

# PRESCRIBING IN NORTHERN IRELAND

STUDY No. 1

## SLEEPING TABLETS

by

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THE use of sleeping tablets has recently been the subject of much discussion and controversy. Criticism of their use has been based on doubts about their value and their adverse reactions.

### THE VALUE OF HYPNOTICS

The value of all medication for sleep has been called into question. Although current research is adding to our knowledge of what happens to the brain, the circulation and the endocrine system during sleep, we are ignorant of how much sleep is needed and what processes need to go on during sleep. There is evidence (Oswald 1973) that hypnotics interfere with the physiological features of normal sleep and that their effects on the performance of skilled tasks persist during the following day and possibly for several days. It has been shown that some patients who take a hypnotic at night are abnormally restless in the early hours of the following morning and that nocturnal restlessness is common for many nights after stopping sleeping tablets after more than a few days of regular use. This restlessness may convince patients, and doctors, that medication should be restarted and is a major factor in perpetuating the use of hypnotics.

### THE ADVERSE REACTIONS OF HYPNOTICS

Barbiturates which were the choice in 80 per cent of prescriptions written for hypnotics fifteen years ago, have been the subject of critical comment in recent years (B.M.J. Leading Article, 1975: Wells, 1975). They may lead to dependence and they can cause serious withdrawal symptoms. They have in some parts of the United Kingdom become drugs of abuse, popular with teenagers and those who wish to potentiate the effects of alcohol. They have become commonly used drugs for self poisoning either to draw attention to distress or to commit suicide. Because of the evidence of their misuse the Campaign for the Use and Restriction of Barbiturates (C.U.R.B.) was launched in 1975 to reduce the prescribing and availability of barbiturates. Barbiturates have also been criticised, although other hypnotics are probably just as bad, because in elderly patients with reduced cerebral reserves, they often cause confusion at night and uneasiness and drowsiness the following day. They are potent inducers of hepatic enzymes and interfere with the metabolism of many drugs, especially the anticoagulants.

It has been widely recommended that other hypnotics should be substituted for the barbiturates. Of those currently available the benzodiazepines seem the best: they do not induce hepatic enzymes, are not so liable to cause serious dependence and are seldom dangerous in overdose. However, even nitrazepam (Mogadon) has not been in use long enough to assess its disadvantages when widely used in a community. Chloral and its derivatives (Noctec, Tricloryl, Welldorm) all induce hepatic enzymes and are gastric irritants causing dyspepsia. Methaqualone, either alone (Melsedin, Revonal) or in combination with diphenhydramine (Mandrax) also induces hepatic enzymes. Moreover, Mandrax has been widely misused, and overdose, especially if combined with alcohol, is dangerous and often difficult to treat. Glutethimide (Doriden) another enzyme inducer, occasionally causes neuropathy. All the evidence suggests that all hypnotics, not only the barbiturates, should be used with greater caution.

#### THE PRESCRIBING OF HYPNOTICS IN NORTHERN IRELAND

The prescribing of hypnotics in Northern Ireland has been under surveillance since 1966. The drugs that are prescribed are listed in Table 1 with their "agreed

TABLE 1  
*Agreed daily doses for sleeping tablets*

<i>Approved name</i>	<i>Commonly used proprietary names</i>	<i>Agreed daily doses</i>
1. BARBITURATE		
a) Amylobarbitone	Amytal Mylomide	100 mg.
b) Butobarbitone	Soneryl	100 mg.
c) Cyclobarbitone	Rapidal Phanodorm	200 mg.
d) Heptabarbitone	Medomin	200 mg.
e) Methylphenobarbitone	Prominal	100 mg.
f) Pentobarbitone	Nembutal	100 mg.
g) Quinalbarbitone	Seconal	100 mg.
2. BARBITURATE MIXTURES		
a) Amylobarbitone and Quinalbarbitone	Tuinal	200 mg. tablet
b) Quinalbarbitone } Butobarbitone } Phenobarbitone }	Ethobral	1 tablet
3. NON-BARBITURATES		
a) Chloral	Noctec Somnos	1.0 g.
b) Dichloralphenazone	Welldorm Paedo-sed	1.3 g.
c) Triclofos	Tricloryl	1.0 g.
d) Glutethimide	Doriden	250 mg.
e) Methaqualone	Melsed Quaalude	150 mg. 150 mg.
(+ diphenhydramine)	Mandrax	1 tablet
f) Nitrazepam	Mogadon	5 mg.

daily doses". Details of the methods used in the survey and the basis on which daily doses of drugs are agreed are given in the first paper of this series (Elmes, Hood and Wade, 1976).

Hypnotics were prescribed at a rate of 30 daily doses/1,000 persons on doctors lists/day in 1966 (Fig. 1). This rate rose sharply between 1966 and 1969 to 42.7

FIG. 1

*Changes in the Prescribing of Sleeping Tablets in Northern Ireland 1966 – 1974*

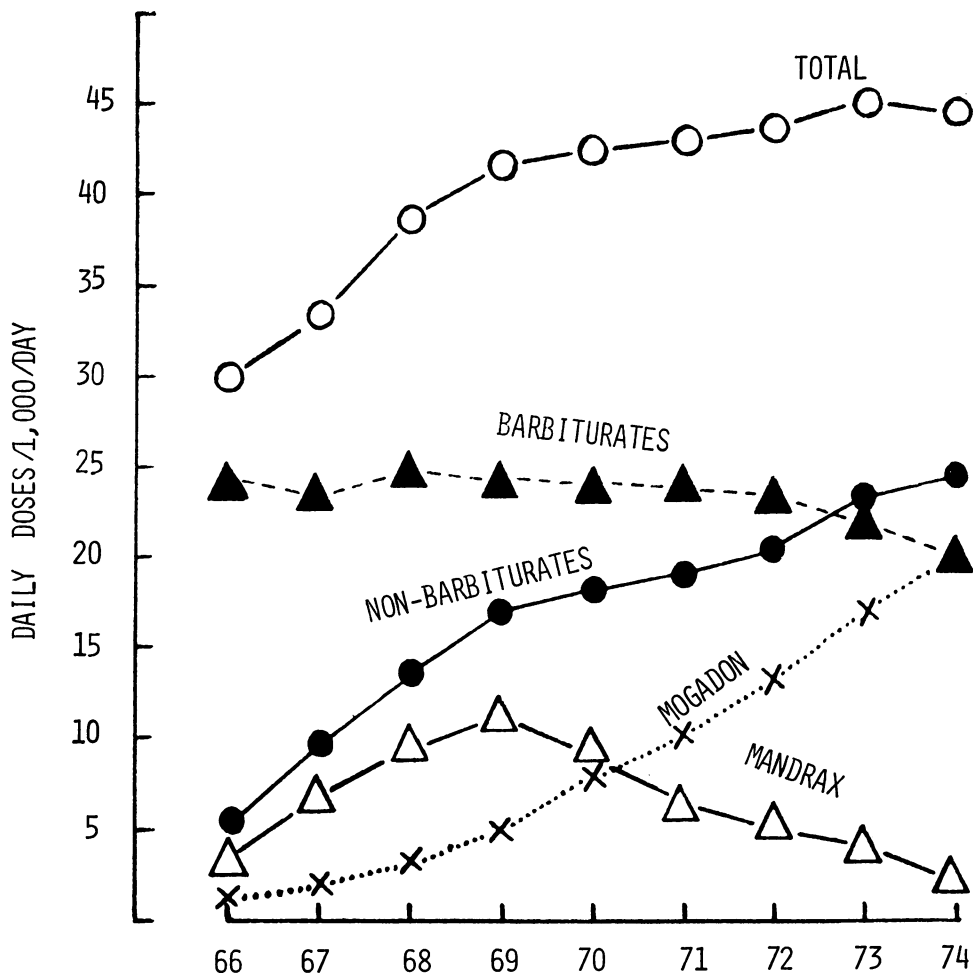


FIG. 1. *The rise in total prescribing was most rapid between 1966 and 1969 and has slowed down since then. The changes in the two most commonly prescribed non-barbiturate sleeping tablets introduced in the early 1960s are also shown.*

daily doses/1,000/day. Since that time it has remained fairly constant and in the second quarter of 1974, doctors prescribed on the average 44.3 daily doses of

hypnotics per 1,000 persons/day. Unfortunately, it is not possible to relate the prescribing of these drugs to the age of patients, but assuming that hypnotics are seldom prescribed for children under 15 the data suggest that during the late 1960's and early 1970's about one in every 15 adults was being prescribed sleeping tablets. The prescribing was above the average for the province in Belfast (59

FIG. 2  
*Prescribing of Sleeping Tablets in General Practice*  
*Second Quarter 1973*  
*(Daily Doses/1,000 Population/Day)*

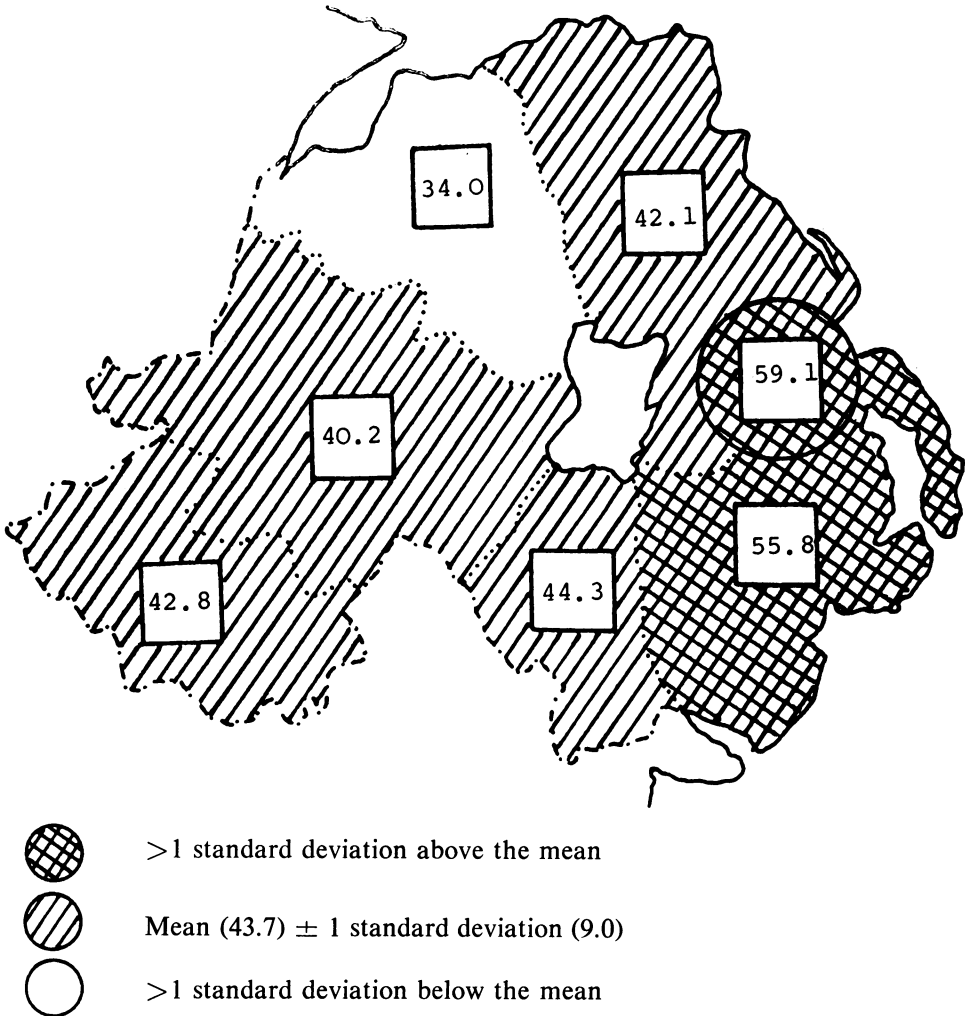


FIG. 2 The highest prescribing (59.1/daily doses/1,000 day) is in Belfast and neighbouring Co. Down and the lowest is in Co. Londonderry.

daily doses/1,000/day) and County Down (56 daily doses/1,000/day) and below the average in County Londonderry (34 daily doses/1,000/day) and the City of Londonderry (31 daily doses/1,000/day) (Fig. 2).

Although the use of hypnotics has increased since 1966, the geographical distribution of high and low prescribing has remained constant and the prescribing of hypnotics has not been related either temporarily or geographically to the level of civil strife which broke out in 1969 and has persisted sporadically in some areas of Northern Ireland ever since. In 1973 a reorganisation of the health services took place and data on the prescribing of hypnotics in 1974 is available for the new Health Services Districts. The variations in prescribing between these 17 districts (Table 2) are greater than was found between the previous counties and

TABLE 2  
*Prescribing of Hypnotics in Northern Ireland  
by Health Services Districts - 1974*

<i>Area</i>	<i>Daily doses/1000/day</i>
East Belfast	52.7
North and West Belfast	48.4
South Belfast	76.6
Down	36.6
Lisburn	47.1
North Down and Ards	57.7
Ballymena and Antrim	27.3
Coleraine, Ballymoney and Moyle	29.4
Larne and Carrickfergus	32.0
Magherafelt and Cookstown	28.4
Newtownabbey	26.8
Craigavon and Banbridge	36.7
Dungannon and Armagh	32.2
Newry and Mourne	41.4
Fermanagh	23.5
Londonderry, Limavady and Strabane	24.7
Omagh	34.7
Northern Ireland      Average	40.4

county boroughs (Fig. 2). The highest prescribing of hypnotics in 1974 was in South Belfast, 76.6 daily doses/1,000/day and the adjacent part of County Down (Bangor, Holywood and Newtownards District) 57.7 daily doses/1,000/day. The lowest was in Fermanagh 23.5 daily doses/1,000/day, but the Londonderry, Limavady, Strabane District and the Newtownabbey District were almost as low.

## THE HYPNOTICS PRESCRIBED

The rate of prescribing of barbiturates was 24 daily doses/1,000/day in 1966 and it represented more than 80 per cent of hypnotic prescribing (Fig. 1). Despite the greater increase in the prescribing of hypnotics since 1966, the prescribing of barbiturates has decreased to 20 daily doses/1,000/day in 1974 and it now constitutes only 45 per cent of all hypnotic prescribing.

The increase in the prescribing of hypnotics between 1966 and 1969 coincided with the introduction and vigorous promotion of two new proprietary preparations, Mandrax and Mogadon (Fig. 1). At first Mandrax was the most popular of these two preparations, but reports of its misuse in combination with alcohol by young people led to a reduction in prescribing after 1969. By 1974 the rate was only 2 daily doses/1,000/day. It is not known whether the prescriptions written for Mandrax in 1974 are for a residue of patients originally given the drug in the 1960's when it was popular, or whether it is still being prescribed for the first time for some patients by doctors who consider the effectiveness of this preparation outweighs its disadvantages.

Mogadon was used less than Mandrax at first but the rate of prescribing of this drug has increased and is still increasing so that in 1974, it equalled that of all the barbiturates, 20 daily doses/1,000/day. This increased prescribing of Mogadon has probably been partly due to the adverse publicity given first to Mandrax and now to the barbiturates.

Although the prescribing of hypnotics varies very greatly from county to county (Fig. 2), the increase in the use of Mogadon and the decrease in the use of barbiturates has occurred in all areas, both where the prescribing of hypnotics was high as in Belfast or low as in Londonderry.

## DIFFERENCES BETWEEN DOCTORS

The average figures for prescribing in counties or administrative districts conceal the great variations that exist in the prescribing habits of individual doctors. These differences are demonstrated in a survey of the prescribing habits of five selected groups of doctors in 1972, 1973 and 1974. Their prescribing has been compared with the average prescribing for the whole province during those years (Table 3).

*Group 1* was a control group of doctors in 19 practices chosen because their total use of hypnotics in 1972 was the same as the average of the whole province. Seven of the practices were in Belfast, three in Co. Down, two in Co. Armagh, three in Co. Antrim and two in Co. Londonderry. The pattern of prescribing of this group was similar to the average of the whole province except that they were rather higher prescribers of Mandrax. Over the 3 years the proportion of their prescriptions written for barbiturates and Mandrax fell from 44 per cent and 19 per cent respectively to 39 per cent and 7 per cent. The proportion of prescriptions for Mogadon rose from 35 per cent to 48 per cent so becoming similar to the provincial average.

TABLE 3  
*Prescribing of Groups of Doctors*

Group No.	Description (see text)	Year	Average prescribing of hypnotics Daily doses/ 1000/day	PERCENT OF HYPNOTIC PRESCRIBING		
				Barbiturates	Mandrax	Mogadon
I	CONTROL	1972	40.7	44	19	35
		1973	40.8	41	12	41
		1974	40.3	39	7	48
II	HIGH HYPNOTIC PRESCRIBERS	1972	85.2	56	10	28
		1973	85.0	54	6	38
		1974	83.5	49	4	46
III	OVER 75% BARBITURATES	1972	43.5	83	5	11
		1973	43.0	76	3	18
		1974	43.4	68	1	29
IV	OVER 65% MOGADON	1972	22.9	17	5	75
		1973	23.5	21	3	74
		1974	25.7	17	3	78
V	OVER 35% MANDRAX	1972	35.5	31	45	18
		1973	36.7	27	36	29
		1974	36.8	31	23	41
PROVINCE AVERAGE		1972	40.7	51	12	34
		1973	41.0	48	8	42
		1974	40.4	43	5	49

*Group II* was a group of 13 doctors who were high prescribers of hypnotic drugs and who all prescribed more than 85 daily doses/1,000/day of these drugs in 1972. The high prescribing of hypnotics by these doctors persisted throughout the three years of the survey. They prescribed a slightly higher proportion of barbiturates and a smaller proportion of Mandrax and Mogadon than was prescribed by the average doctor. Over the 3-year period, the proportion of barbiturates fell from 56 per cent to 49 per cent in line with the trend apparent in the whole province and prescribing of Mogadon rose to 46 per cent of all hypnotics.

*Group III* was a group of doctors from 21 practices, scattered across the province, chosen because in 1972 more than 75 per cent of their prescriptions for hypnotics were for barbiturates. The overall use of hypnotics by these doctors was not unduly high, 43 daily doses/1,000/day, and they were infrequent prescribers of Mandrax. Over the 3-year period there was a sharp fall in the proportion of their prescriptions written for barbiturates from 83 per cent to 68 per cent and this was accompanied by an increase in the proportion of prescriptions for Mogadon from 11 to 29 per cent.

*Group IV* was a group of doctors in 19 practices chosen because in 1972 more than 65 per cent of their prescriptions for hypnotics were for Mogadon. These doctors were low users of hypnotics 23 daily doses/1,000/day and they showed less change in their prescribing than any other Group over the 3-year period.

*Group V* There were in 1972 none of the very heavy users of Mandrax that there had been in 1969 but a group of doctors from 14 practices was chosen because in 1972 more than 35 per cent of their prescriptions were for Mandrax. These doctors were below the average of the province in their prescribing of hypnotics, 35.5 daily doses/1,000/day. They differed from other groups because they replaced their prescribing of Mandrax over the 3-year period by Mogadon but did not reduce their barbiturate prescribing.

This small survey not only illustrates the great differences which may exist between doctors but it shows how remarkably constant the overall prescribing of sleeping tablets by doctors is. The survey suggests that a decrease in the use of barbiturates and Mandrax has occurred, the fall being greatest amongst those who were initially the highest users. There has been a rise in the prescribing of Mogadon, the biggest rise being amongst those who were initially the lowest prescribers of the drug.

#### PRESCRIBING AND THE DATE OF GRADUATION OF DOCTORS

The age of prescribing doctors was not available but the date of graduation was known. Four graduation periods were selected (Table 4). The two groups who graduated before 1947 were taught in medical school at a time when only chloralhydrate or the barbiturates were available. Those graduating before 1957 would have learnt as students about non-barbiturate hypnotics such as thalidomide and

TABLE 4  
*Prescribing and Date of Graduation*

Graduation Date	1972		1973		1974	
	(1)	(2)	(1)	(2)	(1)	(2)
Pre 1935	34.3	48	36.1	47	34.9	40
1944 - 47	36.7	49	38.7	46	39.4	41
1953 - 57	35.2	50	35.3	47	38.2	45
1961 - 68	41.7	48	39.7	45	39.3	42
Provincial Average		51		48		43

Column (1) gives the prescribing of hypnotics as daily doses/1000/day  
Column (2) gives percentage barbiturates prescribed

glutethimide, and only those graduating in the last period 1961-68 would have heard about Mogadon and Mandrax during undergraduate or early postgraduate days. There was no significant difference between the four groups either in respect of their total prescribing of sleeping drugs or their prescribing of barbiturates. During the three-year period all showed the expected fall in their use of barbiturates. Doctors graduating before 1935 showed the lowest overall prescribing of hypnotics and the lowest proportionate use of barbiturates.



### PRESCRIBING AND PRACTICE SIZE

There were 26 practices with less than 1,000 patients per doctor and 35 practices with over 3,000 patients per doctor. These two groups of practices were compared with 97 practices with between 1,900 and 2,300 patients per doctor. The mean size of practice in Northern Ireland is 2,125 patients per doctor.

It was found that the large practices and those with 1,900-2,300 patients/doctor prescribed 39.5 and 37.7 daily doses/1,000/day of hypnotic drugs respectively which was not significantly different from the province as a whole. In the 26 small practices the prescribing was twice as high, 78.3 daily doses/1,000/day ( $P < 0.05$  using the paired T test).

### INTERNATIONAL COMPARISONS

The prescribing of hypnotics in Northern Ireland has been compared with the prescribing of these drugs in Norway where the data is derived from information about the supply of drugs on prescription by pharmacists of the state drug monopoly, Norsk Medicinaldepot, to the community. For this comparison, phenobarbitone is added to the Northern Ireland figures because it is used in Norway

FIG. 3

#### Comparisons between Northern Ireland and Norway

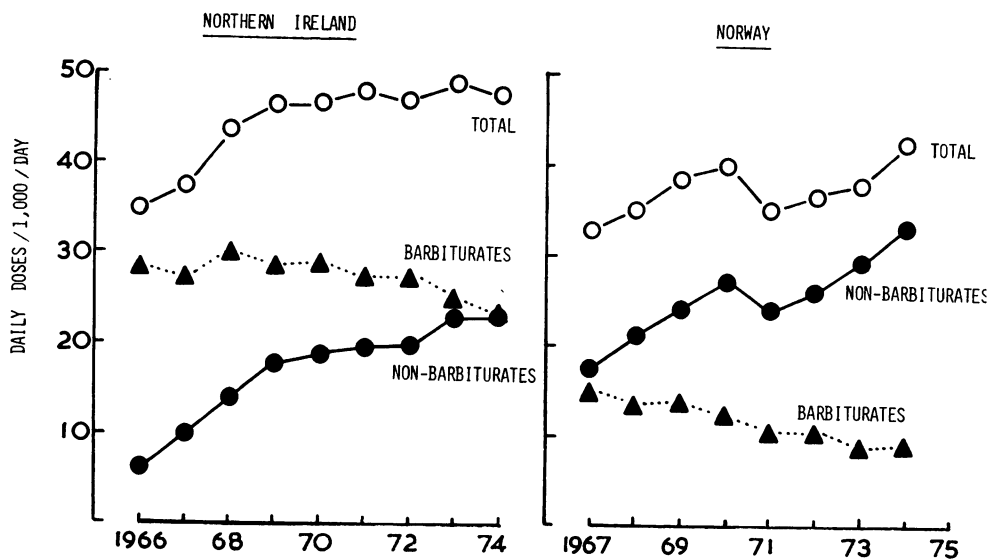


FIG. 3. In the Norwegian data, phenobarbitone is included as it has a significant use as a hypnotic. For the sake of an exact comparison phenobarbitone has been included in the construction of the Northern Ireland graph for Fig. 3, but because it is not used significantly as a hypnotic in Northern Ireland, it is excluded from Fig. 1 and Fig. 2 and from the tables. Other slight discrepancies between the graphs and the tables are due to the exclusion of rarely prescribed hypnotic mixtures from the comparisons between doctors and geographical areas.

as a hypnotic and is included in the Norwegian hypnotic prescribing. In both countries, there has been a rise in the prescribing of hypnotics since 1966 to 48 daily doses/1,000/day in Northern Ireland and 42 daily doses/1,000/day in Norway. Figure 3 shows that in Norway, the use of barbiturates was already declining in 1967. In 1974, non-barbiturates represented 78 per cent of all the hypnotics prescribed in Norway. In Norway there has been no serious misuse of Mandrax as was encountered in Belfast in the late 1960's and about 14 per cent of the prescribing is still Mandrax and only 31 per cent of it is Mogadon.

Detailed information about the doses of hypnotics prescribed by individual doctors or practices in relation to the number of people in the community is not yet available from England. However, the number of prescriptions written per 1,000 of the population can be estimated and in Fig. 4 is compared with similar data from Northern Ireland. The prescribing of all hypnotics and of the barbiturates was higher in England than in Northern Ireland in 1966. It has fallen steadily since that time and in 1973, the number of prescriptions per 1,000 persons/day, was similar in the two countries for all hypnotics, for barbiturate hypnotics and for non-barbiturate hypnotics.

FIG. 4  
*Comparisons between Northern Ireland and England by  
 Number of Prescriptions*

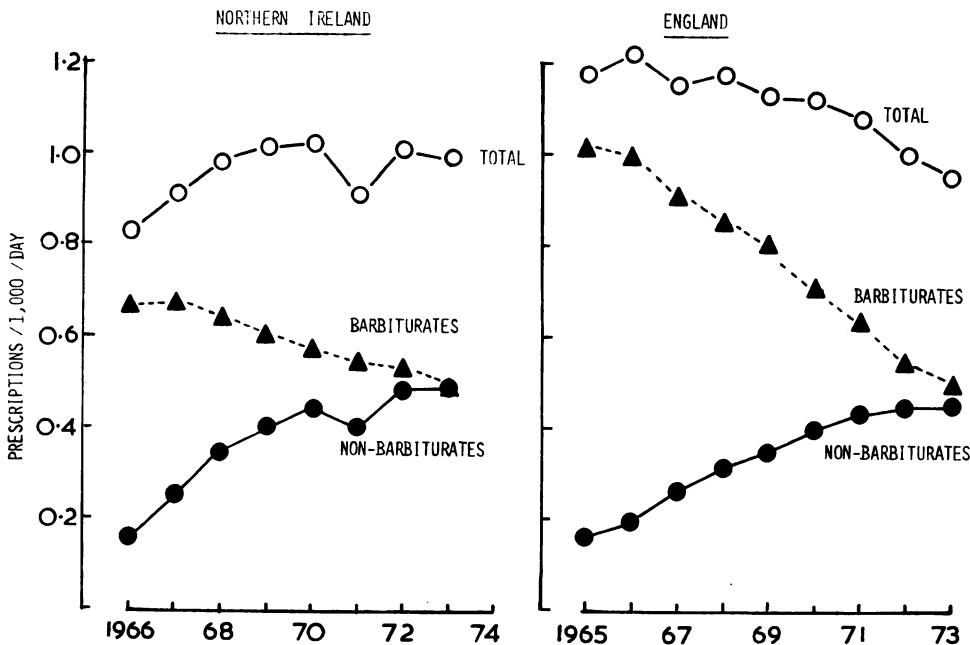


FIG. 4. Although in 1966 prescribing of sleeping tablets in London seemed to be higher than in Northern Ireland, the gradual fall which has occurred since has made the English prescribing both in total and in distribution between barbiturates and non-barbiturates approximately the same.

## DISCUSSION AND CONCLUSIONS

The prescribing of hypnotics in Northern Ireland has risen during the last eight years but may now be levelling off between 40 and 45 daily doses/1,000/day. In 1974, the average rate of prescribing of hypnotics in the province was about 44 daily doses/1,000/day. This rate varied greatly from area to area. It was three times higher in South Belfast, 76.6 daily doses/1,000/day than in Fermanagh, 23.5 daily doses/1,000/day. The rate of prescribing of hypnotics in Northern Ireland does not appear to have been affected by the recent civil strife and it was not, in 1974, dissimilar from that of Norway or England.

Although there are great variations from practitioner to practitioner in their prescribing of hypnotics, an individual practitioner seems to persist in his prescribing habits, the high prescriber remaining a high prescriber and the low remaining a low prescriber even though their choice of hypnotic drugs changes.

Indeed, there has been a decrease in the use of barbiturates and a marked increase in the prescribing of nitrazepam (Mogadon) a benzodiazepine and this change is apparent in the prescribing of all doctors whether high or low prescribers of hypnotics. Mandrax and other non-barbiturate hypnotics apart from Mogadon have become less popular in the last few years.

It is not difficult to understand why there is such great variation in the prescribing of sleeping tablets. The complaint of sleeplessness is subjective and a doctor in deciding whether to prescribe for it or not relies partly on knowledge of the patient's character and partly on the vehemence of his complaints: there are no objective criteria on which he can rely. Indeed, the few studies which have been carried out, usually in hospitals or under laboratory conditions show that there is a very poor correlation between the complaints a patient makes of sleeplessness and the number of hours of sleep which are actually recorded. It is known too that the placebo effects of an impressive looking tablet or capsule may be considerable in the treatment of these complaints.

The findings of this survey suggest that the prescribing of sleeping tablets is not determined predominantly by the medical needs of patients. It is more likely that sleeping tablets are prescribed by doctors mainly in response to demands from patients and that these vary from area to area according to the social climate, the sophistication of the community, its concepts of what constitutes illness and its attitudes to drugs and drug taking. The doctor may be influenced by his training in medical school, his postgraduate experience and drug advertising but he too is probably greatly influenced by the attitudes to the use of drugs prevalent in his community. There is some evidence that doctors with small numbers of patients are more likely than others to accede to the demands of their patients.

If a rational policy for prescribing hypnotics is to be developed it is necessary to find out more than is at present known about patients who demand sleeping tablets, why they need them and what benefits or harm they derive from taking them. Yet even now the evidence already suggests that the long term effects of any hypnotic on sleep and cerebral activity are such that they should not be pre-

scribed to any patient unless there is a very good reason and in any case for only a short period of time.

#### SUMMARY

The prescribing of sleeping tablets and medicines by Northern Ireland general practitioners has been analysed for the years 1966–1974. Total prescribing has risen from 30 daily doses per 1,000 of population per day to 44 daily doses, most of the increase occurring between 1966 and 1969. A combination of methaqualone and diphenhydramine was popular for several years until teenage abuse led doctors to reduce their prescribing. Prescribing of hypnotics is highest in a suburban area of Belfast and lowest in remote country areas, it bears no relationship to civil strife or to the age of the prescribing doctor. Doctors with small practices prescribe twice as much per 1,000 of their patients as doctors with average or large practices. All doctors have tended to replace barbiturates (which amounted to 80 per cent of hypnotic prescribing in 1966) by nitrazepam which now equals in volume the prescribing of all the barbiturate hypnotics added together. Comparisons are made with prescribing patterns in England and in Norway.

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