

Prescriptions for Psychotropic Drugs in a Noninstitutional Population

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INFORMATION about the prescribing of psychotropic drugs is of particular importance because of their widespread and increasing use. Outside of hospitals, however, data have been limited to counts of the total number of such prescriptions that are filled. This study is a first step in the search for significant variables associated with the prescribing of psychotropic drugs.

Data were sought on the patterns of prescribing such drugs for patients as they receive medical care in the physician's office or at home. The population studied consists of 11 of the 32 medical groups in the Health Insurance Plan of Greater New York, a prepaid group practice plan that provides comprehensive medical care. The prescriptions are those written by the family physicians and specialists in the plan. The study gives some insight into the relationship of age and sex to the rate of prescribing various categories of psychotropic drugs, the extent to which such prescriptions are written by family physicians, pediatricians, and other specialists, and the medical conditions of the patients for whom these drugs are prescribed.

Method

During the week of April 7-13, 1959, the Health Insurance Plan conducted a survey

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to establish costs of drugs prescribed by HIP physicians for members of the plan.

All physicians in the participating medical groups were given special prescription pads with alternate slips for carbon copies to be used when prescribing for their HIP patients in the office, at home, or over the telephone. The objectives of the inquiry were explained to all physicians and their cooperation was requested. Rigid control was exercised over the distribution of prescription pads, and virtually all were accounted for at the end of the study. The extent to which physicians used other pads to write prescriptions was not measured. However, discussion with physicians in the study suggested that this was inconsequential.

Copies of about 6,500 of the prescriptions written were received at HIP's central office from the physicians. For purposes of the current study, the prescriptions were reviewed to locate those that were for tranquilizers, antidepressives, barbiturates, nonbarbiturate sedatives, and nonhypnotic central-muscle relaxants. To accomplish this, a detailed list of drugs identified by generic or group names (with trade names for each category) was prepared. Each prescription for psychotropic drugs was then classified by type of drug.

Prescriptions in the study were matched against reports received routinely from HIP physicians regarding the services given to patients during the week of the study. These reports identify patients by name, age, and sex; they indicate where the patient was seen and give the tentative or final diagnosis. Of the 761 psychotropic drug prescriptions in the study, 71 were not matched against physician reports. These were prescriptions which were

either telephoned to the pharmacist or did not have sufficient identifying information to match them with the corresponding entries on the physician's reports of services.

Study Setting

Since the population in HIP and the medical care setting of the plan may have some influence on prescribing patterns, a fairly detailed description of the plan is necessary. In return for the premium, HIP members are entitled to receive comprehensive medical care from physicians associated with 32 medical groups distributed throughout New York City and Nassau and Columbia Counties. Coverage is for preventive and diagnostic services, as well as for therapy of specific illness, from family physicians and all types of specialists. Many of the family physicians are board-certified or board-eligible internists practicing as family doctors. Specialists are, in the main, board certified, the rest are board qualified. Medical services are provided in the doctor's office, the home, and the hospital. Laboratory, radiological, and other diagnostic tests are included. There are no waiting periods for services and no limitations on the number of services or on the duration of medical care.

The only medical services excluded are treatment by a psychiatrist, purely cosmetic surgery, care for drug addiction, anesthesia, and care for chronic illness in institutions other than general hospitals. While psychiatric treatment is excluded, the HIP member does receive diagnostic services from psychiatrists affiliated with all medical groups.

Enrollment in HIP is on a group basis, the requirements being that at least 75 percent of the eligibles join the plan. About 65 percent of the members are in the plan through group contracts with the official agencies of New York City, including such departments as the board of education, police, fire, and sanitation, and the transit authority. The next largest sources of enrollment are union welfare funds which account for one in five of HIP's members.

The rate of nonhospital physician visits in HIP is similar to the rate in population groups outside of HIP. The U.S. National Health Survey shows that in the period July 1957-June 1959 urban residents in the United States

averaged 4.0 physician services in the office and home per person per year. In addition, visits to hospital clinics accounted for about half a service per person (1). The corresponding figure in HIP was 4.5. There are, however, important differences between persons in HIP and the general population in the way they use medical services. A higher proportion of HIP members are seen by physicians during the year than is the case for communitywide populations: 75 percent in HIP, 64 percent among urban residents of the United States (2), and less than 60 percent among New York City residents (3). Also, there is some indication that HIP members see a physician slightly sooner than those not in HIP, but once they contact the physician, they average fewer visits per illness than the others (3).

The 11 medical groups in the study were not selected through a random sampling procedure, but many of their characteristics conform to those of the general membership of HIP. They are distributed throughout four of the boroughs in the city: Brooklyn, Bronx, Manhattan, and Queens. Their age-sex composition and physician utilization rates closely parallel those of the plan's total membership, and judging from their sources of enrollment, they do not appear to be concentrated in special occupational groups.

Data Limitations

In addition to the restrictions on interpreting the results of this study imposed by the particular setting of HIP, several other circumstances should be borne in mind. The data refer only to prescriptions either given to patients or telephoned to the pharmacist. Refills are not included. Also, it is not known what proportion of the prescriptions were actually filled.

The fact that the study was limited to 1 week's experience in April raises some question regarding the effect of season, which may vary with age and sex. However, the number of prescriptions filled in April is virtually identical with the monthly average for the year (4). In the Middle Atlantic States, the volume of prescriptions filled has an index of 90 for April, as compared with a monthly average of 91 (index values use the January volume as the base). There is also some evidence that use of

psychotropic drugs in April is close to the monthly average during the year. National surveys by drug periodicals show that prescriptions containing a tranquilizer or barbiturate as one of the ingredients account for about a fifth of all the prescriptions filled in both April and the entire year (5, 6).

Another point to be considered is that the data are subject to a fair degree of variability because of the comparatively small number of observations. If the rates and percentages are viewed as one of a large series of possible results obtainable under similar conditions, measures of this variability can be estimated. The following table illustrates the variability of the rates for prescriptions for psychotropic drugs.

Category	Annual number prescriptions per 100 persons	Estimated standard error
Males, all ages-----	12	0.8
Females, all ages-----	27	1.2
Both sexes, major tranquilizers, ages 15-44-----	4	.6
Both sexes, sedative-relaxants, ages 45-64-----	9	.9

For percentages, most of which are based on frequencies of at least 150, the formula $\sqrt{\frac{pq}{n}}$ gives a reasonably reliable estimate of the standard error, except when the percentage is very small (less than 10 percent). In the latter instance, as well as for a few of the rates based on low frequencies, reference to textbooks containing tables of binomial limits is suggested.

Findings

About half of the 761 prescriptions for psychotropic drugs were for tranquilizers (major and minor), a fifth (21 percent) for antidepressives, and the remainder (29 percent) for sedative-relaxants. A distribution of these prescriptions by major type of psychotropic drugs follows:

Drug	Percent
Major tranquilizers-----	28.5
Phenothiazine derivatives-----	14.8
Rauwolfia alkaloids-----	13.7
Minor tranquilizers-----	21.8
Phenothiazine derivatives-----	2.1
Compounds of miscellaneous structure-----	4.5
Substituted diols-----	15.2

Drug	Percent
Antidepressives-----	21.2
Sedative-relaxants-----	28.5
Nonbarbiturate sedatives-----	1.2
Nonhypnotic central-muscle relaxants-----	5.3
Barbiturates-----	21.5
Total-----	100.0

The 761 prescriptions for psychotropic drugs represent about 12 percent of all the prescriptions written during the study period, with tranquilizers and barbiturates accounting for 8 percent of the total volume of prescriptions. The corresponding numbers for the country as a whole may be quite different. National studies conducted by drug periodicals show that about a fifth of all prescriptions in the United States contain a tranquilizer or barbiturate as one of their ingredients (6). In an unknown proportion of the prescriptions, these drugs are not the primary ingredient, but in the HIP study a prescription was classified as psychotropic only if the primary ingredient was a psychotropic agent.

Because of the difference in classification procedures, the furthest one can go is to speculate that the proportion of prescriptions written for tranquilizers or barbiturates may, in fact, be lower in HIP than in the general community. Such a finding might result from differences between HIP members and the general population in their personal or health characteristics or perhaps in the prescribing practices of their physicians. It does not, however, reflect a difference in the overall rate of prescribing. In the HIP study, there was an average of 1.8 prescriptions of all types written per person per year as compared with an estimated rate of 1.9 prescriptions for the United States (refills excluded). While exploration of the issue is beyond the scope of the current study, it might be useful in future investigations of factors that influence the prescribing of psychotropic drugs to consider the role of medical care settings along with other circumstances.

From the current study it is estimated that there are 21 prescriptions written annually for psychotropic drugs per 100 population in the HIP medical groups covered (table 1). The rate is markedly affected by age and sex. (In the discussion that follows, the term "rate" refers to the estimated number of prescriptions

per 100 persons in a specified category per year.) For both sexes combined, the rate tends to increase with age.

The situation, however, is different for males and females. Among females the rate in the age group 15-44 years is about five times the figure for children under 15. There is no consistent trend in the rates for older women. On the other hand, among males the increase with age is more regular; that is, the rate in each age group is about twice the rate in the next younger group shown.

One of the most striking differences in table 1 is the higher rate of prescribing psychotropic drugs for females than males. The gap is very marked over the wide age span 15-64 years. An indication of the generality of this difference is that at almost every age in each of the broad classes of the psychotropic drugs, the observed rate for females is higher than for males.

These patterns differ in many important respects from those in the annual rates for all prescriptions (psychotropic and others). The margin between the total prescription rates for males and females (162 per 100 males as compared with 181 per 100 females) is much narrower than the corresponding margin found in the rates for psychotropic drugs. Also, the gap between the low and high age-specific rates is considerably less in the total prescription group. (Chi-square tests indicate that the age and sex patterns of the average numbers of psychotropic drugs prescribed are independent of the corresponding patterns for "all drugs," $P < 0.01$.)

Actually, however, if the comparison is restricted to the rates in the adult age range, there is a similarity between the patterns in rates for all drugs and psychotropic drugs. It is in the childhood ages that a major deviation from the overall picture of drug prescribing is

Table 1. Estimated annual rate of prescribing psychotropic drugs and all drugs, by age and sex of patient

Age (years) and sex	Popula- tion ¹	Number of prescriptions written per 100 population per year					All pre- scribed drugs
		Psychotropic drugs					
		Total	Major tranquil- izers	Minor tranquil- izers	Antide- pressives	Sedative- relaxants	
Total.....	185, 420	21	6	5	5	6	183
Under 15.....	48, 300	5	(²)	(²)	(²)	3	183
15-44.....	70, 650	19	4	4	6	4	147
45-64.....	54, 500	31	10	7	5	9	190
65 and over.....	8, 320	34	14	(²)	8	8	223
Males.....	92, 710	12	4	3	2	4	162
Under 15.....	23, 830	4	(²)	(²)	(²)	3	196
15-44.....	33, 560	9	2	3	2	2	133
45-64.....	28, 560	20	7	4	2	6	165
65 and over.....	5, 190	33	12	(²)	(²)	(²)	226
Females.....	92, 710	27	8	6	6	7	181
Under 15.....	24, 470	5	(²)	(²)	(²)	3	170
15-44.....	37, 090	27	6	6	10	5	159
45-64.....	25, 940	43	14	10	7	12	218
65 and over.....	3, 130	37	18	(²)	(²)	(²)	216

¹ Number of HIP members in 11 medical groups as of June 30, 1959. Males and females were about equal in number.

² Rate not computed, based on less than 10 prescriptions.

NOTE: Data on psychotropic drugs are based on prescriptions written during the week of Apr. 7-13, 1959, by physicians in 11 medical groups in HIP. Data on "all prescribed drugs" are based on a 50 percent sample of prescriptions written during the study week. Population data and rates for age or sex "unknown" are not shown separately. Totals and subtotals, however, include "unknowns." Rates are rounded independently. Accordingly, the sum of the rates in the 4 subclasses of psychotropic drugs may not equal the total.

Table 2. Percentage distribution of psychotropic drugs prescribed by type of drug, by age and sex of patient

Age (years) and sex	Total number	Percent of all psychotropic drugs				
		Total	Major tranquilizers	Minor tranquilizers	Anti-depressives	Sedative-relaxants
Total.....	761	100	28	22	21	29
Under 15.....	43	100	16	16	9	58
15-44.....	252	100	23	24	32	21
45-64.....	322	100	33	23	15	29
65 and over.....	55	100	42	13	22	24
Males.....	217	100	30	22	15	33
Under 15.....	18	100	6	17	6	72
15-44.....	56	100	23	30	20	27
45-64.....	109	100	35	22	11	32
65 and over.....	33	100	36	12	27	24
Females.....	472	100	29	22	24	25
Under 15.....	25	100	24	16	12	48
15-44.....	195	100	23	22	36	20
45-64.....	213	100	32	24	16	28
65 and over.....	22	100	50	14	14	23

NOTE: Based on prescriptions written during the week of Apr. 7-13, 1959, by physicians in 11 medical groups in HIP. Data for age or sex "unknown" are not shown separately. Totals and subtotals, however, include unknowns. Percentages are rounded independently. Accordingly, the sum of the percentages in the 4 subclasses of psychotropic drugs may not equal the total.

observable. At these ages, psychotropic drugs represent a far smaller segment of the total volume of drugs prescribed than at other ages.

The possibility that the age-sex differentials in psychotropic drug rates are only a reflection of the relative frequency of visits to the physician has also been explored. This, however, does not seem to be generally true.

Age and sex	Number of psychotropic drugs prescribed per 100 persons per year	Number of physician visits in office and home per 100 persons (1959)
Total.....	21	433
Under 15.....	5	441
15-44.....	19	408
45-64.....	31	452
65 and over.....	34	535
Males.....	12	404
Females.....	27	463

It is clear that the large differential in psychotropic drug rates for males and females and the wide range in these rates for the various age groups examined are not explained by the relative frequency of seeing a physician. Again, however, in the adult ages, there is a suggestion that the rates for psychotropic drugs follow the pattern for age-specific rates for visits to physicians. To pursue this matter further

would require more detailed information on specific reasons for physician visits than was available.

Age-sex differentials are found not only in the rate of prescribing psychotropic drugs but in the proportion that fall in each of the subclasses of psychotropic drugs (table 2). For example, more than half of the drugs prescribed for children are sedative-relaxants, but at no other age does the proportion exceed a third. There is a high concentration of antidepressives (36 percent) among women in the childbearing ages, 15-44 years. No other age-sex grouping has as high a proportion of the psychotropic drugs prescribed for antidepressives. Despite these differences, there is one fairly consistent finding. In most of the age-sex classes, major and minor tranquilizers account for close to half of the psychotropic drugs.

More than 4 in 5 (82 percent) of the prescriptions for psychotropic drugs were written by family physicians (table 3). These physicians provide about half of all the services in the office and home and account for 70 percent of all prescriptions written. The remaining 18 percent of the psychotropic drugs were prescribed by a variety of specialists, with psychiatrists accounting for only 4 percent of these

prescriptions. It should be kept in mind, however, that patients in HIP receive only diagnostic services from the psychiatrists, and not therapy.

The number of prescriptions written by specialists is too small in this study to draw any conclusion regarding differences among them in the type of psychotropic drugs specified. However, about half of the psychiatrists' prescriptions were for tranquilizers. This is the same proportion found among the prescriptions written by family doctors. Percentages in the other two classes of psychotropic drugs, antidepressives and sedative-relaxants, were also virtually the same for these two physician categories.

From the study, it appears that the patient being given a prescription for a psychotropic drug is far more likely to be ambulatory when the physician is seen than patients receiving other prescriptions. Only 7 percent of the total number of psychotropic drug prescriptions were written during a home visit, whereas almost a third (31 percent) of all the prescriptions (psychotropic and others) were written at the time of a home call (table 4). The figure for psychotropic drugs is, however, only slightly lower than the proportion of all physician visits outside the hospital that were home calls (12 percent).

Table 5 presents the distribution of psychotropic drugs by the diagnosis reported by the physician at the time the prescription was written. It is not known whether the diagnosis reported was the condition for which the drug was prescribed, although it might be assumed that in a majority of cases this was true. In some instances the physician may have reported only the major reason for the visit, but had written the prescription for another condition previously diagnosed and reported, or for an associated condition.

Sixteen percent of the major tranquilizers were for mental, psychoneurotic, and personality disorders, and 36 percent for diseases of the circulatory system. About one-third of the minor tranquilizers were for psychiatric disorders, the rest being distributed over a wide range of conditions. Two in five of the prescriptions for antidepressives were for obesity. Sedative-relaxants did not appear to be concentrated in any category of conditions.

Another way of viewing the diagnostic data is to determine the proportion of all prescriptions written for a disease category that were for psychotropic drugs. Table 6 indicates that in three diagnostic categories psychotropic drugs represent an important segment of the total number of prescriptions written. These are obesity, psychiatric disorders, and hyper-

Table 3. Percentage distribution of psychotropic drugs and all drugs prescribed, by physician specialty

Physician specialty	Percent of psychotropic drugs					Percent of all prescribed drugs (N=3,261)
	Total (N=761)	Major tranquilizers (N=216)	Minor tranquilizers (N=165)	Antidepressives (N=162)	Sedative-relaxants (N=218)	
Total.....	100	100	100	100	100	100
Family physician.....	82	85	76	86	79	70
Pediatrics.....	2	(¹)	2	1	5	14
Obstetrics-gynecology.....	3	4	1	3	3	1
Internal medicine.....	5	6	7	4	3	2
Otolaryngology.....	2	-----	2	1	5	5
Psychiatry.....	4	4	6	5	4	(¹)
Other specialties.....	2	1	6	-----	1	8

¹ Less than 0.5 percent.

NOTE: Data on psychotropic drugs are based on prescriptions written during the week of Apr. 7-13, 1959, by physicians in 11 medical groups in HIP. Data on "all prescribed drugs" are based on a 50 percent sample of prescriptions written during the study week.

tension. The highest proportion, 68 percent, is found in the psychiatric disorder group.

Summary

The study provides information on the prescribing of psychotropic drugs for a population enrolled in a prepaid, comprehensive medical care program, as they are seen by physicians in the home or office. The study showed that about 12 percent of all prescriptions written

during a specified week in April 1959 were for this class of drugs. About half of the psychotropic drugs were tranquilizers, a fifth were antidepressives, and the remainder (29 percent) were sedative-relaxants. The annual rate of prescribing psychotropic drugs was 21 per 100 persons (refills excluded).

Major age-sex differentials in rates were found. By far the lowest rate was among children (5 prescriptions per 100 under 15 years of

Table 4. Percentage distribution of psychotropic drugs and all drugs prescribed, by place of service

Place of service	Percent of psychotropic drugs					Percent of all prescribed drugs (N=3,261)
	Total (N=761)	Major tranquilizers (N=216)	Minor tranquilizers (N=165)	Anti-depressives (N=162)	Sedative-relaxants (N=218)	
Total.....	100	100	100	100	100	100
Office.....	82	81	84	88	76	62
Home.....	7	9	5	3	9	31
Not known.....	11	10	11	9	15	7

NOTE: See table 3 note.

Table 5. Percentage distribution of psychotropic drugs prescribed, by diagnosis

Diagnostic category	Percent of psychotropic drugs				
	Total (N=761)	Major tranquilizers (N=216)	Minor tranquilizers (N=165)	Anti-depressives (N=162)	Sedative-relaxants (N=218)
Total.....	100	100	100	100	100
Allergic, metabolic, endocrine, and nutritional conditions.....	14	3	6	45	7
Obesity.....	10	1	1	41	3
Mental, psychoneurotic, and personality disorders.....	18	16	33	11	13
Diseases of nervous system and sense organs.....	4	3	4	5	5
Diseases of circulatory system.....	15	36	11	2	8
All diseases of heart, except congenital.....	6	9	7	1	5
Hypertension.....	9	26	4	1	2
Diseases of respiratory system.....	8	6	6	5	13
Diseases of digestive system.....	5	11	6	1	3
Diseases of genitourinary system.....	2	(¹)	4	2	2
Diseases of skin and cellular tissue.....	2	1	3	1	1
Diseases of bones and organs of movement.....	5	2	2	1	15
Symptoms and ill-defined conditions.....	3	3	2	4	4
Accidental injuries.....	2	1	2	-----	2
Preventive health examinations.....	8	4	6	12	10
Other.....	2	2	3	2	1
Not stated.....	12	12	12	9	16

¹ Less than 0.5 percent.

NOTE: Based on prescriptions written during the week of Apr. 7-13, 1959, by physicians in 11 medical groups in HIP. Diagnoses refer to conditions or other reasons for the patients' visits, separately reported by the physicians.

Table 6. Distribution of all drugs and of psychotropic drugs prescribed, by diagnosis, and psychotropic drugs as a percent of total prescribed drugs in each diagnostic category

Diagnostic category	All drugs		Psychotropic drugs		Percent of prescriptions which were for psychotropic drugs
	Number ¹	Percent	Number ²	Percent	
Total.....	6,522	100	761	100	12
Allergic, metabolic, endocrine, and nutritional conditions.....	380	6	105	14	28
Obesity.....	150	2	79	10	53
Mental, psychoneurotic, and personality disorders.....	200	3	135	18	68
Diseases of nervous system and sense organs.....	432	7	32	4	7
Diseases of circulatory system.....	464	7	116	15	25
All diseases of heart, except congenital.....	230	4	44	6	19
Hypertension.....	156	2	69	9	44
Diseases of respiratory system.....	2,718	42	60	8	2
Diseases of digestive system.....	342	5	41	5	12
Diseases of genitourinary system.....	150	2	15	2	10
Diseases of skin and cellular tissue.....	248	4	11	2	4
Diseases of bones and organs of movement.....	280	4	40	5	14
Symptoms and ill-defined conditions.....	136	2	26	3	19
Accidental injuries.....	98	2	12	2	12
Preventive health examinations.....	310	5	59	8	19
Other.....	216	3	15	2	7
Not stated.....	548	8	94	12	17

¹ Based on a 50 percent subsample of all prescriptions collected in the study. Frequencies obtained by multiplying the 50 percent data by the factor 2.

² Based on a total count of prescriptions written for psychotropic drugs.

NOTE: See table 5 note.

age); the highest rate was among the aged (34 per 100 over 65 years of age). Females had more than twice as high a rate as males (27 and 12 per 100, respectively). These differentials could not be explained by variations in the rate of physician visits or in the rate at which "all drugs" were prescribed.

A large majority of the prescriptions for psychotropic drugs (82 percent) were written by family physicians. These physicians accounted for a somewhat smaller proportion of all prescriptions written during the study period. Persons receiving a prescription for a psychotropic drug were more likely to be ambulatory than those for whom prescriptions in general were being written. In addition, some diagnostic data are presented for patients who were given prescriptions for psychotropic drugs and for all who had prescriptions in the same time period. Limited numbers of cases precluded relating diagnoses to specific types of drugs.

Because of the medical care setting of the current study and special characteristics of the

population, these findings cannot be generalized to the community as a whole. They are, however, the first data available on patterns of prescribing psychotropic drugs in a noninstitutional population, and it is hoped that they will provide leads for inquiries into this important area of prescribing in more general populations.

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