

# Two stage audit of cerebrovascular and coronary heart disease risk factor recording: the effect of case finding and screening programmes

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**SUMMARY.** *The level of recording of risk factors for cardiovascular disease by general practitioners in north east Scotland has been audited. The effect of the audit on recording levels has also been determined by means of a second audit one year later. Twenty four practices in Grampian took part in the study, each auditing a random selection of 100 records of male patients aged 35–64 years. The risk factors chosen were blood pressure, smoking habit, alcohol consumption, weight and height. Blood pressure was recorded in the majority of the records (68.0%) and the mean level of recording of all of the risk factors increased between the two audits. The increase in the recording of smoking habit, alcohol consumption and weight was statistically significant. Practices with organized systems of data collection had higher levels of risk factor recording than those without. The levels of recording achieved were thus dependent on factors that existed in the practices prior to the study. This suggests that to increase recording levels, future educational intervention should be aimed at changes of motivation.*

## Introduction

GENERAL practitioners are well placed to deliver anticipatory care based on the collection of simple data. However, little is known about the extent to which this data is collected at present. As earlier studies have implied low levels of recording,<sup>1</sup> it was decided to assess the level of recording of certain risk factors for cardiovascular disease by general practitioners in the north east of Scotland. It was also felt to be important to determine whether such an audit had the effect of increasing recording levels.

The risk factors chosen were blood pressure, smoking, alcohol consumption, weight and height. Hypertension, smoking and obesity are now accepted as having definite links with an increased incidence of ischaemic heart disease and strokes.<sup>2–4</sup> It has been calculated that just under half of all strokes and myocardial infarctions could be prevented by early detection and control of high blood pressure,<sup>5</sup> while cessation of all smoking would reduce deaths from ischaemic heart disease by 25%.<sup>6</sup> Saunders and colleagues showed that there was a strong association between alcohol consumption and hypertension, and that blood pressure tended to fall with abstinence.<sup>7</sup> A high alcohol consumption doubles the risk of death from a cerebrovascular accident.<sup>8</sup>

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## Method

Fifty practices in the north east of Scotland were selected at random and invited to participate in the study. It was hoped that this would avoid bias toward any particular type of practice or location in the region.

In August 1977 each practice was asked to take a systematic random sample of 100 records of male patients aged 35–64 years. Patients who had been registered for less than a year were excluded in order to avoid error caused by the delay in transfer of records from other health boards and family practitioner committees. The presence or absence of the five risk factors in each set of notes was recorded on a form. It was also noted whether the record had been dated and if the recording had been made in the five years prior to the sample date. Alcohol consumption was only considered to have been recorded if a quantitative record had been made, for example, of the number of units consumed in a week. Each practice was asked if they had an organized system of risk factor recording prior to the audit.

The audit could be carried out by practice staff and it was hoped that this would encourage a large number of practices to complete the audits.

The results were collected from each practice and then returned to them together with a summary of the combined results for the whole group. The combined results were not only expressed numerically for each risk factor (with means, medians and ranges) but also graphically with each practice's position in relation to the group as a whole being depicted. This was considered preferable to using league tables and rank orders as it gave an indication of how each practice fared but without being misleading. If the results were all close together, very small differences in recording levels could lead to large differences in a league table.

All the results fed back to the practices were confidential and no practice saw another's results. Following this, practices were asked if they had instigated any changes as a result of this feedback. An identical audit was repeated one year after the results of the initial survey had been returned.

Two forms of statistical analysis were carried out. The results for the two audits carried out by each practice constituted a pair and in the first instance, a non-parametric test was used (Wilcoxon's signed rank test for paired observations) as the distribution of variables across the practices was not necessarily normal. Secondly, a general linear model was fitted to the data using the statistical package GLIM (generalized linear interactive modelling).<sup>9</sup> The linear model (with a logistic link function and a binomial error structure) was used to test for differing effects of the audit in practices which did or did not have an organized system of risk factor recording.

## Results

Of the 26 practices who initially agreed to participate 24 completed the whole study. The practices ranged in size from single-handed to partnerships of seven doctors. There were 86 general practitioners with a combined practice population of 146 900.

The records of 9.8% of the 24 489 men aged 35–64 years in the 24 practices were randomly sampled in each audit.

Overall 93.8% of the recordings of risk factors were made in the five years prior to each audit. Table 1 shows the percentages of records in which risk factors were recorded for both audits. The means for all of the risk factors increased between the first and second audit. It is interesting to note that 68% of the men's records had had blood pressure recorded at the time of the first audit. There was no statistically significant increase in blood pressure recording by the time of the second audit. There were, however, statistically significant increases in the recording of smoking habit ( $P<0.01$ ) and the quantitative recording of alcohol consumption ( $P<0.01$ ). There was evidence for a rise in weight recording ( $P<0.05$ ) but no significant rise in the recording of height.

The standard deviations for the percentage of notes in which a risk factor was recorded increased for all factors in the second audit. In the recording of blood pressure, weight, alcohol consumption and smoking the median scores also increased.

*Comparison of practices with and without organized systems of risk factor recording*

Twenty two practices provided information about whether or not they had organized programmes to record risk factor data and whether they had made any changes in their recording practice following the first audit. Eleven practices had existing policies of case finding (the recording of risk factor data whenever the patient attends) and three practices had active screening programmes where patients were specifically invited so that information could be obtained. After the first audit two practices started screening programmes and another two started active case finding. The latter two reported that they had not done this as a specific response to the audit being carried out.

Of the eight practices who said they changed their recording practice as a response to the first audit, six already had some form of case finding or screening programme in place before the study was started. These six practices reported that the audit increased their efforts at case finding. One other practice reported that it had changed to recording alcohol consumption quantitatively.

There was no statistical difference in increased recording between the seven practices who reported increasing their efforts at recording risk factors after the first audit and the 15 practices who reported no change in their activities.

Table 2 shows that in practices which had not set up a system prior to the study the level of recording in the second audit did not overtake that in practices which had some system of planned recording over the whole of the study period. In fact it would appear that the practices with no recording system did not in-

crease their recording to the pre-audit level of the practices which carried out screening and case finding. In all categories except weight, the practices with risk factor recording policies produced slightly larger increases in recording from initially higher levels. Analysis using GLIM showed there was a significantly larger increase in the quantitative recording of alcohol consumption ( $P<0.05$ ) in the practices with a risk factor recording policy than in those without. However, the analysis was unable to demonstrate similar statistically significant increases for the other risk factors.

**Table 2.** Comparison of mean percentages of recorded risk factors in both audits between the 14 practices with specific data collection systems prior to the study and the eight without.

Risk factor	Mean % of records in which risk factors recorded for practices with:			
	Screening or case finding system		No system	
	1987	1988	1987	1988
Blood pressure	70.9	73.4	63.8	64.5
Weight	39.6	45.6	19.5	28.5
Height	15.3	21.1	8.0	10.5
Alcohol consumption	24.0	41.7	13.1	17.6
Smoking habit	50.6	64.1	42.0	46.3

*Comparison of individual practices*

When individual practice performance was examined, it was found that seven practices achieved increases in recording of more than 20% for at least one risk factor category (range 21–54%). Five of these practices achieved increases in recording of greater than 20% in two or more categories. A further seven practices achieved increases in recording in at least one category of 10–20%. Five practices reported falls in recording levels of 10–20% and this included two practices which had said that they had increased their efforts after the first audit.

**Discussion**

This study involved approximately a quarter of all general practitioners in the north east of Scotland. Despite the fact that only 26 out of 50 randomly selected practices invited to take part actually began the project, the wide spread of recording levels suggests that the findings are fairly representative. Participation in the audit was voluntary and a high level of motivation was demonstrated by the participating doctors and their staff as all but two of the practices starting the study completed both audits.

**Table 1.** Percentage of records in which risk factors were recorded for the 24 practices completing the two audits.

	% of records in which risk factors recorded by year of audit									
	Blood pressure		Weight		Height		Alcohol consumption		Smoking habit	
	1987	1988	1987	1988	1987	1988	1987	1988	1987	1988
Mean	68.0	69.2	31.3	37.0	12.7	16.0	19.7	31.5	46.8	55.6
Standard deviation	11.4	13.7	20.6	22.4	19.7	24.0	20.6	25.9	21.5	22.3
Median	64.5	67.0	25.0	34.0	6.5	7.0	16.5	23.0	47.0	54.5
Range	53–99	35–99	10–100	5–97	0–98	1–98	0–100	4–98	1–100	11–100
	NS		P<0.05		NS		P<0.01		P<0.01	

NS = not significant.

The results showed a statistically significant increase in the recording levels of smoking habit, alcohol consumption and weight between the two audits. There may be different reasons why there was no significant increase in the recording of blood pressure and height. The mean recording level for blood pressure was the highest, followed by smoking, weight, alcohol consumption and then height. This is approximately the order in which these factors became accepted as significant risk factors for cardiovascular disease.

Blood pressure had been recorded in 68% of men's records at the beginning of the study and this is markedly higher than has been reported earlier — Heller and Rose found that only 24% of a random sample of patients had had their blood pressure recorded by the general practitioner in 1977.<sup>10</sup> The level of recording had not changed appreciably by the second audit. On average, 65% of a doctor's patients visit him or her in any one year,<sup>11</sup> and therefore if a case finding or opportunistic approach is used then it would be difficult to increase recording from a mean of 68% in only one year. Although the study excluded patients who had recently joined the practices, it could not take into account patients leaving the practices. In this area some practices have an annual patient turnover as high as 24%<sup>12</sup> and so a constant effort would be required to maintain these high levels of recording.

Height was the least recorded category. The comparatively short time that the concepts of body mass index and weight-for-height have been considered to be more useful than weight on its own may be the major reason for this low level of recording.

The results show an increase in the spread of recording levels between the audits. This not only indicated that it may be easier to make dramatic increases in recording from an originally low level but that there was a differential response to the audit. It could be suggested that to produce a more effective response to an audit some organized system of data collection has to be in place prior to that first audit. However, this proposition could only be supported by statistical analysis in the case of alcohol consumption. It could be that doctors find it difficult to ask patients about alcohol consumption out of context. Enquiring about it as part of an assessment of a patient's general cardiovascular health would provide such a context and higher recording levels would be the result.

The higher levels of recording by practices with screening or case finding policies indicate that although an audit carried out by an agency outside the practice may produce a positive effect, the degree of success achieved is dependent on factors that exist in each practice prior to the audit. This study stimulated two practices to set up organized data collection schemes and it documents dramatic responses in risk factor recording by some practices. Other practices did not show increases in their recording levels and five had reductions in recording, including two which reported that they had increased their efforts in response to the first audit. In the situation where a practice sets up an audit for itself, could it be that this is an effect of, rather than a cause of, change? The change in attitudes which have often been attributed to the audit process in the past<sup>13,14</sup> may have occurred before the audit was designed let alone carried out.

This study shows that certain risk factors such as blood pressure and smoking habit have been recorded in the majority of records for men aged 35–64 years. It documents significant rises in recording in alcohol consumption, weight and smoking habit over the study period but there is little evidence to suggest that the audit itself was responsible for this. There is, however, some evidence to suggest that practices which had already demonstrated changes in attitude and motivation by setting up case finding and screening systems prior to the audit

responded better than those which had no such systems. This would imply that to increase recording levels, future educational intervention should be aimed at changes of motivation.

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