subjects. A levels are now showing a sudden and sustained increase in uptake (figure, C), particularly by female students. The change continued into 1993, when 728 574 A levels were sat by candidates from the United Kingdom—0·4% lower than 1992, but a 3·5% increase when demographic changes are taken into account. But the picture for sciences is different. The proportion of male 18 year olds passing science A levels has been surprisingly constant since 1972, at about 5%. In contrast, the proportion of female students taking sciences has shown slow but steady growth since then and seems on target to top out at the same level as men, although female students prefer biology to physics. Intriguingly, the pattern resembles that reported in the Dainton report of 1968,[3] when, despite a 45% increase in the proportion of the population taking A levels between 1962 and 1967, sixth formers taking science remained a constant 5% of the age group. Explaining this remarkable constancy in the proportion of science specialists from 1962 to 1993, despite three decades of massive structural changes in the economy and in education (the Robbins expansion, comprehensive schools, sixth form colleges, GCSEs and AS levels, polytechnics transforming into universities, student loans and reduced student grants), is a difficult and yet unmet challenge for educationalists.

How does this relate to recent changes in higher education? In Britain in 1991 the absolute number of home undergraduates at universities and polytechnics was 50% higher than a decade before—an almost doubling in the proportion of the age group at university, from 13% to 25% (figure, D). Has the number of students studying non-science A levels increased faster than the number studying science because universities have encouraged (cheaper) arts courses at the expense of science courses? No, undergraduate numbers overall increased by 31·4% from 1988 to 1991, while numbers of those taking science courses increased by 34·8%. Here at least is an understanding of August's other news story: unfilled places to study science at universities. Places on science courses increased more quickly than other university places, whereas the number of students taking science A levels showed minimal growth (figure, C), resulting in a shortfall of entrants. The expansion in science has been supply led rather than demand led, and places are outstripping demand.

What implications does this have for medicine? During the 1970s medicine demanded (and obtained) the highest A level grades of any university subject.[4] Recently there have been hints that entrance standards have slipped,[5] although buffering by the increasing pool of well qualified women applicants has mitigated the problem. Medicine still has some leeway, although an overall ratio of two applicants for each place leaves only restricted room for manoeuvre, and applications to study medicine have grown less quickly than applications for other subjects at university.[4] Problems will inevitably occur if a constant proportion of the age group takes science A levels, the size of that age group falls each year, and medical schools seek a fixed absolute number of entrants each year. A crisis may be avoided if medical schools can survive until the nadir of the demographic decline, in 1995, when the cohort born in 1977 enters university. However, following the recommendations of the Medical Manpower Standing Advisory Committee to increase medical student numbers by 5·7% "as soon as practicable"[6] may not help.

I C McMANUS
Professor of psychology

St Mary's Hospital Medical School,
Imperial College of Science, Technology and Medicine,
London W2 1PG

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Screening for cardiovascular risk in general practice

Blanket health promotion is a waste of resources

One of the most controversial components of the new contract imposed on British general practitioners in 1990 was the requirement to offer regular health checks to the public. This requirement came even though multiphasic health checks had been shown to be ineffective in terms of their impact on morbidity and mortality.[1,2]

During the 1970s case finding and health promotion had become to be regarded as options available to general practitioners during consultations,[3] but during the 1980s the value of blanket (population) screening of all adults was disputed.[4,5] The professional and scientific concerns were, nevertheless, ignored when the government required general practitioners (or their staff) to perform health checks of the population and also to identify cardiovascular risk factors for all adults and intervene appropriately.[6]

This week's *BMJ* publishes the early results of two large scale evaluations of health checks and interventions for cardiovascular risk factors from general practice (p 308, p 313).[7,8] In both studies general practitioners were supported by nurses trained to screen and intervene. The Oxford and Collaboration health check (OXCHECK) study was mounted two years before the government's new policy was imposed and entailed a four year block randomised evaluation of the introduction of health checks by practice nurses.[7] The British family heart study is a randomised controlled trial in general practices in 13 towns in Britain to measure the impact of a programme of cardiovascular screening and lifestyle intervention led by nurses.[8]

Both studies cover large numbers of patients. The OXCHECK study is being conducted in five urban practices in Bedfordshire and the family heart study in a nationally scattered sample of 26 small town practices. The intervention of the OXCHECK study is health checks and counselling by nurses of patients about risk factors, with an emphasis on ascertaining patients' views on change and targets. In the family heart study the intervention is cardiovascular screening of men and their partners, with lifestyle interventions based on a client centred family approach. The measures in both studies include the change in the main risk factors for cardiovascular disease, but the family heart study also used the Dundee risk score for coronary heart disease and blood glucose assay.

Both studies found very modest changes in the intervention groups despite intensive intervention. In the family heart study a 12% lower risk of coronary heart disease (on the Dundee risk score) occurred in the group subjected to intensive lifestyle intervention, and this was more apparent in those at highest risk. The authors of the OXCHECK study found that the prevalence of smoking, the rate of stopping smoking, and body mass index were not significantly different between the two groups studied; there was a significant difference between the groups in cholesterol concentration, but the difference was small, particularly in men. Both sets of authors point to the need for longer term follow up, but neither is optimistic about the likelihood of further improvement in its results. So the impact on public health is likely to be marginal.

This style of approach to the population through primary care alone is not going to produce large reductions in the risk of cardiovascular disease. Instead, the government will need to put more effective legislation in place to control use of tobacco and promote the consumption of healthy food. It will also need to reconsider the controversial new arrangements for paying general practitioners for health promotion activity, with their emphasis on data collection.[6] In the meantime, these studies should not be interpreted as casting doubt on general practitioners' opportunistic use of routine consultations for health promotion.

General practice teams have good evidence for the effectiveness of clinical efforts in secondary prevention of vascular disease[9] and growing evidence that a little professional support for people who are ready to change their lifestyles will improve outcomes.[10] These are large tasks in themselves, and there seems to be no justification for the ritualistic collection of risk factors when the public health benefits are marginal, less motivated patients are upset by the process,[5 11] and the primary care professionals are demoralised by bureaucratic payments linked to targets and population coverage. The ethics of screening are clearly being ignored in the new contract imposed on general practitioners,[12] and the scientific evidence that existed before 1990 has been strengthened by the two papers in today's journal.

NIGEL STOTT
Professor of general practice

Department of General Practice,
University of Wales College of Medicine,
Cardiff CF3 7PN

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Mefloquine

In the prophylaxis and treatment of falciparum malaria

Mefloquine is a quinoline-methanol compound structurally related to quinine.[1] It is active against all the human malaria parasites, particularly multidrug resistant *Plasmodium falciparum*. Introduced a decade ago to treat falciparum malaria in Thailand, where multidrug resistance is a particular problem, it was formulated initially in a fixed combination with pyrimethamine-sulfadoxine to delay the onset of resistance. Unfortunately, that did not work, probably because of pharmacokinetic differences between the compounds and because *P falciparum* was already highly resistant to sulfadoxine and pyrimethamine when the combination was introduced.

By 1990, after five years of well controlled use, significant resistance to mefloquine was evident on the eastern and western borders of Thailand.[2] This has increased steadily in these regions, and, although cure rates have improved since the treatment dose of mefloquine was raised from 15 mg base/kg to 25 mg/kg,[3] high grade resistance (that is, failure to clear parasitaemia) now occurs in about 15% of patients, and low grade resistance (recrudescence of the infection) in almost 50%. Fortunately, the situation is considerably better everywhere else in the tropics, although some strains of *P falciparum* from west and possibly east Africa are intrinsically resistant to mefloquine.

For treating uncomplicated multidrug resistant falciparum malaria mefloquine is an alternative to quinine or halofantrine and has the advantage that only one dose is necessary. Compared with mefloquine, quinine is unpleasant to take because it has a very bitter taste and produces cinchonism (tinnitus, deafness, nausea, and dysphoria); patients are often reluctant to complete the necessary five to seven days' treatment. Where infections are known to be sensitive (that is, in most of the tropics) mefloquine 15 mg base/kg suffices, but for resistant infections 25 mg/kg is needed, and now on the borders of Thailand the addition of oral artesunate (10 mg/kg total dose) over three to five days is required for cure.[4]

The main adverse effect of antimalarial treatment with mefloquine is transient central nervous system toxicity; serious adverse effects (psychosis, encephalopathy, and convulsions) occur in about 1 in 1700 treatments with 15 mg/kg,[5] and about 1 in 1200 with the higher dose of 25 mg/kg (F ter Kuile *et al*, unpublished observations). Less serious but still disabling effects, such as confusion, mental clouding, dysphoria, and sleep disturbances, are more common.[6] Over half the patients given high dose mefloquine treatment complain of nausea, anorexia, dizziness, and fatigue, although both the drug and the disease contribute to these symptoms. As with other antimalarial drugs, children tolerate mefloquine better than adults and, interestingly, men better than women.[3]

Recommendations on antimalarial prophylaxis are always difficult and often controversial; the subjects are healthy and do not tolerate even minor adverse effects, they may forget to take the tablets, and, even if they do remember, the drugs