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# A NOTE ON THE INCIDENCE OF MENTAL DISEASE IN THE STATE OF NEW YORK<sup>1</sup>

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Estimating the chances that certain events will occur at an unspecified time during a person's life span is a familiar problem for vital and medical statisticians. In most cases it is solved by multiplying age- and sex-specific annual incidence rates by the number of years lived in each age period by a cohort of males or females as given in the life table, and adding the products.

Thus the chance of acquiring syphilis was calculated in Germany by F. Prinzing(1) from the returns of the survey of venereal disease taken in 1927. His results were 70 per 1000 for males and 56 per 1000 for females. In this country a similar investigation(2) stands behind the "one in ten" formulated by Surgeon General Parran.

The expectation of eventual admission to a hospital for mental disease was computed by Pollock and Malzberg(3) from data on first admissions in the State of New York during the triennium 1919 to 1921. Later the Metropolitan Life Insurance Company published in its bulletin(4) similar figures for both New York and Massachusetts based on the period 1929 to 1931. The whole material has been summarized by H. F. Dorn(5) in Public Health Reports. All these studies indicated an expectation of eventual admission of about 50 per 1000 or one in twenty.

These investigations command great interest. If the assumption is correct that in communities with an adequate and well established system of mental hospitals the great majority of psychotics find their way into institutions at some time during their lives, even though they spend part of their periods of illness on the outside, then the expectation of admission to a mental hospital may be considered a fair measure of the incidence of psychosis as a whole. If the additional

proposition is accepted that the primary diagnosis as a rule correctly indicates the further course and final outcome of the case, then it becomes possible to estimate separately the incidence of each group of psychoses from data on first admissions. Inasmuch as reality falls short of these assumptions the total incidence rate for the aggregate of all psychoses will be a minimum figure and the numerical relationships between the diagnostic groupings will be distorted.

It is believed that the conditions indicated above are approached in New York which at the same time offers the advantages of a large population. The present paper is based on first admissions in that State published by the Department of Mental Hygiene in its two latest reports covering the fiscal years ending June 30, 1940 and 1941(6, 7). For administrative reasons these reports distinguish three types of hospitals for mental disease. These are the civil state hospitals, the hospitals for the criminal insane, and the licensed institutions. The latter group includes some hospitals operated by the federal government and the Veterans' Administration and all private establishments. In 1941 for the first time all first admissions to licensed institutions were included in the annual report, whereas in earlier years the data had been limited to committed cases. As a result the recorded number of first admissions to licensed institutions jumped from 428 in 1940 to 2,161 in 1941. For the purposes of this paper it was assumed that there was no change between the two years; in other words the number of first admissions to licensed institutions in 1941 was substituted for 1940. Table I illustrates this procedure. In view of the great preponderance of the civil state hospitals it is obvious that no large error was thereby introduced.

Table II presents estimates for the more important groupings in the official system of classification. Here again the numbers of first admissions to licensed institutions in 1941 have also been used for 1940. The

<sup>1</sup> From the Mental Hygiene Study of the Eastern Health District in Baltimore, The Johns Hopkins University School of Hygiene and Public Health.

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comparatively small and very heterogeneous group of cases without psychosis is not presented on its own merits but for the benefit of those who may wish to subtract this class from the total.

The reports of the Department of Mental Hygiene contain information about age at admission only for the civil state hospitals. For a complete picture it is necessary to

TABLE I

ESTIMATE OF FIRST ADMISSIONS TO ALL MENTAL HOSPITALS IN NEW YORK STATE, 1940-41, BY SEX

	Males	Females	Both sexes
Civil State hospitals			
1940 .....	6,833	6,156	12,989
1941 .....	7,021	6,442	13,463
Hospitals for criminal insane			
1940 .....	218	10	228
1941 .....	220	14	234
Licensed institutions			
1940 (estimate) ....	1,011	1,150	2,161
1941 .....	1,011	1,150	2,161
Total for 1940-41.	16,314	14,922	31,236

TABLE II

FIRST ADMISSIONS TO ALL MENTAL HOSPITALS IN NEW YORK STATE, 1940-41, BY DIAGNOSIS AND SEX

	Males	Females	Both sexes
General paresis .....	1,389	442	1,831
Alcoholic psychoses .....	1,744	383	2,127
Cerebral arteriosclerosis..	3,094	2,667	5,761
Senile .....	1,319	1,878	3,197
Involutional .....	592	1,425	2,017
Psychoneuroses .....	717	875	1,592
Manic-depressive .....	761	1,536	2,297
Dementia præcox .....	3,767	3,791	7,558
Other psychoses .....	2,239	1,644	3,883
Without psychosis .....	692	281	973
Total .....	16,314	14,922	31,236

extrapolate this age distribution to the other types of hospitals. This was done for each diagnostic group separately and the distribution for the aggregate of all cases obtained by addition.

The assumption that the age distribution of first admissions to private hospitals and to institutions for veterans or for the criminal insane is the same as that found for the civil state hospitals is probably not quite correct, even if the comparison is limited to a fairly narrow diagnostic class. It is alto-

gether possible that the estimates made were sometimes too high or too low for certain age groups. These errors, however, would counterbalance each other almost completely in computing the expectation. In this connection it is pointed out that the civil state hospitals received the following percentages of all first admissions:

Senile .....	95
Cerebral arteriosclerosis.....	94
General paresis .....	94
Dementia præcox .....	80
Alcoholic psychoses .....	86
Involutional .....	81
"Other psychoses" .....	79
Manic-depressive .....	67
Psychoneuroses .....	58
Without psychosis .....	55

It is clear that a high percentage of admissions to civil state hospitals leaves little room for errors by faulty estimates.

TABLE III

RATES OF FIRST ADMISSIONS TO ALL MENTAL HOSPITALS IN NEW YORK STATE, 1940-41, PER 100,000 CORRESPONDING GENERAL POPULATION BY AGE AND SEX

Age group	Males	Females	Both sexes
0-14 .....	10	4	7
15-19 .....	64	53	59
20-24 .....	106	82	94
25-29 .....	111	101	106
30-34 .....	119	106	112
35-39 .....	128	120	124
40-44 .....	130	115	123
45-49 .....	134	130	132
50-54 .....	158	149	154
55-59 .....	178	151	165
60-64 .....	227	177	202
65-69 .....	291	242	266
70 and over.....	541	478	506
All ages .....	122	110	116

In Table III age-specific annual rates of first admissions are given, computed from the estimated age distribution of all cases and the population data of the 1940 census which was taken only three months before the midpoint of the period of observation. The table presents a familiar picture. The rates increase with age steeply and almost uninterruptedly. The only exception is seen in the female sex where the rate is lower for the age group 40-44 than for the preceding quinquennium; it is statistically not significant. The male rate exceeds the female

rate at all ages, the excess ranging—beyond the age of 15 years—between 3 and 29 per cent.

In addition to age-specific rates the determination of the chances of eventual admission to a mental hospital requires an appropriate life table. The life table used for this paper was computed by the abridged Reed-Merrell method from the deaths and the census population of 1940. In passing it may be mentioned that this table indicates an average future life time at birth of 62.9 years for males and 67.3 years for females.

Table IV presents the expectation of eventual admission to a mental hospital for the

TABLE IV

CHANCES OF EVENTUAL ADMISSION TO A MENTAL HOSPITAL BY DIAGNOSIS AND SEX. RATES PER 1000 BORN, NEW YORK STATE, 1940-41

	Males	Females	Both sexes
General paresis .....	6.5	2.1	4.4
Alcoholic psychoses ....	8.0	1.9	5.0
Cerebral arteriosclerosis.	21.1	21.0	21.1
Senile .....	10.4	17.2	13.7
Involuntional .....	3.0	7.4	5.1
Psychoneuroses .....	3.2	4.1	3.6
Manic-depressive .....	3.3	6.8	5.0
Dementia præcox .....	15.8	16.1	16.0
Other psychoses .....	10.6	8.1	9.4
Without psychosis .....	3.1	1.3	2.3
Total .....	85.0	86.0	85.5

aggregate of all cases and for each of the major diagnostic groups distinguished in Table II.

For both sexes and all diagnoses combined the expectation is 85.5 per 1000 born or more than one in twelve. This value exceeds strikingly the hitherto generally accepted ratio of one in twenty. There are at least three causes responsible for this increase. First, the inclusion of all cases admitted to licensed institutions, whereas the earlier figures had covered only court commitments. This accounts for an increase of about 12 per cent. Second, the improvement of mortality conditions during the last decade which has added about six years or 10 per cent to the average future life time at birth. More people than previously reach the ages susceptible to mental illness. Third, a considerable and rather rapid rise in age-specific

rates of first admission has taken place. Whether this is due to a true increase in the incidence of mental illness or merely to liberalization of admission practice cannot be determined now. The present writer inclines toward the latter interpretation.

Although the age-specific rates of first admissions are uniformly higher among men than among women, the expectation of eventual admission is slightly higher at birth for the female than for the male sex. This is of course due to the longer average duration of life among females.

Turning now to the diagnostic groups shown separately in Table IV we find that the two psychoses of advanced age—cerebral arteriosclerosis and senile—account for about two-fifths of the total expectation for both sexes combined; dementia præcox for almost one-fifth; involuntional, manic-depressive, and alcoholic psychoses together with general paresis for a little over one-fifth; and the remainder for the last fifth. The same general distribution, though somewhat distorted, is found for each sex separately. The expectation of eventual admission appears markedly higher among males than among females for alcoholic psychoses, general paresis, and "other psychoses" while the opposite is true for the involuntional, manic-depressive, and senile psychoses and for the psychoneuroses. Virtually no sex difference is noted for cerebral arteriosclerosis and dementia præcox.

It has been suggested earlier that the expectation of eventual admission under a given diagnosis may under certain conditions be interpreted as indicating the true incidence of that form of mental disorder. It is believed that these conditions are most nearly fulfilled in the case of general paresis. Diagnostic criteria are more firmly established for general paresis than for most other psychoses and the advantages of modern fever therapy are known well enough to make early hospitalization accepted practice. The rates for the senile psychoses and cerebral arteriosclerosis, on the other hand, are likely to be deficient because it is apparent that a number of mild cases are cared for in their homes and that death often intervenes before commitment becomes necessary.

Psychoneurotics who require or receive

institutional treatment represent only a small percentage of the total incidence of these conditions.

An expectation of eventual admission to a mental hospital of 85 per 1000 and in particular with schizophrenia of 16 per 1000 are somewhat terrifying. There is reason to believe, however, that the incidence of mental illness in New York State is elevated above the national average by the high degree of urbanization of the state and by the presence of many migrants, both interstate and intercontinental, among whom mental disease tends to appear oftener than in more stable populations. Whether the metropolis has a specific attraction for prepsychotic "schizoid" personalities is a fascinating subject for speculation.

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