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Will the new GP contract lead to cost effective medical practice ?

by Tony Scott and Alan Maynard

DISCUSSION PAPER 82

**WILL THE NEW GP CONTRACT LEAD TO
COST EFFECTIVE MEDICAL PRACTICE?**

by

Tony Scott

and

Alan Maynard

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The Authors

Tony Scott was a Research Fellow in the Centre for Health Economics, University of York from October 1990 until January 1991. He is now a Research Officer in the Centre for Health Economics Research and Evaluation at Westmead Hospital, New South Wales, Australia.

Alan Maynard is Professor of Economics and Director of the Centre for Health Economics, University of York.

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ABSTRACT

Since the mid 1980s the imprecise nature of the GP's contract and the lack of knowledge about what services were provided by general practitioners has created much argument and radical changes in the terms and conditions in the GP's contract. The old contract required a general practitioner to render those services to her patients which were normally provided by GPs. This "John Wayne contract" - a GP's got to do what a GP's got to do - permitted much discretion which some policy makers welcomed as it enabled them to "advise" the extension of GP practice and regard that as a "normal" service.

However the lack of precision such Departmental advice and general ignorance about what GPs did was inevitably challenged by demands for greater accountability and "value for money". Furthermore some research results - for instance a survey of GP working hours in Manchester and Salford - implied that some GPs might be interpreting discretion as an invitation to consume leisure and apparently work quite short working weeks.

Against this background of ignorance about what GPs do and rhetoric from the British Medical Association that asserted, in the absence of appropriate knowledge, that general practice was cost effective, the Government formulated a new contract for GPs which it imposed on the profession from April 1 1990.

The purpose of the new GP contract is to identify "core services" which must be provided by all practices and to reward performance by financial incentives.

The purpose of this paper is to describe the new contract and analyse critically the cost effectiveness of the core services it requires GPs to offer their

patients. The contract requires GPs to provide for remuneration:

- i) health checks within 28 days of joining a GPs list for all new patients.
- ii) health checks for all patients aged 16 to 74 who have not seen their general practitioner in the last 3 years or have not had a health check in the last 12 months.
- iii) an annual consultation and a domiciliary visit for all patients aged over 75 years.
- iv) cervical cytology every 5½ years for women aged 25 to 64 years of age.
- v) immunisation and vaccination services for children.
- vi) health promotion clinics.

In addition GPs can provide child health surveillance and minor surgery for additional fees.

It is cost effective to provide these services? This paper reviews the available scientific evidence and concludes that the cost effectiveness of many of the services which GPs are now required to provide is unproven.

It is possible that GPs are being induced to practice inefficiently. Such an assertion needs to be tested by careful evaluation of these services. Indeed it would have been judicious to develop the core services of the GPs contract in the light of careful evaluation rather than system-wide reform of unknown efficiency.

However given the contract is in place it is essential to evaluate these new services to determine their effects on patients' health. Such evaluation is complex and produces new knowledge slowly but it will at least facilitate the adjustment of the new contract in a way which is demonstrably cost effective.

Like many of the Government's health care reforms, the new GP contract is an attempt to address problems, such as the imprecise nature of the GPs terms and conditions of employment, with a radical and unproven new policy. Such "shots in the dark" should be recognised as such and evaluated to inform future policy choices. Without such evaluation the "next" reform of the GP contract may be based on hope rather than knowledge. No hopes, however sincere and well meant, can substitute for knowledge in the formulation of health care reforms aimed at using scarce NHS resources more efficiently.

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1. INTRODUCTION

General practice is the part of the NHS that has been subject to little or no evaluation as to the effectiveness and costs of the wide variety of services it provides. Yet it is widely believed that it is the most cost effective element in the NHS. This is due to the fact that it consumes only 7.8 per cent of total NHS expenditure, yet treats around 90 per cent of all episodes of ill health presented in the NHS. This is compared with the hospital sector which consumes nearly 60 per cent of NHS resources yet only treats 2 per cent of all episodes of ill health (Office of Health Economics, 1989).

Cost effectiveness must, however, be carefully defined. The above comparison analyses expenditure and processes and does not consider outcomes or the cost effectiveness of different, competing services within general practice itself.

Prior to April 1st 1990 the general practitioners' contract was defined only in general terms. However, since that date the range of services provided by GPs has been more formally defined (Health Departments of Great Britain, 1989). The general basis of the new contract was first set out in the government's White Paper on primary care, "Promoting Better Health" (1987).

The main aim of the new contract was to confirm formally general practice as the ideal setting for the prevention of illness and promotion of health. Various health prevention and promotion activities, most in the form of screening, have therefore been written into the new terms of service (Department of Health, 1989).

The core of the contract is the result of public demands and political

popularity, rather than as a result of careful clinical and economic evaluation. The setting of priorities in primary health care should be related to the evaluation of relative cost effectiveness of different GP activities.

This paper examines the evidence concerning the cost effectiveness of each core contract proposal and will examine the main factors affecting:

- 1) the assessment of priorities within each proposal, and
- 2) the assessment of priorities between each proposal.

More questions will be raised than will be answered because of the lack of conclusive evidence concerning the effectiveness and costs of many GP preventative activities.

In section 2 the eight main core proposals of the contract which have direct effects on patient care are set out together with the changes in GP remuneration which have accompanied the contract.

The third and main section reviews the clinical and economic evidence that exists concerning each contract requirement. The volume and quality of the clinical evidence concerning effectiveness is generally poor. The lack of economic evaluation and cost data in all but a few areas is also apparent.

One main reason for the lack of formal evaluation in General Practice is that delivery of such care is widely dispersed with each practice varying in terms of size, staffing, organisation, patterns of remuneration and quality of care. This also has implications for the measurement of the effectiveness of primary care which is made practically impossible due to the fact that GP's provide a multiplicity of services with a multiplicity of outcomes (Wilkin, 1986).

Each contract requirement is therefore examined in turn and the evidence concerning the effectiveness in terms of mortality and morbidity is reviewed. Such effectiveness can also be determined by many organisational factors. The evidence has therefore been examined with respect to its quality, volume and relevance to general practice.

Since economic analyses are rare in general practice, the main factors likely to affect GP, patient and societal costs and their relevant margins are identified. Generally, the relevant margin, in the case of the contract, is an incremental increase in the activity of concern with technical efficiency for a particular activity existing up to the point at which marginal cost equals marginal benefit. The objective being to compare the marginal benefits and marginal costs of each activity in order to assess priorities in general practice. Priority assessment must, however, be based on accurate information of such margins. A common theme throughout this paper is that such information is scarce and in most cases does not exist.

The evidence regarding the cost effectiveness of the core of the new GP contract is discussed in the fourth section and summarised in Table 1. Although explicit priorities cannot yet be established and comparable outcome measures are not yet available there are some activities, such as population health checks, whose status as legal obligations in the contract cannot be justified on the basis of cost effectiveness. In other areas, such as elderly screening, the evidence to support the effectiveness of such a requirement is mixed. In areas such as cervical screening, the inevitable extension of the programme through the introduction of the contract is hoped to improve effectiveness, even though the service has minimal effects on outcomes at the moment.

The effects of GP remuneration on incentives to provide the most cost effective services are also examined, as are the role of health targets, with the conclusion that the GP, in deciding to provide certain services should be guided by relative levels of remuneration explicitly tied to the relative cost effectiveness of different activities, rather than by legal obligations with no or little evidence of their effectiveness. Only then will patients be given care that is effective.

2. CONTRACT OPTIONS, OBLIGATIONS AND REMUNERATION.

The new GP contract has formally redefined the role of the GP, a role which will now change from the treatment of illness to its prevention, and a role which will emphasise health and well being rather than illness. However, for those GP's who have not developed their practices in this way before now, the new contract may appear radical given that they are now contractually obliged to offer a series of health prevention and promotion services to their patients.

These obligations are summarised in the new terms of service where the GP is required to "offer to patients consultations and, where appropriate, physical examinations for the purpose of identifying, or reducing the risk of disease or injury" (para. 13.2.b) and, "giving advice, where appropriate, to a patient in connection with the patient's general health, and in particular about the significance of diet, exercise, the use of tobacco, the consumption of alcohol and the misuse of drugs and solvents." (para 13.2.a)

These obligations have been accompanied by an overhaul of GP remuneration for the services they provide which enables income to be more directly linked to performance and more dependant on capitation. Capitation payments for a variety of services have been increased from around 40 per cent to around 60 per cent and other flat rate payments have been abolished or reduced. All fees referred to are at the new January 1991 level.

From April 1st 1990 the GP's new obligations have been as follows:

- 1) All new patients (except those under 5 years old) must be offered a health check within 28 days of joining a GP's list. New registrations will attract a fee of

£5.80.

2) A health check must be offered to all patients, aged between 16 and 74, who have not seen a doctor in the past three years or who have not been previously invited for a health check in the past twelve months.

The 'health check' is defined in the new terms of service for GP's and includes, i) the taking of background information concerning the patients history of illness, immunisation, breast and cervical cancer screening, allergies, hereditary conditions and medication, ii) social factors including employment, housing and family circumstances which may affect his/her health, iii) factors affecting his/her lifestyle including diet, exercise, tobacco use, alcohol consumption and misuse of drugs and solvents, and iv) his/her current state of health.

A physical examination must also be carried out and should include the measurement of weight, height, blood pressure and testing of urine for glucose and protein. This information must be recorded in the patients records and the GP must assess any further need for medical services and discuss his conclusions with the patient.

3) All patients over 75 must be offered a consultation and a domiciliary visit once a year in order to assess their need for general medical services. The capitation fee for the over 75's has increased 120 per cent to £31.45. The consultation can take place in the course of a home visit and can be carried out by a GP or a designated deputy (practice nurse/ health visitor).

Any relevant observations must be recorded in the patients records including an assessment of sensory functions, mobility, mental condition, physical condition, social

environment and use of medicines.

Other preventative measures given a high priority include:

4) The introduction of target payments for cervical cytology (replacing an item of service fee). Targets are reached when either 50 per cent or 80 per cent of women aged 25 to 64 on a GP's list have had an 'adequate' cervical smear test during the past five and a half years, where the test is taken by any source. From January 1991 cytology (and childhood immunisation) targets are to be based on average partnership lists rather than on individual GP lists. Payment is made for the proportion of the work done by the GP. For example if the GP has reached the 80 per cent target but only done 70 per cent of the work then he will be paid 70 per cent of the maximum payment, £2,280 from January 1st 1991. The 50 per cent maximum payment is £760.

5) Target payments have also been introduced for childhood immunisations for average coverage of 70 per cent and 90 per cent of all two year olds on the doctors list who have had complete courses of the following three groups of immunisations; Group A - diphtheria, tetanus and poliomyelitis; Group B - pertussis, and Group C - measles, mumps and rubella. Again the proportion of the maximum payment a GP receives depends on his relative contribution to the achievement of targets. The maximum payment for an average of 90 per cent coverage across all three groups is £1,800 and for 70 per cent coverage is £600. The same rules also apply for pre-school boosters for the under 5's, i.e. reinforcing immunisations against diphtheria, tetanus and poliomyelitis. These attract separate payments of £600 for 90 per cent coverage and £200 for 70 per cent coverage. Upper targets for cervical cytology and childhood immunisations become a bonus on intended average income from January 1st 1991.

6) GP's will also now be paid a fee for holding Health Promotion Clinics. Each

session should last one hour and have at least 10 patients. Payment is £45 per session. The clinics can include well person, diabetes, heart disease, alcohol control, diet, stress management and any others considered suitable by the FHSA.

Optional services which the GP may provide include:

7) Child Health Surveillance. This is defined in the terms of service as "monitoring the health, well being, physical, mental and social development of the child while under 5 with a view to detecting any deviations from normal development." The GP is required to keep accurate records of surveillance history and ensure that the DHA is kept informed of the procedures undertaken.

The GP will need to have adequate training as defined by the FHSA, in order to be admitted to the Child Health Surveillance list. A £5 capitation fee per child per quarter was introduced. A single GP in a group practice can carry out this service for his partners, and can share the workload with a suitably trained nurse or health visitor.

8) Minor surgery services. This may be carried out providing GP's have adequate training, which has been defined differently by different FHSAs, before admission to the Minor Surgery list. An average of five procedures a month per GP must be carried out over a quarter to receive payment, with a single GP being able to carry out his partners' quota of procedures. The government insisted that a GP on the list should be "competent in all 22 procedures", however after much wrangling, the regulations were amended so that GP's do not have to possess actual experience of all procedures to qualify for payment but must be competent in terms of qualifications.

Other changes include increased capitation which have been brought about by

the abolition of various fees and allowances and a reduction in the Basic Practice Allowance (BPA). These have been replaced by some of the new fees mentioned above. The BPA deprivation supplement has also been introduced and is currently calculated on the basis of the controversial Jarman Index, which has been heavily criticised as being based on ad hoc assumptions and out of date 1981 census data (Carr-Hill, 1988). The night visit fee is now to be paid at two levels, the higher (£45) for GP attendance and the lower (£15) for attendance of his Deputy. Practices must also now produce a practice leaflet for patients and an annual report for the FHSA. Other changes include the availability of the GP to patients for an average of 26 hours over 5 days.

3. THE COST-EFFECTIVENESS OF THE CORE

The core proposals of the contract have had, and are still having, a major effect on the way GP's carry out their work not only in terms of a changing and increasing workload but in terms of the changed incentive structure faced by GP's. This has been reflected in the establishment of a strong link between GP income and the level of service provided.

However, the positive relationship between income and the process of care does not guarantee such a relationship between process and the outcome of primary care. In effect, each of the eight proposals in the contract, outlined above, has implicitly presumed such a link exists between the process and outcome of such primary care.

Priorities within general practice are therefore determined partly by the relative profit each service generates, rather than the relative improvements in health status each generates, although the contract has assumed that these two criteria are inextricably linked. The eight proposals have been adopted with scant regard to their relative costs and their relative effectiveness in terms of improvements in health status.

The little evaluation that has been carried out in general practice has therefore been in terms of structure and process. Evaluation of this kind is set to increase substantially with the advent of Medical Audit which will have a vital role in assessing the quality of care (Marinker, 1990).

Each proposal will now be examined and existing evidence surveyed to establish whether, where possible, the introduction of the new contractual obligations and options, and the resultant extension of various services, improves the health status of

patients for a given cost. Because of the difficulties of measuring outcome, most of the evidence reviewed measures effectiveness in terms of the process of care. Effects on quality and length of life have yet to be conclusively established in most cases, and even where tenuous links have been established problems of attributability, comparability and measurability remain (Liedekerken, 1990).

3.1 Health Checks for New Patients and Infrequent Attenders

Screening healthy people for disease and risk factors of disease is one of the most controversial obligatory aspects of the new contract. GP's have generally expressed doubts about the value of three yearly checks and the specific procedures which constitute a health check (as set out in the terms of service and outlined above) which are likely to have a major effect on practice workload with little scientific evidence on effectiveness.

Thompson (1990) conducted a study inviting 94 infrequent attenders for a health check as part of a health promotion clinic in order to assess the attendance rate, the recording and identification of morbidity, and the effects on workload. Accurate practice records were recognised as important, even though the attendance rate was only 18 per cent.

One new hypertensive was found, two were recognised as being overweight, four smokers were identified, thirteen required a tetanus booster, and three women required a smear. The workload results were extrapolated to the whole practice with the authors estimating that it would cost them £2740. This included additional staff time costs, equipment costs and administration costs. The authors conclude that the value of population screening as opposed to high risk screening is yet to be established.

The South East London Screening Group (1977) conducted a randomised controlled trial of multiphasic screening (screening for a number of conditions) to assess the value of introducing a GP based screening service for 40 to 64 year olds. Each clinic was operated in the evenings with a battery of tests being performed (height, weight, visual testing, audiometry, chest X-ray, lung function tests, ECG, BP, blood tests, and stool) and questionnaires given out. Patients were screened twice at two year intervals. Fifty three per cent of morbidity detected was previously unknown with 95 per cent being neither disabling nor life threatening. In most cases little intervention was required but advice given where needed. The groups were compared after 9 years in terms of GP consultation rates, hospital admission, sickness absence and mortality rates. No significant differences were found.

Evidence from The United States and Canada also found no significant differences in health outcome and health service resource usage (in SE London Screening Group, 1977). Such screening is therefore not a cost effective activity, in terms of greatest benefit for least cost. Thus merely detecting morbidity via the use of screening does not necessarily mean that such screening and consequent treatment will be effective in reducing morbidity and mortality.

The authors argue that the screening of high risks after appropriate case finding (identifying high risks from practice records) may be of greater benefit than population screening.

The Physical Examination

The requirement of the "health check" to measure a patient's height, weight, and blood pressure and urine analysis, is also of dubious value. The measurement and

recording of blood pressure will be examined later when considering the risk factors for coronary heart disease.

The lack of evidence about the value of such examination also makes one question the rationale behind this proposal being a contractual obligation. Determination of whether a patient is obese as a risk factor for cardiovascular disease is one important consideration, but a GP would initially do this by sight.

The value of urine analysis as a screening test for glycosuria and proteinuria is also in doubt. The potential benefits of screening for glycosuria are in detecting cases of diabetes mellitus. However, Mant and Fowler (1990), in reviewing the evidence on unselective screening, argues that no evidence exists showing that early detection and treatment of asymptomatic diabetes or impaired glucose tolerance will reduce the risk of vascular complications or deterioration of diabetes.

Detection of proteinuria rarely indicates an early renal or haematological disease that requires treatment and the value of discovering such infections of the renal tract remain debatable. Mant and Fowler (1990) identify three studies that have been carried out in general practice with the proportion of new diabetics found being between 0.2 per cent and 0.5 per cent of those screened. Zilva (1985) argues that unselective testing is a crude method of testing for diabetes which is likely to have a low yield and miss all but the most severe and obvious cases. The World Health Organisation also shares the views of Mant and Zilva, "while routine testing remains an essential part of clinical examination, it is not appropriate for case finding" (in Zilva, 1985).

In terms of opportunity costs, one of the relevant margins that may be considered in most screening procedures is the marginal cost of detecting an extra

case of morbidity. In the case of proteinuria between 500 and 5000 people would need to be screened to detect one extra case, depending on the definition of proteinuria used (Mant and Fowler, 1990). The cost of a simple dipstick test, carried out during a consultation, is negligible (and can be used to identify other abnormalities) but the opportunity cost of the GP or practice nurses time in screening a large number of patients may be more substantial, although there is no evidence to support or refute this.

Unselective urine testing as defined in the contract is not a cost effective activity. Screening otherwise healthy people is therefore not justified as being a contract requirement on the grounds of cost effectiveness.

3.2 Health Promotion Clinics

Health promotion clinics are to be the main venue for the all encompassing activities of health promotion and prevention. The relatively high fee for HPC's (£45 per hourly session) have led to many GP's significantly increasing the numbers of clinics held per week. This has been done with little regard to cost-effectiveness in terms of the efficient organisation of potentially effective clinics and in terms of whether the resources could be used for another activity with proven benefits of a larger magnitude. There is currently no ceiling to the number of such clinics a GP can run, nor are there any minimum standards necessary.

The contract and terms of service only define health promotion services in terms of structure, i.e. what activities the GP should undertake, and do not specify any objectives of such promotion and prevention. The status of HPC's are currently under debate.

The setting of explicit objectives and the identification of criteria to measure the performance of preventative activities has recently been identified by policy makers in New Zealand as an integral part of improving the health status of the population.

National goals and specific health outcome targets have been set, with regional goals and targets to follow. Such goals and targets have been written into new performance orientated contracts between the government and the new Area Health Boards, which are to be subject to annual review by the government who will assess performance against targets.

Goals, targets and strategies in terms of processes and outcomes have been defined for tobacco smoking, nutrition, alcohol misuse, high blood pressure, road accidents, hearing loss (in children), asthma, coronary heart disease and stroke, cervical cancer and skin cancer. The targets were selected partly on the basis of their feasibility given present trends, and that their attainment would be "resource realistic" and focus on the most important causes of death, disease and disability in New Zealand.

The feasibility of applying such a target setting approach to general practice in the UK depends on the establishment of workable and realistic goals and targets coupled with financial incentives reflecting the relative cost effectiveness of the various activities involved.

After April 1st 1990 health promotion and prevention in the GP's new contract has been defined in terms of the structure and process of care, for example GP's are obliged to 'enquire about lifestyle' and 'give advice where appropriate', rather than GP's being financially encouraged to generate specific and measurable improvements

in the process and outcomes of promotional and preventative care.

Target coverage rates and financial incentives for cervical cytology and childhood immunisations have already taken on the idea of 'goals and targets' and may prove to be highly effective in increasing coverage. Extension of such targets to other areas of prevention and promotion, such as smoking cessation, and coronary heart disease prevention may therefore provide incentives not only to set up clinics and increase risk factor detection rates (structure and process incentives) but to generate positive gains in health status (outcome incentives). These are further examined in the discussion.

3.2.1 Risk factors for Coronary Heart Disease

Screening for risk factors of disease (and actual disease) and consequent treatment, advice and follow up is thus a major activity of these measures (and of the other proposals in the contract) with cost effectiveness of such procedures being generally determined by;

- 1) whether screening and consequent treatment will result in positive benefits for each case detected in terms of increasing length and quality of life (for it is not beneficial to the patient in detecting morbidity if little can be done about it), and

- 2) by the efficiency of the screening and treatment programme itself with regard to; i) the location, ii) who carries out the procedures, iii) the effective recruitment and identification of the population to be screened, iv) sensitivity, specificity, predictive value and yield of the screening procedure.

Many screening procedures have not yet been fully evaluated in this way but

have been appraised in terms of the process of care, for example risk factor detection rates, attendance rates, smoking abstinence rates, and percentage uptake, which all attempt to measure the quality of programmes, but not their economic and clinical efficiency.

A rationale behind the preventative proposals of the contract is the identification and treatment of risk factors for various conditions, one of the most important of which is Coronary Heart Disease (CHD). Apart from the facts that 30 per cent of deaths in men and 25 per cent of deaths in women are a result of CHD, it was also the cause of the loss of 30 million working days, £940 million in lost production and £355 million in treatment costs in 1981/82 (Holland and Stewart, 1990).

It is agreed that such activity should concentrate on all risk factors as there is more chance of reducing mortality in this way (Department of Health, 1990 and Weiner and Ferriss, 1990). This activity has recently been endorsed by the Coronary Prevention Group, which includes the BMA and RCGP (Pulse, November 1990), who have issued consensus guidance to GP's on the identification and treatment of CHD risk factors. Evidence of effectiveness has also been comprehensively reviewed by the U.S. Preventative Services Task Force (1989).

Various studies have looked at the effectiveness of screening for risk factors in general practice (Grace 1983, Fullard et al 1987 and Sacks and Marsden 1989) in terms of practice organisation, response rates to invitations, and numbers of risk factors identified and recorded in the patients records.

However, proving effectiveness in terms of improving health status only comes with effective advice and follow up of patients at risk, proven via well controlled clinical trials. Cost effective counselling and advice are still to be fully evaluated

with respect to the most efficient organisation of these activities. For example, the cost effectiveness of group versus individual advice, nurse or counsellor versus GP advice, the use of health promotion pamphlets, the number of follow up sessions required and the tailoring of intervention according to risk and age all still need to be properly addressed as to how they relate to improvements in length and quality of life. One of the reasons why this has not happened is because many risk factors remain unproven as causal mechanisms (Office of Health Economics, 1990).

Therefore the main measures of effectiveness used in most studies are in the form of reductions of measurable risk factors such as blood pressure, blood cholesterol, smoking, alcohol intake, and the increase of protective factors such as a good diet and exercise. The area for more research is in how these reductions in risk factors actually relate to reductions in the risk and incidence of disease in the UK.

The reduction in the incidence of CHD is now well recognised as one of the most important objectives of health promotion/prevention in the UK, and it is widely agreed that GP's are in the best position to facilitate such a reduction. The three main proven risk factors are;

- i) elevated blood lipid (cholesterol) levels,
- ii) raised blood pressure, and
- iii) cigarette smoking.

The extent of reducing these and reducing CHD mortality and morbidity has not yet been conclusively established, though the link between them has. Other risk factors include physical inactivity, excessive alcohol consumption, diabetes, obesity, stress, family history of CHD and low socioeconomic status.

It is also recognised that the existence of multiple risk factors have a multiplicative rather than additive effect on the relative risk of CHD (Kannel et al, 1986). One of the main studies linking reductions in risk factors to significant increases in life expectancy is the Framingham Study in the United States (Kannel and Gordon, 1973) which has followed a cohort of men for nearly 30 years.

A Kings Fund consensus statement on CHD concludes that "much of the success in reducing CHD is likely to have been the result of reductions in cigarette smoking. High blood pressure treatment has reduced death rates from stroke, heart failure and kidney failure, but appears to have had little effect on CHD. Further major impact on CHD mortality will only be achieved by reducing blood cholesterol levels." (Kings Fund, 1990).

3.2.2 Cholesterol reduction

With respect to the lowering of blood cholesterol (BC), a recent study from the Department of Health (1990) on the cost effectiveness of opportunistic cholesterol testing reviews the evidence on the magnitude of the link between reductions in BC and reductions in risk. It gives the cholesterol elasticity as being between 2 and 3, i.e. a 10 per cent reduction in BC leads to a 20 to 30 per cent reduction in the risk of CHD.

Peto (in Department of Health 1990), as part of the study reviewed all randomised, unconfounded trials and concluded that the estimated reduction in total CHD mortality two years after a 10 per cent reduction in BC was 16 per cent, with less than half the expected CHD avoidance achieved within 5 years of BC reduction. The study assumed that each CHD death prevented in middle age, on average, causes a gain in life expectancy of around 17 years, with an additional gain in quality and

length of life from avoiding non-fatal myocardial infarctions. Non-fatal attacks were also assumed to reduce quality of life by 10 per cent.

The study concentrates on the cost effectiveness of lowering cholesterol and gives a cost per QALY of £2,979. This figure is shown to be crucially dependent on the amount of prescribing of cholesterol lowering drugs to the more severe cases and the type of treatment received. Values range from £44/QALY for men aged between 40 and 69 whose treatment is a diet only, up to £19,000/QALY using intensive drug therapy. The figure of £2,979 is judged to be "the most realistic estimate". However, the costings used in the study were crude and it must be remembered that there is no clear evidence that lowering BC saves lives (MRC response to Department of Health report). The report also assumes that GP based dietary counselling by nurses reduces BC by 5-15 per cent, when the evidence is taken from hospital lipid lowering clinics.

A randomised controlled trial of the effect of GP based nutritional advice, which may help reduce cholesterol levels, (Baron, 1990) proved inconclusive. A questionnaire, booklet and two follow up sessions in the study group lowered cholesterol significantly after three months but the differences narrowed after one year. The evidence concerning the use of diet in reducing the risk of CHD is not conclusive although the link between diet and good health has been long established (U.S. Preventative Services Task Force, 1989 p50).

The GP must also consider cost effectiveness in terms of the other more beneficial services he may provide, which the Department of Health study did not consider, and he/she has to reconcile these results with the characteristics of his practice, his methods, and his population at risk. The cost effectiveness of such screening in 25-39 year olds was estimated at £28,560/QALY, thus the GP must target treatment at those at most risk.

The evidence presented in the report therefore suggests that opportunistic BC screening will be most cost-effective when priority is given to individuals at high risk, with minimum use of drugs, and with adequate follow up and advice. Many organisational issues concerning the cost effectiveness of lowering cholesterol still need to be addressed in terms of reliability and validity of the different screening methods available, such as desk top analyzers (Leese and Hutton, 1990 and U.S. Preventative Services Task Force, 1989) and whether population screening should be introduced as opposed to opportunistic screening. On this latter point, however, the consensus is that opportunistic screening is more cost effective, accompanied by screening for other CHD risk factors.

3.2.3 Hypertension Reduction

High blood pressure is not only thought to be a major risk factor for CHD but also for stroke, heart failure (myocardial infarction) and kidney failure. High blood pressure is also one of the best predictors of risk for CHD (Holland, and Stewart 1990).

The commonest cause of death in patients with hypertension is myocardial infarction which occurs two to three times more frequently than does death through stroke (Cruickshank et al, 1987). Stroke is potentially a greater source of distress as disability can be profound which places a large burden on society and family.

Many U.K. studies have shown that lowering high blood pressure with the use of drugs prevents non-fatal and fatal strokes and other non fatal cardiovascular events but confers no obvious benefit in preventing deaths from CHD. Evidence from the United States indicates that reductions in CHD mortality of 20 per cent may be

possible in patients with mild hypertension (in U.S. Preventative Services task Force, 1989 p24). Recent evidence, however, suggests that lowering blood pressure below a certain threshold will increase the incidence of myocardial infarction (Criuckshank et al, 1987). No single treatment programme has yet proved particularly effective (MRC working party, 1988) although results of an MRC trial estimate that the risk of stroke can be halved over a five year period if patients remain compliant to drug treatment (MRC, 1988).

A cost analysis of mild hypertension programmes was carried out by Edgar and Schnieden (1989). This looked at two hypothetical alternatives, both based in general practice. The first was a population screening programme where all 35 to 64 year olds were invited to attend an evening session for counselling and measurement of blood pressure (3 blood pressure readings). The second used an opportunistic case finding approach where blood pressure was tested as the patient presented to the GP for another reason. Both identified groups were offered the same drug treatment and follow up over five years.

NHS and patient costs were estimated (GP/nurse time, drugs, tests, equipment, evening surgery opening, cost of invitations, patients travel, travel time and time in clinic) with both patients working and leisure time costs estimated. Effectiveness was obtained from the MRC trial whose results were generalised. Costs and benefits were discounted to reflect their differential timing.

The results favour the opportunistic case finding approach with a cost per stroke prevented of between £17,000 and £23,900, compared to a cost per stroke prevented of between £25,000 and £42,600 for the population screening alternative. This, the authors argue, provides a strong case for opportunistic screening as opposed to population screening for hypertension.

As well as having implications for HPC's, these results also apply to the contract requirement of measuring blood pressure during three yearly health checks and checks for new patients. The above results suggest, however, that such requirements are misplaced and that it would be more cost effective to have a contract requirement obliging the GP to take blood pressure readings during the course of a normal consultation.

3.2.4 Smoking Cessation

As well as being a major risk factor for CHD, cigarette smoking is, along with diet, the main risk factor for all types of cancer (with 75 per cent of lung cancer attributable to smoking (Godfrey, et al 1989)) as well as being a risk factor in stroke, chronic lung disease and various circulatory disorders. Godfrey et al (1989) estimated that in England and Wales nearly half of all life years lost due to cervical, bladder, pancreatic, laryngeal, lung, breast, and colorectal cancer were attributable to smoking. The World Health Organisation views the eradication of smoking as the most potentially effective preventative health measure that developed countries can take (Ramstrom et al, 1988).

Given the large potential avoidance of mortality and the relatively low cost of giving effective advice and counselling, prevention is widely believed to be one of the most cost-effective activities in general practice (Russell, et al 1979). However, the cost effectiveness of such prevention depends on the organisation of prevention in general practice, with the wider question of whether mass health education is more cost effective.

Routine advice from GP's has produced abstention rates of between 3 per cent

and 23 per cent after one year, these rates increasing when patients attended follow-up visits, were shown concentrations of tobacco products in their systems and used nicotine chewing gum (Richmond et al,1986).

In terms of overall national cessation, it is argued that a 5 per cent success rate among 10,000 people is 333 times more effective than a 30 per cent success rate by group work with 50 subjects (Chapman, 1985). Specialist clinics are therefore seen as not cost effective as they only benefit 0.2 per cent of smokers wanting to stop and are extremely labour intensive (Chapman, 1985). The GPs' daily contact with thousands of smokers is, however, assumed to be highly cost effective.

Clearly more clinical and economic evaluation is needed to determine the cost effectiveness of the various locations for prevention (general practice versus specialist clinics versus national health promotion) and of the various methods to help someone reduce smoking (psychological advice, versus pamphlets, versus GP advice, versus practice nurse advice, versus nicotine chewing gum).

Only a few studies have attempted to answer some of these questions. The U.S. Preventative services Task Force (1989) examined the evidence concerning the role of counselling to prevent tobacco use and concluded that effectiveness depends on a variety of factors including the number of contacts with the patient, the number of months of intervention, the use of personal face to face advice, the type of counsellor, and the level of nicotine dependence in the patient.

A three year evaluation of a GP programme to help patients stop smoking was carried out (Richmond et al, 1986) using patient education and support administered by GP's. The groups were recruited opportunistically, with the study group given a questionnaire and a smoking diary with six monthly follow up sessions including

pamphlets, advice and photographs showing the effects of smoking on the body. Biochemical tests were used to ascertain cessation. The groups were telephoned after three years with 36 per cent in the study group abstinent compared with only 8 per cent in the control group. The authors conclude that more intensive intervention seems to be more effective.

One main feature of the working of the contract is that it will be more profitable for GP's to delegate health promotion and prevention activities to practice nurses and other members of the primary health care team. Whether this is more effective has yet to be established.

A randomised trial by Sanders et al (1989) examined the effect of anti-smoking advice by nurses. Eleven practices in Oxfordshire were involved with 4330 smokers identified and 751 randomised between treatment and control groups. Practice nurses received a two day training course. There was no significant difference after one year. The trial was, however, poorly designed with many confounding variables present.

A trial by Hjermann et al (1981) looked at the effect of dietary counselling and smoking cessation advice on the incidence of CHD. 1232 subjects were followed up for 5 years. A dietician gave a 30 minute initial consultation with anti-smoking advice given individually and in group sessions. The incidence of myocardial infarction and sudden death was 47 per cent lower in the intervention group.

A trial which took place in a Health Maintenance Organisation (Ershoff et al, 1990) examined the cost effectiveness of cessation advice during pregnancy. The money saved by avoiding one preterm birth would be enough to cover the smoking cessation programmes costs for more than 500 women. Improved birth outcomes were apparent in the intervention group and a benefit-cost ratio of 3:1 was estimated. Thus

smoking cessation advice during pregnancy is a cost effective activity.

The evidence is therefore mixed, highlighting the need for more research with regard to the costs and effects of general practice based advice by practice nurses.

Again, no economic evaluations have been carried out to assess the costs of such advice, but, as mentioned earlier it is widely believed that such advice and follow up is one of the most highly cost effective activities in general practice in terms of obtaining greatest benefit for least cost. More evidence is needed to confirm this belief.

3.2.5 Alcohol Consumption

Alcohol is a risk factor for cardiovascular disease and can inflict irreversible damage on every organ in the body, particularly the liver, gastrointestinal tract and nervous system. It is also associated with psychiatric disorders, criminal behaviour, road accidents, family violence, absenteeism and many other social bads. The financial costs to industry and the NHS are estimated at nearly £2 billion at 1987 prices (Maynard, 1989). One in seven men and one in thirty women are categorised as being excessive drinkers in the UK (i.e. as defined by consumption of over 35 units per week for men and over 20 units a week for women).

As with most risk factors effective screening and subsequent treatment and advice are essential and need to be thoroughly evaluated with respect to effects on mortality and morbidity.

Reviews of the evidence (Babor et al 1986, Hodgson 1989 and U.S Department of Health and Human Services 1990) on secondary prevention of alcohol abuse cite

several studies showing effectiveness in terms of decreased mortality, but these then need to be applied in general practice of which there is little evidence of such effects. For example, the Malmo project in Sweden identified 585 men between 46 and 69 as heavy drinkers. A biochemical test (GGT) was used to identify reductions in consumption. The sample was randomised, with the intervention group given a physical exam, interviewed and offered appointments every third month with the physician and every month with a nurse who repeated GGT assessments.

The results were evaluated at two and four years with a significant reduction in GGT levels in the intervention group, and the control group spending three times more days in hospital for alcohol related conditions and being absent from work significantly more often. At five year follow up there were twice as many deaths in the control group as in the intervention group.

Evidence from a trial at Edinburgh Royal Infirmary (Chick et al, 1985) is also cited as showing the effectiveness of brief interventions with problem drinkers. Again the GGT test was used, with the intervention group, after an initial interview, having a further thirty to sixty minute counselling session and being given a booklet. At 1 year follow up only 35 per cent of the intervention group had drinking problems compared to 62 per cent in the control group.

However, as with smoking and dietary advice, effective treatment will depend on who gives the treatment and advice, its location, and its quality. Thus more studies need to be carried out in a general practice setting.

Some specialist alcohol clinics have a 60 per cent to 70 per cent success rate after one year but require a large input of manpower of 45 hours per client (Babor et al, 1986). Ten session behavioural self control training have shown similar success

rates with considerably less resources. However, Miller (in Babor et al) has shown that a self help manual is as effective as 10 sessions of behavioural self control training using experienced therapists. "The evidence clearly supports the proposition that such low cost intervention is appropriate when the aim is not the treatment of the relatively small number of alcoholics who are severely dependant, but rather the large and increasing numbers of people who simply drink too much." (Babor et al, 1986).

Results of other programme evaluations suggest that modest but reliable effects can follow from brief interventions, especially with the less serious type of problem drinker. Babor concludes that low intensity, brief interventions seem to have much to recommend with the potential to reach large numbers, while recognising that different types of drinkers and cultural groups will respond differently.

A randomised controlled trial over 12 months was carried out (Wallace et al, 1988) and the treatment group were interviewed, received advice and information and given a drinking diary by their GP. Patients were followed up at one, four, seven and ten months with detailed assessment at six months and one year. A 45.8 per cent reduction in consumption was apparent in the study group compared to a 27.3 per cent reduction in the control group, with evidence of a dose-response relationship. However, the results were based on self reported consumption. Self reported abstention among smokers has been shown to have a 40 per cent deception rate. The authors argue that the GGT test is not reliable at relatively low levels of consumption.

The applicability of such results to general practice still needs to be evaluated. A recent study in the Lancet (Drummond, 1990) suggests that GP care of problem drinkers is at least as effective as specialist clinics. However, GP care was preceded by detailed assessment at the clinic and was supplemented by regular GP contact with

the clinic.

Most of these results on effectiveness and success of the various combinations of intervention are dependent on patient characteristics, the definition of a high risk, excessive drinker, the reliability and validity of the various questionnaire screening tests used to identify such drinkers and the form of subsequent treatment.

3.2.6 Diabetes

The main benefit of the early identification of diabetes is in minimising complications such as kidney damage, damage to the nervous system and eye problems such as retinopathy (including blindness in old age). Such clinics would therefore concentrate on improving the quality of life of diabetics by reducing morbidity from the disease, although diabetes is also recognised as a potential risk factor for CHD (though as a risk factor its onset cannot be prevented or reduced). Diabetic care and better management of the condition is therefore one of monitoring and continuing education as to diet, exercise and attitudes (given that 60 to 90 per cent of non-insulin dependent diabetics (type II) are obese in the United States (Kaplan, et al 1987)) with effectiveness involving improvements in quality of life rather than length of life. Kaplan et al (1987) cites evidence concerning the positive effects of diet and exercise but concludes that it is not clear which lifestyle interventions will be the most effective.

A cost utility analysis by Kaplan et al (1987) evaluated the costs and improvements in 'quality of well being' from 4 interventions with a sample of 76 adults with type II diabetes. The interventions were diet, exercise, diet plus exercise or education (control). The most effective treatment over an 18 month period in terms of health status, measured by the Quality of Well Being Scale, was found to be

diet plus exercise which showed a steady improvement in quality of life throughout the study. Only the diet plus exercise and control groups were subject to cost utility analysis. Costs and benefits were discounted only as part of sensitivity analysis and was found not to alter the results. Each participant gained an extra 0.092 well years as compared to the control group, at a cost of \$1000. This gives a cost utility of \$10,870 per well year gained.

Evidence of the value of identifying diabetes at an early stage is, however, not conclusive as it may simply label an otherwise healthy person as being ill with no improvement in prognosis, in the case of non-insulin dependent diabetes (Holland and Stewart, 1990).

The value of such a clinic being held as opposed to a smoking cessation clinic, assuming costs are similar in terms of staff time, is therefore doubtful. GP clinics may also be seen as an alternative to hospital clinics. Again, more clinical and economic evidence is required before we can make any firm conclusions as regards cost effectiveness.

3.2.7 Other Clinics

Primary and secondary preventative strategies for AIDS have become increasingly important given the lack of effective treatments. The adverse consequences of this disease are now well known, as are the general methods of primary prevention. The cost effectiveness of primary GP preventative advice and pre and post-HIV test counselling have not yet been evaluated in terms of increases in quality of life, in modifying risk factors and how these are quantitatively related to reduced risk of contracting AIDS. Some research has however, examined these aspects (Chester, et al 1988). Effectiveness would depend on who is targeted, how they are

targeted, their subjective assessment of their risk, and the costs and benefits to them of changing their personal behaviour (Drummond and Davies, 1990). Much research evaluating the benefits of prevention still need to be carried out.

Of other sexually transmitted diseases, there are half a million new cases a year, having significant effects on health service resource use. Long term cancer of the cervix, of which there were 1900 deaths in 1984, 10,000 hospitalisations and many more outpatient attendances, could be another goal of primary prevention coupled with cervical screening (to be looked at later). Clarke (1985) asks whether such morbidity and mortality could be avoided by better organised primary prevention in general practice, with responsibility given to an appropriately trained practice nurse, involved, not only in primary prevention clinics, but in the cervical cytology and breast cancer screening programmes. However, there is currently no evidence to support or refute the potential effectiveness of such a clinic. GP's must bear this in mind when deciding on which clinics to run in their practices.

Physical exercise is associated with improving health status in several areas including CHD, hypertension, osteoporosis and diminished psychological well being (U.S Preventative Services Task Force, 1989). Physically inactive persons are twice as likely to develop CHD as are persons who engage in regular physical activity. The U.S Preventative Services Task Force cites evidence of a consistent association between physical activity and reduced incidence of CHD. However, there is a limited amount of evidence regarding the ability of GP's to influence the exercise behaviour of patients.

Several other clinics have been approved by some FHSA's with little or no evidence of their cost effectiveness as compared to other types of health promotion clinic. These include Travel clinics giving advice on immunisations and vaccinations,

medical services, safe eating and drinking and other medical advice appropriate for people travelling abroad. A spiritual healing clinic has also been approved by one FHSA, as has an acupuncture clinic and an Exercise Clinic showing a Jane Fonda Workout video ! (Pulse, November 3rd, 1990). Other clinics sometimes held include asthma, menopause, epilepsy and arthritis.

3.2.8 Resource Consequences of GP Preventative Services

The resource usage of HPC's can reasonably be assumed to be the same across different types of clinic in terms of staff time, equipment and patient travel costs. The cost of a Health Promotion Clinic, from a GP's point of view, will be nursing time less 70 per cent reimbursement from the FHSA and less a 40 per cent tax allowance, plus the cost of premises, equipment, receptionists time, general administration and power, less any reimbursements.

GP's will then offset these costs against income received from the FHSA which will include the sessional HPC fee, any item of service fees obtained during the course of a clinic (e.g. tetanus boosters) and dispensing fees on vaccines (costs and income will obviously vary for different clinics).

Profits for HPC's have in some cases increased by 1000 per cent (Medeconomics, July 1990). However, from a societal point of view, costs, in terms of resource use, would include all FHSA reimbursements and all income payments to the GP, due to the fact that "society" is interested in the GP's use of all resources.

A societal viewpoint would also encompass patient costs. Such costs should not only include travelling costs and the time costs of the patient and family but also any adverse psychological costs brought about by, for example, high false positive rates

and labelling an otherwise healthy person as ill after the recognition of a risk factor, whose treatment would not alter prognosis (e.g moderately raised blood cholesterol).

The general organisation of health promotion services will be a major factor affecting their cost. For example, three yearly health checks and health checks for new patients can be organised into HPC's run by the practice nurse. The frequency of clinics will have a bearing on their cost and this will in turn be dependant on the percentage of the list eligible for these services.

One important aspect affecting the cost effectiveness of general practice based screening programmes is the method of identifying and encouraging the participation of the relevant target population. This can be seen in terms of opportunistic health promotion versus HPC/invite based health promotion. Opportunistic invitations and consultations are generally seen as being more effective in terms of high attendance/coverage rates and in terms of least cost.

Attendance at HPC's depend vitally on the method of notification. Many studies exist giving wide variations in attendance rates depending whether the patient was invited by letter or invited when presenting for some other health problem, the latter being shown to be the most effective.

One study has shown that it is generally the low risk groups who attend clinics and respond to written invitations. Pill et al (1988) found that attenders were of a higher social class, were employed, had no dependants, had no children under 5 and were more highly educated. "Offering cohorts of patients additional screening is unlikely to be efficient or effective because high risk people are known to attend GP's more than low risk, yet low risks are more inclined to respond to a specific invitation for screening" (Pill, et al 1988). Other studies also show that likelihood of

acceptance to attend is inversely related to patients' cardiovascular risk (Waller, et al 1990).

Face to face, opportunistic invitations to clinics are therefore seen as more effective than written invitations, with respective response rates of 91 to 94 per cent compared to 36 to 63 per cent (Mann, et al 1988) and will also reach more of the high risks in the population. Written invitations also use more resources in terms of administration and efficient call/recall systems.

Given that only low risk groups attend GP initiated clinics and that 70 to 85 per cent of the average practice population visit their GP once a year and 90 per cent once every 5 years, it is widely believed that opportunistic screening and advice (i.e. during a consultation initiated by the patient for some other reason) is more cost effective than population screening.

The South East London Screening Group (1977) argued that organised programmes of multiphasic (i.e a battery of tests) health checks are a waste of time since many procedures could be carried out opportunistically, given that 93 per cent of all patients in the group studied had attended their doctor at least once in the past five years.

The effective banning of using opportunistic consultations as counting towards an HPC sessional fee may therefore act as a disincentive towards giving health promotion advice during routine consultations. However, many (Holland and Stewart, 1990) believe that only through opportunistic consultations will GP's reach the high risk groups, coupled with the fact that such consultations are believed to be more convenient to the patient. GP's now have a financial incentive to keep consultations exclusively for the treatment of illness and HPC's for its prevention.

3.3 Screening the Over 75's

3.3.1 Effectiveness

The objective of this contractual obligation is not clear but is thought to be linked in with the governments community care proposals (Freer, 1990). The main benefits of such screening are thought to be in detecting unmet need rather than in mass screening for the prevention of disease - this activity is referred to as case finding.

MacLennan (1990) argues that some "serious" disorders go unrecognised. Practice surveys have found that only two fifths of over 75's with acute depression were receiving treatment, less than three quarters with moderate or severe dementia had had their problem identified by their GP and that two fifths of over 80's with painful feet were receiving chiropody. This does not mean that a GP's (or health visitor/practice nurse) intervention will improve quality and length of life however. As with most screening activities, effective follow up and monitoring is needed to determine whether health outcomes be affected.

There is a fear that, as with three yearly health checks and health checks for new patients, GP's will see fit and healthy people. Given that some 86 per cent to 90 per cent of patients over 75 visit their GP's at least once a year, and that a GP has on average 6.3 consultations a year with each patient aged over 75 and that infrequent attenders are generally fit and healthy (Bowling, 1989) then the bulk of such visits could be done opportunistically (Freer, 1990).

Actual evidence (see below) for the effectiveness of geriatric screening points

to the fact that the main benefits come in terms of quality of life and increased morale, with little effects on mortality and hospital usage. There is also little evidence that case finding would lower the rate of functional decline or the probability of admission for long stay care (Stringfellow, 1986).

A randomised controlled trial by Vetter et al (1984) examined the effectiveness of home visits for the over 75's by two health visitors, one in a rural area and one in an inner city area, who assessed physical, mental and social factors via the use of questionnaires. Intervention groups reported a non-significant increase in quality of life, measured by assessing physical, mental and social factors using questionnaires, with a beneficial effect on mortality in the inner city area. They concluded that in most cases patients may require more than two years of visiting to affect mortality and morbidity.

McEwan et al (1990) also used a randomised trial to evaluate effectiveness of screening the over 75's. 296 subjects were randomised with the study group assessed using three different questionnaires, the McMaster health index, the Philadelphia Morale scale and the Nottingham Health Profile. Follow up advice and booklets were given and patients seen 20 months later. Morale was significantly better in the intervention group and emotional reaction and isolation significantly worse in the control group.

Hendriksen et al (1984) found that three monthly visits aimed at medical and social intervention in the over 75's reduced the death rate and hospital and nursing home admission in the study group over three years. Tulloch and Moore (1979), however, in a two year, general practice based study found no significant impact on the prevalence of socioeconomic, functional and medical problems affecting health.

Effects on morbidity have recently been highlighted by Fries (1980, 1989a, 1989b) who examines morbidity in old age from a lifetime perspective of prevention. He argues that the main effects of preventative medical interventions in the early twentieth century were to increase life, with the result that average life expectancy has risen dramatically. However, with the limits to the extension of life almost reached and the fact that further extension of life merely increases morbidity, he argues that the future scenario will be one of an increasing age of onset of chronic disease resulting in a "compression of morbidity".

Delaying the onset of chronic disease (coupled with a relatively fixed life expectancy), Fries argues, must be the main aim of future health promotion strategies aimed at the elderly. Exercise and other healthy activities in youth may have no effect on morbidity in old age unless they are continued throughout life or started later in life. The preoccupation of the worlds' medical profession with the extension of life is therefore now misplaced, "The primary purpose of population interventions, risk assessment, and risk reduction in developed societies is to compress morbidity and to improve the quality and vigour of life." (Fries, 1989b).

A trial by Fries in California used a sample of 6000 (middle class) retirees who were divided into three groups: one received a low cost health promotion package, one received questionnaires only and the control group received no such attention. The groups' characteristics were similar and follow up was at six and twelve months. There was a 20 per cent reduction in the cost of medical insurance claims by the experimental group with such savings six times greater than the cost of the health promotion intervention. Social class may, however, have had a significant role to play in the above results.

Fries therefore argues that health promotion for the elderly has been neglected

in the United States. Morbidity compression is therefore a feasible option enabling the quality of life to be increased and health service resources freed for other, more beneficial, uses.

The current evidence on the effectiveness of annual screening of the over 75's is therefore inconclusive with marginal effects on morale and quality of life. A shift of emphasis towards health promotion in the elderly and the compression of morbidity may produce greater gains in the quality of life for elderly people than are produced at present. Again, more evaluation is necessary of the effectiveness of the methods to assess the elderly and the potential efficacy of compressing morbidity.

3.3.2 Resource Consequences

This contract obligation represents a significant increase in workload and may necessitate the hiring of an extra practice nurse, given that each home visit may last more than one hour and that extra administration costs will have to be borne. Some smaller practices may hire joint practice nurses to deal solely with this requirement. Such costs are likely to be around 18 hours a week of health visitor's time for a practice of 4000 patients (MacLennan, 1990). Consultation based screening can be carried out in the form of a clinic attracting a sessional fee which, with increased capitation, may offset the GP borne costs of home visiting, but would merely increase the costs to society.

However, such costs must be offset against the fact that 90 per cent of the average elderly practice population visit their GP at least once a year. From the GP's point of view, the capitation fee may go some way to offsetting such costs, but again the societal point of view would include this fee as a cost.

3.4 Cervical Cytology

Cervical cancer is associated with smoking, oral contraceptives, multiple sexual relationships and pregnancy outside marriage. Since the cause has not yet been established, secondary prevention in the form of cervical screening must be used. The prevalence of a 'truly important' cytological abnormality is estimated to be between 0.02 per cent and 0.3 per cent which rises rapidly until around the age of forty, then levels off (Smith et al, 1989). The protection afforded by screening is thought to be high in the first three to five years but disappears after ten years when the incidence is the same as a non-screened population.

With respect to the contract, the cost effectiveness of the introduction of 50 per cent and 80 per cent targets must be looked at in terms of the resulting marginal extension of the cervical cytology programme. Whether the introduction of target payments has increased coverage of the population (specifically the high risk population) is yet to be seen but by November 1990 54 per cent had achieved the upper target and 35 per cent had achieved the lower target (Doctor, 29th November 1990).

Thus the relevant marginal benefits must be seen in the context of an incremental increase in coverage and the resultant effects on mortality, while the relevant marginal costs include the additional increase in GP and Health Authority Laboratory workload, increases in GP's remuneration via the introduction of target payments and increases in false positive rates.

3.4.1 Effectiveness

One area of agreement is that there is incomplete knowledge about the natural

history of the pre-invasive disease and no way of predicting which pre-cancers will become malignant as 60 per cent of abnormal smears revert to normal. Department of Health and Royal College of Obstetricians and Gynaecologists guidelines (Intercollegiate Working Party, 1987) recommend that even minor abnormalities should be investigated. False positive rates are therefore thought to be high (20 to 45 per cent in the United States, (U.S. Preventative Services Task Force, 1989)) and dependent on the cut off point to referral for colposcopy (a diagnostic test). It is argued that only pre-smear counselling and education can reduce some of these adverse psychological costs (Johnston, 1989).

The potential of cervical screening to reduce mortality and morbidity is now acknowledged (Laara, et al 1990). However, doubts about effectiveness in the UK have been reinforced as a result of increases in mortality among young women and an overall number of deaths exceeding 2000 a year since the 1960's. UK mortality has only dropped from 12.53/100,000 to 9.10/100,000 between 1968 and 1984, with an increase of 0.22/100,000 to 0.91/100,000 in the under 30 age group. The introduction of the UK programme in the 1960's was a result of "enthusiasm running ahead of critical appraisal", (Day, 1989). There has never been a randomised controlled trial, and probably never will be due to ethical considerations.

Most of the evidence of beneficial effects on mortality is from the United States and Scandanavia (Holland and Stewart 1990, U.S. Preventative Services Task Force 1989 p58, and Laara, et al 1987) which look at time trends associating mortality rates with intensity of screening programme coverage. However, observational studies do not constitute direct evidence that screening was responsible for the findings.

Falls in mortality in five Nordic countries were between 5 per cent and 80 per cent (Laara, et al 1987). If the Scandinavian experience had been repeated in the UK

a 75 per cent reduction in the incidence of cervical cancer may have been apparent (Pulse, 20th October 1990). Hakama (1976) argues that near complete coverage by programmes in the Nordic countries was responsible for their success.

The only positive evidence in the UK is from a screening programme in North East Scotland (Duguid et al, 1985) which also links intensity of coverage to reductions in mortality.

A negative link between screening and mortality appears to exist but its magnitude in the UK has still not been evaluated even though we have a national programme consuming a large amount of resources each year.

3.4.2 Organisation

This is one area which has caused the failure of the UK programme of cervical screening, which has been widely debated. The success of many of the Nordic programmes have not led to a consensus as to how screening should be organised with a consequent lack of a clear focus of responsibility in the UK. Holland and Stewart (1990), in reviewing the issues concerning the efficient organisation of the national screening programme, conclude, "It is generally agreed that the problem is not so much one of money or of expertise but of organisation, accountability, and commitment."

In terms of effective organisation within general practice, smear clinics need to be run flexibly and must have adequate back up in the form of counselling and education. The quality of the smear test itself must also be subject to more evaluation. The call recall system is now locally based at each FHSA with a national average response rate of 51 per cent (Smith et al, 1989) which could be increased by a GP based call/recall offering more flexible appointments, keeping records up to

date and sending more 'personalised' invitations. Target payments may now cause this figure to rise. The costs associated with this will be examined later.

As with most invitations to attend clinics, non-responders are at the greatest risk (Johnston, 1989). One cause of failure in the UK has been due to a failure to promote cervical screening among those at greatest risk, especially women aged over 40. In the UK one third to one half of such women have never been screened (Smith et al, 1989). Johnston (1989) argues that this could be remedied by taking full account of women's attitudes to screening and trying to change them by education and counselling.

Opportunistic smears (smears taken over and above the requirements of the national programme) may at first seem a cost effective method of reaching the high risks but some argue that such smears are taken from the wrong women and too few taken from the right ones. Opportunistic smears also have implications for the workload of health authority labs, "District Labs refusing such smears are doing the population a service." (Day, 1989).

General practice is now 'in competition' with local health authority clinics. The DHA in its new purchasing role may not want to duplicate services which GP's are already providing, thus the new purchaser/provider relationships may help clarify responsibility.

Other problems and areas of debate include the quality of the screening test itself, monitoring and evaluation, and the adequacy of follow up for abnormal smears. All of these factors will affect the costs and effectiveness of the UK programme.

There is therefore much debate in the UK concerning the effectiveness and

organisation of the cervical screening programme which can only be resolved with more research, evaluation, and better organisation.

3.4.3 Resource Consequences

The matter of interest however, is whether the extension of the programme in general practice is feasible from a cost effectiveness point of view. The only objective referred to in the contract concerning the targets is in terms of increasing coverage of women aged between 25 and 64.

Evidence that this is effective has already been examined (Laara et al, 1987) where Iceland targeted the widest age range with 100 per cent coverage of the 25 to 69 age group which was linked to an 80 per cent decrease in mortality. Assuming that an increase in coverage will take place due to target payments (nine out of ten GP's are currently hitting targets, 54 per cent the higher target and 35 per cent the lower target), we must now consider the extra costs incurred.

One of the relevant costs to be considered are the marginal costs of detecting one extra case of pre-invasive cervical cancer. Data from a laboratory serving two districts in Exeter (Anthony and Kelly, 1987) show that cytology detected 518 potentially lethal lesions between 1979 and 1985 and estimated that, assuming a 40 per cent risk of progression to invasive cancer, 207 cases at all ages were prevented at a cost of around 140,000 smears. This gives an average of around 676 smears per case prevented and 270 smears per case detected.

The frequency of screening is also a major determinant of costs. Computer modelling of the neoplastic sequence has suggested that five year smears may reduce the incidence of invasive disease by 85 per cent and three year smears by 90 per cent

(Smith et al, 1989). Estimates assume that a five year interval will prevent 4000 cases at a cost of 3.5 million smears and a three year interval will prevent 4300 cases at a cost of 5.5 million smears (Smith et al 1987). This gives a marginal benefit of 300 cases prevented at a marginal cost of 2 million smears, if the frequency of screening is reduced from five to three years.

Costs of increasing coverage also include the extra costs incurred by health authority labs. These are reported to have increased with the introduction of government guidelines (Intercollegiate Working Party, 1987) and can only increase further with the introduction of targets. Estimates from the National Association of Health Authorities and Trusts put a figure of £6 million on extra pathology services created by the contract, a substantial proportion of which may be due to cervical smears. The lab serving Rotherham district have reported that smear numbers taken by GP's have increased by between 30 per cent and 54 per cent since 1989 (Slater, 1990). Such extra costs will be shifted onto the budgets of GP fundholders in the future who may then target smears at those who have a greater potential capacity to benefit from them.

The main way forward is therefore in targeting more efficiently those at high risk, better organisation of the programme itself, and the setting up of cohort studies coupled with economic evaluation to see if increasing uptake in the UK is a cost effective use of resources.

3.5 Childhood Immunisations

As with cervical cytology, cost effectiveness should be seen in terms of the extra benefits and extra costs associated with GP's increasing immunisation uptakes above the status quo. Again, these marginal considerations have not yet been studied.

The top contract target of 90 per cent is in line with World Health Organisation targets, who eventually envisage the eradication of the respective diseases. However, the eradication of disease is not a worthwhile goal, as compared to other activities in health care, if it is found that it takes a considerable amount of resources to increase uptakes by a small percentage in order to eliminate the disease. The setting of such goals takes no account whatsoever of the cost effectiveness of different activities in health care.

3.5.1 Effectiveness

"Immunisation of children is one of the most cost effective activities in health care." (Nicoll et al, 1989). Statements such as this are common in the literature as are statements highlighting the effectiveness of vaccination on mortality and morbidity.

Nicoll et al (1989) cite several studies from the United States showing the cost effectiveness of vaccines in terms of benefit/cost ratios with measles 12:1, rubella 8:1, and whooping cough 11:1. There are no such studies in the UK however.

There are among 90,000 to 100,000 cases of measles notified each year in the UK, with 10 per cent of patients experiencing complications. Around 90 to 100 develop measles induced encephalitis of whom 15 per cent die and 25 per cent have residual sequelae (Banatvala 1987 and Fine and Clarkson 1983). Other complications include pneumonia, bronchitis, croup, laryngitis, diarrhoea, otitis, deafness and blindness.

The vaccine was introduced in this country in 1963 when its ability to provide protection "was rapidly demonstrated" (Fine and Clarkson, 1983). In terms of

eradication of disease, 94 to 97 per cent of children have to be immunised to reduce the reproduction rate to less than unity, i.e. so that more cases are prevented than are spread. Only when this rate is reached can the goal of eradication become real.

The World Health Organisation has set a European target of 90 per cent coverage of all children by 1990 and complete coverage by the year 2000 (Begg and Noah, 1985). This has not yet been achieved in Britain as the country has one of the worst records of the industrialised countries. Uptake of measles vaccine in England and Wales is now 68 per cent which is comparable to pertussis but well below 85 per cent diphtheria, poliomyelitis and tetanus, with mortality and morbidity from the latter at an all time low (Begg and Noah, 1985).

A joint measles, mumps and rubella (MMR) vaccine was introduced in 1988, with a secondary external benefit being to eliminate the hazard of pregnant women being infected by young children. (2.8 per cent of 72,200 pregnant women are susceptible to rubella, Banatvala, 1987).

Pertussis vaccine is acknowledged as being effective in reducing the incidence of whooping cough in the UK (Jenkinson, 1988). The many attempts to measure its effect have produced widely differing figures for its efficacy and little information about the duration of its effect and its costs, and all studies have been cross sectional.

Contraindications and adverse side effects of such vaccines were highlighted during several court cases in 1986/87 where brain damage was linked to whooping cough vaccine. The evidence of side effects were gathered during a court case with the judge concluding that there was incomplete evidence to establish causation (Dyer, 1988). The National childhood encephalopathy study, a three year case control study

was set up to establish whether the vaccine caused brain damage, and concluded in 1982 that it can do so in only 1 in 300,000 cases. It is now widely believed that the benefits of immunisation for whooping cough outweighs any possible risk of vaccine induced disease.

The benefits of immunisation, in terms of protection of the population from disease, accrue well into the future as do the costs.

Obvious reductions in mortality and morbidity are apparent only until a significant proportion of the population have been immunised, after this point the benefits are less tangible but nevertheless real. Vaccination programmes must therefore be kept operational long after the national eradication of the disease. This has significant implications for the costs of such programmes.

3.5.2 Organisation

Immunisation uptakes in the UK are comparable to many third world countries rather than to industrialised ones. This has partly been due to the brain damage scares of whooping cough vaccine, which resulted in confused information on contraindications. Efficient organisation of the programme also has a part to play.

A study by Jarman et al (1988) used multiple regression analysis to determine the factors affecting uptakes. The main factors having a negative influence included social conditions, overcrowding of households and high population density. Negative influences specific to general practice include a high proportion of elderly on practice lists, single handed GP's and high average list sizes. Wide variations in uptake between districts were due to the separation of responsibility between GP's and community services.

One main positive influence thought to be important is a high staff enthusiasm which may achieve a high uptake even in the face of socioeconomic deprivation and parental uncertainty (Nicoll et al, 1989).

3.5.3 Resource Consequences

The main marginal considerations were looked at above, with the emphasis regarding the GP contract on the extra costs and extra benefits of increasing uptake by a certain percentage. A survey in one practice (Chadwick, 1989) examined the potential to improve the uptake of pertussis vaccine, in order to reach the contract's 90 per cent target. After initial immunisation non-attenders were sent questionnaires of which half were returned. The other half were visited at home with 4 households needing more than one visit. The author concluded that considerable effort was needed to increase uptake by 1 per cent to 85.1 per cent after initial immunisations. Target payment was not therefore reached.

Reaching upper targets may therefore exhibit the property of diminishing returns to scale where the most compliant parts of the population are immunised first, with marginal costs increasing more than proportionately as uptake increases and more effort being required to reach the non-attenders and to maintain a given level of health benefit (Jefferson, et al 1987). This property can be seen in most areas of screening/vaccination activity and can have significant effects on intertemporal cost effectiveness.

From a GP's point of view, the extra costs of achieving 90 per cent uptake must be balanced against the extra income he will receive (up to £1,800 per quarter) which could pay for the hiring of an immunisation nurse used to immunise persistent

non-attenders. From a societal point of view however, payments to GP's will become a cost.

The use of health visitors and practice nurses, with immunisations organised into clinics and child health surveillance sessions will also have beneficial implications for costs.

3.6 Child Health Surveillance

Paediatric surveillance of the under 5's can cover a wide variety of basic screening procedures, depending on the particular definition of 'surveillance' used. The history of child health surveillance (CHS) goes back to the beginning of the century, with the introduction of various public health measures. Historically CHS has been a DHA responsibility but GP's have increasingly carried out such services with health visitors attached to practices fulfilling this role.

CHS as a whole has, however, been subject to no evaluation in terms of the relative effects on the child's health status and the relative costs of the various procedures undertaken.

3.6.1 Effectiveness

Since there is a long established tradition of such activities and very little evaluation, certain examinations may be carried out routinely and rigorously with little benefit just because they have always been done, while other very basic screening procedures, such as listening to parental concerns, may be almost entirely neglected (Holland and Stewart, 1990). Little scientific evidence exists, therefore, to justify many of the activities undertaken and few data are available to indicate whether

surveillance reaches the whole population or leads to improved health.

However, a major step in terms of effective protocols is the Hall report, 'Health for All Children' (Polnay, 1989). This considered many current screening procedures in detail and produced a recommended core programme to be undertaken by the primary health care team.

The core programme incorporates those procedures which they believe can be supported in the light of available evidence. The content of the screening programme should be determined, "by our state of knowledge about the conditions sought, the effectiveness of the test and the availability of programmes of management." (Polnay, 1989).

The report also emphasises the anecdotal evidence of the effectiveness of parental observation as opposed to developmental screening in the diagnosis of a wide range of handicaps and highlights the health education content of the programme.

The consensus recommendations of the report suggest that checks should be carried out at birth, 6 weeks, 8 months, 21 months, 39 months and 5 years. The recommended checks, which at the moment differ between districts, are as follows:

In terms of physical examination, screening for congenital dislocation of the hip, congenital heart disease and undescended testes should be continued. Screening for hypertension, asthma and adolescent scoliosis is not recommended due to the fact that, i) there is no accepted treatment for hypertension, ii) general awareness of asthma is more effective than screening, and iii) more research needs to be carried out on the natural history adolescent scoliosis to improve predictive value of exams.

The only well established Laboratory and radiological tests are those for phenylketonuria and hypothyroidism, which received full support from the Hall report. Acceptability of screening and effectiveness of intervention programmes for iron deficiency anaemia still need to be fully established, however.

One of the foundations of CHS, monitoring growth, may be ineffective if measurements are inaccurate and not plotted on growth charts. Weighing at each visit and the measurement of height at 3 years and between 4 and 5 years are also recommended.

Vision testing should be by "careful" inspection of the eyes and the child's visual behaviour and to recognise the importance of parental observation. The ability to correctly diagnose sensorineural hearing losses at an early age has been regarded as a useful indicator of the effectiveness of CHS. Distraction testing at six to eight months has been regarded as the means for achieving this.

One of the most controversial aspects of the report, in terms of condemning a long established procedure, is that developmental screening should be abandoned. This method of monitoring child development used scales of normal and abnormal development, with a wide variation of the term 'normal', problems in showing such normality, and poor predictive value reflected in high false positive and false negative rates. The "commonsense" solution is that of parental observation.

There is therefore little or no evidence of effectiveness in terms of increases in the quality and length of life of CHS, although the Hall report does sift the good evidence from the bad.

A study in Northumberland health district (Colver, 1990) has attempted to

evaluate a programme of CHS for pre-school children and measure its effect on child health. The protocol followed was similar to that suggested by the Hall report, and was used for 4 years in the whole district. The programme was fully integrated with primary care, systematically applied and evaluated. The work was carried out by health visitors attached to general practice, GP's paid by the health authority on a sessional basis and Clinical Medical Officers based in community health services.

The monitoring and evaluation of performance was carried out by data collection at district level of immunisation uptake, screening tests, age at diagnosis of deafness, age of therapy for cerebral palsy and age of therapy of special needs.

Measles immunisation uptake increased from 68 per cent in 1984 to 93 per cent in 1989, with similar increases for other childhood immunisations. In 1989 54 out of 57 practices over 90 per cent uptake of immunisation against diphtheria, tetanus and polio, compared with only 22 practices in 1984. However, before and after studies present problems of attributability, where the results may have been contaminated by other uncontrolled factors.

The increase in the percentage of children screened for congenital abnormalities was between 17 per cent and 23 per cent between 1984 and 1989, and the average age of diagnosis for congenital deafness fell to 9 months. Measurable effects on health status, apart from those achieved by increasing immunisation uptakes, were not evaluated however. Only a long term randomised controlled trial will give us the answers needed to assess the cost effectiveness of these services.

3.6.2 Organisation

Child health surveillance is an optional service that GP's can provide. GP's on the

CHS list can provide services for any of his partners. CHS is thought to be best carried out in clinics run by health visitors or practice nurses with effective problem management in terms of referral pathways if a child fails any tests (Colver and Steiner, 1986).

The Hall report does not examine how its recommendations can be effectively implemented. CHS obviously involves a high degree of cooperation and integration between GP and community health services. Colver (1990) highlights the importance of effective data collection, monitoring and feedback in CHS. Medical audit will eventually take over this role and will need to interact between DHA, GP and FHSA.

3.6.3 Resource Consequences.

One of the perceived benefits to GP's in terms of increasing their income is carrying out CHS in order to meet childhood immunisation targets. Problems may still be encountered, however, in terms of the extra costs (e.g. home visiting) of increasing coverage by a small percentage and in terms of persistent non-attenders being at high risk.

Other costs include extra administration and an efficient call/recall system or age sex register and various items of specialist equipment. An estimate of the cost of a clinic in terms of equipment and staff time, and the income generated to the "average" GP with a list of 2000 gives a cost to the GP of £194 a year with an annual income of £533 (Pulse, 11th August 1990). This does not take into account increased income from the attainment of immunisation targets.

However, if the fee is included as an additional cost to the NHS then this broader cost estimate would be £727 plus the costs incurred by patients in terms of

travelling expenses and time costs and any adverse consequences of treatment.

Considering other cost implications of the expansion of GP CHS services, GP's, who have previously been paid by DHA's for carrying this out, may reduce the workload of community health services as they transfer the service to a general practice setting. With the advent of the contract, many more GP's are likely to undertake CHS services as subscriptions to specialist courses in some areas have increased dramatically (Medeconomics, April 1990).

The implications of the White paper are that shared responsibility may also be affected by the District not wishing to purchase services from provider units that are already being provided by GP's. The trend may therefore be towards a general practice based CHS service. Alternatively the budget holding GP may find it financially advantageous to purchase such services (e.g a Clinical Medical Officer for a few hours a month) from local provider units rather than provide the service him or herself. (This will depend on future levels of GP remuneration.) All of these hypothetical effects remain to be seen and evaluated.

3.7 Minor Surgery

The optional provision of minor surgery by GP's has not yet been formally evaluated with respect to, i) the potential resource savings over hospital inpatient and day case surgery, ii) the potential reductions in hospital waiting lists including patient costs, and iii) the relative effectiveness of GP versus hospital surgery.

Cost effectiveness also needs to be considered in terms of the extra costs and benefits of the potential extension of minor surgery services in general practice (85 per cent of GP's have applied for admittance to the minor surgery list and 9 out of

10 have been accepted (GP, 29th June 1990)) and its potential effects on district pathology services.

GP's have again looked at this service in terms of potential profit with a fee of £100 for 5 operations per quarter. Larger practices will have the advantage of economies of scale as one GP can be the surgeon for the other partners in the practice. Set up costs can then be spread among the partners. However, a survey of 260 GP's showed that all had a sterilisation unit and 79 per cent had adequate instruments (Medeconomics, November 1989).

Effects on hospital waiting lists are, however, difficult to evaluate, given the inaccuracy of some lists and whether a particular type of operation will have any effect on waiting lists.

Godfrey et al (1990) examined the running of minor surgery services in seven practices in Stockport over a period of six months and found that 32 per cent of minor surgical procedures carried out had a histology specimen sent to DHA pathology services. Extension of minor surgery to the whole of the Stockport area would necessitate a 15 per cent increase in specimens sent for analysis. Such costs will, however, be transferred to fundholding GP's from April 1st 1991. As with CHS and Cervical cytology, DHA's may not wish to purchase minor surgery services from local provider units if GP's are providing the service. Budget holding GP's may or may not find that they can provide such services more cost effectively than hospitals.

Minor surgery is widely believed to be very popular with patients as it avoids months of discomfort waiting for a hospital appointment and hours in an outpatient clinic waiting room, and may also save on travelling expenses to and from hospital. Godfrey et al (1990) assumes that patients attending hospital outpatients for minor

surgery often make three visits, one for consultant diagnosis, one for the operation and one for follow-up.

Godfrey found that 20 per cent of patients attending GP's received treatment on the same day. Savings in travel costs to the patient may therefore be substantial. This factor is probably the most important consideration when GP's decide whether to provide such services.

There is also concern at the qualifications required by GP's which are to be determined locally by FHSA's and the quality of the service provided. This represents another area for evaluation.

Resource savings to the hospital may be minimal as many of the procedures involve a minimal hospital stay and are usually carried out on an outpatient basis. The magnitude and existence of savings will depend crucially on the method and approach used in their calculation (Scott, 1990). Again, more clinical and economic evaluations are needed to provide firm evidence on the relative cost effectiveness of GP minor surgery.

4. SUMMARY AND DISCUSSION

The evidence examined highlights the need for more clinical and economic evaluation in general practice. The lack of good evidence for the cost effectiveness for many of the procedures set out in the GP contract means that prioritisation is determined by many other factors relating to each specific general practice. In order to ensure that the GP is obtaining the greatest benefits for his or her patients at the least cost, evidence of proven cost effectiveness is therefore essential.

Table 1 summarises the evidence and attempts to present the evidence so comparisons can be made between the alternative proposals in the contract in order to assess priorities.

Due to the lack of evidence, however, such comparisons are difficult to make and are inevitably subjective. Comparisons between the contract measures set out in table 1 are likely to be affected by many factors which still need to be evaluated.

Comparisons between each alternative would ideally be made possible by the application of a single outcome measure, such as the Quality Adjusted Life Year (QALY). However, comparisons of cost per QALY estimates, if they existed, for various interventions may be misleading due to the fact that costs are average and not marginal and that the measurement of quality of life still needs to be subject to more research as regard to its reliability and validity (Loomes and MacKenzie, 1989).

It must also be noted that a '+' in the table does not indicate that the activity has been conclusively proven as effective. Many such activities, such as cervical screening, still need to be evaluated in this country as well as in a general practice based setting with potential effectiveness being demonstrated elsewhere.

Likewise a '-' does not mean that the activity is ineffective but merely indicates that the current weight of evidence goes against this conclusion. All areas therefore need further evaluation either to assert, confirm or refute their effectiveness.

Much of the evidence in table 1 is inconclusive or simply does not exist, thus making it more difficult to make meaningful comparisons between each activity. However, some general conclusions can be reached.

Assuming costs are similar, HPC's concerned with the main risk factors for CHD (smoking and cholesterol) may be more cost effective than alcohol, stress, diabetes or other clinics.

However, examining the contractual obligations for health checks, it can be seen that the evidence points to the fact that such activities provide little or no benefit to the patient in terms of reducing mortality and morbidity, and incur substantial costs.

The time taken to conduct a health check (up to half an hour) would be much better spent in other more beneficial areas of care as indicated in the table. It would also be more cost effective to record blood pressure and identify high risks when the patient presents opportunistically, given that three quarters of patients do so each year. Even if health checks were effective, written invitations would only attract the low risks.

Annual geriatric screening for the over 75's and Child Health Surveillance are other areas where a large amount of resources in terms of nursing time (over one and a half hours per home visit for the former) might be better used in terms of greater patient benefits elsewhere. These conclusions will hold no matter the quality of organisation.

TABLE 1. - RELATIVE COST EFFECTIVENESS

	REDUCTIONS IN		PROCESS	NHS\	ANNUAL
	MORTALITY	MORBIDITY	OUTCOME	PATIENT	FEE
			LINKED?	COSTS	PER GP
					£696
<u>HEALTH CHECKS</u>					capitation
GENERAL	-	-	-	1,2	for new
URINE	-	-	-	1,2	patients.
BLOOD PRESSURE	+	+	+	1,2	See HPC
HEIGHT/WEIGHT	*	*	*	1,2	for 3yr
					checks.
<u>RISK FACTOR IDENTIFICATION</u>					
<u>AND TREATMENT (HPC's)</u>					
GENERAL/CHD	?	+	+	1,2,4,6,7	}
CHOLESTEROL/DIET	+	+	+	1,2,4,5,6,7	}
SMOKING	+	+	+	1,2,4	}
HYPERTENSION	+	+	+	1,2,4,6,7	}
ALCOHOL	?	+	+	1,2,4	}£1629
DIABETES	*	+	?	1,2,4,6	}
EXERCISE	*	*	+	1,2,4	}
OTHER	*	*	*	1,2,4,6	}
<u>GERIATRIC SCREENING</u>	?	+	?	1,2,3,6	£3796
					(capitation)
<u>CERVICAL CYTOLOGY</u>	+	+	+	1,2,4,5,7	£2448
<u>CHILDHOOD IMMUNISATION</u>	+	+	+	1,2,4,6	£3165
<u>PAEDIATRIC SURVEILLANCE</u>	*	?	?	1,2,4	£533
					(capitation)
<u>MINOR SURGERY</u>	n/a	+	+	1,2,4,5	£698

LEGEND

"+" more evidence for, than against
 "?" inconclusive evidence
 "-" more evidence against than for
 "*" no evidence

- 1 - administration, computers, equipment, patient travel costs
- 2 - practice nurse/health visitor for less than 1 hour
- 3 - practice nurse/health visitor for more than 1 hour
- 4 - GP
- 5 - hospital pathology services
- 6 - drugs
- 7 - psychological patient costs

In terms of economic evaluative methodology, the main factors that must be borne in mind are firstly that evaluation must take the form of a consideration of alternatives, of which there are many in general practice when considering the causal pathway of a preventative service, i.e. the chain of events and range of possibilities in which a preventative measure can influence clinical outcome.

The breadth of costs, in terms of direct, indirect and intangible costs must also be considered. Benefits of GP preventative activities must include any potential cost savings that may be made over the status quo and any benefits (or costs) in the form of externalities accruing to parties other than patients (these occur in contagious diseases, misuse of alcohol, and smoking).

Priorities and relative cost effectiveness of the contract measures are therefore determined by many factors including local organisation and characteristics such as:

- 1) The health needs of the practice population in terms of the socio-demographic characteristics of the population, for example the percentage of, say, people at high risk of CHD. This will determine the frequency of health promotion clinics.

- 2) The size of each practice in terms of number of partners will also have a serious effect on priorities. Single handed, inner city GP's are seen as the losers of the contract since they do not have the facilities or staff to achieve high uptakes and hold HPC's in deprived areas, which have the potential to benefit the most from prevention and promotion. There is thus an incentive for such practices to merge or to jointly hire staff in order that they are not restricted in providing the most cost effective services to their population. Larger practices, however, are more able to provide a wider range of services due to their size and ability to spread costs.

3) The level and quality of practice organisation in terms of accurate age/sex registers, use of computing facilities, motivated and enthusiastic staff, and use of health promotion facilitators.

4) Decreasing returns to scale may also affect relative priorities over time. For many screening procedures the benefits, in terms of cases detected, diminish over time as the population at risk decreases. With costs remaining the same, cost per unit of benefit may rise thus reducing the efficiency of the activity as compared to other activities. Alternatively marginal costs may rise over time to achieve a given level of benefit. This was seen with childhood immunisations when marginal costs were relatively stable as children were brought to the surgery for immunisation but the cost of immunising an extra child rose when the practice nurse was required to visit children at home to increase uptake to reach target.

Practice organisation can thus have a major effect on prioritisation, with such organisation determining effectiveness in terms of health outcomes in many cases. Areas where the quality of organisation has been shown to affect health outcomes are cervical cytology and childhood immunisation where high coverage rates, therefore efficient organisation, are necessary for effects on mortality and morbidity to be significant. At the moment cervical cytology services are not operating efficiently, therefore other services may provide a greater benefit for a given cost. For both cervical cytology and childhood immunisations, the extra costs and extra benefits of increasing uptake have yet to be evaluated.

Another thread running through the evidence is that the cost effectiveness of each contract requirement is dependent on the organisation of the specific screening programme. In most cases opportunistic screening is regarded as more cost effective

than population screening. The two areas of screening and treatment should not be considered separately, as only together can either have a positive effect on health outcomes.

The incentives in the new contract coupled with the introduction of fundholding may signify a shift of workload onto the GP by many traditionally based health authority services. Child health surveillance, minor surgery, various clinics, childhood immunisations, and cervical cytology are all areas where the GP may have an increased role. Districts in their new purchasing role may find it prudent not to buy such hospital based services if GP's are providing or purchasing such services on a regular basis.

One of the main factors which may now influence prioritisation more than ever before, is that of profit. The changes in GP remuneration are likely to have profound effects on the types of services GP's provide. A main point of interest is whether remuneration for each service gives GP's the incentives for providing the most cost effective services. The adoption of some services by GP's, who previously did not carry them out, are now more dependent on whether they are financially viable with little regard to evidence of the effectiveness of such services.

The importance of GP incentives in determining priorities and relative cost effectiveness cannot be emphasised enough. Initial effects of remuneration on the provision of the most cost effective services, as outlined in table 1, have not been good.

One example of profit maximising behaviour are the new fees to be paid for Health Promotion Clinics (HPC's). This has proved to be a major loophole for many of the larger practices due to the fact that what exactly constitutes a HPC has not been

made very clear and has been left up to the discretion of FHSA's.

Some FHSA's have been allowing advice during opportunistic consultations (i.e. consultations initiated by the patient for some other reason) to count as '1 unit' towards a 10 unit sessional fee. This has resulted in one GP claiming for 40 clinics a week generating an annual expected income of £80,000 ! (Medeconomics, April 1990) As a result the Department of Health have now banned such opportunistic clinics and have authorised the claw back of money from GP's paid for such services. Payment has also been forbidden when the criteria for 10 patients attending a clinic had been met only by adding together attenders over a number of days (Pulse, November 1990). As mentioned earlier this may provide GP's with incentives not to provide advice during opportunistic consultations, which may be a more cost effective location than the HPC in terms of targeting the high risks and patient convenience.

The main problem has been in defining what a HPC actually is.

One potential way to encourage GP's to prioritise is to have different levels of remuneration for different types of clinic reflecting their relative cost effectiveness, with effectiveness being continually monitored.

The national pay review body is thought to be considering lowering the overall payment for HPC's in 1991 to curtail excessive financial claims by GP's. This would, however, not solve the underlying problem of defining what a clinic is, in terms of their content, aims, potential relative cost effectiveness, and their need to be monitored. FHSA's need to encourage cost effective behaviour in terms of greatest relative benefit for a given cost through remuneration.

The correlation between GP remuneration and the relative cost effectiveness

of the contract requirements has been examined using estimates of annual remuneration per GP, shown in table 1. These estimates were taken from a sample of quarterly payments received by GP's and published in 'Pulse', 'Medeconomics' and 'General Practitioner' over the past few months.

Costs of the various types of GP care can be assumed to be similar since most of the activities in table 1 can be organised into clinics, whose costs vary little. The main determinant of cost differentials is therefore GP remuneration.

The only fees specifically paid for health checks are if they are organised into a HPC. If they are, then such a clinic would be of little value as compared to other clinics and activities. Capitation payments for new registrations, child health surveillance and geriatric screening are also included although they are merely intended to cover some of the costs and not to act as incentives.

Estimated annual fees for childhood immunisation and cervical cytology are currently up to double than that for HPC's. Whether, with increased uptakes, cervical cytology and immunisation generate health benefits of double the value of the CHD group of clinics (for a given cost) is yet to be firmly established at a local level.

Fee levels might be more compartmentalised, for example a higher fee for a smoking clinic than for a diabetes clinic, in order to reflect the relative cost effectiveness of each service the GP provides, as determined by the existing clinical and economic evidence. If they are not then GP's may tend to provide services which do not provide the maximum benefits to their patients.

Another alternative to the contract would be the New Zealand method of target setting, mentioned in section 3.2. The specification of 'goals and targets' relating to

the GP's health promotional and preventative activities, combined with financial incentives, may make many of the obligatory measures in the contract redundant as this will give the GP freedom to organise services how he or she thinks best (and not be legally bound to provide services of doubtful value). This process will be achieved with the knowledge that the attainment of specific targets will result in improvements in patients' health status and an enhancement of income.

However, meeting targets in a cost effective manner is an issue that still needs to be examined. Marginal costs may rise above average costs with each additional unit of benefit (e.g. each 1 per cent reduction in prevalence) which will cause the activity to be technically inefficient and may alter relative priorities over time. The main difficulty in such a scheme would be in defining specific targets and in monitoring progress towards them. Targets set at a disaggregated level (by Regions or FHSA's) would need to be both general in the sense that they can be applied to different types of practices and, at the same time, specific in the sense that they represent realistic goals and achievable objectives to each practice concerned.

Application to different types of practices will need to take account of, for instance, the potential impossibility of some single handed, inner city practices and rural practices of meeting high targets. Targets and accompanying fees may therefore have to be on a sliding scale to take account of such equity issues.

Target setting could be used either as a determinant of, or supplement to, a GP's or practices' basic income with sliding scales of remuneration corresponding to different target levels (from January 1st 1991 the upper target payment for Childhood Immunisation will be regarded as a bonus and not part of the average intended net remuneration). For example, a fee could be paid for each percentage reduction in the prevalence of smoking in the practice population, a fee which could rise with each

additional percentage reduction in prevalence. This would take account of the existing prevalence in the population and would not penalise practices with a high prevalence who may otherwise have found it difficult to achieve flat rate reductions in prevalence.

Alternatively targets could be set which incorporate specific time horizons, for example an x% reduction in smoking prevalence by 1992, similar to New Zealand and WHO targets. But these may be more difficult to apply at such a disaggregated level and would need to be incorporated as a performance related bonus or supplement to basic income rather than as a determinant of it.

Relating income to targets in this way would require extensive local epidemiological data on the prevalence of risk factors and the health of the local population. Such data is already being collected by DHA's who have the responsibility of assessing their populations' health care needs. This, along with GP data, would need to be incorporated in a practice based database. Accuracy of practice and patient records would therefore be necessary, as would sending lifestyle questionnaires to those patients who attend infrequently.

Some obligatory measures in the contract, which GP's are legally bound to provide, have been shown to generate little or no benefit to patients and yet will consume potentially large amounts of resources. Most other areas still need to be subject to rigorous clinical and economic evaluation.

However, greater flexibility must be given (back) to GP's so they can carry out preventative activities and prioritise them with regard to the local conditions which may affect cost effectiveness, which the contract currently prohibits. This must be coupled with changes in GP remuneration so that GP's are encouraged to provide

those services which generate the greatest health benefits to their patients at least cost.

This can only happen with more clinical and economic research, until then priorities in general practice will continue to be determined by ad hoc considerations which may bear little relation to cost effectiveness.

REFERENCES AND BIBLIOGRAPHY.

ANTHONY P.P. and KELLY R.M. (1987) "Cervical Smears: New Terminology and New Demands." (Letter) British Medical Journal, 294 (6588), p1687.

ASSOCIATION OF THE BRITISH PHARMACEUTICAL INDUSTRY (1989) "Agenda for Health 1989 - Preventative Medicine: Working for Patients."

BABOR T.F, RITSON E.B. and HODGSON R.J. (1986) "Alcohol Related problems in the Primary Care Setting: A Review of Early Intervention Strategies." British Journal of Addiction, 81 (1), p23-46.

BAIN J. (1990) "Child Health Surveillance." British Medical Journal, 300 (6736), p1381-82.

BANATVALA J.E. (1987) "Measles must go and with it Rubella." British Medical Journal, 295 (6589), p2.

BARON J.A. et al (1990) "Preliminary Trial of the Effect of General Practice based Nutritional Advice." British Journal of General Practice, 40 (333), p137-141.

BEGG N.T. and NOAH N.D. (1985) "Immunisation Targets in Europe and Britain." British Medical Journal, 291 (6506) p1370-1371.

BOWLING A.P. (1989) "Contact with General Practitioners and Differences in Health Status Among People Aged Over 85 years." Journal of the Royal College of General Practitioners, 39 (319), p52-55.

British Medical Journal, 300 (6741), p1728 ('News').

BUCKLEY E.G. and WILLIAMSON J. (1988) "What Sort of Health Checks for Older People ?" British Medical Journal 296 (6630), p1144

CARR-HILL R. (1988) "Revising the RAWP Formula: Indexing Deprivation and Modelling Demand." Discussion Paper 41, Centre for Health Economics, University of York.

CHADWICK S. (1989) "Immunisation - Causes of Failure and Strategies for Success." [Letter], British Medical Journal 299 (6707), p1102-1103.

CHAPMAN S. (1985) "Stop Smoking Clinics - A Case for their Abandonment." Lancet i; p918-920.

CHESTER R. et al (1987) "Advice, Support and Counselling for the HIV Positive." DHSS.

CHICK J. et al (1985) "Counselling Problem drinkers in Medical Wards: a controlled study." British Medical Journal, 290 (6473), p965-967.

CLARKE M. (1987) "Sex and Health Promotion: The Need for a new Primary Care Initiative." Journal of the Royal College of General Practitioners, 37 (12), p555-556.

CLOSE J. (1990) "Managing Diabetic Complications." Medical Monitor, November 2nd 1990.

COLVER A.F. and STEINER H. (1986) "Health Surveillance of Preschool Children." British Medical Journal, 293 (6541) p258-260.

COLVER A.F. (1990) "Health Surveillance of Preschool Children - Four Years Experience." British Medical Journal, 300 (6734), p1246-48.

CRUICKSHANK et al (1987) "Benefits and Potential Harm of Lowering High Blood Pressure." Lancet, i, p581.

DAY N.E. (1989) "Screening for Cancer of the Cervix." Journal of Epidemiology and Community Health, 43 (2), p103-106.

DEPARTMENT OF HEALTH (1989) "Terms of Service for Doctors in General Practice." HMSO.

DEPARTMENT OF HEALTH, WELLINGTON (1989) "New Zealand Health Goals and Targets."

DEPARTMENT OF HEALTH (1990) "Blood Cholesterol Testing - The Cost effectiveness of Opportunistic Cholesterol Testing." Standing Medical Advisory Committee.

DEPARTMENT OF HEALTH (1990b) "Child Health Surveillance: Implementation of the New Contract." Circular EL(90)P/36.

DRUMMOND D.C. et al (1990) "Specialist versus General Practitioner Care of Problem Drinkers." Lancet, 336 (8720), p915-918.

DRUMMOND M.F. and DAVIES L.M. (eds) (1990) "Aids: The Challenge for Economic Analysis." University of Birmingham, Health Services Management Centre.

DUGUID H.L.D., DUNCAN I.D. and CURRIE J. (1985) "Screening for Cervical Intraepithelial Neoplasia in Dundee and Angus 1962-1981, and its Relation with Invasive Cervical Cancer." Lancet, ii, p1053-1056.

DYER C. (1988) "Judge 'not satisfied' that Whooping Cough Vaccine causes Permanent Brain Damage." British Medical Journal, 296 (6630), p1189-1190.

EDGAR M.A. and SCHNIEDEN H. (1989) "The Economics of Mild Hypertension Programmes." Social Science and Medicine, 28 (3) p211-222.

ERSHOFF D. et al (1990) "Pregnancy and Medical Cost Outcomes of a Self-Help Prenatal Smoking Cessation Programme in a HMO." Public Health Reports 105 (4), p340.

FINE P.E.M. and CLARKSON J.A. (1983) "Measles in England and Wales - III: Assessing Published Predictions of the Impact of Vaccination on Incidence." International Journal of Epidemiology, (3), pp.332-339

FLETCHER A. et al (1990) "Screening Elderly Patients." [Letter], British Medical Journal, 300 (6731), p1074.

FOWLER G. (1988) "Coronary Heart Disease Prevention: A General Practice Challenge." Journal of the Royal College of General Practitioners 38 (314), p391-392.

FOWLER G. and MANT D. (1990) "Health Checks for Adults." British Medical Journal 300 (6735), p1318-1320.

- FREER C.B. (1990) "Screening the Elderly." British Medical Journal, 300 (6737) p1447-48.
- FRIES J.F. (1980) "Aging, Natural Death and the Compression of Morbidity." New England Journal of Medicine, 303 (3), p130-135.
- FRIES J.F. (1989a) "The Compression of Morbidity: Near or Far ?" The Milbank Memorial Fund Quarterly, 67 (2), p208.
- FRIES J.F. et al (1989b) "Health Promotion and the Compression of Morbidity." Lancet i; p481-483.
- FULLARD E. et al (1984) "Facilitating Prevention in Primary Care." British Medical Journal, 289 (6458), p1585-87.
- FULLARD E, FOWLER G. and GRAY M. (1987) "Promoting Prevention in Primary Care: Controlled Trial of Low Technology, Low Cost Approach." British Medical Journal 294 (6579), p1080-1082.
- GODFREY C., HARDMAN G. and MAYNARD A. (1989) "Priorities for Health Promotion - An Economic Approach." Discussion Paper 59, Centre for Health Economics, University of York.
- GODFREY E. et al (1990) "Initiation and Evaluation of a Pilot Scheme for Minor Surgery in General Practice." Health Trends, 22 (2), p57.
- GRACE J.F. (1983) "Screening in General Practice - Implications for Cost and Extra Work." British Medical Journal, 287 (6392), p589-590.
- 'GP' June 29, 1990.
- HALL D.M.B. (1989) "'Health for All Children' and the new contract." British Medical Journal, 299 (6712), p1352-53.
- HAKAMA (1976) "Effect of a Mass Screening Programme on the Risk of Cervical Cancer." American Journal of Epidemiology, 103, p572.
- HEALTH DEPARTMENTS OF GREAT BRITAIN (1989) "General Practice in the National Health Service - The 1990 Contract." HMSO.
- HENDRIKSEN C. et al (1984) "Consequences of Assessment and Intervention among Elderly People: A Three Year Randomised Controlled Trial." British Medical Journal 289 (6457), p1522.
- HJERMANN I. et al (1981) "Effect of Diet and Smoking Intervention on the Incidence of Coronary Heart Disease." Lancet ii; p1303-1310.
- HODGSON R.J. (1989) "Low Cost Responses." in Robinson et al (eds) "Controlling Legal Addictions." Macmillan.
- HOLLAND W.W. and STEWART S. (1990) "Screening in Health Care - Benefit or Bane?" Nuffield Provincial Hospitals Trust.
- INTERCOLLEGIATE WORKING PARTY (1987) "Report of the Intercollegiate Working Party on Cervical Cytology Screening." Royal College of Obstetricians and Gynaecologists.

JAMROZICK K. et al (1984) "Controlled Trial of Three Different Anti-smoking Interventions in General Practice." British Medical Journal, 288, (6429) p1499-1503.

JARMAN B. et al (1988) "Uptake of Immunisation in District Health Authorities in England." British Medical Journal, 296 (6639), p1775-1778.

JEFFERSON N. et al (1987) "Immunisation of Children by a Nurse Without a Doctor Present." British Medical Journal 294 (6569), p423-424.

JENKINS S. (1990) "Screening and the 1990 Contract." British Medical Journal, 300 (6728), p825.

JENKINSON, D. (1988) Duration of effectiveness of pertussis vaccine: evidence from 10 year community study. British Medical Journal, 296 (), pp 612.

JOHNSTON (1989) "Screening for Cervical Cancer - A Review of the Literature." Health Economics Research Group, University of Aberdeen, (Discussion Paper 04/89).

KANNEL W.B. and GORDON T (eds) (1973) "The Framingham Study: An Epidemiological Investigation of Cardiovascular Disease." U.S. Department of Health, Education and Welfare Publications. 74-618.

KANNEL W.B. et al (1986) "Overall and Coronary Heart Disease Mortality Rates in Relation to Major Risk Factors in 325,348 men Screened for the M.R.I.F.T." American Heart Journal, 112, p825.

KAPLAN R.M. et al (1987) "The Cost-Utility of Diet and Exercise Interventions in Non-insulin Dependent Diabetes Mellitus." Health Promotion, 2 (4), pp331-140.

WEINER J.P. and FERRISS, D.M. (1990). GP budget holding in the UK: lessons from America. King's Fund.

LAARA et al (1987) "Trends in Mortality from Cervical Cancer in the Nordic Countries: Association with Organised Screening Programmes." Lancet, 1, p1247.

LEESE B. and HUTTON J. (1990) "Changing Medical Practice: A Study of Reflotron use in General Practice." Discussion Paper 60, Centre for Health Economics, University of York.

LIEDEKERKEN P.C. et al (eds) (1990) "Effectiveness of Health Education - Review and Analysis." Dutch Health Education Centre, Utrecht.

LOOMES G. and McKENZIE (1989) "The Use of QALY's in Health Care Decision Making." Social Science and Medicine, 28 (4), p299-308.

MacLENNAN W.J. (1990) "Screening Elderly Patients - A task well suited to health visitors ?" British Medical Journal 300 (6726), p694-695.

McEWAN R.T. et al (1990) "Screening Elderly People in Primary Care: A Randomised Controlled Trial." British Journal of General Practice, 40 (332), p94-97.

MANN et al (1988) "Blood Lipid Concentrations and other Cardiovascular Risk Factors: Distribution, Prevalence and Detection in Britain." British Medical Journal, 296 (6638) p1702-1706.

MANT D. and FOWLER G. (1990) "Urine Analysis for Glucose and Protein: Are the Requirements of the new Contract Sensible ?" British Medical Journal 300 (6731), p1053-1055.

MARINKER M. (ED.) (1990) Medical audit and general practice. British Medical Journal.

MAYNARD A.K. (1989) "The Costs of Addiction and the Costs of Control." in Robinson et al (eds) "Controlling Legal Addictions." Macmillan, pp84-100.

MAYNARD A.K. (1990) "Help the Elderly." Health Service Journal, forthcoming.

'MEDECONOMICS' November, 1989.

'MEDECONOMICS' April 1990.

'MEDECONOMICS' July 1990.

M.R.C. WORKING PARTY (1985) "MRC Trial of Treatment of Mild Hypertension: Principal Results." British Medical Journal, 291 (6488) p97-104.

M.R.C. WORKING PARTY (1988) "Stroke and Coronary Heart Disease in Mild Hypertensives : Risk Factors and Value of Treatment." British Medical Journal, 296 (6636), p1565-1570.

M.R.C. response to the Standing Medical Advisory Committee Report on Blood Cholesterol Testing. (1990) Personal Correspondence to Prof. A.K. Maynard.

NICOLL A, ELLIMAN D. and BEGG N.T. (1989) "Immunisation: Causes of Failure and Strategies and Tactics for Success." British Medical Journal, 299 (6703) p808-812.

OFFICE OF HEALTH ECONOMICS (1989) "Compendium of Health Statistics 1989." 7th edition.

OFFICE OF HEALTH ECONOMICS (1990) "Coronary Heart Disease - The Need for Action."

PENNINGTON E. and WILCOX R.M.L. (1988) "Immunisation, Practice Records and the White Paper." Journal of the Royal College of General Practitioners, 38 (316), p515-516.

PILL R. et al (1988) "Invitation to Attend a Health Check in a General Practice Setting: comparison of attenders and non-attenders." Journal of the Royal College of General Practitioners, 38 (306), p53-56.

POLNAY L. (1989) "Child Health Surveillance - A new report highlights the value of parental observations." British Medical Journal, 299 (6712) p1351-52.

'PULSE' October 13, 1990.

'PULSE' October 20, 1990.

'PULSE' August 11, 1990.

'PULSE' November 3, 1990.

'PULSE' November 10, 1990.

'PULSE', November 24, 1990.

RAMSTROM L, RAW M. and WOOD M. (1988) "Guidelines on Smoking Cessation for the Primary Health Care Team." World Health Organisation/International Union Against Cancer.

RICHMOND R.L, AUSTIN A. and WEBSTER I.W. (1986) "Three year Evaluation of a Programme by General Practitioners to Help Patients Stop Smoking." British Medical Journal 292 (6523), p803-806.

ROSS S.K. (1989) "Cervical cytology Screening and Government Policy." British Medical Journal, 299 (6691), p101-104.

RUSSELL M.A.H. et al (1979) "Effect of General Practitioners Advice Against Smoking." British Medical Journal, 283 (6184), p231-235.

SACKS G. and MARSDEN R. (1989) "Evaluation of a Practice Based Programme of Health Checks: financial cost and success at risk detection." Journal Of the Royal College of General Practitioners, 39 (326), pp.369-372.

SANDERS et al (1989) "Randomised Controlled Trial of Anti-smoking Advice by Nurses in General Practice." Journal of the Royal College of General Practitioners, 39 (324), pp.273-76.

SCOTT A. (1990) "An Economic Analysis and Evaluation of Ante-Natal Day Care." MSc. Dissertation, University of York.

SECRETARIES OF STATE (1987) "Promoting Better Health" CM249, HMSO.

SIXTH KING'S FUND FORUM (1990) "Blood Cholesterol Measurement in the Prevention of Coronary Heart Disease." King Edward's Hospital Fund for London.

SLATER D. (1990) "Screening and the 1990 Contract." [Letter], British Medical Journal, 300, p1074.

SMITH A. et al (1989) "Making Cervical Screening Work." British Medical Journal, 298 (6689), pp1662-1664.

SOUTH EAST LONDON SCREENING STUDY GROUP (1977) "A Controlled Trial of Multiphasic Screening in Middle Age." International Journal of Epidemiology, 6 (4), pp 303-308. No.6.

STRINGFELLOW (1986) "Prevention for patients over 75: is it Worth the Bother ?" British Medical Journal, 292 (6530), p1243-1244.

STONE D. (1990) "A Sober Approach to Drinking." Medical Monitor, 9th November, 1990.

THOMPSON N.F. (1990) "Inviting Infrequent Attenders to attend for a Health Check: Costs and Benefits." British Journal of General Practice, 40 (1), p16-18.

TULLOCH A.J. and MOORE V. (1979) "A Randomised Controlled Trial of Geriatric Screening and Surveillance in General Practice." Journal of the Royal College of General Practitioners, 29 (209), p733-740.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES (1990) "Alcohol and Health" Seventh Special Report to the U.S. Congress.

U.S. PREVENTATIVE SERVICES TASK FORCE (1989) "Guide to Clinical Preventative Services - An Assessment of the Effectiveness of 169 Interventions." Williams and Wilkins.

VETTER N.J. et al (1984) "Effect of Health Visitors Working with Elderly Patients in General Practice - A Randomised Controlled Trial." British Medical Journal, 288, p369.

WAINE C. (1986) "Towards a Comprehensive Child Health Service." Journal of the Royal College of General Practitioners, 36 (288), p299.

WALLACE P. et al (1988) "Randomised Controlled Trial of General Practitioner Intervention in Patients with Excessive Alcohol Consumption." British Medical Journal 297 (6649), p663-668.

WALLER D. et al (1990) "Health Checks in General Practice - Another Example of Inverse Care." British Medical Journal, 300 (6732), p1115-1117.

WELLS N. (1986) "General Practice Today." in Teeling Smith G. (ed.) "Health Prevention and General Practice". Office of Health Economics.

WILKIN D. (1986) "Outcomes Research in General Practice." Journal of the Royal College of General Practitioners, 36 (282), pp.4-5.

WILLIAMS A. (1987) "Screening for Risk of Coronary Heart Disease: Is it a Wise use of Resources ?" in Oliver M. et al (eds) "Strategy for Screening for Risk of Coronary Heart Disease." Wiley, pp. 97-105.

ZILVA J.F. (1985) "Is Unselective Biochemical Urine Testing Cost Effective ?" British Medical Journal, 291 (6491), p323-325.