Long-term monitoring and evaluation of a new system of community-based psychiatric care. Integrating research, teaching and practice at the University of Verona

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Summary. The South-Verona community psychiatric service (CPS) was implemented in 1978, according to Law 180, by the Department of Psychiatry of the University of Verona. Since then this CPS provides prompt, comprehensive and coherent answers to patients' needs, psychological and social, as well as practical, while trying to decrease and control symptoms. Special emphasis is given to integrating different interventions, such as medication, rehabilitation, family support, and social work. The South-Verona experience was from the beginning associated with a long-term research project of monitoring and evaluating the new system of care. The research team has grown and expanded over the years and presently includes the following research units: a) environmental, clinical and genetic determinants of the outcome of mental disorders; b) psychiatric register, economics and geography of mental health; c) clinical psychopharmacology and drug epidemiology; d) brain imaging and neuropsychology; e) clinical psychology and communication in medicine; and f) physical comorbidity and health promotion in psychiatric patients. This paper summarises the main results of the coordinated, long-term evaluative studies conducted so far.

Key words: community mental health services, health service research, outcome assessment.

Riassunto *(Monitoraggio e valutazione a lungo termine di un nuovo sistema di assistenza psichiatrica community-based. Integrare ricerca, didattica e pratica all'Università di Verona)*. Il Servizio psichiatrico territoriale di Verona-Sud è stato sviluppato nel 1978 dal Dipartimento di Psichiatria dell'Università di Verona secondo le indicazioni della Legge 180. La finalità del servizio è di fornire una risposta rapida, adeguata e coerente ai bisogni dei pazienti, sia sul versante psicologico che sociale e pratico, cercando allo stesso tempo di ridurre e controllare i sintomi. Particolare enfasi viene data all'integrazione di diversi interventi: farmacologici, riabilitativi, di supporto alla famiglia e di assistenza sociale. L'esperienza di Verona-Sud è stata fin dall'inizio associata con un progetto di ricerca a lungo termine per monitorare e valutare il nuovo sistema di cura. Il team di ricerca è cresciuto e si è allargato negli anni e attualmente include le seguenti unità di ricerca: a) determinanti ambientali, clinici e genetici dell'esito dei disturbi mentali; b) registro psichiatrico dei casi, economia e geografia della salute mentale; c) psicofarmacologia clinica e farmaco epidemiologia; d) *brain imaging* e neuropsicologia; e) psicologia clinica e comunicazione in medicina; e f) comorbidità fisica e promozione della salute nei pazienti psichiatrici. Questo articolo riassume i risultati principali dei vari studi valutativi condotti finora.

Parole chiave: servizi psichiatrici territoriali, ricerca sui servizi sanitari, valutazione dell'esito.

THE IMPLEMENTATION OF THE PSYCHIATRIC REFORM IN SOUTH-VERONA IN 1978 AND THE NEW SOUTH-VERONA COMMUNITY PSYCHIATRIC SERVICE

The South-Verona community psychiatric service (CPS) was implemented in 1978, according to Law 180, by the Department of Psychiatry (DoP) of the University of Verona. The latter dated back to 1970 and operated as one of the typical Italian University Departments of Psychiatry that were regarded as élite facilities with mainly teaching and scientific purposes. They generally treated the acute, less severe cases while most serious psychotics, long-term patients and patients compulsory admitted where hospitalised in the state mental hospital.

Inpatient and outpatient care was the primary treat-

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ment offered. However, over the years, the Verona team decided to decrease inpatient care and improve outpatient care. At the end of 1977 the mean number of occupied beds was as low as 15 out of 36 available. This implied avoiding admissions from out of Verona Province. There was also in the team a strong interest and a commitment to the ideas of deinstitutionalization as they were spreading in Italy and close contacts were maintained with colleagues active in deinstitutionalization. Site visits involving both professionals and nurses were made to those places where deinstitutionalization was progressing [1].

In 1976 the staff began making family visits in teams of two or three people to provide on-the-spot crisis intervention in an attempt to avoid hospitalisation. Also, crisis intervention at the emergency room was intensified. The psychiatrist on duty was helped by a nurse of the team, who would participate in the assessment and would then ensure continuity of care. The door of the ward was kept always open; if very disturbed patients were admitted, efforts were made to minimize limitations to personal freedom by offering extra personal care.

Therefore, in 1978, when the reform law was passed, it found the workers of the DoP of the University of Verona ready to agree with the spirit of Law 180 from the outset. They offered to assume responsibility for the implementation of the law in one of the four districts of greater Verona, served by the Verona health authority (400 000 total population). The initial size of the catchment area was one of 75 000 population. Further additions over the years have then expanded to encompass a population of about 103 000 inhabitants. Such decision implied tackling the difficulties of community psychiatry and giving up some of the privileges of an academic institution (such as choosing patients), while keeping up with university duties (teaching and research).

THE MATRIX MODEL FOR IMPLEMENTING AND EVALUATING A MENTAL HEALTH SYSTEM OF CARE

According to Thornicroft and Tansella [2, 3], a map is necessary to help shape service aims and the steps necessary for their implementation. To be useful such a map should be simple. A scheme was therefore created with only two dimensions, which has been called the matrix model. This model will help to assess the relative strengths and weaknesses of local services, and to formulate a clear plan of action to improve them. The matrix model may assist also by offering a step-by-step approach that is clear, but is also flexible enough to be relevant to local circumstances.

The two dimensions of this map are place and time. Place refers to three geographical levels: 1) country/regional; 2) local; and 3) individual. The second dimension (time) refers to three phases: a) inputs, b) processes; and c) outcomes. Using these two dimensions we can make a 3x3 matrix to bring into focus critical issues for mental health care.

Thornicroft and Tansella [2, 3] have chosen to include the geographical dimension in the matrix because they believe that mental health services should be primarily organised locally, to be delivered to individuals in need. However, some of the key factors are decided regionally or nationally, for example overall financial allocations to the mental health sector. In this sense, therefore, the local level acts as a lens to focus policies and resources most effectively for the benefit of individual service users. It was selected time as the other organising dimension, as a clear sequence of events has been seen, flowing from inputs to processes to outcomes. In this model outcomes should be the most important element, and the mental health system as a whole should therefore be judged on the outcomes it produces.

This matrix model can assist, in a sense, the accurate diagnosis of dysfunctional mental health services so that corrective action can be applied at the right level(s) to improve care. At the same time, this model is not intended to be rigidly prescriptive. It can be taken as a tool to use in analysing problems, and then in deciding what action to take.

We will use the matrix model to describe the South-Verona community-based system of psychiatric care.

INPUT. THE RESOURCES OF THE SOUTH-VERONA CPS AND THEIR DEVELOPMENT OVER THE YEARS

Psychiatric Care

In Verona all community staff members are divided into three multidisciplinary teams, each serving a subsector of the South-Verona catchment area. The three teams are organised according to a "single staff module" to ensure continuity of care, both longitudinal continuity (through the different phases of treatment) and cross-sectional continuity (through the different components of the CPS). Within each team each patient is assigned to one particular member of the staff (case manager).

The style of intervention is psychosocial: the service aims to provide prompt, adequate and coherent answers to patients' needs, psychological and social as well as practical, while trying to decrease and control symptoms. Special emphasis is given to integrating different interventions, such as medication, rehabilitation, family support, and social work. Case management, patient advocacy, and welfare provision are key aspects of these interventions. Special attention is paid to the most disabled and difficult to manage, as well as to chronic patients, with special support offered to the family when available [4].

The South-Verona CPS has different facilities and components.

- The Community Mental Health Centre is the hub of the CPS: the centre, located in a recently completely renovated historical three storey building with garden, not far away from the Academic general hospital, is open on weekday from 8 a.m. to 8 p.m. and on Saturday from 8 a.m. to 5 p.m.

Therapeutic programs include crisis intervention, day care for acute and chronic patients, rehabilitation and socialisation groups.
- The Psychiatric General Hospital Unit is a psychiatric ward of 15 beds located in the Academic general hospital.
- The Outpatient Department provides psychiatric consultations and individual and family therapy. Offices are located both in the general hospital and in the mental health centre.
- The Emergency Service is a consultation-liaison psychiatric service for the Emergency and Accident room of the general hospital, open 24 hours a day, seven days a week. It is run by a psychiatrist from our team, who is on call. There is also an emergency night and week-end service, run by two psychiatric nurses from our team, who are on call and may provide care in our residential facilities (flats and hostel), as well as at our patients' homes, co-ordinated by the psychiatrist on call.
- Home Visits can be made to provide crisis intervention in response to emergency calls, but for chronic patients these are usually planned in advance and offer regular, long-term support and care to patients and their families with the goal of minimising relapses and hospital admissions.

Since the front door of the mental hospital was partially closed from 1978 and completely closed from 1982, an important aspect of our community-based service has been the provision of residential care for long-term patients. Residential facilities for 20-25 patients are also part of the South-Verona CPS. One of them is a 24-hour-staffed supervised hostel (12 places) while two more are partially supervised (12 places). Group homes have increased in number over the years especially for the work of a mutual-help group supported by the Service, which extensively uses the practice of mutual hospitality.

The South-Verona CPS clinical facilities include also: the Service of Psychosomatics and Clinical Psychology and the Service of Psychotherapy. The first one provides specialised outpatient care for patients with panic attacks and obsessive-compulsive disorders, as well as consultations for patients and doctors of other departments of the University General Hospital (800 beds). It maintains psychiatric integration with other hospital-based medical activities and ensures continuing contact with our patients when hospitalised for medical reasons. The Service of Psychotherapy provides individual and family psychotherapy and houses a Regional Centre for the Treatment of Eating Disorders.

The South-Verona CPS has the following distinctive features: 1) it is not experimental but is a long-term experience, implemented 30 years ago; 2) it was designed and is still functioning as alternative, not complementary to the old hospital-based system of care; 3) it is organised according to a "single-staff module", to ensure continuity of care and to encourage full responsibility and commitment by the service; 4) it is well integrated, and allows easy and informal access to patients; 5) it is a public service run by the National health service.

Research

While implementing the new community-based system of care a structured programme of evaluative research in mental health, primarily dedicated to the monitoring and evaluation of the South Verona CPS was started [5]. The research units are located in a recently refurbished building, within the University General Hospital. The main research activities focus on epidemiological and social psychiatry (including economics and geography of mental health studies), genetics and neuroimaging of schizophrenic and bipolar disorders, clinical psychopharmacology, communication in medicine and evaluation of mental health services. The staff (more than 50 persons) includes now psychiatrists, clinical psychologists, computer scientists, physicists, geographers and social scientists, statisticians, technicians and secretaries.

Since that time many integrated and evaluative research projects have been completed and disseminated, with more than 550 papers published in peer-reviewed journals. Thus, the South Verona CPS is one of the most intensively evaluated mental health services in the world.

The DoP of Verona and the South-Verona CPS were designated by WHO as Collaborating Centre for Research and Training in Mental Health in 1987. Since then, the designation of our centre was confirmed every four years.

The research team has grown and expanded over the years and presently includes the following research units:
- Environmental Clinical and Genetic Determinants of the Outcome of Mental Disorders (Head: Prof. Mirella Ruggeri).
  This research area includes two main topics: 1) measuring satisfaction with mental health services; and 2) assessing outcomes in routine clinical practice and performing follow-up studies of patients treated in mental health services. Patient satisfaction can be viewed both as a measure of outcome per se and/or as a factor in the process of care, influencing other outcomes. Outcome is measured according to a multi-dimensional assessment, *i.e.* an assessment which simultaneously takes into account: different perspectives (for example, from clinicians, patients, relatives, etc.); different outcome indicators; and various process variables.
- Psychiatric Register, Economics and Geography of Mental Health (Head: Prof. Francesco Amaddeo).
  A psychiatric case register (PCR), managed by the DoP, which covers the same geographical area as the South-Verona community psychiatric service, was started on 31 December 1978 and

has been in operation since that time. The South-Verona PCR is used for clinical, administrative and research purposes (longitudinal analyses of patterns of care [6], studies on incidence, prevalence and services utilisation; comparisons with other case-register areas; and costs of care and outcome [7]). The PCR is also used as a sampling frame for studies on specific groups of patients. For these studies the PCR is usually used in combination with other approaches, for example: follow-up and cohort studies and linkage with other databases. [8].

Another main research area is to study the effect of urbanicity, socio economic status and distance from services on the incidence and prevalence of treated patients, and on Mental Health Services utilisation (also using the health geography approach).

- Clinical Psychopharmacology and Drug Epidemiology (Head: Dr. Corrado Barbui).

  This research area has two main objectives: 1) to describe the patterns of use of psychotropic drugs in routine practice; and 2) to assess the efficacy and tolerability profile of psychotropic drugs in experimental conditions [9].

  Psychiatry is an interesting area for drug epidemiology studies, because the use of psychotropic drugs is linked to many epidemiological variables, such as: patient-related (diagnosis, length of illness), family-related (level of expressed emotions), setting-related (outpatient psychiatric services, psychiatric hospital), social-related (economic situation, work opportunities) and macro-variables such as local regulations and/or national laws. Systematic reviews of randomised clinical trials (RCTs) are the research approach adopted to assess the efficacy and tolerability profile of psychotropic drugs in experimental conditions. Systematic reviews, using meta-analytical techniques, combine the results of RCTs, and provide an overall summary measurement of treatment effect [10].
- Brain Imaging and Neuropsychology (Head: Dr. Paolo Brambilla).

  This laboratory was established in the spring of 2003. A variety of neuroimaging techniques are being used to investigate the neurobiological bases of affective and psychotic disorders, particularly MRI investigations of bipolar disorder and schizophrenia. Specifically, the main aim of this Research Unit is to increase the knowledge of possible neural circuitry shared by these two conditions sustaining common psychopathological symptoms. We are also very interested in a greater understanding of the neural abnormalities underlying the brain anatomy of subtypes of psychotic spectrum (*i.e.*, early onset schizophrenia, late onset schizophrenia).
- Clinical Psychology and Communication in Medicine (Head: Prof. Christa Zimmermann).

  The application of the bio-psychosocial model in medical practice requires health providers to learn to integrate physician-centred and patient-centred communication skills when interacting with their patients. Patient-centred communication skills involve the collection of reliable information on patients' health and life problems within reasonable time limits, the ability to establish and to maintain a collaborative relationship, and are associated with better health outcomes. These skills are taught in learner centred courses offering supervised exercises and video feedback [11, 12].

  The main areas of interest which have been developed by this Research Unit during the last decade comprises the following: 1) the development and standardization of classification systems to measure doctor-patient interaction in primary care and in psychiatry; 2) the evaluation of the efficacy of training courses in improving communication skills of general practitioners and psychiatrists; 3) the application of sequence analyses to study doctor-patient interactions and 4) the study of the information-giving process in primary care consultations and in psychiatric outpatient intake interviews.
- Physical Comorbidity and Health Promotion in Psychiatric Patients (Head: Prof. Lorenzo Burti)

  The project aims at studying the prevalence of physical comorbidity in mental patients with functional psychoses, in implementing preventive strategies related to dietary habits and physical exercise and studying their efficacy with a randomised controlled study. The Unit is also involved as partner in two related, EU funded, multicentre projects: ITHACA (Institutional Treatment, Human Rights and Care Assessment) and HELPS (European Network for Promoting the Health of Residents in Psychiatric and Social Care Institutions). The two projects aim at identifying evaluation instruments and disseminating best practice to improve the protection of human rights and dignity and the general health status of residents in health or social care institutions. Within this Research Unit a multicentre study of the network of Veneto regional centres for the treatment of eating disorders has been recently planned.

Education and training

Education and training is provided for undergraduate medical students, for post-graduate residents, for post-graduate Ph.D. students in psychology and psychiatry and for undergraduate students in psychosocial rehabilitation. Two Masters in advanced nursing are presently offered to psychiatric nurses in Verona and in side branch of the University, in Bolzano. Short courses in psychiatry, medical and clinical psychology, psychosomatics, and psychogeriatrics are also provided for other schools of specialisation within the Medical School of the University of Verona.

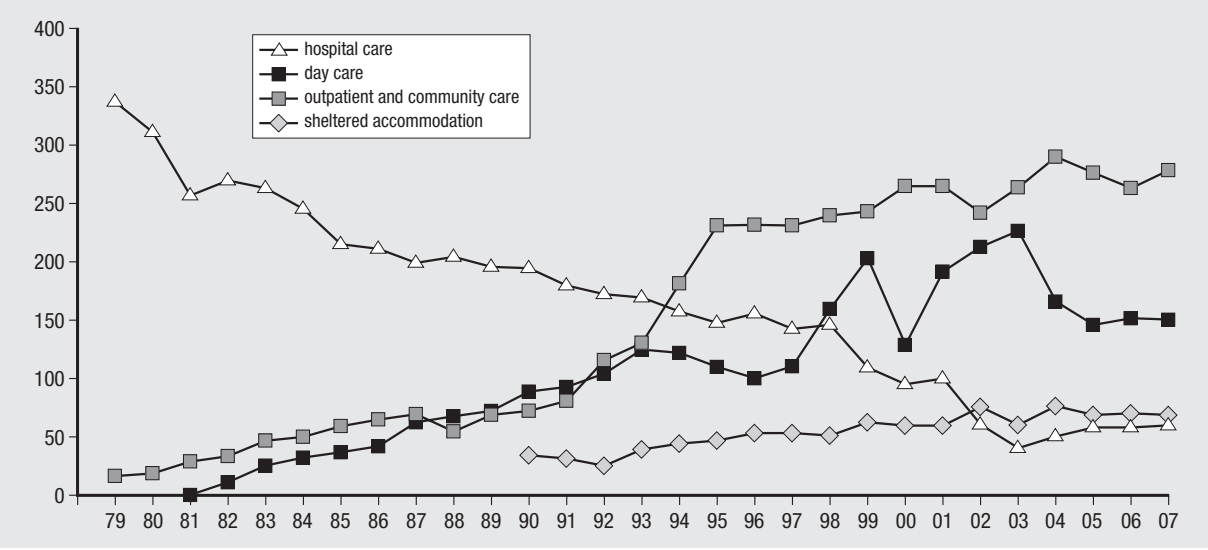

Fig. 1 | *Patterns of care (ratios per 1000 adult South-Verona residents).*

PROCESS. INTEGRATING CARE PROVIDED OUTSIDE AND INSIDE HOSPITAL, WHILE MOVING THE FOCUS OF CARE IN THE COMMUNITY

How service utilization changed after the psychiatric reform?

Longitudinal monitoring of service utilization in South-Verona has shown that, between 1979 and 2007, hospital care consistently decreased whereas out-patient and community care, home visits and other community contacts, number of day care contacts and attendance at the day hospital and number of days in sheltered accommodation run by the CPS, all steadily increased *(Figure 1)*.

The decrease in the use of beds was mainly because of the decrease of long-stay patients in the mental hospital and occurred whilst psychiatric beds for short and medium term stays were available. A comparison of in-patient admissions before and after the 1978 psychiatric reform showed that in 2007 (29 years after the reform), compared with 1977 (1 year before), there was a 6% decrease of in-patient admissions, with a 69% decrease in compulsory admissions (which never exceeded 22 admissions per year per 100 000 adult population), with a complete halt of admissions to state mental hospitals *(Table 1a)*. As a consequence, the mean number of occupied beds per day consistently decreased over time and in 2007, this figure was 72% lower than in 1977. This decrease is entirely due to the decline of the number of patients remaining in the state mental hospital. In 2007, the total number of beds occupied in both public and private hospitals was 29 per 100 000 adult South-Verona residents *(Table 1b)*.

Table 1 | *In-patient admissions (a) and mean occupied beds\da y(b) before (1977) and after the Psychiatric Reform (ratios per 100 000 adult South-Verona residents)*

	1977	1979	1984	1989	1994	1999	2004	2007	Difference (%) 2007 *vs* 1977
a)									
Compulsory	55	8	5	22	6	17	18	21	-69%
To state mental hospital (voluntary)	194	86	0	0	0	0	0	0	-100%
To other facilities:									
Public care	172	304	345	273	326	262	250	333	+72%
Private care	67	72	66	78	61	141	126	104	+79%
Total	**488**	**469**	**416**	**373**	**393**	**420**	**394**	**458**	**-6%**
b)									
In state mental hospitals	86	69	38	29	18	0	0	0	-100%
In other public hospitals	9	16	18	15	15	20	14	17	+84%
In private hospitals	9	7	8	9	10	9	12	12	+34%
Total	**104**	**93**	**64**	**53**	**43**	**29**	**26**	**29**	**-72%**

To what extent are service costs associated with clinical, social and service history variables?

The growing movement in many European countries towards capitation-based systems for financing mental health care has generated increasing interest in developing appropriate models capitation formulae.

A study was conducted on all patients in contact with the South-Verona CPS during the last quarter of 1996 [13]. Clinical and service-related variables were collected at first index contact; 3 months later, patients were interviewed using the client services recipient interview. For those who completed both the clinical assessments and the services receipt schedule (n. = 339), one-year psychiatric and non-psychiatric direct care costs were calculated. Weighted backward regression analyses were performed. The most significant variables associated with psychiatric costs were: admission to hospital in the previous year; intensity and duration of previous contacts with South-Verona CPS; being unemployed; having a diagnosis of affective disorder; and global assessment of functioning (GAF) score. The final model explained 66% of the variation in costs of psychiatric care and 13% of variation in non-psychiatric medical costs. The model explains a higher degree of cost variance than previously published studies. In community-based services more resources are targeted towards the most disabled patients. Previous psychiatric history (number of admissions in the previous year and intensity of psychiatric contacts lifetime) is strongly associated with psychiatric costs.

Following these results, a further study was carried out to obtain a new, well-balanced mental health funding system, through the creation of: i) a list of psychiatric interventions provided by Italian CPSs, and associated costs; ii) a new prospective funding system for patients with a high use of resources, based on packages of care. Five Italian CPSs collected data from 1250 patients during October 2002. Socio-demographical and clinical characteristics and GAF scores were collected at baseline. All psychiatric contacts during the following six months were registered and categorised into 24 service contact types. Using elasticity equation and contact characteristics, the costs of care were estimated. Cluster analysis techniques allows to identify packages of care and logistic regression defined predictive variables of high use patients. Multinomial logistic model assigned each patient to a package of care. The sample's socio-demographic characteristics are similar, but variations exist between the different CPSs. Patients were then divided into two groups, and the group with the highest use of resources was divided into three smaller groups, based on number and type of services provided. Our findings show how is possible to develop a cost predictive model to assign patients with a high use of resources to a group that can provide the right level of care. For these patients it might be possible to apply a prospective per-capita funding system based on packages of care [14].

Do socioeconomic status, accessibility and distance affect the use of community-based psychiatric services?

A study allowed to assess the effect of socioeconomic status (SES) on psychiatric service use in an Italian area with a well-developed CPS [15, 16]. An index of SES was calculated from nine census variables and grouped into four categories, ranging from SES-I-affluent to SES-IV-deprived, for each of 328 census blocks (CB) of our catchment area. Fifteen indicators of psychiatric service use were collected using the psychiatric case register. All patients resident in the catchment area, who had at least one psychiatric contact in 1996 (n. = 989), were included in the study. Indicators of in-patient, day-patient, out-patient and community service use showed an inverse association with SES. Only first-ever and long-term psychotic patients were equally distributed in the four SES groups. The inverse association between SES and most indicators of psychiatric service use suggests that the planning of community-based services and resource allocation should take into account the SES of residents.

The results highlighted that, in an area with a community-based system of care, socioeconomic characteristics of the place of residence are associated with psychiatric service use by patients. Socioeconomic status and distance from hospital or other community based services shouldn't prevent the access to the care, but for some type of care (day care, for example) there is a relation between services utilisation and nearness between place of residence and services. Accessibility is a many-sided concept, that regards many factors, like the cost of the travel, the availability of public transports, psychological and physical barriers, social and cultural factors and environment characteristics, as well as social capital and social cohesion. Further studies whose main aim is to analyse the effect of urbanicity, socio economic status and distance from services on the incidence and prevalence of treated patients, and on Mental Health Services utilisation are presently in progress.

Are inappropriate terminations of contact (dropping out of care) or single consultations with community-based psychiatric services predictable?

Few studies have investigated so far factors which predict inappropriate terminations (drop-out) of clinical contact with mental health services. A study aims to identify patient and treatment characteristics associated with dropping out of contact with South-Verona CPS [17].

A three-month cohort of patients attending the CPS was followed up for two years, to identify drop-outs. We identified 495 patients who had had at least one psychiatric contact of whom 261 had complete ratings for the GAF and the Verona service satisfaction scale (VSSS). In the year after the index contact, 70 (26.8%) terminated contact with the CPS; of these, 62.9% were rated as having inappropriate

terminations (the "drop-out" group) and 37.1% had appropriate terminations of contact. Drop-outs were younger, less likely to be married and their previous length of contact with services was shorter. No drop-outs had a diagnosis of schizophrenia. Multivariate analysis revealed predictors of dropping out. In a CPS targeted to patients with severe mental illnesses, those who drop out of care are younger patients without psychoses who are generally satisfied with their treatment.

Another study examined variables associated with having a once-only contact with the out-patient department of two community mental health services in Italy and Australia [18]. Two 8-year cohorts of patients, who had a new episode of care with out-patient psychiatric departments in South Verona and in Western Australia, were followed-up for 3 months after the first contact, to identify those patients who had no further contact with services. Potential determinants of once-only contact were analysed. Thirty percent of new episodes of care for persons who met the inclusion criteria of the study were once-only contacts with the service in South Verona. In Western Australia, the figure was 24%. Moreover, the proportion of once-only contact patients has increased over time in South Verona whereas, in Western Australia, it has remained stable. In Western Australia, once-only contact patients were younger whereas in South Verona they tended to be older. At both research sites, patients who had a once-only contact were more likely to be male and to have a less severe mental illness. The results of this study suggest that only clinical characteristics were significant determinants of this pattern of contact with services consistently at both sites: the less severe the patient's diagnosis, the more likely the patient is to have a once-only contact. This may well indicate good screening at the initial point of contact by both sets of mental health service providers.

OUTCOME. ASSESSING TREATMENT EFFECTIVENESS IN "REAL-WORLD" PSYCHIATRIC SERVICES

In order to assist clinicians in making treatment decisions, data obtained from randomised trials should be integrated with information drawn from studies assessing treatment effectiveness as provided in "real world" health care settings.

Is mortality of psychiatric patients in an area with a community-based system of mental health care different to that of the general population?

A study conducted in South-Verona explored the effect of those causes of death considered avoidable [19]. All patients with an ICD-10 psychiatric diagnosis, living in the catchments' area of about 100 000 inhabitants, seeking care in 1982-2005 (23 years) were included in this study. Standardised mortality ratios (SMRs) were calculated for each cause included those considered avoidable, using the mortality of the general population in the Veneto Region to estimate the expected number of deaths. For avoidable causes, a list derived from the Rutstein's list and from an EC version set up in the 1980s was used, and then causes were divided into two groups: indicators of quality of: i) health care; and ii) health policies. The observed number of deaths for avoidable causes was four times greater than the expected ($P < 0.01$). SMR was higher for deaths preventable with adequate health promotion policies than for those preventable with appropriate health care. Males, alcohol/drug addicted and young patients had the highest avoidable SMRs. From these results it seems important the implementation, by specialist psychiatric services, of health promotion and preventive programs targeted to psychiatric patients. Another study [20] evaluated not only avoidable mortality, but the relation among mortality, causes of death and associated risk factors among psychiatric patients. Patients were followed-up over a 20-year period in an area where psychiatric care is entirely provided by community-based psychiatric services. Many of the mortality studies published so far were conducted in areas where hospital-based system of care are available for mentally ill. All subjects who had at least one contact with the South-Verona CPS during a 20 year period and who at the first contact or later received an ICD-10 psychiatric diagnosis were included in this study (59 139 person years). Total SMR of our psychiatric population was 1.88, mortality in out-patients was significantly high (SMR = 1.70, 95% C.I. 1.6 to 1.8), and, as expected, it becomes higher after the first admission (SMR = 2.61, 95% C.I. 2.4 to 2.9). SMRs for infectious diseases are higher among younger patients and extremely high in patients with drug addiction (216.40, 95% C.I. 142.5 to 328.6) and personality disorders (20.87 C.I. 5.2 to 83.4). Our data show that, also in a community-based mental health service, psychiatric patients are at almost twofold higher risk of death than the general population and this becomes extremely higher for those diagnosed with drug addiction or personality disorders.

Routine outcome assessment in mental health services should involve health-care providers and at the same time guarantee a satisfactory quality of data collected [21, 22]. Taking into account multiple perspectives (*i.e.*, those of clinicians, patients and caregivers) and integrating these views is a necessary step when evaluating mental health outcomes. The outcome of mental disorders is heterogeneous and the relationships among multiple outcome variables are complex; thus specifically developed methodologies are needed in order to gain a deeper understanding of their reciprocal interactions. Clinical and social dimensions of outcome display different patterns of exacerbation and remission over time and might be influenced by different set of predictors and susceptible to specific interventions. To answer these questions, we have conceived the South

Verona Outcome Project (SVOP), whose protocol and main results will be described in the next paragraphs.

Is the assessment of outcome feasible in a routine community-based mental health service?

The SVOP is one of the few systematic outcome evaluations of a "real world" mental health service available in the international literature. It is a naturalistic, longitudinal research which aimed to assess the outcome of care provided by the South-Verona CPS. Its key-features are that: a) data collection has been conducted in the routine clinical practice setting of a well established "real world" psychiatric service; b) professionals engaged in clinical work have been systematically involved in the assessment process; c) the assessment included a comprehensive set of both clinician-rated and patient-rated outcomes; d) regular checks of the reliability and quality of the data collected have been performed.

Prevalence cohorts of patients on the caseloads of the South-Verona CPS were systematically assessed with a set of standardised instruments. Assessments took place twice a year, from April to June (wave A) and from October to December (wave B). During these periods all key-workers (psychiatrists or psychologists) were asked to assess at the first or, at latest, the second visit in the period, both first-ever patients and patients already in contact with the service. In wave A the assessment was made only by the key-professional on the basis of the patient's condition in the previous month and included an assessment of global functioning, psychopathology, and disability in performing social roles. In wave B, the assessment was made both by the key-professionals (again the same assessments as in wave A, plus the assessment of needs for care) and by the patients, who were requested to assess their quality of life and satisfaction with mental health services in relation to their experience over the previous year.

All primary clinicians (psychiatrists and psychologists) were trained in the correct use of the standardised instruments. Training took place every year in the month preceding wave A and consisted of 5 training sessions. All instruments used showed good psychometric characteristics

The SVOP was conducted between 1994 and 1997, with the assessment of a series of cohorts of patients attending the South-Verona CPS. More than 2500 patients have been assessed in a standardised way by clinicians, and more than 1000 patients have completed self-administered instruments. A comprehensive data set has thus been obtained, providing a valuable source of information that can be used for purposes of service planning and evaluation. As part of the SVOP a series of follow up studies were performed, including also patients which were not in contact with our service at follow-up. This comprehensive set of data was used in order to: a) identify changes occurring in the short and medium period in each of the indicators of outcome assessed; b) identify the predictors of favourable and unfavourable outcome in each area; c) analyse the link existing during the course of the time between the various indicators. Overall, the results obtained provided a deeper understanding of social, health-related, and service-related factors which influenced the outcome of mental disorders. Results from the SVOP clearly show that in "real world health services" the outcome of care is multifaceted, that it can be perceived differently if different perspectives are taken, but at the same time that such a complex picture can provide comprehensive information regarding the effectiveness of care provided in order to act as a feedback for improving clinical practice. It is hoped that the SVOP experience may be viewed as a framework model for future research initiatives to be conducted in routine services and that empirical findings derived from the rich data set of the SVOP may increase and reshape the body of knowledge for both mental health services professionals and administrators [21].

Which are the predictors of clinical and social outcome in patients receiving community-based mental health care?

A total of 354 patients treated in the South-Verona CPS were followed-up over 6 years (with assessments made at baseline, at 2 and 6 years) by using a set of standardised measures exploring psychopathology (BPRS) and social disability (DAS). GLLAMM models were used to explore longitudinal predictors of clinical and social outcome.

Psychotic patients displayed a clinical and social outcome characterized by complex patterns of exacerbation and remission over time; however a clear trend towards a deteriorating course was not found, thus challenging the notion that psychotics are not fatally prone to a destiny of chronicity. Non psychotics reported a significant reduction in the core symptom of depression and in the observable physical and motor manifestations of tension and agitation, and a parallel increase of complaints about their physical health. These data show that clinical and social dimensions of outcome are influenced by specific and different set of predictors. The results of this study confirm the need to implement naturalistic outcome studies conducted in the "real world" services in order to inform decisions and strategies to be adopted in routine clinical practice [23].

Which are the predictors of changes in needs for care in patients receiving community-based mental health care?

The study was conducted using a 4-year prospective longitudinal design. A cohort of patients from the South-Verona CPS was assessed at baseline and follow-up using the Camberwell assessment of need, both staff and patient versions. Predictors of needs' changes were explored using block-stratified multiple regression analyses.

An overall stability for both patient-rated and staff-rated needs was found over time; however, significant changes in some specific need domains were found, such as self-rated health needs (improvement), self-rated social needs (deterioration) and staff-rated health needs (deterioration). Changes over time in self-rated and staff-rated needs are influenced by different and specific set of predictors, thus indicating that the two measures are not overlapping and convey different types of information. Our data support the adoption of a negotiated approach in which both staff and users' views should be given equal weight when planning and providing needs-led mental health care [24].

Which are strengths and weaknesses, in the patients' perspectives, of a "real world" service and the characteristics that might be associated with service dissatisfaction?

Service satisfaction was measured with the Verona service satisfaction scale (VSSS) across three subsequent waves of the SVOP; frequency distributions of scores in the various VSSS domains were compared. Service dissatisfaction proved to be one of the main causes for drop-out, especially in non psychotic patients. Many patients no longer in contact had mild to moderate problems, especially anxiety and depression and some social disability. Patients out of contact rarely sought help from other agencies [25].

The relationship between satisfaction with psychiatric care and a number of well-established mental health indicators, including socio-demographic, clinical and service intervention variables, was investigated using random-effects models. The organisation of service and the behaviour and manners of the professionals were the main service strengths. Weaknesses were identified in the physical layout of facilities, the lack of involvement of relatives, and in the information provided. Overall satisfaction was medium-high, while subjects with longer duration of service contact and higher disability were the most dissatisfied. The predictors we examined, however, explained only modest percentages of variance. Repeated, routine assessments of service satisfaction have provided a clear view of the South-Verona CPS's strengths and weaknesses; this set of information was crucial for the continuous quality improvement process in the service [26].

Which are the changes over three-years in caregiving burden and emotional distress in relatives of people with schizophrenia, and what are the factors predicting levels of caregiving burden?

A cohort of 51 caregivers of patients with schizophrenia attending the South-Verona CPS was assessed over 3-years with the involvement evaluation questionnaire, European version (IEQ-EU). Predictors of care giving burden included both caregivers' and patients' characteristics and patterns of carers-patients interaction [27].

Baseline levels of family burden were high in worrying and urging domains. Fifty-one per cent of caregivers experienced significant emotional distress. Both overall burden and emotional distress improved. Higher patients' psychopathology, higher numbers of patient-rated needs, patients' lower global functioning, and patients' poorer quality of life were found to be related to the severity of family burden. The only significant predictor of caregivers' burden at follow-up was the baseline level of caregivers' burden itself. On the basis of these findings, a policy addressing the caring burden of informal caregivers beyond patients' symptoms reduction should be considered [28].

FURTHER RESEARCH DEVELOPMENTS. THE ROAD AHEAD

To complement information on the predictors of outcome and improve evaluation at the patient and service levels, we have recently conceived the Psychosis Incident Cohort Outcome Study (PICOS), that aims to integrate genetic, clinical and environmental data [29]. Specifically, the interaction between genetic and environmental events, as well as brain morpho-functional alterations, occurring during a critical period in neuronal maturation, has been hypothesized to contribute to onset of psychosis. However the specific role, the relative weight and the possible relationship among biological and environmental factors are far from being fully understood.

PICOS is a multisite collaborative research on one-year incident cases of psychoses attending mental health services in the Veneto Region. We hypothesized that patients with higher genetic load, in term of putative susceptibility genes (such as neuregulin 1, dysbindin and DISC-1), and morpho-functional brain abnormalities will display: 1) earlier onset; 2) more severe clinical condition at baseline; 3) worse clinical and social outcome. A network of 28 collaborating sites, covering about 80% of the Veneto Region (with a catchment area of 3 500 000 inhabitants), was established [30]: the network includes both mental health services providing care within NHS framework and mental health facilities working in the private sector.

PICOS has a "modular" structure, as follows:

Module 1 - Clinical and social evaluations

The baseline data collection started in January 2005 and was concluded in December 2007. A total of 544 subjects were recruited; among these, 350 patients accepted to be interviewed with the set of the study instruments and completed the assessments (life events, premorbid adjustment, premorbid IQ, parental bonding, psychopathology, social disability, quality of life, needs for care).

Module 2 – Genetics

It includes the reconstruction of probands' Family Tree for psychosis and techniques of molecular genetics. Blood samples from patients and their first-

degree relatives were collected for DNA analyses, which will be focused on putative susceptibility genes for psychoses. So far, the reconstruction of Family Tree for psychosis and the collection of venous blood samples for DNA analyses was performed in 280 patients. Blood samples from 170 first-degree relatives were also collected.

Module 3 - Brain imaging

It includes the evaluation of structural/ functional brain abnormalities by MRI scans; a series of neuropsychological tests has been also performed in order to find possible correlations between brain abnormalities and specific brain functions. MRI scans are performed at baseline and at 1 year. So far, the evaluation of structural/ functional brain abnormalities through MRI scans was conducted in 72 patients; neuropsychological tests were also performed on the same number of patients.

CONCLUSIONS

The thirty years experience conducted in South-Verona showed that it is possible and sustainable to run an academic community-based mental health service where there is a strong integration between innovative psychiatric care, scientific research and modern academic undergraduate and postgraduate education. The care provided everyday by such a service must be continuously informed by scientific evidence [31] and by the exchange of knowledge and experiences with other colleagues in the country and abroad. This is what has been happening in Verona for 30 years. On the other hand, it is worthwhile to underline that most research projects conducted so far are based on real-word psychiatric care and that the routine monitoring of clinical activities represents, since many years, the framework for epidemiologically-based evaluations of the outcome.

Finally, thanks to the coordination between innovative care and evaluative research, the South-Verona CPS provides undergraduate and postgraduate students with the opportunity to receive up-to-date education and training in settings very similar to those that they will find in their professional life.

Submitted on invitation.
Accepted on 30 January 2009.

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