An evaluation of recorded information about preventive measures in 38 practices

D. M. FLEMING, MB, FRCGP
Research Fellow, Birmingham Research Unit, Royal College of General Practitioners

M. S. T. A. LAWRENCE, MB, MRCP, MRCGP
Chairman, Education Sub-committee, Thames Valley Faculty, Royal College of General Practitioners

SUMMARY. This paper reports the results of a review of practice records for information about various preventive measures; 8,500 records from 38 practices were studied. In collecting the data a Practice Activity Analysis data sheet was used.

The results are presented in a way which makes it possible for others undertaking these analyses to compare their results with those reported here. They point to a number of conclusions, in particular:

1. Much less cervical cytology has been done for women in their 50s than for those in their 30s and 40s; in particular 45 per cent of women in their 50s have never had a smear.
2. Only 35 per cent of girls aged 15 to 19 were known to be immune to rubella.
3. Only 14 per cent of adults aged 20 to 40 were known to be immune to polio.
4. Of men in their 40s, 47 per cent had no record of their blood pressure having been taken during the previous 10 years.
5. Information about smoking habits was available in 23 per cent of records.

Introduction

PREVENTIVE care was the theme of a residential postgraduate course organized by the Thames Valley Faculty of the Royal College of General Practitioners at New College, Oxford, in April 1980. Both for practical and educational reasons, the course organizers thought it important to assess the state of preventive care in the practices of those doctors attending the course. This paper describes the results of a Practice Activity Analysis (PAA) exercise which we carried out before the course took place.

PAA is the title given by the Birmingham Research Unit to its brand of audit by self-assessment. It involves measuring some aspect of individual performance, relating that to group performance and discussing the results in the group (Royal College of General Practitioners, 1977a). A report of the group discussion of our findings is presented in the Appendix.

Method

A sample of 200 to 250 medical records was extracted by each of the course participants in accordance with the following instructions:

1. Start with letter 'A' and withdraw every third record until you have collected 10 records. Records should be withdrawn regardless of age, sex, adequacy or thickness. As each is withdrawn, insert a marker in the filing system.
2. Repeat the task in letters 'B', 'C' and so on until the entire filing system has been sampled (in letters such as 'Q' and 'X', where there may not be 10 records, simply withdraw one third of the total).
3. Separate from the total batch of records those which are incomplete, for example those recently registered and for whom the record folder has not yet arrived.

The remaining records were divided by sex and decade of birth (Table 1) and examined for the items as listed in Table 2. As an example, the score grid for the analysis of blood pressure record is illustrated in Table 3. Altogether, 38 doctors provided returns from 8,522 patients' records.

Results

The mean results for each of the analyses are shown in

Table 1. Age-sex distribution of records reviewed (total records reviewed 8,522 (average 224 per practice)).

Year of birth	Age	Distribution		
		Males (per cent)	Females (per cent)	Total (per cent)
1880-89	90-99	*0.0*	*0.0*	*0.0*
1890-99	80-89	*0.5*	*1.5*	*2.0*
1900-09	70-79	*2.9*	*3.4*	*6.3*
1910-19	60-69	*3.8*	*4.5*	*8.3*
1920-29	50-59	*5.6*	*5.4*	*10.9*
1930-39	40-49	*5.9*	*6.4*	*12.3*
1940-49	30-39	*7.7*	*8.1*	*15.7*
1950-59	20-29	*7.0*	*7.6*	*14.6*
1960-69	10-19	*8.0*	*8.2*	*16.2*
1970-79	0-9	*7.0*	*6.5*	*13.4*
Total		*48.3*	*51.7*	*100.0*

Table 2. Topic investigated by age and sex.

Topic	Sex	Age
Cervical cytology	Females	30-59
Rubella immune status	Females	15-39
Primary immunization	Males and females	1-9
Polio immune status	Males and females	20-39
Blood pressure record	Male	40-69
Smoking habits	Males and females	40-59

Table 3. Blood pressure record, males 1910-39. Score recording of blood pressure measurement in the last 10 years. For the purpose of this analysis, scan the records back as far as 1 Jan 1970 and disregard records before that.

Year of birth	Not recorded in period	Last recorded 1970-74	Recorded since 1 Jan 75
1910-19	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
1920-29	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
1930-39	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10

Table 4. Cervical cytology.

A. Recorded examination by age group.

Age group	Women at risk	Percentage examined		
		None	1970-74	1975-79
50-59	390	*44.6*	*12.8*	*42.6*
40-49	494	*28.5*	*13.0*	*58.5*
30-39	667	*24.6*	*12.7*	*62.7*
Total	1,551	*30.9*	*12.8*	*56.3*

B. Distribution of results among five recording groups.

Recording group	No recorded test (per cent)	Recording group	Test in last five years (per cent)
A	*9-25*	A	*31-50*
B	*25-29*	B	*50-55*
C	*29-33*	C	*55-58*
D	*33-36*	D	*58-61*
E	*36-48*	E	*61-74*

Section A of each of the Tables 4-10. Information about the range of results is provided in Section B. For each result, the recorders are ranked into five groups (A, B, C, D, E) of approximately equal size; group A contains the one fifth of recorders with the lowest values, and group E the one fifth with the highest values. The values entered in a table are the minimum, the maximum and those which separate the recorders into the five groups.

Cervical cytology (Table 4)

Women aged 30 to 59 years; 1,666 records. One hundred and fifteen women had undergone hysterectomy or amputation of the cervix, leaving 1,551 women at risk; 56 per cent of these had a record of cervical cytology examination within the last five years, but for 31 per cent there was no record of them ever having had a smear. There are comparatively small differences between women in their 30s and 40s, but for women aged 50 to 59 years, there were significantly fewer with records of recent cytology and a higher proportion (45 per cent) with no recorded examination.

The mean rate for all patients who had never had a smear test was 31 per cent of women at risk, but this figure ranged between nine and 48 per cent (Table 4B). In one fifth of the practices (group A), the rate lay between nine and 25 per cent, in the second fifth (group B) between 25 and 29 per cent and so on. Although 56 per cent of women had had a smear test in the previous five years, the results in individual practices ranged from 31 to 74 per cent; one fifth of the practices achieved rates of 61 to 74 per cent.

Rubella immune status (Table 5)

Women aged 15 to 39; 1,675 records. Immunity to rubella was based on a record of the presence of rubella antibodies or of rubella immunization. By these criteria, 28 per cent were known to be immune; this varied from 35 per cent of women aged 15 to 19 to 19 per cent of women aged 30 to 39. In two practices the level of recorded protection was over 50 per cent.

Primary immunization (Table 6)

Children aged one to nine years; 975 records. Sixty-eight per cent had a record of completed primary immunization defined as a three-dose course of triple vaccine (DPT) or dip-tet vaccine (D & T) plus three doses of oral polio vaccine; 23 per cent had no record of receiving any

Table 5. Rubella immune status.

A. Recorded immunity by age group.

Age group	Subjects	Percentage immune
30-39	666	*18.6*
20-29	612	*33.5*
15-19	397	*35.3*
Total	1,675	*28.0*

B. Distribution of results among five recording groups.

Practice recording group	Percentage of women at risk
A	*5-17*
B	*17-24*
C	*24-29*
D	*29-36*
E	*36-57*

Table 6. Primary immunization, 975 subjects, aged 1-9.

A. Recorded immunity (percentage).

Course completed	*68.3*
Partial immunization	*8.3*
No recorded immunization	*23.4*

B. Distribution of results among five recording groups.

Practice recording group	Percentage for whom course completed
A	*30-50*
B	*50-65*
C	*65-75*
D	*75-88*
E	*88-96*

immunization. Individual practice results again showed considerable variation.

Polio immune status (Table 7)

Men and women aged 20 to 39; 2,599 records. Any record of polio immunization was accepted as evidence of immunity. Only 14 per cent of records mentioned immunization. There were age but not sex differences.

Blood pressure record (Table 8)

Men aged 40 to 69; 1,322 records. Fifty-one per cent had a blood pressure reading recorded in the last five years, eight per cent contained a recorded reading from the previous five years and in 41 per cent there was no reading from the last 10 years. There were more recordings in the notes of older men than younger men. The range of results described in Table 8B included one practice in which 95 per cent of the subjects had a recorded blood pressure during the last five years; in a fifth of the practices the figure was over 63 per cent.

Table 7. Polio immune status.

A. Recorded immunity by age and sex.

Age/sex	Subjects	Percentage immune
30-39 Males and females	1,347	*8.8*
20-29 Males and females	1,252	*19.3*
All males	1,220	*13.7*
All females	1,379	*14.1*
Total	2,599	*13.9*

B. Distribution of results among five recording groups.

Practice recording group	Percentage immunized
A	*1-9*
B	*9-13*
C	*13-17*
D	*17-20*
E	*20-32*

Smoking habits (Table 9)

Men and women aged 40 to 59; 1,845 records. Any mention of smoking behaviour was scored. Information was present in 23 per cent of records; there was more information on record about men than about women. In one fifth of the practices, information was available for 28 per cent or more; in one practice this was as high as 61 per cent.

Quality of data (Table 10)

The structure of the data collection sheet allowed us to assess the quality of record-keeping. For each analysis the numbers in each category should have equalled those in the appropriate age/sex band recorded in Table 1. We tested the accuracy of this match for cervical cytology, rubella immune status and blood pressure on each of the 38 data sheets. The difference between the totals exceeded one in only eight out of a total of 113 comparisons.

A further assessment of quality is shown in Table 10B. Of the 38 recorders, 20 submitted returns in which all three pairs of numbers were identical; a further nine recorders made only one trivial error.

Discussion

The information contained in this report is presented in similar manner to that used in earlier PAA reports (Royal College of General Practitioners, 1977a, 1977b, 1978a,b,c,d). Our chief aim in providing it is as comparative material for other self-assessment groups reviewing records. The data sheets piloted in this study have been modified slightly in that the analyses concerned with risk factors, such as cervical cytology and blood pressure records, have been separated from those

Table 8. Blood pressure record.

A. Recorded examination by age group.

Age group	Subjects	Recorded examination (percentage) None	1970-74	1975-79
60-69	333	*30.3*	*8.7*	*61.0*
50-59	481	*42.4*	*8.3*	*49.3*
40-49	508	*47.0*	*6.9*	*46.1*
Total	1,322	*41.1*	*7.9*	*51.0*

B. Distribution of results among five recording groups.

Recording group	No recorded test (per cent)	Recording group	Test in last five years (per cent)
A	*5-28*	A	*24-38*
B	*28-38*	B	*38-44*
C	*38-45*	C	*44-52*
D	*45-53*	D	*52-63*
E	*53-76*	E	*63-95*

Table 9. Smoking habits.

A. Recorded information by age group and sex.

Age/sex	Subjects	Information available (percentage)
50-59 Males and females	884	*23.1*
49-49 Males and females	961	*22.4*
All males	919	*26.8*
All females	926	*18.6*
Total	1,845	*22.7*

B. Distribution of results among five recording groups.

Practice recording group	Percentage recorded
A	*4-13*
B	*13-17*
C	*17-22*
D	*22-28*
E	*28-61*

Table 10. Quality of recording.

A. Recording error encountered in three analyses.

Analysis	Recording error 0	1	2 or more
Cytology (38 recorders)	27	8	3
Rubella immune status (37 recorders)	32	4	1
Blood pressure (38 recorders)	28	6	4
Total records (113)	87	18	8

B. Distribution of errors among 38 recorders.

Recorders with no error	20
Recorders with no more than one trivial error (an error not exceeding 1)	9*
Recorders with more than one trivial error	9

*Includes one recorder undertaking two of the three analyses.

concerned with immunization. These sheets are available from the PAA Unit in Birmingham (the address is given at the end of the paper).

Information gathered in PAA packages such as this one has considerable value as a research instrument. The first research concern must be for the quality of data and the representativeness of samples. Whatever PAA form is completed and processed, there will inevitably be some recording errors. In this study, the quality of recording was high, though that in itself does not necessarily mean that the information from the records is entered correctly on the data sheet.

A random sampling method implies that there is an equal chance for any medical record held to be selected. Our sampling procedure was not random. Nevertheless, ours is a method which avoids any bias which might affect the availability of information about preventive measures in the practices studied. The practices, however, are not representative. The doctors attended a particular postgraduate residential course, and as such share all the biases associated with doctors willing and able to attend such courses. The distortion that this introduces will be particularly evident in analyses concerned with recent information (for example cervical cytology or blood pressure record in the last five years) but its importance will decrease with the age of the information sought. For instance, for many of the subjects in the poliomyelitis analysis, the relevant record would have been generated by a previous practitioner.

The quality of the available records is also important. For some of these analyses, the records provide a very accurate reflection of the true state of affairs. Doctors generally record the blood pressure after measuring it, and cervical cytology reports for women aged 30 or over are usually returned to the general practitioner regardless of who takes the specimen. Recorded information about poliomyelitis and rubella immunity depends on good communication between immunizing agencies (school clinics, employers and so on) and those who file the information in the medical record envelope: a chain of several links, each of variable strength. Information about smoking is likely to be a very personal affair; some doctors record it assiduously, others do not bother.

Cervical cytology

The results for cervical cytology can be viewed in the light of the recommendations of the British Society for Clinical Cytology (Spriggs and Husain, 1977). These include recommendations for five-yearly screening for

women over 35 and that no age limit should be imposed for the first test. Knox (1976), using data about morbidity and mortality from cancer of the cervix, concluded that screening of women over 45 is more likely to reduce mortality than screening younger women.

In this study 45 per cent of women aged 50 to 59 years had no recorded cytology. The comparable figure for women aged 40 to 49 was 29 per cent. If Knox's arguments are accepted, and they appear to have influenced the recommendations of the British Society for Clinical Cytology, the women most at risk are not being screened effectively. Although the apparent inadequacy of screening among older women is a cause for further efforts, these efforts should not be allowed to reduce screening among younger women, as earlier intercourse among these age groups requires earlier regular examination.

Immunization

Rubella

In this study 28 per cent of women of child-bearing age were known to be immune to rubella, a rate which leaves great scope for improvement. In particular, the recorded immunity of girls aged between 15 to 19 years was only 35 per cent, despite known acceptance rates of rubella vaccination by schoolgirls of around 70 per cent (DHSS, personal communication). A study of rubella susceptibility among antenatal women in Glasgow (Clarke *et al.*, 1979) shows that susceptibility rates fell from 14·2 per cent in 1976 to 10·2 per cent in 1979. These national figures and the PAA figures suggest that our rubella immunization programme could be improved and that there is a substantial recording deficit. Should not screening for rubella immunity be part of the initial examination of women seeking contraceptive advice?

Polio

The level of recorded immunity to polio (14 per cent) is most unsatisfactory. It is likely this reflects a recording deficiency rather than the true state of immunity, but it is certain that we have no idea of the population's polio immune status. The recommended schedule for polio immunization (DHSS, 1978) is for a primary course with boosters at five and 16 years. Official notifications for 1974-78 (DHSS, 1978) include 2·4 million boosters to children aged between four and eight years and 1·6 million to age group eight to 16 years. These figures suggest that the programme is slackening in its momentum.

Primary immunization

Sixty-eight per cent of the records of the children studied detailed complete immunization and a further 10 per cent partial immunization. The report of the *Chief Medical Officer* (DHSS, 1979) showed that, by the end of 1978, 79 per cent of children born in England during 1976 were completely immunized and made no reference to children beginning but failing to complete a course. The likely explanations of the difference between our PAA figures and those from official notifications are gaps in the general practice records and failure to distinguish in official figures between partial and complete immunization.

Blood pressure and smoking habits

Forty-one per cent of subjects had no record of their blood pressure having been taken in the past decade. Men in their 40s had a much lower incidence of blood pressure readings than the older men, yet this group includes those who would benefit most by treatment if found to be hypertensive. Since 90 per cent of patients attend over a five-year period, there is great scope for screening for hypertension on an opportunistic basis; screening all men in their 40s would seem to be a goal which all practices could reach.

Whether or not smoking habits are recorded varies considerably between doctors, and on average fewer than a quarter of records contained any information at all. Perhaps general practitioners prefer to ignore smoking because they feel unable to influence it, but it has recently been shown (Russell *et al.*, 1979) that a concerted effort by all general practitioners might yield half a million ex-smokers a year. If we are to take seriously our task of preventing morbidity due to smoking, then we must begin by identifying those at risk.

Appendix: Report of group discussions

The following is a brief description of the way in which the findings of the PAA exercise were used in discussion during the Oxford course in April 1980.

Practice activity analysis has three components:

1. Identifying what is going on—this involves measurement.
2. Showing how individuals compare with their colleagues.
3. Considering why individual results differ. Doing so involves the individuals in group discussion.

For some doctors, measures of performance are threatening rather than stimulating. With this in mind, the entire PAA programme was designed to preserve confidentiality.

We estimated that collecting the data would involve three to three and a half hours' work extracting records and completing the data sheets. For many it took much longer. The task was usually shared between ancillary staff and doctor, but in five practices the ancillary staff were able to complete the entire task. This information generated discussion on the value of well-organized notes and the quality and value of ancillary staff.

The results were presented by giving each individual recorder a sheet which contained the group results, his or her own individual results and some indication of the range. Participants were thus able to consider the implications for the situation in his or her own practice. Those at extreme ends of the range discussed particular techniques that seemed to work well or particular difficulties encountered in their practices.

Discussion was in small groups of about eight doctors and took place on the second day of the course. Each topic was discussed in turn and a few key questions were provided as a stimulus to discussion. For instance, for cervical cytology we posed the questions: which women, how often, what about women over 60, and should we undertake breast screening at the same time? We also spent some time discussing the problems of carrying out preventive care in general. For example, primary immunization figures were useful in considering the value of working with attached health visitors, and blood pressure figures in considering the problems of screening. Opportunistic screening is often appropriate to general practice and, generally speaking, it was preferred to systematic screening from an age/sex register.

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Address for reprints

Dr D. M. Fleming, RCGP Research Unit, 54 Lordswood Road, Harborne, Birmingham B17 9DB.

Further information

For further information about the Birmingham Research Unit's method of practice activity analysis, complete and return the form on p.592.