Health psychology had its origins in clinical psychology, social psychology and psychophysiology. Its traditional focus was on functioning at the level of the individual and understanding individual differences. Over the past 15 years, however, it has branched out to address public health issues, and this has required new concepts and approaches to research (Schneiderman et al., 2000; Wardle, 2000). This article illustrates some of the opportunities, insights and challenges that follow from a meeting of public health and health psychology, under headings that cover the different elements of the combined approach.

A focus on the health of the nation

Three important public health problems are discussed here.

Health behaviours

The major causes of ill-health and premature death have a predominantly behavioural aetiology. It has been estimated that diet, physical activity, smoking, alcohol use, sexual practices, driving habits, and interpersonal violence together accounted for about half the deaths in the United States in 2000 (Mokdad et al., 2004). Most authorities now acknowledge that significant improvements in population health will only be achieved by changes in lifestyle and behaviour (Department of Health, 1999; US Department of Health and Human Services, 2000; Wanless, 2004; World Health Organization, 2002). These issues are relevant not only to advanced market economies with the diseases of affluence, but also to the developing world. For example, a recent review has estimated that handwashing with soap could reduce diarrhoea risk by more than 40 per cent in developing countries, potentially saving up to one million lives annually (Curtis & Cairncross, 2003).

Health psychologists have been at the forefront of the development of theoretical approaches to understanding individual differences in health behaviours (Fishbein et al., 2001; Rutter & Quine, 2002), and these models have underpinned many successful health education initiatives, most strikingly in the prevention of HIV transmission (e.g. Kamb et al., 1998). They have also increased the impact of individually based behavioural treatments through the use of modern information technologies, which make it possible to deliver personalised behaviour-change advice, on a wide scale but at modest cost, and with individuals’ characteristics linked to specific pieces of advice (e.g. Baker &

Health communication

Information on health and disease is now widely available, and people expect to be participants in the process of diagnosis and treatment. Modern health care is increasingly a shared process between health professionals and the public. The ‘expert patient’ initiatives reflect this trend in Britain, with a major contribution from psychological research into promoting and teaching self-management of disease (www.expertpatients.nhs.uk).

We are seeing dramatic developments from the field of genetics, and in the future health care may become more individually based. Each person’s genetic and behavioural disease susceptibilities and drug responsiveness profiles may be taken into account for prevention and treatment. The immediate challenge is to enable people to understand the concepts of multiple causes of diseases, susceptibility genes, which confer only a small effect, and the relevance of moderate exposures to environmental risk over a lifetime (Nash et al., 2003; Wardle et al., 2001).
Health inequalities  There is increasing interest in understanding how social influences get ‘under the skin’ (Adler et al., 1999) – the pathways through which population-level factors affect individual health. Socio-economic disparities in health are a growing concern, because higher quality health care has not increased equality of health. Analyses of health inequalities have often argued that psychological factors such as sense of coherence, perceived control or optimism may play an important role; and these are now being demonstrated at the population level (Wardle & Steptoe, 2003; Wardle et al., 2004). Psychobiological approaches are being used to understand how socio-economic factors influence the biological substrates of physical disease (Steptoe & Marmot, 2002). For example, recent studies have shown that the rate of post-stress recovery of cardiovascular and biochemical responses to behavioural challenge is prolonged in adults from lower compared with higher socio-economic status groups, and that these differences may be relevant to long-term health risk (Steptoe & Marmot, 2005).

Another relevant idea is functional health literacy, or the extent to which people can undertake the reading and computational tasks that enable them to access and utilise health-related information, and interact effectively with health professionals. This is also strongly socially graded, and predicts self-management in chronic disease and other health outcomes (Mirowsky & Ross, 2003). Similar issues arise in the exploration of ethnic and gender differences in health, and there are growing demands for a psychological understanding of the underlying processes.

Using the methodological strengths of epidemiology  The methodological strengths of epidemiology have several important implications in the combined public health psychology approach.

Sampling issues  Many health psychology researchers recruit convenience samples of volunteers from the community, workplace, patients attending hospital clinics, or students. Although appropriate for some research projects, these samples may introduce bias if volunteers’ motivation for participation is different from that of the target group. For example, the benefits derived from a behavioural programme may be greater for people who have chosen to take part than the average benefit when the programme is made available to all members of the public with the problem. In the case of obesity, intensive behavioural treatment is the gold standard, but many obese people prefer less intensive interventions that, unfortunately, have less effect.

Good practice in public health psychology research demands a careful identification of the appropriate sampling frame for any study (e.g. adolescents in the South East of England) and the sampling method (e.g. stratified random sampling of secondary schools). It also requires the development of strategies to maximise response rates, characterise non-responders, check the representativeness of the final sample and, if necessary, compute weighted outcomes. Population-based sampling frames bring with them special design and analytic issues. The statistical methods favoured by psychologists, such as general linear model factorial procedures and linear regression, may not be satisfactory in population-based studies because of cluster sampling. Participants from one general practice, school or clinic often share characteristics that distinguish them from participants from other centres in the study; they can be more receptive or resistant to change, or more or less satisfied with the atmosphere of the clinic. This has implications for the power of the study and may require the use of clustering methods or multilevel modelling techniques to analyse the results.

Small effects and statistical power  Public health psychology can also learn from epidemiology about how to test small effects. In the aetiology of complex diseases, any one variable is, by definition, going to contribute only modestly to disease outcomes. The correlations between smoking and mortality, blood pressure and mortality, or aspirin use and survival in patients following myocardial infarction, are less than 0.1, below even the threshold for small effect sizes according to Cohen; yet these are associations of the greatest importance to public health (Rutledge & Lob, 2004). Associations of a similar order are observed between aspects of personality or coping style and disease outcomes or health behaviours, but have often been dismissed as minor effects of little importance (Steptoe & Wardle, 2001). If psychological or behavioural factors of modest impact are important, studies need to be powered to detect them, which will involve larger sample sizes and a commensurate increase in the cost of our research. One option for reducing costs is to combine forces with other researchers who are investigating related, or at least compatible, issues. Another possibility is to use existing data sets; notwithstanding the limitations of the variables that were recorded during the original data collection, psychologists may be able to mine the riches of the large cohort data sets that are held in Britain.

Similarly, in intervention research, the magnitudes of effects, and consequently the size of study required to detect them, are quite different in public health psychology than in studies of individual therapy (where comparatively smaller groups may suffice). For example, if general practitioners give smokers a simple reminder of the risks of smoking and a recommendation to give up, this is associated with about a 3 per cent smoking quit rate (Silagy, 2000). Given that around 11 million of the 15 million British smokers will visit their doctor each year, this could yield 330,000 extra quitters a year. Health psychologists might predict that adding a new factor to general practitioner advice, such as advice on the formation of implementation intentions (e.g. Gollwitzer, 1999) could increase its effectiveness by 50 per cent – a very worthwhile gain. But to test the difference between a 3 per cent and a 4.5 per cent quit rate would require 2500 patients per group (80 per cent power, p < .05), which is a lot larger than many smoking intervention studies reported in the psychological literature. Studies of this kind are expensive, but are essential to progress research into behaviour change.

Effectiveness and implementation  In attempting such behaviour change, public health psychologists make a distinction between the efficacy and the effectiveness of interventions. The efficacy of a treatment denotes its effect when it is administered properly to the intended target population. Effectiveness takes account of the multiple barriers to proper administration, and refers to the impact of the treatment protocol when implemented in the real world. Psychologists often prefer to ask efficacy questions because they are interested in processes of change...
as well as outcomes. This may lead them to restrict data analyses to the participants who followed the protocol and attended for follow up, and exclude those who dropped out. This causes two problems: the randomised element of the design is forfeited because the research participants are, in effect, selecting themselves in and out of the groups, and effectiveness may be overestimated. For example, a number of randomised controlled trials show favourable effects of physical activity compared with control procedures for depression (Steketoe, 2004). However, the drop out rate is typically substantial, and different types of people may drop out of different treatment conditions. This may lead to a false impression of the benefits that would accrue should the programme be delivered to the population at large. This is one reason why, from the public health perspective, we might be sceptical about the psychological benefits of physical activity (e.g. Lawlor & Hopker, 2001). Randomised designs should involve intention-to-treat analyses, which count all outcomes in the treatment group as consequences of treatment, with inevitable dilution of efficacy estimates.

Even when efficacy has been established, there is still important work to be done. The influential RE-AIM work group in the US has argued that health behaviour change will only become a public health reality when proper attention is paid to adoption, implementation and maintenance in target populations and institutions (Glasgow et al., 2004).

**Investigating the determinants of population health**

Understanding population health issues demands a perspective that goes beyond a focus on individual differences. For example, in the case of the obesity epidemic, the critical public health question is not why some people are obese and some not, but why so many more people are obese now than 20 years ago. The related public health intervention question is not how obese people can be helped to reduce weight (important as that is in its own right), but how the population trends in obesity can be reversed.

It is known from twin and adoption studies that genes are the major cause of individual differences in weight in the population. The phenotype which carries the risk is being characterised, and methods of helping obese individuals to lose weight need for physical activity in everyday life combined with changes in the food supply, which have shifted the energy balance upwards for the whole population (Jeffery & Uter, 2003). The environment drives this process; food is cheap, easily accessible, varied, palatable and energy dense (all factors shown in by psychological research to promote overconsumption), and activity has been engineered out of modern life. Reversal of the trends in body weight will require modification of the food and activity environments. New research approaches are needed to identify causal associations between environmental change and health change, and the actions needed to convince legislators, planners and policy makers of the value of ‘health promoting’ environments are going to be different from those needed to convince health organisations of the value of behavioural interventions.

**The energy balance has been shifted**

are improving. These are vitally important issues, but there must be quite different processes at work to explain weight trends over time. These effects are widely believed to be due to changes in the environment; specifically decreases in the need for physical activity in everyday life combined with changes in the food supply, which have shifted the energy balance upwards for the whole population (Jeffery & Uter, 2003). The environment drives this process; food is cheap, easily accessible, varied, palatable and energy dense (all factors shown in by psychological research to promote overconsumption), and activity has been engineered out of modern life. Reversal of the trends in body weight will require modification of the food and activity environments. New research approaches are needed to identify causal associations between environmental change and health change, and the actions needed to convince legislators, planners and policy makers of the value of ‘health promoting’ environments are going to be different from those needed to convince health organisations of the value of behavioural interventions.

**Testing psychological interventions**

A major theme in the scientific psychology tradition is that hypothesised causal processes should, wherever possible, be tested. Surprisingly, the pursuit of the experimental tradition to evaluate psychological interventions in relation to health outcomes has been limited, and it remains commonplace for health psychology papers to end by suggesting that the findings could have important implications for health. Promising results and small-scale pilot studies should not be the end point of a programme of research but provide the foundations for the next step, which consists of convincing funding bodies of the value of the research and obtaining support for real-life trials. Large-scale clinical trial evidence provides the best basis for contacts with opinion-formers, and the strongest evidence from which to persuade policy makers to use the research findings. Psychological interventions are among the most powerful available for a number of health outcomes, yet health psychologists are not always at the forefront of new developments or policy making. Obesity treatment is one example: numerous authoritative guidelines identify cognitive behavioural treatment as the ‘gold standard’ for obesity and recommend that other health professionals should be trained to deliver it (National Institutes of Health, 1998). However, there are few psychology-led research programmes in obesity in the UK, and even fewer training programmes for other health professionals.

The largest psychologically driven intervention study of recent years has been the ENRICHD trial (Enhancing Recovery in Coronary Heart Disease Patients: Berkman et al., 2003). It was based on the observation that patients who are depressed or socially isolated following a myocardial infarction have a poor prognosis, and it involved a randomised trial of the provision of cognitive behavioural treatment of depression. The study involved screening thousands of cardiac patients, and randomising them to cognitive behaviour therapy or usual care. The results have been disappointing, with no differences in survival or recurrence of cardiac problems over a 2- to 3-year period. But, while unexpected, these findings are not a reason for abandoning efforts to test psychologically based interventions. Rather they bring home the point that treatment research is a difficult and long-term enterprise. We need to learn from the poor results of some studies how better to apply our methods, and what techniques need to be enhanced. An iterative process of refinement and retesting is essential to develop treatments that are of lasting value in health care.

Design and endpoints in health psychology intervention research need to be considered carefully if they are to influence decision makers. Healthcare planning now depends strongly on an ‘evidence base’, and that evidence base derives from systematic reviews of the literature. A recent US Preventive Services Task Force (2002) report considered the
evidence for primary care advice on physical activity, diet and weight. Putting together the literature that met the high standards for systematic review resulted in the exclusion of many significant intervention studies in the literature. Common reasons for exclusion were inadequate reporting of methods (so that the treatment could not be ascertained) and inadequate description of trial design and patient flows. Adherence to the CONSORT guidelines (Moher et al., 2001) could greatly improve trial reporting. For example, outcome measures need to be valid and convincing if research is to influence policy and practice. If a simple intervention designed to increase physical activity can be shown to produce a sustained decrease in blood pressure, this provides a medically useful intervention. If the outcome is behavioural, it needs to be quantified in a way that is readily understood by planners, such as the increase in the proportion of the sample who meet recommended physical activity targets. When the outcome is change in scores on a non-validated physical activity scale, no health planner can make any estimates of its utility.

Advocacy and policy making
If psychologists are to maximise their contribution to public health, it is not sufficient merely to demonstrate associations between psychological factors and health outcomes, or even to conduct a randomised trial showing that a psychologically orientated intervention has health benefits. It is necessary to develop advocacy skills to work towards having the findings implemented at local and national levels. This requires understanding the chain of decision making, which may involve managers, health planners, policy drafters, and ultimately politicians. It is essential to identify the priorities of policy makers and, if necessary, work towards changing them. The budgetary and political constraints on changing policy need to be taken into account. Advocacy involves taking and creating opportunities to communicate in policy forums, presenting information in a form that is comprehensible to people making decisions and formulating conclusions in such a way that they can be implemented practically. Influencing policy is a long-term enterprise, but should be seen as part of the challenge of public health psychology.

References