

occurred over a long period and are a disparate group of different diagnoses. The Sellafield plant has probably been at least partly responsible, either directly, such as through preconceptional exposures, or indirectly if population mixing is a cause. The judge decided on the balance of probabilities that paternal preconceptional irradiation did not cause the two cases brought to the court. In the scientific community, preconceptional exposures are still being investigated and the jury is still out. The Gardner and infectious agent hypotheses need further work, but other factors may also be operating. Martin Gardner provoked researchers into a new field of investigation. Such challenges to the scientific community are few and far between, and more are needed if the causes of leukaemia and lymphoma are to be identified.

HAZEL INSKIP

1 Gardner MJ, Snee MP, Hall AJ, Powell CA, Downes S, Terrell JD. Results of case-control study of leukaemia and lymphoma among young people near Sellafield nuclear plant in west Cumbria. *BMJ* 1990;300:423-9.

2 Parker L, Craft AW, Smith J, Dickinson H, Wakeford R, Binks K, et al. Geographical distribution

of preconceptional radiation doses to fathers employed at the Sellafield nuclear installation, west Cumbria. *BMJ* 1993;307:966-71.

3 McLaughlin JR, King WD, Anderson TW, Clarke AE, Ashmore JP. Paternal radiation exposure and leukaemia in offspring: the Ontario case-control study. *BMJ* 1993;307:959-66.

4 Health and Safety Executive. *HSE investigation of leukaemia and other cancers in the children of male workers at Sellafield*. Sudbury: HSE Books, 1993.

5 Beral V, Roman E, Bobrow M, eds. *Childhood cancer and nuclear installations*. London: BMJ Publishing Group, 1993.

6 Urquhart JD, Black RJ, Muirhead MJ, Sharp L, Maxwell M, Eden OB, et al. Case-control study of leukaemia and non-Hodgkin's lymphoma in children in Caithness near the Dounreay nuclear installation. *BMJ* 1991;302:687-92. (Reproduced in reference 5.)

7 Roman E, Watson A, Beral V, Buckle S, Bull D, Baker K, et al. Case-control study of leukaemia and non-Hodgkin's lymphoma among children aged 0-4 years living in west Berkshire and north Hampshire health districts. *BMJ* 1993;306:615-21. (Reproduced in reference 5.)

8 Kinlen LJ. Can paternal preconceptional radiation account for the increase in leukaemia and non-Hodgkin's lymphoma in Seascale? *BMJ* 1993;306:1718-21.

9 Kinlen LJ, Clarke K, Balkwill A. Paternal preconceptional radiation exposure in the nuclear industry and leukaemia and non-Hodgkin's lymphoma in young people in Scotland. *BMJ* 1993;306:1153-8. (Reproduced in reference 5.)

10 Kinlen L. Evidence for an infective cause of childhood leukaemia: comparison of a Scottish new town with nuclear reprocessing sites in Britain. *Lancet* 1988;ii:1323-7. (Reproduced in reference 5.)

11 Kinlen LJ, Clarke K, Hudson C. Evidence from population mixing in British new towns 1946-85 of an infective basis for childhood leukaemia. *Lancet* 1990;336:577-82.

12 Kinlen LJ, O'Brien F, Clarke K, Balkwill A, Matthews F. Rural population mixing and childhood leukaemia: effects of the North Sea oil industry in Scotland, including the area near Dounreay nuclear site. *BMJ* 1993;306:743-8. (Reproduced in reference 5.)

13 Draper GJ, Stiller CA, Cartwright RA, Craft AW, Vincent TJ. Cancer in Cumbria and in the vicinity of the Sellafield nuclear installation, 1963-90. *BMJ* 1993;306:89-94. (Reproduced in reference 5.)

## General practitioners and incentives

### *Carrots and sticks may make GPs behave more like donkeys than doctors*

Incentives probably influence the activity of some general practitioners all of the time and all general practitioners some of the time. But no incentive package yet offered influences all general practitioners all of the time.

This is unsurprising as the general practice workforce is not a homogeneous group in terms of skills, commitment to whole population perspectives, and attitudes to scientific medicine. The growth of practice teams—itsself a consequence of successive incentives for multidisciplinary working—may make responses to incentives even more variable, simply because of the greater variety of players in the game.

General practitioners' responsiveness has prompted some analysts to propose that management interventions are needed to deal with family doctors who fail to respond "rationally" to economic incentives.<sup>1</sup> Others regard the development of teams working from purpose designed premises in 40% of practices, over one decade, as evidence of a strong response to incentives.<sup>2</sup> Both viewpoints have found expression in the 1990 contract, but the belief in incentives has gained greater weight.

Although effective incentives need not be material, they often are. Bosanquet and Leese showed that the development of primary care teams in general practice between 1977 and 1987 could be attributed primarily to a combination of demand pressures (population growth) and supply opportunities (cheap labour and available sites for new premises).<sup>3</sup> Local professional leadership also promoted growth but was a secondary factor, operating most powerfully in poorer areas.

The material incentives for general practitioners introduced in 1966 were relatively simple, with fees for items of service increasing the provision of cervical cytology screening and contraceptive services in general practice. But these were not accompanied by appreciable uptake of smear tests by those women with the highest risk or by any fall in the rate of unplanned pregnancy and abortion. Subsidies for premises and staff introduced in the family doctors' charter of 1966 prompted only limited development until the late 1970s,<sup>3</sup> even though the subsidies for premises effectively created a second pension for enterprising and innovative doctors.

More recently, economic incentives have become more complex, with a mixture of positive and negative incentives in the same package. For example, targets for immunisation of children and for cervical smear testing have been achieved faster than expected, not only because of target payments but also because practice incomes were threatened by the reduction in the basic practice allowance and the increased emphasis on capitation introduced in 1990. When fees for items of service have been extended, as in minor surgery, a ceiling has been added to prevent an epidemic of claims. Health promotion and activities for managing chronic diseases have also become subject to increasingly complex incentives, with as yet unknown consequences for public health.

In one sense general practice fundholding is itself an elaborate form of economic incentive, creating the possibility for reallocation of resources within the practice, including the development of improved premises that will yield, in time, improved extra pensions for their owners. One immediate effect of this incentive has been the curbing of increases in prescribing costs that has occurred in fundholding practices.<sup>4,5</sup> This refutes earlier speculation that increased list sizes would mean shorter consultations, less attention to psychosocial factors, and therefore more prescribing<sup>6</sup> and strengthens the argument for complex packages of incentives.

These complex incentives seem to be powerful, but do they raise the health status of the population as much as they do the income of the practice? Incentives may have the perverse effect of increasing inequalities in health care, either through the unequal provision of services or through their unequal uptake. Singlehanded practices responded less than larger practices to the incentives to run health promotion clinics,<sup>7</sup> yet the areas that these practices serve often need disease prevention most. Because achieving even a 50% target for cervical smear testing is regarded as unrealistic in some inner city areas some general practitioners are tempted to abandon any attempt at screening. Even if incentives can be designed that overcome this perversity people also respond in different ways to inducements to improve their health, so that inequalities in the uptake of cervical smear tests and other

health promotion activities will persist within practice populations.<sup>8</sup>

The quality of the activity stimulated by incentives may not be high. Contraceptive services provided by general practitioners offer less choice than those provided by dedicated family planning clinics, yet incentives have encouraged the shift of contraceptive care away from such clinics into general practice. The growth of minor surgery in general practice may be another example of incentives promoting more rather than better care. Increased numbers of skin lesions, some of them malignant, have been removed by general practitioners. Incomplete excision occurs more commonly when the procedure is done by general practitioners who took up minor surgery after 1990,<sup>9</sup> but the proportion of incompletely excised lesions is also increasing as time passes.<sup>10</sup> When an underskilled workforce attempts to meet a demand but only partially succeeds, the potential exists for an increase in workload for specialist surgical services, which have to respond when treatment fails.

Has the boom in minor surgery performed by general practitioners relieved the pressure on hospital services in other ways? Much of the substantial increase in minor surgical procedures performed in general practice after 1990 has occurred among patients who would not otherwise have been referred to specialists.<sup>11</sup> Is this supplier induced demand or previously unmet need uncovered by new activity?

American experience of incentives for doctors suggests that they increase the intensity of medical practice,<sup>12</sup> but in Britain more time given to contact with patients and less to other work, such as education and communication, is seen as a threat to the quality of medical care.<sup>13</sup> Mathematical modelling of general practitioners' behaviour at local level might allow family health services authorities to develop local packages of incentives that could offset the inherent perversity of the incentive approach (S Gallivan, personal communication). Concern about the suitability of incentives as the main lever to influence increasingly complex activity in general practice must, however, remain.

Perhaps we need to return to first principles. The organisation of general practice, including the incentives built into it, has less impact on how doctors work than the characteristics

of the population and the local economy.<sup>3,14</sup> Incentives may become overvalued as an approach to promoting innovation and growth at a time when adequate resources for the development of general practice are not available. Tighter management of general practice, with reaccreditation and short term contracts, might be necessary to guide rapid development of the discipline, but these might be worth exchanging for enhanced funding for primary care. In the end carrots and sticks may make general practitioners behave more like donkeys than doctors. The time has come for an experiment to test the potential of well resourced and well managed primary care.

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- 1 Taylor D. Primary Care. In: Maxwell R, ed. *Reshaping the National Health Service*. Oxford: Policy Journals/Transaction Books, Oxford 1988.
- 2 Bosanquet N. *Health care in the 1990s: perestroika and the NHS*. In: Harrison A, Grettton J, eds. *Health Care UK 1989*. Newbury: Policy Journals, 1989.
- 3 Bosanquet N, Leese B. *Family doctors and economic incentives*. Aldershot: Dartmouth, 1989.
- 4 Bradlow J, Coulter A. Effect of fundholding and indicative prescribing schemes on general practitioners' prescribing costs. *BMJ* 1993;307:1186-9.
- 5 Maxwell M, Heaney D, Howie JGR, Noble S. General practice fundholding: observations on prescribing patterns and costs using the defined daily dose method. *BMJ* 1993;307:1190-4.
- 6 Howie JG, Porter AM, Forbes JF. Quality and the use of time in general practice: widening the discussion. *BMJ* 1989;298:1008-10.
- 7 Gillam SJ. Provision of health promotion clinics in relation to population need: another example of the inverse care law? *Br J Gen Pract* 1992;42:54-6.
- 8 Waller D, Agass M, Mant D, Coulter A, Fuller A, Jones L. Health checks in general practice: another example of inverse care? *BMJ* 1990;300:115-8.
- 9 Bull AD, Silcoks PB, Start RD, Kennedy A. General practitioners, skin lesions and the new contract. *J Public Health Med* 1992;14:300-6.
- 10 Brown PA, Kernohan NM, Smart LM, Savargaonkar P, Atkinson P, Robinson S, et al. Skin lesion removal: practice by general practitioners in Grampian region before and after April 1990. *Scott Med J* 1992;37:144-6.
- 11 Lowy A, Brazier J, Fall M, Thomas K, Jones N, Williams BT. Minor surgery by general practitioners under the 1990 contract: effects on hospital workload. *BMJ* 1993;307:413-7.
- 12 Hemenway D, Killen A, Cashman SB, Parks CL, Bicknell WJ. Physicians' responses to financial incentives. *N Engl J Med* 1990;322:1059-63.
- 13 Calnan M, Groenewegen PP, Hutten J. Professional reimbursement and management of time in general practice. *Soc Sci Med* 1992;35:209-16.
- 14 Kristiansen I, Mooney G. The general practitioner's use of time: is it influenced by the remuneration system? *Soc Sci Med* 1993;37:393-9.

## Confidentiality, contraception, and young people

### *Explicit guidance at last*

Reducing the rate of teenage pregnancy is an important objective of the health service in England,<sup>1</sup> Wales,<sup>2</sup> and Northern Ireland.<sup>3</sup> Provision of contraceptive services and effective sex education is associated with comparatively low rates of teenage pregnancy,<sup>4</sup> and this twin track approach forms the basis of current national and international strategies<sup>5,6</sup> to reverse what has been for most of the past decade an increasing problem.

But the question must be asked why existing contraceptive services in the United Kingdom are proving inadequate when it comes to helping young people who are, or intend to become, sexually active. Part of the explanation must lie in the image created by the term "family planning," an activity with which most young people hope not to be involved. The contrast with the situation in the Netherlands, which has a rate of teenage pregnancy one seventh that of England and Wales, is particularly striking. Undoubtedly, frankness

when it comes to talking about sex, whether in school or elsewhere, is part of the explanation, but substantial differences also exist in the provision of contraceptive services to young people.

Behind the problems of image and the often inadequate facilities from which health authority services are provided lie the concerns that young people have about confidentiality. An evaluation of three contraceptive and pregnancy counselling projects set up by the Department of Health in 1986 emphasised that confidentiality was the single most important factor in the provision of such services for young people.<sup>7</sup> The view that young people are unlikely to use a service if they are not reassured about confidentiality is reinforced in the handbook on this key area of the *Health of the Nation*.<sup>8</sup>

Although doctors' legal position regarding the provision of contraceptive services to young people under 16 was clarified by the House of Lords judgment in the case of *Gillick v West*