Nilsson-Ehle (department of clinical chemistry). Central Middlesex Hospital Trust, London: Clive Dash. Centre for Health Economics, Stockholm School of Economics: Bengt Jönsson, Magnus Johannesson (associate member). Department of Family Medicine, University of Uppsala, Sweden: Gösta Tibblin. Department of Primary Health Care and General Practice, University of Linköping: Erik Trell. Steering Committee: Lars H Lindholm (chairman), Clive Dash, Tord Ekbom (coordinator).

1 Kannel WB, Dawber TR, Kagan A, Revotskie N, Stokes J. Factors of risk in the development of coronary heart disease-six-year follow up experience. The Framingham study. *Ann Intern Med* 1961;55:33-50.
2 Keys A. *Seven countries: a multivariate analysis of death and coronary heart disease.* Cambridge, MA: Harvard University Press, 1980.
3 Rose G, Tunstall-Pedoe H, Heller RF. UK heart disease prevention project: incidence and mortality results. *Lancet* 1983;i:1062-5.
4 Ramsay LE, Yeo WW, Jackson PR. Dietary reduction of serum cholesterol concentration: time to think again. *BMJ* 1991;303:953-7.
5 Danielsson H, Ekman R, Fex G, Johansson BG, Kristensson H, Nilsson-Ehle P, *et al.* Changes in plasma high density lipoproteins in chronic male alcoholics during and after abuse. *Scand J Clin Lab Invest* 1978;38:113-9.
6 Roeschlau P, Bernt E, Gruber W. Enzymatische bestimmungen des Gesamtcholesterins in Serum. *Zeitschrift Klinischer Chemie und Klinischer Biochemie* 1974;12:226-30.
7 Wahlefeld AW. Triglyceride determination after enzymatic hydrolysis. In: Bergmayer HV, ed. *Methods of enzymatic analysis.* New York: Verlag Chemie, Weinheim, and Academic Press, 1974:1874.
8 Friedewald WT, Levy RI, Frederickson DS. Estimation of the concentration of low-density lipoprotein cholesterol in plasma without the use of a preparative ultracentrifuge. *Clin Chem* 1972;18:499-502.
9 Johannesson M, Borgquist L, Nilsson-Ehle P, Jonsson B, Ekbom T, Lindholm L. The cost of screening for hypercholesterolaemia–results from a clinical trial in Swedish primary health care. *Scand J Clin Lab Invest* 1993;53:725-32.
10 Turpeinen O, Karvonen MJ, Pekkarinen M, Miettinen M, Elosuo R, Paavilainen E. Dietary prevention of coronary heart disease: the Finnish mental hospital study. *Int J Epidemiol* 1979;8:99-118.
11 Research Committee to the Medical Research Council. Controlled trial of soya-bean oil in myocardial infarction. *Lancet* 1968;ii:693-700.
12 Leren P. The effects of plasma cholesterol lowering diet in male survivors of myocardial infarction. A controlled clinical trial. *Acta Medica Scandinavica* 1966;446(suppl):1-92.
13 Franz ID, Dawson EA, Ashman PL, Gatewood LC, Bartsch GE, Kuba K, *et al.* Test of effect of lipid lowering by diet on cardiovascular risk. The Minnesota coronary survey. *Arteriosclerosis* 1989;9:129-35.
14 Hjermann I, Velve Byre K, Holme I, Leren P. Effect of diet and smoking intervention on the incidence of coronary heart disease. Report from the Oslo study group of a randomised trial in healthy men. *Lancet* 1981;ii: 1303-10.
15 Dayton S, Pearce ML, Goldman H, Harrish A, Plotkin D, Schickman M, *et al.* Controlled trial of a diet high in unsaturated fat for the prevention of atherosclerotic complications. *Lancet* 1968;ii:1060-2.
16 Tibblin G, Tibblin B, Peciva S, Kullman S, Svardsudd K. The Göteborg quality of life instrument—an assessment of well-being and symptoms among men born 1913 and 1923. *Scand J Prim Health Care* 1990;1(suppl): 33-8.
17 Lingfors H, Lindström K, Persson L-G, Bengtsson C, Lissner L, Ellegrd L, *et al.* Evaluation of a pedagogic dietary questionnaire aimed for health surveys. *Scandinavian Journal of Nutrition* 1994;38:106-11.
18 National Board of Health and Welfare (Drug Information Committee, Sweden). *Treatment of mild hypertension.* Uppsala: NBHW, 1987.
19 Kannel WB, Wolf PA, Garrison RJ, eds. *The Framingham study; an epidemiological investigation of cardiovascular disease, section 37. The probability of developing certain cardiovascular diseases in eight years at specified values of some characteristics.* Springfield: USS Department of Commerce, National Technical Information Service, 1987.
20 Family Heart Study Group. Randomised controlled trial evaluating cardiovascular screening and intervention in general practice; principal results of British family heart study. *BMJ* 1994;308:313-20.
21 Imperial Cancer Research Fund OXCHECK Study Group. Effectiveness of health checks conducted by nurses in primary care: results of the OXCHECK study after one year. *BMJ* 1994;308:308-12.
22 Downie RS, Fyfe C, Taunahill A. *Health promotion, models and values.* Guildford: Oxford University Press, 1993.
23 Festinger L. *Conflict, decision and dissonance.* Stanford: Stanford University Press, 1964.

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Strategies for reducing coronary risk factors in primary care: which is most cost effective?

K Field, M Thorogood, C Silagy, C Normand, C O'Neill, J Muir

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Gwent College of Higher Education, Newport Business School, PO Box 180, Newport NP9 5XR
K Field, *senior lecturer*

Public Health and Policy Department, London School of Hygiene and Tropical Medicine, London WC1E 7HT
M Thorogood, *senior lecturer*
C Normand, *professor of health policy*

Department of General Practice, School of Medicine, Flinders University of South Australia, Adelaide 5001, Australia
Chris Silagy, *professor*

Imperial Cancer Research Fund General Practice Research Group, University of Oxford, Radcliffe Infirmary, Oxford OX2 6HE
C O'Neill, *nurse facilitator*
J Muir, *senior research fellow*

Correspondence to: Dr Thorogood.

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Abstract

Objective—**To examine the relative cost effectiveness of a range of screening and intervention strategies for preventing coronary heart disease in primary care.**

Subjects—**7840 patients aged 35-64 years who were participants in a trial of modifying coronary heart disease risk factors in primary care.**

Design—**Effectiveness of interventions assumed and the potential years of life gained estimated from a risk equation calculated from Framingham study data.**

Main outcome measure—**The cost per year of life gained.**

Results—**The most cost effective strategy was minimal screening of blood pressure and personal history of vascular disease, which cost £310-£930 per year of life gained for men and £1100-£3460 for women excluding treatment of raised blood pressure. The extra cost per life year gained by adding smoking history to the screening was £400-£6300 in men. All strategies were more cost effective in men than in women and more cost effective in older age groups. Lipid lowering drugs accounted for at least 70% of the estimated costs of all strategies. Cost effectiveness was greatest when drug treatment was limited to those with cholesterol concentrations above 9·5 mmol/l.**

Conclusions—**Universal screening and intervention strategies are an inefficient approach to reducing the coronary heart disease burden. A basic strategy for screening and intervention, targeted at older men with raised blood pressure and limiting the use of cholesterol lowering drugs to those with very high cholesterol concentrations would be most cost effective.**

Introduction

Coronary heart disease currently costs the NHS about £500 million annually (with an extra £10 million for prevention). In 1988 in England and Wales coronary heart disease accounted for 153 084 deaths,[1] and the government recently introduced a policy to reduce the incidence of coronary heart disease by 40% in people under 65 by the year 2000.[2] The 1993 general practice contract provided financial incentives for general practitioners to screen for and treat prevalent coronary disease risk factors,[3] but the effectiveness of of such programmes has been called into question.[4]

It is debatable whether coronary disease risk screening should be universal or targeted at high risk groups, who would gain more from the interventions. Silagy *et al* used data on the prevalence of coronary disease risk factors in participants in the OXCHECK trial to estimate how many people would need to be treated and how many potential coronary events would be averted with different screening strategies.[5] They showed that the ratio of events averted to workload fell as the screening strategies became more comprehensive but did not address costs. Recent results of trials of health promotion clinics in primary care have shown only modest reductions in risk.[6,7] To determine whether screening programmes are worth while we analysed the relative cost effectiveness of different coronary heart disease strategies in primary care.

Subjects and methods

In 1989, 11 090 men and women aged 35-64 years registered with general practices in Bedfordshire were randomly allocated to receive a health check during one of four years as part of the OXCHECK trial.[6] We used data on the prevalance of coronary risk factors from 7840 consecutive subjects attending a first health check before February 1993.

We considered six prevention strategies ranging from targeting a small high risk group to an unselective strategy including the whole population aged 35-64 years (table I). The strategies represent a reasonably logical progression from minimal intervention to blanket screening of the whole population.

Patients found at screening to have coronary risk factors were assumed to have been offered lifestyle counselling together with drug treatment where appropriate. We assumed that the effectiveness of interventions was intermediate between that reported by Silagy *et al*[5] and that in two recently published trials[6 7]—that is, treatment of diastolic blood pressure ≥95 mm Hg would achieve a mean reduction of 5 mm Hg (for simplicity systolic blood pressure was not considered); the 12 month sustained rate of stopping smoking among smokers would be 5%; patients with total cholesterol concentrations above 8·5 mmol/l would achieve a mean fall of 15% (20% would achieve this by dietary change alone, the remainder would be prescribed long term lipid lowering drugs); patients with a total cholesterol concentration of 7·5-8·5 mmol/l would achieve a mean fall of 5% by dietary change alone.

COST OF HEALTH CHECKS

The cost of each strategy included the costs of the initial screening, further tests for subjects at high risk, and the interventions discussed above. The cost of treating raised blood pressure has not been included since it is a fixed cost and the objective was to examine the relative cost effectiveness of the strategies. We assumed that a qualified grade G nurse conducted the health checks; the time required for collecting information on diet was 5 minutes; the time required for screening for other risk factors, such as smoking, body mass index, and family history, was two minutes each; the time required for taking a blood sample was 5 minutes; and the cost of measuring cholesterol concentration was £4.80. These times were based on analysis of tape recorded checks from the OXCHECK trial done by one of us (CO'N).

Subjects found to be at risk were given lifestyle advice or drugs or both. We assumed that the lifestyle advice required four 15 minute sessions of nurse time plus 40 minutes of nurse organisational time (total 100 minutes); subjects with a high cholesterol (>8·5 mmol/l) would be given this lifestyle advice over three months; the 80% of subjects whose cholesterol concentration did not fall below 8 mmol/l would take long term lipid lowering drugs; the general practitioner would spend nine minutes each year advising a patient and prescribing a drug; a typical drug (synvastatin 20 mg/daily) would cost £235 a year. Future costs have been discounted at 6% a year. (The assumed costs are given in the appendix.)

TABLE I—*Strategies for reducing risk factors for coronary heart disease in primary care*

Strategy	Initial screening	At risk group	Additional screening for those at risk
1	Measure blood pressure, ask about personal history	Systolic blood pressure >140 mm Hg, history of ischaemic heart disease, stroke or transient ischaemic attack	Smoking, height, weight, diet, family history, cholesterol
2	As strategy 1 plus ask about smoking	As strategy 1 plus smokers	Height, weight, diet, family history, cholesterol
3	As strategy 2 plus measure of height and weight	As strategy 2 plus body mass index >28	Diet, family history, cholesterol
4	As strategy 3 plus dietary assessment	As strategy 3 plus fat intake >110 g/day	Family history, cholesterol
5	As strategy 4 plus family history	As strategy 4 plus first degree relative with ischaemic heart disease, stroke, or transient ischaemic attack before 60 years	Cholesterol
6	As strategy 5 plus measure of blood cholesterol	As strategy 5 plus total cholesterol >7·5 mmol/l	None

Diet assessed by simple screening questionnaire. High fat intake defined as >110 g/day, which is equivalent 45% of energy intake in daily diet of 9·2 MJ.

MEASURING BENEFITS

We calculated the benefit of the screening and intervention as the number of years of life gained by averting premature death from coronary heart disease. The probability of death from coronary heart disease was determined from data derived from the Framingham study. The Framingham parametric model[8] was chosen because it was derived from a geographically defined population representative of similarly aged men and women. The model can provide predictions for different lengths of time and takes into account the effect of age, sex, smoking, blood pressure, the ratio of total cholesterol to high density lipoprotein cholesterol, diabetes, and left ventricular hypertrophy.

Data on risk factors in the study cohort were inserted in the parametric model and used to predict individuals' risk of coronary heart disease death over the next 10 years. Because no electrocardiographic data were available, the contribution of left ventricular hypertrophy to the regression equation was omitted, producing a conservative estimate of the risk.

The assumptions we made were used to modify the probability of coronary heart disease death and calculate avoided deaths. The expected years of survival for each age group have been taken from a survival table[9] and avoided deaths have been converted to years of life saved. We calculated both the years of life saved and also years of life saved discounted at 6% a year to account for the fact that people prefer present benefits to future benefits and future costs to present costs. If someone borrows to spend now they have to repay the debt with interest. This means that the same sum of money is worth less if it is paid in the future.

The cost effectiveness of a strategy was calculated as the ratio of cost to years of life gained.

SENSITIVITY ANALYSIS

Cost effectiveness is dependent on the assumptions made about the effectiveness of the interventions. We therefore carried out a sensitivity analysis testing two further sets of assumptions—a best and worst scenario. For the best scenario we assumed that among cigarette smokers the 12 months sustained rate of stopping smoking would be 10%; all patients with a total cholesterol concentration above 8·5 mmol/l would achieve a mean fall of 20% (25% would achieve this by dietary change alone); and patients with a total cholesterol concentration of 7·5-8·5 mmol/l would achieve a mean fall of 10% by dietary change alone. For the worst scenario we assumed that the 12 month sustained rate of stopping smoking would be 3%; all patients with total cholesterol concentrations above 8·5 mmol/l would achieve a mean fall of 10% (15% by dietary change alone); and patients with a total cholesterol concentration of 7·5-8·5 mmol/l would achieve a mean fall of 3% by dietary change alone.

Results

Table II shows the years of life gained, the costs, and the cost effectiveness of the six strategies by sex. The percentage of costs attributable to cholesterol lowering drugs was more than two thirds of the total cost for all strategies. The most basic strategy was the most cost effective, with an increasing cost effectiveness ratio as the strategies became more comprehensive. All strategies were more cost effective in men than women. Cost effectiveness improved greatly when screening and intervention were confined to the two older

TABLE II—*Estimated years of life gained, costs, cost effectiveness, and incremental cost of six strategies for coronary heart disease risk reduction in 7840 men and women aged 35-64*

	No of year of life gained (not discounted)		Discounted total		% Of cost on cholesterol lowering drugs		Cost effectiveness ratio (£1000 life year gained)		Change in cost effectiveness from previous strategy (£1000 life year gained)†		Cost effectiveness rates (£1000/discounted life years gained)	
Strategy*	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
1	132	78	97	206	72	87	0·73	2·65	—	—	1·24	4·73
2	182	103	173	295	71	82	0·95	2·85	1·53	3·47	1·64	5·15
3	211	121	250	421	70	81	1·19	3·47	2·65	6·97	2·04	6·27
4	216	124	263	444	69	80	1·22	3·59	2·49	9·57	2·09	6·48
5	218	125	263	465	69	81	1·21	3·70	0·18	12·47	2·08	6·70
6	227	133	287	503	69	79	1·27	3·78	2·72	5·04	2·18	6·85

*See table I for definition. †Calculated before rounding of numbers.

age groups and particularly to men over 60 years (table III).

SENSITIVITY ANALYSIS

Table IV shows the years of life gained, costs, and cost effectiveness for the best and worst scenarios for men and women. In men, the worst scenario resulted in a higher cost per year gained, and a greater difference between strategy 1 and 6. This effect was much greater in women. None of the assumptions changed the relative position of the six strategies, or the difference with sex.

INTERVENTION FOR CHOLESTEROL

Because cholesterol lowering drugs represented at least 70% of the total costs incurred we explored further the relative cost effectiveness of different protocols for the treatment of raised cholesterol concentration (table V). Providing no cholesterol screening or intervention was less cost effective in men than screening for raised cholesterol but offering drugs only if cholesterol concentrations remained above 9·5 mmol/l after dietary advice. The incremental cost effectiveness of introducing treatment at these concentrations was just £30 per year of life gained in men in strategy 1. However, introducing drug treatment at lower cholesterol concentrations was considerably less cost effective.

TABLE III—*Cost effectiveness ratio (£1000/life year gained) of six strategies for coronary heart disease risk reduction by sex and age (without discounting)*

	Age 35-49		Age 50-59		Age 60-69	
Strategy	Men	Women	Men	Women	Men	Women
1	1·2	2·7	0·8	3·1	0·6	2·1
2	2·0	5·0	0·9	3·0	0·6	2·2
3	2·2	7·4	1·1	3·4	0·7	2·7
4	2·3	7·5	1·1	3·5	0·7	2·8
5	2·3	7·7	1·1	3·7	0·7	2·9
6	2·4	8·0	1·2	3·7	0·7	2·9

Discussion

Our calculation did not represent the total costs of coronary heart disease prevention in primary care as we did not include the cost of blood pressure screening and treatment, which was the same for all strategies, or cost of treating existing coronary heart disease. We also did not consider the savings generated by lower morbidity and therefore less demand for medical care. Those people surviving who would not otherwise have done so will generate other costs of care as they became at risk of other diseases. These costs are unknown.

We have shown that recording blood pressure and identifying prevalent vascular disease with appropriate interventions is more cost effective than more comprehensive screening. In men the cost was £730 per non-discounted year of life gained for the most basic strategy and £1270 per non-discounted year of life gained for the comprehensive strategy. The equivalent cost effectiveness ratios taking into account discounting of benefits were £1240 and £2180.

TABLE IV—*Years of life gained, cost, and cost effectiveness of six strategies for coronary heart disease risk reduction after changing assumptions about efficacy of interventions either to be more effective (best) or less effective (worst) in men and women*

	Years of life gained		Discounted total		Cost effectiveness (£1000/life year gained)		Cost effectiveness (£1000/discounted life year gained)	
Strategy	Best	Worst	Best	Worst	Best	Worst	Best	Worst
Men:								
1	288	109	88	102	0·31	0·93	0·51	1·58
2	459	139	158	182	0·34	0·31	0·59	2·24
3	567	157	230	261	0·41	1·67	0·70	2·86
4	588	160	239	273	0·41	1·71	0·70	2·94
5	595	161	241	275	0·41	1·71	0·70	2·94
6	628	166	262	299	0·42	1·80	0·72	3·10
Women:								
1	167	63	184	218	1·10	3·46	1·96	6·18
2	245	77	264	310	1·08	4·03	1·91	7·11
3	313	90	378	442	1·20	4·93	2·18	8·89
4	321	91	399	466	2·24	5·11	2·25	9·23
5	327	92	418	488	1·28	5·29	2·32	9·55
6	355	97	455	528	1·38	5·45	2·33	9·89

TABLE V—*Cost effectiveness and incremental cost effectiveness of different protocols for intervention on raised cholesterol levels by sex for the basic strategy*

Cholesterol intervention protocol*	Cost effectiveness (£1000/life year gained)		Change in cost effectiveness (£1000/discounted life year gained)		Change in cost effectiveness from previous protocol (£1000/life year gained)		Change in cost effectiveness from previous protocol (£1000/discounted life year gained)	
	Men	Women	Men	Women	Men	Women	Men	Women
1	0·6	1·6	1·1	2·9				
2	0·3	1·6	0·5	2·8	1·6	0·03	2·7	0·03
3	1·1	3·9	1·8	7·0	22·3	16·5	40·0	27·3
4	3·0	8·7	5·2	15·5	28·2	17·8	48·4	30·1
5	6·4	14·2	10·8	25·9	31·2	17·8	60·5	29·2

*Protocol 1=No treatment; 2=dietary advice at 8·5 mmol/l, drugs at 9·5 mmol/l; 3=dietary advice at 7·5 mmol/l, drugs at 8·5 mmol/l; 4=diet at 6·5 mmol/l, drugs at 7·5 mmol/l; 5=dietary advice at 5·5 mmol/l, drugs at 6·5 mmol/l.

Key messages

- General practitioners are encouraged to screen for risk factors for coronary heart disease
- The most cost effective strategy is to target patients with raised blood pressure or a history of coronary heart disease
- Extending the strategy to include other factors increases the cost by variable amounts
- All prevention strategies are more cost effective in men than in women and in older than younger age groups
- Drug treatment for patients with high cholesterol concentrations is cost effective, but the incremental cost of extending treatment to lower cholesterol concentrations is high

APPLICABILITY OF RESULTS

Evidence on the effectiveness of primary care interventions is mixed. Our assumptions about the effectiveness of interventions are more optimistic than those reported recently.[6 7] The calculations may therefore overestimate the cost effectiveness of such checks. A sensitivity analysis showed that, irrespective of whether optimistic or pessimistic assumptions were used, the relative position of the strategies did not change, nor did the differential effect seen in men and women.

We studied a cohort of 7840 people screened in Bedfordshire. The prevalence of such risk factors is likely to vary in other parts of Britain, but the relative importance of different risk factors in men and women will be much the same. We used data from the United States to calculate years of life gained because no such data are available for a British population. The Framingham model provides an optimistic estimate of gain from interventions and does not distinguish between risk associated with an initial cholesterol concentration and that associated with the same concentration achieved by dietary change or drug treatment. In addition, the model gives a coefficient of risk for smokers and non-smokers but does not allow for a gradual fall in risk in those stopping smoking. The Framingham population will be genetically similar to a British population, but, nevertheless, it is impossible to determine the true predictive value of the Framingham equation in our population. However, since we were comparing relative cost effectiveness of strategies, the inaccuracies caused by using non-British data will not invalidate our conclusions.

EFFECT OF AGE AND SEX

Screening and intervention were considerably less cost effective in women. In addition, the incremental cost of extending from one strategy to the next was considerably greater in women than men. Cost effectiveness improved greatly as age increased.

POLICY IMPLICATIONS

Our results suggest that strategies to reduce coronary heart disease risk in primary care are most cost effective if they are limited to patients with raised blood pressure or a history of coronary heart disease. These initiatives are more cost effective in men than women, and in older rather than younger subjects. Lipid lowering drugs account for a large proportion of the cost, and protocols which limit use of these drugs to those with very high cholesterol concentrations (above 9·5 mmol/l) will increase cost effectiveness.

Our calculations are based entirely on the risk of death from coronary heart disease. A small reduction in smoking incidence would have a large effect on the incidence of other fatal diseases, and it is important, therefore, to inquire about smoking habits and encourage patients to stop.

Although these data do not define an ideal screening policy or provide exact figures for the cost of different preventive strategies, they may be useful to health planners and primary care teams. Focusing on comparative cost effectiveness allows more informed choices. Data on the relative cost effectiveness of different preventive strategies and the incremental cost per extra year of life gained when increasing the scope of a strategy should allow health planners to set a hypothetical ceiling of expenditure for each year of life gained and then choose a package tailored to age group and sex which lies below that ceiling. Further research, preferably by randomised trials, on the effectiveness of health promotion interventions would enable better comparisons between different strategies for preventing coronary heart diseases and between strategies for preventing different diseases. We need information on the long term changes that can be expected from health promotion interventions and also the effects that these changes have on the future risk of disease.

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Appendix

Assumed costs of screening were as follows: Annual salary for a grade G nurse=£17 725 including national insurance of 4% and superannuation of 10·6%. Syringes (20 ml)=£3.07/50.

Needles=£1.15/100. (10 ml tubes=£94.50/1000.

Laboratory cholesterol test=£4.80 (Luton and Dunstable Hospital).

General practitioner is £44 000 plus 6·5% NHS contribution toward superannuation.

Lipid lowering drug (simvastatin 20 mg)=£18.29/28 tablets.

1 Langham SJ, Normand C, Piercy J, Rose G. Coronary heart disease. In: Stevens AM, Raftery J, eds. *Health care needs assessment. The epidemiologically based needs assessment reviews.* Vol 1. Oxford: Radcliffe Medical Press, 1994; 341-78.
2 Secretary of State for Health. *The health of the nation: a strategy for health in England.* London: HMSO, 1992.
3 *National Health Services general medical services: amendment to statement of fees and allowances.* London: HMSO, 1993.
4 Stott N. Screening for cardiovascular risk in general practice. *BMJ* 1994;308:285-6.
5 Silagy C, Mant D, Muir J, Neil A. Modelling different strategies to prevent coronary heart disease in primary care. *J Clin Epidemiol* 1994;47:993-1001.
6 Imperial Cancer Research Fund OXCHECK Study Group. Effectiveness of health checks conducted by nurses in primary care: rules of the OXCHECK study after one year. *BMJ* 1994;308:308-12.
7 Family Heart Study Group. Randomised controlled trial evaluating cardiovascular screening and intervention in general practice: principal results of a Britsh family heart study. *BMJ* 1994;308:313-20.
8 Anderson DM, Odell PM, Wilson PWF, Kannel WB. Cardiovascular disease risk profiles. *Am Heart J* 1991;121:293-8.
9 Office of Population Censuses and Surveys. *Mortality statistics general 1989.* London: HMSO, 1991: table 15. (Series DH1/23.)

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