The British Journal of Psychiatry

 Volume 173(10), October 1998, pp 334-340

Utilisation of mental health services and costs of patients with schizophrenia in three areas of Spain

[Papers]

HARO, J. M.; SALVADOR-CARULLA, L.; CABASES, J.; MADOZ, V.; VAZQUEZ-BARQUERO, J. L.

JOSEP MARIA HARO, MD, Centre de Salut Mental de Gava, Sant Joan de Deu-SSM, Barcelona, Spain; LUIS SALVADOR-CARULLA, MD, Centro de Investigacion en Minusvalias, Universidad de Cadiz, Spain; JUAN CABASES, PhD, Departamento de Economia, Universidad Publica de Navarra, Spain; VICENTRE MADOZ, MD, Fundacion Argibide, Navarra, Spain: JOSE LUIS VAZQUEZ-BARQUERO, MD, Unidad de Investigacion en Psiquiatria, Social, Universidad de Cantabria, Spain

Correspondence: Joseph Maria Haro, CSM Gava, Sant Joan De Deu-SSM, 13-15, E-08850 - Gava, Barcelona, Spain. Tel: 4393-662-51-52; Fax: 3493-662-55-56; e-mail:27652jha@comb.es

(First received 27 February 1998, final revision 16 June 1998, accepted 16 June 1998)

Abstract

Background The analysis of the costs of schizophrenia and its treatment under different mental health care structures will facilitate the improved allocation of the limited resources available for the treatment of schizophrenia.The research we present compares health service use and total health care costs of three cohorts of subjects with schizophrenia which are representative of three areas of Spain (Burlada in Navarra, Cantabria and the Eixample of Barcelona).

Method We selected first-time contacts with any psychiatric service who received a diagnosis of schizophrenia. Subjects were evaluated in the third year after onset.

Results The mean number of out-patient visits per patient per year was 10.7 and the mean in-patient days were 9.5. The mean direct cost per patient in the third year of treatment was US$2243. Costs were higher for single subjects and for people who had a relapse. Costs of subjects with better functioning were lower than costs of subjects with a worse state.

Conclusions Direct costs of care in Spain were lower than the reported figures from other western European countries.Costs were greater in the two centres with greater community mental health service development. Some of the findings may be explained by service availability.

The movement towards deinstitutionalisation started in Spain in the late 1970s. However, the development of community services has evolved at very different paces in distinct areas of the country. This diversity creates an opportunity to compare mental health care use and costs under different health care structures, that may facilitate the improved allocation of the limited resources available for the treatment of schizophrenia. The research we present uses a 'micro level' approach (Rice & Miller, 1996) [17] to compare health services use and total health care costs of three cohorts of subjects with schizophrenia in the third year after onset. These three cohorts are representative of three areas of Spain with very different socio-demographic characteristics and mental health services development.

METHOD

Spain is a country with several autonomous regions. The health services of these regions are mostly administered by the autonomous governments. This has lead to the coexistence of different health policies in which public, non-profit-making and private agencies have diverse roles. In this study we compare three catchment areas that represent different scenes in the mental health care reform. The area of Burlada (a region of the autonomous region of Navarra) has a wide development of public community services; Cantabria, an autonomous region in the north of Spain, has hardly initiated the mental health care reform; and the Eixample, a district in the centre of Barcelona, has an important private sector besides the network of community and rehabilitation services.

The comparison of mental health services among areas is hindered by the fact that the heterogeneity in the development of services has lead to the use of similar names for facilities with very different resources that offer different programmes. For example, the term day hospital may be used to name a service that provides certain types of treatments (electroconvulsive therapy) or a service with partial hospitalisation whose objective is patient rehabilitation and whose mean length of stay is several months. An international glossary is needed in order to avoid this problem. The European Service Mapping Schedule, Spanish Version (Salvador-Carulla et al, 1997) [19] has been designed to provide a standardised description of services. We have used this instrument to compare the three areas, which ensures that services are compared not in relation to names, but to human and material resources, patients served and treatment provided.

Description of the three areas

The area of Burlada includes a part of Pamplona, the capital of the autonomous region of Navarra, and a rural region nearby, with a population of 60 000 inhabitants. The area has a community network of psychiatric services: a mental health centre for the treatment of people with mental disorders including drug misuse, a day hospital, a day care centre, a sheltered work centre and use of several in-patient units (a unit for acute patients in a general hospital and units for acute and long-stay patients in a mental hospital located outside the area). All the services are funded by the Government of Navarra, but the managing agencies of all the community centres are non-profit-making agencies.

The epidemiological catchment area in Cantabria covers the whole autonomous region with a population of 530 000 inhabitants. The capital of the region, Santander, has around 200 000 people, and the rest of the population lives in semi-urban and rural areas. Community mental health services are much less developed than in the other two areas. The area has three mental health care centres and an acute in-patient unit, a 24-hour emergency unit and an out-patient service located at a university hospital. There are no public tertiary mental health resources as day care centres and the mental hospital in the region does not admit new patients. All services are managed and funded by the Spanish central government. Psychiatric care of the cohort was given by the Psychiatric Department of the University Hospital (Vazquez-Barquero et al, 1995) [23].

The third area is the Eixample, a district of Barcelona with 275 000 people. The area, located in the centre of a city with almost two million inhabitants, has a wide range of public and private health services. The network of public mental health services includes two primary

mental health care centres, an acute in-patient unit in a university hospital, medium- and long-term in-patient units in a mental hospital (located outside the area), a day care centre and a day hospital. Besides these services, the area has several public hospitals with psychiatric units and a number of private ambulatory offices. The area lacks sheltered work centres. The public mental health network is funded by the Catalan Autonomous Government, but its services are managed by public, private and non-profit-making agencies.

The three areas differ in relevant sociodemographic variables: the unemployment rate in Navarra was 14.7% in 1994, compared with 24.6% in Cantabria and 23.4% in Barcelona; mean expenditure per household per year was US$24 070 in Navarra, US$19 215 in Cantabria and US$22 875 in Barcelona. Barcelona has the highest immigration rate: 37.1% of the people were born outside the province, compared with 14% in Cantabria and 18.6% in Navarra; but the proportion of people who live alone is very similar in the three areas (around 13.5%).

Patient selection

We selected three incident representative samples of patients, one in each area. Cases selected were first-time contacts with any psychiatric service (either in-patient or out-patient) who received a diagnosis of schizophrenia (DSM-III-R criteria; American Psychiatric Association, 1987 [1]), lived in the catchment area and whose age was between 16 and 45 years. Cases with a primary diagnosis of learning disability or drug misuse or dependency were excluded.

Since health information systems and population in each area were different, we used different methodologies and time periods to assure representativeness of the selected samples. The Cantabrian cohort included all patients suffering from a first episode of schizophrenia who, over a one-year period, made their first contact with any of the Cantabria public mental health services. This sample has been shown to be representative of the incident cases of schizophrenia in the area (Vazquez-Barquero et al, 1995) [23].

Burlada has a cumulative psychiatric case register that started in 1987. The register includes all people who have been in contact with any public psychiatric service in the area. Patients selected were those who during a four year period (1989-1992) fulfilled the inclusion criteria. We had to use a longer recruitment period since this area has the lowest population of the three.

Barcelona has no psychiatric case register. Cases were selected from a database created for a wider project that included all patients who had contacted any service in the public mental health network during a five-year period. Patients selected were first-time contacts with any public mental health service during the period 1990-1992 who fulfilled the inclusion criteria.

The total number of subjects selected was 112; 42 in Burlada, 40 in Cantabria and 30 in Barcelona. Four subjects were excluded from the analysis: two patients from Burlada moved away from the province, one in Cantabria committed suicide (in the first year of follow-up), and one person in Barcelona refused to participate. A total of 108 subjects were included in the analysis (participation rate of 96.4%).

Methods

Assessment

Subjects were evaluated in the third year after onset. Information about service use, informal care, indirect costs, functioning and disability was obtained for each subject. Since comprehensiveness of data is important in the measurement of service use and costs, information about each subject was obtained from all available sources (clinical charts, health care databases and subject and family interviews). In case of discrepancy of service use, which we think was mainly due to recall biases from subjects and their families, the data in the clinical charts and databases were used. All subjects and family members interviewed were informed about the objectives of the study and agreed to participate.

A standardised psychiatric interview was used to confirm the diagnosis of schizophrenia. The Spanish version of the Present State Examination (PSE-9) was used in Cantabria (Vazquez-Barquero et al, 1987) [22] and the Schedules for Clinical Assessment in Neuropsychiatry (SCAN; Vazquez-Barquero, 1993 [21]) in Barcelona. Subjects in Burlada were evaluated using a standardised psychiatric interview that included the Brief Psychiatric Rating Scale (BPRS; Overall & Gorham 1962 [16]).

The Questionnaire for Cost Evaluation in Schizophrenia was also administered. This instrument is an adaptation of the Client Service Receipt Interview (CSRI; Beecham, 1995 [3]) for the Spanish health system. The CSRI records health service use an indirect costs and has been widely used in studies of cost in mental disorders (Beecham, 1995) [3].

Measurements of functioning and disability were made using the Disability Assessment Schedule, short version (DAS-sv; Janca et al, 1996 [10]), Global Assessment of Functioning scale (GAF; American Psychiatric Association, 1994 [2]) and Social and Occupational Functioning Scale (SOFAS; Goldman et al, 1992b [7]).

Cost calculation

The calculation of direct costs was based on health service use relating to schizophrenia. This included, for example, psychiatric visits and admissions, primary care visits related to mental problems and use of residential facilities that could be attributed to disabilities associated with the disorder (a person unable to live on his or her own). Service use not related to schizophrenia was excluded, for example admissions to hospital for medical reasons. Doubtful cases were included. Charges were used to measure direct costs. Despite the fact that the identification of the long-run marginal opportunity cost is the optimum method for cost calculation (Netten & Beecham, 1993), [15] the diversity of services used by the population in our study made charges the only available measure. A sensitivity analysis was used to test the influence that a change in the cost of each particular service would have on total costs. All figures were converted into US$ using the average exchange rate of 1994 (US$1=131.7 Spanish pesetas).

In calculating the indirect costs we included loss of productivity of the subject and his or her family members due to caring for the patient and the informal care given by family members. For the calculation of the loss of productivity we used a conservative approach, since only those subjects and family members who had been actively working at some time were included. Time spent on care and loss of productivity was converted into monetary value using the mean salary in Spain.

Statistical analyses

Statistical analyses were performed with SPSS for Windows 6.0.1. Chi-squared tests and one-way analysis of variance were used to calculate statistical differences in socio-demographic and clinical variables among the three samples. Since costs have a very skewed distribution, a logarithmic transformation was used in the analysis of the relationship of costs with the other relevant variables. One-way analysis of variance and correlation coefficients were employed for bivariate comparisons. Finally, multiple regression was utilised to account for the influence of covariates.

RESULTS

(Table 1) shows the main socio-demographic characteristics of the three cohorts. Around 60% of the subjects were male and the mean age was approximately 28 years. Mean age and gender distribution were similar to the results of other European incidence studies (Hafner et al, 1993) [8]. Most of the subjects lived with their parents, which is usual for people with schizophrenia in Spain. The rate of employment was between 25 and 40% and the rate of unemployment between 22 and 50%. There were no significant differences in these socio-demographic variables among the three samples.

	Burlada (*n*=40)		Cantabria (*n*=39)		Barcelona (*n*=29)	
Male, *n* (%)	26	(65.0)	22	(56.4)	18	(62.1)
Mean age, years (s.d.)	27.9	(5.8)	28.4	(7.3)	27.3	(6.2)
Single, *n* (%)	36	(90.0)	26	(67.7)	24	(82.8)
Accommodation type						
Living with parents or siblings, *n* (%)	33	(82.5)	26	(66.7)	19	(65.5)
Living with spouse or children, *n* (%)	4	(10.0)	10	(25.6)	3	(10.3)
Living alone, *n* (%)	1	(2.5)	1	(2.6)	3	(10.3)
Living in a community psychiatric residence, *n* (%)	1	(2.5)	0		0	
Living in a mental hospital, *n* (%)	1	(2.5)	0		1	(3.4)
Other, *n* (%)	0		2	(5.1)	3	(10.3)
Occupation						
Employed, *n* (%)	15	(37.5)	11	(28.2)	11	(37.9)
Student, *n* (%)	3	(7.5)	6	(15.4)	1	(3.4)
Housekeeper, *n* (%)	3	(7.5)	7	(17.9)	1	(3.4)
Unemployed, *n* (%)	9	(22.5)	11	(28.2)	15	(51.7)
Other, *n* (%)	10	(25.0)	4	(10.3)	1	(3.4)

Table 1. Socio-demographic characteristics of the three cohorts

(Table 2) presents health service use in the third year after onset. The mean number of out-patient visits per patient per year was 10.7 (s.d.=11.5). This number was significantly different in the three centres: 11.2 (s.d.=7.8) in Burlada, 5.8 (s.d.=3.9) in Cantabria and 16.4 (s.d.=18.2) in Barcelona ($P < 0.001$). This difference is accounted by the greater number of nurse visits in Burlada and private out-patient visits in Barcelona.

	Burlada (n=40)	Cantabria (n=39)	Barcelona (n=29)	Total (n=108)
Hospital services (in-patient days)				
General hospital	86	321	26	433
Psychiatric hospital	365	0	228	593
Total in-patient days	451	321	254	1026
Community out-patient services (visits)				
Public sector				
Psychiatrist	207	166	143	516
Psychologist	46	4	18	68
Social worker	9	3	8	20
Psychiatric nurse	124	27	0	151
Group therapy	6	0	24	20
Hospital emergency services	3	9	19	31
Family practitioner	27	0	56	83
Private sector				
Psychiatrist	24	18	60	102
Psychologist	0	0	146	146
Alternative medicine	4	0	2	6
Total number of community out-patient visits***	450	227	476	1153
Residential and tertiary or rehabilitation centres (days)				
Psychiatric residency	365	0	365	730
Day hospital	46	0	180	226
Day care centre*	374	0	1020	1394

*$P < 0.05$, ***$P < 0.001$.

Table 2. Health service use in the third year after onset of illness for the three cohorts

The mean number of in-patient days for the cohort was 9.5 (s.d.=40.8). Although there were no significant differences in total length of stay for the three cohorts, type of hospital used differed greatly: all admissions in Cantabria were at a general hospital, whereas in the other centres they mostly corresponded to psychiatric hospitals. The higher number of in-patient days in Burlada was due to a subject who had been admitted to a long-stay psychiatric unit and who remained at the hospital for the whole year.

Since Cantabria had no residential, tertiary or rehabilitation centres, subjects were not able to use these types of facilities. The mean number of day care centre visits for Burlada and Barcelona were 9.4 (s.d.=42.9) and 35.2 (s.d.=96.9), respectively ($P < 0.05$).

(Table 3) shows the clinical characteristics and the functioning and disability measures of the three cohorts. Comorbidity was evaluated based on the diagnosis present in the subjects' clinical charts. Comorbidity was much lower in Cantabria. Substance misuse, mostly alcohol misuse, was the most frequent comorbid disorder. No significant differences were found in functioning measures. Although Cantabria had the lowest relapse rate, the difference does not reach statistical significance.

	Burlada (n=40)	Cantabria (n=39)	Barcelona (n=29)
Substance misuse, n (%)***	9 (22.5)	1 (2.6)	12 (41.4)
Other psychiatic disorders, n (%)***	11 (27.5)	0	2 (6.9)
Relapse, n (%)	14 (35.0)	9 (23.1)	14 (48.3)
Mean GAF score (s.d.)	67.0 (9.9)	61.5 (15.1)	61.0 (19.1)
Mean SOFAS score (s.d.)	64.7 (10.9)	61.8 (15.2)	61.7 (19.5)
Mean DAS–sv score (s.d.)			
Personal	0.7 (0.9)	0.8 (0.7)	0.5 (0.6)
Family	1.5 (0.9)	1.5 (0.9)	1.6 (1.4)
Occupational	1.8 (1.1)	2.1 (1.1)	2.6 (1.9)
Other activities	1.8 (0.9)	1.7 (1.1)	1.4 (1.2)

***$P < 0.001$. GAF, Global Assessment of Functioning scale; SOFAS, Social and Occupational Functioning Scale; DAS–sv, Disability Assessment Schedule, short version.

Table 3. Clinical functioning and disability data for the three cohorts at the third year after onset

The mean direct cost per subject in the third year of treatment was US$2243 (see Table 4). Barcelona had the highest cost per patient (US$2796) and Cantabria the lowest cost. The distribution of direct costs was very different in the three centres: in Cantabria 76% of the costs were generated by in-patient hospital services, the percentage in Barcelona was 31% and in Burlada 49%.

	Burlada	Cantabria	Barcelona
Direct costs			
Community out-patient services	316	185	692
In-patient services	1174	1422	920
Residential and tertiary services	459	0	832
Drugs	249	242	331
Laboratory and other medical examinations	10	18	22
Mean total direct costs (s.d.)	2208 (990)	1868 (652)	2798 (922)

Table 4. Direct costs per patient in US$ for the three cohorts at the third year after onset

Relation of direct costs with socio-demographic, functioning and disability data

In order to study the relationship of direct costs with the socio-demographic characteristics of the subjects and the functioning measures, we grouped the three samples. Although there was a tendency for costs to decrease with age, single subjects had a much higher cost (US$2559 per subject) than married subjects (US$979); subjects working, studying or house-keeping (between US$1063 and 1473) had a lower cost than subjects who were unemployed (US$2566); none of these differences reached statistical significance. The high variability of costs and the low number of cases in some strata may explain this lack of findings. Obviously, we found a strong relationship between costs and place of residency (subjects in long-stay units or psychiatric residences had a much higher cost than patients living alone or with their parents). There was a strong correlation between direct costs and clinical and disability

measures: the correlation coefficient of the logarithmic transformation of costs with the GAF score was -0.43 ($P < 0.001$), -0.45 ($P < 0.001$) for the SOFAS score, and the correlation with each of the subscales of the DAS-sv varied from 0.28 to 0.38 (all $P < 0.005$). A better functional status correlates with a lower cost (in the interpretation of the results we must take into account that higher values of DAS-sv and lower GAF scores correspond to poorer functioning).

(Table 5) shows the results of the multivariate regression analysis of the relationship of costs with the explanatory variables. Among the clinical and disability measures, only the GAF score was included in the model because of the high correlation among all the functioning and disability variables.

	Beta coefficient (95%CI)
Single status	0.77 (0.03–1.51)
Relapsed	0.90 (0.25–1.56)
GAF score	−0.04 (−0.02 to −0.06)
Other psychiatric disorders	0.79 (−0.13–1.72)
r^2	0.29
Adjusted r^2	0.26

GAF, Global Assessment of Functioning scale.

Table 5. Predictors of direct costs of care in schizophrenia (multiple regression analysis)

Indirect costs

Great differences appeared between Cantabria and the other two centres in indirect costs. While loss of productivity in Cantabria was US$11.2 per subject, in Barcelona the loss was US$737 and in Burlada US$702. The costs of informal care were US$2161 in Burlada, US$57 in Cantabria and US$1686 in Barcelona.

DISCUSSION

Direct costs of care were found to be much lower than those found in other European countries. Mean costs in Spain were US$2243 (US$2693 if we adjust for the purchase power parity (PPP)), compared with US$15 859 in a study in Mannheim, Germany (Salize & Rossler, 1996), [18] $32 003 found in West Lambeth, England (which includes informal care costs) (Beecham et al, 1995) [4] and US$5678 found in Italy (Moscarelli et al, 1991) [14]. All the figures have been adjusted for the PPP and inflation rates.

Correlates of direct costs

We found remarkable differences in the distribution of direct costs among the three areas studied. Costs were greater in the two centres with greater community mental health development. This increased cost represented a shift from hospital costs to the community services. Total costs were greater in Barcelona, which is consistent with the finding that the provision of mental health services in large cities is more difficult and costly than in less densely populated areas (Goldman et al, 1992a) [6]. The increased cost was due to a larger use of out-patient and community residential and rehabilitation services. Service availability may explain this fact, since the Eixample in Barcelona has many public and private services. For example, the number of day care centre places is 2.4 per 100 000 people in Burlada, 7.3 per 100 000 in Barcelona and 0 in Santander. Other studies have also found that service development is one of the main determinants of service use (Sytema et al, 1996) [20].

These differences in health service use were not related to better functioning or lower disability, since no statistically significant differences were found in relapse rate, GAF or DAS-sv measures among the three cohorts. An explanation of this finding appears when we take into account the relationship of costs and functioning, since better functioning correlates with lower costs. It seems that our mental health system, rather than curing or aiding recovery of patients, takes care of them. Patients who do poorly have more needs and use more services. Since the outcome of schizophrenia is worse in more developed areas (Leff et al, 1992), [13] patients in a big city like Barcelona need more attention. If we had measured met and unmet needs, it could be that the patients in the areas with lower costs would also have had more unmet needs. We cannot infer from these results that greater health care utilisation and costs do not change outcome, since only a prospective study can make this type of inference.

Calculation of indirect costs

Great differences appeared in the three centres in indirect costs. Although this could be a true difference, we believe the most plausible explanation is that the interviewer in Cantabria was very conservative in the evaluation of the informal care by family members: he only recorded the extra care provided by family members that would not be considered usual for someone living at home, without considering that the subjects were adults who were supposed to be able to live independently. Thus, we believe that the real costs are much nearer to the higher figures (US$2863 in Burlada and US$2423 in Barcelona). These methodological difficulties in the calculation of indirect costs seem to be present in other studies (Knapp, 1997), [11] as reported figures are very different: Hu et al (1996) [9] found them to be less than 1% of total costs, Rice & Miller (1996) [17] less than 10%; but Davies & Drummond (1994) [5] found them to be much higher than direct costs. There also exists a controversy on the general calculation of indirect costs. The usual calculation is based on the human capital approach, which has been used in this study, that measures potential production losses. However, there is a strong need for obtaining estimates of the real production losses, which implies taking into account the complex relationships among absence time from work, productivity and production costs (Koopmanschap et al, 1997) [12]. It may well be that an absence from work when an individual is sick is compensated by an increase in productivity by other workers or by the individual when recovered, therefore maintaining the levels of productivity without an increase in costs.

Limitations of the study

Several limitations must be taken into account to evaluate the findings. Subject selection

deserves consideration, since the incidence figures in each centre differ. Although the selection criteria were the same for the three centres, the treated incidence in Barcelona was lower than in the other two areas. A plausible explanation is that Barcelona is a large city with many private services and it could be that some people start treatment in the private sector or move away from their neighbourhood to seek help. If this is true, cases in Barcelona may be biased towards greater severity, since patients who are admitted to a hospital have a much greater opportunity to receive treatment in the public sector.

Another aspect that may explain some of the differences among centres is that, while in Burlada and Barcelona the study was naturalistic, subjects from the Cantabrian cohort were included in a follow-up study of incident cases of schizophrenia (Vazquez-Barquero et al, 1995) [23]. Every effort was made to avoid inclusion of any costs that could be attributable to the cohort study (computer tomography, evaluation interviews). However, the inverse could also be true: regular follow-up can interfere with psychiatric treatment and the Hawthorne effect may have decreased service use and improved outcome.

The fact that costs were measured as service charges also deserves consideration. Although this represents public and private costs of treatment, charges commonly include a share of the cost of uncompensated care for other subjects, can reflect the cost shifting between different departments in a hospital or a clinic and may incorporate profits of private sector providers. However, the identification of the long-run marginal opportunity cost increases the complexity of the analysis and many studies use charges for the calculation of direct costs (Rice & Miller, 1996) [17]. In order to ascertain whether fees approached real costs, we compared costs of out-patient visits to mental health care centres, calculated from the running costs of the facility, with the fees of that service. The figures were very similar. We feel quite confident that charges are very similar to real costs for out-patient services and in-patient services in psychiatric hospitals. However, for in-patient services in general hospitals, there could be a greater difference. In order to evaluate the magnitude of this bias we used a sensitivity analysis in which we altered the price of in-patient days in general hospitals. Cantabria was the only centre in which this made a difference, and costs changed by a few hundred dollars when we used extreme prices for in-patient days.

The cost estimates reported should be considered as a lower approximation to the real value, since some costs were not included in the results. Criminal justice costs, indirect costs due to increased mortality and intangible costs (pain and suffering) can be an important part of total costs. It is possible that if we were to measure these costs, the centre with less developed community services would have a higher increase in costs than the other centres. For example, we did not include any costs from the suicide of a subject in Cantabria; as it occurred in the first year after onset of illness, costs should have been attributed to that year.

Future prospects

Our study prompts many questions about the costs of schizophrenia. The high dependency of costs on the development of mental health services indicates that cost studies should be repeated periodically as psychiatric care systems evolve. For example, the appearance of the new atypical antipsychotics is increasing medication costs. Another aspect that deserves further research is the relationship of costs with functioning state. As discussed above, this can be an artefact of the determinants of service utilisation, and prospective studies should be

carried out to clarify these aspects. Finally, we believe that more studies, not limited by a small sample size like our study, should be done with homogeneous cohorts of subjects to compare areas with very different health service availability. These data could be used in the future for statistical modelling of costs, an analysis that could be employed to better predict how service development could influence costs and outcomes.

CLINICAL IMPLICATIONS

- Direct costs of care of people with schizophrenia in Spain are lower than the reported figures from other European countries, which could mainly be due to differences in costs of community accommodation.

- Service availability seems to be one of the main determinants of service use and costs of care.

- Single people who have a relapse and those with a poor functioning state tend to have higher direct costs of treatment.

LIMITATIONS

- Charges, not long-run marginal opportunity costs, were used to measure costs of treatment.

- The small sample size and the cross-sectional design should be taken into consideration when analysing the results.

- The estimation of indirect costs had methodological problems. The calculation of care-giver time seems to have a low reliability.

ACKNOWLEDGEMENTS

This study was partially funded with grants by the Spanish Fondo de Investigaciones Sanitarias (FIS 97/1295); Lilly (ESQ00196) and a post-residency prize from the Hospital Clinic i Provincial of Barcelona.

The PSICOST Group is a multi-disciplinary group that studies the costs of mental illness that includes the Spanish investigators participating in the European EPCAT project from the Biomed Program (CT94-1304).

The PSICOST Group members are: Cristina Agustench, Adrian Argente, Juan Cabases, Luis Gaite, Josep Maria Haro, Vicente Madoz, Alfredo Martinez, Cristina Romero, Jose Antonio Sacristan, Luis Salvador-Carulla, Francisco Torres and Jose Luis Vazquez-Barquero.

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Accession Number: 00002405-199810000-00013