Frequency and predictors of adverse events

PRiSM Psychosis Study 3

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Background Community care has been criticised as a hazardous policy associated with high rates of adverse events. There is little research evidence as to the truth of this claim.

Method Best available evidence from public records, interviews, case notes, keyworkers and general practitioners was assembled to establish: (a) which of the 514 subjects initially identified as having psychotic illnesses had died during an average follow-up of 4.9 years; (b) care currently received by all 286 subjects originally selected for interview; and (c) rates of major adverse events and of admission for these 286 individuals.

Results Twenty-eight natural and 11 unnatural deaths had occurred. Among subjects still living at the end of the follow-up, 84% were in contact with specialist mental health services and 11% only with primary care services. Rates of serious violence, imprisonment and homelessness were relatively low. Forty-one per cent had been admitted at least once during a mean follow-up of 3.2 years and 20% at least once under the Mental Health Act. After adjustment, there were no significant differences between standard and intensive care sectors.

Conclusions Rates of adverse events and 'slipping through the net' are relatively low among individuals receiving community-based services, whether intensive or standard care.

A central concern for the clinicians and researchers involved with innovative programmes has been whether community-based care can surpass standard care in important domains such as users' needs, satisfaction and quality of life. Other papers in this series address these questions. However, in the UK a preoccupation of the public, the media and, at times, local and central policy-makers has been rather different: the move to the community has been criticised as a hazardous policy which leads to large numbers of severely ill individuals 'slipping through the net', with seriously adverse outcomes, such as violence towards members of the public, homelessness and suicide.

ESTABLISHING THE FACTS ABOUT ADVERSE EVENTS IN THE COMMUNITY

Whereas from the perspective of clinicians and service users these public concerns often appear stigmatising and exaggerated, there is as yet relatively little research evidence on the prevalence of negative outcomes in cohorts of severely mentally ill individuals receiving community-based services. Such evidence may be useful in indicating that public fears are taken seriously and in attempting to allay them. The Team for the Assessment of Psychiatric Services study has investigated rates of crime, vagrancy, death and readmission of the long-term mentally ill in a large cohort of people in the first year following discharge from the long-stay wards of two large asylums (Dayson, 1993), finding relatively low rates of adverse events. Three individuals from the sample of 278 patients committed violent acts: one was imprisoned after throwing a cup of tea at a stranger and carrying a knife, one was charged with wounding after a pub brawl, and one attacked his father. One became vagrant, and five more could not be traced after a

year. Death rates were similar in those discharged and those remaining in hospital, and one suicide occurred in each of these groups.

From the Nottingham centre in the World Health Organization study on determinants of outcome of severe mental disorders, information is available on homelessness, imprisonment, admission to long-stay wards and deaths (Harrison *et al*, 1994; Mason *et al*, 1995) among 99 individuals, traced for 13 years following their first episodes of psychotic illness. Again, the results do not suggest high rates of major adverse events. The whereabouts of all but four of the subjects were traced. None was homeless, in prison or in a long-stay ward at the follow-up point. Over 13 years, six had experienced some episode of homelessness and four had been in prison, with two spending some time on a long-stay psychiatric ward.

The PRiSM Psychosis Study complements the evidence from these two recent UK studies by describing rates of death, other adverse events, loss to follow-up, hospital admission and detention under the Mental Health Act in a large catchment-area-based sample of individuals with psychotic illnesses, with a wide range of duration of illness and patterns of service use. In this part of the study we aim to answer the following questions:

(a) At the follow-up point, where were all members of the sample originally selected for interview and what care, if any, were they receiving?

(b) What were the rates of natural and unnatural death, attempted suicide, violent acts, homelessness, loss to follow-up, hospital admission and detention under the Mental Health Act among the sample?

(c) Was there confirmation for the hypothesis that, controlling for clinical and demographic characteristics and previous history, adverse events would be less frequent in Nunhead (the intensive community care sector) than in Norwood (the standard community care sector)?

(d) What were the major demographic and clinical predictors of adverse outcomes?

In examining predictors of adverse events, we were particularly interested in ethnic origin as a possible predictor of admission and detention under the Mental Health Act. Analysis based on data collected at baseline in this study, referring to the year before case identification and to

lifetime history, indicated significantly higher rates of detention under the Mental Health Act among Black African and Black Caribbean people (Davies *et al*, 1996). The hypothesis we wished to test in this follow-up study was that outreach and more community-based management would reduce previous differences in ethnic groups in the stage at which they get access to services when relapsing, and that the marked ethnic difference previously observed in compulsory admission rates would be attenuated in the follow-up period.

METHOD

The overall methodology of the PRiSM study and the care received in the two study sectors are described in other papers in this series. The investigation of adverse events within the PRiSM Psychosis Study had two major components.

Tracing of deaths

Deaths were tracked for the whole cohort assembled at the case identification, whether selected for interview or not. Names and dates of birth were forwarded to the Office of Population Censuses and Surveys, who agreed to notify PRiSM of any death recorded for a member of the sample. We received notification of the details recorded on the death certificate and the outcome of any inquest, including date, place and cause of death and, where relevant, coroners' verdict. Further information about the circumstances of deaths was also collected from local case notes and professionals to clarify some details of the unnatural deaths.

Tracing of whereabouts, care received and adverse events other than death

Further data collection for this aspect of the study focused on the sample selected for interview. Our aim was to assemble a core set of data for the whole of this sample, regardless of whether or not we had succeeded in interviewing them. We developed a schedule which elicited basic information on current whereabouts and living situation, pattern of care over the follow-up period and the major adverse events discussed above. (Copies of this schedule are available from S. J. or L. B. upon request.) This schedule was completed using best available data assembled from the following sources.

(a) Interview data – for those who had been traced and consented to interview, substantial sections of the required information had already been collected during interviews.

(b) Local computerised databases – the local PAS (Patient Administration System) and computerised local records for the Care Programme Approach (CPA) register and the supervision register were consulted for details of recent and current care, particularly admissions. The hospital placements manager was consulted for details of hospital admissions outside the catchment area on an extra-contractual referral basis.

(c) Bethlem and Maudsley National Health Service Trust case notes – hospital case notes held at central medical records and at community team bases were examined for information relevant to any aspect of the schedule.

(d) Discussions with keyworkers – where data had not been obtained from above sources, or where case notes were missing, keyworkers were asked to provide information.

(e) Health authority records – records held at Lambeth, Southwark and Lewisham Health Authority were used to identify current general practitioners (GPs) and whereabouts for those no longer in contact with local mental health services.

(f) Contacts with GPs – for those no longer in contact with local specialist services, basic information about current care and major events in the follow-up period was obtained from GPs.

The time span for which data were collected for interview responders was the period between interview dates (Time 1 to Time 2), except for hospital admission and compulsory detention where data related to the period from case identification to follow-up interview (Time 2). Where no interviews had been carried out, the data collection period was fixed on the basis of median interview dates for the responders in the same sector. For those subjects who had never been interviewed, our data collection period was the time between the median date of baseline interview for responders in the subject's sector and the median date of follow-up interview. Where interviews had been completed only at baseline or only at follow-up, the other date was fixed on the basis of the median interval between baseline and follow-up for each sector. For in-patient admission and for detention under the Mental Health Act, the data collection period was the time between the case identification date and the follow-up interview.

Analysis

Data were analysed using SPSS for Windows (Release 6.1) and Stata4 (StataCorp, 1995). χ^2 or Fisher's exact tests were used to compare Nunhead and Norwood, and ethnic groups, in the proportions involved in adverse events. Mortality rates are given unstandardised, but natural mortality was age-standardised before comparison with the Lambeth and Southwark rates for 1992–1994. Logistic regression analyses were carried out to examine variables associated with the occurrence of each major type of event. The following independent variables were entered in each logistic regression (a) gender; (b) age; (c) ethnic group (White, Black African, Black Caribbean or other); (d) diagnosis (schizophrenia, manic–depressive illness or other psychosis); (e) sector (Nunhead or Norwood); (f) marital status as recorded at case identification stage (grouped into (i) married or cohabiting, (ii) single and (iii) divorced, widowed or separated); (g) Global Assessment of Functioning (GAF; Jones *et al*, 1995) score at case identification stage and (h) length of follow-up period. In certain regressions, additional variables with particular relevance to the dependent variable being examined were entered. For example, history of violence prior to the study was included as an independent variable where violence during the follow-up period was the dependent variable. For the purposes of these analyses, SCAN ICD–10 (Wing, 1989) diagnosis was used to assign each subject to a diagnostic group. The schizophrenia group included all forms of schizophrenia and also delusional disorders. The affective psychosis group included manic–depressive illness, schizoaffective disorder and depression with psychotic symptoms. Where Operational Criteria Checklist (OPCRIT; McGuffin *et al*, 1991) generated an ICD–10 diagnosis of some form of psychotic illness but SCAN suggested no psychiatric disorder or nonpsychotic disorder, however, it was assumed that the OPCRIT diagnosis was correct. The rationale for this was that we

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assumed that the most probable explanation where OPCRIT but not SCAN indicated a history of psychosis was that case notes described past symptoms which were denied by patients at interview (whether because of lack of insight, unwillingness to discuss symptoms or lack of recall).

RESULTS

Sample

A total of 514 people with a research diagnosis of psychotic illness were identified in the original case identification. The data we will report on deaths relates to the whole of this cohort.

The other results reported here relate exclusively to the 320 people originally selected for interview (whether or not an interview actually took place). Eighteen were excluded prior to further analyses as neither OPCRIT nor SCAN indicated an ICD–10 diagnosis of psychotic illness. Sixteen (5%) of those selected for interview at baseline had died by the follow-up point. Of the remaining 286 subjects, 73 (58%) of 126 in Nunhead and 79 (49%) of 160 in Norwood were successfully contacted and agreed to interview.

The mean time from Time 1 (the initial interview point) to Time 2 in Nunhead was 2.4 years while the mean time from case identification to Time 2 was 3.3 years. (See Method for details of how hypothetical dates were fixed for Time 1 and Time 2 for those who had not been interviewed.) In Norwood, the mean time between Time 1 and Time 2 was 2.1 years, with a mean time from case identification to Time 2 of 3.2 years.

Deaths

Deaths were monitored from case identification in 1991 or 1992 until 30 September 1996 (average follow-up 4.9 years). Twenty-eight natural deaths occurred, a rate of 11.2 per 1000 person-years. The rate of natural death for those aged 15–64 was 6.0 per 1000 (95% CI 3.1–10.2). The standardised mortality ratio for natural death in this age band (standardising to the Southwark and Lambeth age-specific rates during 1992–1994) was not significantly different from 1 at 1.68 (95% CI 0.89–2.22).

There were 11 unnatural deaths (all age groups), giving a rate of 4.0 (CI 1.9–7.3) per 1000 person-years. Table 1 shows the information available to us about the circumstances and location of these unnatural deaths.

Table 1 Unnatural deaths among individuals with Operational Criteria Checklist diagnoses of psychotic illness (case identification stage sample, $n=514$)

Date	Cause and circumstances	Coroner's verdict
Nunhead sector (January 1991–September 1996)		
August 1991	Antidepressant overdose, at home	Open verdict
August 1991	Died by drowning in the Thames	Misadventure
January 1993	Died by burning at home	Suicide
March 1993	Severe head and neck injuries – sustained in road traffic accident	Accidental death
July 1994	Died due to therapeutic administration of psychotropic medication in a hospital in East Anglia	Misadventure
Norwood sector (January 1992–September 1996)		
June 1992	Found dead at home – cause unascertainable	Open verdict
July 1993	Died by hanging in hospital in another London catchment area	Suicide
January 1994	Died at home of antidepressant overdose	Open verdict
December 1994	Died in general hospital of lithium toxicity	Accidental death
February 1996	Found dead at home – cause unascertainable	Open verdict
July 1996	Allegedly killed by his brother	Still *sub judice*

There was no significant difference between Nunhead and Norwood in rates of unnatural or natural death: for Nunhead the rate of natural death was 10.1 per 1000 person-years, compared with 12.7 in Norwood: rate ratio 0.80 (95% CI 0.35–1.82). There were 4.0 unnatural deaths per 1000 person-years in Nunhead and 4.9 in Norwood: rate ratio 0.83 (95% CI 0.21–3.43).

Initial characteristics of the sample selected for interview

Table 2 is based on data collected at the initial case identification stage and shows socio-demographic and clinical characteristics of members of the interview sample who were living at the follow-up point, including both responders and non-responders to the interview. Data on age, ethnic origin, diagnosis, length of illness, number of admissions and marital status suggest very similar clinical populations in the two sectors. However, other data show important differences: mean GAF score was lower in Nunhead suggesting greater disability ($t=-3.5$, $P=0.001$), more people in Nunhead had a history of violence ($\chi^2=5.5$, $P=0.019$) or at the case identification point provoked concern in staff because of their perceived potential for violence ($\chi^2=12.1$, $P<0.001$), more had a criminal conviction ($\chi^2=4.0$, $P=0.045$), and a history of suicide attempts or of being assessed as a high

suicide risk was more frequent ($\chi^2=15.7$, $P=0.004$).

Tracing and status at follow-up point

Data on marital status and employment were also collected with respect to Time 2. For the sample as a whole these characteristics remained relatively stable between the two time points: at Time 2, 83% of the sample had no employment of any form, sheltered or open market, and 57% were single. There was a statistically significant difference between the sectors in proportions of subjects living in supported accommodation at Time 2: 33% ($n=34$) of those for whom information was available in Nunhead compared with 11% ($n=16$) in Norwood ($\chi^2=17.9$, $P<0.001$).

Table 3 shows data on whether subjects' whereabouts and care currently received were successfully established and, if so, the types of service with which subjects had contact at Time 2. This indicates that most subjects were traced, but a slightly greater proportion remained untraced in Nunhead than in Norwood. Characteristics at the case identification stage of the eight subjects who could not be traced at all at Time 2 were examined. Seven out of eight were under the age of 40 at the case identification stage, of whom three were male. The whereabouts at follow-up of an 80-year-old woman were

Table 2 Socio-demographic and clinical characteristics of individuals initially selected for interview and still alive at the follow-up point: case identification data

Characteristic	Frequency or mean in Nunhead (% of valid cases)	Frequency or mean in Norwood (% of valid cases)	Frequency in whole sample (% of valid cases)
Gender			
Male	68 (54%)	70 (44%)	138 (48%)
Female	58 (46%)	90 (56%)	148 (52%)
Mean age	40.9 years	43.1 years	42.1 years
ICD–10 diagnosis			
Schizophrenia/delusional disorder	84 (67%)	108 (67%)	192 (67%)
Manic–depressive illness, depression with psychotic symptoms and schizoaffective disorder	22 (17%)	27 (17%)	49 (17%)
Other functional psychoses	20 (16%)	25 (16%)	45 (16%)
Ethnic group			
White	81 (64%)	98 (62%)	179 (63%)
Black Caribbean	32 (25%)	42 (27%)	74 (26%)
Black African	8 (6%)	8 (5%)	9 (6%)
Other	5 (4%)	9 (6%)	14 (5%)
Marital status			
Single	73 (59%)	84 (53%)	157 (56%)
Married or living as married	24 (19%)	34 (21%)	58 (21%)
Divorced, widowed or separated	26 (21%)	40 (25%)	66 (24%)
Living situation			
Lives alone	35 (32%)	79 (52%)	114 (44%)
Lives with partner	24 (22%)	26 (17%)	50 (19%)
Lives with other family members	22 (20%)	32 (21%)	54 (21%)
Lives with others	28 (26%)	14 (9%)	42 (16%)
Employment			
Not employed	85 (90%)	113 (78%)	198 (83%)
Open market employment	9 (10%)	20 (14%)	20 (12%)
Sheltered employment	0	12 (8%)	12 (5%)
Mean Global Assessment of Function	54.1	60.8	57.7
Mean lifetime number of admissions	4.8	4.5	4.6
Mean length of illness (years)	16.0	15.0	15.5
History of having been detained under the Mental Health Act	68 (65%)	78 (59%)	146 (62%)
History of suicide attempt or of being assessed as significantly at risk of suicide (lifetime)	50 (51%)	47 (35%)	97 (42%)
History of violence (lifetime)	51 (46%)	43 (31%)	94 (38%)
Currently viewed by staff as at risk of committing violent act	23 (21%)	9 (6%)	32 (13%)
Has a criminal conviction	40 (32%)	33 (22%)	73 (26%)

also unknown. Seven of the eight had had relatively little contact with psychiatric services prior to case identification, with no admissions or only one admission in their lifetime and no documented history of violence.

For one subject, details at case identification suggested rather more cause for concern about possible consequences of loss to follow-up: this was a 30-year-old single male with diagnosis of schizophrenia who had had six hospital admissions over the preceding 10 years, including an admission under Section 3 of the Mental Health Act in the previous year following detention by the police under Section 136. This subject was not registered with a GP, had a history of violence and was rated by staff as someone at risk of committing a violent act. He was already untraceable by the time of the Time 1 interviews.

For those subjects who were traced, patterns of care at follow-up are similar in the two sectors, with the majority still in touch with specialist mental health services, around one in 10 in touch only with primary-care-level services, and around one in 20 out of contact with any service.

Data on unplanned loss of contact indicate that the rate of loss of contact with patients which has not been planned and seen as appropriate by staff is 7% (95% CI 4–12%) over the period between Time 1 and Time 2 for those where data are available.

Adverse events other than death and their predictors

Table 4 shows the frequencies in each sector of the major adverse events studied. The 14 subjects who had experienced

Table 3 Subjects' whereabouts and care at follow-up

	Number of Nunhead subjects (%) total $n=126$	Number of Norwood subjects (%) total $n=160$	P^1	Total for whole sample (%) $n=286$
Were the subject's whereabouts at the follow-up point successfully established?				
Yes	119 (94%)	159 (99%)	0.012	278 (97%)
Was the type of care received at follow-up established?				
Yes	113 (90%)	157 (98%)	0.002	270 (94%)
Type of care received at follow-up (Nunhead $n=113$, Norwood $n=157$)				
In-patient	8 (7%)	10 (6%)	0.82	18 (7%)
On case load of secondary mental health services, not in-patient	85 (75%)	122 (78%)	0.63	207 (77%)
In prison	2 (2%)	0	0.14	2 (1%)
No secondary service contact, but sees GP and/or other non-secondary care staff[2]	11 (10%)	18 (11%)	0.65	29 (11%)
No service contact	7 (6%)	7 (4%)	0.53	14 (5%)
Has unplanned loss of contact with services occurred?[3] (Nunhead $n=89$, Norwood $n=139$)				
Yes	8 (9%)	9 (6%)	0.48	17 (7%)

1. Nunhead v. Norwood: χ^2 test where sufficient data, otherwise Fisher's exact test.
2. This category includes (a) people cared for solely through regular contact with GPs and (b) people who were not on the case loads of secondary mental health services, but were in contact with other staff with some mental health care role (e.g. support staff in hostels, community support workers, staff at mental health drop-ins).
3. We have defined unplanned loss of contact as having occurred where the subject's care at the follow-up point fits into one of the following categories: (a) The subject has been formally discharged from the care of the secondary mental health team despite the fact that the team believe that continuing care is indicated – this has happened because of the subject's unwillingness to accept follow-up. (b) The subject has not been formally discharged, but contact with the secondary mental health team appears to have lapsed – there has been no contact in the past three months and there is no clear plan for future contact. (c) The secondary mental health team has attempted to make contact with the subject over the past three months, but has not achieved any face to face meeting.

homelessness between the initial interview and the follow-up point had all been in temporary accommodation or hostels: no one had slept rough. Episodes of homelessness had lasted between 1 and 25 months, with a mean of 6.6 months and a median of 6 months.

Twenty-four subjects were reported to have engaged in violent or threatening behaviour. Data were collected on the most serious episodes for each subject. In the Nunhead sector, the most serious assaults and threatening behaviour of 13 subjects were classified as minor, with no more than first aid required by the victim. Four subjects committed moderately severe assaults, following which the victim required medical attention but did not need hospital admission and did not sustain lasting injuries. There was one serious sexual offence, committed by a subject who was on leave from a regional secure unit and resulting in his admission to Broadmoor (a highly secure hospital) – this subject was an in-patient in secure settings throughout the study period so that he had no contact with the local community services. In Norwood four subjects committed assaults classified by our criteria as minor. For one subject, details of the incident are uncertain but it does not seem to have been very severe. One subject committed an assault of moderate severity,

but was later detained in Broadmoor because of unmanageable behaviour while an in-patient. For three of these 24 subjects, the victims of the violent or threatening behaviour included strangers. In all other instances the victims were relatives, friends, acquaintances or mental health staff.

Of the 105 subjects who had any psychiatric in-patient admission between the case identification stage and follow-up and for whom we had data on number of admissions, 45 (43%) had been admitted just once, 53 (50%) on between two and four occasions, and seven (7%) between five and eight times. The mean number of admissions among this group was 2.3 (median 2). Fifty-six individuals had been detained under the Mental Health Act during this period, of whom 24 (43%) had been detained only once, 26 (46%) between two and four times and six (11%) between five and seven times. The mean number of detentions among this group was 2.4 (median 2).

We also examined differences between interview responders and non-responders in rates of adverse events. For violence, in-patient admission, detention under the Mental Health Act, homelessness and unplanned loss of contact with services, rates were similar for responders and non-responders. Eight per cent of responders had been violent or threatening compared

with 11% of non-responders, 40% of responders and 45% of non-responders had been admitted to hospital, 19% of responders and 21 % of non-responders had been detained under the Mental Health Act, 5% of responders and 7% of non-responders had been homeless, and 6% of responders and 9% of non-responders had had unplanned loss of contact with mental health services. The only area where a substantial difference was observed was in rates of non-fatal suicide attempts, where 10 responders (7%) were identified as having made such attempts, compared with only one non-responder (1%: Fisher's exact test $P=0.05$).

Table 5 shows distribution of these major adverse events by ethnic group, indicating significant differences between ethnic groups in rates of detention under the Mental Health Act, though not in the other events studied, with the highest rates of being detained occurring in the Black Caribbean group.

Table 6 shows the results of logistic regression analyses used to investigate variables associated with the major adverse events. These analyses suggest that once major confounders are controlled for, no statistically significant associations persist between sector and adverse events.

With regard to the relationship between ethnicity and compulsory detention, initial

Table 4 Major events during follow-up period (among members of the interview sample still alive at follow-up)

Event	Frequency in Nunhead (% of valid cases)	Frequency in Norwood (% of valid cases)	P[1]	Frequency overall (% of valid cases) (95% CI)	
Episode of homelessness	6 (6%)	8 (5%)	0.81	14 (5%)	(3–9%)
Episode of violent or threatening behaviour[2]	18 (17%)	6 (4%)	<0.001	24 (9%)	(6–13%)
Detention under the Mental Health Act[3]	28 (24%)	28 (18%)	0.22	56 (20%)	(16–26%)
In-patient admission	56 (47%)	61 (39%)	0.17	107 (44%)	(38–51%)
Non-fatal suicide attempt	5 (5%)	6 (4%)	0.75	11 (4%)	(2–8%)

1. Nunhead v. Norwood: χ^2 test where sufficient data, otherwise Fisher's exact test.
2. Definition: person has been involved in a fight, hit or otherwise assaulted someone, or threatened someone with a weapon.
3. For in-patient admission and for detention under the Mental Health Act, the follow-up period is the period since the initial case identification date, rather than since the initial interview date as for the other events.

Table 5 Ethnic variations in adverse events during the follow-up period

Event	White (% of valid cases)	Black Caribbean (% of valid cases)	Black African (% of valid cases)	Other (% of valid cases)	P[1]
Suicide attempt	6 (4%)	4 (6%)	0	1 (7%)	0.63
Episode of violent or threatening behaviour	11 (7%)	8 (12%)	2 (14%)	3 (21%)	0.22
Homelessness	10 (6%)	3 (4.6%)	0	1 (7%)	0.90
Detention under the Mental Health Act	26 (15%)	23 (33%)	4 (27%)	3 (21%)	0.017
In-patient admission	71 (41%)	31 (45%)	10 (62%)	5 (36%)	0.36
Unplanned loss of contact	10 (7%)	4 (7%)	2 (15%)	1 (8%)	0.74

1. P for comparing ethnic groups (χ^2 test where sufficient data, otherwise Fisher's exact test).

multivariate analysis suggests that the significant effect of ethnicity previously seen on univariate analysis has disappeared when other independent variables are entered: the odds ratio for detention under the 1983 Mental Health Act for Black Caribbean people compared with White people emerges from this logistic regression as 1.54 (95% CI 0.58–3.99, $P=0.38$). However, given that ethnicity and past history of being detained are closely associated, it is potentially misleading to conclude, on the basis of analyses in which this past history is an independent variable, that ethnicity and detention are not associated. The logistic regression with compulsory detention as dependent variable was therefore repeated omitting past history of being detained, and the independent variables then emerging as associated with being detained compulsorily were lower GAF score (i.e. greater disability) (odds ratio 0.96 per point on scale, 95% CI 0.93–0.98, $P=0.002$) gender (odds ratio 2.40 for men compared with women, 95% CI 1.10–5.24, $P=0.027$) and age (odds ratio 0.96 per year, 95% CI 0.93–0.99). Again, ethnicity is not significant at $P=0.05$, but it comes very much closer than on initial analyses, with an odds ratio for being detained for

Black Caribbean people compared with White people of 2.19 (95% CI 0.96–4.99, $P=0.063$).

DISCUSSION

Data limitations

The method of collecting data for this element in the PRiSM study has obvious limitations: the reliability of clinical case notes, PAS systems and GP reports in supplying the types of data collected has not been independently investigated, and much of our data collection was retrospective. The amount and likely quality of data obtained varied greatly between individuals. However, a strong justification for the use of these methods is that they have allowed us to obtain information on what has happened to the whole of the sample, responders and non-responders, throughout the study period, rather than being limited to cross-sectional snapshots at just two points in time of the functioning and problems of the interview responders only. Many of the events examined are major ones which are relatively likely to be recorded and recalled, and the use of multiple sources should increase the likelihood that most important events have

been captured. The fairly similar rates of most events reported for responders and for non-responders give some reassurance that we have succeeded in detecting such events without interviewing subjects. However, this does not apply to non-fatal suicide attempts, where the most obvious explanation for the lack of reports of such events among non-responders is that our methodology does not adequately capture them. Standardised ways of recording details of care and of major events need to be developed and validated for follow-up studies of populations of people with severe mental illness.

Do individuals with severe mental illness slip through the net?

Our data give some indications as to whether individuals with mental illness are likely to be 'slipping through the net' and inadvertently dropping-out of care on a large scale, although much of the data is susceptible to a variety of interpretations. There were eight individuals who remained entirely untraced. The most pessimistic explanation for this would be the possibility that these individuals became vagrant. However, examining their characteristics

Table 6 Logistic regression analyses examining associations with major adverse events

Event (dependent variable)	Additional independent variables entered[1]	Independent variables associated with dependent variable at least at P=0.05 level	Odds ratio for independent variables (95% confidence intervals)	P	Direction of effect
Episode of homelessness	History of imprisonment before study period Court conviction before study period	Court conviction before study period	6.7 (1.02–44.1)	0.05	Previous conviction – more likely to experience homelessness
Episode of violent or threatening behaviour	History of violence before study period Court conviction before study period	Previous history of violence	25.4 (2.7–235.9)	<0.001	Previous violence – more likely to be violent again
		Court conviction before study period	4.8 (1.1–21.2)	0.031	Criminal conviction – more likely to be violent
		GAF score	0.94 per point on GAF scale (0.89–1.00)	0.031	Greater disability/symptoms – more likely to be violent
Detention under the Mental Health Act	History of being detained before study period	Previous history of being detained	6.9 (2.1–22.7)	0.001	Detained previously – more likely to be detained in study period
		GAF score	0.96 per point on GAF scale (0.94–0.99)	0.012	Greater disability symptoms – more likely to be detained
		Age	0.95 per year (0.92–0.98)	0.001	Younger age – more likely to be detained
In-patient admission	Number of admissions before study period	Number of admissions before study period	3.1 per admission (1.77–5.38)	<0.001	More previous admissions – more likely to be admitted in study period
	Length of illness	GAF score	0.98 per point on GAF scale (0.96–0.99)	0.04	Greater disability symptoms – more likely to be admitted
Non-fatal suicide attempt	Previous history of suicide attempt or of being assessed as suicide risk	No significant predictors			
Unplanned loss of contact		Male gender	6.7 (1.4–31.8)	0.007	Male subjects – unplanned loss of contact more likely

1. All the independent variables listed in the methods section were entered in each case, together in some of the regressions with some additional ones of specific relevance to the dependent variable being examined: this column lists only these additional ones.
GAF, Global Assessment of Functioning.

suggests that more optimistic explanations are plausible: in all but one instance, the untraced individuals had had limited contact with services and given little cause for serious concern, so that they may be people who have made good recoveries, moved away and stopped having contact with any form of service. The reasons for failure to trace some of the subjects are likely to be administrative: loss of case notes or failure to record names, addresses and dates of birth correctly at the case identification stage may have prevented us tracing some individuals.

Of those who were traced and whose care status was established, a substantial majority were on the case loads of secondary mental health services, suggesting some success in retaining contact with people with psychotic illnesses. A small proportion were followed-up in primary care or other community services, but not by secondary services, and a smaller proportion had no service contact at all. The suitability of this cannot readily be established from our data. However, the proportions out of contact with secondary services do not seem inappropriately high, given that the sample originally included some people who were already out of contact or managed only in primary care, and some who had experienced only one episode of

psychosis, of whom up to a quarter would be expected to remain well without treatment in the long term (Johnstone, 1990).

Our data on unplanned loss of contact provide a further way of gauging how far people may slip through the net. The information on recent care required to assess this is more detailed, and consequently there are larger numbers of missing values than for most of the events examined. With this reservation, the proportions losing contact in an unplanned way do not seem unduly high given the considerable reluctance of some people with long-term mental illness to remain engaged with services. In our data collection, we stipulated

that loss of contact had taken place if attempts at contact had been unsuccessful or had lapsed over a minimum period of three months: we cannot tell how lapses in contact over such a period relate to longer-term loss of contact.

Frequency of adverse events

Data on deaths indicate, as would be anticipated, higher rates of unnatural death in this population than in the local general population, and rates of natural death are also slightly higher. It has been estimated that the lifetime risk of suicide for people with major affective disorders is 15%, and for people with schizophrenia it is estimated as around 10% (Charlton *et al*, 1993). The yearly rate we found implies a lifetime risk of unnatural death for a subject in Nunhead or Norwood aged 40 of about 15%, assuming a potential further life span of 40 years. The risk of unnatural death is therefore approximately similar to the expected suicide rate nationally for people with severe mental illness. However, examination of Table 1 indicates that not all unnatural deaths among people with severe mental illness can be assumed to be suicide, as causes of unnatural death in this cohort included drugs given therapeutically in hospital, an alleged murder and a road traffic accident. In Nunhead three possible suicides occurred, but all pre-dated the intervention period. Five of the deaths in Norwood may have been suicides: of these, one hanging appears to have taken place in hospital, a reminder that in-patient wards as well as the community may be the setting for adverse events.

There are few other data available on rates of homelessness, violence or suicide attempts, either among population-based samples of people with psychotic illnesses or among the general population in inner-city areas, which constrains interpretation of our data on these events. However, some limited reassurance may be drawn from our results. Although around one in 20 were reported to have lived in temporary accommodation during the follow-up period, none was reported to have slept on the streets. Most of the reported episodes of violent or threatening behaviour fell into the less serious categories, and only three were perpetrated against members of the public. The perpetrator of the most serious incident was an in-patient of a secure unit, so that community-based care cannot readily be held responsible for this. Rates of non-fatal

suicide attempts also seem relatively low, but as discussed, this may be the area where collection of good quality information about non-responders is most difficult.

Initial examination of rates of events within each ethnic group suggests that the only event in which there are significant ethnic variations is detention under the Mental Health Act. Black Caribbean people have a rate more than twice as high as White people of having been detained during the follow-up period, despite a similar rate of having been admitted to hospital, suggesting that ethnic groups differ more in circumstances of admission than in levels of need for admission. On multivariate analysis, age, gender and disability had clear associations with

detention, with Black Caribbean ethnic origin just failing to reach the conventional threshold for statistical significance. Thus, our findings about the association between ethnic origin and risk of compulsory treatment are rather more equivocal than some previous examinations of this question: rather than indicating clear-cut ethnic differences, they suggest that there may be a need to consider how younger people in general might be engaged in treatment on a voluntary rather than a compulsory basis.

Are there differences between Nunhead and Norwood?

Once potential confounders are controlled for, the general picture is of few differences

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CLINICAL IMPLICATIONS

■ Rates of homelessness, loss of contact with services, serious violent acts and suicide were relatively low in a cohort of individuals with psychotic illnesses receiving community-based care.

■ There was little evidence of a difference in rates of adverse events or loss to follow-up between a sector in which people received intensive community care and one in which they received standard care, with both appearing reasonably safe.

■ Rates of most types of event were similar across ethnic groups: there was some evidence of higher rates of detention under the Mental Health Act for Black Caribbeans, but this was rather less marked than in some previous studies.

LIMITATIONS

■ The data on which the study was based were in part derived from routine sources, such as general practitioners' records, hospital case notes and hospital patient administration systems, rather than on standardised research assessments.

■ Data collection was to a large extent retrospective.

■ Data obtained on one particular type of adverse event, non-fatal suicide attempts among interview non-responders, appeared unlikely to be accurate.

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between the two sectors in rates of major adverse events, patterns of care or hospital admission and compulsory detention rates. However, we have detected significant differences between the sectors in baseline rates of violence, staff assessments of risk of violence, history of criminal conviction and disability scores, and these initial differences appear to have persisted through the follow-up period in the form of a higher rate of violent and threatening behaviour in the Nunhead sector. Why these important differences should exist between the clinical populations of two demographically very similar sectors is unclear. It may be that the characteristics of the population with serious mental illness in a given area are associated not only with the area's general socio-demographic indicators, but also with the history of its services and of that population with mental illness, so that the availability of services in an area, the extent to which individuals with serious illness tend to be moved into or resettled outside the area and the local housing department's placement policies might all influence the eventual composition of the population.

Although the initial differences between the sectors make comparisons more complex, our hypothesis that the intensive sector would be characterised by lower rates of adverse events has not been confirmed. Rates of such events are relatively low in both sectors suggesting reasonably safe care in both.

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