

# Evaluation of a practice-based programme of health checks: financial cost and success at risk detection

GERALD SACKS

ROBERT MARSDEN

**SUMMARY.** *With the help and supervision of a facilitator, a scheme of nurse-run health checks was established in 1983 in a suburban group practice of approximately 12 000 patients. The practice receptionists recruited patients opportunistically when they presented to consult a doctor. After two and a half years, 1382 patients had been screened for cardiovascular risk factors; this was 94.0% of those invited to attend and 24.9% of the target population of patients aged 25–64 years. Recording of risk factors increased greatly between 1983 and 1986, although uptake of immunizations was low. Sixty five previously undiagnosed hypertensives were identified, as were 11 new diabetics. This was achieved with two sessions per week; thus to succeed in screening the whole population within five years, four weekly sessions would have been necessary. When the cost of equipment and staff salaries were offset against 70% reimbursement of salaries and item of service fees the net financial cost to the practice from 1983–86 was approximately £1.73 per patient, or £477.00 per clinic session per year.*

## Introduction

IN 1983 the Manor surgery, Oxford, was one of the first of many practices to follow the example of Elaine Fullard and others<sup>1,2</sup> in setting up a health clinic with the objective of screening patients for cardiovascular risk factors. A facilitator (E.F.) recruited and trained both a health nurse, who was a health visitor with educational skills, and a practice nurse, who performed the secondary role of taking blood and carrying out immunizations. The facilitator attended meetings with the practice team and developed a close, constructive relationship with the receptionists and guided them through the initial stages of launching the clinic. She advised the practice about obtaining weight charts, leaflets, risk cards, protocols, reminder labels and recall systems. A huge amount of enthusiasm and commitment was generated.

One of the initial objectives was to offer patients a health check every five years. It was not certain how many hours of clinic time per week this would entail, but the health nurse could only offer two four-hour sessions, so the partners accepted this, realizing that it might not be sufficient.

As with the three Oxford practices participating in the Oxford prevention of heart attack and stroke project,<sup>2</sup> this practice had no outside funding for the scheme. An added objective was therefore to generate enough item of service payments through tetanus and polio vaccination and cervical cytology, to finance the extra costs of the scheme.

G. Sacks, MRCP, general practitioner, Oxford; R. Marsden, MB, trainee general practitioner, Oxford.

© *Journal of the Royal College of General Practitioners*, 1989, 39, 369–372

The aims of this paper are to present an evaluation of the first two and a half years of this clinic from December 1983 to June 1986 in terms of: (1) the proportion of the target population actually screened and the potential for complete population screening; (2) the clinic's success at finding patients with risk factors for cardiovascular disease and recording these in the records; and (3) the financial cost to the practice.

## Method

### *The health checks*

All patients in the target age group who presented at the reception desk for an appointment with a doctor were given a verbal invitation to the clinic and a typed letter reinforcing this and explaining the details. Recruitment was suspended temporarily if the clinic was fully booked. Patients were given 20 minutes for a first appointment and 10 minutes for follow-up appointments. Initially men and women in the 36–64 year age group were recruited, but after six months the 25–34 year olds were added because the practice entered the multicentre national lipid study.<sup>3</sup>

During the health check the health nurse took a history. Height and weight were measured to determine overweight and obesity, blood pressure was measured for hypertension and urine glucose levels for diabetes. After the practice had entered the national lipid study, serum cholesterol and serum glucose measurements were added to the original menu and urine glucose measurement was then stopped.

Using information from the history and the practice records patients who were overdue for their tetanus or polio vaccination or cervical smear were identified and referred to appropriate members of the practice to have these performed. Previously undiagnosed diabetics were referred to the general practitioner.

Patients with raised blood pressure (defined as 160/90 mmHg or above) had this noted and three were recalled for further measurements and, if necessary, referred to the general practitioner according to an agreed protocol.<sup>2</sup>

Smokers were advised to stop smoking and offered leaflets, follow-up appointments for counselling and nicotine chewing gum if they wanted to try and use it as an aid to stopping.

'Overweight' was defined as being more than 10% above ideal weight with a quetelet or body mass index of 25–30.<sup>4</sup> 'Obese' was defined as being more than 20% above ideal weight, with an index of more than 30. The obese were given leaflets, advice on weight reduction and the offer of a follow-up appointment for counselling and support.

Patients with raised cholesterol levels ( $\geq 6.6$  mm) were given dietary instructions and leaflets and recalled after three months for a repeat blood level measurement.

All the information collected in the health checks was entered on a specially designed risk card which was filed in the practice records. The information was also entered on a main-frame computer with the cooperation of the Oxford community health project.

### *Audit of records*

Before the establishment of the health clinic in 1983, an audit of the practice records of 200 men and 200 women aged 35–64

years had been performed. This was based on a 10% random sample of records, using a method which had been validated by complete audit in other practices.<sup>1</sup> The audit noted whether a written record of blood pressure, weight and smoking habit had been made in the previous five years. A repeat audit was carried out in 1986 to look at changes in the risk recording as a result of the clinic.

### Financial costs

The cost to the practice of running in the clinic was estimated by determining the cost of extra equipment and staff time and subtracting the reimbursements of staff costs and item of service fees.

## Results

### Target population

Over the course of 130 weeks, 1470 patients were invited to have a health check and 1382 received one (94.0%). These comprised 24.9% of the target population aged 25–64 years (5542 patients).

The average rate of seeing new patients was 10.6 per week, or 5.3 per four-hour session.

### Case finding and risk recording

Table 1 shows the number and percentages of the 1382 patients attending the health clinic who were found to be in high risk categories for cardiovascular disease.

Overall, 34.9% of the patients were overweight (body mass index of 25 or over). The proportion of smokers was 27.0%. Previously undiagnosed hypertension was found in 66 patients and 20 of these had a blood pressure of 180/100 mmHg or above. A total of 159 patients were found to be hypercholesterolaemic of whom 24 had serum cholesterol levels of 8 mM or above. Eleven new diabetics were found.

Nearly half the patients (591) were referred for tetanus vaccination but only 26% responded and of the 453 referred for polio vaccination even fewer (11%) responded. Polio vaccination uptake may have been lower than tetanus because the importance of this had not been stressed to the practice nurse during this period and because of doubts about the agreed vaccination policies for polio within the practice.

Seventy eight patients were referred for a cervical smear but the rate of uptake was difficult to determine. The rate of uptake of smears had to be estimated because the practice had instituted a separate call and recall system shortly after the health checks began. This produced a large increase in cervical smear-taking and it was impossible to separate those extra smears generated by the health check and those by the postal invitation system.

The results of the repeat audit of records are shown in Figure 1. These apply to the records of patients aged 35–64 years because the 25–34 year olds had not been considered at the preliminary stage. Considerable increases in the recording of all three risk factors had occurred between 1983 and 1986.

### Financial cost

The cost of equipment needed for the clinic was minimal. New weighing scales (more accurate), a weight chart, postage and stationery amounted to £275.00. Individual record cards designed to fit in the medical record envelopes were made free of charge by a pharmaceutical company. All leaflets and handouts were provided free of charge by private companies or by the Health Education Council.

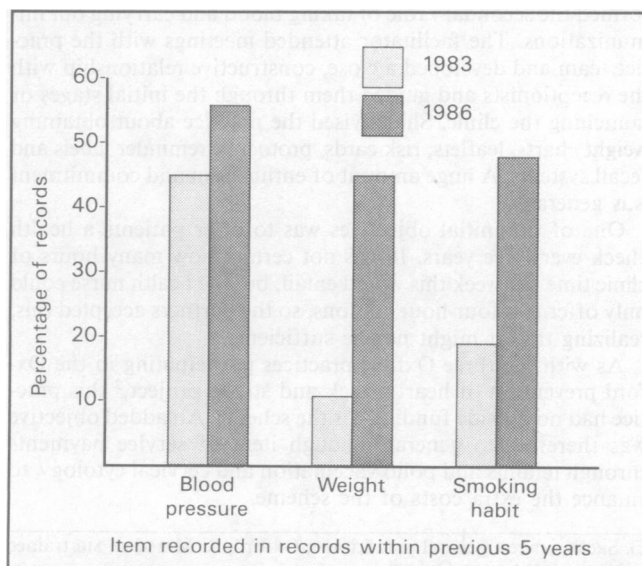
The major expense was the cost of employing additional staff. The health nurse was employed for eight hours per week to conduct the health checks and the practice nurse was employed for five hours per week to take blood samples and administer vaccinations. The receptionist time devoted to the clinic was harder to quantify than for the nurses because it was combined with their normal practice duties. The practice recognized that its reception staff were fully employed before the clinic started and saw the need to engage an extra half-time receptionist to ensure the success of the project. It was estimated that receptionists spent approximately five hours per week recruiting patients to the clinic, booking their appointments, handling their records and answering enquiries. Table 2 shows the cost to the practice of extra staff time over the two and a half year period and the 70% reimbursement by the National Health Service.

Table 2 also shows the sums received by the practice from item of service payments. Calculation of the actual sums paid in arrears by the family practitioner committee for vaccinations and cervical smears over four financial years proved too complicated, so an average was taken of four different annual rates of pay-

**Table 1.** Risk profile of patients attending the health clinic between 1983 and 1986.

Risk factor	Number (%) of patients (n = 1382)
Smoking	373 (27.0)
Overweight	
≥20% above ideal weight	173 (12.5)
≥10<20% above ideal weight	309 (22.4)
Total	482 (34.9)
Hypertension	
≥200/110 mmHg	2 (0.1)
≥180/100 <200/110 mmHg	18 (1.3)
≥150/90 <180/100 mmHg	46 (3.3)
Total	66 (4.7)
Diabetes	11 (0.8)
Hypercholesterolaemia	
≥8.0 mM	24 (1.7)
≥6.6 <8.0 mM	135 (9.8)
Total	159 (11.5)

n = total number of patients screened.



**Figure 1.** Percentage of records (n=400) containing an entry for each risk factor within the previous five years: comparison of 1983 and 1986.

**Table 2.** Net cost to the practice of screening 1382 patients.

Expenditure	£	Income	£
<i>Equipment and stationery</i>			
Sub-total	275		
<i>Staff salaries</i>			
		<i>70% reimbursement of salaries</i>	
Health nurse (8 hours)	6897	Health nurse	4828
Practice nurse (5 hours)	2513	Practice nurse	1759
Receptionists (5 hours)	2100	Receptionists	1470
Sub-total	11 510	Sub-total	8057
<i>Item of service fees<sup>a</sup></i>			
		Tetanus vaccinations (n = 153)	892
		Polio vaccinations (n = 48)	153
		Cervical smears <sup>b</sup> (n = 20)	122
		Sub-total	1167
		Sub-total allowing 15% attrition	1342
<i>Total expenditure</i>	11 785	<i>Total income</i>	9399
Net cost to practice £2386.00 or £1.73 per patient			

<sup>a</sup>Average fees for four years. <sup>b</sup>Estimated figure because of coincidental call-recall scheme.

ment. The two different rates of payment for tetanus vaccination (the lower A rate for first or second injections or the higher B rate for boosters) were calculated and the various fees paid for dispensing the injections were included.

As stated earlier, the uptake of cervical smears was difficult to estimate. For this study it has been assumed that the response to the health nurse referring a woman for cervical cytology was the same as the overall response to referrals for tetanus vaccination.

Fifteen per cent of the records of patients referred for vaccination were not available because the patients had died or left the area. The total sum of payments received has been corrected for this on the assumption that these patients had responded at the same rate as the 85% who had remained in the practice area.

The total cost for each patient seen was £8.53 of which £6.80 was reimbursed by the NHS in fees and salaries and £1.73 was contributed by the practice. Expressed as a sessional rate, each four-hour session cost £2357 per annum, £1880 of which was contributed by the NHS and £477 by the practice.

Some of the potential costs to the practice have not been included. Cholesterol estimations were funded by the multicentre national lipid study. The present cost of this test in the John Radcliffe hospital's biochemistry department is approximately £2.50. In addition, no financial estimate has been attempted of the cost of extra work done by doctors in counselling and treating patients with newly diagnosed hypertension, hypercholesterolaemia or diabetes.

## Discussion

Although a 94% attendance rate at the health checks looks impressive, only a quarter of the target population was screened in two and a half years. It is clear, with hindsight, that more clinic time was necessary for the task of screening the whole population within five rather than 10 years. The unanswered question is whether a 94% responses would continue throughout such a programme until the last patient had been screened. Commonsense suggests that it would not, and that it would fall progressively as the more cooperative and well-motivated patients

had been screened and a rump of non-responders remained.

Studies of the impact of opportunistic screening on entire populations within a finite time span, for example five years, are now needed to demonstrate its potential.

Workers who have attempted to screen whole practice populations by sending postal invitations to cohorts of patients from age-sex registers have had disappointing rates of uptake.<sup>5-9</sup> Mann and others<sup>3</sup> had a 36-63% response to postal invitation in the multicentre lipid survey but when opportunistic recruitment was used, 91-96% of patients responded. However, this study was of short duration.

Pill and others<sup>10</sup> made a careful study of the characteristics of responders and non-responders to postal invitations and found the former to be well motivated with a low cardiovascular risk profile and the latter to be a high risk group. They concluded that the exercise was wasteful of time and resources. Although we did not study non-attenders, our conclusions differ in that patients who attended the surgery for a consultation with the doctor and subsequently attended the health clinic, were not a particularly low-risk group. Their cardiovascular risk profile, as indicated by smoking and obesity rates, was only slightly lower than that of the general population. According to the OPCS survey of cigarette smoking<sup>11</sup> the average smoking rate in Britain was 34% in 1984 and 33% in 1986. That of our patients was 27%. The report of the Royal College of Physicians on obesity<sup>4</sup> quotes an obesity rate of 40.4% of adults. That of our patients was 34.8%. It is surely worthwhile to provide preventive services and health promotion to these people.

Financially the cost to the practice is important and has not been fully met by salary reimbursement and item of service payments. The estimated cost of £477 per session per annum (and we really needed four sessions rather than two) is a disincentive to general practitioners who want to provide this kind of service. The clinic could have been more efficient and cost-effective by double-booking appointments and providing the health nurse with syringes and needles so that tetanus injections could have been given during the health check. Both of these strategies were considered and rejected. The former might have reduced the nurse's effectiveness as a health educator and the latter have deterred the more anxious patients.

The accuracy of our financial calculations is weakened by several factors. The family practitioner committee remunerations are complex, retrospective and variable; the receptionists' precise input cannot be computed because it was combined with their other duties; the cervical cytology fees were only estimates because of the effect of concurrent postal invitations. We recognize these limitations but have attempted a careful and detailed accounting exercise which we hope will be helpful to doctors planning their own clinics.

This clinic continues to exist within the practice and is popular with patients, staff and doctors. The partners consider that, despite the cost, it is a worthwhile exercise to provide this kind of service.

The latest government white paper<sup>12</sup> recommends that general practitioners should undertake more preventive medicine, and there has been a recent proliferation of general practitioner based health clinics. At the time of writing there are more than 80 facilitators employed in promoting this activity in the UK (Fullard EM, personal communication). It is being promoted as a low cost, low technology system<sup>2,13</sup> the cost of which should be fully recuperated from item of service payments. Our findings cast doubt on this.

The RCGP's working party on prevention<sup>14</sup> recognizes that there is a financial disincentive to general practitioners who undertake this kind of work, and our findings support its recom-

mendation that staff employed by general practitioners to do preventive work should have 100% of their salaries reimbursed by the government.

## References

- Fullard EM, Fowler GH, Gray JAM. Facilitating prevention in primary care. *Br Med J* 1984; **289**: 1585-1587.
- Fullard EM, Fowler GH, Gray JAM. Promoting prevention in primary care: controlled trial of low technology low cost approach. *Br Med J* 1987; **294**: 1080-1082.
- Mann JI, Lewis B, Shepherd J, et al. Blood lipid concentrations and other cardiovascular risk factors: distribution, prevalence and detection in Britain. *Br Med J* 1988; **296**: 1702-1706.
- Royal College of Physicians. Obesity. *J R Coll Physicians Lond* 1983; **17**: (no. 1).
- Pill R, Stott N. Invitation to attend a health check in a general practice setting: the views of a cohort of non-attenders. *J R Coll Gen Pract* 1988; **38**: 57-60.
- Wrench JG, Irvine R. Coronary heart disease: account of a preventive clinic in general practice. *J R Coll Gen Pract* 1984; **34**: 477-481.
- Woods JO, Cullen MJ, Dorman RH. The prevention of coronary heart disease in general practice. *J R Coll Gen Pract* 1980; **30**: 52-57.
- Rankin HWS, Horn DB, MacKay AW, Forgan CM. The control of coronary heart disease risk factors in general practice: a feasibility study. *Health Bull (Edinb)* 1976; **34**: 66-72.
- Jones A, Davies DH, Dove JR, et al. Identification and treatment of risk factors for coronary heart disease in general practice: a possible screening model. *Br Med J* 1988; **296**: 1711-1714.
- Pill R, French J, Harding K, Stott N. Invitation to a health check in a general practice setting: comparison of attenders and non-attenders. *J R Coll Gen Pract* 1988; **38**: 53-56.
- Office of Population Censuses and Surveys. *Cigarette smoking 1972-1986. SS 88/1*. London: OPCS, 1988.
- Secretaries of State for Social Services, Wales, Northern Ireland and Scotland. *Promoting better health. The Governments programme for improving primary health care (Cm 249)*. London: HMSO, 1987.
- Grace JF. Screening in general practice — implications for cost and extra work. *Br Med J* 1983; **287**: 589-591.
- Royal College of General Practitioners. *Prevention of arterial disease in general practice. Report 19*. London: RCGP, 1981.

## Acknowledgements

We would like to thank the following for their help, support and advice in the writing of this paper: Professor Jim Mann, Margaret Thorogood, Angela Coulter, Melanie Lawless and Lynnie Butcher. The Oxfordshire health authority provided a small research grant.

## Address for correspondence

Dr Gerald Sacks, The Manor Surgery, Osler Road, Headington, Oxford OX3 9BP.

# College Publications PRACTICE ORGANIZATION

## BOOKS AND PAPERS

### Doctors on the Move (Occasional Paper 7)

Describes a revolutionary method of organizing a general practice whereby doctors and nurses move from patient to patient instead of following traditional consulting room patterns. £3.00

### Computers in Primary Care (Occasional Paper 13)

This report from an RCGP working party describes current and future possibilities for computerizing aspects of care in general practice. £3.00

### Trends in General Practice Computing

Covers computerized prescribing, office systems, computers in the consulting room, attitudes of patients and future developments. An easy-to-read introduction to the subject with plenty to offer those already committed. £12.50

## INFORMATION FOLDERS

### Age/Sex Registers

Describes the different types of register, their functions and applications, and how to construct and operate one. Suggestions are made on more advanced registers, and computer applications. £3.00 (£4.00 non-members)

### Entering General Practice

Describes most aspects of entry to general practice for trainees and young GPs, including how to present a CV, how applicants may be assessed by a practice, and how they should assess a practice. There are monographs to help women GPs in full time practice or job sharing. £6.00 (£7.00 non-members)

### Appointment Systems

Based on the work of the original Practice Organization Committee of Council, the folder covers the amount of time which should be provided for each list size, different booking systems and common faults, together with suggestions on how to adjust an appointment system which is not working properly. £5.00 (£6.00 non-members)

All the above can be obtained from the Sales Office, Royal College of General Practitioners, 14 Princes Gate, London SW7 1PU (Enquiries, Tel: 01-823 9698). Prices include postage. Payment should be made with order. Cheques should be made payable to RCGP Enterprises Ltd. Access and Visa welcome (Tel: 01-225 3048, 24 hours).

## Medical Records

Provides a wide ranging view of medical record keeping, describing the basic components of the good medical record and suggesting how practice records might be improved in a stepwise progression. Different authors discuss different formats for records and the place of interacting specialist registers and recall systems. £5.00 (£6.00 non-members)

## Practice Information Booklets

Written largely by the College's Patient Liaison Group, this folder has many useful suggestions for the content and presentation of patient information booklets, together with a useful section on the constraints of advertising. £6.00 (£7.00 non-members)

## VIDEO PACKAGES

### Management in Practice

Produced jointly by the RCGP and MSD Foundation, the package consists of a video and supporting course book. It is the first management video that has been specifically designed for use in general practice by all members of the primary care team. A diabetes mini-clinic is used to illustrate the management problems that can result when new initiatives are not properly thought through. £19.50\* (additional course books £4.50)

### We Need a Practice Manager

The second package in the series produced by the RCGP and MSD Foundation. It deals with the process leading to the appointment of a practice manager. The principles demonstrated are relevant to the recruitment of all members of the practice team. £24.95\* (additional course books £6.50)  
\*£35.00 if ordered together

## RECORD CARDS

A range of medical record cards and other items are available, including: age-sex register cards, menstruation cards, pink summary cards, obstetric cards, medical summary problem orientated cards (BD1), family and personal history cards (BD2A), drug treatment cards (BD3A), repeat prescription cards (BD3B), flow sheets (BD4), patient questionnaires, pre-school record cards, personal history cards. Prices on request.