PRACTICE OBSERVED

Practice Research

Maintaining the accuracy of a computer practice register: household index

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Abstract

In this practice, with a family practitioner committee list of 9726 patients, we use a computer register for recall, screening, morbidity data, audit, and repeat prescribing. The computing techniques used to achieve accuracy in maintaining the register are described. After one year of full use the register was validated by using the computer to select a random sample of 200 patients from patients' computer records that had not been updated recently. Two patients were untraceable, and in only 11 records were errors of information found, none of which was important. We think that it is feasible and valuable to have a household index.

Introduction

Sheldon *et al* and Fraser *et al* have measured the accuracy of age-sex registers in general practice.[1 2] In 10 highly motivated practices Sheldon found an average inflation rate in the number of patients of 4% when compared with the family practitioner committee register and of 7·2% when compared with the number of patients in the community. We set out to achieve much greater accuracy by using the computer's inexhaustible capacity to rapidly search, sort, and compare the data we entered. Some methods were merely manual tasks that can be carried out more quickly on a computer, others were a feature of many computer systems, but in addition we wrote special programs dedicated to checking the practice register. One of these led us to believe that having an index of households would be a natural development of computing in general practice with fixed lists of patients. Our system was written for the practice and runs on a TRS-80 Model III with hard disk storage.[3]

Setting up the register

Avon Family Practitioner Committee is computerised and we could have transferred data electronically, but we wished to enter details into our computer more consistently and include extra details, such as the marital state and the dates of the last consultation, cervical cytology examinations, and visits for family planning. Our manual records are Lloyd George, with families with the same surname and address bundled together. Details were entered by a member of the ancillary staff, who was employed for 200 hours, representing an addition of 2·3% to staff costs in that year. She took batches of notes from the filing cabinets and added a marker when they were entered.

At this stage the register was a list of the manual records with the possibility that patients might have been entered twice or missed. Furthermore, not all the manual records we held were for patients who were registered with us, being either omitted from the family practitioner committee list or unreturned. Of those patients registered with the family practitioner committee, some would have left the practice area permanently or died without our knowing about it, and we describe them as untraceable. Errors of detail on address and date of birth, for example, could result from continuing errors, inaccurate transcription, or a failure of the patient to notify changes.

Maintaining the register has been the sole responsibility of the records clerk, who works 12 hours a week in a separate office entering data in to the computer and receiving, sorting, and returning manual records. Temporary cards were made for newly registered patients and filed in a new patients' file and not added to the computer register until registration was confirmed, an average time of two weeks in Avon since 85% of our patients move within the county.

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The registration of new babies was checked off a list of maternity services that the computer produced. Deceased patients were removed immediately, but patients who were leaving the list were not removed until the notes were requested by the family practitioner committee. Eight hundred and forty five patients joined the list and 783 were removed in the year to July 1984, representing a turnover of 8%, and an increase of 0·64%.

The following features of our computer system were used both to improve and to maintain accuracy:

Alphabetical index—The main patient record is not stored alphabetically, but an alphabetical index of surname and forenames is updated at every entry and includes numbers that refer to the main data record. The practice register can be displayed in alphabetical sequence and compared with the family practitioner committee list. This comparison took roughly 20 hours' time of two staff but resulted in identifying about 300 records that were not on the family practitioner committee list. Subsequently, we registered roughly 30 patients and returned the records of those whom we had not treated for several years. This was a useful exercise that would have been difficult to perform manually with our method of filing records by family name.

Size of households in practice compared with that in 1981 census[4] (9351 patients in 3719 households)

No in household	No of patients	Percentage of total households in practice	Minimum percentage correct in >10% sample	Corrected percentage for practice	Percentage of total households in 1981 census
1 aged 65 +	551 } 1192	14·8 } 32·0	95	12·5 } 22·0	21·7
aged 40-64	323	8·7	70	6·1	
aged 17-39	318 }	8·5 }	40	3·4 }	
2	2044	27·5	94	33·5	32·2
3	1605	14·4	97	17·5	17·0
4	2472	16·6	98	17·0	18·1
5	1195	6·4		6·9	7·3
6	516	2·3		2·3	2·5
7	98	0·4		0·4	0·7
8	40	0·1		0·1	0·3
9	18	0·1		0·1	0·1
10+	171	0·2		0·2	0·1
Average household size		2·51		2·68	2·67

Date of birth index—This is a list of dates of birth arranged chronologically for either sex, but unlike the manual age-sex register only numbers refer to the main patient record and so transcription errors cannot occur. This index may be used to search only those patient records in the age range specified but may also identify all patients with a given date of birth in seconds. When notes cannot be found because of unnotified name changes the index can identify the patient by date of birth in seconds.

Household index—This indexes addresses by the first three letters of the street, the post code, the number or house name, and the first letter of the surname and date of birth of each occupant. The household index requires individual programming for a practice but once implemented the address may be used for demographic information as well as for identification and location. Thus a detailed breakdown of the practice population by locality is possible, and the whole practice may be listed by household in a sequence by street and number. This is more helpful to the general practitioner than alphabetical listings and closely resembles the electoral roll, except that it includes those aged under 18 but not members of the household who are registered with other practices. The table shows how we validated the index by comparing our analysis with the figures from the 1981 census on the size of households. Single person households are shown in three age ranges. Checking at least a 10% sample against the electoral roll showed that 85% of the patients 65 and over who our index showed were apparently living alone were indeed, though figures were unreliable in younger single person households. Figures for households of two people and more were accurate. The corrected percentages for each household size are remarkably close to census figures. Using the household index we produced a list of every household in which there were two or more different surnames, which numbered 369 out of the total of 3719 households. This shows extended families, other family relationships, cohabiting, and that new patients have moved into the residences of former patients who may have left the district some time earlier. This list was of interest to the partners, showing domestic situations that they had not previously recognised. We also produced a list of patients over 64 living alone (with its 85% accuracy) for the geriatric health visitor to use. The under 5s were listed in address sequence for the children's health visitor, which clearly showed, for example, families with three children under 5. The household index may be used to identify in seconds all the persons living at a given address and is helpful when parents have different surnames from the children.

Checking for errors at input—The computer system can provide programmed safeguards against error at input. Thus when new patients are entered similar names or dates of birth of patients already on the register are displayed to avoid duplication. The postcode may be checked for basic postcode rules and that it lies in the practice area.

Programs to detect errors—Special programs may be run to check all the registration data by creating, sorting, and comparing temporary indexes. Thus the computer can check that the postcode is identical for a given address, that the address for a particular surname in a particular postal area is similar, and that the sex for a particular first name is the same. Duplicate entries may be sought by listing patients with identical surnames and roughly the same birthdays or identical first names and same birthdays. Not all the computer listings are errors and these methods are not 100% effective, but we found them useful in tidying up the register.

Single register for all data recording—Separate registers are not necessary in a computer system so that whenever morbidity data and cervical cytology and family planning dates are entered the practice register is accessed, as it is with the 15% of patients with a repeat prescription record. Failure to include a patient in the computer list would be recognised immediately.

Patient contact with computer output—Patients may notice incorrect personal details on their repeat prescription. Computerised recall and screening letters may be returned or amended. We have sent more than 750 recall letters for hypertension, cervical cytology, and rubella screening, and this has led to address corrections and the recognition of untraceable patients in non-responders.

Date of last data analysis—Data may be regularly entered to record important information on morbidity, cervical cytology, family planning, expected date of delivery, immunisation, blood pressure, and even the date of the last consultation in selected cases. A program was written to list all the patients for whom no event dates had been entered for five years. Checking their notes and the electoral roll showed many who must have left the practice. When the search was confined to patients with no event data for shorter periods the computer produced an impossibly long list. On the assumption (not always valid) that patients with the same surname in the same household move together, the computer was programmed to identify patients who had no current prescription record or no event data entered for the past year. If any were found then this patient and all patients with the same surname in the same household were eliminated from the check, leaving a list of 350 unfamiliar names with a high probability of having left the practice.

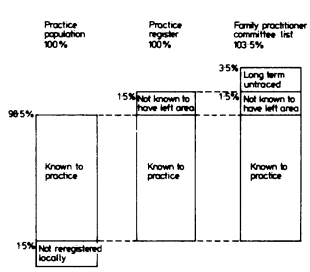
Validating the register

After one year of using these procedures we had excluded roughly 360 patients from the practice register for screening and statistics and made hundreds of corrections. Having checked once that all patients on the practice register are included on the family practitioner committee list, a further comparison of the two lists would not be necessary for some years. A serious omission would be to miss patients from the practice register who were registered with us, but since only a handful of patients might be concerned, checking a sample would be meaningless. Using the computer regularly is the most likely way to discover these—two have come to light in the past year. Although we had identified untraceable patients, the biggest source of error must still be patients who have left the practice area but have not registered elsewhere, particularly moves that have occurred in the past year or two. To increase the chance of picking up these patients the computer first separated the under 5s and patients on whom we had entered data in the past three months and then selected a random sample of 200 from the remainder. A personalised mailing list was produced at the same time so that word processed letters to patients could be produced with all the details that we wished to confirm. Using our family bundles of records it was easy in many cases to find sufficient corroborative evidence on accuracy and only 21%, were written to or telephoned. Two patients were untraceable, six had incorrect dates of birth by one year at the most, and five had incorrect postcodes.

Discussion

Age-sex registers may be expected to develop an increasing number of inaccuracies in proportion to both the length of time they have been set up and the turnover of patients unless they are regularly checked. Inflation leads to inaccurate morbidity figures and apparently poor response rates to screening. For example, the percentage of patients seen in the practice in the past five years was corrected from 93·2% to 96·7% from our findings. Mistakes over registration may cause unnecessary distress or embarrassment to relatives and may make the practice appear inefficient. Improving the records is less work when superfluous notes are identified, and practice projects and audit can appear more manageable. Computers will work more efficiently in selecting patients and performing searches than people. As general practitioners undertake preventive and anticipatory care the accuracy of their patient list becomes more important. Surgery computers will continue to list patients for preventive care and screening unless they are labelled as untraceable or are removed from the practice register.

Provision for list inflation is made in calculating the target income of general practitioners, and perhaps a rough fairness operates since inflation bears some relation to list turnover, with its attendant workload. One legal requirement on general practitioners is set out in schedule 1, part I of the 1974 National Health Service regulations. Paragraph 30 states that the doctor "shall . . . not later than one month of . . . learning of . . . a death . . . forward the records relating to that person to the [family practitioner] committee." Thus when the practice has issued the death certificate or has a document referring to the death then the responsibility is clear. Paragraph 13 states that doctors shall render services if the condition of the patient so requires at some other place where the doctor has agreed to visit him and has informed the patient and the family practitioner committee accordingly. Thus if a patient is known to have moved to an address where the doctor is not prepared to visit the doctor should notify the patient and the family practitioner committee. Nevertheless, having complied with these regulations, most patients we identified apparently disappeared without a trace. That we are not absolutely correct in our assumptions is confirmed by our having had to reinstate two patients on the practice register. We have, however, a percentage figure (3·5%) approximating to the percentage inflation of NHS registered patients above the Registrar General's estimate of the population for the county (figure). A further one to two per cent of the family practitioner committee list will have moved out of the practice area but not yet reregistered, and this is balanced by an equal percentage that will not register with the practice unless the need arises. This is the smallest margin of error of a practice register that computer monitoring and checking with the last electoral roll can produce.



Relation between population of practice catchment area, practice register, and family practitioner committee list

As all family practitioner committees become computerised and thus able to offer more facilities to general practitioners, such as age-sex registers, cervical cytology recall, and morbidity data, they will also have the means to control list inflation by the methods described.[1] More detailed guidelines may be necessary than a "gentlemen's swings and roundabouts agreement." Family practitioner committee staff, however, who work on up to 500-fold numbers of patients and are remote from the point of patient contact, will find it difficult to maintain the motivation for achieving the accuracy that is necessary for doctor initiated intervention. If we rely too much on family practitioner committees for computerised data our independent contractor status may lose some credibility. Regardless of where the computerised data is held there is room for improvement in the office procedures of most of our surgeries. Computers can help to check for errors and focus attention on possible anomalies in the simple ways that we have described.

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100 YEARS AGO

Our Paris correspondent writes: At a recent meeting of the Council of Hygiene of the Department of the Seine, M. Riche, in the name of a commission of medical and sanitary authorities, read a report concerning the practice of using vaseline in pastry as a substitute for butter or fat. Pastry thus prepared can be kept for some time without becoming rancid, a quality advantageous to the seller, and as equally undesirable for the buyer and consumer, who is not warned, either by smell or taste, of the falsification of the ingredients or the staleness of the pastry. Vaseline does not possess the nutritive qualities of either butter or fat, and its action on the digestive apparatus has not been determined, so that it cannot be affirmed that its introduction into articles of food may not be dangerous to health. The Council of Hygiene, therefore, has resolved that it is not desirable that the use of vaseline, petroleine, or neutraline, and all similar products, in preparing pastry or any other form of food, be permitted in France. (*British Medical Journal* 1885;i:242.)

Giving advice about welfare benefits in general practice

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Abstract

Many people do not receive the full state welfare benefits to which they are entitled. Roughly two thirds of the population consult their general practitioners at least once a year. General practitioners and community nurses are exceptionally well placed to detect those who are suffering genuine financial hardship but they are not well equipped to give advice about the complex system of state social security benefits. Imparting such advice in suitable cases, particularly where the lack of it is detrimental to health, might be regarded as a proper function of general practitioners and health centres. A method of providing such advice in a health centre with the help of a computer is described.

Introduction

In our practice we have recorded the diagnoses made at every consultation for 7000 patients over the past few years. For 1979-81 roughly 2·3% of the problems presented by patients were given a primary diagnosis (in accordance with the ninth revision of the *International Classification of Diseases*) as being connected with their social circumstances—that is, 1427 diagnoses out of a total of 62 829—and 565 (40%) were directly or indirectly related to financial problems. We know that in some cases where physical, psychological, or social symptoms are thought by the general practitioner to be due, at least in part, to financial stresses, there are state benefits that might be claimed by the patient. In most of these cases the patients do not present with direct complaints of financial problems.

We wondered how many of our patients were not receiving the benefits to which they were entitled, although these might have beneficial effects on their health. By examining the list of our "chronic visits"—the 100 or more people we visited regularly in their homes—we discovered that about a third were entitled to, but were not receiving, an attendance allowance (to enable them to pay someone to look after them) and that several were also entitled to a mobility allowance (to help them get out and about if they had substantial difficulty in walking). Unfortunately, some of these last patients had passed the age of 65, the upper age limit for claiming mobility allowance. Had they claimed in time the allowance would have been paid until the age of 75 if they remained immobile. Most who were entitled to claim now receive these allowances, a few after appealing against decisions that they were not entitled.

It is difficult to obtain reliable data on the national uptake of mobility allowance and attendance allowance, but according to Department of Health and Social Security figures 49% of people who are entitled to family income supplement do not claim it[1] and at least £760m per year of supplementary benefit goes unclaimed.[2] The rules governing individual benefit entitlements depend on age, income, marital state, and other fairly easily quantifiable things. Finding the rules written down somewhere, putting them all together, and then doing all the arithmetic is complicated as there are so many factors involved.

The obvious answer is a computer, which can be given all the rules, and then if the correct information for each case is fed in it will do all the calculations needed in a fraction of a second. This is now possible because since 1980 the conditions for payment of supplementary benefit have been formalised on a full statutory basis and no longer depend so much on the judgment of individuals in the local social security office. There are, however, times when it is difficult to decide by computer whether, for instance, a person is entitled to a heating addition, but these are relatively few.

Using the Child Poverty Action Group booklets on welfare benefits,[3 4] Tolley's *Social Security and State Benefits*,[5] and the DHSS's housing benefit guide,[6] I have written a computer program that is run daily in our health centre and has been used to give advice to some of our patients who we think have problems related to their financial difficulties. I started writing the computer program early in 1980, and it is updated and modified continually but has been working fully for more than a year.

There are roughly 30 state social security benefits. Some depend on National Insurance contributions that people have paid in the past—for example, the contributory benefits such as retirement pension and widow's benefit. Others are means tested, such as supplementary benefit and family income supplement, and others, like attendance allowance and mobility allowance, depend on disability. Doctors give evidence about sickness and disability for some of these benefits. Housing benefit, which replaced rent and rate rebates and allowances in April 1983, is administered by local authorities, unlike the other benefits, which are administered and paid by the social security branch of the DHSS.

In 1983-4 the United Kingdom spent £35 478m on social security[7]—twice as much as is spent on health, defence, or education. Therefore, it is all the more important to ensure as far as possible that social security payments are going to those who need them most rather than to those who are most efficient at making claims.

Method

The computer program is divided into several parts. In the first part there is a series of questions about details such as the age and sex of the person concerned. A form of branching logic ensures that people are asked only relevant questions—for example, men are not asked if they are pregnant. It is possible to inquire about one benefit only rather than to be considered for the whole range of benefits, and in this case the questions asked relate only to the benefit in question. Attendance allowance and mobility allowance require a few questions only, family income supplement more, and supplementary benefit still more. When housing benefit is included things become even more complicated, as it is closely connected with supplementary benefit.[6]

Having asked about the details in the first part of the program, the program goes on to test one by one whether the person is entitled to each of the possible benefits. One main problem is that for the contributory benefits it is necessary to have an accurate record of National Insurance contributions made in the past, which most people cannot remember. They may obtain this information by writing to the DHSS and then enter the details into the computer, but the program gives them the option of entering the amount that they are actually receiving of any contributory benefit (retirement, widows's, sickness/invalidity, maternity, unemployment) and assuming that this is correct. Alternatively, to calculate any of the con-

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