

Drug advertising and prescribing

RICHARD DAJDA, BA, M.SC

Research Fellow, Medical Sociology Research Centre, University of Swansea

SUMMARY. A study of the amount of drug advertisements received by general practitioners and the amount of the drugs practitioners prescribed showed a strong correlation of 0.80. Analysis suggests that a straight line graphic relationship provides the best fit for the results obtained.

Further analysis of the quantity of advertising in relation to the amount of prescribing revealed two groups of drugs: those which were relatively more and those which were relatively less often advertised in proportion to the number of prescriptions issued for them.

Introduction

THERE is increasing concern about the extent of drug advertising to general practitioners (*General Practitioner*, 1977; *Guardian*, 1977). At the Medical Sociology Research Centre in Swansea (1976) we have been monitoring drug advertising for several years.

Aim

In this paper I try to relate the advertising for drugs to the amount they are prescribed by general practitioners.

Method

The source of my information on drug advertising is the mailed advertisements and journals sent to the doctors in three group practices in Swansea. By selecting one of each of the different advertisements I have an estimate of the total amount of mailed advertising being presented to general practitioners.

This study covers the advertising sent to general practitioners during the whole of 1975, during which there were about 14,000 advertisements, about 40 a day. Obviously no doctor reads all of the journals or drug

company letters sent to him, but these figures give some idea of the total amount of mailed advertising aimed at general practitioners. Slatter (1977) estimates that whilst all doctors do not read all of the material sent them, "as many as 70 per cent might glance briefly at what they receive".

The advertisements were coded according to their therapeutic group, using the 88-code DHSS classification shown in Table 1. The number of advertisements for each group has been related to the number of items prescribed in each therapeutic group in Great Britain during 1975. Only drugs prescribed by brand name were considered, as non-proprietary drugs are not advertised. This gave a total of 84 groups.

Results

Figure 1 shows the relationship between the prescribing and advertising of proprietary drugs in 1975. The horizontal axis gives the number of advertisements for each therapeutic group. The vertical axis shows the number of prescribed items for each therapeutic group.

The graph shows scatter, although the correlation coefficient for the measures is high at 0.80. This indicates a strong relationship between the two measures but does not imply any causal direction. That is, we cannot tell simply from the strength of the relationship whether high advertising is generating high prescribing or whether the high prescribing of a successful drug is associated with high advertising to maintain the drug's market position. It is certain that a mixture of these forces is acting as the market contains both new and old drugs.

Near the origin of the plot in Figure 1 is a shaded area. This region, bounded by one million prescriptions in a year with 20 advertisements in a year, contains many groups, too many to be plotted within the small area. This region has been expanded as Figure 2.

It will be seen from the vertical axis of Figure 2 that nine therapeutic groups were not advertised at all, and that for a further 14 groups there were fewer than 10 advertisements during the year.

Table 1. Therapeutic groups of drugs. (Asterisked groups contain only non-proprietary items.)

01	Antacids	46	Anti-TB preparations (other than antibiotics)
02	Antispasmodics	47	Anthelmintics
03	Bitters and tonics	48	Other anti-infectives (including antileprotic, antisyphilitic, antiprotozoal preparations)
04	Gastrointestinal sedatives	49	Corticosteroids for systemic use
05	Other miscellaneous digestive remedies	50	Oestrogen-progestogen combinations
06	Laxatives and purgatives, evacuant enemas and suppositories	51	Other sex hormone preparations
07	Corticosteroid preparations acting locally on the rectum	52	Insulin
08	Anti-infective agents acting locally on the gastrointestinal tract	53	Oral hypoglycaemics
09	Preparations acting on the heart	54	Antidiuretics and other pituitary hormones
10	Diuretics	55	Anabolic drugs
11	Antihypertensives	56	Thyroid and anti-thyroid preparations
12	Vasodilators	57	Other preparations affecting metabolism
13	Vasoconstrictors	58	Cobalamin preparations
14	Antimigraine drugs	59	Iron and other erythropoietic preparations
15	Anticoagulants	60	Vitamins and vitamin preparations other than cobalamin preparations
16	Other preparations acting on blood vessels	61	Antimycotic preparations
17	Expectorants and cough suppressants	62	Calcium preparations
18	Preparations relaxing bronchial spasm	63	Preparations for electrolyte and water replacement
19	Antibiotic preparations acting locally on the lower respiratory tract	64	Other preparations affecting nutrition and blood
20	Other preparations acting locally on the lower respiratory tract	65	Preparations specified for rheumatic diseases and gout
21	Other preparations affecting the lower respiratory tract, including stimulants	66	Antihistamines for allergic reactions
22	Addictive analgesics	67	Preparations for protein desensitization
23	Antipyretic analgesics	68	Other preparations affecting allergic reactions
24	Barbiturates (unadmixed or if principal ingredient)	69	Antibiotic preparations acting on the ear, nose and oropharynx
25	Hypnotics (non-barbiturate)	70	Corticosteroid preparations acting on the ear, nose and oropharynx
26	Tranquillisers	71	Other preparations acting on the ear, nose, and oropharynx
27	Antidepressants	72	Antibiotic preparations acting on the eye
28	Stimulants and appetite suppressants	73	Sulphonamide preparations acting on the eye
29	Anticonvulsants	74	Corticosteroid preparations acting on the eye
30	Preparations used in Parkinsonism	75	Other preparations acting on the eye
31	Muscle relaxants	76	Antibacterial preparations acting on the skin
32	Other preparations acting on the nervous system	77	Fungicides and antiparasitics
33	Local anaesthetics and counter-irritants	78	Corticosteroid preparations acting on the skin
34	Anti-emetics (other than preparations of unadmixed hyoscine salts)	79	Sedatives, antipruritics, keratolytics and protectives
35	Antibiotic and other anti-infective preparations acting locally on the vagina and urethra	80	Antiseptics (including surgical antiseptics)
36	Other preparations acting locally on the vagina or urethra	81	Other preparations acting on the skin and mucocutaneous junctions
37	Preparations acting on the uterus	82	Vaccines and sera
38	Other preparations acting on the genito-urinary system	83	Reagents
39	Penicillins	84	Others
40	Tetracyclines	85	Dressings*
41	Streptomycins	86	Appliances*
42	Chloramphenicol	87	Trusses*
43	Anti-fungal antibiotics	88	Hosiery*
44	Other antibiotics		
45	Sulphonamides		

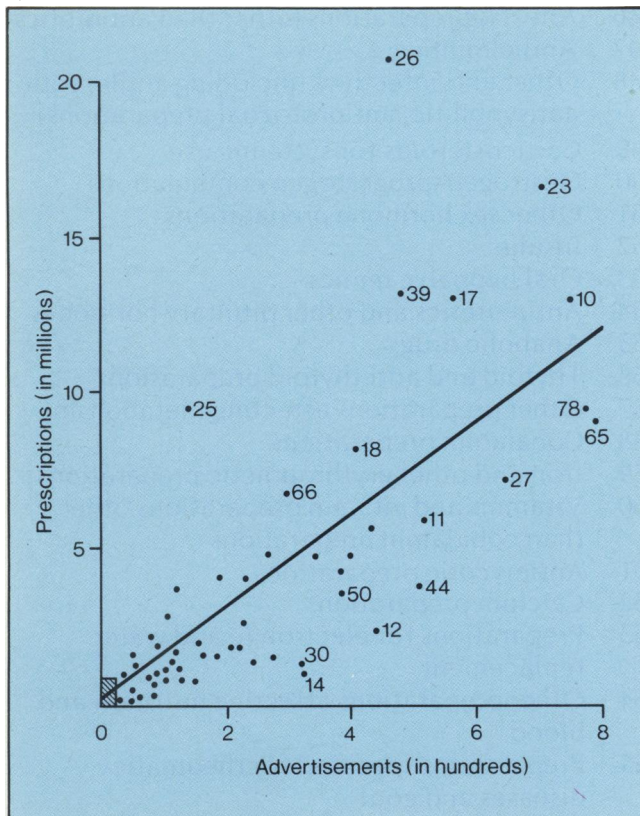


Figure 1. Plot of prescribing against advertising. Proprietary drugs in 1975.

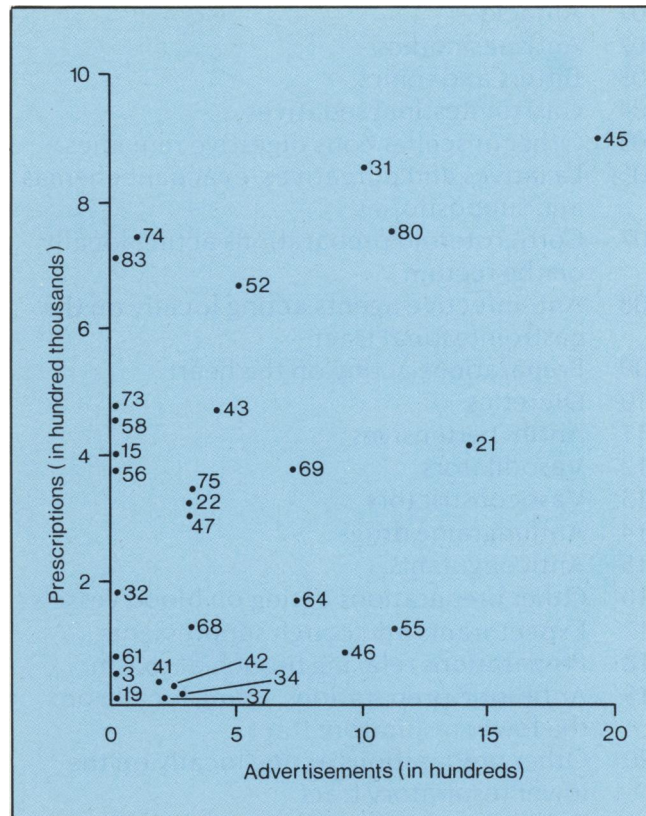


Figure 2. Plot of prescribing against advertising. Lowly advertised proprietary drugs 1975.

Returning to Figure 1, which shows the more widely prescribed and advertised drugs, it will be seen that a line has been plotted. This is the regression line predicting prescriptions from advertising. The form of the regression equation is:
 Number of prescribed items = 1.51×10^4 * Number of advertisements + 2.07×10^5

Discussion

Sales of new drugs may well be stimulated as advertising makes more doctors aware of the existence of the drug. The older drugs on the market will be advertised to keep them in the mind of the practitioner. It is also more than likely that, to some extent, advertising is self-generating. One particular company marketing an older drug may feel compelled to continue advertising it simply because other companies are advertising their older drugs. Hence the first company cannot afford to be left out, starting a vicious circle.

Whilst we cannot determine all the market forces, it is enlightening to look at individual therapeutic groups to see some of the forces involved. There are several reasons why therapeutic groups will not be advertised. The first and most obvious is that there is no market. The potential for sales within the group is so low as to preclude any return from investment in advertising.

From Figure 2 we can see that a convenient cut-off point can be taken at sales of less than 200,000 per year. This implies that the average doctor prescribes items in these groups less than once a month.

Within the bounds of 200,000 prescribed items per year and 10 advertisements per year fall 11 therapeutic groups, of which eight have fewer than 100,000 prescriptions per year. Examples of these groups are group 41, streptomycins, and group 61, antimycotic preparations.

The second reason why a therapeutic group may not be highly advertised is when the group is dominated by a single drug. Given that there is a fairly small market for the whole of the group (all the groups plotted in Figure 2 have a total sale of fewer than a million items) a single drug may obtain an unassailable, albeit limited, market position. Such groups are 15, anticoagulants; 43, anti-fungal antibiotics; 68, other preparations affecting allergic reactions; and 73, sulphonamide preparations acting on the eye.

Hence the dominating drug will need little advertising and the other drugs will not gain from advertising.

A third reason is related to the second. This is where a group is dominated not by one drug but by a small number of drugs manufactured by a single company. Such groups are 58, cobalamin preparations; 64, other preparations affecting nutrition and blood; 74, cor-

ticosteroid preparations acting on the eye; and 83, reagents.

A final explanation is that the groups contain drugs which have fallen from favour; for example 22, addictive analgesics, and 24, barbiturates. (This latter group is shown in Figure 1 as it still enjoys considerable sales, about 5 million.)

Since there is such a close relationship between prescribing and advertising with a correlation of 0.80, it is interesting to examine those groups which deviate from the predicted line.

On the basis of deviations from the regression line, points can be allocated to two groups depending on whether they deviate above or below the regression line.

Under-advertised drugs

Groups that deviate above the line in Figure 1 can be deemed to be under-advertised in that the advertising for these groups is much lower than would be expected on the basis of predictions from the regression line. The five groups which deviated the greatest above the line were as follows:

Therapeutic group 26: tranquillisers

Therapeutic group 25: hypnotics (non-barbiturates)

Therapeutic group 23: antipyretic analgesics

Therapeutic group 39: penicillins

Therapeutic group 17: expectorants and cough suppressants.

It will be seen from Figure 1 that these groups are among the most highly prescribed and it would appear that some form of 'diminishing returns' in advertising is occurring. Although these groups are relatively highly advertised—and a cursory inspection of the advertising material would lead one to believe that there is an over-preponderance of advertising for these groups—in fact there is less advertising than one would expect from the sales of these groups.

Having found some groups in which diminishing returns were occurring, all the results were tested to see whether a curve would better fit the data, with the amount of advertising levelling off with increased prescribing. But this was not the case, a straight line proving the best fit. Hence the diminishing returns seem to be limited to only the most highly prescribed groups.

Over-advertised drugs

Turning to deviations below the regression line, the groups can be considered to be over-advertised in relation to their sales. The five most over-advertised groups were:

Therapeutic group 12: vasodilators

Therapeutic group 14: anti-migraine drugs

Therapeutic group 30: Parkinsonism drugs

Therapeutic group 44: other antibiotics

Therapeutic group 65: rheumatic drugs

The over-advertised groups deviate less from the line than do the under-advertised groups and in fact the most over-advertised group deviates less than the least under-advertised group mentioned earlier. No one group stands out in the way that group 26, tranquillisers, does in the under-advertised set. Consequently, less prominence must be given to these groups of drugs.

References

General Practitioner (1977). 29 April, 28.

Guardian (1977). 6 May, 4.

Medical Sociology Research Centre (1976). *Prescribing in General Practice*. Supplement No. 1. *Journal of the Royal College of General Practitioners*.

Slatter, S. (1977). *Competition and Marketing Strategies in the Pharmaceutical Industry*. London: Croom Helm.

Acknowledgement

I am grateful to the Statistics and Research branch of the DHSS for providing the raw prescribing data for this study.

Home monitoring of blood glucose

Sixty-four diabetic patients measured their own blood glucose concentration with 'Dextrostix' (Ames) and an 'Eyetone' (Ames) meter. The records made at home by 53 of these patients have shown that this led to a significant improvement in blood glucose control. A majority (64 per cent) were able to maintain "good" control (80 per cent of blood glucose recordings equal to or less than 10 mmol/l for periods as long as 478 days). This hitherto unobtainable degree of control of blood glucose was achieved mostly with conventional insulin regimens of twice-daily 'Actrapid' (Novo Laboratories Limited) and 'Leo-Retard' (Leo Laboratories Limited). Adjustments of insulin dosage and type were found to be much easier and more predictable than with urine-glucose analysis. No significant complications were encountered. Hypoglycaemic episodes were less frequent. Seventy per cent of patients preferred blood tests to urine tests and 92 per cent would like to buy their own meter "if the price was right". The results suggest that self-monitoring of blood glucose by diabetics makes possible, for the first time, the achievement of near normoglycaemia. This may reduce the incidence of long-term diabetic complications.

Reference

Sönksen, P. H., Judd, S. L. & Lowy, C. (1978). *Lancet*, i, 729-732.