Psychosis incidence through the prism of early intervention services

J. B. Kirkbride, C. Stubbins, P. B. Jones

Summary

We know little about first-episode psychosis epidemiology beyond cities or when measured through early intervention in psychosis services. We present results from 18 months of the 3-year Social Epidemiology of Psychoses in East Anglia (SEPEA) study of incepted incidence observed through five early intervention services. We identified 378 eligible individuals (incidence: 45.1/100 000 person-years, 95% CI 40.8–49.9). Rates varied across these services, but were 2–3 times higher than those on which services were commissioned. Risk decreased with age, was nearly doubled among men and differed by ethnic group; doubled in people of mixed ethnicity but lower for those of Asian origin, compared with White British people. Psychosis risk among ethnic minorities was lower than reported in urban settings, which has potential implications for aetiology. Our data suggest considerable psychosis morbidity in diverse, rural communities.

Declaration of interest

None.

Method

The study methodology was based on the principles of a major epidemiological study of first-episode psychosis previously conducted in England, modified for use in early intervention services. We established a surveillance system to record socio-demographic and clinical data on all people aged 16–35 years resident within East Anglia, referred and accepted to our early intervention services. We established a surveillance system to record socio-demographic and clinical data on all people aged 16–35 years resident within East Anglia, referred and accepted to our early intervention services with first-episode psychosis over 3 years, resident within East Anglia, referred and accepted to our early intervention services with first-episode psychosis over 3 years, resident within East Anglia, referred and accepted to our early intervention services with first-episode psychosis over 3 years.

Results

Over the first 18 months of the study 510 people were referred to early intervention services in East Anglia with suspected first-episode psychosis. In total 70% (n = 357) met inclusion criteria during over 835 000 person-years of follow-up. The main reason for exclusion was not meeting clinical criteria for psychosis at referral (n = 106; 20.8%) (see online Fig. DS1 for a complete breakdown of exclusions).

The crude incidence of clinically relevant psychotic disorder in East Anglia was estimated as 42.6/100 000 person-years (95% CI 38.4–47.2). Rates were generally similar across services (online Table DS1), but were notably raised in Great Yarmouth and Waveney (54.9/100 000 person-years; 95% CI 39.9–75.4).

Discussion

We identified variation in the incidence of psychosis in a diverse, mainly rural English region. The overall incidence was higher than typically reported in first-episode psychosis studies of the entire adult age range (16–64 years), but this is to be expected given our lower age limit (35 years) and the decline in risk with age. For comparison, the incidence for people 16–35 years old in the ÆSOP study varied from 32.0/100 000 person-years in Bristol to 74.0/100 000 person-years in south-east London, placing our lower age limit (35 years) and the decline in risk with age.

Research into social factors in the aetiology of psychotic disorders has demonstrated notable variation observed by age and gender, cannabis use, immigrant status and ethnicity, and urban birth and upbringing. This epidemiological landscape is taken from studies predominately conducted in large cities. Less is understood about these risk markers outside of conurbations, where almost one-fifth of the English population lives. Delineating such epidemiology is also relevant to health services planning, particularly given recent reports that early intervention in psychosis services in both urban and rural English communities have observed psychosis rates up to three times higher than those upon which such services were first commissioned (i.e. 15/100 000 person-years). We present initial findings from the Social Epidemiology of Psychoses in East Anglia (SEPEA; www.sepea.org) study, a large, 3-year population-based first-episode psychoses study.

The study methodology was based on the principles of a major epidemiological study of first-episode psychosis previously conducted in England, modified for use in early intervention services. We established a surveillance system to record socio-demographic and clinical data on all people aged 16–35 years resident within East Anglia, referred and accepted to our early intervention services with first-episode psychosis over 3 years, from 1 August 2009. ICD-10 clinical and research (OPCRIT) diagnoses for psychotic disorder (F10-39) are established at the time of analysis. Median age at first presentation was similar for women (21.9 years, IQR = 18.2–25.8) and men (22.3 years, IQR = 19.3–26.7). Risk was elevated among men (RR = 1.7, 95% CI 1.4–2.2), after adjustment for age and ethnicity. Our data also suggested risk differed by ethnicity. Compared with the White British group, people of Black (RR = 1.8; 95% CI 1.0–3.3) and mixed ethnicities (RR = 2.1; 95% CI 1.3–3.6) were at elevated risk of psychotic disorder after adjustment for age and gender. By contrast, people of Asian origin (including the Indian subcontinent and Southeast Asia) were at lower risk of psychosis compared with the White British group (adjusted RR = 0.5, 95% CI 0.3–0.9) (Table 1).

A total of 56% of our sample were unemployed at initial referral; 25% were in paid employment, 19% were students and 4% were unpaid family carers; information was missing from 2% of our sample.

We identified variation in the incidence of psychosis in a diverse, mainly rural English region. The overall incidence was higher than typically reported in first-episode psychosis studies of the entire adult age range (16–64 years), but this is to be expected given our lower age limit (35 years) and the decline in risk with age. For comparison, the incidence for people 16–35 years old in the ÆSOP study varied from 32.0/100 000 person-years in Bristol to 74.0/100 000 person-years in south-east London, placing our estimates within this range. Nevertheless, observations from both SEPEA and ÆSOP are consistent with recent empirical data that the incidence of psychotic disorders seen through early intervention services is generally three times greater than the figure upon which such services were commissioned. This has...
important implications for mental health service provision. In our sample, age at first presentation was similar for both genders before 36 years old, a point easily overlooked in entire adult-onset samples, where median age at onset typically occurs a few years later for women\(^1\) as a result of a secondary peak of psychosis close to the time of menopause,\(^2\) not captured by our early intervention services data.

We also reported elevated psychosis risk for some minority groups in East Anglia, although not, even at the upper limit of the confidence interval, to the extent observed in more urban settings.\(^3\) Strikingly, relative risk estimates in people from Asian populations were half those observed in the White British group. Although we cannot exclude the possibility that these differences were explained by differential service utilisation, our findings are consistent with the possibility that migrant and minority groups in more rural communities may not be exposed to the same degree to the factors that drive elevated psychosis rates in cities. This hypothesis will be pursued in the full data-set, but there is already supporting evidence: cumulative social disadvantage and separation and loss events in childhood are reported to be associated with increased odds of psychosis for both White British and ethnic minority groups but the impact of such events appears to be more pervasive among some minority groups.\(^4,5\) If socioenvironmental exposures were also amplified in urban compared with rural populations, or led to greater stress responses in urban dwellers, as has been recently observed in a small sample of healthy adults,\(^6\) this could potentially explain the attenuation in elevated rates among rural minority populations.

Our initial data suggested that incidence rates were elevated in one of our services, and we will consider multivariate, multilevel explanations for this in our final data-set, including the possibility that the variation may be partially driven by service-side factors, such as the degree of active outreach provided by different services and the length of time services have been established. We will also be able to inspect differences in rates according to diagnostic subgroup and demographic factors not reported here (including country of birth, age at migration, generation status, occupation), compare clinical- and research-based diagnoses, and inspect the evolution of symptomatology in a first-episode sample over 3 years of treatment. Nevertheless, the incited incidence rates assessed here through clinical early intervention services highlight a substantial burden of psychotic disorder beyond cities, and potentially provide important aetiological clues.

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**Table 1** Sample characteristics and adjusted rate ratios in the SEPEA study at 18 months*\(^a\)

| Variable | Participants, \(n = 357\) | Denominator, \(n = 378\) | Adjusted relative risk (95% CI) |
|----------|--------------------------|--------------------------|-------------------------------|
| **Total** | 357 (100) | 838 574 (100) | – |
| **Early intervention service (n = 357)** | | | |
| Cambridge, Peterborough & Royston | 122 (34.2) | 306 283 (86.5) | – |
| West Norfolk | 17 (4.8) | 41 765 (5.0) | – |
| Central Norfolk | 91 (25.5) | 219 860 (26.2) | – |
| Great Yarmouth & Waveney | 38 (10.6) | 69 218 (8.3) | – |
| Suffolk | 89 (24.9) | 201 448 (24.0) | – |
| **Gender (n = 330)** | | | |
| Women | 115 (34.8) | 405 221 (48.3) | 1 |
| Men | 215 (65.2) | 433 353 (51.7) | 1.7 (1.4–2.2) |
| **Age group (n = 330)** | | | |
| 16–17 | 52 (15.0) | 71 929 (8.6) | 1 |
| 18–19 | 53 (16.1) | 89 975 (10.6) | 0.8 (0.6–1.2) |
| 20–24 | 118 (35.8) | 219 157 (26.1) | 0.7 (0.5–1.0) |
| 25–29 | 73 (21.2) | 213 385 (25.4) | 0.5 (0.3–0.7) |
| 30–35 | 34 (10.3) | 245 127 (29.2) | 0.2 (1.0–1.3) |
| **Ethnicity (n = 330)** | | | |
| White British | 261 (79.1) | 671 588 (80.1) | 1 |
| White non-British | 21 (6.4) | 50 882 (6.1) | 1.2 (0.8–1.9) |
| Mixed ethnicity | 15 (4.5) | 17 364 (2.1) | 2.1 (1.3–3.6) |
| Black | 12 (3.6) | 18 471 (2.2) | 1.8 (1.0–3.3) |
| Asian | 12 (3.6) | 69 014 (8.2) | 0.5 (0.3–0.9) |
| Other ethnicities | 9 (2.7) | 11 250 (1.3) | 2.3 (1.2–4.5) |

* Adjusted for other variables in model (age group, gender and ethnicity).

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Case ascertainment

Everyone referred to one of five early intervention services in East Anglia over 3 years from 1 August 2009 with suspected first-episode psychoses are potentially eligible for inclusion in the study. The catchment area is coterminous with the boundaries of three mental health trusts in East Anglia, encompassing the counties of Norfolk, Suffolk and Cambridgeshire and the town of Royston (Hertfordshire). All early intervention services in East Anglia incept people with first-episode psychoses aged 14–35 years at first referral, with the exception of Cambridgeshire, which is designed for people aged 17–35 years. Here, we restricted inclusion to people aged 16–35 years (and 17–35 years in Cambridgeshire), consistent with typical definitions of adult-onset psychosis used in academic and clinical practice.12 Individuals not resident within the catchment area at referral or who do not meet clinical diagnosis for ICD-1013 psychotic disorder (F10–39) are excluded. Within each early intervention service we established a surveillance system involving the Mental Health Research Network (MHRN) to record all eligible new referrals identified during the study period. Here, we report data from the first 18 months of case ascertainment in each early intervention service.

Demographic and clinical data collection

We recorded basic sociodemographic and clinical information on standardised SEPEA forms for each participant. This included birth date, gender, postcode at referral, ethnicity (self-defined), birth country, date moved to the UK (if applicable), current or last occupation, parental main or last occupation and current accommodation. Occupation was coded to the Office for National Statistics Standard Occupational Classification, 2010.14 Additionally, we recorded primary, and if applicable, secondary clinical diagnoses at 6 months and 3 years after referral (to assess diagnostic evolution), as assessed by the lead clinician responsible for each participant. Operationalised research diagnoses using OPCRIT are also being obtained.15 An MHRN clinical studies officer or assistant psychologist was permanently based in each early intervention service and liaised weekly with the clinical and research teams to ensure complete data collection.

Denominator data and statistical analyses

To estimate incidence rates, we used 2009 mid-term census population estimates, published by the Office for National Statistics, as our denominator, adjusted for study duration in each early intervention service. Numerator and denominator data were stratified by age, gender, ethnic group and early intervention service. Crude incidence rates and 95% confidence intervals were estimated. Poisson regression was used to test for variation in relative risk (RR) according to sociodemographic characteristics. We also report basic sample characteristics here. All analyses were conducted in Stata, version 11 for Windows.

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| Variable | Participants, n (%) | Denominator, n (%) | Crude incidence rate<sup>a</sup> (95% CI) |
|----------|---------------------|--------------------|------------------------------------------|
| Total    | 357 (100)           | 838,574 (100)      | 42.6 (38.4–47.2)                         |
| Early intervention service (n = 357) |                        |                    |                                          |
| Cambridgeshire, Peterborough & Royston | 122 (34.2) | 306,283 (36.5) | 39.8 (33.4–47.6) |
| West Norfolk | 17 (4.8) | 41,765 (5.0) | 40.7 (25.4–65.5) |
| Central Norfolk | 91 (25.5) | 219,860 (26.2) | 41.4 (33.7–50.8) |
| Great Yarmouth & Waveney | 38 (10.6) | 69,218 (8.3) | 54.9 (39.9–75.4) |
| Suffolk | 89 (24.9) | 201,448 (24.0) | 44.2 (35.9–54.4) |

<sup>a</sup> Per 100,000 person years.
