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the risks beforehand. Equally we need to ensure that patients at higher risk are not denied surgery because no one is willing to operate on them. We need to work collectively to develop a truly open system that limits the incidence of error, recognises risk, allows surgeons (and all healthcare professionals) to learn from mistakes, and replaces blame and retribution with an opportunity for learning and training.

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Research in nursing, midwifery, and the allied health professions

Quantum leap required for quality research

Although the United Kingdom invests almost £3.5bn (\$5.5bn; €5.1bn) in medical research from public and private sources,¹ 73% of published research in nursing and 83% in occupational therapy remain unfunded.² Underfunding in nursing and allied health professions is relative to that in comparable professions and to the size of their workforce. Recent reports indicate that nursing receives only 20% of that allocated to a national programme in teaching and learning of the Economic and Social Research Council.^{2,3} Nurses, midwives, and members of the allied health professions represent two thirds of the staff responsible for direct care for patients, yet little is known of the clinical or cost effectiveness of the largest sector of care. For nurses, only 1482 research publications have appeared in eight years¹; this is at a time when NHS research leads to over 13 500 research publications annually. The public, policy makers, and all members of the healthcare team are therefore poorly served by the undernourished research base in nursing, midwifery, and allied health professions. Without targeted investment the service will fail to deliver the benefits of evidence based practice.

The case for investment needs to address questions of supply as well as the demand for research. Research into the outputs and supply of funding for research in nursing and allied health professions has shown an increase in volume of activity and research income from £3m in 1996-7 to £9.7m in 1999-2000.² The demand for research is increasing with the policy, service delivery, and design pressures within the NHS, yet nurses, midwives, and allied health professions still lag behind other disciplines.² Research into "payback" shows that research has several benefits; knowledge generation, occasional cost savings—for example, in contributing to a more healthy workforce, better decision making because of the improved information

base, the development of research skills of individuals, and savings from improved working methods.⁴

As "venture capital" investment, decisions in research and development entail risk and rely as much on political will as policy justification and estimates of projected return. One major study from the United States quoted a return on investment 20 times greater than the spending, although such studies tend to be based on heroic assumptions.¹ Moreover, the time lag between investment and pay off may be long; patience and persistence as well as serendipity may help to shape outcome as much as science.⁵ The overall objective of investment should be to upgrade research capacity in nursing and allied health professions to an internationally acceptable level of quality for all health professions that can meet the needs of the service.

Foundations such as the PPP Foundation have taken the initiative to invest in fellowship schemes. But government action is required to provide a solution that is sustainable in the long term. To its credit the Department of Health has announced the award of a research development scheme of £4.8m for research over the next five years in these areas. But the Department of Health cannot solve the situation alone. The Higher Education Funding Council for England must share the burden by ensuring that its commitment to partnership carries through into its funding policy and practice.

But where should investment be targeted? Training the next generation of research leaders needs to be done not just at the doctoral or postdoctoral level but at more senior levels. This will provide a clear and career structure of high calibre, sustainable programmes of research, and, in some cases, stabilise the position of nursing, midwifery, and allied health professions in the higher education sector. A flexible portfolio is required to develop the necessary breadth and depth of methodological and substantive exper-

tise. Investment needs to cover individuals and infrastructure as well as institutions. Doctors have benefited from decades of investment in research and development. Nurses and allied health professions are showing that they deserve to do so too.

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The impact of antisocial lifestyle on health

Family, school, and police interventions can reduce health risks

An antisocial lifestyle comprises a range of related behaviours that include violent and non-violent offending, substance misuse, truancy, reckless driving, and sexual promiscuity, some of which constitute self evident health risks.¹ Overall, onset peaks at 8-14 years, prevalence peaks at 15-19, and desistance peaks at 20-29 years of age. Early onset predicts a long antisocial career. Since antisocial behaviour and risk taking is more prevalent in men, explanations may be biological as well as social. Antisocial individuals tend to be versatile in their behaviours, although early adulthood is characterised by a switch from group offending to lone offending. Overall, diversification in antisocial behaviours is seen up to the age of about 20, followed by gradual specialisation in particular types of antisocial behaviours, such as illicit use of drugs.²

Independent precursors of an antisocial lifestyle include antisocial child behaviour, impulsivity, school failure, an antisocial family, poor parenting, and economic deprivation.² Turning points away from an antisocial lifestyle include getting a job, getting married, moving to a better area, and joining the army.³ Weak bonds to society and individuals, self centredness, low empathy, and lack of religious belief are all associated with substance misuse and an antisocial lifestyle.^{4,5}

The impact of an antisocial lifestyle on health is increasingly well understood. For example, early contact with the police, truancy, school misconduct, and divorce are significant predictors of premature death.⁶ Higher death rates among offenders have been attributed largely to concurrent alcohol and illicit use of drugs. Impulsivity, aggression, alienation, and a tendency to experience anger and irritability in response to daily life hassles characterise those taking single health risks: rejection of social norms, danger seeking, impulsivity, and little need or capacity for relationships with other people have been found to characterise those taking multiple health risks.⁷

Longitudinal research has found particular links between an antisocial lifestyle and injury, especially injury sustained in assaults at age 16-18 and on the roads or at work at age 27-32.^{1,8} Injuries due to assault have been found to predict future convictions.

Attempts to explain the observed association of criminal behaviour, involvement in crashes, and injuries have focused on control theory, which explains behaviour in terms of the way children are socialised, particularly through parental care and control.⁹

DATES syndrome, comprising drug abuse, injury sustained in assaults and accidental trauma, and elective surgery, has been attributed to an antisocial lifestyle.¹⁰ This range of disorders and treatment was significantly more frequent in young adults injured in assaults than in other ways.

Injury is related to elements of an antisocial lifestyle up to the age of 32 including heavy drinking, low job status, and convictions for motoring offences.⁸ Although antisocial men aged 16-18 seem to be less ill than their peers, links between psychiatric illness and convictions and between smoking and illness are established by age 32. A picture emerges of fit, well, but vulnerable risk takers from poor family backgrounds at 18 beginning to reap the consequences of unhealthy lifestyles by age 32. In turn, this fits with the concept that risk factors for adult disease accumulate differentially throughout life.

Given the roots of antisocial behaviour in childhood, families, and risk taking it is perhaps not surprising that prevention targeted at young families, in schools and through criminal justice efforts to deter have been shown to be effective across a range of behaviours.^{11,12} For example, preschool education and early family support have, in randomised trials, been shown to have positive health outcomes in terms of reduced child abuse, neglect and injury, drug misuse, and teenage pregnancy.^{11,12} The High/Scope Perry Preschool programme saved \$49 044 (£30 429; €44 603) in costs of crime alone for every \$12 356 spent on each child.¹² Home visiting and education of parents in day care settings, training in cognitive-behavioural child skills, and management training for parents have been shown to reduce a range of antisocial behaviours including offending and alcohol or other drug misuse. No programmes targeting community risk factors have yet been found to be effective.¹¹

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