Searching for the Causes of Schizophrenia: The Role of Migrant Studies

by Glynn Harrison

Abstract

There have been consistent reports in the literature of increased rates of hospital admissions for schizophrenia among Afro-Caribbean (West Indian) migrants to England. Recent evidence for even higher rates in the British-born second generation is reviewed, together with the methodological limitations of such studies. It is concluded that there is probably an epidemic of schizophrenia and related psychoses in this group of migrants although further prospective and longitudinal studies are required. The findings point to the potentially important role of migrant studies in determining environmental risk factors for schizophrenia.

The change in incidence rates of certain diseases in migrant groups has yielded valuable clues to the etiology of many conditions. For example, among Japanese living in the United States, both prevalence and mortality of coronary heart disease were shown to be higher than among Japanese living in Japan (Marmot et al. 1975; Syme et al. 1975; Worth et al. 1975). This finding strengthened the view that environmental factors play a major role in the etiology of this condition.

Migration studies in the field of schizophrenia have produced conflicting findings and are generally difficult to interpret (Sanua 1970). It may be premature, however, to dismiss the role of such studies in researching putative risk factors for schizophrenia, given progress in the development of standardized diagnostic instruments and greater awareness of both the strengths and the limitations of epidemiological research. There is a growing recognition that we must move flexibly from thinking about the clinical picture of schizophrenia (in its widest sense) to considering how this clinical picture might be biologically determined (Andreasen 1987). Studies of schizophrenia in migrant groups may yield more clues about the etiology of this condition, especially if they can be integrated with research into associated biological variables.

Migrants From the Caribbean In the United Kingdom

A recent study by Harrison et al. (1988) of rates of schizophrenia among second-generation migrants from the West Indies to England has stimulated considerable interest and debate (Littlewood and Lipsedge 1988). There are three principal reasons for this. First, this study was the first of its kind among migrants in the United Kingdom that was based on sound epidemiological principles (Hafner 1987), including prospective case finding within a defined catchment area, standardized measures of symptoms, operationalized diagnostic criteria, and extensive use of collateral history. Second, the inception rates for first-contact schizophrenia, age corrected and allowing for social class and area of residence, were among the highest reported in the world literature. Mean annual incidence rates per 10,000 population at risk aged 16–29 were 29.1 (95% confidence intervals 18.3–45.8) for Afro-Caribbeans and 2.2 (1.59–3.04) in the non-Caribbean general population. Taking into account confidence intervals (Fleiss 1981), rates among Afro-Caribbeans are at least six times
allowing for age standardization, findings (Cochrane and Bal 1987).

related to other factors. Studies of other migrant groups have produced less consistent results among first-generation Afro-Caribbean migrants or brought to this country before the age of 18. This was not, therefore, a study of elective migrants in the traditional sense.

The study employed the methodology of the recent World Health Organization (WHO) investigation into the incidence of schizophrenia in different cultures (Sartorius et al. 1986). The size of difference in rates of schizophrenia found among Afro-Caribbean migrants remained stable even when employing the Present State Examination (PSE) and CATEGO classification (Wing et al. 1974), as a narrow definition of schizophrenia in the WHO studies. It was also possible to differentiate schizophreniform psychoses from schizophrenic disorder in DSM-III-R (American Psychiatric Association 1987) terms, using symptom duration codings based on informant and other collateral information. Rates of schizophrenia based on DSM-III-R criteria showed a similar order of elevation.

Previous Studies of Schizophrenia Among Afro-Caribbeans

There have been 10 studies (see table 1), spanning nearly a quarter of a century, reporting increased rates of hospital admissions for psychoses—and especially schizophrenia—among first-generation Afro-Caribbean migrants. Studies of other migrant groups have produced less consistent findings (Cochrane and Bal 1987). Allowing for age standardization, first-admission rates for schizophrenia among first-generation Afro-Caribbean migrants have been about two to three times higher than those rates among the indigenous population. Interpretation of these data, however, has been clouded by the poor quality of case note diagnoses and by the use of data based on the vagaries of statistical returns to government departments (Glover 1987).

Considering diagnostic difficulties, Gordon (1965) and Tewfik and Okasha (1965) were the first to draw attention to comparative differences in psychotic phenomena shown by West Indian migrants. These differences included a greater preponderance of paranoid features and a tendency for symptoms to develop more acutely and to be accompanied by behavioral disturbance. The most significant contribution to the debate about diagnosis came in 1981. Following administration of the PSE to a series of patients admitted with religious delusions, Littlewood and Lipsedge (1981a) concluded that supposed higher rates of schizophrenia among West Indians could probably be accounted for by "misdiagnoses" of acute psychotic reactions. They argued that such syndromes were analogous to the bouffées délirantes ("delusional puffs"), which account for about 15 percent of hospital admissions in the French West Indies (Constant 1972).

Using Jasper’s (1963) distinction between the so-called reactive psychoses and classical schizophrenia, Littlewood and Lipsedge persuasively argued for the inherent meaningfulness or understandability of psychotic symptoms in many Afro-Caribbean patients. The misdiagnosis debate, which attracted significant media attention, was further fueled by findings of higher rates of compulsory detention or committal in this ethnic group (Rwegellera 1980; Littlewood and Lipsedge 1981b).

Rates of committal seemed to be high even when controlling for area of residence (Ineichen et al. 1984). There were additional reports of lower general practitioner involvement in such admissions and proportionately more police involvement (Harrison et al. 1984). Notions of social control and labeling theories associated with the antipsychiatry movements of the 1960’s were available for reediting as explanatory models for the misdiagnosis phenomenon among West Indians, although several authors raised additional important issues concerning the operation of racism in the mental health services (Burke 1984).

In an attempt to clarify the diagnostic debate, and because Nottingham had been a field center for the WHO incidence study, we decided to use similar methodology to identify every potentially psychotic individual of Afro-Caribbean ethnic origin presenting to the services from a defined catchment area over a 2-year period.

Case finding was not confined to those admitted to the hospital but included all those making contact with the services. We posited that a careful epidemiological study using standardized measures of mental state and taking into account extensive collateral history from families would confirm an excess of atypical psychoses in this cultural group and allow us to study these phenomena in more detail. In contrast to our expectations, however, we found one of the highest rates of schizophrenia reported in the world literature. Rates for British born and for those brought to the United Kingdom before age 18 were higher than rates reported for first-generation migrants.
Table 1. Studies of rates of illness in patients of Afro-Caribbean ethnic origin

<table>
<thead>
<tr>
<th>Author</th>
<th>Data source</th>
<th>Diagnoses</th>
<th>Migrant Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Afro-Caribbean</td>
</tr>
<tr>
<td>Hemsl (1967)</td>
<td>First admissions</td>
<td>All</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Camberwell &amp; Lambeth</td>
<td>Schizophrenia</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>(London)</td>
<td>Affective psychosis</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Personality disorder</td>
<td>*</td>
</tr>
<tr>
<td>Bagley (1971)</td>
<td>Case register</td>
<td>All</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Schizophrenia</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Affective psychosis</td>
<td>*</td>
</tr>
<tr>
<td>Glggs (1973)</td>
<td>Case register</td>
<td>Schizophrenia</td>
<td>*</td>
</tr>
<tr>
<td>Cochrane (1977)</td>
<td>Hospital admissions</td>
<td>All</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Schizophrenia and paranoia</td>
<td>*</td>
</tr>
<tr>
<td>Rwegellera (1977)</td>
<td>Case register</td>
<td>Schizophrenia</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Affective psychosis</td>
<td>*</td>
</tr>
<tr>
<td>Carpenter &amp;</td>
<td>Inpatients case notes</td>
<td>First admission rates</td>
<td>*</td>
</tr>
<tr>
<td>Brockington (1980)</td>
<td></td>
<td>Schizophrenia</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Neuroses</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Personality disorder</td>
<td>*</td>
</tr>
<tr>
<td>Bebbington et al.</td>
<td>Case register</td>
<td>Schizophrenia</td>
<td>*</td>
</tr>
<tr>
<td>(1981)</td>
<td></td>
<td>Mania</td>
<td>*</td>
</tr>
<tr>
<td>Dean et al. (1981)</td>
<td>Hospital admissions</td>
<td>Schizophrenia</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>(national)</td>
<td>(national)</td>
<td></td>
</tr>
<tr>
<td>Cochrane &amp; Bal</td>
<td>Hospital admissions</td>
<td>Schizophrenia &amp; paranoia</td>
<td>*</td>
</tr>
<tr>
<td>(1987)</td>
<td>(national)</td>
<td>(national)</td>
<td></td>
</tr>
<tr>
<td>Glover (1989b)</td>
<td>Hospital admissions</td>
<td>Schizophrenia</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>(national)</td>
<td>(national)</td>
<td></td>
</tr>
</tbody>
</table>

Note.—* = reported excess for specified diagnostic groups.

Methodological Pitfalls

Could this finding be an artifact of the methodology employed in this particular study? As with many migrant groups, there were difficulties in estimating the size of the population at risk, although it has been argued that the method of calculation may slightly underestimate, rather than inflate, the size of the denominator (Landau 1986). In any event, the size of difference in rates reported here would require a miscalculation of the population at risk of an almost impossible magnitude.

There are more cogent methodological objections on the grounds of nosocomial (service-related) factors. Perhaps these rates could be explained by a tendency for psychotic West Indian patients to traverse the various "filters" to psychiatric care more readily, compared with psychotic patients from other groups. This is a critical issue, and it probably explains at least part of the difference in inception rates. However, it has been argued elsewhere (Cooper et al. 1987) that most psychotic patients in the United Kingdom make contact with the services at some point. To explain these findings on the basis of differential filter effects alone supposes a huge pool of hidden psychotic morbidity in the community far in excess of any previously reported finding (Link and

Work carried out in Nottingham by Giggs and Cooper (1987) on the social geography of first-contact schizophrenic patients allowed us to make fairly sensitive comparisons of rates between different neighborhood types. The majority of Afro-Caribbean patients included in the study shared a socioeconomic profile with those living in neighborhoods where inception rates of schizophrenia generally were between 3.0 and 3.3 per 10,000 per year (Harrison et al. 1989). These findings emphasize the need to attempt to control for area of residence and other indices of deprivation when reporting rates of schizophrenia, but they also confirm higher rates in these second-generation migrants. It is regrettable that Afro-Caribbeans included in the study were not compared with a control ethnic population, but preliminary inquiries suggested that the numbers of identified patients would have been extremely small.

It is possible that there were errors in case definition despite the use of standardized diagnostic assessment. Although all patients were English speaking and, indeed, over half had been born in Nottingham, the cross-cultural validity of the PSE in these circumstances has not been established, and there are questions of technical and conceptual equivalence (Kleinman 1987; Flaherty et al. 1988). However, in an effort to reduce error, extensive histories were collected from key informants, and attempts were made to elicit the contextual evolution of symptoms. Allowing for these possible sources of error, it was concluded that the size of difference in rates confirms a real increase of schizophrenia among the children of West Indian migrants in Nottingham, an increase greater even than that reported among the first generation.

Other Second-Generation Migrant Studies

These findings accord closely with several other recent studies. A retrospective case note study by McGovern and Cope (1987) looked at admissions from a defined catchment area in Birmingham, England. Separating out cases of so-called cannabis psychoses, age-corrected rates of schizophrenia and paranoid syndromes among Afro-Caribbean patients were approximately four times those found among non-Caribbeans. However, for British-born Afro-Caribbeans, the size of difference was nearly sevenfold among men and fourteenfold among women.

Another recent study of second-generation Afro-Caribbeans from Manchester (Thomas et al., submitted for publication) has produced similar findings, with first-admission rates for schizophrenia of 320 per 100,000 population per year (95% confidence intervals 152-589). Unfortunately, numbers are small and based on retrospective case note diagnoses, although the authors claim a high concordance between the diagnosis of schizophrenia recorded in the case notes and that arrived at by researchers using Research Diagnostic Criteria (Spitzer et al. 1978). Further corrections must be applied to take into account the changing age profile of the population at risk, and the reported administrative incidence of schizophrenia may not reflect the true incidence. Nevertheless, these data suggest at least a fivefold relative risk for schizophrenia. In addition, this study was the first to compare rates with those among British-born patients of Asian origin, which were found to be approximately the same as rates in the indigenous population. Harvey et al. (in press), using standardized measures of symptoms based on face-to-face interviews, have also recently failed to identify an excess of atypical psychoses in a series of consecutive admissions of Afro-Caribbean patients. Taken together, the above findings provide further support for an epidemic of schizophrenia among certain migrant groups from the Caribbean to Great Britain.

An intriguing study by Lewis et al. (1990) attempted to test for diagnostic bias by varying the ethnic group of patients in an otherwise identical series of case vignettes sent to a sample of British psychiatrists. Interestingly, their respondents tended to underdiagnose schizophrenia in those patients identified as West Indian compared with white patients, reflecting a bias in the direction opposite to that expected. This shows the impact of the misdiagnosis debate on the framework of attitudes influencing the process of diagnosis among British psychiatrists when assessing patients of different ethnic groups.

Future Cross-Cultural Research

What is the relevance of these findings among second-generation migrants in view of the WHO report (Sartorius et al. 1986) of uniform incidence of schizophrenia across cultures? Similar inception rates of a disease need not imply that etiological factors are also evenly distributed. For example, similar incidence rates for jaundice in both a large urban area of a developed country and a rural catchment area of a developing country need not imply that the
etiology is the same in both cultures or even that the same disease entities are being identified.

One of the most striking findings of the WHO study was the replication of the International Pilot Study of Schizophrenia (1975) findings of marked differences in the course and outcome of schizophrenia between centers in developing countries and those in developed countries. While this is related in part to the effect of cultural factors on course and outcome (e.g., Leff et al. 1990), it is also likely that different etiological factors affect outcome. If so, then etiologically heterogeneous disorders, indistinguishable at the syndromal level, were probably included in variable proportions in the different centers. It is important, therefore, that further research investigates rates of disorder in microenvironments and in subpopulations as well as making comparisons across large urban and rural catchment areas.

It should be noted that the Nottingham study did not identify “blackness” as the independent variable: patients originating from other parts of the world, including African countries, were not included in case finding. Indeed, virtually all of the sample of Caribbean patients in Nottingham originated in Jamaica, a finding that accords with important work by Glover (1989a) suggesting that rates of first hospital admissions may vary among Afro-Caribbeans, depending on their island of origin. First-admission rates, derived from centrally gathered government statistics, were strikingly elevated for those born in Jamaica but not for those born in Trinidad. Higher prevalence of schizophrenia may therefore continue to specify country of origin, length of time spent in the country, age, sex, and detailed aspects of social class and spatial distribution in order to avoid reinforcing stereotypes by reference to skin color (Pilowsky 1990) or simplistically equating culture with ethnic group (Littlewood 1990).

It has been argued that schizophrenia may be a disappearing disease in the United Kingdom (Eagles and Whalley 1985; Eagles et al. 1988; Der et al. 1990). The data on which such a conclusion is based have difficulties of interpretation similar to those suggesting elevated rates in migrant groups. However, environmental etiological factors, which may be diminishing in their effect among the general population (e.g., as a result of improved obstetric care or changing viral climates), may remain potent risk factors for certain disadvantaged groups, including some migrants. However formidable the logistic hurdles may seem, first- and second-generation migrant groups clearly merit further investigation.

Clues to the Etiology of Schizophrenia

Torrey (1987) has pointed out that in the history of epidemiology, authors reporting variations in rates of schizophrenia have enthusiastically recruited their findings to support their favored theory of causation. Virtually all the major etiological theories may be harnessed to explain higher rates of schizophrenia among Afro-Caribbean migrants, although the pattern of increase in second-generation migrants points to environmental rather than genetic factors. Before these may be considered, it is necessary to comment on two other explanations.

First, there is possibly an increased prevalence of schizophrenia in parts of the Caribbean. The only epidemiological study carried out in Jamaica (Royes 1962) suggests that rates are broadly similar to those reported elsewhere, although it is not clear how complete the case finding was. Odérgàrd (1932) proposed a second explanation for higher rates among Norwegian migrants based on the selective migration of vulnerable personalities. It is difficult on this basis to explain why rates should be higher in second-generation Afro-Caribbeans when they should begin to converge toward those of the indigenous population. Further, some commentators (Ratcliffe 1981; Wallin 1984) have argued that the West Indian migration phenomenon attracted the better-adapted members of society. However, neither of these explanations has been thoroughly investigated.

Turning to environmental factors, there has been considerable discussion of possible psychosocial precipitants of schizophrenia among migrants. Focusing on migrants’ difficulties of assimilation and alienation, authors have proposed that “goal striving in a climate of limited opportunity” (Parker and Kleiner 1966), “status inconsistency” (Bagley 1971), or “complex social demands” (Murphy 1972) may have schizophrenia-evoking properties in vulnerable individuals. These theories lack specificity however, given that other large immigrant groups in the United Kingdom, notably Asians, have experienced similar discrimination with no consistent evidence of higher rates of schizophrenia.

Biological environmental factors have received comparatively little consideration. To explain the data discussed so far, any hypothesis must take into account higher rates of
schizophrenia in both first- and second-generation immigrants. Further, the Nottingham study showed that rates were similarly elevated for both British-born migrants and migrants brought to the United Kingdom as children. These data were produced by recalculating rates based on place of birth. Although numbers became small and more prone to error, rates for both groups were about 22 per 10,000 after correction for bimodal age-curve effects. It is possible to advance several theories that satisfy one or even two of these factors, but it is almost impossible for any single hypothesis to satisfy all three.

Two principal environmental hypotheses merit consideration: obstetric complications and exposure to novel viruses. There is now fairly consistent evidence that obstetric complications are a significant risk factor in the etiology of schizophrenia (McNeil and Kaij 1978; Murray et al. 1988). Owen et al. (1988) and Cannon et al. (1989) have reported that schizophrenic patients with a history of obstetric complications are more likely to have increased ventricular size and widening of the cortical sulci.

With regard to Afro-Caribbean women, there is a dramatically increased mortality risk from complications of pregnancy, childbirth, and the puerperium (Adelstein and Marmot 1989). However, Asians have a similarly elevated risk with no evidence of higher rates of schizophrenia among their children. Two studies have revealed potentially important differences between Afro-Caribbean and Asian in terms of fetal birth weight and survival. Terry et al. (1987) and Griffiths et al. (1989) showed that Afro-Caribbean infants are more likely than either European or Asian infants to be of low birth weight, but their neonatal survival is actually higher. It is possible that greater survival of low birth weight babies is associated with subsequent risk for schizophrenia; however, as noted above, this hypothesis does not explain why there should be an excess of schizophrenia among those born in the Caribbean.

Research efforts to link viral and viral-like intermediaries to schizophrenia have been reviewed by Torrey (1988) and King and Cooper (1989). Although much of the original data is flawed, the search for infectious intermediaries has been stimulated by evidence of seasonal variation in the disorder (Boyd et al. 1986) and by reports such as that of Mednick et al. (1987) showing an increased risk in cohorts of young adults who had been in the second trimester of fetal development during the A influenza epidemic in Copenhagen in 1957. Wing (1989) suggested that second-generation immigrants may be at increased risk from intrauterine infections to which the mother has not previously been exposed. Similarly, Wing (1979) raised the possibility that infantile autism in children born to immigrant parents (including Afro-Caribbeans) may be associated with maternal rubella infection. Gillberg et al. (1987) found increased rates of autism among the children of migrants to Sweden and advanced a similar explanation. However, the latter study included children born in both Sweden and their parental country of origin, which argues against a simple model based on exposure to viruses after maternal migration.

Stevens (1988) has drawn attention to epidemiological parallels between schizophrenia and multiple sclerosis (MS). A preliminary finding by Elian and Dean (1987) suggests that second-generation West Indian migrants to the United Kingdom have increased rates of MS, which often takes a more malignant form. These findings require replication but form an interesting parallel to those on schizophrenia. It is possible that exposure to a novel virus in the postnatal period through to maturity may be a factor, with neurotropic agents possibly impairing competitive neuronal interaction and development taking place over this period (Haracz 1985; Purves and Lichtman 1985). Converging evidence of increased rates of autism, MS, and schizophrenia among Afro-Caribbean migrants points to the possible role of neurotropic infectious intermediaries in these conditions.

Conclusion

However attractive a single hypothesis may be, this epidemic most probably results from a coincidence of risk factors, including vulnerability based on selection, exposure to novel viruses, abnormal immunological responses, obstetric complications, and differential fetal survival. Future research must systematically investigate these hypotheses and explore other indicators of environmental etiology, such as seasonality of birth and increased ventricular size. In addition, to assist in further hypothesis formulation and to justify large case control studies, findings reviewed here require further replication employing larger numbers and a longitudinal design. Epidemiology, including cross-cultural research, has more to offer in the search for the causes of schizophrenia.

References

Adelstein, A.M., and Marmot, M.G. The health of migrants in England


Owen, M.J.; Lewis, S.W.; and Murray, R.M. Obstetric complications


Sartorius, N.; Jablensky, A.; Korten, A.; Ernberg, G.; Anker, M.; Cooper, J.E.; and Day, R. Early manifestations and first contact incidence of schizophrenia in different cultures. Psychological Medicine, 16:909-928, 1986.


The Author

Glynn Harrison, M.D., M.R.C.Psych., is Consultant Psychiatrist, Academic Department of Psychiatry, University Hospital, Queens Medical Centre, Nottingham, United Kingdom.
Are you tired of getting the office copy of ADAMHA NEWS after everyone else has chewed on it?

For only six dollars a year you can have your very own personal copy of the newsletter of the ALCOHOL, DRUG ABUSE, AND MENTAL HEALTH ADMINISTRATION.

Superintendent of Documents Subscriptions Order Form

<table>
<thead>
<tr>
<th>Qty.</th>
<th>List ID</th>
<th>Title</th>
<th>Price Each</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ADAN-2E</td>
<td>ADAMHA NEWS</td>
<td>$6.00</td>
<td></td>
</tr>
</tbody>
</table>

Total for Subscriptions

Please Type of Print (Form is aligned for typewriter use.)
Prices include regular domestic postage and handling and are subject to change. International customers please add 25%.

Please Choose Method of Payment:
- [ ] Check payable to the Superintendent of Documents
- [ ] GPO Deposit Account
- [ ] VISA or MasterCard Account

To fax your orders and inquiries—(202) 275-0019

Mail To: Superintendent of Documents, Government Printing Office, Washington, DC 20402-9371