# MIGRATION DIFFERENTIALS IN MENTAL DISEASE

## STATE PATTERNS IN FIRST ADMISSIONS TO MENTAL HOSPITALS FOR ALL DISORDERS AND FOR SCHIZOPHRENIA, NEW YORK, OHIO AND CALIFORNIA, AS OF 1950

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D URING the past few decades there have been numerous statistical analyses of associations between various approximate measures of the incidence of mental disease and equally approximate measures of migration status on the one hand and of socio-economic status on the other. Some of these analyses have been ecological; others have been based on case-finding in community surveys; still others have dealth with admissions to hospitals for mental disease. Recent summaries of the field include critical evaluations of findings by Dorothy S. Thomas in an introducton (pp. 1–42) to the monograph by Benjamin Malzberg and Everett S. Lee, on MIGRATION AND MENTAL DISEASE, (New York, Social Science Research Council, 1956) and by H. B. M. Murphy in "Social Change and Mental Health", CAUSES OF MENTAL DISORDER: A REVIEW OF EPIDEMIOLOGICAL KNOWLEDGE, 1959, (New York, Milbank Memorial Fund, 1961, pp. 280–329). Thomas concluded on the basis of her critical review, that

> . . . migrants, variously defined, do indeed differ from non-migrants, also variously defined, in respect to the incidence of mental disease; and the weight of evidence favors an interpretation that migrants represent greater "risks" than nonmigrants. But many exceptions have been noted, and many ingenious attempts have been made to explain them away. Closer examina-

tion of both generalizations and exceptions shows so many inconsistencies in definitions, so few adequate bases of controls, so many intervening variables, so little comparability as to time and place, that the fundamental "cause" of the discrepancies may well be merely the nonadditive nature of the findings of the different studies.[1]

On the "additive" side she called attention particularly (1) to Malzberg's pathbreaking studies of nativity differentials, relating data on first admissions to New York State hospitals to census data as of 1930 where he demonstrated unequivocably that the "unfavorable"[2] foreign-born/native differential narrowed sharply when proper age-sex controls were introduced; (2) to Ødegård's elegantly designed and executed analyses of selective migration among Norwegians, with comparisons among Norwegian immigrants to Minnesota, native Americans in the same state, former Norwegian emigrants returning to the homeland, and the Norwegian population; and to his later studies of internal migration in Norway which, on an inter-community basis showed, contrary to expectation, that "practically everywhere the migrants have considerably lower admission rates than those who have remained resident in their community of birth with the only exception of Oslo;"[3] and (3) to the innovations in the Malzberg-Lee study, especially

> ... the possibilities it reveals of varying the definitions of migrant and nonmigrant within a unified body of material, and of maintaining a high degree of consistency and comparability in relating persons hospitalized for mental disease to populations "exposed to the risk of mental disease." They deal with a limited area, New York State, and a short time interval, 1939–41, for first admissions to mental hospitals, 1940 for the basic population. They have enough material to yield relatively stable rates. They define migrants and nonmigrants first in

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[1] Thomas, *op. cit.,* p. 41.

[2] We use the word "unfavorable" to refer to higher, "favorable" to lower rates of admission.

[3] Ødegård, Ørnulv: The Distribution of Mental Diseases in Norway *Acta Psychiatrica et Neurologica,* 1945, 20: 270.

terms of the foreign born and of native Americans; proceed to subclassify natives as themselves migrants or nonmigrants, in terms of residence in the state of birth; and finally, introduce a control on the time at which the migration occurred. They hold constant age, sex, and color or race. Within the limits of error of census and hospital enumerations, the numerators and denominators of the fractions basic to their rates are comparable. They are thus able to answer more precisely than has previously been possible the following questions:

(1) Do migrants have higher incidence of mental disease than nonmigrants in the area of destination?

(2) Are the differenentials consistent when the definition of migration is varied?

(3) Do the differentials hold over the age range, between the sexes, among groups defined in terms of color or race?

(4) Are the patterns of differentials consistent with respect to the "functional" psychoses and other types of mental disease?

Malzberg and Lee are careful to answer these questions with due regard to the limits of the time period, the area, and the reliability of the basic data at their disposal; but their answers are clearly in the affirmative.[4]

Murphy, too, accepted the main conclusions of the Malzberg-Lee study with special reference to the demonstrated differential between recent and earlier migrants, but he deplored the fact that limitations of census data made control of these time-oriented migrations by nativity and occupation impossible. Although he felt that the results "could be interpreted as reflecting the stress of recent change," other interpretations seemed to him more likely.

As it stands, the evidence is mixed and inconclusive with the weight rather in favor of migrants having raised rates of mental hospitalization, but with no indication whether this would derive from self-selection or from the social change which is presumed to be experienced.[5]

[4] Thomas, *op. cit.*, pp. 41–42.
[5] Murphy, *op. cit.*, p. 290.

Murphy considered Ødegård's analyses of internal migration in Norway as a "counterweight" to the Malzberg-Lee findings but called attention to the difference between Oslo and the rest of Norway regarding migrant/nonmigrant differentials. This suggested to him "that the migration to a metropolitan area or main city of a country may have a different significance for mental health from migration elsewhere."[6] This point of view is explicit in a recent article by Astrup and Ødegård[7] where more extensive analyses of Norwegian internal migration were possible, but where, unfortunately, basic demographic controls were lacking in available census data. Astrup and Ødegård considered their results to be quite in line with those of Malzberg and Lee "for the migration to Oslo is the only type within Norway comparable to the migration to New York." They further emphasized (as Ødegård has consistently in his writings) the necessity of age controls and of taking into account the intervening variables of marital status and occupation, but they considered the adjustments they could make with available data to be probably not statistically sound. In interpreting their results, they posed the intriguing hypothesis that the migrant/nonmigrant differentials (showing nonmigrants as the greater "risks") in various communities other than Oslo might well be due to the high morbidity "in that part of the population which is 'left behind' "[8] in the process of out-migration.

Of the studies not reviewed by Thomas or by Murphy, an analysis by Locke, *et al.,*[9] of migration differentials in Ohio utilizing first admission rates as of 1950 led directly to the present collaboration. In regard to foreign-born/native white differentials, their age-adjusted rates "substantially agree with

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[6] *Loc. cit.*

[7] Astrup, Chr. and Ødegård, Ørnulv: Internal Migration and Mental Disease in Norway. Reprinted from *Psychiatric Quarterly Supplement,* 1960, 34: 116–130.

[8] *Op. cit.,* p. 128, *passim.*

[9] Locke, Ben Z., Kramer, Morton and Pasamanick, Benjamin: Immigration and Insanity. U.S. Department of Health, Education and Welfare, *Public Health Reports,* April, 1960, 75: 301–306.

the findings of Ødegård and Malzberg"[10] and their finding that "white and nonwhite males and females born in Ohio had lower rates than their counterparts who were born elsewhere in the United States and subsequently migrated to Ohio" were in conformity with the state-of-birth analyses of New York data as of 1940. They, too, emphasized the need for replication and expressed the hope that advantage could be taken of the 1960 census period to cross-classify migrant admissions to mental hospitals in terms comparable with census data "by such factors as household composition, marital status, education and occupation" and also to consider various psychiatric diagnoses. Pointing out that "such studies require large numbers of patients" they concluded "it might be that several states would have to collect, in a comparable fashion, data which could be pooled and analyzed to provide this needed information about mental illness among migrants, native and foreign-born."[11]

All of the studies of hospitalized admissions, cited above, as well as many of the ecological and community survey approaches, have called attention to the especially "high risk" of schizophrenia in high-mobility and low socio-economic status populations. But when Locke and his collaborators took a new look[12] at various studies dealing with schizophrenia they found many inconsistencies and concluded that the findings—especially those with regard to

> . . . social mobility, social isolation, association with education, differential use of community and hospital facilities, and so on, together with the twin studies and a large number of admittedly confusing but positive biologic investigations might very well lead us to the hypothesis that we may be dealing with a disorder or group of disorders having organic etiology with possibly cultural, social, psychological, and biological exogenous

[10] *Op. cit.,* p. 305.

[11] *Loc. cit., passim.*

[12] Locke, Ben Z., Kramer, Morton, Timberlake, Charles E., Pasamanick, Benjamin, and Smeltzer, Donald: Problems in Interpretation of Patterns of First Admissions to Ohio State Public Mental Hospitals for Patients with Schizophrenic Reactions. *Psychiatric Research Reports,* (American Psychiatric Association), December, 1958, 10: 172–196.

Table 1. First admissions, ages 20–59, for schizophrenia and for all disorders to all hospitals for mental disease, New York State, 1949–1951 and to State Hospitals for Mental Disease, Ohio, 1948–1952 and California, 1949–1951 by sex, color, nativity and birthplace; and corresponding populations, 1950.

| | NEW YORK | | | OHIO | | | CALIFORNIA | | |
|---|---|---|---|---|---|---|---|---|---|
| | First Admissions | | Population | First Admissions | | Population | First Admissions | | Population |
| | Schiz. | All | | Schiz. | All | | Schiz. | All | |
| *Males* | | | | | | | | | |
| 1. Foreign-Born Whites | 814 | 2,672 | 771,520 | 79 | 519 | 123,370 | 263 | 1,129 | 309,070 |
| 2. Native Whites | 4,610 | 10,713 | 3,051,370 | 1,887 | 8,020 | 1,817,830 | 2,096 | 9,438 | 2,463,845 |
| 3.   Born in State | 3,567 | 8,244 | 2,481,627 | 1,399 | 5,540 | 1,313,479 | 612 | 2,252 | 681,030 |
| 4.   Born Out of State | 1,043 | 2,469 | 569,743 | 488 | 2,480 | 504,351 | 1,484 | 7,186 | 1,782,815 |
| 5. Native Nonwhites | 1,109 | 2,215 | 243,345 | 371 | 1,361 | 146,210 | 399 | 1,033 | 175,300 |
| 6.   Born in State | 220 | 387 | 47,886 | 116 | 295 | 33,956 | 53 | 113 | 32,626 |
| 7.   Born Out of State | 889 | 1,828 | 195,459 | 255 | 1,066 | 112,254 | 346 | 920 | 142,674 |
| 8. Total | 6,533 | 15,600 | 4,066,235 | 2,337 | 9,900 | 2,087,410 | 2,758 | 11,600 | 2,948,215 |
| *Females* | | | | | | | | | |
| 9. Foreign-Born Whites | 1,041 | 3,283 | 802,120 | 114 | 512 | 121,865 | 286 | 861 | 295,885 |
| 10. Native Whites | 5,042 | 11,276 | 3,324,975 | 2,548 | 6,708 | 1,925,700 | 2,769 | 7,035 | 2,503,105 |
| 11.   Born in State | 3,772 | 8,487 | 2,676,415 | 1,838 | 4,677 | 1,388,402 | 821 | 1,866 | 710,397 |
| 12.   Born Out of State | 1,270 | 2,789 | 648,560 | 710 | 2,031 | 537,298 | 1,948 | 5,169 | 1,792,708 |
| 13. Native Nonwhites | 1,113 | 1,921 | 303,490 | 453 | 1,037 | 151,560 | 463 | 822 | 173,555 |
| 14.   Born in State | 156 | 267 | 53,479 | 107 | 205 | 35,651 | 59 | 101 | 31,747 |
| 15.   Born Out of State | 957 | 1,654 | 250,011 | 346 | 832 | 115,909 | 404 | 721 | 141,808 |
| 16. Total | 7,196 | 16,480 | 4,430,585 | 3,115 | 8,257 | 2,199,125 | 3,518 | 8,718 | 2,972,545 |
| 17. Both Sexes: Total | 13,729 | 32,080 | 8,496,820 | 5,452 | 18,157 | 4,286,535 | 6,276 | 20,318 | 5,920,760 |

Source: Populations from *1950 Census of Population, II, Characteristics of Population, Parts 5, 32 & 35 and Special Report P.E No. 4A.* First admissions for Ohio for a 4½ year period centering on April 1, 1950, from manuscript tables, NIMH; for California and New York from tabulations made at the University of Pennsylvania based on punch cards supplied by the respective State Departments of Mental Hygiene for a 3-year period centering on April 1, 1950. Natives with "state of birth not reported" were distributed by age, sex and color, proportionately within the in- and out-of-state born categories. Totals shown on lines 8, 16 and 17 above, do not include foreign-born nonwhites.

precipitating factors. Such a synthetic approach, . . . seems to be a very valuable model at this time for the formation of hypotheses for further investigation, and may lead to knowledge which can more readily explain the sometimes disparate findings.[13]

With due regard to known variations in diagnostic procedures and definitions, we therefore decided to analyze schizophrenia separately along with our analyses of "all disorders".

With a view toward (1) establishing base lines for 1960 analyses which are now being planned for several states, (2) testing the statewise consistency of migration and socio-economic patterns, and (3) experimenting with cross-classification of socio-economic characteristics by migration status,—a series of three analytical papers dealing with 1950 data have been prepared. This, the first in the series, collates the Locke data for Ohio on migration status by age, sex, and color or race with similar data for New York State and for California. A second paper collates data on socio-economic differentials in mental disease (marital status and education by age and sex, and occupation of employed males by age) for Ohio and New York. The third paper (by Everett S. Lee, *et al.*) cross-classifies the New York admissions-population data by marital status, and education (by sex) and occupation of employed males—each by age, color or race, *and* migration status (that is, nativity and state of birth) and thus tests the importance of intervening variables.

Table 1 shows, in summary form, the basic migration data used in the computation of rates of first admission. The numerators for these rates consist of data on first admissions for 4½ years in Ohio and for 3 years in New York and in California— with the periods centered on the reference date of the population census, that is, April 1, 1950. In Ohio and California these admissions relate to state hospitals only, but in New York they include admissions not only to state hospitals, but also to all private (licensed) hospitals for mental disease, to hos-

[13] *Op. cit.,* p. 194.

pitals for the criminally insane, and to mental hospitals op-
erated by the Veterans Administration. The data shown in
this table are totals for ages 20–59, for "all disorders" and for
schizophrenic patients. They are subdivided by sex, by nativity
of whites, and by color and birthplace of natives (omitting
foreign-born nonwhites). The denominators consist of 1950
census populations similarly subdivided with persons whose
state of birth was unascertained distributed proportionately
by age, sex and color among the in- and out-of-state born. In
Table 2 rates of first admission per 100,000 population are
shown on an average annual standardized basis, age specific
rates by 10-year age groups for each category having been
standardized to conform with the New York State population
distribution.[14]

Although it seems, from observation of Table 1, that the
numbers of patients and the numbers in the population for
each category are sufficiently large for technically reliable rates,
there are, in fact, too few first admissions diagnosed as schizo-
phrenic for standardization among in-state born nonwhites
of both sexes in all three states and for the out-of-state born and
total native nonwhite females, as well, in California.[15] These
categories are therefore omitted in Tables 2 and 3 and in Figs.
1 and 2. In Table 3 (and Figs. 1 and 2 which are based on
it) statewise patterns are determined by expressing each stand-
ardized rate for each diagnostic category as a relative (per
cent) of the corresponding total standardized rate (line 15
of Table 2).

[14] The total population for New York State in 1950 (excluding foreign-born
nonwhites which are not used in this analysis) was distributed as follows over the
20–59 age range:

| Ages | Per Cent |
|------|----------|
| 20–29 | 26.61 |
| 30–39 | 27.43 |
| 40–49 | 25.10 |
| 50–59 | 20.86 |
| 20–59 | 100.00 |

[15] The denominators (populations) are always large enough for rate computa-
tion, but use of too small numerators (admissions), especially for diagnostic cate-
gories, is unsound. The number 10 is arbitrarily taken as the cut-off point.

Our reasons for using such a limited age range (20–59), for standardizing within this age range, and for determining patterns on the basis of relatives are primarily to achieve maximum comparability among the three states. As noted above, admissions data for New York have much wider coverage than for the other two states. First admissions to reporting non-state hospitals, in fact, account for one-fifth of all such first admissions. ("Reporting" here refers to characteristics of patients.) Because of this, New York rates may more nearly approximate "incidence" measures than do those of the other states, but they are, of course, inflated compared with the other states. In Ohio and California there is differential use of private hospitals (which do not report the characteristics of patients) versus state (which do)—total first admissions to private institutions in the former being half or less than half as numerous as in the latter. Moreover, administrative practices vary among the

Table 2. Average annual standardized rates of first admission, ages 20–59, for schizophrenia and for all disorders to all hospitals for mental disease, New York State, and to State Hospitals for Mental Disease, Ohio, and California, by sex, color, nativity and birthplace, per 100,000 populations as of 1950.

|  | NEW YORK | | OHIO | | CALIFORNIA | |
|---|---|---|---|---|---|---|
|  | Schiz. | All | Schiz. | All | Schiz. | All |
| *Males* | | | | | | |
| 1. Foreign-Born Whites | 61 | 119 | 26 | 89 | 37 | 114 |
| 2. Native Whites | 47 | 118 | 22 | 99 | 27 | 131 |
| 3.   Born in State | 44 | 112 | 22 | 95 | 25 | 121 |
| 4.   Born Out of State | 60 | 145 | 22 | 109 | 27 | 134 |
| 5. Native Nonwhites | 134 | 299 | 53 | 207 | 67 | 197 |
| 6.   Born in State | * | 250 | * | 182 | * | 138 |
| 7.   Born Out of State | 141 | 311 | 51 | 211 | 74 | 214 |
| *Females* | | | | | | |
| 8. Foreign-Born Whites | 57 | 130 | 28 | 90 | 39 | 95 |
| 9. Native Whites | 48 | 114 | 28 | 78 | 35 | 95 |
| 10.   Born in State | 44 | 107 | 28 | 75 | 35 | 92 |
| 11.   Born Out of State | 63 | 144 | 28 | 84 | 35 | 96 |
| 12. Native Nonwhites | 111 | 214 | 61 | 154 | * | 157 |
| 13.   Born in State | * | 172 | * | 127 | * | 118 |
| 14.   Born Out of State | 117 | 222 | 64 | 161 | * | 167 |
| 15. Both Sexes: Total | 54 | 126 | 28 | 95 | 34 | 115 |

(Standard = total population by 10-year age groups, 20–59, in New York State, 1950).
* Too few first admissions (<10) in one or more age groups to warrant standardization.
*Source:* Computed from data underlying Table 1.

three states and there is reason to believe that divergence in procedures is greatest for senile patients. This inference is strengthened if we examine the average annual age-specific rates of first admission for the three states, for "all disorders", over the whole age range:

| Ages | New York | Ohio | California |
|------|----------|------|-----------|
| 10–19 | 52 | 23 | 36 |
| 20–29 | 126 | 78 | 83 |
| 30–39 | 118 | 96 | 116 |
| 40–49 | 122 | 105 | 137 |
| 50–59 | 140 | 100 | 119 |
| 60–69 | 200 | 118 | 122 |
| 70 + | 598 | 209 | 245 |

It is apparent that the inflation of New York admissions, compared with those of other states, is appreciably greater at

Table 3. Relative annual standardized rates of first admission, ages 20–59, for schizophrenia and for all disorders to all hospitals for mental disease, New York State, and to State Hospitals for Mental Disease, Ohio and California, by sex, color, nativity and birthplace, as of 1950.

| | NEW YORK | | OHIO | | CALIFORNIA | |
|---|---|---|---|---|---|---|
| | Schiz. | All | Schiz. | All | Schiz. | All |
| *Males* | | | | | | |
| 1. Foreign-Born Whites | 113 | 94 | 93 | 94 | 109 | 99 |
| 2. Native Whites | 87 | 94 | 79 | 104 | 79 | 114 |
| 3.    Born in State | 81 | 89 | 79 | 100 | 74 | 105 |
| 4.    Born Out of State | 111 | 115 | 79 | 115 | 79 | 117 |
| 5. Native Nonwhites | 248 | 237 | 189 | 218 | 197 | 171 |
| 6.    Born in State | * | 198 | * | 192 | * | 120 |
| 7.    Born Out of State | 261 | 247 | 182 | 222 | 218 | 186 |
| *Females* | | | | | | |
| 8. Foreign-Born Whites | 106 | 103 | 100 | 95 | 115 | 83 |
| 9. Native Whites | 89 | 90 | 100 | 82 | 103 | 83 |
| 10.    Born in State | 81 | 85 | 100 | 79 | 103 | 80 |
| 11.    Born Out of State | 117 | 114 | 100 | 88 | 103 | 83 |
| 12. Native Nonwhites | 206 | 170 | 218 | 162 | * | 137 |
| 13.    Born in State | * | 137 | * | 134 | * | 103 |
| 14.    Born Out of State | 217 | 176 | 229 | 169 | * | 145 |
| 15. Both Sexes: Total | 100 | 100 | 100 | 100 | 100 | 100 |

(Standardized rates for each sex-color-nativity-birthplace class in each state, as shown in Table 2, as percentages of standardized total rate for both sexes.)
* See note on Table 2.
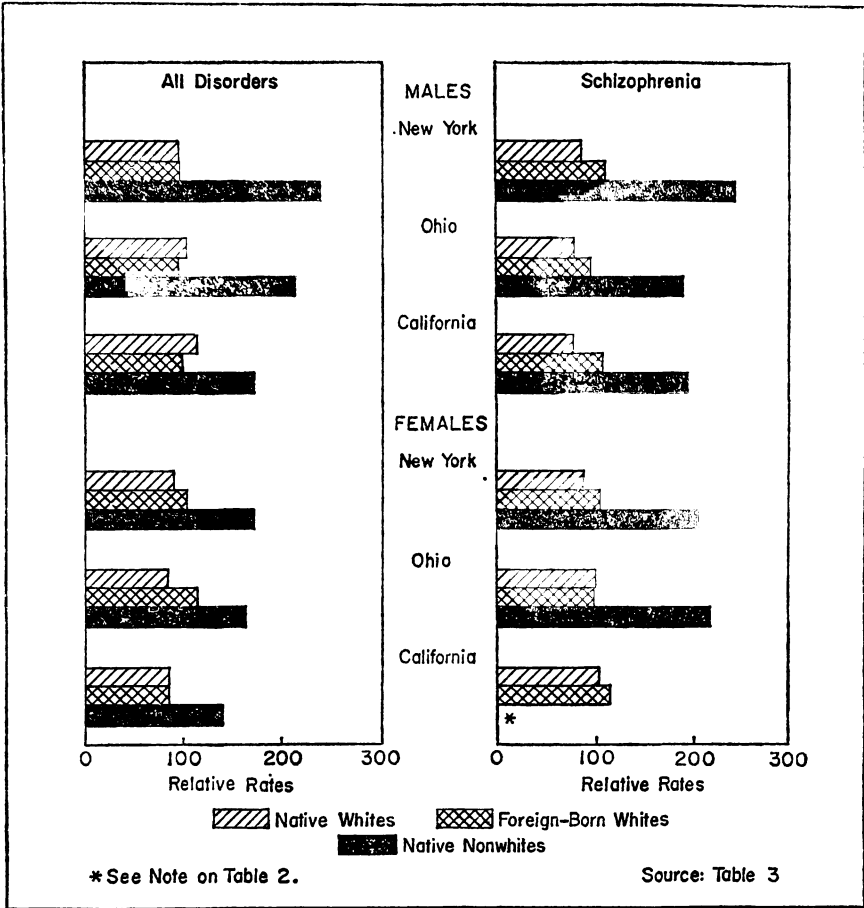*Source:* Computed from Table 2.

Fig. 1. Relative rates of first admission ages 20–59 to hospitals for mental disease, New York, Ohio, California, as of 1950, by sex, color and nativity.

the terminal ages than at other parts of the age range, and that more valid comparisons may be obtained for the middle range. The reason for omitting data for the youngest ages is, however, more on a conceptual basis: migrations are not usually initiated by the individuals concerned in childhood, nor (for the socio-economic comparisons in our second paper) are marital status, education or occupation stabilized much before the early or middle twenties. A further reason for restricting the age range is the mushrooming, with increasing age, of classes whose status is "unascertained" in both admissions and census
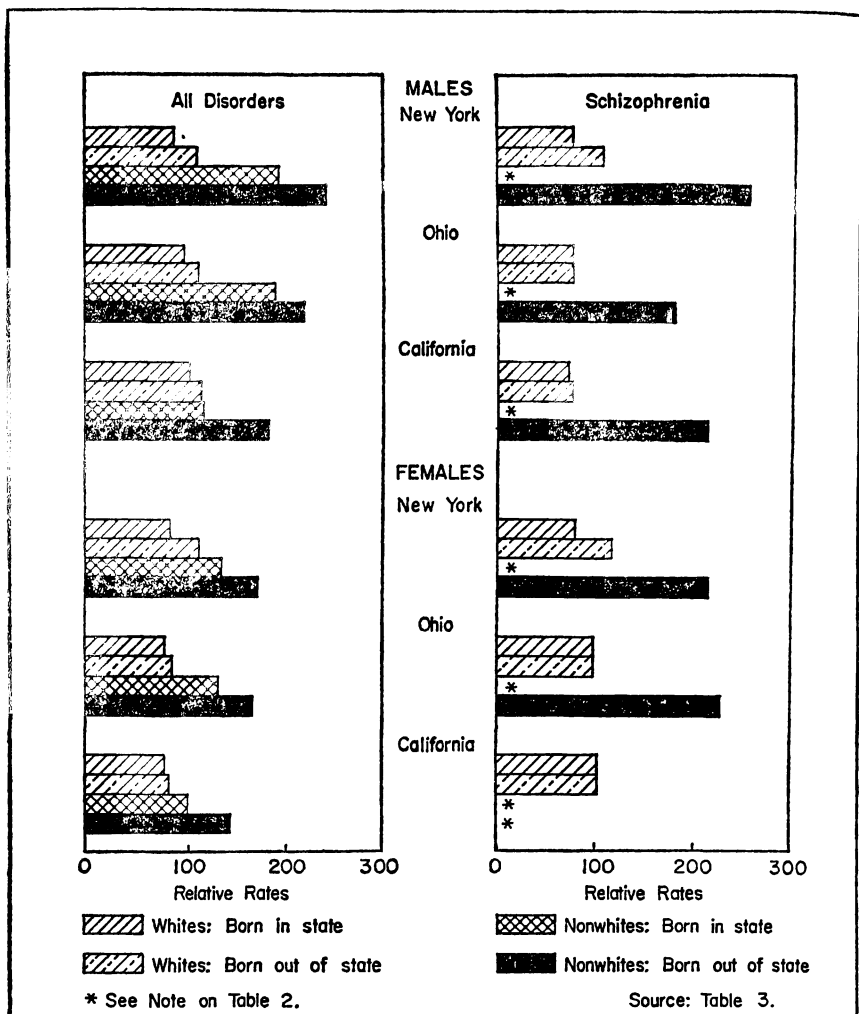
Fig. 2. Relative rates of first admission ages 20–59 to hospitals for mental disease, New York, Ohio, California, as of 1950, by sex, color of natives and state of birth.

data, and the difficulty of assigning these "unascertained" classes to reasonably appropriate categories.

The reason for age standardization *within* this relatively narrow age-range is not so much because of moderate differences among the total populations of the three states, although these do exist. It is, rather, because of extreme compositional differences among the populations of the three states; and in schizo-

phrenic admissions, the rapid decline of rates from ages 20–29 to ages 50–59. The first point may be illustrated by the percentages the foreign-born white male populations aged 20–29 and 50–59, respectively, bear to the corresponding total population of ages 20–59. These are 8 per cent, 6 per cent and 11 per cent, respectively in New York, Ohio and California for ages 20–29 (compared to the New York total, used as the standard, of 27 per cent); and 45 per cent, 53 per cent and 39 per cent, in the three states in order, for ages 50–59 (compared with the standard of 21 per cent).[16] In all three states, total native whites conform much more closely to the standards, the percentages for the younger group being 31 per cent in New York, 30 per cent in Ohio and 30 per cent in California; and for the older group, 16 per cent, 18 per cent and 17 per cent, respectively. The second point is demonstrated by the rapid decline in age specific rates for schizophrenia:

| *Ages* | *New York* | *Ohio* | *California* |
|---|---|---|---|
| 20–29 | 85 | 38 | 48 |
| 30–39 | 65 | 39 | 44 |
| 40–49 | 38 | 20 | 29 |
| 50–59 | 18 | 9 | 11 |

Were crude rates of first admission for schizophrenia among foreign born and native white males presented for this age range, the following discrepancies between them and age standardized rates would emerge:

| | *Crude rates,*<br>*ages 20–59* | | | *Age-standardized*<br>*(for 10-year groups,*<br>*ages 20–59)* | | |
|---|---|---|---|---|---|---|
| | *New*<br>*York* | *Ohio* | *Calif.* | *New*<br>*York* | *Ohio* | *Calif.* |
| Foreign-born | 35 | 14 | 28 | 61 | 26 | 37 |
| Native | 50 | 23 | 28 | 47 | 22 | 27 |

The foreign-born rates exceed those of the natives in age-

[16] See Footnote 14 for the standard.

standardized comparisons (and very markedly so for New York and California) and quite erroneous conclusions would arise had we used crude rates even for this very restricted age range, since the native rates so computed greatly exceed those for the foreign born in both New York and Ohio and the two classes achieve equality in California. Similar, but not such marked discrepancies exist for color and state-of-birth components, depending upon the magnitude and direction of migration streams. Thus, age-standardized rates for native nonwhites are uniformly lower than crude rates for ages 20–59 in all three states and for both sexes. Among whites, the most serious discrepancy is for California, a heavily in-migrant state, where differentials apparently favoring nonmigrants (the in-state born) are eliminated or reversed with standardization.

The reasons for using *relatives* rather than actual *rates* for determining *patterns* in Table 3 and Figs. 1 and 2 are implicit in the preceding discussion. To make them explicit, we merely state that we do not claim to have measured the "true incidence" of mental disease in general or of schizophrenia specifically in the three states and that we believe that the levels of the actual rates represent a spurious comparison. We do believe, however, that within each state we can, on a relative basis, demonstrate the presence (or absence) of persistent *patterns* of migration differentials. Before proceeding to delineate these patterns, we note briefly some remaining conceptual difficulties, caused by census definitions, and further important substantive differences in the composition of the populations of the three states—matters for which we can make no immediate adjustments.

A major difficulty arises because of ambiguity in the census "color" classification of the population. In the New York and the Ohio populations as of 1950, "nonwhites" were overwhelmingly Negro (96 per cent and 99 per cent respectively), but in the California population, this category was only 69 per cent Negro, the other 31 per cent being predominantly Japanese,

Chinese, and other so-called "minor races". Inasmuch as the nonwhite category could not be reallocated in the denominators of rates, this ambiguous classification had to be retained in the numerators.[17] This is especially unfortunate for the California analysis because of the *a priori* probability that the proportion of Negroes among out-of-state born nonwhites greatly exceeds the corresponding proportion among the in-state born, and that there are real but presently unmeasurable cultural differences reflected in rates of Negroes and other nonwhites.

It is not only among nonwhites that certain of our comparisons may be open to question because of cultural diversity. The modal foreign-born white groups are, for example, of quite diverse ethnic origins, one-fifth of the total in New York being of Italian origin, almost one-third of the total of Ohio coming from "other Southern and Eastern European nations" and in California well over a quarter originating in Mexico, Canada and other American countries. In regard to the state of birth of native whites, almost three-quarters of the Californians were born in other states, compared to less than one-quarter in Ohio and one-fifth in New York. Among native nonwhites, there were smaller differences, the proportions of out-of-state born varying from 77 per cent in Ohio to 82 per cent in New York and California. In two other respects, there were major disparities in the migration experience of the populations of the three states: (1) California had, over time, gained consistently and heavily by interchange with other states among both whites and nonwhites, whereas New York and Ohio were consistent heavy gainers only of nonwhites, New York having been for decades an out-migrating area of native whites and Ohio having had erratic periods of loss and gain through the internal migration of this color-birthplace class; (2) California had drawn large numbers of white migrants from every state in the Union, whereas the movement to New York and Ohio was more local in nature, being disproportionately from nearby states. Thus,

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[17] We had to reclassify "Mexicans" as "Whites" in the California admissions records, following the census procedure of identifying "Spanish surnames".

the cultural diversity of California natives greatly surpassed that of other states.

To some extent, these ethnic, cultural and experiential differences are offset by certain basic structural similarities among the three states, compared with other states. Perhaps the most important are their population size, their urbanness, (86 per cent for New York, 81 per cent for California and 70 per cent for Ohio living in urban areas), their high degree of industrialization (97 per cent in New York, 93 per cent in Ohio and 92 per cent in California being in nonagricultural occupations) and their relatively high average income levels. To use Ødegård's concept, the New York in-state born whites (and to some extent those in Ohio) represent populations "left behind" or negatively selected in the process of migration, whereas those in California may have been more positively selected.

With these differences and similarities in mind, let us examine the patterns shown in Figs. 1 and 2 in terms of the *relative rates*, presented in Table 3.

For "all disorders", it is apparent from the left-hand panel of Fig. 1 that relative rates differ only slightly, state by state, for foreign-born compared with native whites and that the differences are not always in the same direction. In New York there are undetectable differences for males and in California for females. In Ohio and in California, the male foreign born have a slightly favorable differential, their rates being 10–13 per cent below those for native whites; whereas among females in New York and Ohio, a differential of about the same order favors the native-born. In all six statewise sex comparisons, however, nonwhite natives have very much higher relative rates of first admission for mental disease than do corresponding classes of whites: 50 per cent–65 per cent greater in California, about 100 per cent greater in Ohio, and 88 per cent–153 per cent higher in New York. It seems, therefore, to be *not* nativity but color that determines the pattern shown in this part of the analysis. The smaller differential in California probably reflects the composition of the nonwhites, as indicated above,

Continuing with the "all disorders" category, patterns for birthplace differentials of natives shown in Fig. 2, are unvarying and clearcut. The highest relatives in every one of the six comparisons among whites are for the out-of-state born, with the more favorable position universally held by the in-state born. This is in contrast to the varying pattern of foreign-born/native differentials and, for comparable classes, the differentials tend to be wider for in-state/out-of-state comparisons; and, perhaps contrary to expectation, at least for whites, New York has the greatest differences between birthplace categories. The wider margins for nonwhites in California are in line with expectation. Although color or race is still an important factor, migration status *per se* is apparently a major determinant of admission to hospitals for the mentally ill for all classes of natives.

Turning to the right-hand panels in Figs. 1 and 2, differentials among schizophrenics are shown wherever admissions were numerous enough to warrant computing rates. In contrast to the shifting patterns for "all disorders", foreign born whites in 5 out of 6 possible comparisons show a markedly unfavorable differential compared with natives, the average annual standardized rates being from 11 per cent to 37 per cent higher for the former than for the latter. The only exception is among Ohio females. Again, the color differential predominates invariably and the margins are uniformly much greater for schizophrenics than for "all disorders." For the few categories where comparisons can, by our criterion, be made for natives on a birthplace basis, the differentials are of the same general order of magnitude as for "all disorders."[18]

In conclusion, we find color more important than migration status in our statewise patterns of differentials; migration dif-

[18] Analysis of birthplace differentials in schizophrenia for natives by color and sex for ages 20–29 and 30–39 indicates that only in New York do the out-of-state born consistently have higher rates (at these ages of concentration for schizophrenia) than do the in-state born. The excesses amount to 26–43 per cent for white males, 28–45 per cent for white females, 12–79 per cent for nonwhite males and 30–45 per cent for nonwhite females. In Ohio and California, the patterns are neither so clearcut nor so consistent.

erentials more consistent among native whites (on a state-of-birth basis) for "all disorders" than when native whites are compared with the foreign born; more marked nativity and color differentials for the few determinable patterns for schizophrenia than for "all disorders." And, finally we call attention to the fact that, with due regard to unresolvable incomparabilities in procedures for hospitalizing the mentally ill and in population composition, the patterns for the three states in 1950 are so similar that they lend confidence to the "additive" nature of the results, and point the way toward further analysis of 1960 data.