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Original Scientific Paper

Heartwatch: a secondary prevention programme in primary care in Ireland

Kathleen Bennett[a], Siobhan Jennings[b], Claire Collins[c], Michael Boland[c], John Leahy[c], Declan Bedford[d] and Emer Shelley[b]

[a]Department of Pharmacology and Therapeutics, Trinity Centre for Health Sciences, St James's Hospital, [b]Health Service Executive-Population Health, Dr Steevens Hospital, [c]Irish College of GPs, Lincoln place and [d]Department of Public Health, Health Service Executive, Navan, Co Meath, Dublin, Ireland

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Background **Heartwatch, a secondary prevention programme in primary care was initiated in 2003, based on the second European Joint Task Force recommendations for secondary prevention of coronary heart disease (CHD). The aim was to examine the effect of the first 2 years of the Heartwatch programme on cardiovascular risk factors and treatments.**

Design **Prospective cohort study of patients with established CHD enrolled into the Heartwatch programme.**

Methods **Four hundred and seventy (20%) general practitioners nationwide participated in the programme, recruiting 11 542 patients with established CHD (earlier myocardial infarction, coronary intervention or coronary artery bypass surgery). Clinical data were electronically transferred by each general practitioner to a central database. Comparison of changes in risk factors and treatments at 1-year and 2-year follow-up from baseline were made using paired *t*-test for continuous and McNemar's test for categorical data.**

Results **Statistically significant changes in systolic blood pressure, diastolic blood pressure, total and low-density lipoprotien cholesterol and smoking status at 1 and 2 years ($P<0.0001$) were observed. Little or no improvements were shown for exercise, BMI or waist circumference. Increases in the prescribing of statins, angiotensin-converting enzyme inhibitors and β-blockers over the course of the study were observed.**

Conclusion **The Heartwatch programme has demonstrated significant improvements in the main risk factors and treatments for CHD. More effective interventions are required to reduce BMI, waist circumference and physical inactivity in this population. The increases in treatment uptake are approaching the optimal levels in this population. *Eur J Cardiovasc Prev Rehabil* 00:000–000 © 2008 The European Society of Cardiology**

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Introduction

Despite reductions in recent years, coronary heart disease (CHD) remains a leading cause of death and disability in Ireland [1]. The evidence based on secondary prevention after an acute myocardial infarction (AMI) or coronary intervention is strong, with risk reductions of 20–25% for most therapeutic interventions [2–7]. Studies, such as INTERHEART, have shown that risk factors associated with AMI such as smoking, hypertension, diabetes, obesity, low consumption of fruit and vegetables and physical inactivity are important across many countries [8]. The evidence based on the benefit of lifestyle and risk factor changes is also growing [9].

In line with the secondary prevention recommendations of Ireland's National Cardiovascular Health Strategy 'Building Healthier Hearts' [10] the Heartwatch initiative involved the Department of Health and Children, the Irish College of General Practitioners (ICGP), local

Correspondence to Dr Kathleen Bennett, Department of Pharmacology and Therapeutics, Trinity Centre for Health Sciences, St James's Hospital, Dublin 8, Ireland

Tel: +353 1 8961303; fax: +353 1 4539033; e-mail: bennettk@tcd.ie

What the study adds. The Heartwatch programme is the first study to develop a database of coronary heart disease in primary care in Ireland. Heartwatch reflects actual practice, and has shown that significant improvements can be made in the main risk factors for coronary heart disease, smoking, cholesterol and blood pressure reduction through a structured programme in general practice. Heartwatch has shown significant improvements in uptake of preventive therapies including statins, angiotensin-converting enzyme inhibitors and β-blockers over 1 and 2 years of the programme.

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health boards [replaced in 2005 by the Health Services Executive (HSE)] and the Irish Heart Foundation and was implemented in 2003 under the auspices of the ICGP. The programme is based on the second European Joint Task Force recommendations for secondary prevention of CHD that were available at the time [11].

The aim of this study was to examine the effect of the structured secondary prevention Heartwatch programme during the its first 2 years up to December 2005 in relation to (i) cardiovascular (CV) risk factors and (ii) CV treatments.

Methods

The programme was based on implementing internationally recognized CV prevention guidelines in patients attending primary care from February 2003 after an AMI or coronary intervention, such as percutaneous coronary intervention or coronary artery bypass grafting, which may have been recent or some time ago [11]. The second European Joint Task Force reported on the recommendations for secondary prevention of CHD in practice and this has been followed by the current Third European Joint Task Force recommendations which are more stringent for measures such as cholesterol (reduced from total cholesterol < 5 mmol to < 4.5 mmol) [12].

In total, 470 general practitioners (GPs) – 20% of all Irish GPs – were selected to participate in the programme. Demographic and clinical data were electronically transferred from GP practices to an Independent National Data Centre, where the data is centrally stored. Patients attended their GP for an initial (baseline) visit (visit one) and then up to four visits per year thereafter. Patients included in an associated separate diabetes programme in the Midlands Health Board were excluded from this analysis. GPs were required to report on the physical and medical measurements of the patient at each visit. Although there were no special interventions on diet and physical activity, the GP would have given verbal/written advice about healthy eating and encouragement to increase physical activity. Practices had access to and could refer patients to smoking cessation services, physical activity officers and nutritionists. Nurse facilitators were available to address the needs of practice nurses.

Data were extracted from the centrally held database in December 2005. Each patient had to have at least a valid baseline visit and a 1-year follow-up visit to be included in the analysis. In addition, for the 2-year follow-up analysis, only those individuals described above who also had a valid 2-year follow-up visit were included. To assess whether patients had valid follow-up data, the difference in days was calculated between visit one and all other subsequent visits. The visit date closest (in days) to 365 days and 730 days was assigned as the 1-year or 2-year follow-up visit, respectively. Each follow-up visit had to be within ± 60 days of the 365 (1 year) and 730 (2 year) days to be included. In addition, for the 2-year cohort, individuals were required to have data available at 1 year.

Treatment data

Percentage uptake of treatments, including aspirin, statins, β-blockers, angiotensin-converting enzyme (ACE) inhibitors, diuretics, calcium-channel blockers, other lipid lowering agents, antihypertensive and oral hypoglycaemic agents were examined at visit one and at the 1-year and 2-year follow-up visits. For the purpose of categorising patients as having received or not having received such treatments the following were combined: 'decreased dose', 'increased dose', 'maintained' and 'new' as receiving treatment; 'not prescribed' and 'discontinued' as not receiving treatment.

Aspirin, statin and ACE inhibitor prescribing was examined in the subset of patients with diabetes at both visit one and at either the 1-year or 2-year follow-up visit.

A proportion of the patients in the programme would have been eligible for the medical card scheme, known as the HSE Primary Care Reimbursement Services (PCRS) scheme. The HSE-PCRS provides health services including medicines to 1.15 million people in Ireland, approximately one-third of the total population. Eligibility for the service is primarily by means test and age, with patients over 70 years of age automatically qualifying for entry. Therefore, groups such as the elderly and the socially disadvantaged are overrepresented with respect to the general population.

Statistical methods

Means (SD) at baseline and at the 1-year and 2-year follow-up visits were calculated for the following risk factors: systolic blood pressure, diastolic blood pressure, total cholesterol, low-density lipoprotein (LDL) cholesterol, weight, body mass index (BMI), fasting glucose (for nondiabetics at both visits), HbA1c (for diabetics at both visits) and waist circumference. In addition, the percentage smoking prevalence was calculated based on an individual having at least one of the following recorded: smoker of one or more cigarettes per day, cigar or pipe smoker.

Absolute change in risk factors between baseline and the 1-year or 2-year follow-up visit was calculated. Paired *t*-tests were used to compare mean changes in risk factors between visits for continuous data and McNemar's test for paired dichotomous data (e.g. smoking). Chi-square test was used to compare proportions across groups. Multiple regression was used for adjusted analysis, including adjustment for age of the patient.

The percentages of patients outside the risk management targets (as recommended by the Second Joint Task Force report [11]) at baseline and the 1-year and 2-year follow-up visits were calculated, including for physical activity. Waist circumference targets were different for men and women: less than 4 cm (men) and less than 80 cm (women). Two-sided significance is assumed throughout at *P* value of less than 0.05. SAS statistical software (SAS Institute Inc V9, SAS Institute Inc., Cary, NC, USA) was used for analysis purposes.

Results

A total of 11 542 individual patients were available for analysis in the Heartwatch database. The majority of patients were men (75.6%) and the largest age category was 55–74 years (65.2%). The mean age of the cohort was 66 years (SD = 10.6).

One-year follow-up cohort

All individuals having valid data at baseline and at the 1-year follow-up visit were included in this analysis. The total number was 7099, with the majority (84.4%) having four or five visits over the year. The data from the 1-year follow-up visit was used in subsequent analysis of risk factors and medications. More women were eligible for the HSE-PCRS scheme (83.0%) than men (71.0%).

Risk factor data

Substantial decreases in several of the risk factors from baseline to the 1-year follow-up time point were observed. Table 1 gives the details of the actual levels in all patients at baseline, at 1 year and the difference between these. A statistically significant decrease in systolic and diastolic blood pressure, total and LDL cholesterol, BMI and smoking prevalence ($P < 0.01$) was observed. A statistically significant decrease in HbA1c levels for those with diabetes at 1 year ($P < 0.01$) was observed. In addition, there was a statistically significant change for BMI though clinically this was not so important (change of 0.05 in BMI).

An additional 215 (3.0%) new cases of diabetes or impaired glucose tolerance diagnosed by the 1-year follow-up was found, increasing the overall prevalence to 17.1%. By 1 year the majority of these had type 2 diabetes (82.3%), followed by type 1 diabetes (9.0%) and impaired glucose tolerance (8.6%). More women (19.4%) compared with men (16.4%) had evidence of diabetes ($P = 0.004$), with little difference across age groups (< 55 years 14.2%; 55–64 years 18.8%; 65–74 years 17.3%; 75 years and over 16.6%).

The percentage of patients within recommended targets had improved by 1 year, to 35.5% outside target for systolic BP (≥ 140 mmHg) and 9.3% for diastolic BP (≥ 90 mmHg). Over one-fifth (21.3%) were outside range for total cholesterol (≥ 5 mmol/l), 22.5% for LDL cholesterol (≥ 3 mmol/l) and 12% remained smokers at 1 year. Although the percentages outside target had improved for BMI (≥ 25; 76.1%), waist circumference (70.6%) and exercise levels (< 210 min per week; 64.0%), the percentages remained high.

Table 1 Risk factor data at baseline and 1 year in the 1-year follow-up cohort (*N*=7099)

Variable	*N* with data at both visits	Baseline (means ± SD except for smoking)	One year (means ± SD except for smoking)	Difference between 1 year and baseline (*P* value)[a]
Systolic BP	7041	134.8 ± 19.2	132.6 ± 17.6	−2.2 (*P*<0.0001)
Diastolic BP	7045	77.8 ± 9.9	76.3 ± 9.5	−1.5 (*P*<0.0001)
Total cholesterol	7037	4.6 ± 1.0	4.4 ± 0.9	−0.26 (*P*<0.0001)
LDL cholesterol	7023	2.7 ± 0.9	2.5 ± 0.8	−0.2 (*P*<0.0001)
BMI	6733	28.1 ± 4.1	28.0 ± 4.1	−0.05 (*P*=0.009)
Fasting glucose[b]	4138	5.4 ± 2.0	6.0 ± 4.3	+0.6 (*P*<0.0001)
HbA1c[c]	817	7.3 ± 1.4	7.1 ± 1.3	−0.2 (*P*=0.0005)
Waist circumference	6336	95.6 ± 12.4	95.6 ± 11.9	−0.05 (*P*=0.66)
Smoking (%)	7097	14.8%	12.0%	−2.8% (*P*<0.0001)

BP, blood pressure; LDL, low-density lipoprotein. [a]Mean change presented except for smoking. [b]Data based on nondiabetic patients at both baseline and 1 year. [c]Data based on diabetic patients at both baseline and 1 year.

Treatment data

Substantial increases in medication usage between visit one and 1 year was observed. The largest increases in prescribing were for statins (at 7.0% absolute, or 8.8% relative increase), ACE inhibitors at 4.8% absolute increase, β-blockers with an increase of 2.5%, and diuretics and angiotensin II antagonists inhibitors at an increase of 2.1% and 1.5%, respectively. Table 2 gives details of the actual medication uptake levels in all patients at visit one and again 1 year later. In addition, the difference between these is given, with a positive value indicating a greater uptake in use of the medication. For diabetic patients there were increases in prescribing for aspirin (+1.1–87.0%), statin therapy (+6.7–85.3%) and ACE inhibitors (+5.3–63.5%) at 1-year follow-up.

Two-year follow-up cohort

All individuals having valid data at baseline and at 1 and 2 years were included in this analysis. The total number was 4011 and most (60.5%) had at least eight or nine visits over 2 years. The data from this visit was used in subsequent analysis of risk factors and medications. The percentage of women and men who were eligible for the HSE-PCRS scheme was 85.7 and 72.2%, respectively.

Risk factor data

Substantial decreases in several of the risk factors from baseline to the 2-year follow-up time point were observed. Table 3 gives the details of the actual levels in all patients at baseline and at 1 and 2 years and the differences between these. Statistically significant reductions in systolic and diastolic BP, total and LDL cholesterol, BMI and smoking prevalence ($P < 0.0001$) were observed. The levels of the main risk factors had decreased even further than at 1-year follow-up, suggesting that continued improvements beyond the initial year were possible. A slight decrease in HbA1c levels for those with diabetes at both 1-year and 2-year follow-up visits was observed, but the percentage outside target did not change significantly. The percentage of patients with diabetes having HbA1c levels greater than or equal to 7.5% was 34.5% at baseline, 30.2% at 1 year and 29.7% at 2 years, suggesting some improvement in those in the highest band. Age adjustment using multiple regression (for 2-year period) made no difference to the results.

By 2 years there was an additional 170 (4.2%) new cases of diabetes from baseline, increasing the overall prevalence of diabetes to 18.7% at 2 years.

The percentage of patients within recommended targets had improved by 2 years; 34.2% were outside target at 2 years for systolic BP and 7.6% for diastolic BP. Only 16.4% were outside the range for total cholesterol and 16.6% for LDL cholesterol, and 10.1% remained smokers at 2 years. Although the percentages outside target did improve for BMI, waist circumference and activity levels, the percentages still remained relatively high at 74.5, 70.5 and 61.7%, respectively.

Treatment data

Table 4 gives details of the medication uptake levels in all patients at visit one and 2 years later. In addition the difference between these is given, with a positive value indicating an increase in the uptake of the medication. The trends in prescribing of secondary preventive

Table 2 Medication usage at baseline and 1 year

Medication	Baseline (visit one) % uptake (95% CI)	One year % uptake	Difference between 1 year and visit one
Sulphonylureas	6.7 (6.1, 7.3)	6.8 (6.2, 7.4)	+0.1
Biguanides	7.3 (6.7, 7.9)	7.9 (7.3, 8.5)	+0.6
Glucosidase	1.3 (1.0, 1.6)	0.7 (0.5, 0.9)	−0.6*
Other hypoglycaemic agents	1.3 (1.0, 1.6)	1.1 (0.9, 1.3)	−0.2
Aspirin	87.0 (86.2, 87.8)	87.0 (86.2, 87.8)	0.0
Beta blocker	59.8 (58.7, 60.9)	62.3 (61.2, 63.4)	+2.5*
ACE inhibitors	44.4 (43.2, 45.6)	49.2 (48.0, 50.4)	+4.8*
Anticoagulants	10.7 (10.0, 11.4)	10.7 (10.0, 11.4)	0.0
Antiplatelets	17.2 (16.3, 18.1)	17.4 (16.5, 18.3)	+0.2
Statins	79.2 (78.3, 80.1)	86.2 (85.4, 87.0)	+7.0*
Fibrate	2.7 (2.3, 3.1)	2.3 (2.0, 2.7)	−0.4
Other lipid lowering	4.0 (3.5, 4.5)	4.0 (3.5, 4.5)	0.0
Diuretic	25.0 (24.0, 26.0)	27.1 (26.1, 28.1)	+2.1*
Calcium-channel blocker	19.4 (18.5, 20.3)	19.4 (18.5, 20.3)	0.0
ATII inhibitor	8.7 (8.0, 9.4)	10.2 (9.5, 10.9)	+1.5*
Other antihypertensive	12.4 (11.6, 13.2)	11.4 (10.6, 12.1)	−1.0

ACE, angiotensin-converting enzyme; ATII, angiotensin II. *$P<0.05$.

Table 4 Medication usage at baseline and 2 years

Treatment	Baseline (visit one) % uptake (95% CI)	Two year % uptake (95% CI)	Difference between 2 years and visit one
Sulphonylureas	7.0 (6.2, 7.8)	7.3 (6.5, 8.1)	+0.3
Biguanides	7.2 (6.4, 8.0)	8.6 (7.7, 9.5)	+1.4
Glucosidase	1.4 (1.0, 1.8)	0.6 (0.4, 0.8)	−0.8*
Other hypoglycaemic agents	1.3 (0.95, 1.7)	1.25 (0.9, 1.6)	−0.05
Aspirin	87.2 (86.2, 88.2)	86.8 (85.8, 87.9)	−0.4
Beta blocker	59.2 (57.7, 60.7)	63.4 (61.9, 64.9)	+4.2*
ACE inhibitors	43.5 (42.0, 45.0)	50.8 (49.3, 52.4)	+7.3*
Anticoagulants	10.3 (9.4, 11.2)	10.0 (9.1, 10.9)	−0.3
Antiplatelets	14.1 (13.0, 15.2)	16.0 (14.9, 17.1)	+1.9
Statins	78.5 (77.2, 78.8)	89.9 (89.0, 90.8)	+11.4*
Fibrate	2.5 (2.0, 3.0)	1.8 (1.4, 2.2)	−0.7
Other lipid lowering	3.9 (3.3, 4.5)	4.9 (4.2, 5.6)	+1.0
Diuretic	25.3 (24.0, 26.7)	28.9 (27.5, 30.3)	+3.6*
Calcium-channel blocker	20.7 (19.5, 22.0)	21.0 (19.7, 22.3)	+0.3
ATII inhibitor	8.9 (8.0, 9.8)	11.8 (10.8, 12.8)	+2.9*
Other antihypertensive	12.5 (11.5, 13.5)	11.1 (10.1, 12.1)	−1.4

ACE, angiotensin-converting enzyme; ATII, angiotensin II. *$P<0.05$.

Table 3 Risk factor data at baseline and 1 and 2 years in the 2-year follow-up cohort, who also have data at 1 year ($N=4011$)

Variable	*N* with data at all visit	Baseline (means ± SD except for smoking)	One year (means ± SD except for smoking)	Two year (means ± SD except for smoking)	Difference between 2-year follow-up and baseline (*P* value)[a]
Systolic BP	4011	135.2 ± 18.8	132.5 ± 17.4	132.5 ± 17.2	−2.7 ($P<0.0001$)
Diastolic BP	4011	77.9 ± 9.8	76.3 ± 9.4	75.6 ± 9.0	−2.3 ($P<0.0001$)
Total cholesterol	4009	4.7 ± 0.9	4.4 ± 0.9	4.3 ± 0.9	−0.4 ($P<0.0001$)
LDL cholesterol	4008	2.7 ± 0.8	2.5 ± 0.7	2.4 ± 0.7	−0.3 ($P<0.0001$)
BMI	3908	28.1 ± 4.1	28.0 ± 4.1	28.0 ± 4.1	−0.1 ($P<0.0001$)
Fasting glucose[b]	2442	5.3 ± 1.7	5.3 ± 1.7	5.3 ± 1.7	0.004 ($P=0.031$)
HbA1c[c]	501	7.2 ± 1.5	7.0 ± 1.2	7.1 ± 1.2	−0.1 ($P=0.08$)
Waist circumference	3550	95.7 ± 12.2	95.6 ± 12.0	95.5 ± 11.6	−0.2 ($P=0.35$)
Smoking (%)	4011	13.7%	11.3%	10.1%	−3.6% ($P<0.0001$)

BP, blood pressure; LDL, low-density lipoprotein. [a]Mean change presented except for smoking. [b]Data based on non-diabetic patients at both baseline and 1 year. [c]Data based on diabetic patients at baseline, 1 and 2 years – the percentage of those with Hba1c greater than or equal to 7.5% was 34.5% at visit one, 30.2% at 1 year and 29.7% at 2 years.

therapies continued; the largest increases in prescribing were for statins. By 2 years, 91% of diabetic patients ($n = 582$) were receiving statin therapy (+ 13.0% from baseline), and 66% were on ACE inhibitors (+ 5%).

Discussion

The Heartwatch programme, a national approach to the implementation of internationally recognized CV prevention guidelines [11] has shown significant improvements in the main CV risk factors and treatments during its first 2 years. This includes significant improvements in the control of systolic BP, diastolic BP, total cholesterol, LDL cholesterol and smoking at 1-year and 2-year follow-up visits. These are the three main risk factors, which have been shown to account for approximately 60% of the decrease in CHD mortality in Ireland as elsewhere [13].

Although the reductions in total and LDL cholesterol levels are modest, decreases in cholesterol in the population have been shown to have a large effect on CHD mortality, as recent meta-analyses have shown [14]. The decrease in cholesterol levels is likely to be mainly because of the increased uptake of statin therapy in the cohort of patients (11.4% at 2 years), and less so to any large changes lifestyle.

Heartwatch increased the detection of diabetes by 4.2% at 2 years to almost 19%. Average HbA1c levels did not change significantly at 2 years, despite early indications of improvements. Five percent less patients with HbA1c greater than or equal to 7.5% at 2 years compared with baseline were present. Considering that the Fourth European Task Force on Cardiovascular Disease Prevention recommended an HbA1c target of less than or equal to 6.5%, there is substantial scope for improved glucose control in diabetics. [15] More intensive, structured interventions for diabetes should be considered either in a diabetes-specific programme or within Heartwatch.

Little or no improvements were shown for BMI, waist circumference or exercise, and the lack of improvement in activity levels may help explain the small change in BMI over time. Improved linkages with structured community programmes for physical activity and diet may achieve greater lifestyle improvements in the future. Capacity for cardiac rehabilitation increased in Ireland almost six-fold from 2000, however, attendance at cardiac rehabilitation was not documented within the Heartwatch programme. Integration of hospital and community programmes should be considered in such patients.

Internationally it has also been difficult to achieve changes in BMI, and exercise as evidence in the EUROASPIRE surveys [16]. Changes in these risk factors may require a more direct intervention to modify lifestyle, which might include both individually tailored advice on diet and exercise regimes, as well as a more team based approach, such as the recent EUROACTION study. This included a 16-week multidisciplinary hospital based CV prevention and rehabilitation programme on lifestyle, risk factors and therapeutic management of patients with CHD and families. Results after 1 year suggest that the programme has been effective in reducing the main risk factors associated with CHD, including BMI [17]. Currently the ICGP is developing healthy lifestyle education for GPs and practice nurses.

A National Swedish Programme, with similar entry criteria to the Heartwatch programme, found that after one year the majority of patients (70%) had reached recommended total cholesterol targets, and targets for systolic BP were achieved in 58% and targets for diastolic BP in 81% of participants. Aspirin, β-blocker and lipid-lowering drug prescribing were also high at between 78% and 96%, which was similar to the high levels achieved within the Heartwatch programme [18].

In a randomized controlled trial of nurse-led clinics in primary care, Campbell *et al.* showed improvements in secondary prevention [19]. Most patients in the intervention arm gained at least one effective component of secondary prevention, which included aspirin, BP and lipid management, physical activity, and diet changes. However, no change was observed for smoking status. A cost-effectiveness analysis showed that the intervention was very cost-effective, at just £1236 per life year saved. Moher *et al.* [20], in a cluster-randomised trial to promote secondary prevention, assessed three main risk factors (BP, cholesterol and smoking) and anti-hypertensive, lipid lowering and antiplatelet therapy and found that the more intensive nurse-led/GP clinic was more effective than audit alone. Errikson *et al.* [21], examined the effect of a lifestyle (exercise/diet) intervention in primary care to modify CV risk factors. After 1 year, those in the intervention arm had increased physical activity and improved quality of life, and decreased body weight, BMI, systolic and diastolic BP, and triglycerides, but not total cholesterol. A secondary prevention programme in Spain in 305 patients showed similar significant reductions in risk factors and increased uptake of preventive therapies after 1 year, indicating that reinforced action on risk factors can show beneficial effects in coronary patients [22].

Heartwatch is the largest database on cardiovascular disease in primary care in Ireland. Given the weight of evidence in relation to secondary prevention in CHD, it was not considered ethical to design the Heartwatch programme as a randomized controlled trial. Rather it was established as a demonstration project, to study feasibility and to demonstrate efficacy of the preventive measures in everyday practice. The design was 'before-after', captur-

ing changes within individual patients after the implementation of the programme. Unlike a randomized controlled trial, Heartwatch has captured 'real-life' health care by a representative group of GP nationally. This makes it more generalizable to a wider population than a randomized controlled trial [23].

Attrition in the number of patients eligible for analysis was observed, because of the GP visits not being scheduled at the recommended frequency (four times per year), but this is unlikely to affect the overall conclusions from the programme. Follow-up data at 2 years was not available on all patients at the time of analysis. To be eligible for analysis, patients were required to have attended for a baseline, 1-year and 2-year visit. The attrition in numbers at 2 years is unlikely to have affected the results as the demographics at baseline were similar in the 1-year and 2-year cohorts.

Some evidence that the structured programme made a difference over and above what might have been expected without the programme exists. In a separate analysis of the prescribing data, comparing all patients registered with participating and nonparticipating GPs, we found that GPs participating in the Heartwatch programme had significantly increased prescribing of preventive therapies among all their patients, beyond that expected from the underlying increasing trend [24].

Heartwatch has shown significant improvements in the main risk factors and uptake of treatments associated with CHD and increased detection of diabetes and has demonstrated that improved standards of care in secondary prevention. Further improvements may be achieved through improved linkages to community-based programmes and support, and attention to improving body weight, exercise levels and glucose metabolism. Further expansion of the programme is recommended to include all patients with CHD. Overall, Heartwatch has shown that a chronic disease management programme can be implemented in primary care in Ireland and it provides a model for the management of such diseases.

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AUTHOR QUERY FORM

LIPPINCOTT
WILLIAMS and WILKINS

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