

## **Identification and characterization of early and late prescribers in general practice<sup>1</sup>**

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**Summary:** National Health Service prescriptions written by general medical practitioners in one urban Area were analysed over a fifteen-month period to classify doctors into those who prescribed a named drug early or relatively later in its market life. A questionnaire, designed to answer a number of hypotheses intended to characterize these groups of practitioners, was mailed to the 100 doctors in each group. Statistical analysis of the results suggests that there are several identifiable characteristic differences between 'early' and 'late' prescribers. Early prescribers have larger list sizes than late prescribers and rely more on industrial sources for information about drugs.

### **Introduction**

When a drug is launched it is accompanied by a large volume of information. If the new product is an 'innovation' in that it treats a disease in a new way or fills a therapeutic gap then sources of information will include medical journals and professional bodies; otherwise the pharmaceutical industry will be left largely to advertise the product.

Doctors do not form a homogeneous group when their prescribing habits or their use of drug information are considered. If those doctors who prescribed a new drug early in its market life could be identified and sent only the information they required, and similarly if those doctors who prescribed a new drug late or not at all could be sent the drug information that they preferred, money could be saved and the time wasted in disposing of unwanted information could be preserved.

In this study an 'innovation', cimetidine, was studied in depth and those general practitioners who prescribed it 'early' were isolated.

### **Methods**

All prescriptions written for cimetidine from its day of launch (November 1976) by general practitioners in one Family Practitioner Committee (FPC) urban Area were collected and stored at the appropriate office of the Prescription Pricing Authority. This was carried out for fifteen consecutive months. Approximately ten thousand prescriptions for cimetidine were issued by over 400 practitioners during this period, from a total of nine million prescriptions for all drugs issued in the Area.

Data from the cimetidine prescriptions were recorded under headings which included date, prescribing doctor's name and code number, and the quantity of the drug prescribed. These data were sorted in various ways to give information of different emphasis. One sort was by date order within which the data were then sorted by prescribing doctor. A cumulative plot was made of first-time prescribers against the date on which they first prescribed cimetidine. This plot was used to find the early and late prescribers. Of the 438 doctors who had prescribed cimetidine, the first 100 were taken as representing the early prescribers and the last 100 as the late prescribers.

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A questionnaire was designed and posted to each doctor in the early prescriber and late prescriber groups. Using 'Statistical Package for the Social Sciences' (Nie *et al.* 1970) a number of cross-tabulations for statistical significance were performed. Statistical analyses were carried out on the data in order to see if there were any differences between members of the two groups which might be used to predict the outcome of a new drug launch.

Certain details about each doctor and his practice were found from the Medical Register and the FPC Medical List before posting the questionnaires. When direct comparison of some of the parameters was required the statistical analyses included the *t* test or the proportion test for significance. The results are presented in relation to four, previously-postulated hypotheses which were tested using the data provided by the questionnaires.

### Results and discussion

Approximately half of the questionnaires in both early and late prescriber groups were completed and returned. Four variables which were easily obtainable were used to check for differences between the responders and non-responders: these were sex, the doctor's qualifications, the number of years qualified and the number of partners in the practice. Using the *t* test, there was no significant difference between responders and non-responders in respect of the four variables chosen.

*Hypothesis 1: 'The larger the prescriber's list size, the greater the probability that the doctor will be an early prescriber'*

The list size is defined as the number of patients a general medical practitioner has registered for National Health Service treatment. It represents an approximate measure of work load although the number of patients treated in a day could be more realistic. This measure and the length of the working day was shown by Hemminki (1974) in Finland to be related to the number of psychotropic drugs prescribed. It was suggested in a report on NHS prescribing trends (Ministry of Health 1964) that the larger the general practitioner's list size, the lower his prescribing rate per patient. This was also suggested by Wade (1976), who stated that doctors with large practices prescribe half as much per thousand patients as doctors with average or small practices. There was also some evidence to support the hypothesis that a doctor with a low list size had a greater propensity to accede to patient demand (Wade 1976). Wilson (1964) suggested that general practitioners with a large number of patients on their list prescribed brand-named products, the name of which had been impressed upon them by advertisements, and that these general practitioners had little time to examine relative costs. Mapes (1977) found that the tendency to prescribe better known, perhaps in some cases outmoded, preparations was related to the high number of prescriptions issued. All seem to agree that the list size is inversely related to the total number of prescriptions written and that better prescribing comes from a low rate of prescription writing.

The list size of the early and late prescribers in the present study is shown in Table 1. Early prescribers have a larger list size than late prescribers ( $t > 1.96, P = 0.05$ ). This indicates a number of possibilities: first, that the doctor who sees or has the opportunity to see more patients has a greater chance of seeing patients with the condition for which any particular new drug has been indicated; secondly, that the doctor who is generally innovatory or first to do things may be more likely to attract the largest number of patients; thirdly, that doctors who are more rushed are less critical of advertising.

Table 1. Comparison of list size

	Early prescribers	Late prescribers
No. of GPs in sample	43	45
Average list size	3032	2354
Standard deviation	728	1126

Table 2. Sources of information used most by general practitioners

Sources in order of greatest use by all respondents	Early prescriber		Late prescriber	
	Score	Rank	Score	Rank
1 <i>MIMS</i>	159	1	131	3
2 Articles in medical journals	134	3	140	1
3 Consultant recommendations	130	5	137	2
4 <i>British National Formulary</i>	131	4	121	5
4 <i>Prescribers' Journal</i>	122	6	130	4
6 Drug firm representative	135	2	93	8
7 Postgraduate refresher courses	110	7	113	6
8 Professional contacts	98	8	94	7
9 <i>Data Sheet Compendium</i>	86	10	83	9
10 Textbooks	90	9	74	10

*Hypothesis 2: 'Early prescribers will rate industrial sources of information more highly than late prescribers'*

Table 2 shows the ten most popular sources of information selected by all respondents to the questionnaire. The sources and ranks given by early and late prescribers respectively are also shown. The score was calculated by grading a first selection as five points, down to a fifth or lower selection as one point.

Each information source was considered separately using the proportion test. The actual score presented as a proportion of the total possible score was used. This latter figure was obtained by multiplying the total number of early or late prescribers in each group by the maximum possible score, i.e. 5. A statistically significant difference was noted with the source 'drug firm representative' and it was concluded that early prescribers rate the representative significantly higher than late prescribers. The representative is one of the earliest sources of new product information available to the general practitioner and it seems reasonable to suppose that the early prescriber will use such sources of information.

Four other sources showed significant differences. These were: advertisements in medical journals; direct mail; *MIMS*; and controlled circulation journals. All of these sources are 'industrial' and were given significantly higher scores by the early prescribers than by the late prescribers.

*Hypothesis 3: 'Direct mail will be read more by early prescribers than late prescribers'*

The response to the question 'Do you read direct mail?' is shown in Table 3. Using the *t* test at the 5% level of significance, early prescribers read more direct mail than late prescribers. Direct mail was estimated to cost the pharmaceutical industry £6 million in 1973, Stimson (1977) considered that direct mail advertising contained limited therapeutic information. Direct mail is generally concerned with making general practitioners aware of new products and with keeping the name of existing products before them.

*Hypothesis 4: 'Early prescribers read fewer journals than late prescribers'*

There is a perceived risk involved in prescribing any new preparation. The preferred method of handling this risk is to increase knowledge about the new preparation. In most cases this

Table 3. Response to question: 'Do you read direct mail?'

Response	Early prescribers	Late prescribers
Yes	29 (67%)	19 (42%)
No	14 (33%)	26 (58%)

Table 4. Journals listed in questionnaire

<i>British Medical Journal</i>	<i>Doctor</i>
<i>Lancet</i>	<i>World Medicine</i>
<i>Practitioner</i>	<i>Health Trends</i>
<i>Journal of the Royal College of General Practitioners</i>	<i>Prescribers' Journal</i>
<i>General Practitioner</i>	<i>New Scientist</i>
<i>Pulse</i>	<i>MIMS</i>
<i>Medical News</i>	<i>Medical Letter</i>
	Others (respondent to specify)

Table 5. Journals stated as being 'read'

	Early prescribers	Late prescribers
Total no. of journals read	131	171
Mean no. per person	2.85	3.7

involves information processing by receiving or seeking and evaluating new information, or through referring to and evaluating information already stored (Cox 1964).

In the questionnaire respondents were asked to indicate which of several journals listed (*see* Table 4) they received, scanned, read and stored for reference. For the purposes of this paper, data relating only to the 'read' section were used for further analysis (Table 5). Using the *t* test at the 5% level of significance, early prescribers read fewer journals than late prescribers. This finding contradicts those of Coleman *et al.* (1966) but agrees with the general results of the present study.

Ten personal characteristics of the general practitioner were chosen from the FPC Medical Lists and Medical Register for each respondent in the 'early' and 'late' groups. These were: (1) number of partners; (2) number of years qualified; (3) university of graduation; (4) qualification obtained; (5) individual practitioner's list size; (6) whether or not the doctor did his own dispensing; (7) number of receptionists in the practice; (8) number of years the practitioner had been in the current practice; (9) whether or not the doctor specialized; (10) sex of the practitioner.

In addition to these characteristics the study also considered a number of extra variables which it was thought might help to characterize the early and late prescribers. These included the way sources of information were used generally, and specifically for awareness or evaluation; the way the CSM 'yellow card' system and other methods of adverse drug reaction reporting were used; the emphasis made by the GP on the Data Sheet, direct mail, the consultant and the drug firm representative. The journal reading habits of the doctor, the way he used the postgraduate medical centre and postgraduate courses were also considered as was the number of 'out of town' conferences or symposia attended.

In all cases, except those specifically referred to in the above text, there was no statistically significant evidence to suggest that the early and late prescribers differed in their approach or acceptance of the various information sources.

## Conclusion

Early and late prescribers in general practice have been shown in this study to have a number of characteristics which can be used as indicators to define these groups. The early prescribers are greater users of information from the pharmaceutical industry and read less published information than their less innovative colleagues.

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