Effects of community services on disability and symptoms

PRiSM Psychosis Study 4

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Background Community care for people with psychosis can be provided via several different service models. The study compared two models: standard community treatment with high patient: staff ratios, and intensive community treatment in which there was more of an emphasis on community involvement and lower patient:staff ratios.

Method All people fulfilling diagnostic criteria for psychosis and living in two defined geographical areas in south London were identified. These people were provided with either an intensive or standard service depending on their address. Their social behaviour and symptoms were measured at the beginning of the study and after two years.

Results There is little evidence of any effects of the two service models on levels of symptoms. However, the standard service did seem to be advantageous in reducing social disability for those with medium or low levels of disability.

Conclusions The effect of intensive community services was the opposite to that predicted. Despite improvements in outcomes (e.g. hospital admission), there were no advantages for this type of service in the measures of disability or symptoms. In fact, the standard service was effective in reducing disability, whereas in the intensive service there was no change.

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The majority of patients with diagnoses of psychosis are now cared for in the community rather than in hospitals for the large proportion of their life (Department of Health, 1990). Despite the general agreement about the benefits of this form of care in terms of the rights and expectations of patients with mental health problems, there is still no accepted model of the service organisation necessary to deliver a high-quality service.

QUALITY OF CARE IN THE COMMUNITY

The main aim of community services has been to lessen the use of hospital bed provision because it is not only costly but it also takes the patient away from his or her community life with its opportunities for continuing contact with family and friends. The evaluations of community care were successful in supporting these claims. In the UK, studies have shown reductions in hospital bed use but little effect on symptoms or functioning except in one or two cases (Dean & Gadd, 1989; Creed *et al*, 1991; Muijen *et al*, 1992; Burns *et al*, 1993; Audini *et al*, 1994; Marshall *et al*, 1995). The problem with these studies is that they were not epidemiologically based. They admit people to the evaluation once they have come into contact with services, usually when they are in an acute episode. However, community services care not only for those who have had an acute episode, but also for those who need support, sometimes for many years, without a hospital admission. They also offer a service to all those in the community, particularly with diagnoses of psychosis, who may never be admitted. Studies which overcome the acute episode criterion include those which have investigated the transfer of people from long-stay hospitals to the community. Their results show little disadvantage but again few overall improvements in functioning (Leff, 1993) even after six years in the community (Wykes, 1994). What is needed is a more natural experiment where the effects of different service delivery systems on the population of people carrying a diagnosis of psychosis can be investigated.

Two main sorts of service organisation have recently come under scrutiny. These are 'intensive comprehensive care' models (including assertive community treatment (ACT) and intensive case management) in which there is a multi-disciplinary approach with low patient:staff ratios and where the primary aim is to keep people at home and avoid admission (Holloway *et al*, 1995; Bond *et al*, 1995; Marshall & Lockwood, 1998; Muese *et al*, 1998). The remaining group of treatments are those which are generally referred to as 'standard community care'. These services have an emphasis on keyworking. The teams also contain people from different disciplines, but hospital admission is seen as part of the whole service profile and the aim is to improve or maintain functioning and reduce levels of symptoms. The patient:staff ratio is higher than in the intensive models (Holloway *et al*, 1995; Marshall & Lockwood, 1998; Mueser *et al*, 1998).

As well as the reduction in relapse and admissions, all mental health services should aim to reduce the disability of their users, which means reducing symptoms and improving social functioning (Holloway, 1991). If people are more engaged with their own community, they will have the chance to practise their life skills and keep in contact with family and friends as well as developing new social contacts. This engagement with community life has to be carried out in the context of reducing or containing levels of risk, particularly of violence and self-harm. The necessity of risk management has been highlighted in several recent UK and US reports (e.g. Estroff *et al*, 1994; Flannery *et al*, 1997). It has also been suggested that community care can produce detrimental effects but there is little strong evidence to support this contention.

Two recent reviews concluded that although intensive models have been effective in reducing hospital bed use and have a moderate effect on symptoms, they were ineffective in improving social outcome (Meuser *et al*, 1998; Marshall *et al*, 1998). There are several reasons why this result might be expected. One reason is methodological – the populations studied in the two service models may have been different. Patients admitted to intensive services are more likely to be chosen from the most severe end of the disability range than those admitted to standard care management. The comparison may therefore not be fair. Again this suggests the need to study the effectiveness of the two different models in an epidemiological setting.

A further reason why the intensive services may not produce social functioning changes is that these models concentrate on directly assisting patients to meet immediate needs and this process may not be helpful in promoting individual independence or self-reliance.

In order to investigate whether an intensive community service with its emphasis on crisis management and high levels of support does produce extensive clinical gains (in symptoms and functioning) two services – an intensive and standard service – were compared over a two-year period. The services were based in two matched geographical areas but whereas the standard service was mainly based around a hospital, the intensive service had two bases in the community. The service philosophy differed between the two settings as did the service organisation. Details on service provision are given in paper 2 of this series (Becker *et al*, 1998). The main focus of the present paper is the effects on functioning and symptoms, particularly the effect on challenging behaviour.

METHOD

Measures

(a) Global Assessment of Functioning (GAF; Endicott *et al*, 1976) – this schedule measures general levels of functioning on a 1–100 scale. Each 10-point mark is anchored with detailed levels of functioning.

(b) Social Behaviour Schedule (SBS; Wykes & Sturt, 1986) – this is a detailed measure of instrumental functioning describing 21 different problem areas which limit rehabilitation potential. It has been used in a number of hospital and community service evaluations and has good reliability and validity.

(c) Brief Psychiatric Rating Scale (BPRS; Ventura *et al*, 1993) – this is the 24-item version of the scale which has high reliability and validity. The scale points are anchored and there are suggested questions for each separate item to reduce rater drift.

(d) Schedules for Clinical Assessment in Neuropsychiatry (SCAN; World Health Organization, 1992) – this is a detailed interview based on the Present State Examination (Wing *et al*, 1974).

Design

The study is a prospective, epidemiologically based service evaluation in two matched geographical areas in south London. Each area had a distinct service organisation and philosophy which is discussed in detail in paper 2 in this series (Becker *et al*, 1998). The areas were matched on a number of variables which are predictive of service use and prevalence of need (see paper 1 in this series for full details; Thornicroft *et al*, 1998).

People with possible diagnoses of psychosis were identified in the community and via service contact records. After identification of the total population of subjects, these were further screened for definite cases of psychosis using OPCRIT (McGuffin *et al*, 1991) and SCAN (World Health Organization, 1992). There were 514 people in the total population. This represents a prevalence of 7.7 per 1000 population aged over 15 (95% CI 7.1–8.4). Of this population half were randomly chosen as the sample. Data from this sample were collected at Time 1, the beginning of the study and Time 2, two years later.

Procedure

Disability data were collected at each of the three different time points shown in Table 1. The baseline is the identification of the total population of people with psychosis.

Table 1 Disability data at different time points

Disability schedule	Time frame		
	Pre-sampling	Time 1	Time 2
GAF	√	√	√
SBS		√	√
BPRS		√	√
SCAN		√	√

GAF, Global Assessment of Functioning scale; SBS, Social Behaviour Schedule; BPRS, Brief Psychiatric Rating Scale (24-item); SCAN, Schedules for Clinical Assessment in Neuropsychiatry.

Statistical analysis

The general strategy of analysis is given in paper 1 in this series (Thornicroft *et al*, 1998). Comparisons were made both within and between groups over time. Repeated measures analysis of variance was used to compare the sectors overall (both Time 1 and Time 2), to test changes over time and differential effects between sectors. Analysis of covariance was used to estimate the effect of the two types of service, controlling for differences at Time 1. If the parallel line assumption was not met (i.e. there was evidence of different effects across the spectrum of disability), then this was investigated further. Sensitivity analyses were performed and, if they were different from the overall analyses, they are reported.

RESULTS

Are the samples representative?

From the 514 people in the population 302 were chosen to be sampled. The number of subjects actually interviewed varies between measures and across time because of problems of contacts, refusal of information, death, etc. The effects of some of these issues were investigated by Johnson *et al* (1998, paper 3 this series) and Thornicroft *et al* (1998, paper 1 this series). This basic information about the population and the sample who have complete SBS follow-up data is given in Table 2.

There are very few differences between the sample and the population (Table 2) and there were also no differences between the sampled and non-sampled individuals on the GAF. However, the intensive sector service contains users who are significantly more disabled than the standard service users. This occurs because although the sectors were chosen for their similarity on general population variables, there are differences between the sectors in the development of mental health services over the past 10 years. These are discussed by Becker *et al* (1998) in paper 2, this series.

What are the levels of disability compared to other samples?

The percentages of users with problems on the SBS are shown in Table 3, together with comparison data from an inner-London area similar to the ones in which the service evaluation was carried out. The results are broadly similar. The main differences are in the levels of anxiety, hostility and difficulties

Table 2 Diagnosis, disability and socio-demographic information

	Population (*n*=514)	Intensive community service sample (*n*=83)	Standard care (*n*=107)
Average age	42	43	43
	(range 15–89)	(range 15–89)	(range 18–81)
Percentage male	49%	58%	45%
Diagnosis			
Functional psychosis	77%	70%	78%
Affective psychosis	16%	18%	14%
Other	7%	12%	8%
BPRS total score	–	37	35
		(range 24–71)	(range 24–71)
GAF score	58	55	62*
	(range 10–90)	(range 10–88)	(range 20–85)
SBS			
Severe problem score	–	1.7	1.3
Total score		(range 0–10)	(range 0–7)
		12.1	8.3*
		(range 0–47)	(range 0–31)

*Significant difference between sector samples at Time 1, $P<0.01$.
BPRS, Brief Psychiatric Rating Scale; GAF, Global Assessment of Functioning scale; SBS, Social Behaviour Schedule.

Table 3 Items on the Social Behaviour Schedule scoring as at least a mild problem

Item	PRiSM data (%)	Camden data[1] (%)
Underactivity	27	26
Other behaviours	26	–
Depression	19	24
Odd or inappropriate	17	27
Self-care	17	28
Overactivity	16	25
Laughing and talking to self	13	14
Posturing and mannerisms	13	15
Taking initiative	12	17
Socially unacceptable manners/habits	11	13
Attention seeking	11	14
Incoherence	10	14
Concentration	10	13
Anxiety	9	26
Hostility	8	16
Making appropriate social contacts	8	16
Slowness	7	14
Acting on bizarre ideas	6	6
Sexual behaviour	5	2
Suicide	4	6
Destructive to property	2	4

1. From Harvey, C. (1996).

in making social contacts, where the current study population had less disability. These differences can be explained by sampling frames of the two studies. There was no criterion in the present study for established contact with the psychiatric services and, therefore, we were likely to include those with lower levels of disability.

Not all the group was disabled. Nearly one-third had no behaviour problems measured on the SBS and one-quarter scored above 70 on the GAF. Of the people who were interviewed on the symptom rating (BPRS), one-quarter did not score on more than one item.

Are there changes over time in social functioning and symptoms?

There was only one significant change over time in the total BPRS score, for the intensive sector only: the level of anxiety and depression was reduced (means: Time 1=6.6, Time 2=5.7; t=2.3, d.f.=66, $P<0.05$). There were no changes in the standard sector over time.

Overall there was a modest improvement in functioning over the two years of the study with a reduction in disability which was significant on the SBS but not on the GAF (paired t-tests, total SBS score means Time 1=10, Time 2=8.1; difference =1.9, $P<0.01$, 95% CI 0.5–3.3).

Do the service models differentially affect disability and symptoms?

Differential effects between sectors were investigated using analyses of covariance with sector as the independent factor and initial level of disability as the covariate. In order to check that there were no differential effects on changes in disability between sectors the model tested included the interaction between sector and baseline level of disability. This was important because for the analyses of social behaviour the interaction between sector and initial level of disability was significant (P= 0.007), indicating that there was a different relationship between Time 1 and Time 2 values between the two sectors. The putative differential effects of the two service models were therefore investigated by fitting a model including the interaction term and predicting the mean sector difference at different levels of disability (25%, 50% and 75% quartiles: 2, 7 and 14 respectively). On this basis the estimated differences between the standard and intensive sectors were 4.23 (95% CI 1.25–7.2), 2.54 (95% CI 0.18–4.91) and 0.18 (95% CI −2.28–2.64) at low, medium and high levels. These show an advantage to the standard sector at low and medium levels but no evidence for differences at higher levels.

For extremely high values at Time 1 (SBS scores of ⩾30) the model would predict an advantage to the intensive sector at $P=0.05$. However, the model is not well defined since there was only one user in the standard sector in this category. Those five users scoring above 30 in the intensive sector are relatively influential on the regression model and when these are omitted a simple main effects model fits well with a mean advantage to the standard sector of 2.3 (95% CI 0.1–4.5, $P=0.04$).

Table 4 Changes in social functioning and symptoms at different severity levels

	Severe behaviour at Time 1		No severe behaviours at Time 1	
	Time 1 mean (95% CI)	Time 2 mean (95% CI)	Time 1 mean (95% CI)	Time 2 mean (95% CI)
SBS total	15.5	10.4	3.19	3.89
	(13.1–17.2)	(8.2–8.7)	(2.0–4.3)	(2.1–5.7)
BPRS total	38.8	34.6	31.8	31.7
	(35.4–42.2)	(32.1–37.1)	(29.3–34.3)	(29.7–33.7)
GAF total	50.5	57.3	71.2	70.1
	(46.1–54.9)	(52.5–62.1)	(68.5–73.8)	(66.1–74.1)

SBS, Social Behaviour Schedule; BPRS, Brief Psychiatric Rating Scale; GAF, Global Assessment of Functioning.

In order to test further whether these differential effects were due to the distribution of the data in each sector, a repeat analysis was carried out using a square-root transformation. This showed that over the whole range there was an advantage to the standard sector ($P=0.08$). The analysis of the GAF scores also showed a similar but non-significant overall advantage to the standard sector. Controlling for age, gender, marital status, ethnic group and accommodation support made little difference to the original model fitted. The sector effect was further investigated by comparing the proportions who deteriorated or improved in each sector (see severity analyses below).

Does community care cope with people with severe and challenging behaviours?

Severe disability was defined as scoring at least 3 on any item on the SBS. Any person scoring at this level would require some intervention and/or supervision by a health or social care agency. Users with severe disability did improve significantly more than the remaining group, which would be expected in the presence of ceiling effects but it also reflects the service's ability to engage with these individuals (repeated measures analysis of variance with sector and severity (severe *v.* not severe) as the between-subjects effects: SBS total score $F=17.2$, $P<0.001$; symptoms score $F=7.2$, $P<0.01$; GAF total $F=8.1$, $P<0.005$: see Table 4 for means).

The proportions of people with severe disability for the two sectors over time is shown in Table 5. The individuals making up the group with severe problems did not remain the same. Only 46% in the intensive sector and 28% in the standard sector had severe disability at both time points. However, three times as many people in the standard sector who changed their status improved (22 *v.* 9%) but in the intensive sector the proportions of people who improved or deteriorated were similar (17 *v.* 12%). From Table 5 it is clear that the proportions of people who had severe disability were similar at Time 1 but significantly different at Time 2. The standard sector has significantly reduced the proportion of people with higher levels of disability ($\chi^2=7.86$, $P<0.005$). These data support the previous finding that the standard sector was reducing disability.

Challenging behaviour was defined as scoring as a moderate problem on the SBS for any of the following items: destructive behaviour, hostility, overt sexual activity, suicidal behaviour and/or suicidal ideas or hostility on the BPRS. This score then includes all those people who have exhibited these behaviours over the previous month. Challenging behaviour was associated with more disability and high levels of symptoms (differences between those with and without challenging behaviours: Time 1 SBS $t=4.3$, $P<0.001$ (means 8 *v.* 16) 95% CI, -11.8–4.4; BPRS $t=4.2$, $P<0.001$ (means 32 *v.* 43) 95% CI -15.7 to -6.3; Time 2 SBS $t=1.8$ $P<0.07$ (means 7.5 *v.* 10) 95% CI -5.4–0.22, BPRS $t=3.9$, $P<0.001$ (means 32 *v.* 38) 95% CI -10.5 to -3.4). There were no differences in the proportion of people showing challenging behaviour between the two sectors at either time point. Table 6 shows the overall numbers and the population estimates. Twenty-three per cent of the sample had a challenging behaviour. The same number of people exhibited either suicidal or hostile challenging behaviour at both time points. However, the overlap in terms of the particular individuals involved is only one-third of those with hostile behaviour and a half of those with suicidal behaviour. There were no differences in the proportion of people with challenging behaviour between the two sectors at either time point. In addition, analyses of interaction terms revealed no effects on disability due to random error.

Table 5 Percentages of people with severe disability

	Intensive sector	Standard sector
Time 1	62	50
Time 2	58	37

Table 6 Number of people with challenging behaviour[1] (rate per 1000 population)

	Time 1	Time 2
Hostile challenging behaviour	43 (1.7, 95% CI 1.2–2.3)	33 (1.2, 95% CI 0.9–1.9)
Suicidal challenging behaviour	6 (0.24, 95% CI 0.08–0.51)	16 (0.65, 95% CI 0.38–1.06)
Either type of challenging behaviour	44 (1.8, 95% CI 1.3–2.4)	43 (1.7, 95% CI 1.2–2.3)

[1] Of the 190 interviewed.

DISCUSSION

The study reported here had an epidemiological sampling frame. The criteria for entry were the presence of a diagnosis of psychosis or behaviours which were later confirmed as related to that diagnosis. The sample included a wide range of disability including those who currently had no measurable behaviour problems or symptoms. However, there were also people who had very severe behaviour problems and/or challenging behaviours. The level of disability was very similar to that observed in other similar surveys of inner-city mental health services, but at the time of sampling there was an unexpected difference between the sectors as the intensive care sector had on average higher levels of disability. But the proportions of people with challenging behaviours were the same for both sectors. It is therefore reasonable to assume that the sample was representative of users of mental health services and therefore could support a reasonable test of the two service models as long as the initial differences could be controlled in the analyses.

Over the course of the study there was a reduction in disability but no change in the overall level of symptoms in the whole sample. The level of challenging behaviour remained static over the two years but less than half the individuals maintained their challenging behaviour status. These people not only had a challenging behaviour but they also tended to be the ones who had the most symptoms and the most severe disability. The task for community services is therefore to identify this group of patients for continuous high support. For the remaining group community services must be continually assessing their status so that resources for higher support can be transferred in a flexible manner.

The most surprising finding was that although there were improvements in the subjects overall, the most advantageous model was not intensive care but the standard community service. This conclusion was supported by two separate analyses. The first shows that the effect on subjects was different over the different disability levels with the significant advantage being to the standard sector at the medium and low levels of disability. When cases with very high levels of disability on the SBS (total score $\geqslant 30$) were excluded the advantages over the remaining range to the standard sector was clear. The second analysis showed that the standard service was able to reduce the overall severity of disability whereas the intensive sector tended only to maintain it. These differential changes would, over time, produce differential levels of severity between the two samples of the sort we identified in our baseline sampling. In other words, the greater severity in the intensive sector at Time 1 would continue as a result of this intensive service provision.

At first glance these findings are similar to those produced by ACT models. That is, these intensive services were generally designed to reduce hospital admissions in the group who had the highest levels of admissions and the results of studies support this claim (Marshall & Lockwood, 1998; Marshall *et al*, 1998; Mueser *et al*, 1998). However, there were no advantages between ACT models and standard services in social functioning and symptoms. It is possible that the differences observed in this study were because of the different criteria for entry. However, when the same criteria are adopted (more than one previous admission) then the results are identical. There is an advantage to the standard care group (intensive: improve $n=8$, deteriorate $n=8$; standard care: improve $n=16$, deteriorate $n=5$). The differential effect was significant for the standard sector (McNemar $P<0.04$).

Frequency of hospital admissions is likely to be correlated with level of disability so the intensive models may be beneficial mainly for those with the most severe levels of disability and it might be argued that the data presented in this study support this claim. However, the only supporting evidence is from six people who are extremely disabled and who are mainly present in the intensive care sector, so we cannot perform a true comparison. In addition, when investigated in more detail, the case for standard community care in preference to the intensive model is more compelling. In the standard service the overall proportions of people with severe disability decreased over the two years of the study, whereas they remained static in the intensive sector. This is evidence that the standard service can have an effect on the overall disability of the group. The intensive sector, however, had no effect on the overall proportion of people with severe disability, despite this being one of the main aims of this service model.

Clearly there are other advantages for intensive services which are reported elsewhere in this series. The intensive sector did decrease admission to hospital rapidly and increased community engagement for patients in this service. The concentration on these aspects of mental health care may have been to the detriment of other important factors such as social disability, which may have effects on future service provision and quality of life (Wykes & Sturt, 1986). Proponents of intensive community care may point to the discrepancy between our two samples at the outset of this study as a possible explanation of our results. It was certainly true that people in the intensive service had higher disability scores and this may have made the job of the team harder; however, these differences were accounted for in our analyses.

What may explain our results is the dependence in the intensive sector on responding to the immediate needs of clients. This may have produced some improvements but to the detriment of a long-term rehabilitation process which would have affected social outcomes.

In conclusion, community-oriented care, which is what both our sector services provided, did systematically improve aspects of social functioning but had little impact on symptoms. There was little evidence that the intensive community service showed more achievements for disability reduction than standard care – in fact, the opposite was true.

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CLINICAL IMPLICATIONS

- Community care models improve social functioning in patients with psychosis, but have little impact on symptoms.
- For most patients standard community care models have a greater impact on social functioning than intensive services.
- Intensive services may have only a limited application in comprehensive community care.

LIMITATIONS

- The results may only apply to community psychiatric services operating in the inner city.
- The intensive care sector had more patients with very severe social functioning problems, which may have limited its effectiveness with the remainder of the sample.

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