Cross-National Study of Diagnosis of Mental Disorders: Hospital Diagnoses and Hospital Patients in New York and London

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Statistical reports based on diagnoses submitted by public psychiatric hospitals in the United States and the United Kingdom show wide cross-national differences in the ratios of newly admitted patients given diagnoses of schizophrenia or affective disorder. This contrast between the two countries could be explained by cross-national differences in either the clinical condition of patients admitted to public psychiatric hospitals or the relationship between the patients' clinical condition and the hospital diagnoses.

We have already examined the effects of these two factors for a single New York State mental hospital (Brooklyn) and a single London area mental hospital (Netherne). We found both factors to be present, with the second factor far more important than the first. In this paper we will report on results from a wider survey of New York and London public mental hospitals and explore the relationship between the clinical condition of patients and their hospital diagnoses.

Materials and Methods

Sample Selection

We determined that about 180 patients from each city would give a sufficiently large sample for statistical precision. This number is close to half the number of patients expected to be admitted in any week to all nine state mental hospitals that serve the metropolitan area of New York City, based on admission statistics for 1967. Therefore, the number of patients selected from each New York hospital was taken to be equal to half of that hospital's average number of weekly admissions. Selection was at random, was spread over seven consecutive days at each hospital, and yielded 192 patients.

The sampling problem in London was more complicated, since fully 23 area mental hospitals serve the Greater London area. As a first step, five of the 23 hospitals were excluded because they had less than half of their catchment population living within the boundary of Greater London. Each of the 18 remaining hospitals was assigned to one of three types, depending on whether the catchment area it served was peripheral or central to the city, or both. Three hospitals were randomly selected from each of the three types, with the probability of a hospital's selection being roughly proportional to its number of admissions in 1967. At each of the nine selected hospitals, a series of con-

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secutive admissions approximately equal to the average number of weekly admissions in the preceding year was studied. A total of 174 patients was studied in London.

The only criteria for inclusion in the study were that the patient's age be in the interval 20-59 years, and that he be newly admitted (though not necessarily a first admission) to the hospital (not be a transfer from another state or area mental hospital or a return from leave).

Method of Study

As soon as possible after admission, every selected patient was interviewed by a project psychiatrist using a standardized mental state interview schedule" and a standardized psychiatric history schedule. In the majority of cases, the interview was conducted within 48 hours of admission. The project psychiatrist made preceeding ratings of psychopathology during the mental state interview. The ratings were combined into summary scores measuring various dimensions of psychopathology. Descriptions of these measures and evidence for their reliability are given by Kendell et al.7

Following each interview, the project psychiatrist made a diagnosis using the eighth revision of the International Classification of Diseases in conjunction with the glossary of terms compiled in the U.K. by the Registrar General.8 The final project diagnosis given a patient was arrived at by consensus after the interviewing psychiatrist discussed his choice with at least one other project psychiatrist. Evidence for the reliability of the project psychiatrists’ diagnoses is given by Cooper et al.3

The hospital diagnosis given a patient is the one finally emerging from the New York State Department of Mental Hygiene for the New York sample and from the Ministry of Health for the London sample, after the routine procedures beginning at the hospital are gone through. The project psychiatrist had no access to the patient’s clinical record, nor did the hospital personnel have access to the project psychiatrist’s judgments.

Two broad categories of diagnoses are of especial interest, schizophrenia and affective disorder. Within the category of schizophrenia we include the schizophrenias, schizo-affective psychosis and the paranoid states. Within the category of affective disorder we include both the depressed and manic types of manic-depressive psychosis, involutional melancholia, reactive depressive psychosis and depressive neurosis.

Characterizing Clinical Condition

In this paper we restrict the characterization of a patient’s clinical condition to the project’s ratings of mental state psychopathology, because we have more confidence in these than in the ratings of the patient’s psychiatric history. We found the ratings of psychopathology to be more reliable (median intraclass correlation coefficient = .85) than the items of psychiatric history (median coefficient = .60).9

In our previous work4 we were able to identify the fourteen dimensions of psychopathology, as rated by the project, which best discriminated the hospital diagnosis of schizophrenia from that of affective disorder at both Brooklyn State Hospital in New York and Netherne Hospital in London. These dimensions, each scored as the sum of the ratings made on the items from the standard mental state interview which refer to a circumscribed area of psychopathology, are as follows: general anxiety, specific anxiety, retardation, depressed mood, and apathy; hypomania; depersonalization, lack of insight, delusions of control, delusions of persecution, delusions of grandeur, somatic delusions, blunting, and incomprehensibility. For ease of reference only, we designate the first five dimensions as the scales of “mood disturbance;” the next dimension stands by itself as the scale “hypomania;” and the last eight dimensions we designate as the scales of conceptual or perceptual “disorganization.”

The most powerful method of comparing our two current samples of psychiatric patients

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*Certain dimensions, such as auditory hallucinations, were omitted because they added little to the discriminations achieved with the fourteen dimensions above, and were much less frequently noted as present.
from New York and London would be to cluster all patients into homogeneous groups, and then to determine whether these groups are represented in different proportions in the two samples and whether patients from the same group tend to be diagnosed differently by the two sets of hospitals. All of the existing methods of numerical typology, which purport to cluster subjects on the basis of how similar they are, suffer from one defect or another, not the least of which is the requirement for very large sample sizes. In the absence of a sound method which is purely empirical, we rely instead on the ad hoc approach described below.

We developed methods for clustering patients into groups within which psychopathology was fairly homogeneous in the light of the following results from our earlier study at Brooklyn and Netherne. Patients who had high scores on the scales of disorganization were most often diagnosed schizophrenic by the staff at both hospitals. Patients who scored high on the scale for hypomania were called schizophrenic in a majority of cases by both hospitals, but a sizable minority was diagnosed manic-depressive, manic by the Netherne hospital staff. Patients who had high scores on the scales of mood disturbance were more likely to be diagnosed as a depressive disorder by both hospitals than were patients who scored high in the other areas. At Netherne, the diagnosis of a depressive disorder was the majority diagnosis for such patients. At Brooklyn, on the other hand, only a minority of such patients were given a diagnosis of depression, the majority being called schizophrenic.

These three areas of psychopathology are thus seen to be associated to a greater or lesser degree with hospital diagnoses at both Brooklyn and Netherne. Their use as the basis for constituting homogeneous groups of patients in the current replication sample is therefore indicated because we are again especially interested in the association between psychopathology and hospital diagnoses.

Since a patient can have either a high or a low score in any of the three areas of mood disturbance, hypomania, and disorganization, it is possible to define a total of eight relatively homogeneous groups of patients, each group having a characteristic pattern of high and/or low scores in the three areas. Because few patients fulfilled the criteria for two of the groups (one group with low scores in all three areas, and a second with a high score only on hypomania), these two groups had to be merged into a single one, leaving seven groups instead of eight.

Figure 1 illustrates the rules we adopted for assigning patients to groups. The exact rules may be obtained from the authors; here, we will deal only with the main principles. The scale used for measuring each of the fourteen dimensions had been standardized to a mean of 50 and a standard deviation of 10 across all patients in our first study at Brooklyn and Netherne hospitals. A high standard score for a patient would be represented.

![Figure 1](https://example.com/fig1.png)

Fig. 1.—Scheme for assigning patients to behavioral categories.
in the figure by a point high along the vertical scale for that dimension of psychopathology. Patients are grouped into seven kinds on the basis of our ratings of their psychopathology. Patients who score high, i.e. above a stipulated point near the mean, only on conceptual or perceptual disorganization are called "disorganized." Patients who score high only on mood disturbance are called "moody." Patients who score high on both the scales of mood disturbance and the scales of disorganization are called "bipolar."

All those patients who score high on the hypomania scale we call hypomanic, but there are three varieties. Those with high scores on disorganization as well as on hypomania are "hypomanic-disorganized." Those with high scores on mood disturbance as well as on hypomania are "hypomanic-moody." Those with high scores in all three areas, namely mood disturbance, disorganization, and hypomania, are "hypomanic-bipolar." Finally, there is a kind of patient who scores low on all the scales; we call this kind the "mild" group. The mild group also contains a very small number of patients who score high only on hypomania but not on any other dimension.

In our earlier study we had observed, both at Brooklyn and Netherme Hospitals, that the disorganized, hypomanic-disorganized and hypomanic-bipolar groups of patients were more likely to receive a hospital diagnosis of schizophrenia than were the moody, hypomanic-moody and mild groups of patients. Conversely, the latter three groups were more likely to be called affective disorder than were the former three groups.

Results

In the samples of patients studied in this survey of New York and London hospitals, the difference in ratios of schizophrenia to affective disorders, as diagnosed by the hospital staffs, is in the same direction as previously reported. In the New York sample this ratio was over nine to one (119 schizophrenics to 13 affectives), and in the London sample about even (59 schizophrenics to 68 affectives). This difference has been studied using the project diagnoses* as a basis of comparison by Cooper et al. Here we study it using, for the most part, behavioral categories as a basis of comparison.

Comparison of the Patients' Clinical Conditions

For purposes of this comparison, patients were excluded from analysis if the hospital and project diagnoses concurred that the patient was neither schizophrenic nor affectively ill. This restriction eliminated a number of clear-cut alcoholics, drug addicts and patients with organic disorders. Table 1 compares the distribution of the seven groups of patients in the London and New York samples. The total frequencies for the three groups of patients expected on the basis of our previous work to have the highest proportions of schizophrenics as diagnosed by the hospitals (namely the disorganized, hypomanic-disorganized, and the hypomanic-bipolar groups) are shown on the line labeled "Highest probability of being called schizophrenia." The total frequencies for the three groups of patients expected to have the highest proportion of affective disorders as diagnosed by the hospitals (namely the moody, hypomanic-moody, and the mild kinds) are shown on the line labeled "Highest probability of being called affective."

The ratio of patients in the groups expected to have the highest proportions

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*The project diagnoses showed a ratio of schizophrenia to affective disorder equal to 0.9:1 (56 schizophrenics to 62 affectives) in the New York hospitals and 0.8:1 (61 schizophrenics to 78 affectives) in the London hospitals.
Table 1.—Percentage Distribution of Groups of Patients for New York and London Samples (Omitting Patients Agreed by Hospital and Project to be Neither Schizophrenic nor Affective)

<table>
<thead>
<tr>
<th>Group</th>
<th>New York</th>
<th>(N = 147)</th>
<th>London</th>
<th>(N = 153)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disorganized</td>
<td>22.4</td>
<td></td>
<td>15.7</td>
<td></td>
</tr>
<tr>
<td>Hypomanic-Disorganized</td>
<td>21.8</td>
<td></td>
<td>17.6</td>
<td></td>
</tr>
<tr>
<td>Hypomanic-Bipolar</td>
<td>11.6</td>
<td></td>
<td>15.0</td>
<td></td>
</tr>
<tr>
<td>&quot;Highest probability of being called schizophrenia&quot;</td>
<td>55.8</td>
<td></td>
<td>48.3</td>
<td></td>
</tr>
<tr>
<td>Bipolar</td>
<td>19.0</td>
<td>19.0</td>
<td>21.6</td>
<td>21.6</td>
</tr>
<tr>
<td>Hypomanic-Mody</td>
<td>3.4</td>
<td></td>
<td>9.8</td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>9.5</td>
<td></td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>Moody</td>
<td>12.2</td>
<td></td>
<td>17.0</td>
<td></td>
</tr>
<tr>
<td>&quot;Highest probability of being called affective&quot;</td>
<td>25.1</td>
<td></td>
<td>30.1</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>99.9</td>
<td></td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

of schizophrenics to those in groups expected to have the highest proportions of affective disorders is somewhat greater in New York (55.8:25.1 or 2.2:1) than in London (48.3:30.1 or 1.6:1). This difference in ratios is in the same direction as the previously mentioned difference in the ratios of hospital diagnoses of schizophrenia and affective disorder, 9.1:1 in New York and 0.9:1 in London, but is of a much smaller order of magnitude. Thus, only a small part of this latter difference could be attributed to a difference between New York and London hospitals in the kinds of patients who are candidates for a diagnosis of schizophrenia or affective illness.

Comparison of Relationship Between Hospital Diagnosis and Patients' Clinical Condition

We now proceed to examine the relationship between kinds of patient and the hospital diagnosis in the New York and London samples. For purposes of this comparison, only those patients are included whom the hospitals diagnosed as either schizophrenic or affectively ill. The differences between the New York and London hospital staffs in the way they diagnose patients whose psychopathology is similar is shown in Fig. 2.

Each pair of horizontal bars represents one of the seven groups of patients. In each pair of bars the upper represents the patients in the New York sample who belonged to that category of psychopathology, while the lower represents the corresponding group in the London sample. Within each bar, the solid area represents the proportion of patients diagnosed depressive; the open area,
the proportion diagnosed manic-depressive, manic; and the cross-hatched area, the proportion diagnosed schizophrenic. The first two categories together form the affective disorders.

In every one of the seven groups of patients shown here, the New York hospitals diagnose a higher proportion of patients as schizophrenic than do the London hospitals. Thus, even when patients are placed in groups within which there is relative homogeneity of ratings of psychopathology (i.e., similarity in clinical condition), the New York hospital diagnoses show a higher ratio of schizophrenia to affective disorder in every group than do the London hospital diagnoses.

The disparity in the ratios of schizophrenic to affective disorders, as diagnosed by the New York and London hospitals, is greatest in the moody and bipolar groups and much less in the other groups, suggesting at first sight that there are only a few groups of patients which give rise to substantial disagreement in the New York and London hospital diagnoses, and that there are other groups upon which there is substantial agreement. However, this inference is largely spurious and arises mainly because the New York hospitals diagnose a high percentage of all patients as schizophrenic. In those groups where London hospitals also diagnose a high percentage of patients as schizophrenic, apparent agreement is obtained with New York, but where London diagnoses a high percentage of patients as affectively ill, a striking contrast emerges between the hospital diagnoses.

Only in the hypomanic-moody group do the New York hospitals diagnose a depressive disorder as often as schizophrenia, but this is only a small group of four patients. Only one patient was given a hospital diagnosis of manic-depressive, manic in the entire New York sample: he was a member of a hypomanic-bipolar group. In short, the association between the diagnoses of the New York hospitals and the various kinds of patients as defined by their ratings of psychopathology is weak, and is statistically significant only at the
10% level ($\chi^2 = 12.2$, $df = 6$, for schizophrenia versus affective disorders).

Diagnoses by the London hospital staffs, on the other hand, tell a different story. For example, the disorganized patients are diagnosed mostly as schizophrenic, whereas the moody patients are diagnosed mostly as depressive. The London hospitals diagnose manic-depressive, manic disorders more frequently than do the New York hospitals, and do so mostly for patients in the groups with a hypomanic element. The association between the various kinds of patients and the diagnoses in the London hospitals is far stronger than in New York, and is statistically significant beyond the 0.1 per cent level ($\chi^2 = 36.2$, $df = 6$, for schizophrenia versus affective disorders).

One way of summarizing this comparison is that the diagnoses in the New York hospitals are heavily weighted in favor of schizophrenia and do not distinguish among these various kinds of patients with nearly as much sensitivity as do the diagnoses by the London hospitals.

**Discussion**

We have assumed that the ratings of psychopathology made by our team, and the kinds of patients defined by these ratings, have, for the analyses reported here, adequately characterized the patients’ clinical condition in both New York and London. There remains the possibility that other associations would have emerged between the patients’ clinical condition and the hospital diagnoses if the patients’ psychopathology had been rated by other methods or by interviewers of a different background; or if reliable items in the patients’ psychiatric and socio-cultural history had been included in characterizing the patients’ clinical condition. This possibility is being examined, but does not seem likely to alter our overall conclusions.

**Conclusion**

The differences between New York and London in the ratio of schizophrenia to affective disorder, as reported in hospital diagnoses, appears to be primarily a result of differences in the way the two groups of hospital psychiatrists diagnose patients, and only slightly a result of differences in the actual psychopathology exhibited by patients eligible for these diagnoses. New York hospital staffs tend to give a diagnosis of schizophrenia to the major proportion of every kind of patient group (from which the alcoholics, drug addicts and patients with organic disorder have been excluded), whereas the London hospital staffs tend to diagnose schizophrenia only in certain kinds of patient groups and affective disorder in other kinds of patient groups.

**Summary**

Samples of patients from New York and London public mental hospitals were examined to investigate the sources of the reported cross-national difference in the ratio of schizophrenia to affective disorder among hospital admissions. The primary source of this difference was that the hospital staffs in New York tend to diagnose all kinds of patients (excluding alcoholics, drug addicts and patients with organic disorders) as schizophrenic, whereas in
London some kinds of patients are diagnosed mainly as schizophrenic and others mainly as affective disorder.

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REFERENCES


