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Service utilization and costs of first-onset schizophrenia in two widely differing health service areas in North-East Spain

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Objective: The aim of the study was to analyse the cost-incidence of schizophrenia in two areas with widely differing health service systems.
Method: The costs of patients with schizophrenia in the 3 years after the first service contact were evaluated (i) in an area (A) with fully developed mental health community programmes and (ii) in another area (B) without such programmes. The assessment included a standard description of services, as well as clinical, social and disability aspects.
Results: Sociodemographic and clinical characteristics were comparable. The mean direct costs for both areas in the 3-year period were, respectively, $4287 and $6540 in year 1, $2416 and $2888 in year 2, and $2120 and $1862 in year 3. Direct costs in area A were 35% lower than those in area B during the first year, 16.4% lower during the second year, and 12.2% higher during the third year.
Conclusion: Direct costs were higher in the area that lacked intermediate mental health services, mainly due to hospitalization. Non-provision of intermediate mental health care may lead to inefficiencies in the health-care system.

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Key words: schizophrenia; costs; utilization; service; equity

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Introduction

Cost-of-illness (COI) studies provide basic data for assessing the costs of treatments and programmes and contribute to evidence-based health planning and resource allocation. Four different (COI) designs can be identified according to sample selection (prevalence or incidence) and overall approach (top-down or bottom-up). Top-down studies are sophisticated reviews mainly based on macro-economic data, literature reviews and modelling, in which absent or uncertain information is replaced by assumptions made on the basis of experts' opinions. The assumptions made in top-down studies as well as the different methods involved, particularly in the calculation of indirect costs, may explain the variability in the results found for the same country in previous COI studies (1, 2). On the other hand, bottom-up studies are based on actual samples studied in identified catchment areas. Bottom-up COI studies may complement other sources of information, reduce the number of assumptions and improve health mathematical modelling with actual data at both local and national level. Furthermore, these studies play an important role in identifying inequalities in health care and health service comparison. They may complement other small area designs, such as ecological descriptions or medical practice variation studies, as well as cost-effectiveness analysis of different health programmes (3).

[a] PSICOST is a multidisciplinary group studying the costs of mental illness, and including the Spanish investigators participating in the European Psychiatric Care Assessment Team project from the Biomed Programme (CT94–1304).

Despite their variability, cost-prevalence studies of schizophrenia using a 'top-down' approach all suggest that this illness has a major impact on health costs in countries such as the USA (1, 2), the UK (4, 5), Denmark (6) and The Netherlands (7). The cost-incidence of schizophrenia has been estimated according to 'top-down' models in Australia (8, 9) and the UK (10). The estimates thus obtained should be confirmed with illness-cost studies of real cases, followed from the onset of the illness (11, 12). In Spain, the only information available to date refers to the cost of psychiatric treatment of chronic psychoses in the Basque Country, based on the case register in this region (13).

The present paper reports on the service utilization and direct costs of schizophrenia in two different areas according to mental health service provision in Spain, using a 'bottom-up' approach and the recommendations of the European Psychiatric Care Assessment Team (EPCAT) for mental health care research. EPCAT is a European Union-funded international panel of experts from six different countries aimed at establishing minimum methodological standards for standardized evaluation of long-term mental health care which could take into account economic aspects (14, 15). A focus on widely differing areas including a 'no provision' or 'no-treatment' option, has been recommended in order to obtain relevant information for health decision-making and modelling (16).

Material

A study was made of the service utilization and costs generated by new cases of schizophrenia treated in two different catchment areas (treated incidence), with a follow-up covering the 3 years after this first treatment contact. In the scenarios selected, there was an extensive record of services use during the 3-year assessment period, as well as detailed data on the clinical situation of the population assessed.

Health areas

The distribution of health and social deprivation indexes divides Spain into two broad regions: North-East and South-West Spain (17). From an administrative point of view, Spain is divided into 17 autonomous regions. During the last 20 years, the National Health System has been gradually transferred to local governments, which have adopted different health planning policies. Thus, from a common health organization based mainly on social welfare, a whole array of different health systems has emerged. The mental health system has its own peculiarities which have been discussed elsewhere (18). For the present study, two widely differing areas were chosen with regard to mental health services provision in North-East Spain:

Scenario A — optimum services provision level (Burlada health area, Navarre, North Spain). The mental health centre in the Burlada district (population 59 000) covers a catchment area in the Navarre region (population 520 000). Since Navarre has a psychiatric case register dating back to 1987, it was possible to estimate the number of subjects who were actually treated in that catchment area. The estimate of compliance with the therapeutic programme after 5 years in the Burlada area was 80%, and it provides the most efficient mental health care coverage in Navarre according to the report from the Navarre Health Council (19). Navarre has a well-established network of intermediate programmes, and can be considered to have reached the final phase of psychiatric reform according to available standards in Spain (level 6: consolidated community psychiatry) (20).

Scenario B — minimal level of services provision (Cantabria, North Spain). At the time of the assessment, the region of Cantabria (population 527 000) had not yet had any services transferred from the nation-wide health-care system, nor did it have any specific mental health programmes. The region also lacked adequate intermediate and long-stay settings. The psychiatric reform initiated in 1985 had yet to be implemented in that region, so its mental health network for new cases of schizophrenia was basically limited to care in a general hospital and three mental health centres without well-defined limits, corresponding to level 0 of the psychiatric reform process indicators in Spain. However, the database of cases treated in this region is adequate, due to the Cantabria Schizophrenia Incidence Study which was conducted by the social psychiatry team at the University of Cantabria (21).

Selection of the sample

The sample consisted of a historical cohort of patients, men and women between 16 and 45 years old at the time of their first mental health contact, with a confirmed diagnosis of schizophrenia (DSM-IV) at the time of assessment by a third-party interviewer 3 years later. Informed consent was obtained from the patient, and subjects were excluded if their principal diagnosis was mental retardation or substance abuse. The lack of well-defined sectorization in small mental health areas in

Cantabria made it necessary to set different enrolment periods in order to obtain samples of a similar size. In the Burlada health area of the Navarra autonomous region (area A), the enrolment period was set at 4 years (1989–1992). Patients who had contacted the mental health services for the first time during that period were located using the case-register records (n=42). This sample implies an annual treated incidence of 17.5 per 100 000, which is similar to the mean annual incidence for the case-register studies conducted primarily in Europe (0.20) (22). In the Cantabria autonomous region (area B), the cases from a study on the incidence of schizophrenia (21) included in the year 1989 (n=40) were located (annual incidence of 7.5 per 100 000). Unlike area A, Cantabria lacked a case register. In this situation it was assumed that the contacts with the only reference hospital in the entire area (Valdecilla Hospital) were representative of the treated incidence of schizophrenia for that year and in that region (21). This approach probably missed first-onset cases which did not contact Valdecilla Hospital.

Methods

Prudo and Blum's schizophrenia severity classification criteria (23) were used. This scale allocates cases, according to the duration of episodes and treatment needs, into four groups ranging from least (group I) to greatest (group IV) severity. The following instruments were also completed: (i) Global Assessment of Functioning (GAF) total and clinical (GAF-c); (ii) Social and Occupational Functioning Assessment Scale (SOFAS) (24); (iii) Short Version of the Disability Assessment Schedule (DAS-s) (25); (iv) the European Service Mapping Schedule (ESMS), a scale for the standardized description of services in the catchment areas developed by the EPCAT group (14); and (v) a service utilization inventory (Cuestionario para Evaluación de Costes de la Esquizofrenia; CECE). This inventory included operational definitions of relapse developed by an international experts' consensus group (26). This group defined relapse as 'the appearance, reappearance or exacerbation of symptoms (typically psychotic) of schizophrenia which may require a change in clinical care'.

Information was completed with clinical records, existing databases (including the Navarre case register and the Cantabria incidence study database) and interviews with each patient and a relative conducted by independent experienced clinicians. In area A, the general functioning and disability data (GAF and DAS-s) had to be completed retrospectively from clinical records by the interviewer. In area B, yearly GAF data were available from the database and the DAS-s score was obtained from the complete form of this questionnaire (DAS) (27). Data were reviewed by an independent rater. In both areas, use of mental health services, both social and medical, was recorded for each year, excluding medical contacts that were clearly unrelated to mental illness (e.g. dental care, surgery). When uncertainties about the relationship between certain medical procedures and the schizophrenia persisted, these procedures were included in the analysis. A restrictive estimate of indirect costs was also made, based on production capacity and productivity loss due to absenteeism or sick leave on the part of the patients and their relatives. Working days lost due to the illness, both per patient and per relative, were also assessed.

Data analysis

A comparison of sociodemographic and clinical data from both samples was made, using Student's t-test for quantitative variables, the Chi-square test for categorical variables, and the Kruskal-Wallis test for ordinal variables. Quantitative data are expressed as mean values with standard deviation (SD).

Resources were assessed in pesetas at 1994 prices. They have been converted to US$ (mean EUROSTAT for 1994: 1$=133,85 ptas; Purchase Power Parities for 1994; 1$=119,07 ptas). Charges were used to measure direct costs. Despite the fact that identification of the long-term marginal opportunity cost is the optimum method for cost calculation (28), the diversity of services used by the population in our study meant that charges were the only available measure. Charges for health and social services in Navarre were used in this study. Research costs derived from the Cantabrian schizophrenia incidence study were excluded. A sensitivity analysis was performed with the variable that has the greatest weight in overall direct costs, namely number of days spent in a general hospital inpatient unit. No estimate was made in monetary terms of intangible costs associated with the illness, such as degree of functioning and patients' disability during each year. Despite the importance of extreme cases in the estimated mean costs, it was decided not to exclude these values from the analysis. In order to compare both areas, a cost-consequence approach was adopted. Cost-consequence analysis provides separate data on costs and outcomes, leaving their aggregation or computing to the decision-maker (29).

Results

Deprivation indexes are fairly similar in both areas compared to other regions in Spain. Data for Cantabria and Navarre were, respectively, as follows: unemployment rate, 16.4% and 14.22%; illiteracy rate, 0.6% and 1.0%; unskilled workers (low social class) rate, 41.6% and 50.2%; and percentage of inhabitants in private households with more than one person per room (overcrowding rate), 11.7% and 6.3% (17).

The Burlada health area (area A) had a community health centre covering the whole area, an emergency unit, a general hospital ward, *a non-acute residential service*, and 'day and structured activity services', including a day hospital, a day centre and two occupational centres. The Cantabria region (area B) had three community mental health centres without adequate sectorization at the time of this study, an emergency service and a general hospital acute ward.

A total of 82 patients were included in the study, 42 patients in Burlada, Navarre (area A, with optimum level of services provision) and 40 patients in Cantabria (area B, with minimum level of services provision), assessing the first 3 years of the course of the illness after patients' first health service contact.

In area A (Burlada), one subject left the area during the year after his first hospitalization. Because of the incomplete information available for this case, it was decided to exclude his data from the analysis, so in this area the final sample consisted of 41 subjects. In area B (Cantabria), one subject committed suicide at the end of the first year, and another patient left the area during the second year but was contacted subsequently. Both cases were included in the study, so the total dropout rate was 1.2%.

Sociodemographic and clinical data

The majority of the subjects were single (77%), male (59%), and had not finished secondary school (50.5%). The mean age at the time of the first interview was 27.9±5.8 years in area A, and 28.4±7.2 in area B. No significant differences were found with regard to age, sex, marital status, educational level or social class between the two areas. Whereas in Cantabria the majority of the patients were dependent on their families (approximately 65% during the 3 years), in Burlada 45% of them were living independently. Their occupational status was quite stable throughout the 3 years in both areas, with an average of 37% of the patients having a normal job in Burlada (Navarre), compared to 25.6% in Cantabria. In most cases the subjects were unskilled workers.

With regard to clinical data, the level of social functioning in the third year, as assessed by the SOFAS, was in the range 60–69 in 70.8% of the cases. This corresponds to individuals with some deficit in their family, social or occupational life; the scores were similar to those for clinical and general functioning assessed with the GAF. The level of disability assessed with the DAS-s showed that the greatest degree of deterioration was in occupational roles and other activities, followed by family functioning and, to a lesser extent, self-care.

The mean time (±SD) from onset of symptoms to the first health service contact was 8.8±27 months in Cantabria and 26.4±35.9 months in Burlada. The time from onset of symptoms to the first psychiatric contact was 11±27.3 months in Cantabria and 28.7±39.9 months in Burlada. There was no evidence of differences between the two areas in the first year with regard to general functioning (GAF), global clinical status (GAF-c) or social functioning (SOFAS). There were slight differences in global functioning, as assessed with the GAF, between the first and the third years, with a better level of functioning in area A (Kruskal-Wallis, $P=0.045$). Nor was there evidence of differences between the two areas with regard to disability levels in the four roles assessed (self-care, family role, occupational role and other roles), or in patients' scores on Prudo and Blum's severity scale when comparing the first and third years after initial contact. Although the majority of patients' symptoms scored mild or moderate on the clinical and functioning scales, 58.5% of the subjects in Burlada and 60% of those in Cantabria scored at the most severe level (IV) of Prudo and Blum's scale. For each of the three years assessed, the relapse rate was 26%, 30.8% and 28.3% respectively. In years 1 and 3, this rate was lower in Cantabria, although in years 2 and 3 the duration of relapse episodes in this scenario was twice as long (64 and 71 days) as that in Burlada (29 and 32 days). During the first 2 years, there were four suicide attempts (three in Burlada and one in Cantabria), and one suicide in Cantabria; the patient was a 24-year-old single woman who lived with her parents and was in semi-skilled employment.

Service utilization data

Table 1 summarizes the data for service utilization in each area, showing the changes that occurred from the first contact (year 1) until the third year after health contact. A general trend towards decreasing consumption of health-care resources can be seen, except for occupational therapy in area A (Burlada). With regard to the services used, a higher number of visits to psychiatrists (Student's

Table 1. Services utilization per schizophrenic patient during the 3 years of the course of the illness in areas A (Burlada-Navarre, n=41) and B (Cantabria, n=40)

Services utilization[a]	Area A			Area B		
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Number of out-patient visits						
Emergency	5	1	3	46	21	9
Public psychiatrist	321	223	207	174	169	166
Private psychiatrist	11	25	24	12	32	18
General practitioner	66	52	27	2	0	0
Public psychologist	62	29	46	11	9	4
Private psychologist	0	21	0	0	0	0
Public social worker	8	12	9	32	2	3
Public psychiatric nurse	136	130	124	25	73	27
Other specialists	300	12	0	0	0	0
Alternative medicine	0	1	4	0	1	0
Public group therapy	0	0	6	0	0	0
Hospital resources (number of days/year)						
Public general hospital acute unit	518	0	9	1328	547	321
Concerted psychiatric hospital acute unit	0	30	77	0	0	0
Psychiatric hospital acute unit	24	0	0	0	0	0
Public medium to long-term stay unit	0	365	365	0	0	0
Intermediate resources (number of days/year)						
Supervised housing	365	365	365	0	0	0
Day hospital	686	342	46	0	0	0
Occupational therapy	244	379	374	0	0	0

[a] Health and social services that have been used in at least one of the areas.

t-test, P=0.003), social workers (Student's t-test, P=0.000) and nurses (Student's t-test, P=0.006) was observed during year 1 in area A (Burlada). A difference in nurse visits also occurred in year 3 (Student's t-test, P=0.02). The greater use of visits to general practitioners in area A was due to a single patient, and is not significant. In area B (Cantabria), a higher rate of utilization of emergency services was noted during the first 2 years (Student's t-test, P=0.000 and P=0.01, respectively), as well as more days of general hospital stays (Student's t-test, P=0.005 and P=0.002, respectively).

The mean total number of days of hospitalization was as follows: in the first year, 12.9±26.2 (area A) and 33.2±36.4 (area B); in the second year, 9.6±57.1 (area A) and 13.7±24 (area B); and in the third year, 11±57.3 (area A) and 8±23 (area B). The medium or long-stay hospitalization in area A was due to an extreme value for a single patient, and the utilization of intermediate resources (day hospital, sheltered housing, occupational therapy centres) only occurred in area A, because area B lacked these resources.

Cost analysis

With regard to aggregate costs for the first 3 years of treatment ($10 057), 53.8% of the total was consumed in year 1, 26.3% in year 2, and 19.7% in year 3. The use of hospital resources accounts for 68.5% of direct health-care and social costs during the first year, and 61–63% for the following 2 years. The majority of these costs correspond to hospitalization in acute in-patient units. Disaggregation of services costs can offer more precise information than the evolution of direct costs during the 3 years after the first contact. Direct costs for utilization of social and health services during the first 3 years show notable differences with regard to their distribution, when comparing both scenarios chosen for this study. Direct costs for health and social services in area A (Burlada) were 35% lower than those in area B during year 1, 16.4% lower during year 2, and 12.2% higher than in area B during year 3 (Table 2).

The high rate of utilization of hospital care in area B (Cantabria), compared to area A, is virtually the same as the total costs for intermediate care in area A, with fully implemented community mental health programmes (Fig. 1). It should also be noted that in Burlada (area A), 93% of all hospitalization costs in year 2, and 82% of those in year 3, were due to a single extreme case who was hospitalized outside the catchment area. Also noteworthy is the progressive increase in pharmacological spending in both areas, starting at 7% of total direct costs for health and social assistance, and rising to 10% and 13% thereafter. In Burlada (area A), the day hospital constitutes the second most important resource during the first year. The relative importance of the cost of medication increased during each year evaluated, representing between 11%

Table 2. Disaggregation of the average costs per patient for the first 3 years of the schizophrenia in areas A (Burlada-Navarre, n=41) and B (Cantabria, n=40) (US$)[a]

	Year 1				Year 2				Year 3			
	Area A	%	Area B	%	Area A	%	Area B	%	Area A	%	Area B	%
Out-patient visits												
Emergency	14	2	129	34	3	1	59	22	8	3	25	14
Psychiatrist	276	49	186	45	191	83	155	56	166	55	135	76
Psychologist	46	8	9	2	47	13	6	2	32	10	3	2
Psychiatric nurse	83	15	18	5	67	16	44	16	62	20	14	6
Social worker	11	2	40	10	9	3	2	1	6	2	1	1
Group therapy	0	0	0	0	0	0	0	0	3	1	0	0
General practitioner	51	9	2	0	40	11	0	0	21	7	0	0
Other specialists	87	15	0	0	3	1	0	0	0	0	0	0
Alternative medicine	0	0	0	0	1	0	0	0	5	2	0	0
Subtotal	568	13	384	6	363	15	266	9	303	14	178	10
Hospital resources												
General hospital acute unit	2148	97	5645	100	68	7	2325	100	213	19	1364	100
Psychiatric hospital acute unit	60	3	0	0	0	0	0	0	0	0	0	0
Medium to long-term stay unit	0	0	0	0	914	93	0	0	914	81	0	0
Subtotal	2208	51	5645	86	982	41	2325	81	1127	53	1364	73
Intermediate resources												
Supervised housing	268	22	0	0	268	33	0	0	268	61	0	0
Day hospital	879	72	0	0	438	52	0	0	59	13	0	0
Occupational therapy centre	74	6	0	0	116	15	0	0	114	26	0	0
Subtotal	1221	29	0	0	822	34	0	0	441	21	0	0
Medication	261	6	504	8	241	10	285	10	241	12	302	16
Diagnostic tests	29	1	7	0	9	0	12	0	9	0	18	1
Total	4287	100	6540	100	2416	100	2888	100	2120	100	1862	100

[a] Mean 1994 (EUROSTAT).

(area A) and 16% (area B) of direct costs for service utilization during the third year of treatment. The cost of utilization of individualized services (emergency care, psychiatrist, general practitioner, etc.) is similar to that of medication. Diagnostic and laboratory tests had a negligible impact on costs.

The sensitivity analysis of direct costs was performed with the most relevant variable, namely hospitalization in acute in-patient units, using data on cost per stay at the upper extreme of the ranking of known values, which represented 55% more than the cost estimated initially. In this case, the cost of hospitalization increased from 52% to 63% of the total direct cost during the first year, from 27% to 37% in the second year, and from 25% to 33% in the third year. Total direct costs for the 3-year period were as follows: year 1, from $5400 to $7331; year 2, from $2649 to $3221; year 3, from $1993 to $2338.

Discussion

This study compares two health areas with widely differing mental health resources and extremely different levels of mental health care planning within North-East Spain. This unique situation has changed in recent years, and a mental health plan is currently being developed in Cantabria. However, this study may provide useful information for other areas in Europe where community psychiatry has yet to be deployed. Historical cohorts could be properly studied because of an ongoing study of schizophrenia in Cantabria. As stated above in order to compare 'best-planned' and 'unplanned' programmes, different size areas and recruitment periods were considered. Case-finding differed in both areas as well (case register in area A and hospital contact in area B). The single suicide in Cantabria was not included in indirect costs. With regard to the ranking of costs analysed, all of those derived from crime and justice were also excluded due to the lack of reliable data on subjects in the sample. Our data cannot be extrapolated to the total set of health-care patterns in Spain, since this study used only two subsamples of newly diagnosed schizophrenic patients under 45 years of age at the year of onset, in two areas with differing health-care profiles and geographical size, and also one of the areas lacked a defined health-care sector and intermediate community services (thus reinforcing the contrast between them, which is why these two areas were chosen).

The disparity in evolution time as well as in the incidence rates found between the two areas can be

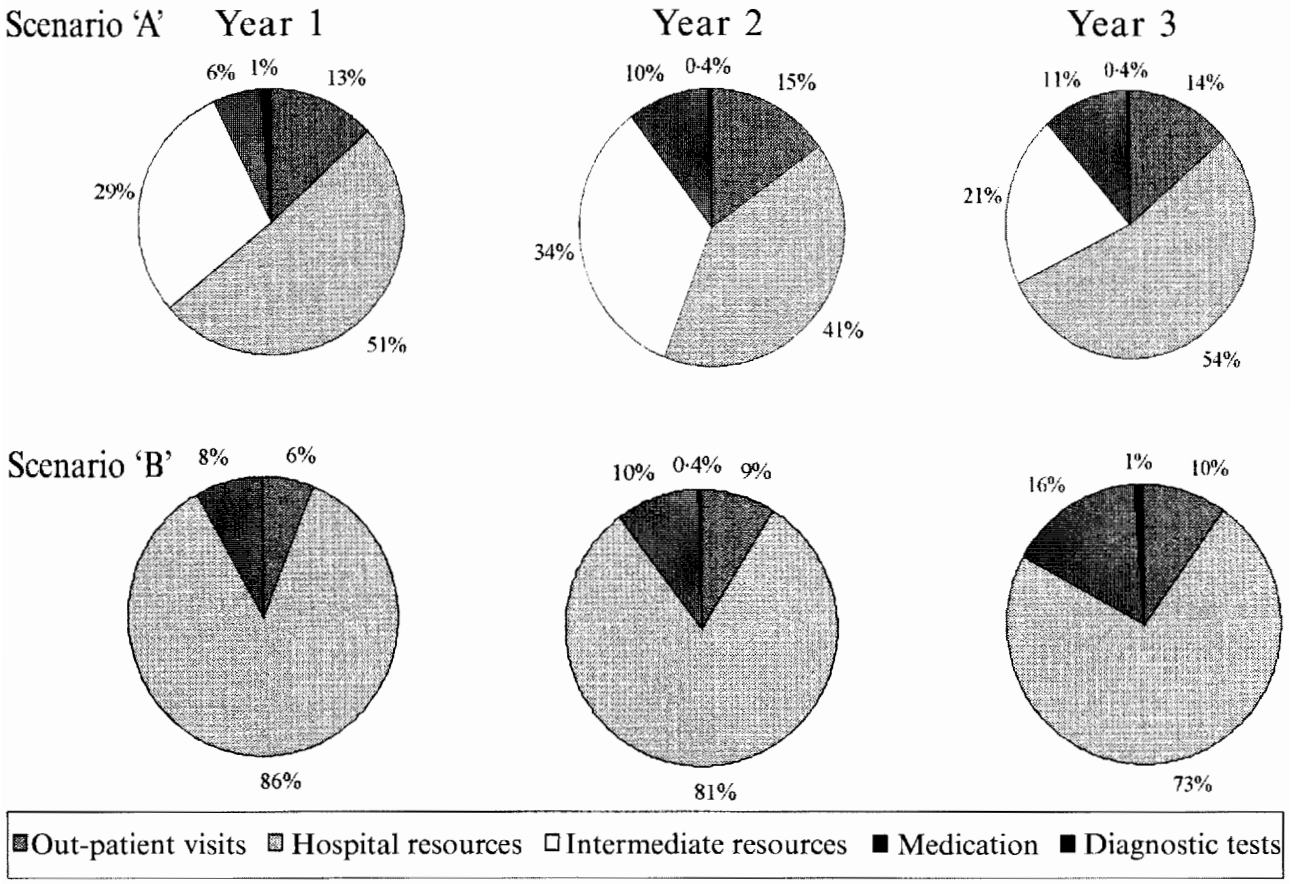

Fig. 1. Cost distribution for services utilization in the first 3 years of the course of schizophrenia in two scenarios in Spain.

attributed to the different systems used to detect cases. The start-up phase of the Navarre case registration system in 1987 led to an active search for patients in the Burlada area, which entailed detecting cases that, under other circumstances, would have gone unnoticed. Despite this, the samples did not show significant differences with regard to age, sex, educational level and a number of clinical variables. The latter included general, clinical and social functioning, as well as their disability levels and severity at the end of 3 years. These data indicate that the two samples are comparable, despite the major differences in their geographical and socio-economic situations, and the dominant health-care model in each of the two areas chosen. In addition, the mean age and gender distribution were similar to those found in other treated incidence studies in Europe (12, 30).

There was a lack of significant differences at the assessment 3 years after the first health contact with regard to the relapse rate, level of severity, and functioning and disability.

In the first year, a significantly higher rate of use of emergency services was found in Cantabria. This difference can be explained by the tendency of patients to resort to this service as a way of contacting their therapists for the first time, or avoiding the appointments system used in Cantabria. Although no significant differences in visits to general practitioners were observed, it should be noted that in Burlada (Navarre) this utilization was concentrated during year 1 on a single case who made 48 visits.

Figure 1 shows a notable difference in the utilization of available resources, indicating that two schizophrenic patients in different regions but in the same year of the course of their illness receive very different treatment. Perceived needs have not been assessed in this study. Therefore horizontal inequalities in the availability and utilization of services should be treated with caution. It is important to note that, even using a very conservative approach, direct mean average costs for use of health-care resources during the first 3 years after diagnosis are higher in the area lacking a well-established system of community-based psychiatry. This difference was much greater after excluding a single extreme case, responsible for 80% of the hospitalization costs in area A (Burlada) during years 2 and 3. Clinical results being equal, this higher cost would indicate the inefficiency of a health-care system lacking in planning and provi-

sion of community-based mental health services, at least in this case. This finding does not take into consideration the costs of informal care received by the patient. Some authors have pointed out that the deployment of community programmes could involve a progressive 'substitution' of hospital--based care for family-based care (31). The analysis of informal-care costs involves major conceptual and methodological problems that are currently being studied in an ongoing Psicost project.

Bottom-up COI studies may benefit from a standard description of services and catchment areas. On the other hand, cost data should be included in health service research. EPCAT recommendations and tools provide a useful bridge between service research and cost research in the mental health sector.

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