



## Original article

# Measuring costs of community mental health care in Italy: A prevalence-based study



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## ABSTRACT

**Background:** Information on individual mental healthcare costs and utilization patterns in Italy is scant. We analysed the use and the annual costs of community mental health services (MHS) in an Italian local health authority (LHA). Our aims are to compare the characteristics of patients in the top decile of costs with those of the remaining 90%, and to investigate the demographic and clinical determinants of costs. **Methods:** This retrospective study is based on administrative data of adult patients with at least one contact with MHS in 2013. Costs of services were estimated using a microcosting method. We defined as high cost (HC) those patients whose community mental health services costs place them in the top decile of the cost distribution. The predictors of costs were investigated using multiple linear regression. **Results:** The overall costs borne for 7601 patients were 17 million €, with HC accounting for 87% of costs and 73% of services. Compared with the rest of the patients, HC were younger, more likely to be male, to have a diagnosis of psychosis, and longer and more intensive MHS utilization. In multiple linear regression, younger age, longer duration of contact with MHS, psychosis, bipolar disorder, personality disorder, depression, dementia and Italian citizenship accounted for 20.7% of cost variance. **Conclusion:** Direct mental health costs are concentrated among a small fraction of patients who receive intensive socio-rehabilitation in community services. One limitation includes the unavailability of hospital costs. Our methodology is replicable and useful for national and cross-national benchmarking.

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## 1. Introduction

The recent Mental Health Action Plan 2013–2020, promoted by the 66th World Health Assembly [1], included among its main objectives the provision of comprehensive, integrated mental health and social care services in community-based settings, the implementation of strategies for promotion and prevention; and strengthened information systems, evidence and research. Mental health care comprises the main care domains provided to citizens with mental illness and/or substance use disorders (ambulatory, home, residential and semi-residential care) and accounts for 5% of total health care expenditure in Italy, remaining a neglected area of health policy compared to other countries [2]. The recognition of

the complexity, multifactorial nature of mental illness has led to redefining the essential levels of care [3] for mental health and pathological substance dependence in Italy, with a focus on the assessment of health and social care needs, accessibility, continuity of care and personalized care pathways. To address this new challenge, in the last few years the ‘health budget’ has been introduced in some Italian regions as a new tool to manage the complex problems of patients with mental illness, in which the local and health care institutions, together with other resources (voluntary associations, cooperation, family) and the person himself, share pathways built on subject’s needs. For each patient a personalized health budget is defined that brings together the economic, social, personal and context resources [4,5]. Still, the implementation of personalized care pathways tailored to patients’ needs would require a careful assessment of feasibility and sustainability of interventions over time. Moreover, no fine-grained data on activity-based budgeting of mental health services are available to support decision-making because estimates of mental health care costs are based on average costs obtained as the

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ratio between the overall costs of hospital and community care and the resident population [6].

Amaddeo et al. [7] reviewed the few existing studies conducted on the analysis of the costs of the Italian mental health provision of care and described the current financing system for mental health care in Italy.

These costs are largely borne by the national health system through the Local Health Authorities (LHAs), by patients' families and by a part of the municipality budget devoted to social care. LHA costs can broadly be divided into: costs sustained within the accounting year by the Mental Health and Pathological Dependence Department (MH-PDD) as part of the per-capita quota allocated to the Department and those generated by patients' admissions to other departments and services (ambulatory consultations, drugs, emergency, hospitalization, day-hospital and long-term rehabilitation among public and private facilities, homecare).

The MH-PDD administers approximately 5% of the 1.940,61 € per-capita average regional expenditure in 2011–2012 [8] and its financing is granted to each LHA according to historical expenditure as a quota of the per-capita transfer made by the Region to the LHAs.

The current accounting schemes leave little room for measurement and provides no useful insight on individual care needs. MH-PDD costs are merely benchmarked yearly as the proportion of MH-PDD costs on the overall per-capita quota: an average € 82.4 for MH and an average of € 16.68 for PDD per-capita in 2011. Moreover, MH information systems and the LHA accounting systems are not yet integrated, hindering research on individual and organizational sources of variability [9–11].

In the attempt to fill this knowledge gap, and given the lack of information on individual costs of mental illness, we set up a costing methodology to estimate the costs of 45 types of services provided by the MH-PDD. A simple bottom-up procedure was used, based on the principle of full absorption costs, that includes fixed and variable costs. The cost items included in the procedure were the workforce costs, the indirect costs associated with clinical activity and the general administration overheads allocated to MH-PDD at 2013 prices. After linking the mental health information system and the current accounting system of a Local Health Authority in Italy, we applied this methodology to estimate the overall annual MH costs borne by the LHA.

Converging evidence indicates that a small proportion of mental health care users account for a large share of health care costs [12–14].

Our aims are therefore to compare the characteristics of patients in the top decile of costs with those of the remaining 90%, and to analyse the demographic and clinical determinants of costs.

## 2. Methods

### 2.1. Overview and data source

The study population consists of adult patients who had at least one contact with the mental health services of the Local Health Authority of Reggio Emilia (Italy, 535869 inhabitants at 01.01.2013) in 2013.

Data on patient characteristics and on the MH-PDD services they received in 2013 were extracted from mental health information system database (SISM) database. SISM includes information on socio-demographic characteristic, on ICD-9 CM diagnoses and on the number and type of services delivered. ICD-9 CM diagnoses are recorded at the first/second visit by the psychiatrists/psychologists when a specific treatment plan is defined, targeted to the patient's needs and are updated over time if they change or when additional symptoms emerge. The algorithm for the classification into diagnostic groups is provided as Supplementary material.

Data are entered in the SISM on a regular basis by the mental health services operators and delivered to the Regional Health Authority for quality check twice a year. Inconsistencies are resolved and the Region, in turn, sends the data to the Ministry of Health for reporting. The SISM glossary (2013) defines 45 types of community services (Table 1), from the fulfillment of legal and organizational requirements (e.g. writing and exposing a report for the justice), not involving any contact with the patient, to group activities. The 45 services were classified into 7 clinical-therapeutic pathways that included initial (re)assessment, psychotherapy, psychiatric-clinical encounter, vocational training, socio-rehabilitation, day center (DC) and community day-hospital (CDH).

Specifically, socio-rehabilitation consists of individual or group daytime activities, tailored to the needs of care or rehabilitation of patients with a high degree of disability/chronicity. Socio-rehabilitation activities are aimed at providing patients social and/or economic support, or helping them (re) acquire daily activity skills and interpersonal functioning. They are carried out outside day centers or day hospital.

Day center activities are daytime group rehabilitative therapeutic activities for patients with severe mental illness.

Community day hospital interventions include drip, and parenteral or oral drug administration to patients in an acute illness phase, as an alternative to hospitalization. They are carried out in non-hospital facilities.

### 2.2. Cost calculation

The costing methodology used in the present study was based on a microcosting (bottom-up) approach to establish the costs of services at individual level.

The LHA accounting system was used to determine costs that are directly driven by service user care (clinical care staff time and the administered drugs) and those that are more loosely tied to service user activity (indirect costs and overheads).

Cost of labor estimates for each activity provided were possible because the MH-PDD database reports reliable information on the number and qualification of health professionals involved in each service and, to some extent, information regarding the duration and the location of the activity. The beginning and the end of each activity was estimated in a sub-sample of 19,634 records obtained by excluding services with zero or over 3 h duration. The average length in minutes for each MH-PDD activity was calculated and then validated by two experienced senior psychiatrists and a 'displacement' multiplication factor was assigned to services provided outside the typical setting (e.g. prison, patient home and acute service consultations by MH-PDD staff).

Gross hourly costs were attached to each service provided by the MH-PDD in 2013 up to a maximum of 4 health professionals involved in each activity, then multiplied by the duration of the service. The duration in minutes was set to the validated standard time (Table 1) when provided in the main location, otherwise a weight varying between 1.25–1.50 was applied if provided in other locations requiring personnel displacement. Group activities were assigned a 0.36 weight, assuming that on average 2.8 users took part in each group activity.

Because services are mainly relational and labor-intensive, only staff costs were considered as direct costs and were derived from actual labor costs in the LHA (Table 2).

Indirect costs and overheads were taken from the LHA accounting system by selecting only those items referring to support clinical activities and MH-PDD general management. Among direct health care goods, pharmaceuticals and charges paid for buying health and rehabilitation services outside the MH-PDD

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