5 Public Health Evidence

Summary and Implications

Achieving the "fully engaged" scenario would require a step change in our ability to monitor the health of the UK population and improve the cost-effectiveness of NHS and other interventions to maximise the health gain to the nation. Over 50 years after the NHS was created, there has been no exploitation of one of its unique advantages: the ability to generate national data on the healthiness of the population and lifestyle risks to future health. Little comprehensive information is collected on the health status of the population, the prevalence of important behavioural factors, such as smoking, drinking, diet and exercise, or what the NHS actually spends its money on in relation to public health.

In addition, there is no regular mechanism by which a PCT or local authority can gather reliable information on its own population, and the information held about individual patients is inadequate to provide such local population information comprehensively. Practice registration data on the health of the population should be captured on the future electronic patient records system, and used as the basis for disease and risk factor monitoring.

Even with greater prioritisation and a clearer focus on delivery, the major constraint to further progress on the implementation of public health interventions is the weakness of the evidence base regarding their effectiveness and cost-effectiveness across the majority of risk factors. Information is particularly scarce on which interventions can help reduce health inequalities due to, say, smoking or obesity, by differentially changing the behaviour of lower socio-economic groups.

The dearth of evidence is not unrelated to the lack of funding of public health intervention research – with funding from research organisations and the private sector heavily directed towards clinical, pharmaceutical, biological and genetic research – and the lack of a clear and coherent set of Government priorities for the public health research which does exist.

To address the almost complete absence of an evidence base on the cost-effectiveness of public health interventions, substantial investment will be necessary, backed up by building the capacity of the public health research sector in England, establishing clear priorities and ensuring that responsibility to collate what evidence does exist is assigned.

However, the need for action is too pressing for the lack of a comprehensive evidence base to be used as an excuse for inertia. Instead, current public health policy and practice, which includes a multitude of promising initiatives, should be evaluated as a series of natural experiments. Resources should be made available to ensure that successful initiatives are rapidly rolled out in other areas, while initially promising but ultimately unsuccessful initiatives should be discontinued. Future allocations of cash should be conditional on proper evaluation of initiatives with central support available for evaluation if necessary, so that over time an evidence base can be built up which can deliver a step change in our ability to make cost-effective interventions to improve the health of the population.

MONITORING THE HEALTH OF THE POPULATION

5.1 Health data are essential for monitoring the health of the population and for evaluating the effects of health interventions[1]. This section describes the main sources of information in England for monitoring the health of the population and the key risk factors that affect future health.

Mortality

5.2 Mortality statistics[2] have been produced annually since 1837, and provide mortality data by cause of death for PCT and local authority populations. Although inaccuracies in the registered cause of death are recognised, especially with multiple causes, mortality statistics provide a valuable source of information on trends in the main causes of death.

Morbidity

5.3 While there is universal comprehensive data on mortality, there is only very partial data on morbidity, varying by disease (with cancer data better than CHD) and type of treatment (with hospitals having better data that primary care). A number of sources provide information on disease incidence and trends. These include:

- Hospital Episode Statistics (HES): Introduced in 1987, HES provides information on hospital activity aggregated to PCT level. However HES only collects data on patients who are severe enough to be admitted to hospital, which depends on a number of factors[3]. Although HES data is useful for monitoring the incidence of conditions that almost always result in hospital admission (such as fractured hip), it provides little information on diseases for which admission rates are variable (for example respiratory disease and mental illness), and does not measure the severity of the patient's illness.

- Cancer registration: This is carried out by ten regional registries in England and Wales and provides accurate information on the incidence, prevalence and survival trends of all cancers. Aggregate information is routinely published for England, the Regions, SHAs and PCTs.

- Communicable disease surveillance: The Health Protection Agency (HPA) collates information on infectious disease incidence from a variety of sources including laboratory reports, statistical returns from genito-urinary medicine clinics and from the statutory notification of diseases[4, 5]. National results are published weekly by the HPA[6].

- Primary Care Information: Under the auspices of the Royal College of General Practice, information on national prevalence of major illnesses is gathered from over 90 sentinel practices covering about 600,000 patients. Information is aggregated to provide age and sex specific incidence of disease episodes. While this system does not include information about patients who do not experience symptoms or who do not contact their GP, it has proved particularly useful in monitoring disease trends, and its value is particularly recognised for influenza.

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[1] *Primary prevention of ischemic heart disease: evaluation of community interventions*, W. Winkelstein Jr and M. Marmot, 1981

[2] *Mortality Statistics, cause, England & Wales*, ONS, produced annually

[3] *Morbidity statistics from health service utilisation*, P Fraser et al., 1997

[4] *Public Health (Control of Disease) Act.*, HMSO, 1984

[5] *The Public Health (Infectious Diseases) Regulations.*, HMSO,1988

[6] *CDR Weekly.* http://www.hpa.org.uk/cdr

Population surveys

5.4 There are a number of regular surveys (see Annex D) gathering information on morbidity, and on lifestyle and behaviours that are known to be risk factors for future ill health. These include:

- The Health Survey for England;
- General Household Survey;
- National Diet and Nutrition Survey;
- Infant Feeding Survey;
- Office for National Statistics (ONS) Omnibus Survey;
- School Survey; and
- Psychiatric Morbidity Surveys.

Additional data information

5.5 In addition to these data sources and surveys, there is a wealth of ad hoc local health data, and routine information collected by non-health partners, predominantly on the 'wider determinants of health'. Examples of such data include measures of deprivation, housing, education, crime, social care, accidents and air quality. A wide range of such data sources has been identified in the 'basket of indicators', which the DH has recommended for use in monitoring progress towards meeting the health inequalities targets. Public Health Observatories (PHOs) have a particular role to help gather and make accessible to the NHS the wealth of data available.

Surveillance information

5.6 Not only is there very little information of the current well-being of the population, there is also very little information on lifestyle behaviours linked to poor future health, which would be the starting point for preventative work. Despite the importance of current behaviours such as smoking, drinking, diet and exercise on future morbidity and mortality, the information we have on these factors is poor at a local level. Although age, sex, regional, socio-economic and ethnic variations in health are available from national surveys (Annex D) there is no regular mechanism by which a PCT or local authority can gather reliable information on its own population to identify population subgroups for targeted interventions. The information held about individual patients is inadequate to provide such local population information comprehensively.

5.7 Some PCTs have attempted to overcome this by conducting local 'health and lifestyle surveys' but these are resource intensive and the cost of local surveys can make it uneconomic for a local health economy to undertake these regularly to monitor trends in their population over time, and to evaluate local interventions.

Box 5.1 Knowsley PCT Health and Community Survey

Knowsley PCT undertook a Health and Community Survey in 2001 to gather data on lifestyle, social capital, health status and use of health services. 2 per cent of the adult population were sent a questionnaire, which had a 54 per cent response rate. Based on the information gathered specific targets were set to improve diet, physical activity, reduce smoking prevalence and to guide the targeting of individuals in high risk areas. The PCT aims to repeat the survey in 2005/6 to monitor progress in achieving these targets.

5.8 To improve understanding and risk factor management, much greater use needs to be made of primary care data systems. The potential of the National IM&T programme, specifically the electronic patient record, and of the new GMS contract to begin to collect this type of information and subsequently use the information to guide local activity must be fully realised.

5.9 An annual report about the state of people's health and of the major determinants of health should be made available at national and local authority levels to encourage understanding.

5.10 PHOs have a valuable role to play in gathering and collating information from a range of sources including health, social services, local authority, crime and education. While PHOs are a valuable resource, they require sufficient capacity and investment to provide an effective function for the health communities they serve. In a survey of public health Specialists in PCTs in 2002/3[7], only 17 per cent felt they had a strong relationship with their PHO.

5.11 It is recommended that efforts of arm's length bodies should be co-ordinated at a local level (for example, the Health Development Agency, Public Health Observatories and the Health Protection Agency) and their relationships with PCTs should be examined by the review of arm's length bodies.

THE PUBLIC HEALTH EVIDENCE BASE

5.12 *Securing Our Future Health* concluded that the UK must devote a significantly larger share of its national income to health care to catch up with the best-developed countries in ten years and to keep up for the following decade. Success or failure will depend largely on how effectively the health service uses its resources. The Report also stressed that evidence-based principles need to be established for public health expenditure decisions.

5.13 However, there is currently limited evidence about what works in terms of preventative and public health interventions, how effectively to implement them, and even less evidence on their impact on inequalities and on the cost-effectiveness of these interventions. This makes it difficult to decide how to invest in public health interventions in terms of their value for money.

Difficulties in evaluating public health interventions

5.14 There are practical issues with the evaluation of public health interventions. Research on the effectiveness of interventions to improve health has become increasingly dominated by the randomised controlled trial (RCT). RCTs can be applied to the evaluation of certain types of public health interventions, but in some instances it may be considered unethical or impractical to randomise or use control studies, particularly with respect to evaluating the health effects of social interventions, such as the impact of financial support through benefits and tax credits, which may not have improved health as an explicit and quantified objective.

5.15 Consideration needs to be given to the level of evidence required to justify action, given the current gaps in the evidence base[8]. Unfortunately, within the research community and funding organisations, methods for evaluation other than RCTs are often not considered scientifically rigorous and are not rated highly. In addition, the

[7] *Capacity and development needs of Specialists and Consultants in Public Health based in PCTs and SHAs: Final report to the Department of Health*., JL. Chapman et al., 2003

[8] *Evaluating the health effects of social interventions*, H. Thomson et al., BMJ, 2004

cost of undertaking RCTs of public health interventions that would demonstrate a significant effect may be substantial, and their feasibility may be marginal, even though the impact of these interventions at a population level may be large.

5.16 Given the lack of a solid evidence base for the cost-effectiveness of public health interventions, the pursuit of the ideal should no longer be allowed to be used as an excuse for inaction, rather promising approaches should be piloted with evaluation a condition for funding.

5.17 Many public health interventions are focused on achieving changes in current behaviour to produce health benefits in the future. Where potential benefits may not accrue for a long time period due to the lag times between interventions and benefits, it may not be possible to identify the full health benefits of public health interventions within the short time periods demanded of researchers, aside from evaluating changes in knowledge, attitudes or behaviour. In addition, due to influences outside the control of the researchers, outcomes may be difficult to attribute to the original intervention, and simply keeping track of individuals in the community over such long timescales is difficult.

5.18 Modelling techniques could be applied to extrapolate data on the effect of interventions, from a public health evidence base, over the long time periods required for the assessment of the effectiveness of public health interventions. In addition, modelling would allow the application of these results to real populations or sub-populations to assess their impact on population health at a national or local level.

Data Protection

5.19 Another important issue reported to be undermining the capacity for public health monitoring and research is that information has become harder to access. The difficulties of obtaining access to information may be creating disincentives to undertake public health research. The Data Protection Act prohibits the sharing of personalised information for the purposes of research without prior consent of the individual. Steps have been taken to provide a legal basis for public health research through Section 60 of the Health and Social Care Act 2001[9], but there is concern that the mechanism is both slow and difficult to satisfy. Although the National Programme for IM&T may in time provide access to appropriately anonymised information this is a number of years away. There is little hard evidence that public health research has been adversely affected, but the concern is that by the time such evidence emerges considerable damage may already have been done. There is a clear need to seek consensus and clarify the balance between access to data and protection for individuals.

5.20 The White Paper should address the possible threat to public health research, which arises from the difficulty of obtaining access to data because of the need to strike a balance between individual confidentiality and public health research requirements.

[9] *Health and Social Care Act*, DH, 2001

GATHERING EVIDENCE

5.21 Public health research is wide ranging, incorporating interventions to reduce risk factors for disease and interventions to address the wider determinants of health, at the individual, community and national levels. Two main areas are:

- synthesising existing evidence on public health interventions (and identifying gaps); and
- research that designs, tests and evaluates interventions and policy initiatives in public health.

Health Development Agency

5.22 Evidence-based policy and practice have come to the fore within the realm of public health, following the shift towards evidence-based medicine. The Health Development Agency (HDA) was established in 2001 to build and maintain an up-to-date evidence base in public health with a special focus on reducing inequalities in health, advising on the setting of standards, in the light of the evidence, for public health and health promotion practice and the effective and authoritative dissemination of evidence to practitioners. Surprisingly, evaluation of the cost-effectiveness of public health interventions was not specified within the HDA's original remit.

5.23 The use of systematic review methodology to generate evidence of effectiveness has to some extent been perceived to be robust and reliable, given its contribution to evidence-based medicine, and is widely recognised as an appropriate method for synthesising existing knowledge in health care. The HDA, as a first step, has undertaken to produce *Evidence Briefing* documents that collate, review and synthesise international review level literature on the effectiveness of public health interventions across a range of key topic areas[10], and for the first time to provide accessible syntheses of this level of public health literature. In the future it is planned that a far broader range of evidence and information sources will be collated, assessed and synthesised by the HDA.

Other players

5.24 There are a number of other key organisations, academic institutions and collaboratives within public health research, both nationally and internationally, with remits that include funding, developing and building the evidence base for, or relevant to, public health. (See box 5.2). Their roles cover a range of activities that include funding research, carrying out primary research, undertaking systematic reviews and economic analysis, literature searching, developing methodologies, synthesising and mapping evidence, and disseminating information to a varied range of stakeholders across research, policy and practice.

[10] http://www.hda.nhs.uk/evidence

Box 5.2 Potential players in public health research in England

- Government departments: the Department of Health, Department of Trade and Industry, Department for Education and Skills, Department for Transport, Department for Farming and Rural Affairs, the Home Office.
- Research councils: Medical Research Council (MRC), Economic and Social Research Council (ESRC), Biotechnology and Biological Sciences Research Council (BBSRC), Natural Environment Research Council (NERC);
- Other public bodies: HDA, HPA, FSA, NICE, NHS Information Authority;
- Academic departments: For example, the Centre for Reviews and Dissemination (CRD) at the University of York and the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) at the Institute of Education, University of London;
- Charitable organisations: For example, National Heart Forum, Diabetes UK, Wellcome Trust; and
- Others: For example, Cochrane and Campbell Collaborations

5.25 Many of these organisations have their own research priorities and methodologies. It is not clear how their efforts are coordinated towards building an evidence base that can be applied in a consistent fashion to address common public health policy and practice agendas. The HDA has worked to develop concordant methodologies through its Public Health Evidence Steering Groups on which other agencies are represented. The Cardiovascular Research Funders Forum, involving the DH, Wellcome Trust, National Heart Forum and Diabetes UK has made similar efforts. However, is it not clear how funding is coordinated to facilitate the efficient use of resources, which is a major concern given the limited capacity to undertake these tasks.

The funding role of the DH

5.26 The DH itself funds research through a number of routes and works in collaboration with other government departments and agencies such as the HDA. Research within the DH is organised in two main programmes; the Policy Research Programme (PRP), and the NHS Research and Development (R&D) Programme.

5.27 The PRP gets its overall direction from Ministerial and Departmental priorities. About thirty per cent (£8.9 million in 1999/2000) of the PRP annual budget is spent on public health topics. Recent initiatives within this programme include those on smoking (circa £4 million over 6 years), inequalities in health (circa £4 million over 5 years), diet and nutrition (circa £2.5 million over 6 years) drug misuse (circa £2.4 million over 4 years) and sexual health and HIV (£1 million annually allocated through the MRC). It has also funded evaluations of complex interventions (Health Action Zones, Health Living Centres, Teenage Pregnancy Strategy) and advises across Government on health related initiatives (for example, drugs, teenage pregnancy, accidents) and on the impact of non-health-led policy (for example, New Deal for Communities, Sure Start).

5.28 In 2004 PRP will be commissioning a public health research consortium to gather evidence on interventions to reduce health inequalities; risk and behaviour; and the impact of incentives and regulations on health behaviour.

5.29 The NHS R&D Programme funds Health Technology Assessments. These are systematic reviews of the evidence base and have covered a variety of topics including the effectiveness of different smoking cessation interventions and promoting individual

behaviour change for health. It also undertakes research on Service Delivery and Organisation. An example of current work is a review to look at the barriers to access to healthcare for socially excluded sectors of the population.

5.30 With so many players within the funding and evidence arenas, what is missing is an overarching body charged with setting priorities and allocating funding for public health research, and an absence of any requirement to apply a common and consistent approach to evaluating public health interventions.

GAPS IN THE EVIDENCE BASE

5.31 Despite the public health research undertaken, gaps in the evidence base persist. Epidemiological research has provided a great deal of knowledge and understanding about the risk factors for disease, the effects of wider determinants on health and about health inequalities. However, we have much less understanding of what can be done effectively to prevent illness, and what research does exist offers little with regard to the practical implementation of interventions.

5.32 *Securing our Future Health* drew attention to the gaps in the evidence required for making decisions, which could maximise the health of the population (and therefore the economic benefit to the nation) over the long term. The *Programme for Action* to address health inequalities also identified the evidence base as patchy[11], and a recently published HDA report illustrated that, of research in the UK, which addressed the public health priority areas outlined in *Our Healthier Nation* and the *NHS Plan*, less than 0.4 per cent was related to interventions for the prevention and reduction of ill health[12].

5.33 In particular, little is known about the differential impact of public health interventions across the socio-economic gradient. Previous public health interventions, while improving the health of those in higher social classes, probably contributed to widening health inequalities. In addition, little is known about the likely health impact of interventions that tackle the wider determinants of health and health inequalities. An aim of HDA's *Evidence Briefing* documents is to highlight gaps in the evidence base across a number of public health topic areas, and so provide a steer for future public health research commissioning, for instance through the Department of Health.

5.34 The *Acheson Report* highlighted as one of its key recommendations "that as part of health impact assessment, all policies likely to have a direct or indirect effect on health should be evaluated in terms of their impact on health inequalities, and should be formulated in such a way that by favouring the less well off they will, wherever possible, reduce such inequalities". This recommendation has yet to be fully realised but it is crucial if the degree of success of the health inequalities programme is to be monitored and forecast to enable all those involved to understand whether objectives set are likely to be achieved.

EVALUATION OF PUBLIC HEALTH PRACTICE AND POLICY

5.35 Given the limited evidence base for public health, every opportunity to generate evidence from current policy and practice needs to be realised. Much of public health policy and practice currently being implemented has not been rigorously evaluated to

[11] *Tackling Health Inequalities. A Programme for Action*, DH, 2003

[12] *Public health intervention research – the evidence.*, LM. Millward et al., 2003

assess its effectiveness. Many in the research community highlight the potential of public health programmes for use as natural experiments, where evaluation should be an explicit component of the implementation of new interventions, programmes and policies, and so could inform the evidence base for public health.

5.36 It is understood that evaluation methods other than the use of RCTs need to be applied to assess the effectiveness of such interventions. There is also an urgent need to develop an appropriate practical framework for evaluating public health interventions in practice, which highlights the importance of evaluating process, short-term effects and long-term outcomes (expected and then proven), as well as costs. Such an evaluation framework would articulate the need for:

- appropriate outcome measurements to demonstrate effectiveness and cost-effectiveness of interventions;
- the use of controls to attribute outcome to intervention, if ethically possible;
- the use of appropriate timeframes for evaluation of outcomes; and
- considering the degree of change to outcomes that would constitute success.

5.37 Information on what works in real life practice to improve health or health care is to a limited extent currently being gathered through 'collaboratives' and 'pilot sites'. Examples of collaboratives within England include the National Primary Care Collaborative (NPCC) and the Healthy Communities Collaborative Pilot (HCCP), see Boxes 5.3 and 5.4. Both are led by the National Primary Care Development Team and supported by evidence provided by the HDA.

Box 5.3 The National Primary Care Collaborative Pilot

The NPCC Pilot was launched in 2000. Initially 80 PCTs were selected to focus specifically on primary care access, the management of people with established heart disease and the patient journey between primary and secondary care. The approach involved gathering information on existing best practice through an expert panel and disseminating this at a series of workshops with 'action periods' in between. A 'plan, do, study, act' approach was used to make incremental changes.

Within each PCT, a core group of five or six practices worked with the support of a PCT-based Project Manager to make improvements in each of the three topic areas and, from these core practices, learning was spread across the rest of the PCT.

While every practice and PCT in the country has been involved in CHD work through the implementation of the NSF, an analysis of the Office of National Statistics (ONS) data has demonstrated that PCTs on Waves 1 and 2 of the Collaborative have, on average, delivered a four-fold greater reduction in CHD mortality compared with the rest of England. Some PCTs, who have systematically monitored practice CHD mortality rates, can point to a reduction of 30per cent in CHD deaths in only one year.

The improvement in Waves 1 and 2 of the first phase of the NPCC translates to just over 800 extra lives saved compared to the rest of England. Replicating this improvement across the whole of England would result in over 6,000 fewer deaths from CHD in a year. As result of this knowledge, the National Primary Care Development Team (NPDT) has made the rollout of the learning on improving secondary prevention CHD a priority for Phase II of the National Primary Care Collaborative.

Box 5.4 Healthy Communities Collaborative Pilot (HCCP)

The HCCP is a scheme aiming to reduce falls in the elderly, which commenced in September 2002. A key element of the HCCP is the participation of the community in the scheme, building on the principles of community development. The collaborative was piloted in three PCTs each of which identified 5 ward or neighbourhood teams. The teams were predominantly local people from the area supported by community workers. Additional support and advice was available from local charitable organisations such as Age Concern, and from health, social care and local authority services.

Activity resulting from the initiative included:

- Improved lighting inside and outside homes, installation of grab rails and stair rails, provision of non-slip mats and shower mats, provision of exercise classes, improved provision of foot care services and footwear, improved provision of domiciliary eye tests, raising awareness amongst older people and involving children to take the message to their grandparents.
- Evaluation after 6 months demonstrated a 32 per cent reduction in falls in the elderly across the 3 sites.
- As a result funding has been made available to support a second wave of PCTs to pilot the collaborative approach to falls prevention.

Evercare Pilots

5.38 In addition to the pilots outlined above, the DH is supporting United Healthcare to work with nine PCTs to implement the Evercare model for managing care for a

vulnerable elderly population.

5.39 An independent evaluation found that over a seven year period the Evercare programme in the United States was highly cost-effective and reduced hospitalisations and A&E visits by about half compared to a control group (see box 5.5)[13].

Box 5.5 Evercare Programme at Airedale PCT

The project involves the identification of elderly residents who are 'at risk' of hospital admission. The criteria for selection are those aged 65 years or over with two or more hospital admissions within the last year. To date (December 2003), 60 patients in Airedale have been selected.

A small team of specially trained nurse practitioners is employed to co-ordinate the care of each individual. Working with a care team of district nurses, practice nurses, GPs, health visitors and social services as well as carers, relatives and friends and the patients themselves, the aim is to actively identify and address the health and care needs of the elderly person and provide as much home care as possible in order to reduce the need for hospital admission. Service to each client depends on the level of need. However key to the scheme is the freedom provided to clients and carers to contact the team for help and support when needed and the rapid response of the team to that need.

National evaluation is being led by the University of Manchester.

5.40 Projects such as the collaboratives and pilots described above, if evaluated appropriately, can provide evidence of interventions that have been shown to work and from which lessons can be disseminated to other PCTs.

GETTING EVIDENCE INTO PRACTICE

5.41 Evidence on effective interventions must not just be generated; it must also be disseminated into practice. Information on the evidence base is available through a range of publications and websites including those of the HDA, Cochrane Collaboration, NHS Centre for Reviews and Dissemination, NICE and the National Electronic Library for Health.

5.42 The HDA also has a remit to support the translation of evidence into practice, with their Evidence Briefings forming the basis of its "Evidence into Practice" programme, the focus of which is to translate the evidence findings into advice and guidelines for practitioners.

5.43 Following *Shifting the Balance of Power* the National Primary Care Trust Development Programme (NatPact) was established to provide organisational development support to PCTs, which could include their capacity to implement evidence-based policies in relation to public health.

5.44 It is recommended that the forthcoming Department of Health review of arm's length bodies should ensure that the gaps in activity identified here are filled. Responsibilities should be assigned for:

- **Developing the cost-effectiveness evidence base on public health; and**
- **Researching the practical effectiveness of current activities and interpreting findings for future implementation.**

[13] *Evaluation of the Evercare demonstration program: Final Report to the Centers for Medicare and Medicaid Services.*, R Kane, 2002

PUBLIC HEALTH RESEARCH CAPACITY

Under-investment in public health intervention research

5.45 The lack of evidence on the effectiveness of public health interventions has resulted in part from a lack of investment in public health research, with 6per cent of public health related research conducted over the last five years relevant to the Our Healthier Nation public health priorities[12].

5.46 This under-investment in public health research is partly due to its low status within the research community and also relates to the funding of Public Health Academic Departments. Such departments receive funding from the Higher Education Funding Council for England (HEFCE). Assessment of the quality of research in the UK is undertaken through the Research Assessment Exercise process (RAE). However, this process gives greater weight to 'gold standard' RCT type evidence, which as discussed previously, can be less applicable to public health research than clinical research and also gives low value to qualitative research, which could aid understanding of why particular public health interventions are effective. Additionally, the most recent RAE (2003) gave high priority to research of international relevance and low priority to research relevant to the NHS alone and thus gave low priority to intervention public health research in England since by its very nature such research may need to focus on local circumstances. Crucially, HEFCE funding is dependent on RAE ratings so Public Health Departments are not incentivised to conduct research that is relevant to improving public health and tackling inequalities. However, if accepted, the recommendations of a review of the RAE process by Sir Gareth Roberts may help to address these issues[14].

5.47 In addition, public health does not usually offer the commercial and financial rewards that research into pharmaceutical and health technology interventions can offer, and so the private sector has been reluctant to invest in trials of public health interventions, see box 5.6. Also, the relatively undervalued status afforded to public health in the medical world has resulted in the majority of research funding being directed toward medical, pharmaceutical, biological and genetic research.

[14] *Review of Research Assessment*, G Roberts, Higher Education Council for England, 2003, http://www.ra-review.ac.uk/reports/roberts.asp

Box 5.6 The "public good" characteristics of preventative health research

Improvements in medical care and health advice are based on modern research and development, much of which is funded privately. However, there can be difficulties obtaining private funding for research into preventative health care due to its public good characteristics.

Much of privately funded research concentrates on secondary prevention and curative health care because it is possible to patent and sell the derived technology, through drugs, for instance. As consumers can easily be charged for the use of the technology, minimising any problem of free-riding, under-provision of this type of medical research is unlikely. Also, where the management of risks via drug therapies is possible or proven to be effective, this will also attract attention to curative services and is likely to be funded by those who might make the pharmaceutical therapies.

While research into preventative health care can be just as valuable, there are fewer opportunities to patent and sell any technology (although, there should of course be a strong incentive on both the public and private sectors to research and invest in preventative therapies which can be patented). Much of the research is to identify risk factors, which is then used as the basis of medical advice. It is difficult to restrict this advice, indeed possibly unethical and undesirable to do so, making any charging scheme impractical. There is therefore little incentive for the private sector to fund the research, and, if it were left purely to the market, there would be significant under-provision.

To avoid such under-provision, governments and charities invest significant funds. However, given the lack of any market mechanism to allocate resources, it is important that there is objective appraisal of the value for money of committed funds and systems to ensure socially optimal levels of investment in preventative health research.

Lack of capacity in public health research

5.48 The lack of capacity within public health research particularly to undertake systematic reviews of primary research is an important factor. Additionally, the paucity of health economists and mathematical modellers within the public health sciences has been of specific concern.

5.49 A survey commissioned by the DH in 2001 concluded that although there had been an increase in public health research capacity over the past 10 years there remained a lack of depth and expertise in the core disciplines of statistics, epidemiology, social sciences, and health economics. Additionally, the infrastructure lacked secure funding and critical mass to build programmes of work and support research careers[15]. The survey also found that links between academic public health departments and associated disciplines such as health economics, health promotion, trends psychology, health policy and health education were either non-existent or patchy.

5.50 There is a need to evaluate and learn from current public health practice, as 'natural experiments'. However, the evaluation of practice is difficult because of the resources required. In particular, public health practitioners (such as health visitors or community workers) may need additional support to evaluate their activities in order to build the evidence base. Ideally this support should be provided by the PCT with Public Health Specialist input, but this is not always available due to lack of capacity in the Specialist workforce.

[15] *National Academic Public Health R&D Capacity Survey for England 2000/01*, J Weeden et al., 2001

5.51 Equally, links between public health services and academic departments are perceived to be weak[7]. Hence robust evaluation and support from academic departments in undertaking research of 'public health in practice' is not always possible.

5.52 There is an urgent need to develop more effective partnerships between PCTs and academic public health practitioners, not only in 'traditional' public health departments, but increasingly in departments of geography, social sciences, information sciences, and others. There is also a need to ensure that sufficient funds are included in the budgets for new interventions to evaluate outputs and outcomes.

5.53 Evidence submitted to the Review by a working group on the Public Health Services, convened by the Wellcome Trust, highlighted the disparity between, on the one hand, the importance of the public health sciences for public health protection and health improvement, and on the other, the limited strategic interest that is taken in their infrastructure and conduct.

5.54 Although there are a large number of contributors to public health research, and action is being taken to strengthen public health research capacity[16] there remains a need to have a long-term vision of public health research requirements and the workforce required to deliver such an agenda.

5.55 The roles of the various research bodies in relation to public health, and how they best work together to identify and address gaps in public health research, to ensure the structured and coherent development of the public health research requirements of England should be defined as part of an overall public health research strategy. The Chancellor recently announced that a long-term plan for science funding would be a central feature of the 2004 Spending Review[17]. Work on this should consider public health research capacity, and the links between academics and deliverers of public health.

CONCLUSIONS

5.56 Health data are essential for monitoring the health of the population and for evaluating the effects of health interventions. However, despite their future influence on morbidity and mortality, the information collected on the important current behavioural factors such as smoking, drinking, diet and exercise is poor.

5.57 At a local level, there is no regular mechanism by which a PCT or local authority can gather reliable information on its own population, despite its importance for identifying population subgroups for targeted interventions. The information held about individual patients is inadequate to provide such local population information comprehensively.

5.58 The major constraint to further progress on the implementation of public health interventions is the weakness of the evidence base for their effectiveness and cost-effectiveness. This is largely due to the lack of funding of public health intervention research, with funding from research organisations and the private sector very heavily directed towards clinical, pharmaceutical, biological and genetic research. This has, to

[16] For example, the DH funds the EPPI-CENTRE, which aims to promote evidence-based practice and practice based research in health promotion and social interventions. The DH has established capacity building opportunities through funding Career Scientist Awards, Research Evidence Synthesis Awards and Health of the Public Fellowships. Since 2001, DH has contributed over £4 million to these awards.

[17] Speech to the Advancing Enterprise Conference, 26th January 2004

some extent, resulted from the relatively low status with which public health is regarded within the research and medical communities. A possible consequence is that pharmacological solutions might become the focus of primary prevention with considerable financial implications. Substantial investment, or reprioritisation, is necessary if this imbalance in research funding is to be redressed.

5.59 In addition, there is a current lack of capacity for undertaking public health research, particularly with regard to the synthesis of primary research, which could be regarded as a fundamental requirement for building the evidence base for public health, as well as the need for health economists and mathematical modellers.

5.60 However, the need for action is too pressing for the lack of a comprehensive evidence base to be used as an excuse for inertia. Instead, current public health policy and practice, which includes a multitude of promising initiatives, should be evaluated as a series of natural experiments. Resources should be made available to ensure that successful initiatives are rapidly rolled out in other areas, while initially promising but ultimately unsuccessful initiatives should be discontinued. Future funding allocations should be conditional on proper evaluation of initiatives with central support available for evaluation if necessary, so that over time an evidence base can be built up which can deliver a step change in our ability to make cost-effective interventions to improve the health of the population.