Review/Meta-analyses

Standardised description of health and social care: A systematic review of use of the ESMS/DESDE (European Service Mapping Schedule/ Description and Evaluation of Services and DirectoriEs)

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A R T I C L E   I N F O

A B S T R A C T

Background: Evidence-informed planning and interpretation of research results both require stand-ardised description of local care delivery context. Such context analysis descriptions should be comparable across regions and countries to allow benchmarking and organizational learning, and for research findings to be interpreted in context. The European Service Mapping Schedule (ESMS) is a classification of adult mental health services that was later adapted for the assessment of health and social systems research (Description and Evaluation of Services and DirectoriEs - DESDE). The aim of the study was to review the diffusion and use of the ESMS/DESDE system in health and social care and its impact in health policy and decision-making.

Method: We conducted a systematic review following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (1997–2018).

Results: Out of 155 papers mentioning ESMS/DESDE, 71 have used it for service research and planning. The classification has been translated into eight languages and has been used by seven international research networks. Since 2000, it has originated 11 instruments for health system research with extensive analysis of their metric properties. The ESMS/DESDE coding system has been used in 585 catchment areas in 34 countries for description of services delivery at local, regional and national levels.

Conclusions: The ESMS/DESDE system provides a common terminology, a classification of care services, and a set of tools allowing a variety of aims to be addressed in healthcare and health systems research. It facilitates comparisons across and within countries for evidence-informed planning.

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1. Introduction

There is growing interest in moving from evidence-based planning to evidence-informed policy, which takes into account information on the local context and other factors influencing decision-making [1–3]. Context refers to the totality of circum-stances that comprise the milieu of a given phenomenon [4] and therefore encompasses information on the physical environment, the social and demographic determinants of health and the range of services available in the local system and their costs [5,6]. The eventual aim is to allow such information to be incorporated into real world decision support systems to guide planning and resource allocation [7] and facilitate interpretation of research results.

Context analysis, including service provision, is part of "health-care ecosystem research" [8,9], an emerging discipline that analyses the complexity of care systems and interventions in a

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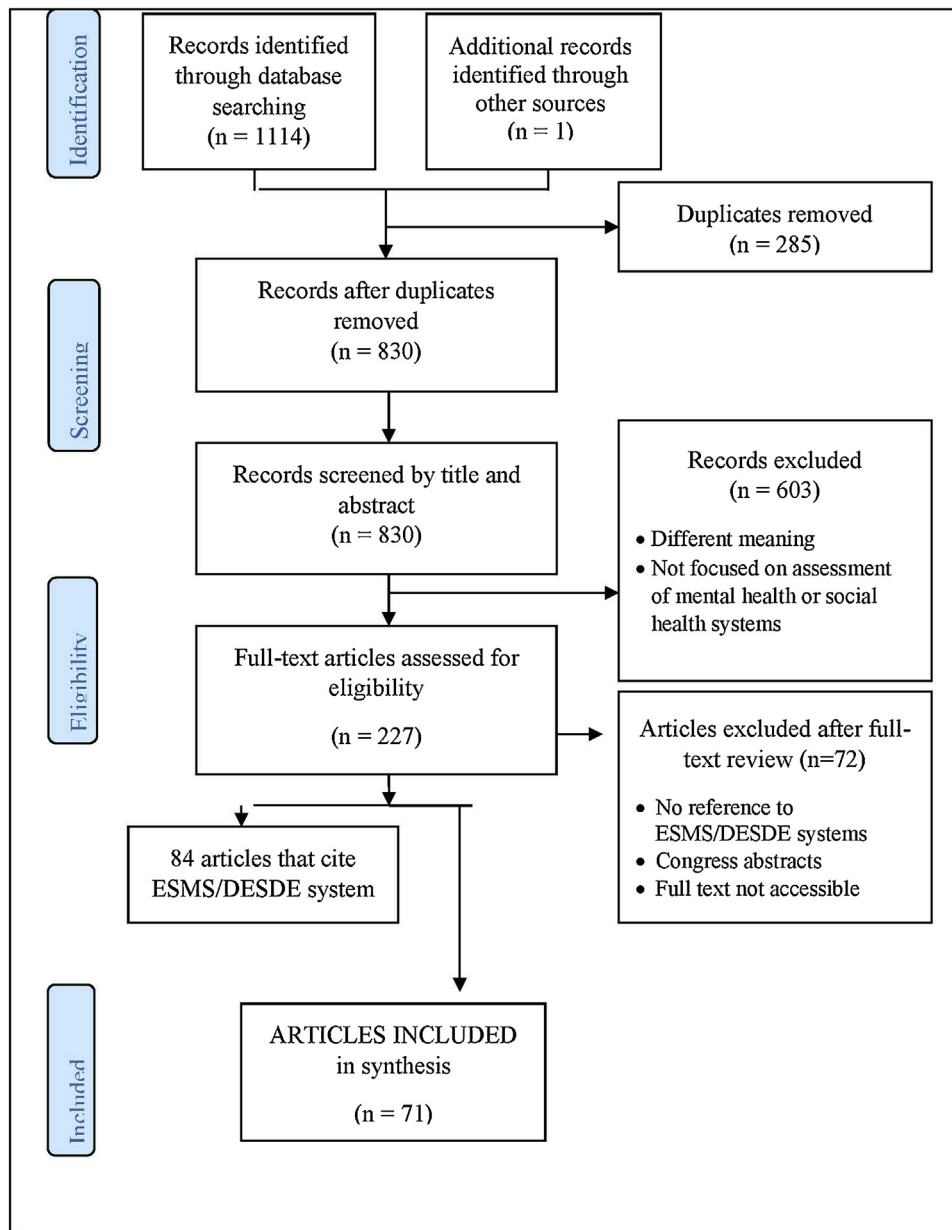[1] www.uloyola.es.

Fig. 1. PRISMA flowchart of study.

defined environment, using methods developed in environmental sciences for ecosystem services research [10].

There is wide variability in the terminology referring to services and programs delivered even in the same geographical area, and listings of services by their names alone should be analysed with caution, as the service names do not always reflect activity. Meaningful international comparisons need a common consensus-based terminology to improve health, strengthen health systems and provide essential healthcare for all [11,12]. A common coding system, using a standardised method of assessment, is important to overcome these challenges and enable better comparisons of data to inform policy and practice [6].

Comparative description of national and international health systems is important for identification of gaps in care, particularly in mental health. The World Health Organization has raised

international awareness of the gap between health care needs and available resources following the launch of the mental health Gap Action Programme in 2008 [13].

Recent guidelines on implementation research (StaRI -Standards for Reporting Implementation Studies) [14] call for transparent and accurate descriptions of the environment in which implementation studies took place [15]. The guidelines specify a detailed description of both the general context in which the intervention is implemented, and the service provision structure at personnel, health resources and sites level in which the implementation takes place.

The European Service Mapping Schedule (ESMS) was developed to facilitate the classification of mental health services and the standardised description of the care system for adults experiencing mental health problems by the EPCAT group (European Psychiatric

Care Assessment Team) between 1994 and 1997, and it was published in 2000 [16,17]. This system evaluation toolkit also included the International Classification of Mental Health Care (ICMHC) [18], which evaluated the different modalities of care available in a service, and the European Socio-demographic Schedule (ESDS) [19] for the standardised description of the sociodemographic characteristics of local catchment areas.

The ESMS was expanded and adapted for the assessment of other target groups such as children and adolescents, people with drug and alcohol problems or disabilities [20] and ageing populations [21]. This expanded version, called "Description and Evaluation of Services and DirectoriEs" (DESDE), was adapted for the evaluation of chronic or long-term care (DESDE-LTC) [22] and for the evaluation of social services (DESDE-AND) including an automated coding system [23]. Hence, the original ESMS instrument for adult mental health care, comprising 36 codes, has been expanded to an international classification of the care sector with 106 codes and over six instruments (see Fig. 1). This classification is here referred as the "ESMS/DESDE" system for health care evaluation. Since the original work of the EPCAT group (1994–2000) several European Union funded research reference groups have continued the seminal work of EPCAT developing and implementing this system (Mental Health Economics Network-MHEEN, Description and Evaluation of Services and DirectoriEs for Long Term Care-DESDE-LTC research Group and REsearch on FINancing systems' Effect on the quality of MENTal health care-REFINEMENT).

The classification and its related instruments describe care provision in catchment areas, comparing the structure, distribution and typology of services across health districts. The ESMS and the instruments derived from it, use a tree diagram to describe health services over four main domains:

A Definition of catchments, target populations and units of analysis for services. Services are analysed as "Care Teams" or "Basic Stable Inputs of Care". A BSIC is a combined and coordinated set of inputs (including structure, staff and organisation) that delivers care at a micro-organisation level, and has temporal and organisational stability. In summary, a BSIC is characterized by a stable group of professionals who on a routine basis provide coordinated care to the same group of patients or consumers. Catchments, target populations and services can be aggregated to provide higher-level analysis of health systems.
B Availability of care: activities performed by the Care Teams. Each team or program is coded according to the Main Types of Care (MTCs) it provides. The MTC codes describe the principal activities of the service according to the ESMS/DESDE hierarchical tree taxonomy. There are six main MTC mapping branches (Residential, Day, and Outpatient Care, Self-help support, Information and assessment, and Accessibility), as well as optional qualifiers that can be used to develop a more granular description of services as required.
C Resource use: The ESMS/DESDE system provides instructions for collection of standardised counts of service use. As with other sections, various levels of granularity can be obtained as required by the specific evaluation project.
D Service characteristics checklist: A more detailed, standardised analysis of local care organisations and functional teams, including information about governance, funding sources, characteristics of the services and staffing.

This system is intended to be widely used and is open access to favour its use by non-for-profit organisations. Its tree structure has facilitated the incorporation of new codes as new target groups or sectors were coded.

Even though the ESMS/DESDE has been extensively applied in health care assessment in many countries, there has not been a comprehensive review on its "diffusion" in a range of different sectors and target groups across the world. Diffusion refers to the spreading of the innovation tool more widely in a range of different contexts [24].

This study aims to identify, describe and analyze the use and the international diffusion of the ESMS/DESDE system for health service evaluation and systems research and its impact in health policy and decision-making.

2. Method

We conducted a systematic review following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [25]. The protocol of the systematic review was published in PROSPERO, a database of prospectively registered systematic reviews in health and social care (CRD42018104864).

2.1. Search strategy

The search was carried out until December 31, 2018. There was no limitation of the search strategy based on language or year of publication. We searched for scientific publications in the following electronic databases: Web of Science, Scopus, Proquest, (Agricultural & environmental science database, Health and medical collection, Nursing & allied health database, Psycarticles, Psychology database, PsycInfo), Pubmed, Google Scholar and OVID.

We used a similar search strategy for every database search. The key words included different nomenclature applied to the ESMS/DESDE system and the instruments derived from it from its initial development to the present. For example in the case of Pubmed database, the search strategy was as follows: (("EUROPEAN SERVICE* MAPPING SCHEDULE"[All Fields] OR eDESDE[All Fields]) OR DESDE-LTC[All Fields]) OR REMAST[All Fields].

2.2. Eligibility criteria

The adapted PICO method included: Participant/Population (all type of services for people with mental disorders, disability or long-term care), Intervention (assessment of services using ESMS/DESDE), and Outcome (application/diffusion of the ESMS/DESDE and policy impact).

Inclusion criteria were: Journal articles reporting studies about services or health systems evaluation that have used ESMS/DESDE, studies about services aimed at people with mental health, disability or long term care needs and introduction of the instruments of ESMS/DESDE system. No restrictions were set about country of use, year of publication or language.

Studies that did not incorporate a care service or systems evaluation or that only provide a reference to other ESMS/DESDE studies were excluded from the final selection list. The studies that only refer to ESMS/DESDE as part of a conceptual framework in evaluation of services have been counted separately but not included in the systematic review. Grey literature has not been included in this review.

2.3. Study selection

Two authors (CR and MR) carried out an independent screening and eligibility analysis. In the first phase, CR and MR checked the paper's title and abstract to assess whether it potentially met criteria for inclusion. In the eligibility phase, they reviewed full text articles. Where there was disagreement between the two reviewers, a third researcher (JAS) was consulted to reach consensus on eligibility. A direct content analysis was made of

papers published in English, Spanish, French, Portuguese and Italian. External support was required for context analysis of papers published in German, Polish, Farsi and Mandarin.

Titles and abstracts of all citations were obtained for phase 1 of the study selection. Citation indices and reference lists of retrieved articles were checked for additional studies not identified in the original database search. The full text of the screened records was searched.

Fig. 1 provides a visual representation of the current review's methodological process, according to the PRISMA framework [25].

When necessary, the reviewers contacted the leading authors to get further clarification and information on the use of the ESMS/ DESDE in other countries.

2.4. Data abstraction

The data abstraction form included: 1) bibliographic information (first author, year of publication); 2) uses of ESMS/DESDE system; 3) specific tools derived from the ESMS; 4) psychometric properties of the tools; 5) language of the version used; 6) country of application; 7) target population; 8) number of evaluated areas. Whenever possible, the catchment areas described in the study were classified in accordance with the territorialisation levels described in the DESDE-LTC instrument (H1-national level, H2-regional level, H3-hospital catchment area and H4-mental health community center catchment areas) [26]. Twenty-two papers used other territorial jurisdictions such as municipalities, urban districts or research sites and the geographical level was not specified; four studies did not describe areas. In addition, we included a description of the following characteristics: 9) number of services evaluated in functional teams or BSICS; 10) research group; (11) impact on policy for plan and health decision use; (12) funding source.

2.5. Study characteristics

The study characteristics are shown in Table 2. This description of the selected papers includes: the specific ESMS/DESDE tool used in the study, the specific tool and its metric properties (feasibility, reliability, validity), framework of service research included in the study, description of the reference areas and its social and demographic characteristics (context analysis) and demographic context (standard description or basic data), the evaluation of the service provision in the system, the agents using and/or providing care in the system (patient, family, professional), resource utilization, the main aim of the study (e.g. scale development, costs, description of the service delivery, supply and demand, health interventions or decision support system model), the use of visualization tools (geographic information system, spatial analysis and atlas), type of analysis (data analytic or decision support system), and use for decision making.

This study has followed the PRISMA quality criteria for systematic reviews [25]. The quality was assessed using a checklist based on the EPCAT model for services evaluation [27] and the domains suggested by Votruba and colleagues for health system and policy research [28]. The quality checklist included the following ten domains listed above. Studies were rated as high quality when they fulfilled at least six criteria in this checklist.

3. Results

3.1. Literature search

The search performed in our review retrieved 1.114 references. One additional paper was included after checking the list with the experts of the group. Fig. 1 shows the flowchart of the selection process. After removing duplicates, 830 abstracts were reviewed by two independent researchers. A total of 603 records were excluded because they were not focused on assessment of health systems and services. The full text of the remaining 227 articles was text assessed for eligibility. Of these, 72 papers were excluded, of which 61 did not include a reference to the ESMS/DESDE system, six were conference abstracts and five were not available for the full text. Another 84 texts referred to the ESMS/DESDE system in the introduction or discussion but did not actually use the ESMS/ DESDE classification or its related instruments.7

3.2. General characteristics

Since 1997, 155 papers have mentioned the ESMS/DESDE system. Out of them, 71 articles have actually used the ESMS/ DESDE for service research. It should be noted that three papers authored by members of the core EPCAT team were published before the ESMS was officially released in 2000 [29–31].

The data abstraction form is included in Annex 1 with information about key features of the papers reviewed. The main characteristics of the reviewed articles are shown in Table 2.

Eleven tools for health services and system research have derived from the original ESMS [16] (Fig. 2). Six are versions of the ESMS and DESDE instruments aimed at different target groups or levels of research [32,33,20–23]. In addition three instruments have been derived from the ESMS by independent groups for a) cost analysis in schizophrenia (Service Utilization Sheet –SUS-, [34], b) analysis of community mental health services in South Africa (framework for CMHS, [35], and c) for evaluating transition services from child to adult mental health care in Finland (European CAMHS Mapping-ECM-Q Questionnaire) [36]. The REFINEMENT Decision Support Toolkit includes two tools derived from DESDE: the Mental Health Service Inventory–MHSI- [6] that summarises information from DESDE-LTC; and the REFINEMENT Glossary of terms for mental health system research [37] that extended the vocabulary developed in the ESMS/DESDE system [26]. Other instruments such as World Health Organization Assessment Instrument for Mental Health Systems (WHO-AIMS) [38] have included terms from ESMS. We have only included instruments directly derived from ESMS in Fig. 2.

The ESMS/DESDE system has been translated from English into eight languages: Italian, Finnish, German, Norwegian, Polish, Russian, Slovenian and Spanish. Contact with the authors allowed the identification of two unpublished versions of ESMS in France and Brazil, that have not been included in this review. Six papers provide a description of versions of the ESMS/DESDE system in different countries: [16,6,37,29,39,40].

From the selected papers, 21.1% fulfilled at least six criteria (high quality) of the 10 quality criteria included in this systematic review. Fifteen papers fulfilled three or fewer criteria and were considered low quality. For further details, see Table 2.

More than 64% of the papers provided a detailed description of the specific instrument used. The inclusion of a context analysis (social and demographics and other characteristics of the area) in the study is an important quality indicator of 29 articles analyzed, 18 of them using standard methodology.

3.3. Psychometric properties of ESMS/DESDE system

The psychometric properties of the different ESMS/DESDE tools have been described in 11 papers (Table 2). The feasibility of ESMS/ DESDE was considered adequate in all of them, although the coding system requires intensive training. The instruments ESMS, DESDE and DESDE-LTC have shown optimal levels of consistency, descriptive validity and inter-rater reliability in studies conducted by the core group [17,41,20], [22]. The ontological properties,

content analysis and hierarchical structure of the DESDE-LTC classification has also been published [22,42].

In addition, four psychometric studies have been carried out by other independent research groups [43–46]. Becker and colleagues indicated a low usability of ESMS, but this evaluation did not follow the training recommended by the EPCAT core group. Two articles using ESMS/DESDE data for decision support system (DSS) include metric properties of the derived decision support tools such as agreement, predictive validity, feasibility and technology readiness level (TRL) [47,9].

Pilot and demonstration studies have been carried out in Spain [41,20], Italy [17] and Australia [48].

3.4. Use of ESMS/DESDE in service research

3.4.1. International diffusion of ESMS/DESDE system

ESMS/DESDE system has been used in 34 countries comprising four WHO world regions. The distribution of the countries is shown in Table 1. There are five European countries with 10 or more publications related to the application of ESMS/DESDE system.

Out of the 71 papers selected for this review, 40 have used a version of ESMS. Two have used the ESMS-b, four the ESMS-R (actually the expanded version of DESDE-LTC). Sixteen papers have used a version of DESDE (Table 2). The remaining four papers have used another tool derived from the ESMS/DESDE system (Fig. 2).

The utilization of the ESMS/DESDE system fell into six domains categories: Methodology aspects of the system (11 papers), description of Health Interventions and Services (13 papers), Context analysis (29 papers), articles describing the relationship between Supply and Demand (8 papers), use in Health Economics (6 papers) and use in Decision Support Systems (4 papers) (Annex 1).

3.4.2. Use by different research reference networks (Annex 1)

Eleven national and international research reference networks have used ESMS/DESDE system in their studies. The ESMS/DESDE system core group (EPCAT, PSICOST, DESDE-LTC and REFINEMENT) has been involved in 31 papers related to the development and use of ESMS/DESDE system. Other research networks that have applied the ESMS/DESDE in their studies include (full names available in annex 1): the EDEN study, the EUNOMIA project, EPSILON Study, LIDO Study, EuroSC project, and MILESTONE project, in Europe. In Latin America, the ESMS/DESDE has been used by the Maristan Network.

3.4.3. Use in different care sectors and target groups

Of the articles that applied ESMS/DESDE system, 48.4% carried out a cross-sectoral evaluation, in some cases focused on specific target groups. The health sector was the focus of 18.7% of the papers; 26.7% related to specific health care: one paper described primary care services for patients with depression [51], three papers evaluated mental health and substance abuse services [33,88,90], one paper evaluated transition services from child and adolescent to adult mental health care [36] and others assessed other specific mental health services. One article focused on the evaluation of vocational services for people with schizophrenia [70] and nine papers described services used for specific target population like people with schizophrenia [30,52,53,57,61,62,70,34] and intellectual disabilities [78].

3.4.4. Use in healthcare ecosystem research (context analysis)

Twenty-six of the selected papers highlighted the relevance of a standard model and method for service research for evaluating health systems. Specific references to ecosystem research were mentioned in two papers [9,91].

In spite of its wide use for describing catchment areas, only 29 studies (40.8%) provided a full description of the areas following an ecological approach. Most of these studies (18) used the European Socio-Demographic Schedule [19], another instrument of the EPCAT Toolkit, or derived instruments from ESDS including more contextual indicators. The remaining documents did not describe socio-demographic characteristics of evaluated areas or presented a poor description (Table 1). These 29 studies provide a standard description of 585 catchment areas. These geographical areas include a wide array of urban and rural districts and different jurisdictions at meso and macro levels that have been described using the health area classification provided in the DESDE-LTC manual (H codes) [26]. One study described a whole country (Level H1) [36]. Fourteen studies have provided descriptions at regional/state level or in health districts (H2). The H3 level (hospital catchment area) has been used in 10 studies, another 16 studies describe catchment areas of community mental health centers (mesolevel-H4), and three studies provide descriptions of a combination of both H3 and H4 areas. These ecological studies should be differentiated from other studies describing purpose areas (e.g. research sites in 18 studies). Finally, three studies describe jurisdiction boundaries that do not facilitate international comparability such as municipalities or urban districts (Table 1).

These studies have allowed standard description of over 6.279 different services (Basic Stable Inputs of Care - BSICS) following the ESMS/DESDE system methodology. In some cases, the paper did not specify the number of BSICs evaluated in the study (see Annex 1)

Thirty-two papers provided comparative analysis of the context of care in nine different countries at national level: seventeen studies in Spain, five in Finland, four in Germany, three in Poland, two in Australia, Chile, Italy and Slovenia; and one in South Africa and Canada.

We also found 24 papers comparing mental health areas or health systems at international level. Six studies compared regions or districts across two countries: Russia and Norway [64,88], and Spain versus a) Bulgaria [42], b) Italy [59], c) Chile [69] and d) Finland [91]. Other international papers described service provision across three to nine countries including the EDEN study, LIDO Study, EPSILON Study, EuroSC project, eDESDE-LTC project and REFINEMENT project. The EUNOMIA study included comparisons across 12 countries in Europe: Germany, Bulgaria, Czech Republic, Greece, Israel, Italy, Lithuania, Poland, Slovak Republic, Spain, Sweden and UK [56,58,73,80].

A significant percentage (66.2%) of the articles described the provision of services of a specific area. Twenty-eight papers used ESMS/DESDE either to provide context to local outcomes or to analyse the relationship between the service delivery system and outcomes such as family burden (e.g. [61]), needs (e.g [84].) and costs (e.g [31].).

Eleven papers used visualization tools for representing data including basic geographical information (4), spatial analysis (1) or advanced geographical information system incorporated to atlases of care (4) (even though the maps did not appear in the paper) [49,81,82,86]. One paper used ESMS/DESDE to inform machine learning using Self-Organising Maps (SOMNET) for health planning [9].

3.4.5. Use in longitudinal studies of the evolution of care systems

ESMS/DESDE has been used to monitor the evolution of the mental health care provision in several countries and regions. The mental health improvement and its relationship to the regional plan was analysed in Catalonia (Spain) in 2002, 2006 and 2010 [81]. Two health districts in Central Chile were evaluated in 2004/05 [69], 2008/09 [95] and 2012 [94]. Three hospital districts in Finland were assessed in 2004 [71], 2011/12 [33] and 2012/14 [84].The area
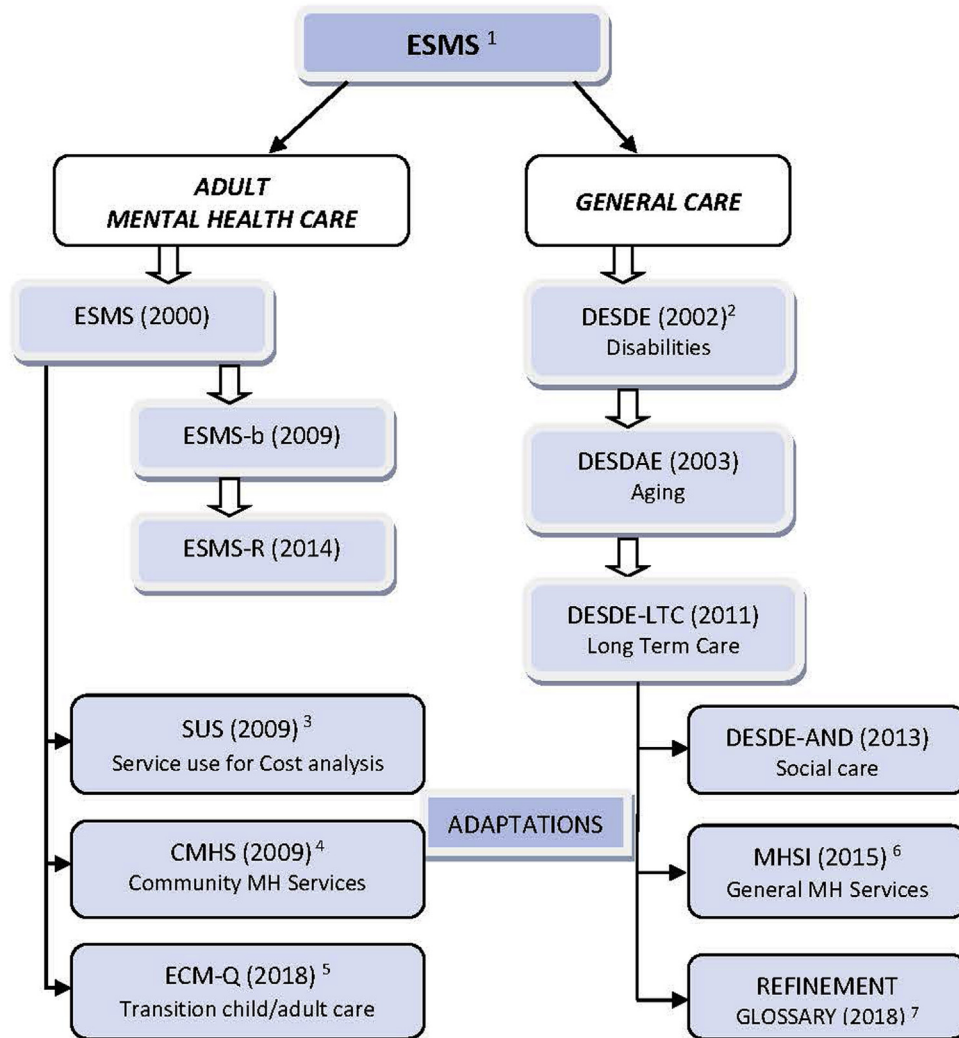
Fig. 2. Tools for service and health systems research derived from the European Service Mapping Schedule and related to the ESMS system for the international classification of care provision.

[1]**ESMS** (European Service Mapping Schedule) [16], the brief version (ESMS-b) [32] and the extended Revised version (ESMS-R) [33] for the assessment of adult mental health care.

[2]**DESDE** (Description and Evaluation of Services and DirectoriEs). Apart from mental health it has been used for the classification of services for Disabilities (DESDE) [20], ageing (DESDAE) [21], Long Term care (DESDE-LTC)[22], automated evaluation of social services in Andalucia (Spain) (DESDE-AND) [23]. It has also been used for mapping Drug and Alcohol Services, Child and Adolescent Mental Health, Chronic care and care for homeless.

[3]**SUS** (Service Utilization Sheet) [34].

[4]**CMHS** (Community Mental Health Services provision) [35].

[5]**ECM-Q** (European Child and Adolescent Mental Health Mapping Questionnaire) [36].

[6]**MHSI** (Mental Health Service Inventory) [6].

7**Glossary of terms REFINEMENT** EU project [37].

of Verona (Italy) has been analysed in 2002 and 2010 [89]; and the areas in Northwest Russia and Northern Norway in 2004/05 and 2011/12 [64,88].

3.4.6. Use in health economics and health financing analysis

Seven papers have used the ESMS/DESDE system for health economics including the analysis of the context of health expenditure [51], the development of units of cost analysis and service utilization [68,34], cost of illness [31,53] and efficiency analysis [83,87].

3.5. Impact of the use of ESMS/DESDE system on decision making

A substantial number of the selected papers have been funded by public agencies or international bodies such as the European Union. Twenty-two articles (31%) received funding from national,

regional or local governmental agencies. Two papers mentioned the use of the ESMS/DESDE terminology and coding structure in the development of other major international classification and service assessment tools such as the International System of Health Accounts (SHA 2.0) [96,42]; and the WHO Assessment Instrument for Mental Health Systems (WHO-AIMS) [38,94].

The ESMS/DESDE system has been adopted for health and social policy planning by public agencies in several countries. ESMS and ESMS-R have been extensively used for health planning in Finland [84]. The DESDE coding has been adopted for the classification system for disability services in three Autonomous Communities in Spain (Navarra, Castilla la Mancha and Andalucia) [20]. Data from the Dernovšek & Šprah study was used to inform the National Mental Health Plan in Slovenia [65].

Four papers focused on models to improve decision support in healthcare systems using ESMS/DESDE system [72,83,87,9].

Table 1
International Diffusion of the ESMS/DESDE system.

WHO WORLD REGION	COUNTRY	NUMBER OF PUBLICATIONS
AFRICA (1)	SOUTH AFRICA	1
AMERICAS (5)	BRAZIL	1
	CANADA	1
	CHILE	2
	USA	1
EUROPE (80)	ALBANIA	1
	AUSTRIA	3
	BELGIUM	1
	BULGARIA	6
	CROATIA	2
	CZECH REPUBLIC	6
	DENMARK	4
	FINLAND	8
	FRANCE	6
	GERMANY	17
	GREECE	4
	IRELAND	1
	ISRAEL	4
	ITALY	16
	LITHUANIA	4
	MACEDONIA	1
	NETHERLANDS	6
	NORWAY	5
	POLAND	10
	ROMANIA	4
	RUSSIA	2
	SERBIA	1
	SLOVAK REPUBLIC	5
	SLOVENIA	3
	SPAIN	35
	SWEDEN	6
	SWITZERLAND	1
	UK	18
WESTERN PACIFIC (2)	AUSTRALIA	2

4. Discussion

To fill the existing gap between the burden of diseases and the resources available to treat them, it is imperative to obtain basic information about care provision at local, regional and national levels [97]. The WPA-Lancet Psychiatry Commission on the Future of Psychiatry [98] has also underscored the need to reform the "traditional structure of services". However, the evaluation of a system's reform requires a detailed knowledge of the existing structure of services and how these services change over time. The ESMS/DESDE set of instruments provides key information for monitoring health systems. It incorporates a common terminology, an international taxonomy and coding of health services, a standard procedure for data collection and meaningful comparisons across and within countries.

ESMS/DESDE addresses three key problems in health service evaluation: commensurability, terminological variability and the lack of contextualisation. First, the incommensurability bias is due to the existence of different units of analysis in health care. "Service" and 'interventions" are vague terms that could refer to very dissimilar units of analysis impeding comparisons like-with-like. The ESMS/DESDE has introduced an operational unit called "Basic Stable Inputs of Care" (BSIC) that allows comparison across jurisdictions [6].

Second, the terminological variability is a major source of ambiguity in healthcare research. The name of the service does not always reflect the activity it performs and this causes major problems when services classified by their names such as "nursing homes" or "day hospitals" are aggregated for care gap analysis, financing or planning. To overcome this problem ESMS/DESDE has developed a fully operational taxonomy for coding BSICS based on their Main Type of Care (MTCs). Its metric properties have been

extensively analysed by several independent groups and the usability of the system has been demonstrated around the world, including a number of key international studies on mental health service research. Papers have been appearing more frequently recently, with 29.5% published in the last five years due to growing interest in health agencies supporting this type of study.

Third, services should be understood in the context of the local system that they belong. Context analysis is now considered a key component of healthcare ecosystem research [9,99]. This approach was advanced 20 years ago by the EPCAT group when the assessment of services provided by ESMS was accompanied by the standard analysis of the social and demographic context using ESDS [19], and by the description of the main modalities of care using ICMHC [18]. Whilst WHO-AIMS [38] and the Mental Health Country Profile (MHCP) [100] have been used for describing national mental health systems worldwide, ESMS/DESDE is the only system that provides local, bottom-up information that can be used across different sectors (health, social, education, employment, housing and justice) [99] and for coding services for different target groups such as mental disorders [89,51] intellectual disabilities [78], substance abuse [33,88,90], general disabilities [20], aging and long term care [21,22]. The usability of ESMS/DESDE for the analysis of local change and improvement has been tested in Catalonia (Spain) where the evolution of the mental health care system was analysed before and after the implementation of the 2006 regional mental health plan (2002–2010) [81]. A 15 years on analysis is currently under way in this region.

This coding system has provided the basic information for producing local atlases of mental health care in America, Australia and Europe. These atlases are one of the visual tools that are being used to analyse mental health systems and support better decision making [100]. This has contributed to the development of regional and national action plans in mental health [81], intellectual disability [78] and social care [23]. In addition, the use of the ESMS/DESDE system provides relevant information for the assessment of equity to universally accessible services, an essential component of the Sustainable Development Goals and the new global health agenda on Universal Health Care [101]. Furthermore, the realisation of integrated people-centred health services depends on health system inputs, which require reliable and standardised information on service provision [102].

The use of ESMS/DESDE system in health economics and health financing identified in this review is particularly relevant for health policy and its incorporation into real world decision support systems routinely used by public agencies to inform their planning strategies [82,103].

4.1. Limitations

However, the use of this system has several limitations. ESMS/DESDE requires extensive training and the interpretation of the results by decision makers should involve additional support from experts. To overcome these difficulties the core group developed open source online training material, made the system fully accessible to non-for-profit organizations and produced a brief and user-friendly version (ESMS b). However, these initial problems persist in the current versions as the problem may not rely on the difficulty of the instrument but on the inherent complexity of care services. In addition, its easy access has led to certain nomenclature confusion in the use of the different versions of the tools, and to the development of instruments not supervised by the original authors. The participation of two members of the original core group in this study (SJ and LSC) may have skewed the review towards positive results. However, these two authors have not participated in the selection process nor the individual analysis of the documents and negative results have been reported. This

Table 2
Study characteristics of the papers included in the systematic review.

REFERENCE	TOOL	TOOL DESCRIPTION	FRAME WORK	REFERENCE AREA (area DESDE code H[1])	DEMOGRAPHIC CONTEXT	SERVICE PROVISION EVALUATION	DESCRIPTION OF SYSTEM AGENTS	RESOURCES USE	MAIN AIM OF THE STUDY	USE OF VISUALIZATION TOOLS	TYPE OF ANALYSIS	USE FOR DECISION MAKING
Salvador-Carulla et al, 1997 [29]	ESMS	Yes	Yes						Scale development			
Haro et al, 1998 [31]	ESMS			2 MH areas (H4) + 1 Hospital area (H3)	Standard description	Cross-sectoral	Patient	Yes	Cost of illness		Data Analytic	
Salvador-Carulla et al, 1999 [30]	ESMS			1 MH area (H4) + 1 Hospital area (H3)	Standard description	Cross-sectoral		Yes	Cost of illness		Data Analytic	
Johnson et al, 2000 [16]	ESMS	Yes	Yes	5 MH areas (H4)					Scale development			
Munizza et al, 2000 [17]	ESMS	Yes (including metrics properties)		3 MH areas (H4)	Standard description	Cross-sectoral		Yes	Description of service delivery	Geographic Information System		
Salvador-Carulla et al, 2000 [41]	ESMS	Yes (including metrics properties)	Yes	4 MH areas (H4)+ 1 Hospital area (H3)	Standard description	Cross-sectoral		Yes	Scale development		Data Analytic	
Beperet et al, 2000 [49]	ESMS	Yes	Yes	1 MH area (H4)	Standard description	Cross-sectoral		Yes	Description of service delivery			
McCrone et al, 2000 [50]	ESMS			5 Sites		Focus on the Health sector*			Supply and demand: assessment of needs		Data Analytic	
Böcker et al, 2001 [44]	ESMS	Yes (including metrics properties)		1 Region (H2)	Basic data	Cross-sectoral	Professional	Yes	Description of service delivery	Geographic Information System		
Chisholm et al, 2001 [51]	ESMS		Yes*	6 Sites	Standard description	Focus on specific health services (primary care)*	Patient	Yes	Description of service delivery for financing			
McCrone et al, 2001 [52]	ESMS			5 Sites		Focus on the Health sector*	Patient		Supply and demand: assessment of needs		Data Analytic	
Adamowski & Trypka, 2002 [40]	ESMS	Yes	Yes						Scale development			
Baková et al, 2002 [39]	ESMS	Yes							Scale development			
Becker et al, 2002 [43]	ESMS	Yes (including metrics properties)	Yes	5 Sites	Basic data	Cross-sectoral		Yes	Description of service delivery			
Knapp et al, 2002 [53]	ESMS			5 Sites	Basic data	Focus on the Health sector *	Patient	Yes	Costs		Data Analytic	
Trypka et al, 2002 [54]	ESMS		Yes						Description of service delivery			
Brieger et al, 2003 [55]	ESMS	Yes		1 Region (H2)		Focus on the Health sector						

Study	Instrument			Coverage	Data	Scope	Target		Purpose	Spatial method	Analysis	
Mastrogianni et al, 2004 [56]	ESMS			12 Sites	Standard description*	Focus on specific health services (psychiatric inpatient units)			Description of service delivery / Health interventions: Coercive psychiatric treatment			
Bebbington et al, 2005 [57]	ESMS	Yes		9 MH areas		Cross-sectoral*	Patient		Health interventions: methods of care			
Kallert et al, 2005 [58]	ESMS			13 Sites	Standard description	Focus on specific health services (psychiatric hospitals)			Description of service delivery			
Salvador-Carulla et al, 2005 [59]	ESMS	Yes (including metrics properties)*	Yes	13 MH areas (H4)	Standard description	Cross-sectoral		Yes	Description of service delivery		Data Analytic	
Tibaldi et al, 2005 [60]	ESMS	Yes	Yes	18 MH areas (H4)	Standard description	Focus on the Health sector		Yes	Description of service delivery	Geographic Information System	Data Analytic	
Roick et al, 2006 [61]	ESMS	Yes		1 Municipality + 1 District		Focus on the Health sector	Patient, Family	Yes*	Supply and demand: family burden		Data Analytic	
Salvador-Carulla et al, 2006 [20]	DESDE	Yes (including metrics properties)	Yes	20 MH areas (H4)		Cross-sectoral			Scale development		Data Analytic	Yes
Marwaha et al, 2007 [62]	ESMS			8 Sites		Focus on specific target: schizophrenia	Patient		Health interventions: employment		Data Analytic	
Moreno, 2007 [63]	ESMS			1 Region (H2)		Focus on the Health sector			Units of costs		Data Analytic	
Rezvyy et al, 2007 [64]	ESMS	Yes	Yes	2 Counties (H2)	Basic data	Focus on the Health sector		Yes	Description of service delivery		Data Analytic	
Salvador-carulla et al, 2007 [47]	ESMS	Yes (including metrics properties)		12 MH areas (H4)	Standard description	Cross-sectoral		Yes	Decision Support System Model		Decision Support System	
Dernovšek & Šprah, 2008 45]	ESMS	Yes (including metrics properties)	Yes	12 Statistical regions (H2)		Cross-sectoral	Professional	Yes	Description of service delivery			Yes
Dernovšek & Šprah, 2008b [65]	ESMS	Yes		12 Statistical regions (H2)		Cross-sectoral		Yes	Description of service delivery			
Eichler et al, 2008 [66]	ESMS			5 Sites		Focus on specific health services (day hospital)*	Patient	Yes	Health interventions: Follow up		Data Analytic	
Moreno et al, 2008 [67]	ESMS	Yes		1 MH area (H4)		Focus on the Health sector	Patient	Yes	Supply and demand: schizophrenia prevalence	Spatial Analysis		
Moreno et al, 2008b [68]	ESMS			1 Statistical region (H2)		Focus on specific health services (residential care)		Yes	Units of costs		Data Analytic	
Salvador-Carulla et al, 2008 [69]	ESMS	Yes (including metrics properties)*	Yes	5 MH areas (H4)	Basic data	Cross-sectoral		Yes	Description of service delivery			
Skiba et al, 2008 [46]	ESMS-b	Yes (including metrics properties)*		5 Sites	Basic data	Focus on specific health services (Mobile Community Teams)	Professional	Yes	Description of service delivery			

Table 2 (*Continued*)

REFERENCE	TOOL	TOOL DESCRIPTION	FRAME WORK	REFERENCE AREA (area DESDE code H¹)	DEMOGRAPHIC CONTEXT	SERVICE PROVISION EVALUATION	DESCRIPTION OF SYSTEM AGENTS	RESOURCES USE	MAIN AIM OF THE STUDY	USE OF VISUALIZATION TOOLS	TYPE OF ANALYSIS	USE FOR DECISION MAKING
Lund & Flisher, 2009 [35]	A framework for CMHS	Yes (including metrics properties)	Yes*	9 Provinces (H2)		Focus on specific health services (Inpatient hospital settings)	Professional		Supply and demand: Human resources needs			
Marwaha et al, 2009 [70]	ESMS			7 Sites		Focus on specific services (vocational services)	Patient		Health interventions: employment		Data Analytic	
Pirkola et al, 2009 [71]	ESMS	Yes		428 Municipalities	Standard description	Cross-sectoral		Yes	Supply and demand: Suicide rate	Geographic Information System	Data Analytic	
Prot-Klinger et al, 2009 [32]	ESMS breve			1 Site		Focus on specific health services (Community Mobile Team)*	Patient, Family	Yes*	Health interventions: community care			
Salize et al, 2009 [34]	SUS			6 Hospital areas (H3)			Patient	Yes	Cost of illness		Data Analytic	
Gibert et al, 2010 [72]	ESMS			12 MH areas (H4)		Cross-sectoral		Yes	Decision Support System Model		Decision Support System	
Raboch et al, 2010 [73]	ESMS			12 Sites		Focus on specific health services: (psychiatric inpatient units)	Patient	Yes	Health interventions: coercive measures		Data Analytic	
Jordanova et al, 2011 [74]	ESMS			5 Sites		Focus on specific health services (psychiatric hospitals)	Patient	Yes	Health interventions: psychotropic prescribing			
Prot et al, 2011 [75]	ESMS			5 Sites		Focus on specific health services (community care)	Patient, Family	Yes	Health interventions: community care			
Salvador-Carulla et al, 2011 [42]	DESDE-LTC	Yes (including metrics properties*)	Yes	2 Municipalities		Cross-sectoral			Scale development			
Kallert et al, 2013 [76]	ESMS	Yes		5 MH areas		Focus on specific health services (day hospitals)	Patient	Yes	Health interventions: psychiatric day care		Data Analytic	
Petersen et al, 2013 [77]	ESMS			1 MH area		Focus on specific health services (psychiatric hospitals)	Patient	Yes	Health interventions: Tertiary Psychiatric Residential Care		Data Analytic	
Salvador-Carulla et al, 2013 [22]	DESDE-LTC	Yes (including metrics properties)	Yes	6 MH areas (H3)		Cross-sectoral			Scale development		Data Analytic	
Salvador-Carulla et al, 2013b [78]	DESDE-LTC	Yes		16 Regions (H2)		Focus on specific target (intellectual disability)		Yes	Description of service delivery		Data Analytic	
Ungewitter et al, 2013 [79]	ESMS	Yes		1 Region (H2)		Cross-sectoral	Professional	Yes	Description of service delivery			
Ala-Nikkola et al, 2014 [33]	ESMS-R	Yes (including metrics properties)*		3 Hospital areas (H3)	Basic data	Focus on specific health services (mental health and substance abuse)			Supply and demand: needs		Data Analytic	

Study	Tool			Territory	Data	Focus	Target		Topic	Atlas	Analysis	
Kalisova et al, 2014 [80]	ESMS			10 Sites		Focus on specific health services (psychiatric hospitals)	Patient	Yes	Health interventions: coercive measures		Data Analytic	
Fernández et al, 2015 [81]	DESDE-LTC	Yes	Yes	1 Region (H2)	Standard description	Cross-sectoral		Yes	Description of service delivery	Atlas		Yes
Iruin-Sanz et al, 2015 [82]	DESDE-LTC	Yes	Yes	2 Provinces (H2)		Cross-sectoral*			Description of service delivery	Atlas		Yes*
Salvador-Carulla et al, 2015 [6]	MHSI (REMAST toolkit)	Yes (including metrics properties)*	Yes	8 Hospital areas (H3)		Focus on the Health sector			Scale development			
Torres-Jiménez et al, 2015 [83]	DESDE-LTC			12 MH areas (H4)		Cross-sectoral		Yes	Decision Suppport System Model		Decision Support System	
Ala-Nikkola et al, 2016 [84]	ESMS-R	Yes		4 Hospital areas (H3)	Standard description	Cross-sectoral	Patient, Professional	Yes	Health interventions: community care		Data Analytic	
Ala-Nikkola et al, 2016b [85]	ESMS-R	Yes		13 Hospital areas (H3)	Basic data*	Cross-sectoral			Supply and demand: catchment area sizes		Data Analytic	
Rodero-Cosano et al, 2016 [86]	DESDE-LTC			60 MH areas (H4)	Basic data	Cross-sectoral		Yes*	Description of service delivery	Atlas	Data Analytic	
Almeda et al, 2017 [87]	DESDE-LTC			19 MH areas (H4)		Cross-sectoral		Yes	Description of service delivery		Decision Support System	
Dahl et al, 2017 [88]	ESMS	Yes		3 Sites	Basic data	Focus on specific health services (outpatient services for substance abuse disorders)	Professional	Yes	Description of service delivery			
Fernandez et al, 2017 [48]	DESDE-LTC	Yes	Yes	1 Region (H2)		Cross-sectoral			Description of service delivery	Atlas		
Gutiérrez-Colosía et al, 2017 [89]	DESDE-LTC	Yes	Yes	8 Hospital areas (H3)	Standard description	Focus on the Health sector			Description of service delivery			
Ala-Nikkola et al, 2018 [90]	ESMS-R	Yes (including metrics properties)		4 Hospital areas (H3)		Focus on specific health services (mental health and substance abuse)	Professional		Description of service delivery		Data Analytic	
Chung et al, 2018 [9]	DESDE-LTC	Yes (including metrics properties)	Yes	106 MH areas (H4)		Cross-sectoral*		Yes*	Decision Suppport System Model		Decision Support System	
Montagni et al, 2018 [37]	DESDE-LTC	Yes	Yes						Scale development			
Sadeniemi et al, 2018 [91]	DESDE-LTC	Yes		2 Hospital areas (H3)	Basic data	Focus on the Health sector	Professional	Yes	Description of service delivery			
Tuomainen et al, 2018 [36]	ECM-Q	Yes		Country (H1)		Focus on specific services (transition)			Description of service delivery			
Cetrano et al, 2018 [92]	DESDE-LTC	Yes	Yes	8 Hospital areas (H3)	Standard description	Focus on the Health sector	Professional		Description of service delivery		Data Analytic	
Furst et al, 2018 [93]	DESDE-LTC	Yes		1 Region (H2)	Standard description	Cross-sectorial			Description of service delivery	Atlas		
Salinas-Pérez et al, 2018 [94]	DESDE-LTC	Yes	Yes	19 MH areas (H3)	Standard description	Cross-sectorial	Professional		Description of service delivery	Atlas		

1Territorialisation levels for mental health planning and policy [25]. H: Health areas as defined in DESDE-LTC. H2 macro level (regional), H3 meso-level (e.g health district, catchment area), H4: micro level MH: Mental Health.
*Implicit information. Type of analysis: Data analytic (statistical analysis of the data to draw conclusions); Decision support systems (tools supporting decision making processes).

review does not include grey literature or technical reports by public agencies even though these sources of information are key for its use in policy and practice. A complementary review of the grey literature of the ESMS/DESDE system is currently under way.

5. Conclusion

The ESMS/DESDE system provides a common terminology, an ontology based classification of care services, a set of instruments covering different aims in healthcare research, a standard method for data collection of service provision in health and social care, and facilitates comparisons across and within countries. This system has been extensively used to provide context information at every level of the health system (local, regional, national), for care gap analysis, health economics, and for modelling healthcare ecosystems. It has been used across different care sectors and has been effectively incorporated into decision support systems to guide evidence-informed planning.

Availability of data and materials

Supplementary materials (Annex 1) are available in the http://psicost.org/ website, and upon request.

Declaration of Competing Interest

The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing their work. Authors declare no conflicts of interest.

Acknowledgments

References marked with an asterisk indicate studies included in the systematic review.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.eurpsy.2019.07.003.

References

[1] World Health Organization. WHO-EURO: European Health Report 2018: more than numbers. Evidence for all. WHO EURO Copenhaguen; 2018. http://www.euro.who.int/__data/assets/pdf_file/0008/379862/who-ehr-2018-eng.pdf?ua=1.

[2] Oxman AD, Lavis JN, Lewin S, Fretheim A. SUPPORT Tools for evidence informed health Policymaking (STP) 1: what is evidence-informed policymaking? Health Res Policy Syst 2009;7(Suppl 1).

[3] Bate P, Robert G, Fulop N, Øvretviet J, Dixon-Woods M. Perspectives on context: a collection of essays considering the role of context in successful quality improvement. Health Foundation; 2014.

[4] Shogren KA, Luckasson R, Schalock RL. Using context as an integrative framework to align policy goals, supports, and outcomes in intellectual disability. Intellect Dev Disabil 2015;53(5):367–76.

[5] Raine R, Fitzpatrick R, Barratt H, Bevan G, Black N, Boaden R, et al. Challenges, solutions and future directions in the evaluation of service innovations in health care and public health. Health Serv Deliv Res 2016;4(16). https://www.journalslibrary.nihr.ac.uk/hsdr/hsdr04160/.

[6] Salvador-Carulla* L, Amaddeo F, Gutiérrez-Colosía M, Salazzari D, Gonzalez-Caballero JL, et al. Developing a tool for mapping adult mental health care provision in Europe: the REMAST research protocol and its contribution to better integrated care. Int J Integr Care 2015;15(4).

[7] García-Alonso C, Almeda N, Salinas-Pérez JA, Gutiérrez-Colosía MR, Salvador-Carulla L. Causal modelling for supporting planning and management of mental health services and systems: a systematic review. Int J Environ Res Public Health 2019;16(332):1–27, doi:http://dx.doi.org/10.3390/ijerph16030332.

[8] Lee BY, Wong KF, Bartsch SM, Yilmaz SL, Avery TR, Brown ST, et al. The Regional Healthcare Ecosystem Analyst (RHEA): a simulation modeling tool to assist infectious disease control in a health system. J Am Med Inform Assoc 2013;20(e1):e139–46. https://academic.oup.com/jamia/article-lookup/doi/10.1136/amiajnl-2012-001107.

[9] Chung* Y, Salvador-Carulla L, Salinas-Pérez JA, Uriarte-Uriarte JJ, Iruin-Sanz A, et al. Use of the self-organising map network (SOMNet) as a decision support system for regional mental health planning. Health Res Policy Syst 2018;16(1):35, doi:http://dx.doi.org/10.1186/s12961-018-0308-y.

[10] Laihonen H. Knowledge structures of a health ecosystem. J Health Organ Manag 2012;26(4):542–58, doi:http://dx.doi.org/10.1108/14777261211251571.

[11] World Health Organization. Improving health systems and services for mental health. Geneva: World Health Organization; 2009.

[12] World Health Organization. The European mental health action plan 2013–2020. Copenhagen: World Health Organization; 2015.

[13] World Health Organization. mhGAP: mental Health Gap Action Programme: scaling up care for mental, neurological and substance use disorders. Geneva: World Health Organization; 2008. http://www.ncbi.nlm.nih.gov/books/NBK310851/.

[14] Pinnock H, Barwick M, Carpenter CR, Eldridge S, Grandes G, Griffiths CJ, et al. Standards for reporting implementation studies (StaRI) statement. Br Med J 2017;356:i6795, doi:http://dx.doi.org/10.1136/bmj.i6795.

[15] Rycroft-Malone J, Burton CR. Is it time for standards for reporting on research about implementation? Worldviews Evid Based Nurs 2011;8(4):189–90.

[16] Johnson* S, Kuhlmann R, EPCAT group. The European Service Mapping schedule (ESMS): development of an instrumentfor the description and classificationof mental health services. Acta Psychiatr Scand 2000;102:14–23.

[17] Munizza* C, Tibaldi G, Cesano S, Dazzi R, Fantini G, et al. Mental health care in Piedmont: a description of its structure and components using a new technology for service assessment. Acta Psychiatr Scand 2000;102:47–58, doi:http://dx.doi.org/10.1111/j.0902-4441.2000.acp28-06.x.

[18] De Jong A. Development of the international classification of mental health care (ICMHC). Acta Psychiatr Scand 2000;102:8-–13, doi:http://dx.doi.org/10.1111/j.0902-4441.2000.acp28–04.x.

[19] Beecham J, Johnson S, EPCAT Group. The European Socio-Demographic Schedule (ESDS): rationale, principles and development. Acta Psychiatr Scand 2000;102:33–46, doi:http://dx.doi.org/10.1111/j.0902-4441.2000.t01-1-acp28-02.x.

[20] Salvador-Carulla* L, Poole M, Gonzalez-Caballero JL, Romero C, Salinas JA, et al. Development and usefulness of an instrument for the standard description and comparison of services for disabilities (DESDE). Acta Psychiatr Scand 2006;114(Suppl. 432), doi:http://dx.doi.org/10.1111/j.1600-0447.2006.00916.x.

[21] Salvador Carulla L. Descripción estandarizada de los servicios de discapacidad para ancianos en España]. Madrid, IMSERSO. Estudios I+D+I, nº 2003;24: [Fecha de publicación: 12/07/2005].

[22] Salvador-Carulla* L, Alvarez-Gálvez J, Romero C, Gutiérrez-Colosía MR, Weber G, et al. Evaluation of an integrated system for classification, assessment and comparison of services for long-term care in Europe: the eDESDE-LTC study. BMC Health Serv Res 2013;13(1):218, doi:http://dx.doi.org/10.1186/1472-6963-13-218.

[23] Almenara Abellán JL, Gutiérrez-Colosía FAlonso MR, Salinas Pérez JA, Arlette MFRaposo S, García Alonso C, Salvador-Carulla L. Adaptación del sistema de clasificación internacional DESDE-LTC para la evaluación de servicios sociosanitarios y Atención Primaria de salud. Software de ayuda a la codificación eDESDE-AND. Semer - Med Fam 2015;41:, doi:http://dx.doi.org/10.13140/RG.2.1.2752.7121.

[24] Greenhalgh T, Robert G, Macfarlane F, Bate P, Kyriakidou O. Diffusion of innovations in service organizations: systematic review and recommendations. Milbank Q 2004;82(4):581–629.

[25] Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. Ann Intern Med 2009;151(4):264–9.

[26] Salvador-Carulla L, Dimitrov H, Weber G, McDaid D, Venner B, Sprah L, et al. For DESDE-LTC group (Eds.). DESDE-LTC: evaluation and classification of services for long term care in Europe. Spain: Psicost and Catalunya Caixa; 2011.

[27] Salvador L, Atienza C, Romero C, the PSICOST/EPCAT Group. Use of the EPCAT model of care for standard description of psychiatric services: the experience in Spain. In: Guimón J, Sartorius N, editors. Manage or perish? The challenges of managed mental health care in Europe. New York: Kluwer Academic/Plenum Publishers; 1999. p. 359–68.

[28] Votruba N, Ziemann A, Grant J, Thornicroft G. A systematic review of frameworks for the interrelationships of mental health evidence and policy in low-and middle-income countries. Health Res Policy Syst 2018;16(1):85.

[29] Salvador Carulla* L, Torres Gonzalez F, Johnson S, Kuhlman R, Varquez-Barquero JL, et al. The Spanish version of the European Service Mapping schedule (European diagram of services). Archivos de Neurobiología 1997;60:163–70.

[30] Salvador-Carulla* L, Haro JM, Cabases J, Madoz V, Sacristan JA, et al. Service utilization and costs of first-onset schizophrenia in two widely differing health service areas in North-East Spain. PSICOST Group. Acta Psychiatr Scand 1999;100(5)335–43. . Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/10563450.

[31] Haro* JM, Salvador-Carulla L, Cabasés J, Madoz V, Vázquez-Barquero JL. Utilisation of mental health services and costs of patients with schizophrenia in three areas of Spain. Br J Psychiatry 1998;173(October):334–40, doi:http://dx.doi.org/10.1192/bjp.173.4.334.

[32] Prot-Klinger* K, Pawłowska M. The effectiveness of community care for people with severe mental disorders. Arch Psychiatry Psychother 2009;4:43–50. . Retrieved from http://www.w.archivespp.pl/uploads/images/2009_11_4/43_APP_4_2009.pdf.

[33] Ala-Nikkola* T, Pirkola S, Kontio R, Joffe G, Pankakoski M, et al. Size matters — determinants of modern, community-oriented mental health services. Int J Environ Res Public Health 2014;11(12):8456–74, doi:http://dx.doi.org/10.3390/ijerph110808456.

[34] Salize* HJ, McCabe R, Bullenkamp J, Hansson L, Lauber C, et al. Cost of treatment of schizophrenia in six European countries. Schizophr Res 2009;111(1-3):70–7. https://qmro.qmul.ac.uk/xmlui/bitstream/handle/123456789/319/PRIEBECostOf2009POSTP.pdf?sequence=2.

[35] Lund* C, Flisher AJ. A model for community mental health services in South Africa. Trop Med Int Health 2009;14(9):1040–7, doi:http://dx.doi.org/10.1111/j.1365-3156.2009.02332.x.

[36] Tuomainen* H, Schulze U, Warwick J, Paul M, Dieleman GC, et al. Managing the link and strengthening transition from child to adult mental health Care in Europe (MILESTONE): Background, rationale and methodology. BMC Psychiatry 2018;18(1):1–11, doi:http://dx.doi.org/10.1186/s12888-018-1758-z.

[37] Montagni* I, Salvador-Carulla L, Mcdaid D, Straßmayr C, Endel F, et al. The REFINEMENT glossary of terms: an international terminology for mental health systems assessment. Adm Policy Ment Health Ment Health Serv Res 2018;45(2):342–51, doi:http://dx.doi.org/10.1007/s10488-017-0826-x.

[38] World Health Organization. World Health Organization assessment instrument for mental health systems-WHO-AIMS version 2.2 (No. WHO/MSD/MER/05.02). Geneva: World Health Organization; 2005.

[39] Baková* N, Raboch J, Stárková L. ESMS (the European Service Mapping schedule). Psychiatrie v medicině a medicina v psychiatrii. Praha Galén 2002;25:.

[40] Adamowski* T, Trypka E. European Service Mapping schedule"(ESMS)–instrument used to describe the structure of mental health care. Psychiatr Pol 2002;36(6 Suppl):369–76.

[41] Salvador-Carulla* L, Romero C, Martinez A, et al. Assessment instruments: standardization of the european service mapping schedule (ESMS) in Spain. Acta Psychiatr Scand 2000;102:24–32. https://www.researchgate.net/profile/Cristina_Romero3/publication/285754449_Assessment_instruments_standardization_of_the_European_Service_Mapping_Schedule_ESMS_in_Spain/links/5669510e08ae8d6928fcfccb.pdf.

[42] Salvador-Carulla* L, Romero C, Weber G, Dimitrov H, Sprah L, et al. Classification, assessment and comparison of European LTC services. Ageing And Long-Term Care 2011;17(2-3):27.

[43] Becker* T, Hülsmann S, Knudsen HC, Martiny K, Amaddeo F, et al. Provision of services for people with schizophrenia in five European regions. Soc Psychiatry Psychiatr Epidemiol 2002;37(10):465–74, doi:http://dx.doi.org/10.1007/s00127-002-0591-2.

[44] Böcker* FM, Jeschke F, Brieger P. Psychiatrische versorgung in Sachsen-Anhalt: Einrichtungen und dienste im überblick: Eine erhebung mit dem "European Services Mapping Schedule". ESMS. Psychiatrische Praxis 2001;28(8):393–401, doi:http://dx.doi.org/10.1055/s-2001-18616.

[45] Dernovšek* MZ. A preliminary report on the implementation of the European Service and Mapping schedule (ESMS) in Slovenia to map preventive and promotion. Psychiatr Danub 2008;20(2):141–7.

[46] Skiba* J, Prot K. The usefulness of the ESMS instrument for the assessment of community care. [Polish]. Postepy Psychiatrii I Neurologii 2008;17(4)319–25. . Retrieved from http://lshtmsfx.hosted.exlibrisgroup.com/lshtm?sid=OVID:embase&id=pmid:&id=doi:&issn=1230-2813&isbn=&volume=17&issue=4&spage=319&pages=319-325&date=2008&title=Postepy-.

[47] Salvador-Carulla* L, García-Alonso C, Gonzalez-Caballero JL, Garrido-Cumbrera M. Use of an operational model of community care to assess technical efficiency and benchmarking of small mental health areas in Spain. J Ment Health Policy Econ 2007;10(2):87–100.

[48] Fernandez* A, Gillespie JA, Smith-Merry J, Feng X, Astell-Burt T, et al. Integrated mental health atlas of the Western Sydney Local Health District: Gaps and recommendations. Aust Health Rev 2017;41(1):38–44, doi:http://dx.doi.org/10.1071/AH15154.

[49] Beperet* M, Nadal S, Martínez A, Salvador L, Romero C, et al. The European diagram of mental health services and its application in sector IB (Burlada). An Sist Sanit Navar 2000;23(1)63–72. . Retrieved from https://recyt.fecyt.es/index.php/ASSN/article/viewFile/6415/5121.

[50] McCrone* P, Leese M, Thornicroft G, Griffiths G, Padfield S, et al. Reliability of the camberwell assessment of need - european version : EPSILON study 6 service reliability of the camberwell assessment of need ^. European Version EPSILON Study 2000;6:, doi:http://dx.doi.org/10.1192/bjp.177.39.s34.

[51] Chisholm* D, Amir M, Fleck M, Herrman H, Lomachenkov A, et al. Longitudinal Investigation of Depression Outcomes (the LIDO Study) in primary care in six countries: comparative assessment of local health systems and resource utilization. Int J Methods Psychiatr Res 2001;10(2):59–71, doi:http://dx.doi.org/10.1002/mpr.101.

[52] McCrone* P, Leese M, Thornicroft G, Schene A, Knudsen HC, et al. A comparison of needs of patients with schizophrenia in five European countries: the EPSILON Study. Acta Psychiatr Scand 2001;103(5):370–9, doi:http://dx.doi.org/10.1034/j.1600-0447.2001.00207.x.

[53] Knapp* M, Chisholm D, Leese M, Amaddeo F, Tansella M, et al. Comparing patterns and costs of schizophrenia care in five European countries: the EPSILON study. Acta Psychiatr Scand 2002;105(1):42–54, doi:http://dx.doi.org/10.1034/j.1600-0447.2002._10310.x.

[54] Trypka* E, Adamowski T, Kiejna A. Presentation of the cost-effectiveness technique questionnaire–the possibility of the Polish adaptation. Psychiatr Pol 2002;36(6 Suppl):389–96.

[55] Brieger* P, Wetzig F, Böcker FM. Institutions and services of psychiatric care in Saxony-Anhalt: assessment with the European Services Mapping schedule. Eur Psychiatry 2003;18(3):145–7, doi:http://dx.doi.org/10.1016/S0924-9338(03)00034-8.

[56] Mastrogianni* A, Georgiadou E, Iosifidis I, Kotrotsios S, Karastergiou A. The Eunomia-Study: european evaluation of coercion in psychiatry and harmonisation of best clinical practice. Hellenic Psychiatry 2004;3(1):37–43.

[57] Bebbington* PE, Angermeyer MC, Azorin J, Brugha T, Kilian R, et al. The European Schizophrenia Cohort (EuroSC): a naturalistic prognostic and economic study. Soc Psychiatry Psychiatr Epidemiol 2005;40(9):707–17, doi:http://dx.doi.org/10.1007/s00127-005-0955-5.

[58] Kallert* TW, Glöckner M, Onchev G, Raboch J, Karastergiou A, et al. The EUNOMIA project on coercion in psychiatry: study design and preliminary data. World Psychiatry 2005;4(3):168. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1414770/%5Cnhttp://www.ncbi.nlm.nih.gov/pubmed/16633543.

[59] Salvador-Carulla* L, Tibaldi G, Johnson S, Scala E, Romero C, et al. Patterns of mental health service utilisation in Italy and Spain. Soc Psychiatry Psychiatr Epidemiol 2005;40(2):149–59, doi:http://dx.doi.org/10.1007/s00127-005-0860-y.

[60] Tibaldi* G, Munizza C, Pasian S, Johnson S, Salvador-Carulla L, et al. Indicators predicting use of mental health services in Piedmont, Italy. J Ment Health Policy Econ 2005;8(2):95–106.

[61] Roick* C, Heider D, Toumi M, Angermeyer MC. The impact of caregivers' characteristics, patients' conditions and regional differences on family burden in schizophrenia: a longitudinal analysis. Acta Psychiatr Scand 2006;114(5):363–74.

[62] Marwaha* S, Johnson S, Be bbington P, Stafford M, Angermeyer MC, et al. Rates and correlates of employment in people with schizophrenia in the UK, France and Germany. Br J Psychiatry 2007;191(JULY):30–7, doi:http://dx.doi.org/10.1192/bjp.bp.105.020982.

[63] Moreno* K. Adaptation of activity-based-costing (ABC) to calculate unit costs in Mental Health Care in Spain. Eur J Psychiat 2007;21(2)117–23. . Retrieved from http://scielo.isciii.es/pdf/ejpen/v21n2/original3.pdf.

[64] Rezvyy* G, Oiesvold T, Parniakov A, Ponomarev O, Lazurko O, et al. The Barents Project In Psychiatry: A Systematic Comparative Mental Health Services Study Between Northern. Norway and Archangelsk County; 2007, doi:http://dx.doi.org/10.1007/s00127-006-0141-4.

[65] Dernovšek* MS, Šprah L. Assessment of mental health services in Slovenia with the European Service Mapping schedule. Psychiatr Danub 2008;2(3):439–42.

[66] Eichler* T, Schuzwohl M, Priebe S, Wright D, Adamowski T, et al. Loss to follow-up in longitudinal psychiatric research. Epidemiologia E Psichiatria Sociale-an International Journal for Epidemiology and Psychiatric Sciences 2008;17(2):138–47, doi:http://dx.doi.org/10.1017/S1121189X00002839.

[67] Moreno* B, García-Alonso CR, Negrín-Hernández MA, Torres-González F, Salvador-Carulla L. Spatial analysis to identify hotspots of prevalence of schizophrenia. Soc Psychiatry Psychiatr Epidemiol 2008;43(10):782–91, doi:http://dx.doi.org/10.1007/s00127-008-0368-3.

[68] Moreno* K, Sanchez E, Salvador-Carulla L. Methodological advances in unit cost calculation of psychiatric residential care in Spain. J Ment Health Policy Econ 2008;11(2):79–88.

[69] Salvador-Carulla* L, Saldivia S, Martinez-Leal R, Vicente B, Garcia-Alonso C, et al. Meso-level comparison of mental health service availability and use in Chile and Spain. Psychiatr Serv 2008;59(4):421–8, doi:http://dx.doi.org/10.1176/ps.2008.59.4.421.

[70] Marwaha* S, Johnson S, Bebbington PE, Angermeyer MC, Brugha TS, et al. Predictors of employment status change over 2 years in people with schizophrenia living in Europe. Epidemiol Psychiatr Sci 2009;18(4):344–51, doi:http://dx.doi.org/10.1017/S1121189X00000324.

[71] Pirkola* S, Sund R, Sailas E, Wahlbeck K. Community mental-health services and suicide rate in Finland: a nationwide small-area analysis. Lancet 2009;373(9658):147–53, doi:http://dx.doi.org/10.1016/S0140.

[72] Gibert* K, García-Alonso C, Salvador-Carulla L. Integrating clinicians, knowledge and data: expert-based cooperative analysis in healthcare decision support. Health Res Policy Syst 2010;8:1–16, doi:http://dx.doi.org/10.1186/1478-4505-8-28.

[73] Raboch* J, Kalisova L, Nawka A, Kitzlerova E, Onchev G, et al. Use of coercive measures during involuntary hospitalization: findings from ten european countries. Psychiatr Serv 2010;61(10):1012–7, doi:http://dx.doi.org/10.1176/appi.ps.61.10.1012.

[74] Jordanova* V, Maric NP, Alikaj V, Bajs M, Cavic T, et al. Prescribing practices in psychiatric hospitals in Eastern Europe. Eur Psychiatry 2011;26(7):414–8, doi:http://dx.doi.org/10.1016/j.eurpsy.2010.05.005.

[75] Prot* K, Anczewska M, Induslka A, Raduj J, Palyska M. Satysfakcja pacjentów i rodzin z opieki środowiskowej – badanie pilotażowe [Patients and families' satisfaction from services provided in community care – pilot study]. Psychiatr Pol 2011;6:799–809 Retrieved from https://www.researchgate.net/profile/Katarzyna_Prot-Klinger/publication/221833115_Patients'_and_families'_satisfaction_from_services_provided_in_community_care_-_Pilot_study/links/5757184508ae05c1ec16ce84.pdf.

[76] Kallert* TW, Howardová A, Raboch J, Priebe S, Kiejna A, et al. To what extent could acute general psychiatric day care reduce inpatient admissions? J Hosp Adm 2013;2(2), doi:http://dx.doi.org/10.5430/jha.v2n2p105.

[77] Petersen* KL, Nicholls TL, Groden D, Schmitz N, Stip E, et al. Redevelopment of tertiary psychiatric services in British Columbia: a prospective study of clinical, social, and residential outcomes of former long-stay inpatients. Schizophr Res 2013;149(1-3):96–103, doi:http://dx.doi.org/10.1016/j.schres.2013.05.022.

[78] Salvador-Carulla* L, Martinez-Leal R, Poole M, Salinas-Perez JA, Tamarit J, et al. Perspectives: the mental health care gap in intellectual disabilities in Spain: impact analysis and knowledge-to-action plan. J Ment Health Policy Econ 2013;16(3):131–41.

[79] Ungewitter* C, Böttger D, El-Jurdi J, Kilian R, Losert C, et al. A. Bramesfeld. Struktur und Kooperation in der Versorgung psychisch Kranker. Nervenarzt Online 2013;84(5):307–14, doi:http://dx.doi.org/10.1007/s00115-011-3433-1.

[80] Kalisova* L, Raboch J, Nawka A, Sampogna G, Cihal L, et al. Do patient and ward-related characteristics influence the use of coercive measures? Results from the EUNOMIA international study. Soc Psychiatry Psychiatr Epidemiol 2014;49(10):1619–29, doi:http://dx.doi.org/10.1007/s00127-014-0872-6.

[81] Fernández* A, Salinas-Perez JA, Gutiérrez-Colosía MR, Prat-Pubill B, Serrano-Blanco A, et al. Use of an integrated Atlas of Mental Health Care for evidence informed policy in Catalonia (Spain). Epidemiol Psychiatr Sci 2015;24(6):512–24, doi:http://dx.doi.org/10.1017/S2045796014000511.

[82] Iruin-Sanz* A, Pereira-Rodríguez C, Nuño-Solinís R. The role of geographic context on mental health: lessons from the implementation of mental health atlases in the Basque Country (Spain). Epidemiol Psychiatr Sci 2015;24(1):42–4, doi:http://dx.doi.org/10.1017/S2045796014000596.

[83] Torres-Jiménez* M, García-Alonso CR, Salvador-Carulla L, Fernández-Rodríguez V. Evaluation of system efficiency using the Monte Carlo DEA: The case of small health areas. Eur J Oper Res 2015;242(2):525–35.

[84] Ala-Nikkola* T, Pirkola S, Kaila M, Saarni S, Joffe G, et al. Regional correlates of psychiatric inpatient treatment. Int J Environ Res Public Health 2016;13(12):1204, doi:http://dx.doi.org/10.3390/ijerph13121204.

[85] Ala-Nikkola* T, Sadeniemi M, Kaila M, Saarni S, Kontio R, et al. How size matters: exploring the association between quality of mental health services and catchment area size. BMC Psychiatry 2016;16:289, doi:http://dx.doi.org/10.1186/s12888-016-0992-5.

[86] Rodero-Cosano* ML, Salinas-Pérez JA, González-Caballero JL, García-Alonso CR, Lagares-Franco C, et al. A multi-level analysis of the relationship between spatial clusters of outpatient-treated depression, risk factors and mental health service planning in Catalonia (Spain). J Affect Disord 2016;201:42–9.

[87] Almeda* N, García-Alonso CR, Salinas-Pérez JA, Gutiérrez-Colosía MR, Salvador-Carulla L. Assessment of relative technical efficiency of small mental health areas in Bizkaia (Basque Country, Spain). In ICORES. . p. 377–84, doi:http://dx.doi.org/10.5220/0006195603770384.

[88] Dahl* HM, Rezvyy G, Bogdanov A, Øiesvold T. Outpatient clinics treating substance use disorders in Northwest Russia and Northern Norway: a descriptive comparative study. Int J Circumpolar Health 2017;76(1):1411733, doi:http://dx.doi.org/10.1080/22423982.2017.1411733.

[89] Gutiérrez-Colosía* MR, Salvador-Carulla L, Salinas-Pérez JA, García-Alonso CR, Cid J, et al. Standard comparison of local mental health care systems in eight European countries. Epidemiol Psychiatr Sci 2017;1–14, doi:http://dx.doi.org/10.1017/S2045796017000415.

[90] Ala-Nikkola* T, Pirkola S, Kaila M, Joffe G, Kontio R, et al. Identifying Local and Centralized Mental Health Services—The Development of a New Categorizing Variable. Int J Environ Res Public Health 2018;15(6):1131, doi:http://dx.doi.org/10.3390/ijerph15061131.

[91] Sadeniemi* M, Almeda N, Salinas-Pérez JA, Gutiérrez-Colosía MR, García-Alonso C, et al. A comparison of mental health care systems in northern and Southern Europe: a service mapping study. Int J Environ Res Public Health 2018;15(6).

[92] Cetrano* G, Salvador-Carulla L, Tedeschi F, Rabbi L, Gutiérrez-Colosía MR, et al. The balance of adult mental health care: provision of core health versus other types of care in eight European countries. Epidemiol Psychiatr Sci 2018;1–10, doi:http://dx.doi.org/10.1017/S2045796018000574.

[93] Furst* MA, Salinas-Perez JA, Salvador-Carulla L. Organisational impact of the National Disability Insurance Scheme transition on mental health care providers: the experience in the Australian Capital Territory. Australas Psychiatry 2018;26(6):590–4, doi:http://dx.doi.org/10.1177/1039856218810151.

[94] Salinas-Perez* JA, Salvador-Carulla L, Saldivia S, Grandon P, Minoletti A, et al. Integrated mapping of local mental health systems in Central Chile. Rev Panam Salud Pãºblica 2018;42:e144.

[95] Romero C, Salinas JA, Saldivia S, Grandón P, Poole M, Salvador-Carulla L, et al. Comparative study of mental health ser¬vices availability and use in Chile and Spain. Int J Integr Care 2009;9(June (Suppl)):e62.

[96] Organization for economic Co-operation and development (OECD), world health organization (WHO) and EUROSTAT (European commission). Pre-edited version: a system of health accounts version 2.0. Paris: OECD. WHO and EUROSTAT; 2011. http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-30-11-270/EN/KS-30-11-270-EN.PDF.

[97] World Health Organization. Mental health atlas 2011-Department of mental health and substance abuse. World Health Organization; 2011.

[98] Bhugra D, Tasman A, Pathare S, Priebe S, Smith S, Torous J, et al. The WPA-lancet psychiatry commission on the future of psychiatry. Lancet Psychiatry 2017;4(10):775–818, doi:http://dx.doi.org/10.1016/S2215-0366(17)30333-4.

[99] Furst MA, Gandré C, Romero-Lopez-Alberca C. L. Salvador-Carulla. Healthcare ecosystems research in mental health: a scoping review of methods to describe the context of local care delivery. BMC Health Serv Res 2019;19(1):173.

[100] Jenkins R, Gulbinat W, Manderscheid R, Baingana F, Whiteford H, Khandelwal S, et al. The mental health country profile: background, design and use of a systematic method of appraisal. Int Rev Psychiatry 2004;16(1-2):31–47.

[101] World Health Organization. Global report on urban health: equitable healthier cities for sustainable development. World Health Organization; 2016.

[102] World Health Organization. Framework on integrated, people-centred health services. Report by the Secretariat. Geneva: WHO; 2016 Retrieved from www.who.int/servicedeliverysafety/areas/people-centred-care/en/on, 18..

[103] García-Alonso CR, Almeda N, Salinas-Pérez JA, Gutiérrez-Colosía MR, Salvador-Carulla L. Relative Technical Efficiency Assessment of Mental Health Services: A Systematic Review. Adm Policy Ment Health Ment Health Serv Res 2019;1–16, doi:http://dx.doi.org/10.1007/s10488-019-00921-6.