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 **Foresight**

**Mental Capital and Wellbeing:
Making the most of ourselves in the 21st century**

**State-of-Science Review: SR-B13
The Mental Ill-Health of People Who Migrate, and Their Descendants:
Risk Factors, Associated Disability and Wider Consequences**

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any Government or organisation.*

Summary of key findings

Psychosis

- Higher incidence rates of psychotic disorders have been observed in all Black and Minority Ethnic [BME] groups when compared with the White British group, defined according to 2001 census categories and used as a standard reference. This represents a distinct health inequality within the British population. Similar findings have also been found in other European countries.
- Incidence rates in BME populations are elevated for all psychotic disorders, not limited to schizophrenia. Misdiagnosis is an unlikely explanation for these raised rates.
- Incidence rates of psychoses are not uniformly elevated in immigrant groups. There is marked variation according to age, sex, ethnicity and generation status, probably reflecting their different experiences of assimilation or acculturation.
- Highest incidence rates of psychoses are consistently observed for Black Caribbean and Black African populations in the UK, having somewhere between 4-10 times the elevated rates compared with the White British group.
- The two most recent studies of incidence rates in BME populations in the UK have also suggested that non-British white groups, such as those from Europe and North Africa, may be roughly at double the risk of psychoses than the White British groups. Indian, Pakistani and Bangladeshi women (but not men) also appear to have elevated rates of psychoses, somewhere in the region of 2-5 times the rates for White British women. Finally, there is some evidence that mixed race groups, particularly the Mixed White and Black Caribbean population, have particularly elevated rates (in the region of 6-12 times the rate in the White British population).
- Demographic differences (age and sex) between BME groups and the baseline population do not explain raised rates in immigrant and BME populations.
- Elevated rates of psychoses in BME populations are not restricted to first generation immigrants but are also present in UK-born, second and third generation groups. This suggests that:
 - a) Migration alone is not sufficient (or perhaps even necessary) to cause psychoses but post-migratory factors are also likely to be important.
 - b) It is unlikely that mental illness or its precursors predispose people to migrate.
- The baseline incidence of psychiatric illnesses in immigrants' country of origin is comparable to the baseline rate in the White British population in the UK. Higher rates of psychoses in BME populations are therefore not due to higher rates of disorder in their country of origin.
- The current evidence suggests that the causes of psychotic disorders in immigrants and their descendents are fundamentally the same as those underlying these illnesses in anyone else: psychosocial stresses can trigger a psychotic illness during early adult life in people who are particularly susceptible by reason of certain combinations of otherwise unremarkable genetic factors and/or adverse effects during early development that sensitise key brain systems to later events.

- In immigrants and their descendents it is the psychosocial triggers that may be more common at the same time that social supports may be insufficient to act as an effective buffer. The relevant psychosocial stressors include stressful life events, discrimination, urban living and socioeconomic deprivation, all of which are correlated to some degree. Recent reports of more parental separation through the migration experience may be an important early-life stressor for children that can increase their vulnerability later in life.

Common mental disorders

- The evidence for non-psychotic disorders, for example, common mental disorders such as anxiety and depression, is less clear. The prevalence of some depression may be raised for some BME groups (Irish, Black Caribbean), but not others (Indian, Pakistani and Bangladeshi), although there may be high-risk groups within these populations (see below), and many will be subject to risk factors such as economic and social deprivation that are common to all groups.

Suicide

- The risk of suicide in immigrant/BME groups appears to vary by sex and ethnicity. In the UK, Asian men generally have lower rates of suicide than the host population, but there is some evidence that rates may be elevated for young Asian women. The Black Caribbean group in the UK appear to have lower rates of suicide than the White British group. Eastern European immigrants to Sweden appear to have elevated rates of suicide than the Swedish-born population. Rates may be particularly elevated in second-generation BME groups. In Canada, the risk of suicide appears to be lower in most immigrant groups than Canadian-born groups.

Post-traumatic stress disorder

- Refugees are at significantly raised rates of post-traumatic stress disorder that may manifest alone, or as a complication of the management of other mental illness.

New groups of migrants

- In view of the different levels of mental disorder in some migrant groups that have become established in the UK over the past century, it is prudent to monitor the mental health needs of new groups of migrants. For example, there is currently virtually no literature on the effects of immigration on disorder in the case of recent economic migrants from Eastern Europe to the UK, and therefore no evidence whether their rates of disorder are higher, or indeed lower. Careful monitoring of such groups is therefore important so as to understand and meet their health needs.

1. Scope of review

This review focuses on the scientific literature regarding migration and mental illness. It covers the major mental disorders, including psychoses, common mental disorders, suicide and post-traumatic stress disorder [PTSD]. The primary emphasis is on the picture in the UK which is of most relevance to the

objectives and vision of Foresight. However, it is impossible to discuss the literature on migration and mental illness without placing it in both a historical and geographical context. We will therefore refer to research from other countries, where relevant, to place the UK setting in context. Furthermore, for some disorders, the relative paucity of research in general demands that we include studies from outside the UK.

This review primarily considers the scientific evidence concerning the incidence of mental disorders for immigrants to the UK and their descendants. The majority of this research has taken place in the decades following World War II, when large numbers of migrants from Commonwealth countries, and beyond, began arriving in the UK. The majority of studies have compared the incidence of psychotic disorders in economic migrants and their UK-born descendants with that of their white British counterparts. Fewer studies have been conducted in asylum seekers, but these do exist and have also been included in this report.

We set the review out as follows: we give a brief introduction to the history of research investigating the association between immigration and mental health; we then take each set of mental disorders in turn, providing both a review of the descriptive epidemiology literature and the major hypotheses that have been proposed to explain any differences (or lack thereof) in the rates of mental disorders in immigrant/BME groups compared with the host population.

2. Technical notes

We have tried to minimise use of jargon, but in places it was necessary to include some scientific terminology, defined below.

Psychosis: We use the term ‘psychosis’ to refer to the group of psychotic disorders – serious mental illnesses primarily characterised by the presence of hallucinations (abnormal perceptions) and delusions (abnormal beliefs and conclusions). Here, we include the two major subsets of psychoses, characterised by either the presence or absence of affective symptoms (changes to mood). Broadly these are referred to as non-affective psychoses (for example, schizophrenia) and the affective psychoses (for example, mania, bipolar disorder, psychotic depression). Our use of the term psychosis refers to conditions meeting the clinical diagnoses for such disorders, as defined by the major classifications of disease – the International Classification of Diseases, tenth revision [ICD-10] and the Diagnostic and Statistical Manual, fourth edition [DSM-IV].

Ethnicity: Throughout this review we use the National Institute for Mental Health in England’s terminology when reviewing the literature on psychosis in Black and Minority Ethnic [BME] and immigrant groups. We include any group other than the White British group in our definition of being of black and minority ethnic status (including non-British white groups). Where possible we differentiate findings which relate to non-UK-born first generation immigrants from those which relate to their UK-born descendants; often referred to in the literature as so-called second- and third-generation immigrant groups. We have used the terminology from the 2001 census to refer to different ethnic groups, even though the original publications under review here may have used a different terminology. For example, Black Caribbean immigrants, prior to 2001, were referred to as ‘African-Caribbean’, further back, as ‘West Indian’. No terminology is universally accepted or temporally stable, but we have attempted to be consistent throughout this review by using 2001 classifications.

Comparison group: When comparing rates of mental illnesses in different immigrant groups it is necessary to have a reference group with which to make comparisons. Traditionally, studies have used the native-born ‘indigenous’ group as the baseline comparator. In Western Europe, this is predominantly the native-born white population (sometimes referred to as Caucasian) of the country under study, for example, the White British group. Older studies may have used the general population as the baseline group for comparison to a specific group (for example Black Caribbean versus the general population) and this will obviously include

some immigrant groups in the baseline group. More recent studies have used either the 'white' group as the baseline, while the latest studies have been able to restrict the baseline group to the White British group, which perhaps provides the most homogenous comparison group for studies investigating the rates of mental illness in immigrant populations.

Immigrant: For the purpose of this review, an immigrant is defined as born outside the country under investigation (first generation). Academic literature sometimes uses the terms second- or third-generation immigrant to refer to descendants of first-generation immigrants, whose parents or grandparents were born outside the country under investigation, but the individuals themselves were born within that country. Because the term 'immigrant' covers a heterogeneous range of people, it is sometimes necessary for studies to provide more precise definitions of which groups they are referring to. In psychiatric epidemiology, as elsewhere in the medical literature, a common way to stratify these groups has been to do so by ethnicity. We report these findings here, but note that it is important not to conflate what is meant by ethnicity and immigration as each has a specific meaning and interpretation.

Incidence: The number of new cases of a disease in a given population over a fixed time period, divided by the total denominator population 'at-risk' during that time period. Incidence is usually expressed as a rate i.e. X new cases per Y number of person-years. An incidence of 10 cases per 100,000 person-years would mean that, over the course of one year, in a population of 100,000 people, there would be 10 new cases of the disease.

Prevalence: The number of all cases of a disease (new and existing) in a population at a given time (point prevalence), or over a given period (period prevalence). Prevalence is expressed as a proportion (i.e. the proportion of the population with a mental illness at any one time point/period).

Relative risk [RR]: This is simply a ratio (also referred to as a rate ratio). It is the rate of disease in one group compared with the rate in another group. The comparison group is usually a meaningful group (see above). A RR greater than 1.0 indicates an elevated rate of disease in the group of interest compared with the baseline comparison group. A RR less than 1.0 indicates a lower rate of disease in the group of interest compared with the baseline group.

95% Confidence Interval [95% CI]: A measure which allows the reader to interpret the precision and significance of an estimated measure, typically an incidence rate or relative risk (see above). A 95% CI gives the lower and upper bounds of precision of that estimate. A 95% confidence interval is a standard measure of confidence in an estimate. At its most literal, it states the confidence with which you believe your estimate of the measure under study includes the true measure in the population (since this is impossible to measure without studying the whole population). Thus, if you were to repeat the study 100 times (in different samples of the same population) you would expect your estimate of the measure under study to fall within the lower and upper bounds of the confidence interval on 95 occasions. Conversely, there is a 5% chance that your estimate of the measure under study does not include the true measure. For example, if you estimate that a disease occurs at an incidence rate of 10 new cases per 1000 people with a 95% CI of 5-15, this suggests that if you were to repeat the study 100 times, 95 percent of the samples would fall between 5 and 15 cases per 1,000 people. Put another way, you have 95% confidence that the sample estimate (5-15 cases per 1,000 people) contains the true rate in the population. 95% confidence intervals are particularly useful for interpreting relative risks [RR]. If, for example, the RR of disease was 10 times higher in Group B than Group A with a 95% confidence interval of 2.0-14.0 (expressed as: RR: 10.0; 95% CI: 2.0-14.0), this suggests that if you were to resample the population, you would expect to observe a rate of disease in Group B of at least twice, and possibly up to 14 times, the rate in Group A, on 95 out of 100 occasions. Since this RR does not overlap 1.0, this provides strong evidence that Group B is significantly more at risk of the disease than Group A. Where a confidence interval for a RR spans 1.0 (i.e. 0.5-2.5), it is impossible to exclude the notion that the rate in Group B may actually be lower than in Group A.

An introduction to the epidemiology of mental disorders: There are several features which are common across several mental disorders. We have briefly stated these here to give some background to these disorders. Mental disorders are commonly incident in young adults, with cases occurring from the time people would otherwise be becoming economically active. Many mental disorders, for example, schizophrenia, also have a chronic (lifetime) course, meaning that subjects may often be economically inactive for their entire adult life. Clearly, these two factors contribute to the enormous economic impact of mental disorders. Sex differences exist too, with young men being at higher risk for schizophrenia and, increasingly, for suicide. For some psychotic disorders, for example, mania and psychotic depression, the risk is about equal between men and women. For (non-psychotic) depression there is evidence that rates are higher in women.

3. History of the link between migration and mental illness

In 1932, Ødegaard reported that the rate of insanity (what we would now term schizophrenia) in Norwegian emigrants to the USA was twice that of either the Norwegian population in Norway or native-born Americans (Ødegaard, 1932). This study was followed by work conducted by Malzberg in New York (Malzberg, 1964; 1969), who observed that the risk of schizophrenia was raised for immigrants, independent of differences in the age structure and level of urbanisation experienced by these two groups, which might have explained these findings. More recently, retrospective studies have attempted to determine whether elevated rates of psychosis were evident in immigrant populations by looking at historical records. Smith and colleagues (Smith et al., 2006), for example, have analysed clinical records between 1902 and 1913 for all psychiatric admissions to hospital in British Columbia, Canada. The authors were able to diagnose patients according to the current Diagnostic and Statistical Manual (fourth edition) [DSM-IV] classification. They found that the rate of schizophrenia in immigrants from Britain and Continental Europe was 54% higher than in the Canadian-born population at the time. The earliest reports of elevated rates of psychiatric disorders in the UK occurred in the 1960s (Hemsi, 1967). In the three decades following the Second World War, the UK saw periods of substantial immigration from former Colonial countries to fill post-war labour shortages in many of the lowest paid sectors of the economy. Though low paid, these jobs were often attractive for immigrants – predominantly young men – keen to take advantage of the opportunity for a better lifestyle compared with their prospects in relatively depressed post-war home economies. In 1967, Hemsi reported significantly higher rates of psychiatric illness in Black Caribbean immigrants to South London than for the background population. This finding has since been replicated several times in the following decades (reviewed below) and is not limited to this population.

4. Psychoses

4.1. Descriptive epidemiology

Following Hemsi's study, several further investigations found elevated rates of schizophrenia in the Black Caribbean population. Cochrane (1971) reported higher rates in this group in England and Wales, independent of the age structure of the population. Littlewood and Lipsedge (1981) reported higher rates of schizophrenia in in-patient care in the Black Caribbean and West African population in London. McGovern and Cope (1987) found higher rates of schizophrenia in both first and second generation Black Caribbean groups to the UK. In 1988, Harrison and colleagues published a study (Harrison et al., 1988) which would become a benchmark for future studies in this field. Breaking with much of the previous literature, they employed a robust methodology including a prospective, case-finding design and standardised diagnoses in a well-defined catchment area. They found that the incidence of schizophrenia was somewhere between 8-16 times greater in the Black Caribbean population in Nottingham than in the general population. Rates were elevated for both first- and second-generation BME groups.

In 1991, the UK census recorded the ethnicity of the population for the first time. This allowed researchers to obtain relatively accurate estimates of the denominator population 'at-risk' in the UK, thus enabling researchers to estimate the incidence of psychoses across several ethnic groups. Combined with improved methodologies, taking into account differences in age which may have explained the raised rates in BME populations, studies continued to report significantly elevated rates of schizophrenia in the Black Caribbean population in the UK, though estimates were attenuated from the rates observed by Harrison et al, namely somewhere in the order of 3- to 8-fold the rate in the white group, which provided the baseline comparison group in analyses (King et al., 1994; Van Os et al., 1996a; Wessely et al., 1991; Castle et al., 1991). Comparably raised rates of schizophrenia were also observed for Black African groups in Great Britain.

The most recent evidence regarding the incidence of psychotic disorders in BME groups in the UK came from two large, well-designed, population-based epidemiological studies of first-episode psychoses. These two studies ascertained all new cases of any psychotic disorder in four centres – Southeast London, Nottingham and Bristol (the Aetiology and Ethnicity in Schizophrenia and Other Psychoses [ÆSOP] study),(Fearon et al., 2006) funded by the UK MRC, and East London (the East London First Episode Psychoses [ELFEP] study) (Kirkbride et al., 2008a). The investigators used similar methodologies, including a prospective, case-finding design in well-defined study areas over a two-year period, standardised diagnoses made blind to the ethnicity of the subject by consensus agreement from a panel of clinicians, and an accurate estimate of the denominator population at-risk in the studies from the 2001 census. Both studies were able to estimate precise incidence rates of various psychotic disorders in several immigrant groups and their descendants, having adjusted for a range of confounders (alternative explanations), including age, sex, country of birth and socioeconomic status. These groups were economic migrants or their descendants. The age and sex standardised incidence rate of any clinically relevant psychoses in the White British group from the ÆSOP study was 20.2 per 100,000 person-years. There was evidence that all BME groups under study were at increased risk of a psychotic disorder. Thus, the rate in the Black Caribbean group was almost seven times greater than in the White British group (Relative Risk [RR]: 6.7; 95% Confidence Interval [CI]: 5.8-8.3) and the rate for the Black African group was over four times the rate in the White British group (RR: 4.1; 95% CI: 3.2-5.3). For specific psychotic disorders, such as schizophrenia, the ÆSOP study reported that rates in the Black Caribbean and Black African populations were approximately nine and six times greater, respectively, than in the White British group. These differences were also observed for the manic psychoses, including bipolar disorder. For the depressive psychoses, rates were elevated in the Black Caribbean (RR: 3.2; 95% CI: 1.5-6.1) and Black African (RR: 2.1; 95% CI: 0.9-5.0) group compared to the White British group, though not to the extent for schizophrenia and mania. All these differences remained apparent when men and women were studied separately.

The ÆSOP study also suggested other BME groups had significantly elevated rates of psychotic disorder, including non-British white groups (RR: 1.6; 95% CI: 1.1-2.2) and mixed ethnicity groups (RR: 2.7; 95% CI: 1.6-4.7). For specific psychotic disorders, elevated rates of psychoses have been observed in the non-British white group for schizophrenia (ÆSOP: RR: 2.5; 95% CI: 1.6-3.9), other non-affective psychoses (ELFEP: RR: 3.2; 95% CI: 1.7-5.9) and the affective psychoses (ELFEP: RR: 2.3; 95% CI: 1.3-4.0). The ELFEP study was also able to address the rates of psychoses in the mixed ethnicity group in more detail, separating out people of Mixed White and Black Caribbean origin from all other mixed ethnic groups. While the findings for the latter group were inconclusive, the study showed that the Mixed White and Black Caribbean population had significantly increased rates of psychotic disorders, most notably for the affective psychoses – mania and depressive psychoses – (RR: 10.9; 95% CI: 4.5-26.3).

For Asian groups, usually treated as a homogenous group (King et al., 1994; Fearon et al., 2006; Bhugra et al., 1997), despite considerable differences in terms of culture, religion, migratory experiences and country of origin (Bhopal et al., 1991), conflicting findings with regard to elevated rates of psychoses have thus far been observed. King et al.(1994) found some evidence to suggest that incidence rates were about five

times higher in this group than the white group. But other studies observed no difference in rates between these two groups (Bhugra et al., 1997).

The ELFEP study was able to shed light on the possibility of raised rates of psychoses in Asian groups, the findings prior to this, including those from the *ÆSOP* study, proving inconclusive. ELFEP, conducted in four East London boroughs with a high proportion of Indian, Pakistani and Bangladeshi populations, has shown that rates of psychotic disorders in these groups are raised, though the effect appears to be restricted to women. Thus, the rate of schizophrenia in Pakistani (RR: 4.9; 95% CI: 1.9-13.0) and Bangladeshi women (RR: 4.4; 95% CI: 2.8-8.9) was over four times greater than for White British women, having adjusted for potential differences in terms of age and sex. There was also evidence that Indian women were at elevated risk of other non-affective psychoses, though Asian groups did not appear to have elevated rates of affective psychoses. The authors of the ELFEP study (Kirkbride et al., 2008a) were also able to adjust for potential differences between the White British and BME groups in terms of socioeconomic status which may have explained these elevated rates. However, the findings from their study did not change. BME populations remained at significantly increased risk of psychotic disorders.

In terms of age differences, Fearon et al. (2006) observed significantly higher rates of psychoses in Black Caribbean and Black African populations of every age group compared with the White British group, for both men and women. This suggests that BME populations face an increased risk of psychoses at all age groups, perhaps independently of generation status. Coid et al. (in press) observed raised rates of psychoses for both UK-born (second generation) and non-UK-born (first generation) Black Caribbean and Black African groups, replicating findings from previous studies (Harrison et al., 1988). For Indian, Pakistani and Bangladeshi women there was evidence that raised rates of non-affective psychoses were restricted to first-generation immigrants, with their female descendants having comparable rates to their White British counterparts. These findings lend support to the idea that social and cultural isolation (in terms of language, employment, culture and stress) may be important in the aetiology of psychoses (see next section).

Increased rates of psychoses in BME groups are not restricted to the UK, with studies in several European countries, including the Netherlands (Selten et al., 2001; Selten et al., 1997; Veling et al., 2006), Denmark (Cantor-Graae et al., 2003) and Sweden (Zolkowska et al., 2001), having recorded similar findings. Thus, rates appear to be raised for Surinamese (Selten and Sibjen, 1994), Dutch Antilles (Selten et al., 1997; Selten and Sibjen, 1994), Moroccan (Selten and Sibjen, 1994; Veling et al., 2007) and perhaps Turkish (Veling et al., 2007) immigrants to the Netherlands, Finns to Sweden (Leao et al., 2006), European, African and Asian immigrants to Sweden (Zolkowska et al., 2001), nearly all immigrant groups to Denmark including European, Australian and American immigrants (Cantor-Graae et al., 2003). Further afield, there is some evidence from the US that the incidence of schizophrenia for African-Americans is approximately three times greater than for the white group (Bresnahan et al., 2007), though this increase became non-significant following adjustment for several confounders. In Australia, findings have been mixed. One early study reported raised rates of schizophrenia in German, Italian and Polish, though not British migrants (Krupinski and Cochrane, 1980), while a more recent case-control study (McGrath et al., 2001) reported that non-Australian-born migrants were at lower odds of developing a psychosis compared with Australian-born subjects. A recent meta-analysis has suggested that mood disorders are elevated in some BME populations, particularly the Black Caribbean group (Leff et al., 1976). Early work by Leff and colleagues suggested that BME populations, particularly Black Caribbeans, were overrepresented in a sample of people with mania in London (Leff et al., 1976). Van Os et al. (1996b) also reported higher rates of mania in the Black Caribbean population in South London when compared with the white group. This finding was further replicated in the *ÆSOP* study which suggested that the incidence of bipolar affective disorders was seven times greater in Black Caribbean groups than in the White British group (Fearon et al., 2006; Lloyd et al., 2005). BME populations of other origin had similarly elevated rates of bipolar disorder, including the Black African and Mixed ethnicity group. Rates of depressive psychoses were also elevated for these groups, but only by a factor of three – considerably less than for bipolar disorder. More recently, the ELFEP study has confirmed

raised rates of affective psychoses in Black Caribbean, Black African and, most notably (see above) Mixed White and Black Caribbean groups (Kirkbride et al., 2008a). It also found evidence that non-British white groups were at a two-fold increased risk of an affective psychosis. No study to date has observed higher rates of affective psychoses in Indian, Pakistani or Bangladeshi groups in the UK.

5. Main hypotheses

Several hypotheses have been raised to explain these elevated rates of psychotic disorders in BME and immigrant groups. Cochrane and Bal (1987) first delineated five hypotheses to explain the increased risk of psychoses among first-generation immigrant groups, and these are reviewed here. These include: sociodemographic differences accounting for the higher rates; higher rates in the immigrants' country of origin; psychoses predisposes people to migrate; misdiagnosis of psychotic disorders; and migration or post-migratory factors. We also review more recent hypotheses which have been proposed (Sharpley et al., 2001; Bhugra, 2000; Bhugra, 2004). We discuss each hypothesis in turn, presenting the research which supports or rejects it.

5.1. Sociodemographic differences account for higher rates

One of the earliest suggestions offered to explain the higher rates in BME populations was that they differed from the native-born population in terms of age and sex. Typically, they are more likely to be younger and male – both of which are associated with a greater risk of psychoses. Some early studies did not control for this possibility, and the hypothesis (Hemsi, 1967) was a valid line of enquiry. Thus, it was suggested, BME populations did not have higher rates of schizophrenia because they were immigrants, more simply because they were (predominantly) younger and male. As described above, studies began to control for differences in age and sex between immigrants and the background population (Cochrane, 1971), such that it became apparent that any differences in the age-sex distribution of each population were not sufficient to explain the higher rates of psychoses amongst BME populations. All modern epidemiological studies, such as *ÆSOP* and *ELFEP* (which reported higher rates of psychoses in BME populations in the UK), now control for age and sex differences as a matter of course. Few studies have, thus far, considered the confounding effects of socioeconomic status [SES] on the risk of psychoses in BME or immigrant groups. Two Swedish studies (Leao et al., 2006; Hjern et al., 2004) have found that a raised incidence of psychoses persisted in immigrants to Sweden after adjustment for individual-level SES, despite some attenuation. This finding has recently been replicated in the *ELFEP* study in the UK, which suggested that the raised rates of psychoses amongst BME populations (described above) could not be explained by SES (Kirkbride et al., 2008a), though this may be a contributory factor amongst many others.

5.2. Higher rates in the immigrants' country of origin

It was considered possible that the rates of psychoses were higher in the immigrant's country of origin and that this explained the higher rates of psychoses in these groups when they moved to the UK. Three studies (Hickling and Rodgers-Johnson, 1995; Mahy et al., 1999; Selten et al., 2002) were conducted in the Caribbean (Jamaica, Barbados and Trinidad) to determine the incidence of psychoses in the population there and compare it with the incidence in first-generation Black Caribbean immigrants and the native-born white population in the UK. Each study found that the incidence of schizophrenia in the Caribbean was comparable to that of the white population in the UK. Therefore, higher rates of schizophrenia in immigrants from the Caribbean could not be simply due to higher rates in their country of origin.

5.3. Psychoses predispose people to migrate

If higher rates were not apparent in the immigrants' country of origin, it was proposed that those individuals who would go on to develop schizophrenia were more likely to migrate. This would explain both the raised rates in immigrants and the comparable rates of psychoses in the native populations of the host and origin countries. This 'selection' hypothesis was first proposed by Odergaard who observed that Norwegian immigrants to the US appeared to have poor social adaptation in Norway and, he reasoned, would have gone on to develop psychoses had they not emigrated. Using an innovative study design Selten et al.(2002) were able to test this idea on a quasi-hypothetical dataset of Surinamese immigrants to the Netherlands. During the 1970s, more than one-third of the Surinamese population migrated to the Netherlands following political instability around the time of the country's independence. In a study of the Dutch psychiatric registry, these immigrants were later found to have roughly four to five times the rate of schizophrenia compared with the Dutch-born group. Selten and colleagues:

"...imagined that the entire population of Surinam had emigrated to the Netherlands and that all the hypothetical additional migrants, consisting of those who in reality had stayed behind, contributed to the Netherlands no new cases of schizophrenia. We repeated the study of the Dutch psychiatric registry and enlarged the denominator for the Surinamese-born population by adding the entire age-correspondent resident population of Surinam during the years in question. We reasoned that the selection hypothesis could be rejected if the risk of schizophrenia for Surinamese-born people remained significantly higher, because this enlargement precluded any possibility of selection."

(Selten et al., 2002 pp.670)

Duly, Selten and colleagues found that the rate of schizophrenia in Surinamese immigrants remained elevated compared with that of the Dutch-born population, thus arguing against Odergaard's selection hypothesis.

This hypothesis is also unlikely since migration is a complex undertaking, especially for people who later develop psychosis, since they often have cognitive impairment (Jones et al., 1994). Further, rates appear to be raised in the descendants of first-generation immigrants (McGovern and Cope, 1987; Harrison et al., 1988; Harrison et al., 1996; Sugarman and Craufurd, 1994) which neither readily fits with this hypothesis.

5.4. Misdiagnosis of psychotic disorders

Yet a further proposal is that psychotic symptoms may be more common, and more frequently reported, in BME populations (Sharpley et al., 2001; Bhugra, 2000; Bhugra, 2004); for which there is some support (Johns et al., 2002). Misdiagnosis of cultural beliefs as psychotic experiences in BME populations by psychiatrists unfamiliar with non-Western cultural mores has been put forward to explain the excess rates in migrants (Littlewood et al., 1981). One study suggested that inter-rater reliability between a Jamaican and UK psychiatrist for diagnosing schizophrenia was low (Hickling et al., 1999). Although there was little agreement between each psychiatrist in terms of who had schizophrenia, there was no evidence of a racist diagnosis – both psychiatrists diagnosed a similar proportion of the Black Caribbean group with schizophrenia (52% versus 55%). Furthermore, modern epidemiological studies, such as AESOP or ELFEP, enforce standardised diagnostic criteria, in which the ethnicity of the subject is withheld from the psychiatrist prior to diagnosis. This, therefore, makes misdiagnosis an unlikely explanation for the excess rates in BME populations (Bhugra, 2000), despite the continued controversy surrounding this issue (Singh and Burns, 2006).

Recent studies (Fearon et al., 2006; Kirkbride et al., 2008a) have also demonstrated that the elevated risk of psychoses for BME populations is not limited to schizophrenia but extends to the affective psychoses,

suggesting that BME groups are not more likely to receive a diagnosis of schizophrenia. This issue is quite separate from the notion of institutionalised racism in health and other public services whereby BME populations do not receive culturally, religiously and ethnically sensitive services in the same way as the majority population (Singh and Burns, 2006) (also see 'Pathways to Care' section, below).

5.5. *Migration or post-migratory factors*

The failure of these suggestions to explain the greater risk of psychoses for immigrant/BME groups has led researchers to consider Cochrane and Bal's (1987) remaining hypothesis – that factors related to migration or the post-migratory experience play a causal role.

Migration itself is a relatively major life event and may place considerable stress upon the individual. This is likely to be compounded by post-migratory experiences including attempts to secure housing and employment, developing social relationships and networks, and understanding the norms, rules and customs of the host culture (acculturation). In a general population sample, Johns et al. (2004) found that, although the prevalence of psychotic symptoms was greater in BME groups, this risk was mostly explained by discrimination and stressful life events. While the prevalence of stressful life events has been shown to be similar across ethnic groups, there is evidence (Gilvarry et al., 1999) that these experiences are interpreted more negatively in ethnic minorities.

There is a body of evidence which suggests that urban birth (Marcelis et al., 1998), upbringing (Lewis et al., 1992) and living (Kirkbride et al., 2006) increase later risk of schizophrenia, with evidence of a dose-response relationship between time lived in urban areas and later increased risk of schizophrenia (Mortensen et al., 1999). Higher rates of schizophrenia are frequently observed in urban compared with rural areas (see McGrath et al., 2004, for a review), though there is less evidence that the affective psychoses vary according to urbanicity (Kirkbride et al., 2007a). Some investigators have attempted to investigate which factors related to urbanicity may be important in increasing the risk of schizophrenia, since urbanicity itself is likely only to be a proxy for underlying physical, social or economic variables. Greater levels of socioeconomic deprivation (Croudace et al., 2000), social isolation and social fragmentation (Allardyce et al., 2005) have all been associated with an increased incidence of psychoses, though it is difficult to establish whether these factors may be genuinely causal or reflect processes of social drift and selection. Recent studies have suggested that neighbourhoods with less social capital may have higher incidence rates of psychoses (Kirkbride et al., 2007b, Kirkbride et al., 2008b), perhaps because social supports are inadequate to protect or buffer people from the adverse effects of psychosocial stress.

How such neighbourhood-level, contextual variables may interact with ethnicity to affect the propensity to psychoses is presently unclear and more research is needed in this area. Since BME populations predominantly live in urbanised areas such research is critical. Fortunately, however, studies are beginning to investigate the joint effects of factors related to urbanicity and urbanicity in the aetiology of psychoses.

Two studies, conducted in different settings, (Boydell et al., 2001; Veling et al., 2006) have now shown that the risk for BME individuals increases as they live in areas with a smaller proportion of BME residents. Additionally, it has been reported that BME populations who face greater degrees of discrimination (Veling et al., 2007), or who have darker skin colour (Cantor-Graae and Selten, 2005), have greater rates of psychoses. In Southeast London, Kirkbride et al. (2008b) have shown that the incidence of psychoses is lower in neighbourhoods where BME groups live in more close-knit communities, lending support to the hypothesis that social cohesion may be protective – in general and for specific BME groups – against the onset of psychoses. It is clear that factors such as immigration, ethnicity and urbanicity are markers of risk, possibly for a range of adverse social conditions. We do not yet know what these may be but the elucidation of individual-level and neighbourhood-level SERFs – and how these may differ by ethnicity –

will be crucial in advancing our understanding of the aetiologies of psychotic disorders, and for treatment and prevention.

5.6. Substance abuse

There is little evidence that increased use of illicit substances, including cannabis, explains the raised rates of psychoses amongst immigrant and BME groups. In a small study of cases of schizophrenia, cannabis use was not more common among Black Caribbeans than the white group (McGuire et al., 1995). Evidence from both the UK and the Netherlands (Sharp and Budd, 2003; Coulthard et al., 2002; Sandwijk et al., 1995) suggests that the frequency of cannabis consumption in the general population is not raised in the Black Caribbean group. Veen and colleagues (2002) have shown that the raised rates of schizophrenia in Moroccan and Surinamese immigrants in the Netherlands are unlikely to be due to substance abuse (not restricted to cannabis). Note that this is distinct from the question as to whether cannabis and other drugs may increase risk for schizophrenia, in general, with the current consensus suggesting that there is a causal link, but not a differential association with respect to ethnicity (Moore et al., 2007).

5.7. Factors across the life course

A number of physical problems affecting the developing foetus or child have been proposed as possible causes of schizophrenia. Although originally considered candidate explanations for raised rates of schizophrenia in BME groups, empirical evidence had not supported this view, rather suggesting psycho-social models. Obstetric complications are unlikely to explain elevated rates of schizophrenia in BME populations. Hutchinson found these to be twice as common in the white group compared with the Black Caribbean group. Prenatal maternal infection (for example influenza during the first trimester) increases the risk of schizophrenia (Brown et al., 2004), but it is not known whether this risk is increased for BME populations.

Childhood life events may be important in the genesis of psychoses in immigrant and BME groups. In a study of childhood parental separation and loss in the *ÆSOP* study, Morgan et al. (2007) found that the size of the risk for schizophrenia due to aberrant separation from, or death of, a parent was similar for the White British, Black Caribbean and Black African groups. However, parental separation events were almost twice as prevalent in the Black Caribbean group, suggesting that this risk factor may have a greater overall impact in this population. This risk factor may be a marker for a range of other traumatic life events during childhood that may also be relevant. Stress at this time is thought to sensitise key brain areas to the effects of later adverse events occurring in the teenage and early adult life when the propensity to develop schizophrenia and other psychoses is greater than at any time in the life course. Regardless of mechanism, it is important as family disruption may lead to, or be a marker for, a range of other adverse outcomes such as childhood behaviour disorders, low educational achievement and longer-term socioeconomic problems.

6. Pathways to care

Pathways to care for BME populations have been observed to differ from those of the White British group. Findings from the *ÆSOP* study suggest that Black Caribbean and Black African BME populations are three times more likely to be compulsorily admitted than their White British counterparts (Morgan et al., 2005). Two further studies (Bebbington et al., 1994; Bhui et al., 2003) have observed similar results. However, the *ÆSOP* study found no evidence that non-British white groups were more or less likely to be compulsorily admitted than their White British counterparts. In terms of mode of referral, evidence from the *ÆSOP* study suggested that Black Caribbean and Black African groups were twice as likely as their White British counterparts (Morgan et al., 2005) to come to the attention of services via the police or judiciary rather

than their general practitioner, a finding confirmed in the “Count Me In” census of mental health services (Commission for Healthcare Audit and Inspection, 2007). Mode of referral did not differ significantly between the non-British white and White British groups, although the “Count Me In” census has suggested the former may be less likely to present via general practitioners (Commission for Healthcare Audit and Inspection, 2007). Little research has been conducted on pathways to care for other BME groups, though one study (Burnett et al., 1999) found little evidence of differences in terms of compulsory admission between the white and Asian groups, a finding replicated more recently (Commission for Healthcare Audit and Inspection, 2007).

7. Rates of psychoses over time

There has been much debate about whether the incidence of schizophrenia has changed over time, with several studies during the 1980s and 1990s reporting a decline (Der et al., 1990; Eagles et al., 1988; Geddes et al., 1993; Munk-Jorgensen and Mortensen, 1993; Osby et al., 2001). It remains unclear whether the declines reported over these two decades were genuine or attributable to methodological artefact (Kendell et al., 1993; Bresnahan et al., 2003). It has been suggested that the re-organisation of mental healthcare in the developed world during this time, with a movement towards outpatient rather than inpatient care, may explain this apparent decline (Harrison et al., 1991), but this has not been equivocally demonstrated (Eagles et al., 1988; Munk-Jorgensen and Mortensen, 1993). More recently, it has been suggested that changes in diagnostic fashion may account for this decline (Osby et al., 2001), and Allardyce and colleagues (2001) have found some evidence to support this assertion using data from Scotland (Eagles et al., 1988; Geddes et al., 1993). Temporal changes in factors close to birth have been investigated (Suvisaari et al., 1999), such as declining obstetric complications or improving maternal nutrition, but the evidence-base is contradictory (see Bresnahan et al. (2003) for a review). In the United Kingdom, at least, the current evidence does not support (Brewin et al., 1996; Allardyce et al., 2000), and possibly counters (Castle et al., 1991; Boydell et al., 2003), a decline in the incidence of schizophrenia. A recent Canadian study (Bray et al., 2006) has also observed an increase in the incidence of schizophrenia. The most recent work, from Nottingham, where the incidence of psychoses has been studied at three points spanning 20 years using similar methodologies, does not support a decline in the incidence of psychotic disorders. Rather, after adjustment for demographic factors, the incidence of psychoses appears to be stable through time. Increases in the incidence of psychoses in inner London between 1965 and 1997 (Boydell et al., 2003) may have been largely attributable to the increased proportion of BME and immigrant groups in the area over this period (van Os et al., 1996a; Boydell et al., 2001). Trends in psychoses incidence should be monitored as absolute increases, regardless of their cause(s), would place increased demands on mental healthcare services.

8. Predicting the future incidence of psychoses in the UK

Research funded by the Department of Health and the Medical Research Council is currently being undertaken to develop models which can accurately predict the incidence of psychotic disorders in the UK given details of the population in a given area. Once developed, this tool will inform healthcare providers about the number of people with psychotic mental illnesses they can expect to see in their catchment area over a given period of time. This should aid service planning, commissioning and provision, including the need to cater for diverse needs in a multicultural population.

The models are based on estimations of the incidence of psychoses from the two large UK studies mentioned above (Kirkbride et al., 2006; Coid et al., 2008) and will become an online resource, allowing NHS users to enter information about the general population in their area so that they can determine health needs in terms of psychotic illness over a given time period.

Models such as these are, inevitably, based on historical information and the particular populations that have been studied to date. Much of our information comes from relatively urban rather than rural settings, such that further refinements are necessary and under way. The information will also need updating in the light of recent and ongoing population changes that include immigration. In particular, it will be important to carefully monitor rates of disorder in economic migrants from Eastern Europe who permanently settle in the UK. Just as the majority of research to date has focused on people from Commonwealth countries who subsequently permanently settled in the UK, future research will need to study new groups of permanent migrants so as to understand and meet their health needs appropriately.

9. Common mental disorders (depression and anxiety)

The evidence for an association between common mental disorders and immigrant and BME status is less clear than for psychotic disorders (Lloyd, 2006). Major studies of depression have been conducted in the UK, with the two largest to date observing equivocal findings. These two studies were the Office for National Statistics National Survey of Psychiatric Morbidity and the Ethnic Minority Psychiatric Illness Rates in the Community [EMPIRIC] study. The National Psychiatric Morbidity Study found no evidence of a difference in the prevalence of common mental disorders between the Black Caribbean and white groups in the UK (Jenkins and Meltzer, 1995), although Sharpley et al. (2001) have suggested that their sample may have been too small. This was backed up by the EMPIRIC study which observed a 60% increase in prevalence of depression in the Black Caribbean group compared with the white group in a community sample in the UK (Nazroo, 1997). The weekly prevalence of depression in White British males and females was 2.7% and 4.8%, respectively. The prevalence was considerably higher prevalence in Irish males (5.8%) and females (6.8%), but lower in Indian (male: 2.5%; female: 3.2%), Pakistani (male: 3.8%; female: 2.9%) and Bangladeshi (male: 1.6%; female: 2.2%) groups than their British counterparts.

Put simply, there is little consistent evidence of raised rates of common mental disorders in BME groups. Differences may partly be a reflection of the size of these surveys and partly a reflection of the population from which they are drawn. Often these surveys have been based on general practitioner [GP] surgeries where one would expect higher rates of common mental disorders. Other studies have also been conducted in the UK. Gillam et al. (1989) found that the Black Caribbean population was much less likely than other ethnic groups to receive a diagnosis of depression or anxiety from their general practitioner than other ethnic groups. Commander et al. (1997) observed higher rates of depression in the Asian population compared with white or black groups in Birmingham.

9.1. *Suicide*

The risk of suicide in BME groups appears to vary by sex and ethnicity. In the UK, Asian men generally have lower rates of suicide than the host population (Thompson and Bhugra, 2000), but there is some evidence that rates may be elevated for Asian women (Thompson and Bhugra, 2000; Bhugra et al., 1999; Soni Raleigh, 1996; Soni Raleigh et al., 1990). The Black Caribbean population in the UK appears to have lower rates of suicide than the White British group (Soni Raleigh, 1996). Eastern European immigrants to Sweden appear to have elevated rates of schizophrenia than the Swedish-born population. Rates may be particularly elevated in second-generation groups (Hjern and Allebeck, 2002). In Canada, the risk of suicide appears to be lower in most immigrant groups than Canadian-born groups (Malenfant, 2004).

10. Post-traumatic stress disorder

Unsurprisingly, refugees are at significantly raised rates of post-traumatic stress disorder [PTSD]. A recent review (Fazel et al., 2005) of 7,000 refugees to western countries found that they were up to 10 times more likely to experience PTSD than the general population. Such PTSD may be the primary reason for presentation to services, or may complicate the picture when refugees present with other mental and physical health complaints.

11. Conclusions

Raised rates of psychotic disorders are evident in all immigrant and BME groups compared with the rate in the background host population.

The extent to which rates are elevated among immigrant/BME groups depends on a number of demographic variables, including ethnicity, age, sex and generation status.

Although seemingly all countries where this phenomenon has been studied show raised rates in BME populations, the UK's specific immigration history and patterns present unique challenges to UK mental health services not faced elsewhere.

The higher rate of psychotic disorders in immigrant or BME groups is one of the most pronounced and consistently replicable findings in psychiatric epidemiology (Bhugra, 2004; Cantor-Graae and Selten, 2005). Several hypotheses for these raised rates have now been excluded. It appears as though factors associated with migration, or post-migratory experiences, provide the most fruitful pathways for future research.

As acknowledged above, being of ethnic minority or migrant status appears to be a risk factor for psychoses independent of urbanicity (van Os et al., 2001; Sundquist et al., 2004), although factors in the urban environment may interact with BME and immigrant status, potentially leading to higher rates of psychoses in these groups. There is no reason to think that the causes of psychotic illnesses in immigrant groups and their descendants are fundamentally different from those operating in any other groups. Rather, the evidence suggests that some relevant factors, such as adverse life events and psychosocial stressors, are more common such that a higher proportion of people susceptible for other reasons may go on to develop these severe mental illnesses in these communities compared with groups where these triggering factors are less prevalent.

The evidence linking common mental disorders and immigrant and BME status is less clear, but it appears that the elevated rates of disorder in BME populations observed for psychoses do not hold.

Finally, in view of the different levels of mental disorder in some migrant groups, it is prudent to monitor the mental health needs of new groups of migrants. For example, there is currently virtually no literature on the effects of immigration on disorder in the case of recent economic migrants from Eastern Europe to the UK, and therefore no evidence whether their rates of disorder are higher, or indeed lower. Careful monitoring of such groups is therefore important in order to understand and meet their health needs.

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