

# The challenge of secondary prevention for coronary heart disease in older patients: findings from the British Women's Heart and Health Study and the British Regional Heart Study

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**Background.** Secondary prevention of coronary heart disease (CHD) among older individuals is associated with considerable benefit.

**Methods.** In this study, we have examined the extent of secondary prevention among British women and men aged 60–79 years who were surveyed and examined between 1998 and 2001.

**Results.** Among 483 women (12.1% of the whole sample) and 831 men (19.5%) with CHD, >90% of both sexes had at least one modifiable risk factor, with over two-fifths having high blood pressure and over three-quarters high cholesterol. For total cholesterol and body mass index, mean values in both male and female subjects were above recommended levels, and a large shift in the population distributions would be required for targets to be met. Less than one-quarter of subjects of either sex were on a statin, and whilst the majority of men were taking an antiplatelet medication, only 40% of women were.

**Conclusions.** Most older women and men in Britain were failing to meet National Service Framework standards for secondary prevention in the period immediately before its implementation. Large shifts in the population distributions of some risk factors would be required in this group to meet these standards.

**Keywords.** Coronary heart disease, secondary prevention, aspirin, statin, older age.

## Introduction

The absolute benefits of coronary heart disease (CHD) prevention are greatest among subjects with established disease. Whilst a number of studies have assessed the extent of secondary prevention in different populations, no British studies have looked at the levels of modifiable risk factors and treatment in a nationally representative sample of older people. The absolute benefit of secondary prevention in terms of reducing morbidity and disability in older individuals may be greater than

that seen in younger individuals.<sup>1</sup> The aim of this paper is to describe the standards of secondary prevention in older (60–79 years) British women and men in relation to the National Service Framework (current national Department of Health policy guidance in this area) requirements.<sup>2</sup>

## Methods

The British Regional Heart Study is a prospective study of cardiovascular disease involving 7735 men, selected from the age–sex registers of one group general practice in each of 24 British towns, and followed-up since baseline data collection in 1978–1980. Between February 1998 and February 2000, a clinical re-examination of all surviving members of the British Regional Heart Study, now aged 60–79 years, was undertaken ( $n = 4252$ , 76% attendance of survivors). The British Women's Heart and Health Study cohort was established in 1999 to

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**Box 1** *UK National Health Service National Service Framework requirements for preventing coronary heart disease in high risk patients in primary care<sup>2</sup>*

GPs and primary care teams should identify all people with established cardiovascular disease and offer them comprehensive advice and appropriate treatment to reduce their risks:

- advice about how to stop smoking including advice on the use of nicotine replacement therapy
- information about other modifiable risk factors and personalized advice about how they can be reduced (including advice about physical activity, diet, alcohol consumption, weight and diabetes)
- advice and treatment to maintain blood pressure below 140/85 mmHg (a footnote states: "In practice, it will not be possible to achieve this for every patient. However, practitioners should not be satisfied with pressures greater than 150mmHg systolic or 90mmHg diastolic.")
- low dose aspirin (75 mg daily)
- statins and dietary advice to lower serum cholesterol concentrations EITHER to <5 mmol/l OR by 30% (whichever is greater)
- $\beta$ -blockers for people who also have had a myocardial infarction

parallel the British Regional Heart Study. The population consisted of women aged 60–79 years, and sampling was stratified by town and by 5 year age group to ensure the distribution proportionately matched that of the men. A total of 4286 women (60% of the 7173 invited) participated and 3994 (56%) had complete data on all variables assessed here. Similar data collection procedures were used for both the women and re-examination of the men and have been described in detail elsewhere.<sup>3</sup> Ethics committee approval was obtained for both studies.

Detailed reviews of participants' general practice medical records (including GP notes, hospital letters and computer data) were undertaken to identify all diagnoses of angina and myocardial infarction occurring since 1978. Confirmation of a diagnosis of myocardial infarction was obtained according to WHO criteria. Treatment targets as specified in the National Service Framework were used for the assessment of risk factor control (see Box 1).<sup>2</sup>

## Results

There were no differences in medical record recordings of CHD between responders and non-responders among the women ( $P = 0.3$ ). In total, 483 women (12.1%) and 831 men (19.5%) had diagnoses of CHD. The prevalence of GP-recorded angina was similar in women and men (10.1 versus 11.6%), but myocardial infarction was more common in men (2.0 versus 8.0%). Both diagnoses increased with age.

Table 1 shows the extent of secondary prevention. More than 90% of both women and men had at least one poorly controlled modifiable risk factor, with two-fifths of women and men having high blood pressure and >75% of both sexes having high cholesterol levels. Figure 1 shows the distributions of blood pressure, body mass index (BMI) and cholesterol levels in women and men with CHD, together with the thresholds for these risk factors as stipulated in the National Service Framework.<sup>2</sup> It can be seen that for total cholesterol and BMI, mean values in both male and female subjects are above recommended levels, and a large shift in the population distributions would be required for targets to be met.

Only a minority of women (27%) and men (24%) were using statins; use of antiplatelet drugs was low in women. Fifteen of the women had had a myocardial infarction in the 12 months prior to assessment and, of these, five (33%) were taking a  $\beta$ -blocker. Of 25 men who had a myocardial infarction in the 12 months prior to assessment, 12 (48%) were taking a  $\beta$ -blocker.

Risk factor control (with the exception of smoking) and treatment tended to be better in younger (60–69 years) patients but, even in this group, >90% had at least one poorly controlled modifiable risk factor and less than one-third were using statins. Both women and men who had angina only, compared with those who had a history of myocardial infarction, were less likely to be using antiplatelet medication (age, social class, area of residence adjusted odds ratio and 95% confidence interval for women 0.32, 0.18–0.57 and for men 0.38, 0.27–0.54) or statins (women 0.33, 0.18–0.59, men 0.52, 0.37–0.74). Those who had been first diagnosed during or before 1995 compared with those first diagnosed more recently were less likely to be using antiplatelet agents (women 0.90, 0.60–1.35, men 0.51, 0.37–0.71) or statins (women 0.59, 0.37–0.95, men 0.47, 0.33–0.67).

## Discussion

Opportunities for improving secondary prevention are present in most older British women and men and our results indicate the considerable challenge required to meet the new National Service Framework for CHD.<sup>2</sup>

There was no difference in GP-recorded CHD between responders and non-responders in the women's study, and the men's study is of a group of male survivors from a cohort followed for over two decades with high response rates. It is therefore unlikely that any important selection bias has arisen in estimating the prevalence of CHD and use of treatment. Though the studies were carried out in general practices that have been involved in the British Regional Heart Study for >20 years, no attempt has ever been made to influence clinical or preventive practice. Any influence on clinical practice occurring simply through participation might

TABLE 1 Risk factor control and medication in women (n = 483) and men (n = 831) aged 60–79 years with coronary heart disease

	Women % (95% CI)			Men % (95% CI)		
	All ages	Aged 60–69 years	Aged 70–79 years	All ages	Aged 60–69 years	Aged 70–79 years
Risk factor control						
Systolic $\geq$ 140 mmHg or diastolic $\geq$ 85 mmHg	55.6 (51.0–60.1)	46.2 (39.1–53.4)	62.2 (56.2–68.0)	60.5 (57.1–63.9)	55.7 (50.6–60.6)	65.0 (60.3–69.5)
Systolic $\geq$ 150 mmHg or diastolic $\geq$ 90 mmHg	42.5 (38.0–47.1)	33.5 (27.0–40.6)	48.9 (42.9–55.0)	44.8 (41.4–48.3)	40.8 (36.0–45.8)	48.5 (43.7–53.3)
Total cholesterol $\geq$ 5mmol/l	87.2 (83.8–90.1)	83.3 (77.3–88.3)	90.0 (85.8–93.3)	77.0 (73.9–79.8)	74.9 (70.3–79.1)	79.0 (74.7–82.7)
LDL cholesterol $\geq$ 3 mmol/l	77.3 (73.1–81.0)	75.1 (68.3–81.1)	78.8 (73.4–83.6)	73.9 (70.6–76.9)	70.6 (65.7–75.0)	76.9 (72.5–80.8)
Overweight (BMI 25 kg/m <sup>2</sup> )	41.9 (37.4–46.5)	39.1 (32.2–46.3)	43.8 (38.0–50.0)	72.6 (69.4–75.6)	76.9 (72.5–80.9)	68.5 (63.8–72.8)
Obese (BMI > 30 kg/m <sup>2</sup> )	32.4 (28.2–36.8)	36.6 (29.8–43.7)	29.4 (24.0–35.1)	22.9 (20.1–26.0)	27.7 (23.5–32.4)	18.4 (14.9–22.4)
Current smoker	10.4 (7.8–13.4)	15.2 (10.5–20.9)	7.0 (4.3–10.6)	11.6 (9.6–14.0)	13.0 (10.1–16.7)	10.3 (7.8–13.5)
At least one of: blood pressure $\geq$ 150/90, total cholesterol $\geq$ 5, BMI > 30, current smoker	97.9 (97.4–98.4)	98.1 (97.4–98.70)	97.7 (97.4–98.7)	92.1 (89.9–93.4)	91.3 (88.0–93.9)	92.7 (89.7–95.0)
Medication						
Antiplatelet use	46.1 (41.5–50.6)	46.2 (39.1–53.4)	46.0 (40.1–51.9)	71.4 (68.2–74.3)	72.3 (67.7–76.5)	70.5 (66.0–74.6)
Statin use	27.0 (23.1–31.2)	31.0 (24.6–37.9)	24.2 (19.4–29.6)	24.2 (21.4–27.2)	32.4 (28.0–37.2)	16.5 (13.3–20.3)
Both antiplatelet and statin use	18.9 (15.5–22.7)	21.3 (15.8–27.7)	17.2 (13.0–22.1)	21.1 (18.4–24.0)	28.7 (24.5–28.7)	14.0 (11.0–17.6)

LDL, low-density lipoprotein

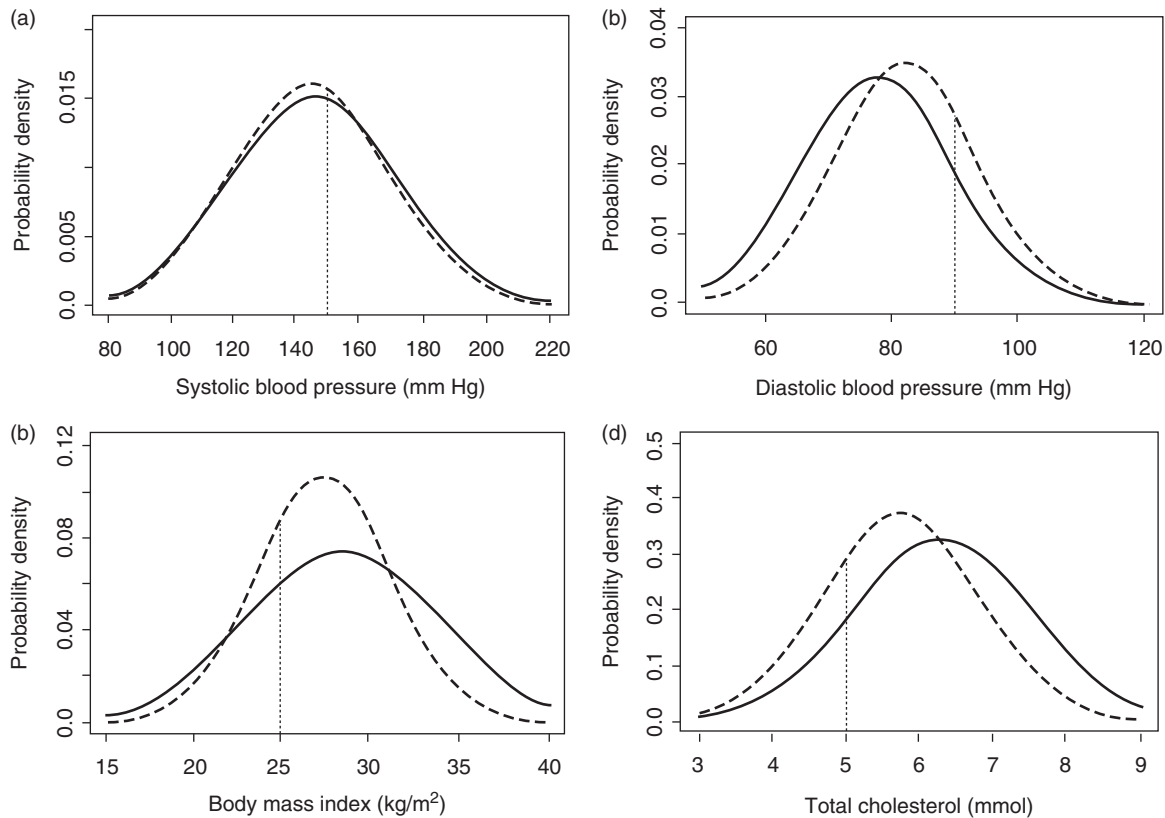


FIGURE 1 Distributions of blood pressure, body mass index and cholesterol levels in women and men aged 60–79 years with coronary heart disease (solid lines women, dashed lines men), with thresholds (dotted vertical line) indicating National Service Framework recommended levels.

make the results more optimistic than would be the case for the country as a whole.

In older individuals with CHD, treatment with aspirin, statins, smoking cessation and blood pressure control are all effective in reducing future morbidity and disability.<sup>1</sup> Our results indicate the considerable shift in population distributions that would be required to meet standards in this group, and achieving compliance with lifestyle factors and medication may be difficult in adults. However, a recent randomized controlled trial has shown that among patients up to 80 years of age, nurse-led clinics in primary care can result in the short-term uptake of secondary prevention and that this is associated with fewer total deaths and CHD events.<sup>4</sup> It has been suggested that, because of the repeated findings of poor secondary prevention in primary care patients, secondary prevention should now become the preserve of secondary care (i.e. that this should be undertaken in hospitals rather than primary care).<sup>5</sup> Though our results confirm poor levels of secondary prevention in older patients in primary care in 1998–2001, we believe that improvements in this area can only be achieved through primary care services. Older individuals, those with angina but with no history of a myocardial infarction and

those with older diagnoses were less likely to be receiving secondary preventive treatments in our study, but these groups form the largest proportion of those with CHD and benefit similarly to others from secondary prevention. To shift the emphasis for identification and initiation of treatment to hospitals would favour new cases of myocardial infarction only and would fail to meet the need of the majority. All primary care teams in the UK were required to begin implementing the National Service Framework criteria in 2002. Thus our study has been conducted immediately before this requirement and with continued follow-up of these cohorts we will be able to examine changes over time in the extent of secondary prevention in older women and men and assess the effect of the National Service Framework in this area.

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## Declaration

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**Ethical Approval:** Both the British Women's Heart and Health Study and the British Regional Heart Study have local (from each of the districts in which the study was based) and multicentre ethical committee approvals.

**Conflicts of Interest:** None.

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