

# Audit of preventive activities in 16 inner London practices using a validated measure of patient population, the 'active patient' denominator

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HEALTHY EASTENDERS PROJECT

## SUMMARY

**Background.** Reliable comparison of the results of audit between general practices and over time requires standard definitions of numerators and denominators. This is particularly relevant in areas of high population turnover and practice list inflation. Without simple validation to remove supernumeraries, population coverage and professional activity may be underestimated.

**Aim.** This audit study aimed to define a standard denominator, the 'active patient' denominator, to enable comparison of professional activity and population coverage for preventive activities between general practices and over time. It also aimed to document the extent to which computers were used for recording such activities.

**Method.** A random sample of people in the age group 30–64 years was drawn from the computerized general practice registers of the 16 inner London general practices that participated in the 'healthy eastenders project'. A validation procedure excluded those patients who were likely to have died or moved away, or who for administrative reasons were unable to contribute to the numerator; this allowed the creation of the active patient denominator. An audit of preventive activities with numerators drawn from both paper and computerized medical records was carried out and results were presented so that practices could compare their results with those of their peers and over time.

**Results.** Of the original sample of 2331 people, 25% (practice range 13%–37%) were excluded as a result of the validation procedure. A denominator based on the complete, unexpurgated practice register rather than the validated active patient denominator would have reduced the proportion of people with blood pressure recorded within the preceding five years from 77% to 61%, recording of smoking status from 68% to 53% and recording of cervical smears from 80% to 66%. Only 53% of the last recordings, within the preceding five years, of blood pressure and only 54% of those of smoking status were recorded on the practice computer. In contrast, 82% of recorded cervical smears were recorded on computer.

**Conclusion.** The active patient denominator produces a more accurate estimate of population coverage and professional activity, both of which are underestimated by the complete, unexpurgated practice register. A standard definition of the denominator also allows comparisons to be made between practices and over time. As only half of the

recordings of some preventive activities were recorded on computer, it is doubtful whether it is advisable to rely on computers for audit where paper records are also maintained.

**Keywords:** preventive medicine; health promotion; practice population; attitude to health; audit.

## Introduction

ALTHOUGH recording of preventive activity is now an established routine in general practice, there have been few attempts to establish definitions of the denominator comparable between general practices.<sup>1</sup> This is particularly important in inner London or other areas of high population turnover where practice list inflation averages between 20% and 30%.<sup>2,3</sup> Those seeking to implement preventive programmes have had difficulties in defining accurate registers.<sup>4</sup> A number of different approaches have been used to estimate the true population at risk.<sup>5–7</sup> The use of patient records as the denominator in an audit documents professional activity, but leaves the population at risk unstated.<sup>8</sup> The use of complete, unexpurgated family health services authority registers or practice registers may overestimate the population at risk,<sup>8</sup> thereby underestimating population coverage and professional activity of general practitioners and practice nurses.

A study was undertaken that aimed to develop a method of audit for recorded preventive activity that was simple, could be applied to the majority of general practitioners in an inner city health district and presented results by practice rather than by individual practitioner.<sup>9</sup> An 'active patient' denominator was developed using a validation procedure. The transition from paper to computerized medical records should, in theory, facilitate the process of audit,<sup>10</sup> but in practice it has led to fragmentary evidence in both sources.<sup>11</sup> Therefore, the study also aimed to document the extent to which computers were used to record preventive activity items.

## Method

The audit was carried out in 1992 in the inner London borough of Tower Hamlets (population 166 000); it involved 60 general practitioners in 16 practices covering approximately 100 000 registered patients. These practices participated in the 'healthy eastenders project' which aims to facilitate the delivery of preventive care and to work to agreed guidelines for preventive activities for people aged from 30 to 64 years.<sup>12</sup> All practices had computerized population registers on which preventive activity items could be recorded.

Comparable definitions of the denominator (practice records) and the numerator (recorded preventive items) were employed, the latter drawn from both paper and computerized records.<sup>13</sup>

Using random number tables, 150 people in the age range 30–64 years were selected from each computerized practice register. A standard denominator, the active patient denominator, was created using the following validation procedure. The paper medical records were sought by trained research staff over six

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weeks and people whose records were not located after at least three searches were excluded. Those whose records showed that they had died or had left the practice were excluded. For those whose records were located, the date of the last recorded contact with the practice (for a consultation, by telephone, for a prescription or an administrative transaction) was noted. Those with no recorded practice contact (effectively blank sets of notes) were excluded. The records of those whose date of last practice contact was more than one year before the date that the sample was generated were checked by the general practitioner, and people who were known to have died or to have left the practice were excluded. Those remaining with no contact with the practice within the preceding year were sent one letter asking if they were still registered with the practice, and a reply-paid envelope. Those who did not respond to this letter or who replied that they were no longer registered were excluded.

Trained research staff carried out the audit of preventive activity items in both the computerized and paper medical records using standard definitions of preventive items. This involved searching computerized and paper medical records within the preceding five years for the last recording of: blood pressure, smoking status, alcohol consumption, height, weight, family history of coronary heart disease, serum cholesterol level, peak expiratory flow rate, dietary advice, cervical smear (for women who had not had a hysterectomy), and mammography (for women in the age group 50–64 years). Hysterectomy was searched for as ever having been recorded.

Practice size varied from 2500 to 10 000 people. Weighting results by practice size increases all quoted percentages by 1%–2%, which is not significant and does not affect the conclusions. Therefore, for simplicity of presentation, unweighted percentages are given.

Comparison was made with an audit carried out in eight of the 16 practices in 1990, which had used the same definitions for numerators and denominator as in this audit in 1992.

The results of the audit were presented to each practice in a form that enabled the practices to compare their results with those of their anonymous peers and with the average for all practices. Strategies for change were discussed with practice staff.

## Results

The original sample O consisted of 2331 people. This comprised 150 people from each of 13 practices and 110, 139 and 132 people from the other three practices; these three practices used a computer system different from that of the other practices and 40, 11 and 18 people, respectively, who had left the practice but had been erroneously included in the original samples of 150 were excluded. Sample A consisted of 1943 people remaining after exclusion of 221 who had no available medical record, 143 who had died or moved away and 24 who had no recorded contact with the practice. Letters were sent to 289 people who had no record of contact with the practice within the preceding year; of these 289 people, 89 replied that they were still registered, 20 that they were no longer registered and 180 did not reply. Sample B, the active patient denominator, consisted of 1743 people and was obtained by including information from this postal validation. The total number excluded was 588, 25.2% of the original sample of 2331; this ranged between 13% and 37% for individual practices (interquartile range 21%–27%).

In sample A, 1562 of 1943 people (80.4%) had had contact with the practice within the preceding year, 240 (12.4%) within the preceding one to two years and 141 (7.3%) within the preceding three or more years. Proportions of preventive coverage varied with the date of last contact with the practice. Blood pressure was recorded for 1252 of the 1562 people who had had contact

within the preceding year (80.2%), for 139 of the 240 people who had had contact within the preceding one to two years (57.9%) and for 19 of the 141 people who had had contact within the preceding three or more years (13.5%).

Preventive coverage was examined in the three samples using records within the preceding five years. Blood pressure was recorded for 1412 of the 2331 people in sample O (60.6%), for 1412 of the 1943 people in sample A (72.7%) and for 1346 of the 1743 people in the active patient denominator sample, sample B (77.2%), and smoking status was recorded for 1240 people (53.2%), 1240 people (63.8%) and 1177 people (67.5%), respectively. Cervical smear in women who had not had a hysterectomy was recorded for 702 of 1069 women (65.7%), 702 of 924 women (76.0%) and 688 of 861 women (79.9%) in samples O, A and B, respectively.

Of the 1346 people in the active patient denominator sample with blood pressure last recorded within the preceding five years, 717 (53.3%) had this recorded on the practice computer (with or without a corresponding recording in paper medical records), as did 633 of the 1177 people (53.8%) with smoking status records. Of the 688 last recorded cervical smears for women without hysterectomy, 563 (81.8%) were recorded on the computer.

Of the 1743 people in the active patient denominator sample, weight was recorded for 60.4%, alcohol consumption for 54.7%, height for 51.7%, dietary advice for 28.8%, family history of coronary heart disease for 20.0%, peak expiratory flow rate for 16.3%, and serum cholesterol level for 11.5%; mammography was recorded for 109 of 313 women in the age group 50–64 years (34.8%).

Comparison of the audits conducted in eight of the practices in 1990 and in 1992 is shown in Table 1. There was no significant change in the proportions of people with recording of blood pressure or cervical smears. There were significant improvements in recording of smoking status, weight, alcohol consumption and height.

An example of the audit results presented to practices to facilitate discussion of their performance compared with that of their anonymous peers and the mean for all practices is shown in Figure 1 for alcohol consumption recording. Similar data were presented for the other audited activities. Strategies for change were discussed with practice staff and changes in organization were implemented where the practice felt this was appropriate.

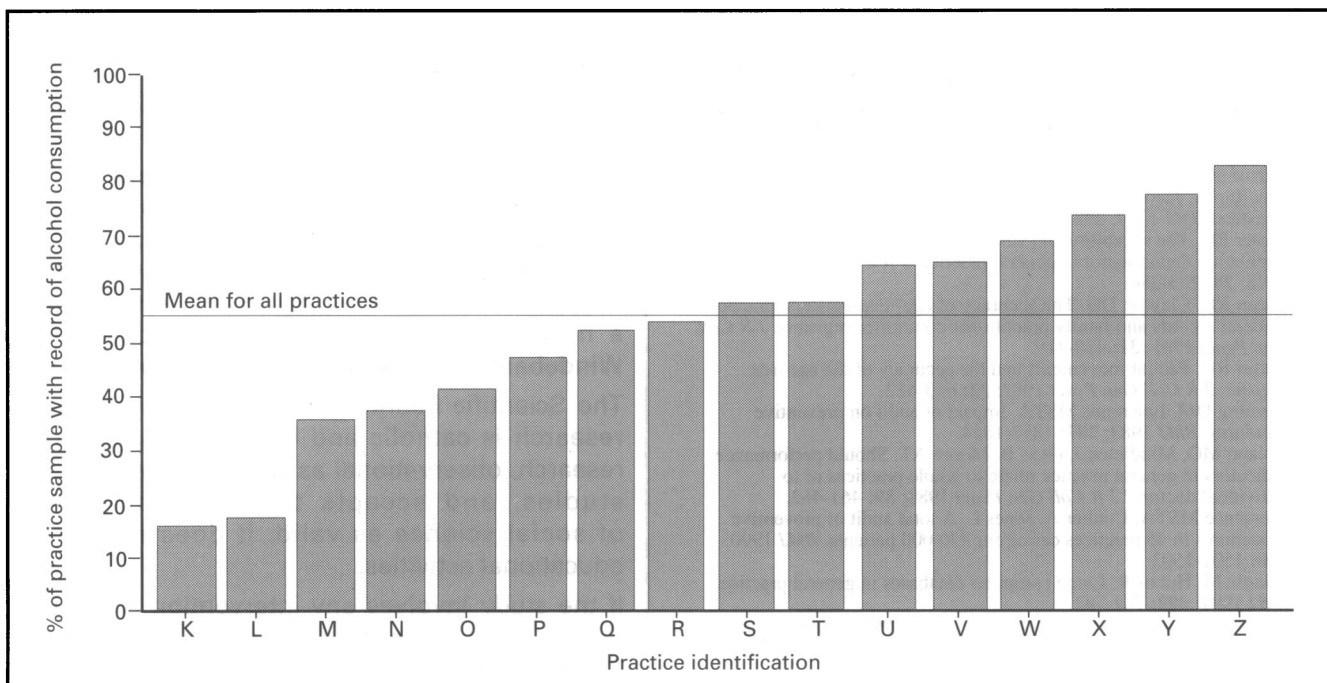
## Discussion

'Inactive' patients comprised 25% of this sample drawn from inner London practices, substantially above the 15% reported from more affluent areas outside London<sup>14</sup> and similar to the

**Table 1.** Comparison of audits in 1990 and 1992 of preventive activity items recorded in samples of people in eight practices in the 'healthy eastenders project'.

Preventive activity	% of sample with recorded item in audit in	
	1990 (n = 884)	1992 (n = 918)
Blood pressure	82.1	80.4
Cervical smear <sup>a</sup> (n=413/441)	78.2	80.5
Smoking status	65.8	72.0**
Weight	52.7	60.9**
Alcohol consumption	48.6	56.9**
Height	34.0	50.2***

n = total number of people in sample. <sup>a</sup>Records for women who had not had a hysterectomy. Chi square test: \*\*P<0.01, \*\*\*P<0.001.



**Figure 1.** Audit in 1992 of alcohol consumption recorded in the preceding five years in 16 practices in the 'healthy eastenders project'.

30% reported from studies using comparable methods of validation in inner London.<sup>15</sup> In the present study, the active patient denominator ranged from 63% to 87% of the practice registers. While the validation might have excluded some 'silent' patients not recently seen in the practice, it would also have included people who had in fact left. There can only be approximations to the true state of the practice register, but by removing some of the more obvious supernumeraries, a more accurate denominator than that obtained from the complete, unexpurgated register was produced.

Not to have validated the register would have lowered preventive coverage from 77% to 61% for blood pressure, from 68% to 53% for smoking status and from 80% to 66% for cervical smears. The complete, unexpurgated practice register thus substantially underestimated population coverage and professional activity.

The difference between coverage for cervical smears and mammography was striking (80% and 35% of the active patient denominator sample, respectively), although at the time of audit systematic breast screening was not fully operational in the health district. The high use of the computer for recording cervical smears indicates that the practices had sophisticated local systems for identification of non-respondents to this centralized screening programme. These data are now forming the basis for local initiatives to improve breast screening through practice identification and recall of non-respondents.

The process of creating an active patient denominator could be simplified. Although some computer systems can now generate random samples, at the time of the study, numbering of the samples was a tedious manual procedure. If the former is not possible, selecting one in  $n$  patients is a practical alternative.<sup>1</sup> The finding that only about half of all recordings of blood pressure or smoking status were recorded on the computer casts some doubt on whether it is advisable to rely on computers for audit where paper records are also maintained.<sup>10</sup>

Postal validation of the samples increased the preventive coverage results by about 4%: this was the increase obtained when the denominator in sample B was used rather than that in sample

A. However, it added four weeks to an audit that could have been completed within a week in most practices. This increased the likelihood of patients leaving during the course of the study and the collation of replies added to the complexity of the study. Of the 381 people who should have been sent a letter, 30 left during the course of the study and 62 were either not sent a letter or the response was not recorded.

Whichever method of validation is chosen, the validation procedure and the number of 'inactive' patients need to be made explicit if meaningful comparisons between practices are to be made of population coverage and professional activity.

Such audits have proved acceptable to practices,<sup>16</sup> and practices in the present study could remain anonymous if they wished. Sampling was an efficient method of data collection and validation was feasible. It is estimated that all 44 practices and 100 general practitioners in the borough of Tower Hamlets could be audited annually by one whole-time auditor or about 150 practices and 340 general practitioners every three years in a rolling programme.

The general practitioners in this study felt that an independent audit based on comparable denominators separated the issue of capitation from that of coverage and professional activity, without financially penalizing those general practitioners working in deprived areas. Using an external auditor, practices were relieved of the not inconsiderable burden of providing good quality data. The current audit is continuing on a rolling basis and there is a waiting list of practices wishing to be included. Inclusion of at least 85% of the borough's 44 practices seems a realistic target within three years.

The creation of an active patient denominator provides a more accurate guide to population coverage and practice achievements than the complete, unexpurgated register, as well as documenting the extent to which the practice register overestimates the population at risk. Individual practices can compare their results with those of their peers, as well as monitoring their own progress over time. It also provides the district health authority and family health services authority with an independently generated and standard set of data on preventive activities.

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## Food for thought...

*'Protocols for chronic diseases, such as diabetes, should be developed by consensus between local general practitioners and hospital physicians as ownership of the protocol then resides with each participant rather than being imposed by a diabetologist, committee or hierarchy.'*

Carney T and Helliwell C. Effect of structured postgraduate medical education on the care of patients with diabetes. *March Journal*, p.149.

RCGP

Research  
Funding

Applications are now being invited for grants for research in or relating to general medical practice, for consideration by the Scientific Foundation Board. In addition to its general fund, the Board administers a number of special funds including the **Windebank Fund for research into diabetes**.

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