculture Departments and other interested bodies such as the Public Health Laboratory Service.

⁸ The Zoonoses Order 1989, (SI 285)

The Government is also conscious of the need to improve the quality of information on patterns of use of antimicrobial compounds as veterinary medicines and as growth promoters. Bids to conduct a survey to establish a “baseline” against which trends in such use of antimicrobials can be measured are being considered as part of the MAFF research and development programme.

Recommendation 11.23. Departmental and Agency boundaries must not be allowed to prevent the Government from getting a grip on the whole of this issue, in the interests of public health. A single multi-disciplinary Government committee to oversee all aspects of antibiotic use should now be set up, as originally recommended by the Swann Report (paragraph 3.31).

While controlling the use of antimicrobials impinges on many interests, the Government’s prime concern in this issue is the protection of public health. The Government agrees, and is rigorously pursuing, a policy to achieve integrated working across Government Departments and their agencies. This policy includes the Joint Food Safety and Standards Group prior to the formal establishment of the new Food Standards Agency. The Government has established a multidisciplinary interdepartmental steering group to develop the wider Government strategy and to steer and co-ordinate activity in this area. The work of this steering group builds on existing work and the recommendations of the Select Committee and the Standing Medical Advisory Committee’s reports and will be further informed by an independent expert advisory committee which will provide advice on scientific aspects of antimicrobial use. Terms of reference and membership of the expert committee will be announced shortly.

Recommendation 11.24. We draw to MAFF’s attention the evidence of Dr Coles (paragraphs 3.36-41), which suggests that resistance in worms and scab pose a serious and imminent threat to the British sheep farming industry.

The Agriculture Departments regularly consider all needs for research and surveillance funding and are aware of the views of Dr Coles. Officials met Dr Coles in September 1997 and invited him to develop his views on surveillance and research needs. The Chief Veterinary Officer invited him again to meet officials. The industry also has a responsibility to fund research important to its future economic position.

Infection control

Recommendation 11.26. ...purchasers and commissioning agencies should put infection control and basic hygiene where they belong, at the heart of good hospital management and practice, and should redirect resources accordingly. The evidence of the cost of hospital-acquired infection (paragraphs 4.30-34) suggests that **such a policy will pay for itself quite quickly.** In particular, **the NHS Executive should assure themselves that every NHS hospital is covered by a properly trained infection control team as recommended in the Cooke Report.**

Prevention and control of communicable diseases is a key public health responsibility of district Health Authorities.

The NHS Executive agrees that hospital infection control and hygiene are core management responsibilities: it emphasised this when it issued the Cooke report⁹ to the NHS in 1995 and has repeatedly underscored this message since. Last year, in reminding Health Authorities and NHS Trusts of their responsibilities in this area, the NHS Executive specifically referred to existing guidelines. The Government's national priorities for health and social services for the next three years, for local action by Health Authorities, NHS Trusts and Primary Care Groups (PCG), are set out in the recently published "*National Priorities Guidance (NPG) for 1999/00-2001/02*" This states that "Health Authorities need to meet their obligations to ensure continuing and effective protection of the public's health with particular regard to the prevention and control of: hospital infection; communicable disease; antibiotic resistance and the health effects of environmental and chemical hazards". The importance of this responsibility has been further highlighted by the Regional Directors of the NHS Executive in the roll out of the NPG (1999/00-2001/02) in their regions. The NPG supports and complements the current (1998/99) NHS Priorities and Planning Guidance which makes it clear that Health Authorities must satisfy themselves that appropriate arrangements are in place for communicable disease control. Progress will be monitored through the performance management process.

The Cooke report places the responsibility for ensuring the provision of effective infection control arrangements in hospitals on the hospital Chief Executive. It also sets out the requirements for infection control teams. All hospitals should have an Infection Control Team (ICT) which has primary responsibility for, and reports to the Chief Executive, on all aspects of surveillance, prevention and control of infection. The ICT includes an Infection Control Doctor (usually a medical

⁹ "*Hospital Infection Control: Guidance on the control of infection in hospitals.*" Prepared by the Hospital Infection Working Group of the Department of Health and the Public Health Laboratory Service. March 1995.

microbiologist) and Infection Control Nurses, who have specialist training and expertise in this field. The report emphasises the key role members of the ICT have in educating staff on how to prevent and control infection effectively. An important aspect of education is effective hand washing, although the difficulties in achieving this are well recognised. The Department of Health (DH) is about to issue fresh guidance on this to the NHS.

ICTs also have a role in monitoring standards of hospital hygiene including the relevant aspects of the frequency and quality of cleaning. The arrangements for hospital infection control recommended in the Cooke report operate in conjunction with, and are supported by, the Health Authority's Consultant in Communicable Disease Control, who works with the hospital ICT and Health Authority and local authority managers to control infection. In Scotland, an equivalent document to the Cooke report, the "*Scottish Infection Manual*", has recently been issued to the NHSiS under cover of a CMO (Scotland) letter¹⁰. In 1997, the Cooke Report was issued to the Health and Personal Social Services in Northern Ireland through the Clinical Resource Efficiency Support Team (CREST) system.

In 1997, the NHS Executive commissioned Regional Epidemiologists to examine communicable disease control arrangements at local (Health Authority) level throughout England. The survey identified a number of shortcomings. An action plan was produced for the NHS and endorsed by the NHS Executive Board (including Regional Directors) to ensure that measures were taken to address these. There has been a clear commitment from senior managers in Health Authorities to improve arrangements and significant improvements have been achieved across the NHS: these include an increase in the number of consultants in communicable disease control and infection control nurses, development of performance standards, introduction of electronic surveillance systems and improved joint working arrangements between communicable disease control teams.

The NHS Executive has now commissioned the Regional Epidemiologists to examine hospital infection control arrangements in all acute hospital Trusts. This examination is running alongside a study of hospital acquired infection being carried out by the National Audit Office. Both studies are expected to report in the first half of next year and the NHS Executive will use the findings to ensure that the NHS makes changes where necessary, monitored through performance management arrangements.

In addition to managerial commitment to ensuring infection control arrangements are in place, and roles and responsibilities clear, the Government is committed to real improvements in the quality of clinical care. "*The New NHS Modern Dependable*"¹¹ White Paper published in December 1997 sets out the Government's intention to introduce a new requirement of clinical governance in the NHS.

¹⁰ Scottish Office Department of Health. SODH/CMO (98) 22

¹¹ *The New NHS: Modern Dependable*, Cm 3807 Stationery Office: London 1997

Clinical governance will, for the first time, require NHS organisations to develop a single coherent programme for assuring and improving clinical quality. Infection control is at the heart of the quality of clinical care provided by hospitals. The routine application of evidence-based practice - including guidance from the National Institute for Clinical Excellence (NICE) - will be a key component of local clinical governance arrangements.

In February 1998, DH commissioned the production of evidence-based multi-professional guidelines on the general principles for preventing hospital acquired infections. The guidelines will contain many elements of clinical practice that are essential in preventing the spread of hospital acquired infections, including multi-drug resistant organisms, and will be completed in March 2000.

More broadly, the Health Departments have issued guidance on the prevention of infection in conjunction with the Health and Safety Executive (HSE) and agencies such as the Medical Devices Agency, with assistance from Government Advisory Committees such as the Advisory Committee on Dangerous Pathogens and Health Services Advisory Committee on subjects ranging from the control of clinical waste, tuberculosis, Legionnaires' disease and viral haemorrhagic fevers, to the sterilisation, disinfection and cleaning of medical equipment, and the safety of staff in post-mortem rooms and laboratories.

Adequate infection control arrangements are required under health and safety legislation. Infection control teams must take account of this legislation and guidance in policy formulation and implementation (eg Control of Substances Hazardous to Health Regulations 1994 and Management of Health and Safety at Work Regulations 1992) in order to protect the health and safety of employees and others who may be affected by work activities (such as patients and members of the public). HSE Inspectors consider arrangements for infection control as part of their normal preventative inspection of health and safety management in hospitals. Other issues relating to infection control may also be considered during normal preventative inspections or investigations. More intensive use of hospital beds requires particular attention to be paid to infection control and cleaning arrangements. Changes in the organisation of clinical care such as increased use of surgical day care facilities can reduce the risk of fit surgical patients acquiring infection from longer stay patients. Admission Assessment Units, leading to swifter allocation of patients to appropriate wards, can also reduce risks of acquired infection.

Recommendation 11.27. While we do not go so far as to recommend a national task force against MRSA, we found what the Department of Health had to say on this subject complacent (paragraphs 4.35-37). **We recommend that the NHS should set itself targets for controlling MRSA in hospitals, and publish its achievements.**

The Government agrees that performance indicators and/or targets on hospital infection control, including methicillin resistant *Staphylococcus aureus* (MRSA), need to be introduced. Development of robust indicators is in progress. In November 1998, the Department of Health held a seminar on standards and target setting for hospital infection control including MRSA. The practical suggestions which resulted, for standards against which targets and/or performance indicators could be set, cover a wide range of activities which contribute to effective infection control. Working with the NHS and the Public Health Laboratory Service (PHLS), these standards will be used as the basis of targets and indicators.

The Government acknowledges that there are complexities in achieving real, rather than presentational, improvements in hospital infection control. For example, if targets on MRSA were based solely on numbers of isolates, they could have the perverse effect of discouraging active ascertainment of cases and carriers. The Government will therefore also be looking at ways to target resources, facilities, activities and policies at improving overall infection control which will nonetheless contribute to preventing the emergence and spread of MRSA. These might include setting national topics within which local targets (agreed with individual hospitals) could be set and monitored as part of the performance management process.

A key prerequisite to enabling hospitals to target their infection control measures better will be to improve the quality and clinical relevance of data on the epidemiology of hospital acquired infection and MRSA. DH is exploring with the PHLS ways to improve its system of MRSA surveillance, in particular, how its data on the number of MRSA isolates (derived from voluntary and confidential reporting by hospitals) can be related to data on clinical cases of MRSA infection and compared with equivalent data on drug-sensitive strains of *Staphylococcus aureus*. Two NHS Regions (North Thames, and Oxford and Anglian) are piloting systems for enhanced surveillance. Further data will also flow following implementation of the PHLS' new overall surveillance strategy for antimicrobial resistance.

The Scottish Office Department of Health has set up a working group to examine the feasibility of establishing a national framework for hospital acquired infection surveillance. The Group, which will report in the near future, has looked closely at activities in the area of hospital acquired infection surveillance in the rest of the UK. It will recommend that any Scottish framework should take account of developments elsewhere in the UK to allow for direct comparison of data wherever possible. In Northern Ireland, a working party is currently examining aspects of control of MRSA

including proposals for regional surveillance of this organism. The remit of the regional epidemiological service which is to be established (see the response to recommendation 11.34) will cover surveillance of organisms resistant to antimicrobial agents, including MRSA.

Recommendation 11.28. ...once the current revision of the Public Health (Control of Disease) Act 1984 is concluded, ...**the NHS should draw up national standards and guidelines for community infection control management** (paragraph 4.20-25), along the lines of the Cooke Report for hospitals. **These should include a requirement that every district Health Authority should have at least one community infection control nurse.** Such an exercise might also usefully include the special factors affecting prisons (paragraph 4.29).

The Government agrees that there is a need for national guidelines and standards for community infection control management. The Department of Health (DH) will take the lead in ensuring these are developed and will work in partnership with the NHS and others. DH issued guidance produced jointly with the Public Health Medicine Environmental Group (PHMEG) on the control of infection in residential homes, in 1996¹².

The Government recognises the essential role of Community Infection Control Nurses (CICN) as members of the Health Authority's communicable disease control team and is committed to support a review of this role and their functions commencing in 1999.

The 1997 Regional Epidemiologists' survey of local communicable disease control arrangements (see response to recommendation 11.26) showed variations both in the composition of local communicable disease control teams - some had no CICN, others had more than one - and in the pattern of the nurses' employment - some were employed directly by the Health Authority (in its Public Health Department) and others by NHS Trusts but working with the team. As part of the action plan developed in response to that survey, Health Authorities have strengthened or are strengthening their Infection Control Teams where needed. As a result, nearly all now have an Infection Control Nurse (ICN) in post, are in the process of recruiting a nurse or have access to the services of an ICN.

The Chief Medical Officer's Project to Strengthen the Public Health Function which was set up in June 1997 is giving careful and detailed consideration to the current and future capacity required to deliver all aspects of public health, including infection control. An interim report was published as a consultation document in February 1998 and distributed widely in the NHS; the final report is expected in 1999.

¹² Department of Health and the Public Health Medicine Environmental Group. Guidelines on the control of infection in residential and nursing homes. Department of Health, 1996.

The decision to exempt public health professionals (including consultants in communicable disease control and infection control nurses) from the definition of Health Authority costs has provided a substantial impetus for improving arrangements for communicable disease and infection control. This will effectively increase the flexibility with which funds can be used by Health Authorities to strengthen such arrangements.

Recommendation 11.29. We draw to the attention of those responsible for the Review of the Public Health (Control of Disease) Act 1984 Dr Mayon-White's evidence (paragraph 4.26) as to shortcomings of the provisions for compulsory medical examination and detention in hospital, and the case for a more humane regime, and for extending the legislation to provide also for supervised treatment at home.

The Government fully agrees that any regime for compulsory medical examination and detention in hospital should be humane. The Government notes Dr Mayon-White's evidence to the Committee and that alternative provision should be made for supervised treatment at home (or at some other suitable location) where hospital admission is not clinically necessary, and will take these issues forward in its ongoing work of reviewing the Public Health (Control of Disease) Act 1984.

Surveillance

Recommendation 11.31. We recommend that the NHS R&D Directorate should support microbiological surveillance among the population at large, with a view to improving denominator information, as a legitimate call on the NHS R&D Budget.... The MRC and the medical charities should also be prepared to support such work (paragraphs 10.9-10).

The Government agrees about the importance of microbiological - and disease - surveillance among the population at large to monitor the prevalence and impact of antimicrobial resistance. Some of this work forms part of the Public Health Laboratory Service's antimicrobial resistance surveillance programme using representative sentinel centres across the country. This routine surveillance needs to be supplemented by research in support of surveillance systems and to answer hypotheses generated from the routine data. These issues will be considered in planning priorities for research in the NHS Research & Development programme and by the Medical Research Council (see response to recommendation 11.48/49).

Recommendation 11.32. It is astonishing that the Departmental subvention for the PHLS is falling (paragraph 5.14), at a time when surveillance of infectious disease and particularly resistant disease has become so important. The Department of Health must reconsider these cuts.

The Department of Health (DH) is this year providing £55.92 million to the Public Health Laboratory Service (PHLS) to fulfil its function in protecting the public from communicable diseases. PHLS is responsible for allocating its resources to priority communicable diseases, including the growing problems of antibiotic resistance, and has accordingly reallocated existing resources to work on antibiotic resistance surveillance. DH will be discussing the longer term funding of the PHLS with that body when they have completed the strategic review which they are currently undertaking. In order to give the PHLS time to undertake the review, present its conclusions to Ministers and agree implementation, £2.3m in additional resources will be made available to the PHLS on a one-off basis in 1999/2000.

Recommendation 11.33. We draw to the attention of those responsible for the review of the notification provisions of the Public Health (Control of Disease) Act 1984 the proposals of our witnesses (paragraphs 5.2-6) for reporting of diseases by causative organism, and for mandatory reporting of certain resistances. Any increase in the burden of reporting placed on hospital laboratories will have resource implications which the NHS must face; and it must be matched by an improvement in the level of feedback from the PHLS.

The Government fully appreciates how the current system of surveillance - founded principally on the clinical reporting by GPs required under the Public Health (Control of Disease) Act 1984 - would be enhanced by a statutory scheme of reporting by laboratories. The Government is therefore looking to take powers at the earliest opportunity that Parliamentary time permits to enable such a scheme to be introduced. “*Information for Health - An Information Strategy for the Modern NHS 1998-2005*” will further increase the effectiveness of laboratory reporting, firstly by integrating laboratory and hospital information systems and, secondly by enabling them to communicate directly with the Health Authority’s Consultant in Communicable Disease Control, the Public Health Laboratory Service and GPs, via the NHSnet.

Recommendation 11.34. We recommend that Health Ministers assure themselves that liaison between the PHLS and its analogues in Scotland (especially in the context of impending Devolution) and Northern Ireland is as close as possible (paragraphs 5.7-9). **In particular, Ministers should set a deadline for full compatibility of definitions and data-collection.**

There is on-going and continuously-developing collaboration between the Public Health Laboratory Service (PHLS) and its analogues in Scotland and Northern Ireland on a wide range of issues. These include priority setting for communicable diseases, membership of advisory committees and peer review groups for research, training, and the production of annual surveillance reports. A key aim, which the surveillance centres and reference laboratories are working actively towards, is the development of mutually compatible data sets to create a UK picture. An important step along this pathway was the recent award by the Department of Health and Social Services (Northern Ireland) to PHLS of its contract for a regional epidemiology service for Northern Ireland. This service will be implemented shortly, and because it will be comparable to the service PHLS provides to the NHS Executive, will help to ensure compatibility of data.

The PHLS is working closely with colleagues in Scotland and Northern Ireland in developing antibiotic resistance surveillance. A technical co-ordination group includes representatives from Scotland and Northern Ireland as well as from the Department of Health.

Recommendation 11.35. We draw to the attention of those responsible for the NHS Information Technology Strategy the scope for IT to facilitate surveillance of disease and resistance (paragraph 5.10).

The Government notes this recommendation. The primary objectives of “*Information for Health - An Information Strategy for the Modern NHS 1998-2005*” are to enhance the day to day work of clinicians and to enable clinical information to be used for secondary purposes such as epidemiological analyses of the patterns of disease and resistance.

The Government fully supports the view that information technology has much more to contribute to supporting the processes and management of health care than it currently does. The potential is vast and still largely untapped. “*Information for Health*” is designed to harness this potential. Over its seven year implementation period, £1 billion will be invested in a range of modern innovations - including electronic patient records, electronic data interchange and electronic prescribing - that will facilitate and greatly enhance the surveillance of infectious diseases and resistance. (See also the response to recommendations 11.17 and 11.51).

Recommendation 11.36. We recommend that the NHS should examine the ICARE Project run by the US Centres for Communicable Disease Control and Prevention (CDC), and consider the possibility of setting up something similar, possibly in partnership with CDC (paragraphs 5.11-13)

The Government accepts this recommendation in principle.

There is some comparability between the Intensive Care Antimicrobial Resistance Epidemiology (ICARE) project in the United States and the Nosocomial Infection National Surveillance Scheme (NINSS) in the UK. ICARE is an enhanced surveillance project in intensive care units which links data on cases of illness with data on resistance patterns and prescribing of antimicrobial drugs. NINSS is more recently established and, whilst it has so far focused on the surveillance of particular types of hospital acquired infection (for example, blood stream infections and surgical site infections), it is planning the development of a surveillance module for intensive care units. It is expected that this module will be capable of incorporating prescribing data, in addition to data on the causative organisms of infection and their resistance patterns. If successful, this linkage will be developed and incorporated into the other NINSS modules.

The Department of Health (DH) and the Public Health Laboratory Service (which runs the NINSS project under a specific contract with DH) are giving active consideration to whether other aspects of the ICARE project might be further incorporated into the NINSS programme and/or the antibiotic resistance surveillance programme.

Recommendation 11.37. We commend the efforts of the BSAC and the PHLS to put resistance surveillance on a more strategic and comprehensive footing (paragraphs 5.18-22). **The Government must engage constructively with those involved, and find additional resources.** Surveillance depends on many microbiological laboratories in the NHS and the medical schools, as well those which are part of the PHLS, and we have received evidence that these are generally understaffed; **we recommend that NHS Trusts and universities should examine their priorities in this area.**

The Department of Health (DH) supports the Public Health Laboratory Service (PHLS) plan to develop a new five year antimicrobial resistance programme, which will provide a broad-based approach to measuring antibiotic resistance. DH is represented on the scientific advisory committee which oversees this work and on a joint PHLS/British Society for Antimicrobial Chemotherapy technical working group. The programme will include a range of activities from whole population surveillance, through sentinel laboratory monitoring and special studies, to detailed investigation and molecular characterisation of emerging strains. The PHLS has designated antimicrobial resistance a priority programme, established a new Antimicrobial

Susceptibility Surveillance Unit in Nottingham and reallocated resources to support this work. The PHLS is also fostering links with the World Health Organisation (WHO) and with European initiatives.

In order to obtain the widest view of the information needs from surveillance in this field, DH held a seminar in July 1998, to which it invited public health physicians, microbiologists, infection control nurses, clinicians from primary and secondary care, academics and representation from WHO. The report of this meeting will be used to inform discussion on future surveillance and research required to address the needs of clinicians and public health professionals locally and nationally.

DH appreciates the need for NHS laboratories to contribute fully to, and to recognise the integral role of the PHLS in, the public health function. It is taking forward work, which it is intended will culminate in guidance to the NHS to increase understanding of the significance of NHS laboratories' contribution to public health microbiology. In Northern Ireland, in response to the Review of Communicable Disease Control, the Department of Health and Social Services will be reviewing the arrangements in place to ensure the continuing provision of a high quality public health microbiology service for the Province.

Recommendation 11.38. We are concerned at the evidence (paragraphs 5.15-17) that clinical academic microbiology, which provides much of the expertise for surveillance, and for infectious disease medicine generally, is currently failing to attract recruits and fill senior posts. The problem is widely acknowledged; **it must be addressed by the NHS, the Higher Education Funding Councils and the heads of medical schools.** This may be a special case of a more general problem concerning the pressures placed on clinical academic medicine by the conflicting demands of the Research Assessment Exercise and the ever-growing burden of teaching, service provision and administration; **we have expressed concern about this before, and we do so again.**

The Government fully recognises the importance of academic and research medicine and has taken steps to strengthen the partnership between the universities and the NHS and to address the concerns of clinical academic staff. The Academic and Research sub-group of the Department of Health's Advisory Group on Medical Education and Staffing provides a forum for the academic and research community to discuss matters of mutual concern with DH officials. The sub-group is aiming to identify where there may be particular problems so that appropriate action can be taken. DH and the Higher Education Funding Council for England have also established a joint task group to examine the links between research, teaching and patient care and to consider the practical steps universities and NHS employers might take locally to reconcile the competing pressures on clinical academics.

The Government shares the Committee's concern about the decline in academic medical microbiology posts in the UK and has brought this to the attention of the Committee of Vice-Chancellors and Principals of the Universities of the United Kingdom (CVCP). The CVCP has indicated that whilst it has limited scope at national level to influence particular specialties such as microbiology, the more general problem of the threat to clinical academic medicine identified by the Select Committee continues to engage its closest concern.

New drug development

Recommendation 11.40. We commend the EU proposal for an “orphan drug” regime (paragraph 6.6). **The Government should respond positively, and should seek to ensure that the scheme gives the pharmaceutical industry a real incentive to work on novel treatments for problem diseases, particularly diseases of the world's poor such as malaria....**

The Government welcomes the proposal from the European Commission (on 27 July 1998) for a Community procedure to designate orphan medicinal products and to introduce a scheme of incentives for bringing them to the market. Orphan medicines are medicines where the prospective market for a new drug is not sufficiently large and/or wealthy to cover the costs of research, development and production. The Government sees the proposal as a useful starting point for detailed negotiation. As noted in the Commission's proposal, the conditions for entry onto the incentive scheme will need to be robust and clearly defined so that resources can be focused on products for which there is a real clinical need but which otherwise would simply not come to the market. There are a number of points of detail in the current proposal which need to be examined carefully before we reach the stage where we can agree a common position with other Member States. The Government will contribute fully to the discussions during the negotiations between Member States on this proposal.

The Government supports the principle of encouraging the development of medicinal products to treat life-threatening or chronically debilitating diseases of low prevalence. The Medicines Control Agency (MCA) already has a procedure to enable market authorisations (product licenses) to be granted for medicines with a very small target population, even though the size of the population precludes the generation of the comprehensive data normally required for licensing purposes. The MCA charges a reduced fee for such applications. Whilst these present arrangements do not constitute an “orphan drugs” policy in the full sense proposed by the European Commission, they do for the moment - until the final European scheme is agreed - already meet part of the objectives of an orphan drugs programme.

Vaccines

Recommendation 11.41. We commend the establishment of the Edward Jenner Institute. The numerous agencies committed to research into effective vaccines must keep up the good work (Chapter 7).

The Government intends that the UK population has available at the earliest possible opportunity, safe and effective vaccines. To achieve this, we have a co-ordinated strategy from the level of fundamental science through to vaccine implementation. The Department of Health (DH) collaborated with the Medical Research Council and BBSRC¹³ in establishing a national framework for co-ordinating vaccine research. One of the greatest impacts of the current very exciting and rapid advances in immunology and biotechnology is likely to be on the development of new vaccines. Work done at the Edward Jenner Institute is of great importance in ensuring that this process starts on the best possible footing and leads to health benefits for the UK population.

DH has its own active portfolio of research aimed at enabling effective new vaccines against diseases with significant health burdens to be introduced as rapidly as possible. Candidate vaccines already identified are meningococcal, pneumococcal and rotavirus vaccines.

DH funded research at the Centre for Applied Microbiology and Research (CAMR) includes significant work on aspects of vaccine development, including the development of alternative vaccine therapies for tuberculosis, oral delivery technologies for both DNA and polysaccharide vaccines, and novel conjugate and protein vaccines for protection against meningococcal and pneumococcal diseases. CAMR is also involved in a tripartite Vaccine Assessment Programme (with the National Institute for Biological Standards and Control and the Public Health Laboratory Service), providing information for the accelerated introduction of new vaccines in the UK, and has recently been invited to become a member of the World Health Organisation Task Force for tuberculosis vaccine evaluation.

As part of the on-going research commissioning process at CAMR, a range of research proposals addressing various aspects of antibiotic resistance and vaccine development are currently being reviewed, including the development of novel strategies to combat infectious diseases and novel approaches to effective immunisation of the elderly.

¹³ BBSRC - Biotechnology and Biological Sciences Research Council

Viruses

Recommendation 11.42. As new antivirals reach the market (see Chapter 8), **the NHS must ensure that they are used prudently from the start, and that changes in susceptibility are monitored.**

The Government supports this recommendation. The National Institute for Clinical Excellence (NICE) (and, in Scotland, the Scottish Inter-collegiate Guidelines Network (SIGN) and the Scottish Health Technology Assessment Centre (SHTAC)) will consider, and authorise guidance on, these types of issue. Other routes by which doctors receive information on new and established products are described in the response to recommendation 11.12. These include publications such as the British National Formulary (BNF), Medicines Resources Centre (MeReC) Bulletin, Drug and Therapeutics Bulletin and Prescriber's Journal, which are issued to doctors free of charge. In Northern Ireland, a similar appraisal system is being developed through the Clinical Resource Efficiency Support Team (CREST) Drugs Sub-Committee.

The Department of Health has agreed to fund a three year project with the Public Health Laboratory Service Reference Laboratory for Antiviral Resistance (see the response to recommendation 11.43 below) to look at geographical and temporal differences in HIV drug resistance.

Recommendation 11.43. **We congratulate the PHLS on establishing the world's first reference laboratory for antiviral resistance, The PHLS must adequately resource the development of this important field.**

The antiviral susceptibility reference unit at Birmingham Public Health Laboratory/Birmingham University was established and is maintained out of the Department of Health's core funding to the Public Health Laboratory Service.

International

Recommendation 11.45. We commend the Government, and particularly the Department for International Development, for their exemplary support over recent years for the WHO Division for Emerging Diseases (paragraph 9.4) **This support should be maintained, and the United Kingdom Government's example should encourage other nations and agencies to contribute to this vital work. We endorse the resolution on this subject which is to be considered by the World Health Assembly in May; we urge the Assembly to pass it.**

The Government will continue to play its part in ensuring that the key issues are addressed internationally as well as at national and local levels.

The Government fully supported the resolution which was signed by the World Health Assembly in May 1998 and will be supporting the work of the World Health Organisation (WHO) in taking the resolution forward. A copy of the Resolution is attached at Annex C. The WHO Regional Committee for Europe subsequently endorsed in September 1998 a new policy framework for international cooperation which identifies the need to monitor changing antimicrobial resistance patterns.

In parallel, the European Commission, in its communication of April 1998 on the development of public health policy in the European Community, identified the growing problem of resistance to antibiotics as one of a number of new risks to health. Subsequently, the Commission's Scientific Steering Committee (see also the response to recommendation 11.11) set up a multi-disciplinary working group to examine all aspects related to the use of antimicrobials and the development of resistance. Its report is expected early in 1999. Separately, prompted by concerns voiced by the Chief Medical Officers of EU Member States, the Danish Ministries of Health and of Food, Agriculture and Fisheries organised a successful international conference in September this year on "*The Microbial Threat*". There was a strong UK contingent. The conference made a number of recommendations to the EU and Member States broadly in line with the action planned in the UK. Details of the recommendations are at Annex B.

The Government is determined to give constructive support to these international initiatives, taking a leading role, if required, to ensure effective systems for monitoring antimicrobial resistance are set up without delay. The UK is an active participant in a European Commission Directorate General V funded collaboration over surveillance of antimicrobial resistance across Europe, which also links in with World Health Organisation's (WHO) initiative in this area. The Government will press for surveillance to be given priority in WHO's next global and regional biennial work programmes and in the future framework for European Community action in the field of public health.

Recommendation 11.46. The United Kingdom has had a good record of support for malaria research, and for the efforts of the WHO to help poor countries to help combat this disease (paragraphs 9.6-15). **The Government and the grant-awarding bodies must maintain this record.**

The Department of Health fully supports the high priority the Medical Research Council gives to the very high standard of malaria research being carried out in the UK which is aimed at improved control of this disease.

Resources for research and data-collection

Recommendation 11.48. Research in this area evidently falls between a number of stools (paragraphs 10.15-20). **The grant-awarding bodies and the NHS Executive should reconsider the important public health issues surrounding antimicrobial research, and should give such research an enhanced priority.** As in the case of surveillance, **we particularly commend this as a suitable area of activity for the NHS R&D Strategy.**

Recommendation 11.49. We note that both the MRC and the Wellcome Trust report a shortage of high-quality research proposals in this area. **We challenge the research community to come forward with proposals which, given the increased interest in the field which is already apparent, will fully justify support from the grant-awarding bodies.**

The Department of Health (DH) fully recognises that there are important public health issues in antimicrobial research requiring further work. It is liaising closely with the Medical Research Council (MRC) to ensure that these are appropriately addressed through the MRC's own research programme, the NHS Research and Development Programme, and DH's Policy Research Programme.

DH formally referred the topic of antimicrobial resistance to the MRC in 1997 as a top priority research and development topic, under the provisions of its Concordat with the MRC. The MRC has responded positively and held a scientific Brainstorming meeting early in 1998 to consider how it might capitalise effectively on new research opportunities and exploit new avenues for working with industry to meet this major health need. Those attending included academic researchers, representatives from industry, the Health Departments and the Public Health Laboratory Service. The report of the meeting (available on the MRC's internet site) identified a number of potential

areas for research. The MRC's Strategy Development Group has considered the report and endorsed the view that research in this area should be afforded a high priority, and recognised the potential to develop more high quality work on antibiotic resistance in the UK.

The MRC and the responsive NHS Research and Development programmes are always willing to consider research proposals of high quality on this issue. The MRC is taking forward a number of suggestions from its Strategy Development Group on how research in this area might be further encouraged. DH and MRC continue to meet regularly to review and refine key policy research requirements.

Information technology

Recommendation 11.51. Information technology can play a major role in the fight against antimicrobial resistance, in three main areas: audit of antibiotic usage (see also 11.7 and 17), collection and analysis of disease surveillance data (paragraph 11.35), and linkage of the one with the other. The full benefits of IT in this area, as in others, will only be realised when every GP, every hospital ward and infection control team, and every clinical microbiology laboratory, has compatible and interconnected IT. **The NHS Executive must work towards this goal, accepting that it will involve considerable cost, and giving a strong lead from the centre to ensure compatibility.**

The Government agrees in principle with this recommendation. In *"Information for Health - An Information Strategy for the Modern NHS 1998-2005"*, previously referred to in this response, the NHS Executive gives a strong lead towards the development of a range of compatible electronic-based clinical support systems (see table below). Considerable work has already been carried out to provide the necessary building blocks for this. These include the provision of NHSnet (NHS Cymru Web in Wales) and communication protocols to enable information between, for example, laboratories and GPs to be exchanged electronically. Specific attention will be given to training clinicians on how to record, use and communicate information effectively through electronic means. In these ways, the strategy will have a unique role in enabling clinical and laboratory data on infectious disease, the use of antibiotics and the relationship between them, to be brought together and analysed, thereby enabling more effective prevention and control strategies to be developed. The strategy is backed up by funding of £1 billion over its 7 year implementation period.

Implementation of “*Information for Health*” will require attention to be given, both nationally and locally, to a number of issues. Those that will support work to address resistance to antibiotics and other microbial agents are summarised in the table below.

Information for the Patients and the Public

role of NHS Direct
role of National Electronic Library for Health

Information for Clinicians

on-line version of NICE clinical guidelines
implementation of GPnet (enabling laboratories to send test results to GPs)
community pharmacies linked to GPs via NHSnet
development of PRODIGY in primary care
hospital-based electronic prescribing - order entry (Electronic Patient Record - level 3), then rules-based decision support

Information for Management

surveillance in hospitals
laboratory reporting within NHS Trusts
clinical governance

Surveillance and Public Health

automated reporting by laboratories to PHLS
MIQUEST¹⁴-based analyses from GPs
reporting by PHLS of key surveillance data and online access to it

Infrastructure issues

confidentiality and security, data ownership and data quality, Year 2000
development of standards to support Electronic Patients Records, including Clinical Terms Version 3 (Read codes)
implementation of UK standard clinical products reference source
development of Electronic Health Records
linkage of PHLS to NHSnet
development of national EDIFACT¹⁵ messages
learning from local browser solutions

Implementation issues

local implementation strategies
HA/Local Authority sharing of information

¹⁴ MIQUEST: A software package designed to extract anonymised health data from GP systems, with the permission of the GP

¹⁵ EDIFACT: An international standard for the transmission of structured electronic messages

An epidemic in its own right

Recommendation 11.54. We do not wish to overstate the problem, at least as it affects the United Kingdom. ... But food poisoning and hospital-acquired infection are already at levels which cause concern, and, if action is not taken now, it is quite conceivable that VRSA, or further outbreaks of MDR-TB, may arise here, with all the consequences of suffering and expense. **The Government clearly desire to develop a strategy to safeguard the effectiveness of antimicrobials; we conclude by urging them to follow this project through along the lines recommended in this report, to back it with resources, and to set themselves and the Health Services challenging targets for real improvement. Antimicrobial resistance is here to stay; but action or inaction now, not only by the Government but by everyone with a stake in public health, will have a real impact on the public health legacy which we pass on to the next generation.**

The Government's response shows that it is well advanced in developing and taking forward a comprehensive strategy aimed at maintaining the effectiveness of antimicrobial agents in the treatment of infection and infectious disease and minimising morbidity and mortality from antimicrobial resistant infection. The many initiatives described in this response underline its commitment to this aim.

The Government believes it is well ahead of many other developed countries in developing an integrated national strategic approach to this problem. However, as the Select Committee has also iterated, there is no room for complacency in this field. The Government recognises that this work must be sustained, with joint working across disciplinary boundaries, and that action must be maintained at local, national and international levels. The Government's programme of work will continue to be coordinated through the already established interdepartmental steering group. Further development of the strategy and work plan will be based on Ministers' responses to the recommendations of advisory committees such as the Advisory Committee on the Microbiological Safety of Food and the advice of the expert scientific advisory group which we will establish to advise on scientific aspects of control of antimicrobial resistance and the use of antimicrobials.

The Government is very grateful to the Committee for the impetus it has given to the public consideration of antimicrobial resistance and recognises the significant contribution its report has made to the growing body of evidence on the importance of this key public health priority.

Annex A

Standing Medical Advisory Committee Report: “*The Path of Least Resistance*”

Recommendations

Prescribing in the community

Patients with minor infections mostly present to GPs; consequently, 80% of UK human prescribing is in the community. This Report therefore concentrates on community prescribing of antimicrobial agents.

There should be a national Campaign on Antibiotic Treatment (CAT) in primary care on the theme of: ‘Four things you can do to make a difference’ (see Box). The CAT must be matched by a National Advice to the Public (NAP) campaign aimed specifically at supporting the initiative in primary care. A key feature of the NAP campaign should be to highlight the benefits of ‘cherishing and conserving your normal bacterial flora’. Further support for appropriate prescribing in primary care should be provided by developing and promulgating evidence-based national guidelines for the management of certain infections, under the aegis of the National Institute for Clinical Excellence. Such national guidelines should be adapted for local use during the development of Health Improvement Plans. To make the incorporation of the guidelines into everyday practice as effort-free as possible they should be integrated within computerised decision-support systems.

Four things you can do

- no prescribing of antibiotics for simple coughs and colds
- no prescribing of antibiotics for viral sore throats
- limit prescribing for uncomplicated cystitis to 3 days in otherwise fit women
- limit prescribing of antibiotics over the telephone to exceptional cases

Prescribing in hospitals

Hospital prescribing accounts for c.20% of human prescribing of antimicrobial agents in the UK; nevertheless, resistance problems are greatest in hospitals and infections may be life-threatening. Although prescribing in hospitals poses some different issues from those in primary care, hospital clinicians would benefit as much as GPs from the availability of computer-aided decision-support systems.

Studies should be undertaken in selected hospitals to develop and test one or more prototype decision-support systems. Systems should include information from local antimicrobial sensitivity profiles; these, in turn, should feed into regional and national surveillance databases.

Prescribing guidelines

Prescribing guidelines should be quality; evidence-based documents. They are often the first source of information for inexperienced prescribers. National guidelines, suitably adapted in response to local resistance patterns, could be integrated into decision-support systems.

Local prescribing information should, wherever possible, be harmonised with prescribing information in the British National Formulary (BNF) and other formularies. Guidelines and formularies should also take account of the proposed national evidence-based guidelines to be produced under the aegis of the National Institute for Clinical Excellence. Local prescribing guidelines should take their cue from these national guidelines. All such local guidelines should include as a minimum, advice on drug dosage, frequency and duration.

International co-operation

Resistant bacteria spread between countries, the UK is not isolated from the greater resistance problems that exist in other parts of the world, for example, Southern Europe. Every effort should be made by the Government, in international fora, particularly in the European Union, to raise the profile of antimicrobial resistance as a major public health issue meriting priority action.

Surveillance of resistance

Effective surveillance is critical to understanding and controlling the spread of resistance. Not only is surveillance essential for monitoring the existing situation, it allows the effects of interventions to be evaluated.

A national strategy for resistance surveillance should be developed and implemented as swiftly as possible, covering the whole of the UK.

Research

Antimicrobial resistance has been of low priority for Research Councils and scored poorly in the recent Research Assessment Exercise.

Research into antimicrobial resistance should become a high priority for all funding bodies concerned with health care and biomedical research.

Education

The development of guidelines and their widescale introduction into clinical practice will have important and beneficial spin-offs for the education of health care professionals involved in antimicrobial prescribing. The whole population would benefit from enhanced education about the benefits and disadvantages of antimicrobials.

Greater emphasis should be placed on teaching about antimicrobial prescribing in Medical and Dental Schools as well as in the undergraduate curricula for pharmacists and nurses. Teaching about antimicrobials should be better integrated with teaching about the infections for which they are used. This enhanced emphasis on education in antimicrobial use should be carried over into continuing medical, dental and professionals education and development. Similar concepts apply in the field of veterinary medicine. In addition to health education material aimed at adults, teaching about antibiotics should be included as part of health Wducation in the National Curriculum.

Hygiene, infection control and cross-infection

Infection control, although intimately bound up with problems of antimicrobial resistance - particularly in health care environments - was outside the Terms of Reference of the Sub-Group. Nevertheless, it is fundamental to preventing the spread of resistant organisms, not only in hospitals but also in the community.

Consideration should be given to producing guidance on infection control in the community, especially in nursing and residential homes, similar to that which exists for hospitals.

Veterinary and agricultural use

Antimicrobials are used in therapy and prophylaxis and as growth promoters/enhancers in animals.

The use of antibiotics in veterinary practice should be guided by the same principles as for human prescribing - namely, they should be used only for clinical conditions where their use is likely to provide a genuine health benefit. Alternative means of animal husbandry should be developed so that the use of antibiotics as growth promoters can be discontinued.

Implications for industry

If our recommendations are followed, they should have the effect, *inter alia*, of reducing antibiotic usage. There may be financial implications for the pharmaceutical industry, upon whose profitability the development of new antibiotics depends.

Consideration should be given by the appropriate bodies to finding ways - through pricing and other mechanisms - of ensuring that investment in the development of new antibiotics remains commercially viable. Industry should be encouraged to undertake studies of optimum prescribing regimens for new antimicrobial agents, for each indication and in adults and children as appropriate. Licensing authorities should have due regard to an antimicrobial agent's potential to select for resistance as well as to its safety and efficacy.

Implementation of recommendations

The aim of this report has been to produce recommendations that can constitute the first phase of a national strategy for minimising the development of antimicrobial resistance.

As part of this phase a small National Steering Group (NSG) should be established, charged with ensuring that these recommendations are implemented and that their effects on prescribing practice and on the development of resistance are monitored.

The NSG, which might need to establish a small number of expert groups to take forward specific aspects of the recommendations, should report to the Chief Medical Officer within a year on progress.

Thereafter the CMO may wish to consider asking SMAC to reconvene this Sub-Group, to provide a suitable inter-disciplinary forum for the development of the next phase of the strategy.

**Ministry of Health
Ministry of Food,
Agriculture and Fisheries
Denmark**

The Copenhagen Recommendations

Report from the Invitational EU Conference on

The Microbial Threat

*Copenhagen, Denmark
9-10 September 1998*

The Copenhagen Recommendations

The implications for human health of the increasing resistance of microorganisms to antimicrobial agents

Resistance to antimicrobial agents is a major public health problem in Europe.

International spread of microorganism means that resistance to antimicrobial agents can no longer be regarded as a national problem. It is a European and global problem and requires a common strategy.

Antimicrobial resistance among microorganisms that cause disease in the community and in hospital is leading to increased deaths, illness, and costs. The full extent of the problem is, however, not yet known.

All antimicrobial drugs can select microorganisms that are resistant.

There is an established but complex relation between the consumption of antimicrobial agents and the prevalence of drug resistance in microorganisms. Dissemination of resistant microorganisms occurs both in hospital and the community. The major route of transmission of resistant microorganisms from animals to man is through the food chain.

Pharmaceutical companies are making great efforts to develop new antimicrobial agents and ways of countering infectious disease, and they should be encouraged to continue this important work. But such innovations cannot be expected to solve the problems in the near future. It is thus essential to introduce policies on the rational use of antimicrobial to avoid further increases in resistance.

The need for surveillance of microorganisms resistant to antimicrobial agents

Good quality data on resistant microorganisms are essential to underpin effective interventions to counter the problem of resistance and for developing guidelines on the prescribing of antimicrobial drugs. Such data must be clinically and epidemiologically relevant.

The conference advocates setting up a European surveillance system of antimicrobial resistance based on national systems. These systems must collect data on trends in antimicrobial resistance in bacteria of animal and human origin. Medical and veterinary collaboration will be essential. These systems should be coordinate within the European Union.

Effective European surveillance must have the agreement and active involvement of all the participants.

The need to collect data on the supply and consumption of antimicrobial agents

Collection of information about national supply of antimicrobial agents shows changes over time and differences among countries. These data are important triggers for investigation and action.

Evaluation of the benefits and risks of antimicrobial agents depends of collecting detailed information about their consumption by animals and humans and their use in aquaculture and horticulture.

Every member state should be able to collect national data on the supply and consumption of antimicrobial agents. They should collect data on dispensing of antimicrobial agents by community and hospital pharmacies. Data should also be collected on antimicrobial agents used to treat animals (by species) and for growth promotion.

Collation of data to compare practices among countries will not occur unless there is clear European Union strategy for ensuring transparency and comparability between national databases. A central strategy is also required to develop a multinational database.

Research information should be collected on the consumption of antimicrobial agents by specific patients, including why they were prescribed the agents. This information is essential for analysis of good clinical practice. Those setting up these research databases need political and financial support.

Encouraging good practice in the use of antimicrobial agents

Educational initiatives for both health professionals (human and animal) and the general public are of major importance for improving the use of antimicrobial agents.

Antimicrobials for therapeutic use should be prescription-only medicines and so should not be advertised to the public.

Antimicrobial teams (including clinical microbiologists, infectious disease specialists, and clinical pharmacologists) should be introduced in every hospital. They should have the authority to modify antimicrobial prescriptions of individual clinicians in accordance with locally accepted guidelines, always taking account of the needs of the patient. Clinicians should be given an opportunity to approve the remit and recommendations of the teams. The teams should also cover the community, including nursing homes and other residential institutions, and the primary/second care interface. Feedback should be provided to clinicians.

Guidelines for appropriate antimicrobial usage should be introduced in all aspects of both medical and veterinary practice.

The conference noted that most guidelines on antimicrobial usage say what should not be done rather than what should be done. A preliminary attempt was thus made to define good practice. What follows must be developed, but it is worth sharing - Treatment should be limited to bacterial infections, using antibiotics directed against the causative agent, given in optimal dosage, dosage intervals and length of treatment with steps taken to ensure maximum patient concordance with the treatment regimen, and only when the benefit of the treatment outweighs the individual and global risks.

Steps must be taken to increase access to diagnostic testing for patients with infections, and the range of tests needs to be improved.

Most of those at the conference considered the use of antimicrobials for growth promotion was not justified and that it was essential to have a systematic approach towards replacing growth promoting antimicrobials with safer non-antimicrobial alternatives including better farming practice. Others thought that it was essential to conduct a full risk assessment before taking any further decisions.

The need for research to counter the problem of antimicrobial resistance

There is an urgent need to implement research programmes aimed at a better understanding and control of antimicrobial resistance. These should examine the effect and cost effectiveness of interventions to control antimicrobial resistance in humans and animals.

Priority should be given to studies on:

- The effects of antimicrobial resistance on human disease
- The optimal use of antimicrobial agents in humans and animals to minimise the risk of microorganisms developing resistance
- The precise effect of antimicrobial agents used for purposes other than treating or preventing infection in humans
- Criteria to define better clinical diagnoses in patients with infections, algorithms for patient management, and assessment of clinical outcome
- Prescribing behaviour of doctors and compliance of patients with treatment
- Ecological modification driven by antimicrobial agents on normal microbial populations in humans and animals
- Novel principles for treating or preventing infections in humans and animals.

The European Union, member states, and national research councils should make coordinate research on antimicrobial resistance a high priority. A multidisciplinary scientific committee should be created at European level to direct and evaluate the research efforts.

Recommendations

- The European Union and member states must recognise that antimicrobial resistance is a major European and global problem.
- Pharmaceutical companies should be encouraged to develop new antimicrobial agents, but these will not solve the problem in the near future.
- The European Union and member states should set up a European surveillance system of antimicrobial resistance.
- The European Union and member states need to collect data on the supply and consumption of antimicrobial agents.
- The European Union and member states should encourage the adoption of a wide range of measures to promote prudent use of antimicrobial agents.
- The European Union, member states, and national research councils should make coordinated research on antimicrobial resistance a high priority.
- A way should be found to review progress with these recommendations and proposals.

Annex C

Emerging and other Communicable Diseases: Antimicrobial Resistance

The Executive Board,

Having considered the report of the Director-General on emerging and other communicable diseases: antimicrobial resistance,¹

RECOMMENDS to the Fifty-first World Health Assembly the adoption of the following resolution:

the Fifty-first World Health Assembly,

Having considered the report of the Director-General on emerging and other communicable diseases: antimicrobial resistance;

Concerned about the rapid emergence and spread of human pathogens resistant to available antibiotics;

Aware that antimicrobial resistance is increasingly hampering treatment of infectious diseases as a result either of totally ineffective currently available antibiotics or of the high cost of “new generation” agents;

Concerned about the extensive use of antibiotics in food production, which may further accelerate the development of such resistance,

1 URGES Member States:

- (1) to encourage the development of sustainable systems to detect antimicrobial-resistant pathogens, thereby increasing the awareness of antimicrobial resistance, and to monitor volumes and patterns of use of antimicrobial agents and the impact of control measures;
- (2) to develop educational programmes for professional staff and the lay public to encourage the appropriate and cost effective use of antimicrobial agents;
- (3) to improve practices to prevent the spread of infection and thereby the spread of resistant pathogens, and to promote appropriate antibiotic use in health care facilities, in the community, and in food-animal production;

-
- (4) to develop measures to protect health workers from the hazards of resistant pathogens;
 - (5) to develop measures to prohibit the dispensing of antimicrobials without the prescription of a qualified health care professional;
 - (6) to strengthen legislation to counter the manufacture, sale and distribution of counterfeit antimicrobial agents and the sale of antibiotics in the informal market;
 - (7) to take measures to encourage the prudent use of antimicrobials in food-animal production;

2 REQUESTS the Director-General:

- (1) to support countries in their effort to control antimicrobial resistance through the strengthening of laboratory capacity for the detection of resistant pathogens;
- (2) to assist in the development of sustainable national policies for rational antimicrobial use, not only in human medicine, but also in food-animal production;
- (3) to collaborate with those in public health, the pharmaceutical industry, universities and institutions concerned with research, laboratory testing, marketing, prescription and consumption of antimicrobial agents, in order to encourage sharing of knowledge and resources to combat antimicrobial resistance;
- (4) to devise means for the gathering and sharing of information between countries and regions of resistance in certain pathogens;
- (5) to develop information and education programmes for prescribers and users of antimicrobial agents;
- (6) to encourage promotion of research and development of new antimicrobial agents.

Sixteenth meeting, 27 January 1998

EB101/SR/16

ACRONYMS

ABPI	Association of the British Pharmaceutical Industry
ACDP	Advisory Committee on Dangerous Pathogens
ACMSF	Advisory Committee on the Microbiological Safety of Food
AGMETS	Advisory Group on Medical Education and Staffing
BBSRC	Biotechnology and Biological Sciences Research Council
BSAC	British Society for Antimicrobial Chemotherapy
BVA	British Veterinary Association
CAMR	Centre for Applied Microbiology and Research
CAT	Campaign on Antibiotic Treatment
CDC	Communicable Disease Control
CREST	Clinical Resource Efficiency Support Team
CVCP	Committee of Vice-Chancellors And Principals
EC	European Community
EDIFACT	An international standard for the transmission of structured electronic messages
GMC	General Medical Council
GP	General Practitioner
HSAC	Health Services Advisory Committee
HSE	Health and Safety Executive
ICARE	Intensive Care Antimicrobial Resistance Epidemiology
ICT	Infection Control Team

LHCI	Local Healthcare Cooperative Information
LHGs	Local Health Groups
MAFF	Ministry of Agriculture Fisheries and Food
MDA	Medical Devices Agency
MDR-TB	Multiple Drug-Resistant Tuberculosis
MEREC	Medicines Resource Centre
MIQUEST	A software package designed to extract anonymised health data from GP systems, with the permission of the GP
MRC	Medical Research Council
NAP	National Advice to the Public
NHSNET	A Secure and controlled managed computer network accessible only to authorised users
NHS R&D	National Health Service Research and Development
NIBSC	National Institute for Biological Standards and Control
NICE	National Institute for Clinical Excellence
NINSS	Nosocomial Infection National Surveillance Scheme
NOAH	National Office of Animal Health
NPG	National Priorities Guidance
PACT	Prescribing Analysis and cost
PCGs	Priority Care Groups
PCR	Polymerase Chain Reaction
PHLS	Public Health Laboratory Service

PRISMS FP	Prescribing Information System for Scotland
PRODIGY	A Computer aided decision support system for use by General Practitioners
RCGP	Royal College of General Practitioners
SCAN	Scientific Committee on Animal Nutrition
SHTAC	Scottish Health Technology Assessment Centre
SIGN	Scottish Intercollegiate Guidelines Network
SMAC	Standing Medical Advisory Committee
SPA	Scottish Prescribing Analysis
UK	United Kingdom
VPC	Veterinary Products Committee
VRSA	Vancomycin-Resistant Staphylococcus Aureus
WHO	World Health Organisation

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