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# Systematic development of quality indicators for mental healthcare in the Danube region

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# Summary

The mental healthcare systems of Bulgaria, the Czech Republic, Hungary and Serbia are undergoing structural reforms. Quality indicators are quality assurance instruments that can be used to evaluate and monitor mental healthcare reforms, their status and impact on the quality of mental healthcare. However, quality indicators for these countries in the Danube region have been lacking.

This study focuses on systematically developing quality indicators for mental healthcare systems in these countries. The first research question focuses on identifying quality domains that are relevant to mental healthcare systems. The second research question focuses on recommending relevant, valid and feasible quality indicators.

Quality indicators were developed by means of a structured consensus-based process. Quality indicators were systematically searched and narrowed down by inclusion and exclusion criteria. In a two-round Delphi study, an international and multidisciplinary panel of experts rated identified quality indicators by means of the criteria relevance, validity, data availability and data collection effort.

The validity and relevance ratings of all 22 quality indicators developed are significantly correlated. There are no differences between countries for relevance and validity. Data availability is rated very differently and is appraised as given by 6% to 94% of the panelists per indicator. In 19 quality indicators, 50% or more of panelists, who rated that data are not likely to be available, consider additional data collection efforts as justifiable.

In contrast to international quality indicator development processes for other European countries, the developed quality indicators in this study focus on quality domains like mental health legislation, workforce, and availability of mental health services that address mostly structural quality deficiencies in all four countries. The Delphi study results emphasize the generalizability of the quality indicators across the involved countries. However, the results do indicate that further refinement of the definitions of quality indicators are required to improve their validity.

This study provides a promising starting point for the further refinement and implementation of systematically developed quality indicators for mental healthcare systems in the Danube region. It is recommended to test all indicators to analyze their feasibility, acceptance and comparability between countries.

# Zusammenfassung

In der psychiatrischen Gesundheitsversorgung in Bulgarien, der Tschechischen Republik, Ungarn und Serbien finden strukturelle Gesundheitssystemreformen statt. Mittels Qualitätsindikatoren können Reformprozesse, deren Status und Einfluss auf die Qualität der psychiatrischen Versorgung überprüft werden. Bislang fehlten für diesen Zweck Qualitätsindikatoren in diesen vier Ländern in der Donau Region.

Diese Studie befasst sich mit der systematischen Entwicklung von Qualitätsindikatoren für die psychiatrische Versorgung in diesen Ländern. Die erste Fragestellung betrifft die Ermittlung relevanter Qualitätsdomänen. Die zweite Fragestellung behandelt die Empfehlung von relevanten, validen und praktikablen Qualitätsindikatoren.

Die Qualitätsindikatoren wurden in einem strukturieren Konsensusprozess entwickelt. Bestehende Qualitätsindikatoren wurden in systematischen Recherchen identifiziert und anhand von Ein- und Ausschlusskriterien vorausgewählt. In einer zweistufigen Delphi-Studie hat eine internationale, multidisziplinäre Expertengruppe die Qualitätsindikatoren anhand der Kriterien Relevanz, Validität, Datenverfügbarkeit und Datenerhebungsaufwand bewertet.

Die Validitäts- und Relevanzbewertungen aller 22 Qualitätsindikatoren korrelieren signifikant miteinander. Es gibt keine Länderunterschiede bei beiden Kriterien. Die Beurteilung der Datenverfügbarkeit wurde sehr unterschiedlich beurteilt und wurde von 6% bis 94% der Experten als gegeben eingeschätzt. Bei 19 Indikatoren haben 50% oder mehr derjenigen Experten, die die Datenverfügbarkeit ausschlossen, dafür gestimmt, dass ein zusätzlicher Erhebungsaufwand gerechtfertigt ist.

Im Vergleich zu anderen Qualitätsindikatorenprozessen fokussiert diese Studie auf Qualitätsdomänen wie Gesetzgebung, personelle Ressourcen und die Verfügbarkeit von psychiatrischen Gesundheitsdiensten, die vornehmlich strukturelle Qualitätsdefizite in den vier beteiligten Ländern darstellen. Die Ergebnisse der Delphi-Studie weisen auf eine generelle Relevanz der Qualitätsindikatoren in den vier beteiligten Ländern hin. Die Ergebnisse zeigen, dass Verfeinerungen der Indikatordefinitionen notwendig sind zur Verbesserung der Validität.

Diese Studie bietet eine wichtige Basis für die Weiterentwicklung und Implementierung von systematisch entwickelten Qualitätsindikatoren für die psychiatrische Gesundheitsversorgung in der Donau-Region. Es wird empfohlen, die Indikatoren in Hinblick auf ihre Machbarkeit, Akzeptanz und Vergleichbarkeit zu testen.

# Index of abbreviations

| | | | |
|---|---|---|---|
| **ÄZQ** | Ärztliches Zentrum für Qualität in der Medizin | **IIMHL** | International Initiative of Mental Health Leadership |
| **BGFAMI** | Bulgarian Family Carer Association | **JCAHO** | Joint Commission on Accreditation of Healthcare Organizations |
| **DGPPN** | German Association for Psychiatry, Psychotherapy and Psychosomatics<br><br>(German: Deutsche Gesellschaft für Psychiatrie und Psychotherapie, Psychosomatik und Nervenheilkunde) | **OECD** | Organization for Economic Co-operation and Development |
| **EFQM** | European Foundation for Quality Management | **QI** | Quality indicator/s |
| **EPA** | European Psychiatric Association | **RAND/UCLA** | Research and development/University of California Los Angeles |
| **EUFAMI** | European Federation of Associations of Families of People with Mental Illness | **WHO** | World Health Organization |
| **GAMIAN** | Global Alliance of Mental Illness Advocacy Networks-Europe | **WHO-AIMS** | World Health Organization - Assessment Instrument for Mental Health Systems |

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# 1 Introduction

## 1.1 Background

The topic of quality of mental healthcare is relevant to all national healthcare systems. Especially in countries that are transforming their healthcare systems towards an optimized use of resources, an expanded population coverage, improved efficiency and deinstitutionalized mental healthcare services, strategies need to focus on the quality of care to achieve the best possible outcomes (WHO 2006).

Bulgaria, the Czech Republic, Hungary and Serbia are high- to upper-middle-income countries located in the Danube region. All four nations are currently undertaking mental healthcare reforms with the goal of creating efficient, effective and high-quality mental healthcare systems (Bitter & Kurimay 2012, Dimova et al. 2012, Höschl et al. 2012, Lecic Tosevski et al. 2007). They mainly focus their reform activities on improving interprofessional and intersectoral cooperation, workforce development, decreasing stigmatization of persons with mental disorders, the psychiatric profession, improving accessibility to mental healthcare services (Bitter & Kurimay 2012, Dimova et al. 2012, Höschl et al. 2012, Lecic Tosevski et al. 2007), and including mental healthcare users and their caregivers in care-related decision-making processes (Dimova et al. 2012, Lecic Tosevski et al. 2007). The monitoring of these reform processes with appropriate measures and methods is warranted to evaluate their effects on the quality of mental healthcare.

## 1.2 Quality of care

Quality of care is a complex construct with varied dimensions and components. It is being evaluated, assured and optimized utilizing various methods and measures of quality assurance (Großimlinghaus et al. 2017b).

In the 1960s, Avedis Donabedian introduced the term “quality” into healthcare. According to Donabedian, “quality of care is the extent to which actual care is in conformity with preset criteria for good care” (quoted in Reerink 1990, p. 200). To assess

the quality of mental healthcare, three system-level dimensions can be differentiated (Donabedian 1988):

- Structures: the given and relatively stable features of care systems and settings, including organizational aspects, material and human resources
- Processes: the actual processes of providing and receiving care
- Outcomes: the effects of care on the health status of patients, whereas health status can be defined by various outcomes such as symptomatology, social functioning, patient satisfaction and patient coping strategies

In this three-level approach, it is assumed that appropriate structures form the prerequisite for providing "high-quality" processes, which in turn can lead to the desired outcomes (Donabedian 1988).

Quality of care can be categorized into different quality domains, which are dimensions of the mental healthcare system (WHO 2006):

- Effectiveness: healthcare is evidence-based, it is provided according to need and results in improved health outcomes.
- Efficiency: healthcare is delivered in a way where resource use is optimized and waste is minimized.
- Accessibility: healthcare is timely, geographically reasonable and delivered in settings that use skills and resources according to need.
- Acceptability/patient-centeredness: healthcare coincides with expectations and preferences of communities, individual services users and their relatives or caregivers.
- Equity: healthcare quality does not vary between members of society because of personal characteristics like gender or socioeconomic status.
- Safety: healthcare should minimize risks and harm to its users.

Quality in healthcare reflects the prevailing values and goals of society and the socially embedded healthcare system (Donabedian 1966). Traditionally, quality of care has been defined mostly in terms of technical delivery of care services. From a clinical standpoint, the expectations and opinions of persons receiving care as well as their representatives

and society in general play an added important role in the definition and assessment of quality of care (Lohr et al. 1988). The dimensions of quality have broadened as mental healthcare systems became more complex and innovative, such that multidisciplinary forms of care services have been implemented (Lohr et al. 1988, Gaebel et al. 2012).

## 1.3 Levels of care

The healthcare system can generally be differentiated into three levels on which quality assessments can be performed (Gaebel et al. 2015, WHO 1997):

1. Macro-level: This is the national, regional or local mental health policy level and its organization. It may include topics like equity, anti-stigma activities, deinstitutionalization, continuity of services, cross-sectoral cooperation, content of mental health policies and involvement of different stakeholders in the development of mental health policies.
2. Meso-level: This refers to the level of mental healthcare institutions such as primary care settings delivering mental healthcare, outpatient settings (e.g. private practices, community mental health centers), inpatient settings (e.g. psychiatric hospitals, psychiatric wards in general hospitals), and residential facilities (e.g. rehabilitation homes).
3. Micro-level: This is the direct level of individual care for persons with mental disorders. Quality assessment may relate to specific interventions, such as psychopharmacology or psychotherapy, or to specific mental disorders, such as schizophrenia or anxiety disorder.

## 1.4 Contextual factors influencing quality assessments

To assess the quality of mental healthcare, at least three preconditions need to be met (WHO 1997):

1. Political will to do so: Traditionally, politicians, health authorities, decision-makers and managers participate in the processes of planning, implementing and evaluating mental healthcare services. Since these processes are interconnected and take place on different system levels, a high-level

involvement of stakeholders like service users and family representatives, local governments and mental healthcare organizations should be included.

2. Evaluative culture: The extent to which an evaluative culture is prevailing depends on the organizational structures of healthcare systems, on the management styles within the system and the care settings. The backgrounds, i.e., education, experience and culture, of mental healthcare professionals and other stakeholders also shape the evaluative culture in different settings of the healthcare system.
3. Technical tools: Tools used in quality management, such as guidelines and quality criteria or indicators, need to be available to assess the quality of mental healthcare (WHO 1997). These tools themselves have to meet certain methodological criteria (Muche-Borowski & Kopp 2011, Reiter et al. 2007).

## 1.5 Quality indicators

Quality indicators can be defined as "quantitative measures that can be used to monitor and evaluate the quality of important governance, management, clinical, and support functions that affect patient outcomes" (JCAHO 1989, quoted in Mainz 2003, p. 524).

Quality indicators are quantitative proxies that depict the quality of care through a numeric value in form of a ratio or proportion (Jäckel 2009). Therefore, they can indicate critical points in mental healthcare that may need further attention. A critical indicator result is usually shown by an outlier outside of a reference range or reference value. A reference range or reference value defines quality indicator results that indicate "good quality" (Jäckel 2009). For example, a quality indicator on psychotropic polypharmacy may measure the number of patients with mental disorders and simultaneous prescriptions of multiple psychotropic drugs. The reference range may be set below 10%. This means that not more than 10% of the measured patient population should be affected by psychotropic polypharmacy. A result between 11% and 100% would indicate an increased rate of polypharmacy and therefore a quality deficiency. Reference ranges or values can be based on evidence from empirical studies or expert/stakeholder consensus, i.e., perceived unacceptable variation in mental healthcare (Campbell et al. 2002, Jäckel 2009).

Quality indicators must fulfill methodological criteria to be able to reliably measure differences in quality of mental healthcare. The German QUALIFY-tool for the assessment of quality indicators evaluates quality indicators by means of 20 different criteria from the categories of relevance, scientific soundness and practicability (Reiter et al. 2007). Thus, it is considered important that quality indicators measure relevant quality aspects (relevance), that they have proper methodological properties (scientific soundness) and that they are applicable in a practical setting (practicability) (Reiter et al. 2007).

Because the mental healthcare system is very complex, involving varied structures, processes and desired outcomes, it is common to measure multiple quality indicators and to combine them to create an "indicator profile" (Altenhofen et al. 2002). Quality indicators can apply to the macro-, meso- or micro-level of the healthcare system. They can be generic (e.g. mortality of all patients with mental disorders) or diagnosis-specific (e.g. utilization of psychiatric inpatient care services of persons with schizophrenia). Quality indicators can focus on different quality domains, such as structures (e.g. number of available psychiatric hospitals in a defined region), processes (e.g. discharge management in hospitals), outcomes (e.g. symptom reduction after medication), equity, accessibility and safety. Moreover, as different stakeholders, such as patients, mental health professionals and policymakers are involved in mental healthcare, depending on the perspective taken, quality indicator sets may focus on different care levels and aspects (Großimlinghaus et al. 2017b). For further illustration, three examples of quality indicators extracted from the literature are shown in Table 1.

**Table 1: Three examples of quality indicators in mental healthcare**

| QUALITY DOMAIN | MEASURE CHARACTERISTICS | QUALITY INDICATOR | SOURCE |
|---|---|---|---|
| **SAFETY** | Structure indicator<br>Proportion<br>Generic | **Numerator:**<br>Number of mental hospitals with at least one yearly external review/inspection of human rights protection of patients<br><br>**Denominator:**<br>Total number of mental hospitals | WHO-AIMS[a] Instrument 2.2 (WHO 2005) |
| **ACCESSIBILITY** | Process indicator<br>Ratio<br>Generic | **Numerator:**<br>Number of patients with a waiting time* of 0 days<br><br>**Denominator:**<br>Number of patients with a waiting time* > 0 days<br><br>*waiting time for outpatient appointments | Quality indicator derived from EPA[b] Guidance recommendation (Gaebel et al. 2012) |
| **PATIENT OUTCOMES** | Outcome indicator<br>Proportion<br>Generic | **Numerator:**<br>Standardized mortality rate for persons with specified severe psychiatric disorders<br><br>**Denominator:**<br>Standardized mortality rate for the total population | OECD[c]-Quality indicators for Mental Health Care (Hermann & Mattke 2004) |

*[a]WHO-AIMS: World Health Organization - Assessment Instrument for Mental Health Systems; [b]EPA: European Psychiatric Association; [c]OECD: Organization for Economic Co-operation and Development*

Quality indicators are measured for various purposes, including:

- Documentation of quality of care ("As-is-situation") (Mainz 2003),
- Comparisons of performance between providers or care systems (benchmarking) or longitudinal analyses for one provider or care system (AQUA-Institut 2015, Mainz 2003),
- Support patient choices for providers (Mainz 2003),
- Support accreditation, regulation and accountability (Mainz 2003),
- Support steering processes and decision-making processes (AQUA-Institut 2015),
- Monitor restructuring of mental healthcare and changed processes (AQUA-Institut 2015).

### 1.5.1 Quality indicator development methods

Different research methods are applied to develop quality indicators. According to Campbell and colleagues (2002), there are non-systematic and systematic methods.

Non-systematic approaches rely on the availability of data and actual critical incidents that occur in mental healthcare and require quality assurance activities. By means of quality indicators, critical incidents can be monitored (Campbell et al. 2002). For example, when increased mortality rates occur in a hospital, indicators can be implemented that measure the number of patients who die due to natural causes versus the number of patients who die due to unnatural causes.

Systematic, evidence-based methods rely on evidence from empirical studies. The better the evidence for a certain mental healthcare structure or process, the greater the benefits of measuring a quality indicator in terms of providing incentives for improving an outcome (Campbell et al. 2002). For example, empirical evidence shows that with psychotropic polypharmacy, the risk-benefit balance becomes unfavorable for the patient and the risk for somatic co-morbidities increases (Correll et al. 2015). Thus, a quality indicator on psychotropic polypharmacy may be a useful evidence-based quality assurance measure to monitor the number of patients with psychotropic polypharmacy.

Systematic, evidence- and consensus-based methods rely on expert consensus in addition to the available evidence, which in many areas of mental healthcare may not be available, may be limited or methodologically weak (Campbell et al. 2002). Consensus can fill in evidence-gaps and has additional benefits to solely evidence-based approaches:

- Inclusion of proficiency and judgment of mental healthcare experts via their professional experience and clinical practice (Sackett 1996),
- Inclusion of group opinions of various professionals or stakeholders is preferable to the opinion of one professional because this decreases the risk of personal bias and lack of external validity (Campbell et al. 2002),
- Inclusion of the experiences of other stakeholders such as patient representatives and care-giver representatives (Reiter et al. 2007),
- Higher chance for acceptance of implementation and continuous monitoring of quality indicators (Altenhofen et al. 2002),
- Inclusion of a broader range of quality indicators topics than when quality indicators were only based on evidence (Campbell et al. 2002).

Common consensus techniques that are used in quality indicator development include the Delphi-technique (Boulkedid et al. 2011), the Research and Development/University of California Los Angeles (RAND/UCLA) appropriateness method (Fitch et al. 2001), and the derivation of quality indicators from guideline recommendations (Kopp 2011). In addition, some project groups use a modified Delphi-technique with aspects of the RAND/UCLA appropriateness method (Hermann et al. 2006, Parameswaran et al. 2015).

**Delphi technique**

The Delphi technique is a structured method in which a panel of experts in a specific field of interest is asked to answer questionnaires, i.e., rate quality indicators. The Delphi technique can involve several Delphi rounds depending on the complexity of the topic (Vorgrimler & Wüben 2003). After the research question and a respective questionnaire have been developed, an appropriate panel of experts is nominated, anonymous

iterative rating rounds are conducted, results are summarized and fed back between rounds, either in statistical or qualitative or a combined form. During this process, anonymity of all panelists is maintained (Campbell et al. 2002). The Delphi technique can be conducted remotely and with a large group of panelists (Vorgrimler & Wüben 2003).

**RAND/UCLA appropriateness method**

In the RAND/UCLA appropriateness method, the panel of experts rates the quality indicators, discusses them and then re-rates them. It involves a preliminary systematic literature search on the identification and/or evidence-based of quality indicators for a specific field. Since experts meet in-between ratings rounds, this is not an anonymous process and usually panel sizes are smaller than in Delphi studies (Campbell et al. 2002). This method has been originally developed to identify criteria for the appropriateness of clinical interventions (Fitch et al. 2001). It has also been applied to develop quality indicators, for example to assess care processes of vulnerable elders (Shekelle et al. 2001). For quality indicator development, some project groups combine the Delphi method and the RAND/UCLA appropriateness method. In these studies, quality indicators are rated remotely by means of defined criteria. In-between rating rounds the panelists meet, discuss the results of the first round and then re-rate the quality indicators in a second round (Hermann et al. 2006, Parameswaran et al. 2015).

**Guideline-based quality indicators**

Quality indicators can be derived from recommendations of clinical practice guidelines (Campbell et al. 2002, Kopp et al. 2007). This process involves identifying key recommendations from a guideline, deriving a precisely defined measurable quality indicator from the recommendation, rating the quality indicator by means of predefined criteria (e.g., relevance to patient outcomes, availability of data) and defining reference ranges for each indicator (Campbell et al. 2002, Nothacker & Reiter 2009).

### 1.5.2 Quality indicator development in mental healthcare

Various initiatives have dealt with the development of quality indicators in European countries. In the following, important initiatives for mental healthcare quality indicators on international and national levels are described.

On an international level, the quality indicator development processes of the Organization for Economic Co-operation and Development (OECD, Hermann & Mattke 2004, Hermann et al. 2006), the quality indicator review and development of the International Initiative of Mental Health Leadership (IIMHL, Parameswaran et al. 2015, Spaeth-Rublee et al. 2010) and the European Psychiatric Association (EPA) Guidance (Gaebel et al. 2012) are noteworthy.

The OECD's international seven-member panel of experts developed a set of twelve quality indicators including the quality domains treatment (n=6), continuity (n=4), coordination (n=1) and outcome (n=1). Quality indicators were identified through systematic literature searches. In a consensus-based development process, an international expert panel rated quality indicators for their importance, scientific soundness and data availability. These indicators were intended for an international benchmarking of mental healthcare processes and outcomes (Hermann & Mattke 2004, Hermann et al. 2006).

The IIMHL group developed another set of mental health quality indicators for industrialized countries, including Australia, Canada, England, Germany, Ireland, Japan, the Netherlands, New Zealand, Norway, Scotland, Taiwan and the United States of America. Quality indicators identified from all participating countries were rated by means of different criteria and in-between rating rounds a personal meeting took place for the discussion and review of ratings (Parameswaran et al. 2015). The consented quality indicators focused mostly on mental healthcare processes, but also included outcome indicators such as death rates, patient functioning and criminal justice encounters (Parameswaran et al. 2015).

In an international study by the European Psychiatric Association (EPA), quality indicators were derived from guidance recommendations for mental healthcare services (Gaebel et al. 2012). The aim was to provide tools to monitor the implementation of

evidence-based and best-practice guidance recommendations for high-quality mental healthcare services. The quality indicators focused on mental healthcare structures and processes. They were developed by the authors of the guidance (Gaebel et al. 2012).

On a national level, the German Association for Psychiatry, Psychotherapy and Psychosomatics (DGPPN) formed a project group (project leader: W. Gaebel, Düsseldorf) to develop evidence- and consensus-based quality indicators in a systematic development process (Großimlinghaus et al. 2013). In this project, we derived quality indicators from both key recommendations of clinical practice guidelines and systematic literature searches. Indicators were rated by means of different criteria from the QUALIFY-instrument (Reiter et al. 2007) and consented in a multidisciplinary consensus group including patient and caregiver representatives. We developed 44 diagnosis-specific quality indicators for alcohol addiction, dementia, depression and schizophrenia (Großimlinghaus et al. 2013).

### 1.5.3 Quality indicator implementation in mental healthcare

During the quality indicator development, the theoretical assessment of feasibility criteria provides a useful first appraisal. In addition, it is necessary to test the quality indicators in a pilot test before an implementation to assess their actual feasibility (Blumenstock 2009).

We tested the feasibility of the DGPPN quality indicators for depression and schizophrenia in ten German clinics for psychiatry and psychotherapy (Großimlinghaus et al. 2015). The quality indicators' feasibility was evaluated by retrospective analyses of the data availability from routine clinical documentations. The more quality indicators can be measured by means of routinely collected and electronically available data, the more they are considered feasible (Großimlinghaus et al. 2015, Reiter et al. 2007).

Of the 12 indicators for depression and 12 indicators for schizophrenia, five for depression and nine for schizophrenia were measurable by means of the available clinical documentations. However, there were differences in the data availability between clinics. Thus, some clinics could assess more indicators than others (Großimlinghaus et al. 2015).

On an international level, the OECD performed a survey on the availability of information to compare mental healthcare quality across several OECD countries (Armesto et al. 2008). On a national level, data availability was very good for structural data, but more problematic for process and outcome data. Regarding the twelve OECD quality indicators (Hermann & Mattke 2004, Hermann et al. 2006), data availability was better for some indicators (hospital readmissions, mortality, length of treatment) than for other indicators (Armesto et al. 2008). Data sources mostly available on a national level included inpatient administrative databases, national surveys and national registries (Armesto et al. 2008).

Overall, the before-mentioned topics form the theoretical framework for this study on the systematic development of quality indicators in countries of the Danube Region.

## 1.6 Research question and aims of this study

Overall, the aim of this work is to identify and develop quality indicators in a structured, iterative and consensus-based process. The aim is to have a multidisciplinary panel of stakeholders rate the relevance, the validity and the feasibility of quality indicators that can monitor and assess the quality of mental healthcare systems in Bulgaria, the Czech Republic, Hungary and Serbia.

For this study the following objectives were defined:

- To systematically search existing quality indicators in mental healthcare
- To categorize quality indicators according to different quality domains
- To identify key quality indicators that can be rated by a Delphi panel
- To establish a multidisciplinary panel of experts, including patient representatives and caregiver representatives, i.e., persons who experienced mental illness and persons who informally take care of persons with mental illness
- To conduct a Delphi study to rate quality indicators by means of predefined criteria

The following two research questions were formulated:

1. What are important quality domains for mental healthcare systems in the Danube region countries covered under this study?
2. From the perspective of a multidisciplinary international expert panel, including patient and caregiver representatives, which quality indicators are considered valid, feasible and relevant, and which can be recommended for measuring quality in mental healthcare in the Danube region countries covered under this study?

This Delphi study was conducted in the framework of a two-year project on the development and implementation of quality indicators in the Danube region, which was financially supported by the German Federal Ministry of Education and Research (BMBF, grant number 01DS17020).

## 1.7 Ethics approval

In this study, personal data in the form of ratings and free text comments on quality indicators were collected. Therefore, ethics approval was requested from the ethics committee of the Medical Faculty of the Heinrich-Heine-University Düsseldorf. The committee provided ethics approval on 26th June 2017 (study number: 5770).

Confidentiality of personal data was protected by analyzing all data strictly collectively and thus anonymously. Only anonymized data were disseminated within the project group and the Delphi panel. Only anonymized data were published in the journal *Psychiatria Danubina* and public forums, such as scientific symposia. All completed Delphi survey forms are saved in pseudonymized form on the research server of the LVR-clinic Düsseldorf – clinic of the Heinrich-Heine-University Düsseldorf. According to the University's research-data-guideline, data are saved for at least ten years. Written informed consent was obtained from all Delphi panelists and all panelists were informed about the eligibility to revoke their participation in this study.

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# DEVELOPMENT OF QUALITY INDICATORS FOR MENTAL HEALTHCARE IN THE DANUBE REGION

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## SUMMARY

***Background:*** *Quality indicators are quality assurance instruments for the evaluation of mental healthcare systems. Quality indicators can be used to measure the effectiveness of mental healthcare structure and process reforms. This project aims to develop quality indicators for mental healthcare systems in Bulgaria, the Czech Republic, Hungary and Serbia to provide monitoring instruments for the transformation of mental healthcare systems in these countries.*

***Methods:*** *Quality indicators for mental healthcare systems were developed in a systematic, multidisciplinary approach. A systematic literature study was conducted to identify quality indicators that are used internationally in mental healthcare. Retrieved quality indicators were systematically selected by means of defined inclusion and exclusion criteria. Quality indicators were subsequently rated in a two-stage Delphi study for relevance, validity and feasibility (data availability and data collection effort). The Delphi panel included 22 individuals in the first round, and 18 individuals in the second and final round.*

***Results:*** *Overall, mental healthcare quality indicators were rated higher in relevance than in validity (Mean relevance=7.6, SD=0.8; Mean validity=7.1, SD=0.7). There was no statistically significant difference in scores between the four countries for relevance ($X^2(3)=3.581$, $p=0.310$) and validity ($X^2(3)=1.145$, $p=0.766$). For data availability, the appraisal of "YES" (data are available) ranged from 6% for "assisted housing" to 94% for "total beds for mental healthcare per 100,000 population" and "availability of mental health service facilities".*

***Conclusion:*** *Quality indicators were developed in a systematic and multidisciplinary development process. There was a broad consensus among mental healthcare experts from the participating countries in terms of relevance and validity of the proposed quality indicators. In a next step, the feasibility of these twenty-two indicators will be evaluated in a pilot study in the participating countries.*

**Key words:** *mental healthcare, psychiatry - quality indicator - quality assurance - quality management - health system performance - Danube region*

* * * * *

## INTRODUCTION

Mental disorders are among the most prevalent and disabling disorders with an estimate of affecting more than a third of the European population each year (WHO Regional Office for Europe 2013, Wittchen et al. 2011). Lack of psychiatrists, regional access barriers to mental healthcare, reducing stigma and discrimination as well as the need for deinstitutionalization and adequate quality assurance measures are currently important issues in all European countries (WHO Regional Office for Europe 2013).

There is an increasing pressure on national healthcare systems to provide timely, safe, effective and high quality health care, including mental healthcare. Reform of mental healthcare systems towards achieving these goals is a central joint theme in countries of the Danube region including Bulgaria, the Czech Republic, Hungary and Serbia.

Quality indicators are widely accepted as important instruments in quality assurance, management and development (Ovretveit 2005, Gaebel et al. 2015). They can be used to increase transparency of mental healthcare, to assess the current status of mental healthcare quality and to monitor the effects of reform processes. Moreover, they can be used to compare and benchmark national mental healthcare systems. Quality indicators usually examine the structures, processes and outcomes on

different healthcare levels: the national healthcare system (macro-level), mental healthcare institutions (meso-level), individual healthcare professionals and patients (micro-level) (Donabedian 1988, Gaebel et al. 2015).

Quality indicators are being developed by various stakeholders, including professional organizations, patient and care giver representatives and political organizations on regional or national levels, such as in Germany (Großimlinghaus et al. 2013, Weinmann & Becker 2009) or on an international level, (e.g., Fisher et al. 2013, Gaebel et al. 2012, Hermann & Mattke 2004, Jordans et al. 2016). However, quality indicators for countries in the Danube region are still lacking, although they may provide valuable information on the current mental healthcare reform processes in these countries.

This study therefore addresses the systematic development of mental healthcare quality indicators for Bulgaria, the Czech Republic, Hungary and Serbia. It identifies quality domains in mental healthcare as the basis for quality indicators to monitor mental healthcare reforms and ultimately improve quality of mental healthcare. Moreover, quality indicators are suggested that are considered relevant, valid and feasible by an international panel of mental healthcare experts from these countries. This paper gives an overview of the quality indicator development process and its results.

## METHODS

Quality indicators were developed in a systematic, multi-step process (Figure 1). This process included a systematic literature search and a two-phase Delphi study with the participation of relevant stakeholders from Bulgaria, the Czech Republic, Hungary and Serbia.

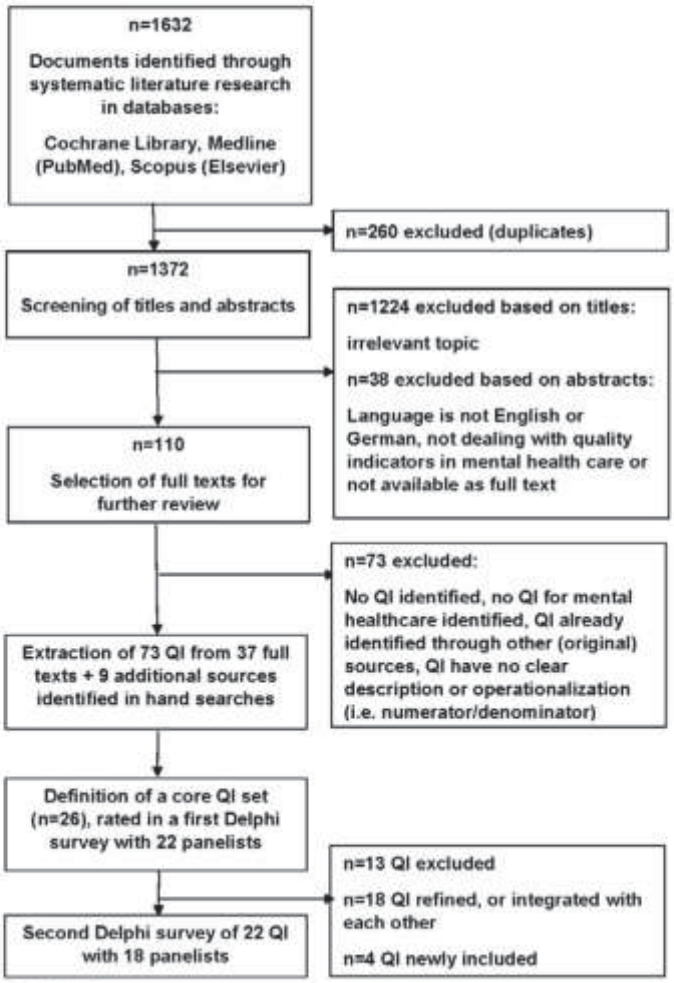


**Figure 1.** Overview of QI development process

## Systematic literature search

In order to identify existing quality indicators for mental healthcare, a systematic literature search was conducted in the databases Pubmed, Cochrane Library and Scopus (date of search: 7 April 2017) applying the search terms ["psychiatr*" OR "mental health" OR "mental healthcare" OR "mental health care"] AND ["quality indicator*" OR "quality measure*" OR "quality assessment*" OR "quality of care measure*" OR "quality of healthcare measure*" OR "performance indicator*" OR "performance measure*"] with the asterisk indicating a truncation. The selection process of relevant articles is shown in Figure 1. The following inclusion and exclusion criteria were applied:

Inclusion criteria:

- Publication deals with quality indicators (QI) in mental healthcare;
- QI is diagnostically generic;
- QI can be applied on macro-(system-)level and meso-(institution-)level in mental healthcare.

Exclusion criteria:

- QI is specifically diagnosis-related;
- QI with a focus on specific patient groups (e.g., only children and adolescents, homeless people, women or persons in forensic psychiatry;
- QI includes very country-specific structures or institutions and cannot be generalized to other countries;
- QI without operationalization (e.g., numerator and denominator not shown).

The quality indicators identified in this systematic search were categorized into different quality domains by the project group (Table 1). The group consensually focused on the following quality domains to be preferably included in a comprehensive QI-Set:

- Mental health policies and legislation;
- Financing and costs of mental healthcare;
- Availability, accessibility and utilization of mental healthcare;
- Mental health reporting and monitoring;
- Continuity, coordination and cooperation;
- Workforce in mental healthcare;
- Promotion of mental health, and preventing mental disorders, stigma and discrimination;
- Integration of research and innovation;
- Recovery, participation and integration of persons with mental disorders;
- Patient safety.

Quality indicators were extracted from the literature (n=73) and integrated into an inventory, differentiated by the quality domains. Their number was further reduced by excluding indicators "with only minor variations to other indicators" (e.g., if several QI covered the same topic, one "key indicator" was defined among these QI), or with "unspecified operationalization" in comparison to other QI. Thus a core set of 26 indicators was created to be rated in the Delphi study.

## Delphi study

The Delphi method is a multi-stage survey technique with feedback after each survey (Vorgrimler & Wübben 2003). This method was chosen because it can be used to systematically identify a group opinion. Moreover, it can be administered remotely and anonymously, making it a cost-effective research approach (Hsu & Sandford 2007). A positive ethics vote for the Delphi study was acquired from the ethics committee of the Medical Faculty of the Heinrich-Heine University Düsseldorf. All participants of the Delphi panel gave their written informed consent.

In this Delphi study, aspects of the RAND-UCLA Appropriateness Method (Fitch et al. 2001) were applied. This means that two rounds of quality indicator ratings took place. In between rounds, members of the project group discussed the statistically summarized ratings and pseudonymous comments of the first Delphi round to provide an input for the second Delphi round.

## Compilation of the Delphi panel

In this Delphi study, a multidisciplinary group of experts, who were knowledgeable in the field of quality in mental healthcare, was created. Experts included mental healthcare professionals such as psychiatrists, psychologists, social workers, mental healthcare managers/administrators, policy makers and patient representatives. The multidisciplinary panel was assembled with the aim to increase acceptance and to facilitate the implementation process for quality indicators. Therefore, it was considered very important to include knowledgeable individuals, who could facilitate the implementation of the quality indicators. Each country partner (H. Hinkov, Bulgaria; C. Höschl, Czech Republic; T. Kurimay, Hungary; D. Lecic-Tosevski, Serbia) nominated four to five experts from each country. In total, a list of twenty-two experts was compiled.

## Development of the Delphi survey instrument

The design of the Delphi instrument drew on our previous experience in the systematic development of quality indicators in Germany (Großimlinghaus et al. 2013, Wobrock et al. 2011, Zielasek et al. 2012) as well as other international projects in which QI were developed employing systematic evidence- and consensus-based processes (Parameswaran et al. 2015, Hermann et al. 2004, Jordans et al. 2016).

The Delphi survey forms included four criteria per QI. These criteria were extracted from the German Instrument for the Assessment of Quality Indicators (QUALIFY) (Reiter et al. 2007) and were defined as follows:

- ***Relevance:*** The QI captures a topic that is or should be relevant to mental healthcare planning and monitoring with the aim to assure and improve quality of mental healthcare.

**Table 1.** Project group

| | |
|---|---|
| Dan Chisholm | Project partner, WHO Regional Office for Europe, Denmark |
| Wolfgang Gaebel | Project leader, Düsseldorf/Cologne |
| Isabell Lehmann | Scientific study coordinator, Düsseldorf/Cologne |
| Hristo Hinkov, Vladimir Nakov | Project partners, Bulgaria |
| Cyril Höschl, Petr Winkler | Project partners, Czech Republic |
| Tamás Kurimay, Gábor Kapócs | Project partners, Hungary |
| Dusica Lecic-Tosevski | Project partner, Serbia |
| Dijana Naumoska | Project coordinator, Düsseldorf/Cologne |
| Jürgen Zielasek | Project partner, Düsseldorf/Cologne |

- ***Validity:*** The QI is defined clearly and unambiguously.
- ***Feasibility:***
  - *Data availability:* It is likely that data needed to measure this QI are routinely collected electronically (i.e. in country-specific statistics, data documentations in mental healthcare, questionnaires) and available from a database/databases.
  - *Data collection effort:* The additional effort for electronic collection of data for this QI is justifiable.

The survey instrument requested the panelists to rate relevance and validity on a 9-point-Likert scale. The feasibility criteria data availability and data collection effort were rated with "Yes", "No" or "Uncertain". In addition, the Delphi panelists could provide free text commentaries on each QI.

### Rating process and analysis

There were two Delphi rounds for the rating process. After the first round, the project group reviewed the summarized results for each criterion for each QI (mean, standard deviation (SD) for relevance and validity; percentage for data availability and data collection effort) together with the pseudonymous comments for each indicator. Between rounds, the quality indicators were further refined based on comments made in the first Delphi survey. This led to the exclusion of some indicators and the inclusion of new ones (Figure 1). All first-round results were summarized and provided to the Delphi panelists, so that they could review their own opinions and ratings in the context of the combined summarized ratings and pseudonymous comments. In the final rating round, a total of 22 indicators from eight quality domains were rated by 18 panelists (Figure 1).

Descriptive univariate statistics were performed for each criterion per indicator using IBM® SPSS Statistics® Version 22 to create a ranking of indicators for relevance and validity. Explorative analyses by means of nonparametric tests were performed to further analyze the results. To identify differences of the relevance and validity scores between countries, Kruskal-Wallis tests were performed.

## RESULTS

The following results were obtained after the second and final Delphi survey. Eighteen experts participated (Bulgaria n=5; the Czech Republic n=4; Hungary n=4; Serbia n=4; WHO Regional Office for Europe n=1). Different professions were involved, including one service user participant (Table 2).

**Table 2.** Characteristics of participants of the Delphi survey (n=18)

| | Number of participants |
|---|---|
| Country | |
| Bulgaria | 5 |
| Czech Republic | 4 |
| Hungary | 4 |
| Serbia | 4 |
| Other | 1 |
| Gender | |
| Male | 11 (61%) |
| Female | 7 (39%) |
| Age | |
| 25-34 | 2 (11%) |
| 35-44 | 2 (11%) |
| 45-59 | 11 (61%) |
| 60 and older | 3 (17%) |
| Participant's profession/perspective | |
| Government official | 5 (28%) |
| Mental healthcare manager – inpatient care | 6 (33%) |
| Mental healthcare manager – outpatient care | 4 (22%) |
| Mental healthcare manager – community care | 2 (11%) |
| Mental healthcare manager – other | 3 (17%) |
| Mental health professional - psychiatrist | 10 (56%) |
| Mental health professional - psychologist | 1 (6%) |
| Mental health professional - other | 4 (22%) |
| Mental healthcare researcher | 12 (67%) |
| Service user representative | 1 (6%) |

Table 3 shows the summarized results of all ratings ranked by relevance. Regarding the ten most highly ranked indicators for relevance, the indicators were rated between 8.2 (mean; SD = 0.7) and 7.7 (mean; SD = 1.2). Table 4 summarizes the results ranked for validity. Here, the ten most highly ranked indicators were rated between 7.9 (mean; SD = 0.8) and 6.1 (mean; SD = 1.8).

The range of relevance ratings for all 22 indicators was between 6.4 and 8.2 and the range for validity was 6.1 to 7.9. Overall, ratings for relevance were higher than for validity. The overall mean for relevance was 7.6 (SD=0.8) and of validity 7.1 (SD=0.7) (Wilcoxon signed-rank test, z=-2.936, p=0.003).

Seven indicators were included in both top-ten relevance and validity rankings:

- "Utilization and coverage of mental health services (bipolar disorder and schizophrenia)",
- "Availability of mental health service facilities",
- "Mental health legislation",
- "Availability and content of a mental health action plan document",
- "Utilization and coverage of mental health services (anxiety disorders and depression)",
- "Utilization and coverage of mental health services (alcohol use disorder)", and
- "Involuntary inpatient admissions".

**Table 3.** Ranking of quality indicators (QI) according to "relevance" (n=22)

| Rank | QI | Relevance: Mean (SD), Range | Validity: Mean (SD), Range | Data availability: "YES" in % |
|---|---|---|---|---|
| 1 | Utilization and coverage of mental health services (bipolar disorder and schizophrenia) | 8.2 (0.7), 7-9 | 7.8 (0.8), 7-9 | 56% |
| 2 | Availability of mental health service facilities | 8.2 (0.6), 7-9 | 7.9 (0.8), 6-9 | 94% |
| 3 | Mental health legislation | 8.1 (0.9), 6-9 | 7.7 (0.8), 6-9 | 83% |
| 4 | Availability and content of a mental health action plan document | 8.0 (0.9), 6-9 | 7.3 (1.3), 4-9 | 61% |
| 5 | Utilization and coverage of mental health services (anxiety disorders and depression) | 7.8 (0.9), 6-9 | 7.4 (0.8), 6-9 | 28% |
| 6 | Total beds for mental health care per 100,000 population | 7.8 (1.0), 5-9 | 7.1 (1.2), 5-9 | 94% |
| 7 | Human resources in mental health facilities per capita | 7.8 (1.5), 3-9 | 7.1 (1.2), 3-9 | 50% |
| 8 | Involuntary inpatient admissions | 7.7 (1.1), 5-9 | 7.6 (1.2), 5-9 | 50% |
| 9 | Utilization and coverage of mental health services (alcohol use disorder) | 7.7 (1.1), 5-9 | 7.4 (1.1), 5-9 | 33% |
| 10 | Health budget | 7.7 (1.2), 5-9 | 7.2 (1.2), 4-9 | 33% |
| 11 | Utilization and coverage of mental health services (children and adolescents with conduct disorder) | 7.6 (1.0), 5-9 | 7.3 (1.1), 4-9 | 28% |
| 12 | Utilization and coverage of mental health services (children and adolescents with intellectual disabilities) | 7.6 (1.2), 5-9 | 7.3 (1.3), 4-9 | 33% |
| 13 | Utilization and coverage of mental health services (substance-use disorder, other than alcohol) | 7.6 (1.3), 5-9 | 7.3 (1.3), 4-9 | 28% |
| 14 | Follow-up of visits after mental health-related hospitalization | 7.6 (1.5), 4-9 | 7.3 (1.1), 5-9 | 17% |
| 15 | Utilization and coverage of mental health services (dementia) | 7.5 (1.2), 5-9 | 7.2 (1.3), 5-9 | 28% |
| 16 | Equity | 7.4 (1.6), 3-9 | 6.6 (1.9), 3-9 | 72% |
| 17 | Integration of care | 7.4 (1.3), 5-9 | 6.5 (1.7), 2-9 | 11% |
| 18 | User associations and mental health policies, plans or legislation | 7.3 (1.6), 4-9 | 6.4 (1.2), 5-9 | 22% |
| 19 | Assisted housing | 7.2 (1.4), 5-9 | 6.4 (1.4), 4-9 | 6% |
| 20 | Total national expenditure on mental health services per capita per year | 7.1 (1.7), 2-9 | 7.3 (1.2), 5-9 | 39% |
| 21 | Multi-disciplinary community mental health teams | 6.9 (1.6), 4-9 | 6.5 (1.5), 3-9 | 22% |
| 22 | Anti-stigma movement | 6.4 (1.9), 1-8 | 6.1 (1.8), 1-8 | 33% |

**Table 4.** Ranking of quality indicators (QI) according to "validity" (n=22)

| Rank | QI | Validity: Mean (SD), Range | Relevance: Mean (SD), Range | Data availability: "YES" in % |
|---|---|---|---|---|
| 1 | Availability of mental health service facilities | 7.9 (0.8), 6-9 | 8.2 (0.6), 7-9 | 94% |
| 2 | Utilization and coverage of mental health services (bipolar disorder and schizophrenia) | 7.8 (0.8), 7-9 | 8.2 (0.7), 7-9 | 56% |
| 3 | Mental health legislation | 7.7 (0.8), 6-9 | 8.1 (0.9), 6-9 | 83% |
| 4 | Involuntary inpatient admissions | 7.6 (1.2), 5-9 | 7.7 (1.1), 5-9 | 50% |
| 5 | Utilization and coverage of mental health services (anxiety disorders and depression) | 7.4 (0.8), 6-9 | 7.8 (0.9), 6-9 | 28% |
| 6 | Utilization and coverage of mental health services (alcohol use disorder) | 7.4 (1.1), 5-9 | 7.7 (1.1), 5-9 | 33% |
| 7 | Follow-up of visits after mental health-related hospitalization | 7.3 (1.1), 5-9 | 7.6 (1.5), 4-9 | 17% |
| 8 | Utilization and coverage of mental health services (children and adolescents with conduct disorder) | 7.3 (1.1), 4-9 | 7.6 (1.0), 5-9 | 28% |
| 9 | Total national expenditure on mental health services per capita per year | 7.3 (1.2), 5-9 | 7.1 (1.7), 2-9 | 39% |
| 10 | Availability and content of a mental health action plan document | 7.3 (1.3), 4-9 | 8.0 (0.9), 6-9 | 61% |
| 11 | Utilization and coverage of mental health services (children and adolescents with intellectual disabilities) | 7.3 (1.3), 4-9 | 7.6 (1.2), 5-9 | 33% |
| 12 | Utilization and coverage of mental health services (substance-use disorder, other than alcohol) | 7.3 (1.3), 4-9 | 7.6 (1.2), 5-9 | 28% |
| 13 | Health budget | 7.2 (1.2), 4-9 | 7.7 (1.2), 5-9 | 33% |
| 14 | Utilization and coverage of mental health services (dementia) | 7.2 (1.3), 5-9 | 7.5 (1.2), 5-9 | 28% |
| 15 | Total beds for mental health care per 100,000 population | 7.1 (1.2), 5-9 | 7.8 (1.0), 5-9 | 94% |
| 16 | Human resources in mental health facilities per capita | 7.1 (1.2), 3-9 | 7.8 (1.5), 3-9 | 50% |
| 17 | Equity | 6.6 (1.9), 3-9 | 7.4 (1.6), 3-9 | 72% |
| 18 | Integration of care | 6.5 (1.7), 2-9 | 7.4 (1.3), 5-9 | 11% |
| 19 | User associations and mental health policies, plans or legislation | 6.4 (1.2), 5-9 | 7.3 (1.6), 4-9 | 22% |
| 20 | Assisted housing | 6.4 (1.4), 4-9 | 7.2 (1.4), 5-9 | 6% |
| 21 | Multi-disciplinary community mental health teams | 6.5 (1.5), 3-9 | 6.9 (1.6), 4-9 | 22% |
| 22 | Anti-stigma movement | 6.1 (1.8), 1-8 | 6.4 (1.9), 1-8 | 33% |

These seven indicators cover three quality domains: „mental health policies and legislation" (two QI), „availability, accessibility and utilization of care service structures" (four QI), and „patient safety" (one QI).

A Spearman rank correlation test was performed for all 22 indicators showing that mean validity and relevance ratings were significantly correlated (P=0.747, p<0.000). When comparing the four countries with each other, there was no statistically significant difference in relevance and validity scores (Kruskal Wallis Test analyses for relevance $X^2(3)=3.581$, p=0.310, and validity $X^2(3)=1.145$, p=0.766). The mean scores for each country are shown in Table 5.

With regard to data availability, there was a wide range for the rating "YES" (data needed to measure a QI are routinely collected electronically and available form a database) between 6% for "assisted housing" and 94% for "total beds for mental health care per 100,000 population" as well as 94% for "availability of mental health service facilities".

The ratings for data availability of the top-ten QI ranked by relevance range from 28% for "YES" ("Utilization and coverage of mental health services (anxiety disorders and depression)") to 83% for "YES" ("Mental health legislation"). There was a statistically significant difference in his expert-estimated data availability between countries in one indicator "Utilization and coverage of mental health services (alcohol disorder)" ($X^2(8)=18.806$, p=0.016). This result was mainly due to the rating for the Czech Republic, which indicated that data are likely to be available there (Table 6). However, for the other six indicators, there were no statistically significant differences in expert-estimated data availability between countries (Table 6).

**Table 5.** Overall mean relevance and validity scores across all quality indicators (n=22) per country

| Country | Relevance (Mean, SD) | Validity (Mean, SD) |
|---|---|---|
| Bulgaria | 7.1 (0.8) | 6.9 (0.8) |
| Czech Republic | 7.8 (0.2) | 7.5 (0.2) |
| Hungary | 8.0 (1.2) | 7.2 (0.9) |
| Serbia | 7.6 (1.0) | 7.1 (1.0) |

**Table 6.** Differences between countries in data availability of seven quality indicators (QI), overlapping in the top-ten ranking of relevance and validity

| QI | Data availability* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Bulgaria | | Czech Republic | | Hungary | | Serbia | |
| | Yes | No | Yes | No | Yes | No | Yes | No |
| Mental health legislation | 80% | 0% | 75% | 0% | 75% | 25% | 100% | 0% |
| Availability and content of a mental health action plan document | 60% | 20% | 100% | 0% | 25% | 0% | 50% | 25% |
| Availability of mental health service facilities | 80% | 0% | 100% | 0% | 100% | 0% | 100% | 0% |
| Utilization and coverage of mental health services (bipolar disorder and schizophrenia) | 40% | 40% | 75% | 0% | 75% | 0% | 50% | 25% |
| Utilization and coverage of mental health services (alcohol use disorder) | 0% | 20% | 100% | 0% | 50% | 25% | 0% | 75% |
| Utilization and coverage of mental health services (anxiety disorders and depression) | 40% | 40% | 50% | 0% | 25% | 25% | 0% | 75% |
| Involuntary inpatient admissions | 20% | 40% | 50% | 25% | 50% | 0% | 50% | 50% |

*Does not include ratings for "uncertain", thus Yes/No ratings per country may not add up to 100%.

## DISCUSSION

The goal of this study was to develop quality indicators for mental healthcare systems in the countries of the Danube region with the aim to monitor mental healthcare reforms and to improve the quality of mental healthcare in these countries. This is the first study that developed a common set of quality indicators in these countries by means of a systematic development process. The indicators were considered both relevant and valid by expert opinion, especially regarding the seven indicators that overlap in the top-ten rankings of relevance and validity (Tables 3 & 4).

When considering the highest rated indicators for the criterion "relevance", the following quality domains are included: Mental health policies and legislation; availability, accessibility and utilization of care services; financing and costs of mental healthcare; workforce in mental healthcare and patient safety. These domains reflect mostly levels of the overall healthcare system (macro-level) and the institutional-(meso)-level.

With regard to the seven overlapping indicators in the top ten rankings of validity and relevance, the quality domains "mental health policies and legislation", "availability, accessibility and utilization of care service structures", and "patient safety" were represented. Patient safety is a domain of growing importance to be considered in quality assurance for mental healthcare. Both, safety and patient-centeredness were defined as core aspects of quality by the Organization for Economic Co-operation and Development (OECD) (Arah et al. 2006) and safety as well as effectiveness of care should be the focus of mental healthcare reforms and included in mental health policies (WHO 2013). The development and content of mental health policies, the availability of different care structures including specialized services, and the availability of community services and teams are all topics included in this indicator set. Since the action plan of the European Joint Action on Mental health and Wellbeing on the transformation of mental healthcare systems towards deinstitutionalized community-based mental health services (Caldas Almeida et al. 2015) recommends these activities, our proposed indicators may serve as a monitoring tool of the implementation of the Joint Action's aims. Moreover, these indicators may be used as an extension of the indicators of the WHO Mental Health Atlas (2015), which provide information on the availability of mental health services and resources in different countries. Our indicators provide additional information as thay also focus on the utilization and coverage of mental health services.

There were no significant differences in ratings for relevance and validity between countries. This indicates an implicit consensus across the four countries in terms of the relevance and validity of quality indicators. All indicators were rated significantly higher in relevance than validity. This indicates that while they may cover a relevant quality aspect, their operationalizations may need improvement. This is especially relevant for the

implementation of quality indicators across countries, which requires the documentation of similar data if indicators are to be compared internationally. Thus, there is a need to field study the implementation of the indicators and to design large-scale studies, which may be able to show whether the country-wide implementation of indicators leads to measurable improvements of mental healthcare.

Our analyses for the seven indicators that overlap in both top-ten relevance and validity rankings showed that for six indicators there were no significant differences between countries as to whether data were likely to be already collected electronically and thus were likely to be available. This may provide an important prerequisite for the implementation of this QI set. However, data availability, data quality and data accessibility need to be further investigated in more detail. For one indicator ("Utilization and coverage of mental health services (alcohol disorder)") data were reported to be likely available in the Czech Republic, but not in Bulgaria, Hungary or Serbia. This may be explained by the availability of both, national registers of health care utilization and recent community-based epidemiological survey, in the Czech Republic.

The more data are systematically and electronically collected, the more likely it is that indicators may be measureable, since a high workload due to separate data collections for quality indicators may strongly decrease feasibility (Gaebel et al. 2015). However, it is unlikely that relevant indicators can only be measured through routinely collected data that originally are not intended for quality assurance purposes, but for the remuneration of mental health services (Gaebel et al. 2015). We conducted a pilot test of quality indicators for schizophrenia and depression in ten German psychiatric hospitals, which showed that of 24 indicators only 14 could be measured by means of routinely available data, including data for remuneration of inpatient mental healthcare services and additional medical documentations (Großimlinghaus et al. 2015).

One further indicator ("Formally defined minimum data set items") was only rated in the first Delphi round. Hereafter, the project group decided to remove it from the indicator set and use it as a "meta-level" indicator to be used to determine if all data for the indicators of the proposed set are being collected. For this meta-level indicator, the minimum data set still needs to be defined, which depends on the final operationalization of all quality indicators.

Furthermore, even though diagnosis-specific indicators were excluded in the systematic literature study, it became clear during this two-stage Delphi survey that differentiating some indicators according to diagnoses may provide a more detailed insight into the utilization and coverage of mental healthcare services. Therefore, indicators focusing on the latter were differentiated by diagnostic groups during the Delphi process.

Overall, the strength of this study relates to the systematic and multidisciplinary approach, which also included different stakeholders from each country. This increases the chance of later acceptance of the quality indicators. In a Delphi study, it is important to select knowledgeable and expert participants, because this determines the quality of the results generated. It is recommended to include participants who can implement the results of the Delphi study (Hsu & Sandford 2007). In our study, many participants may support implementation of the developed indicators and due to their professional and institutional backgrounds had extensive knowledge of data availability in their countries.

A limitation of this study was that indicators were not rated on a broader basis with more stakeholders from the four countries. However, the participation of 18 individuals in our final Delphi round is higher than in other international quality indicators development studies, which included expert panels of 12 persons (Parameswaran et al. 2015, Hermann et al. 2004). Moreover, the number of participants was well balanced between the participating countries with 4-5 panelists per country.

The rating criteria of the Delphi process were defined based on what we considered important in the preselection of quality indicators including their relevance, validity and feasibility. A limitation may be that we did not apply more criteria. However, in other transnational quality indicator development processes (Hermann & Mattke 2004, Parameswaran et al. 2015, WHO 2013) the number of applied criteria was similar. In general, quality indicators can fulfill many different criteria to be fully considered relevant, scientifically sound and feasible (Reiter et al. 2008). For example, the criterion "consideration of potential risks/side effects" establishes whether there are risks, such as false incentives, through the use of an indicator. When the number of psychiatric beds, for instance, is being measured and the quality goal is that the number of beds should be decreasing, it needs to be assured that the provision of community or outpatient treatment is available, accessible and of sufficient quality for persons with mental disorders. Otherwise, there would be a risk of under provision of mental healthcare services. Therefore, the results of quality indicators need to be interpreted in the context of normative goals and can provide incentives for further quality assurance activities.

Regarding validity, the literature proposes many different definitions (Reiter et al. 2008). In this study we chose a definition that focuses on "face validity", i.e. a clear and unambiguous definition of the indicator that is likely to be of "high quality" at first sight. Other definitions of validity include, e.g., "does the indicator really measure what it intends to measure", or "is there a strong evidence base to support that the indicator can lead to improved quality". Further systematic literature studies on the evidence base of each indicator were not feasible within the scope of this study.

In a follow-up study, we will pilot test all twenty-two indicators in Bulgaria, the Czech Republic, Hungary and Serbia. This process includes identifying the necessary data and data sources as well as refining the operationalization of each indicator, acquiring data, performing data analyses and examining the plausibility of the results. The challenges posed by such a transnational study include different data structures, data availability, and data quality.

## CONCLUSION

This study shows the systematic and multidisciplinary development of quality indicators in mental healthcare for Bulgaria, the Czech Republic, Hungary and Serbia.

According to the Delphi process there was a consensus among these four countries regarding the relevance and validity of the proposed quality indicators. Thus, it seems that the participating countries share equal goals and interests in reforming their mental healthcare systems.

The developed quality indicators focus on the mental healthcare system and the institutional level and may be used to monitor the effects of the ongoing mental healthcare reform processes in the participating countries. Pilot testing of these quality indicators is planned to further evaluate their feasibility.

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### *Contribution of individual authors:*

Isabell Lehmann: Research idea, coordination of study, study design, literature search, data collection, statistical analysis, manuscript writing;

Dan Chisholm: Provision of transnational information on countries, expert in quality indicator development, approval of the final version;

Hristo Hinkov, Cyril Höschl, Gábor Kapócs, Tamás Kurimay, Dusica Lecic-Tosevski, Vladimir Nakov & Petr Winkler: Provision of country specific information, expert in quality indicator development, approval of the final version;

János M. Réthelyi: Expert in quality indicator development, approval of the final version;

Jürgen Zielasek; Research idea, expert in quality indicator development, approval of the final version;

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## References

1. *Arah OA, Westert GP, Hurst J, Klazinga NS: A conceptual framework for the OECD Health Care Quality Indicators Project. Int J Qual Health Care 2006; 18(Suppl. 1):5–13*
2. *Caldas Almeida JM, Mateus P, Tomé, Katschnig H, Hinkov H, Soonisto I, et al. Joint Action on Mental Health and Well-being. Towards community-based and socially inclusive mental health care. Situation analysis and recommendations for action. Retrieved on 21 January 2018 from http://www.mentalhealthandwellbeing.eu/assets/docs/publications/WP5%20Final-20151203075843.pdf*
3. *Donabedian A: The quality of care. How can it be assessed? JAMA 1988; 260:1743–1748*
4. *Fisher CE, Spaeth-Rublee B, Pincus HA For the IIMHL Clinical Leaders Group: Developing mental health-care quality indicators: toward a common framework International Journal for Quality in Health Care 2013; 25:75–80*
5. *Fitch K, Bernstein SJ, Aguilar MD, Burnand B, LaCalle JR, Lazaro P et al.: The RAND/UCLA Appropriateness Method User's Manual. RAND UCLA Cooperation 2001. Retrieved on 18 January 2018 from https://www.rand.org/content/dam/rand/pubs/monograph_reports/2011/MR1269.pdf*
6. *Gaebel W, Becker T, Janssen B, Munk-Jorgensen P, Musalek M, Rössler W et al.: EPA guidance on the quality of mental health services. Eur Psychiatry 2012; 27:87-113*
7. *Gaebel W, Großimlinghaus I, Heun R, Janssen B, Johnson B, Kurimay T, et al.: European Psychiatric Association (EPA) guidance on quality assurance in mental healthcare. Eur Psychiatry 2015; 30:360–387*
8. *Großimlinghaus I, Falkai P, Gaebel W, Janssen B, Reich-Erkelenz D, Wobrock T et al.: Developmental process of DGPPN quality indicators. Nervenarzt 2013; 84:350–365. [Article in German]*
9. *Großimlinghaus I, Falkai P, Gaebel W, Hasan A, Jänner M, Janssen B et al.: Assessment of quality indicators with routine data. Presentation of a feasibility test in ten specialist clinics for psychiatry and psychotherapy. Nervenarzt 2015; 86:1393–1399. [Article in German]*
10. *Hermann R & Mattke S: Selecting Indicators for the Quality of Mental Health Care at the Health Systems Level in OECD Countries. OECD Health Technical Papers, No. 17, OECD Publishing. 2004. Retrieved on 3. January 2018 from: http://dx.doi.org/10.1787/388745076135*
11. *Hermann RC, Palmer H, Leff S, Shwartz M, Provost S, Chan J, et al.: Achieving Consensus Across Diverse Stakeholders on Quality Measures for Mental Healthcare. Medical Care 2004; 42:1246-1253.*
12. *Hsu C-C, Sandford BA: The Delphi Technique: Making Sense Of Consensus. Practical Assessment, Research & Evaluation, 2007; 12(10). Retrieved on 30. December 2017 from http://pareonline.net/getvn.asp?v=12&n=10*
13. *Øvretveit J: What are the advantages and limitations of different quality and safety tools for health care? 2005. Copenhagen, WHO Regional Office for Europe (Health Evidence Network report; Retrieved on 3. January 2018 from: http://www.euro.who.int/document/e87577.pdf*
14. *Parameswaran SG, Spaeth-Rublee B, Pincus HA: Measuring the Quality of Mental Health Care: Consensus Perspectives from Selected Industrialized Countries. Adm Policy Ment Health 2015; 42:288–295*
15. *Reiter A, Fischer B, Kötting J, Geraedts M, Jäckel WH, Barlag H et al.: QUALIFY: Instrument for the Assessment*

*of Quality Indicators. Version 1.0 (English). Bundesgeschäftsstelle Qualitätssicherung gGmbH, 2007. Retrieved on 07.08.2015 from http://bqs-institut.de/innovationen/qualify-instrument.html*

16. *Wobrock T, Reich-Erkelenz D, Janssen B, Sommerlad K, Gaebel W, Falkai P et al.: Qualitätsindikatoren in der Psychiatrie. Psychiatrie 2010; 7:179–189. [Article in German]*
17. *Zielasek J, Großimlinghaus I, Janssen B, Wobrock T, Falkai P, Reich-Erkelenz D et al.: Die Rolle von Qualitätsindikatoren in der psychiatrischen Qualitätssicherung und aktueller Stand der Entwicklung von Qualitätsindikatoren. Die Psychiatrie 2012; 9:46-52. [Article in German]*
18. *Vorgrimler D & Wüben D: Die Delphi-Methode und ihre Eignung als Prognoseinstrument. Retrieved on 30. December 2017 from: https://www.destatis.de/DE/ Publikationen/ WirtschaftStatistik/Gastbeitraege/DelphiMethode_82003.pdf?__blob=publicationFile [Article in German]*
19. *Weinmann S & Becker T: Qualitätsindikatoren für die Integrierte Versorgung von Menschen mit Schizophrenie. 2009. Psychiatrie-Verlag, Bonn*
20. *Wittchen HU, Jacobi F, Rehm J, Gustavsson A, Svensson M, Jönsson B et al.: The size and burden of mental disorders and other disorders of the brain in Europe 2010, European Neuropsychopharmacology 2011; 21:655–679*
21. *WHO Regional Office for Europe: European Mental Health Action Plan. 2013. Retrieved on 3 January 2018 from: http://www.euro.who.int/__data/assets/pdf_file/0004/194107/63wd11e_MentalHealth-3.pdf*
22. *WHO (World Health Organization): Mental Health Action Plan 2013-2020. World Health Organization, 2013. Retrieved on 12 February 2018 from http://www.who.int/mental_health/publications/action_plan/en/*
23. *WHO (World Health Organization): Mental Health Atlas 2014. World Health Organization, 2015. Retrieved on 6 February 2018 from: http://apps.who.int/iris/bitstream/10665/178879/1/9789241565011_eng.pdf?ua=1&ua=1*

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# 3 Additional methodological aspects

## 3.1 Compilation of the Delphi panel

The methods section of the publication of this Delphi study describes the compilation of the Delphi panel (Lehmann et al. 2018, p. 199). It is noteworthy that in addition to the nomination of experts from each participating country the two European organizations Global Alliance of Mental Illness Advocacy Networks-Europe (GAMIAN) and European Federation of Associations of Families of people with Mental Illness (EUFAMI) were invited to nominate a caregiver and patient representative to participate as Delphi panelists. However, both organizations were not involved in this study as there was no response from GAMIAN, and EUFAMI did respond to a much later point in time, when the Delphi study was already conducted.

## 3.2 Further refinement of quality indicators throughout Delphi process

In addition to the section “rating process and analysis” (Lehmann et al. 2018, p. 200), the further development of quality indicators in the Delphi study is described in more detail in the following. Figure 1 shows the flow of quality indicators through the Delphi process referring to appendix 2, which provides detailed information on the quality indicators’ definitions and their refinement. In a meeting of the project group in September 2017 quality indicators were either excluded or revised based on the pseudonymous comments from the panelists in the first Delphi survey. The goals were to improve quality indicator definitions, to avoid redundancies between quality indicators and to improve the comprehensiveness of the overall quality indicator set based on the panelists’ comments. The following questions were used by the project group to decide whether to include, revise or exclude an indicator:

- Do panelists suggest changes in the quality indicator descriptions that may improve the relevance, validity or feasibility of the quality indicators?
- Do panelists point out redundancies between quality indicators?

- Do the panelists comments indicate that important quality indicators are missing and should be included?

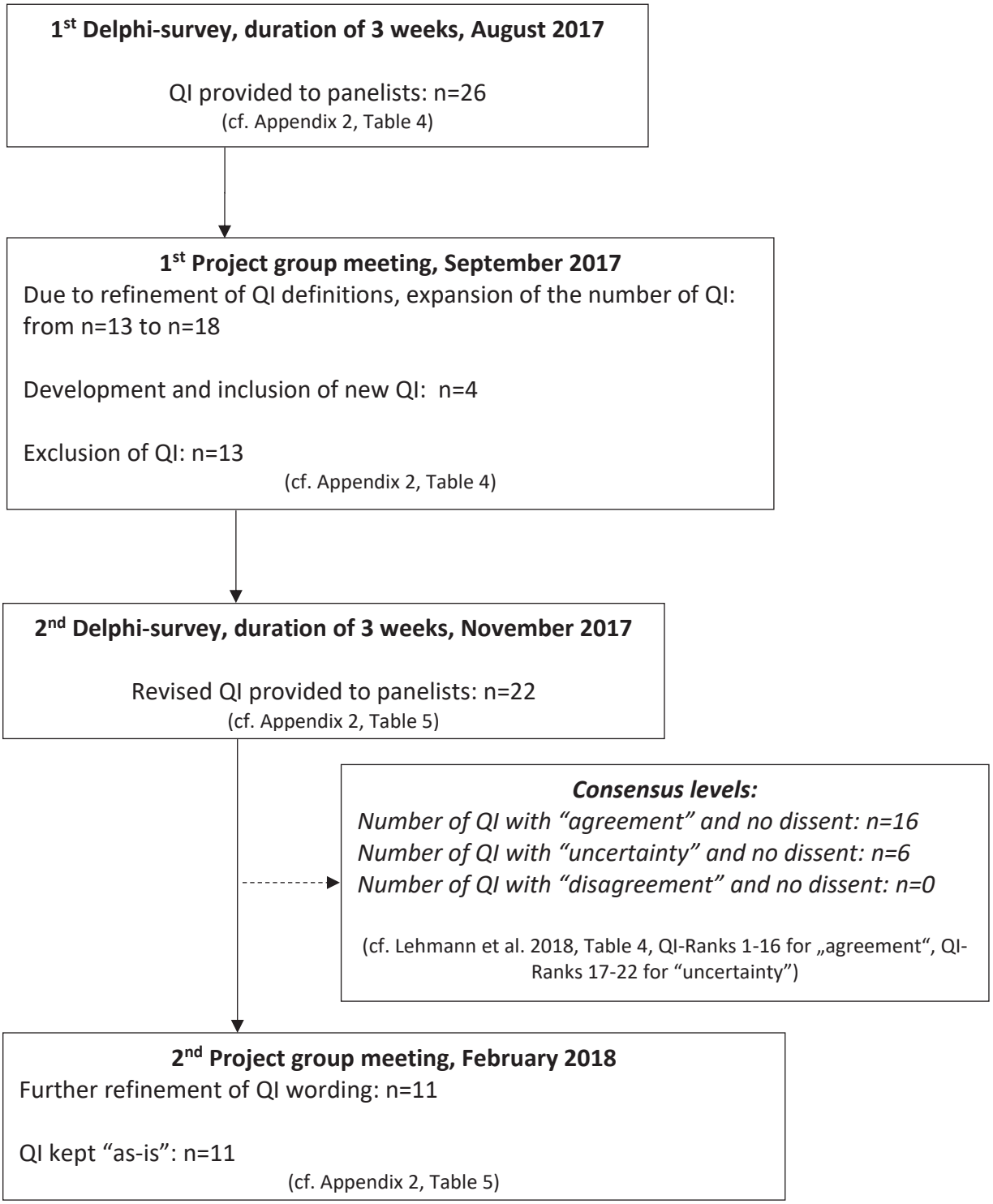


**Fig. 1: Process description of quality indicator development**

After the second Delphi survey, consensus levels were determined (Table 2) and if necessary, based on the comments from the panelists the project group emended the wording of quality indicators without altering their overall meaning. This occurred in a second project group meeting in February 2018.

**Table 2: Categorization of the level of consensus and level of dissent per quality indicator (Fitch et al. 2001)**

| | **Results for criteria relevance and validity on the 9-point Likert scale per indicator** |
|---|---|
| **Level of consensus** | |
| **Agreement/consensus** | Panel mean of ≥7-9 without dissent for validity and relevance |
| **Uncertainty** | Panel mean of ≥4-6 without dissent, or any mean with dissent for validity or relevance |
| **Disagreement** | Panel mean of ≥1-3, without dissent for validity and relevance |
| **Level of dissent** | |
| Panel size of 18 panelists | ≥6 ratings for validity and relevance located in the range 1-3 and 7-9 of the 9-point Likert scale per indicator |

Moreover, appendix 1 shows an excerpt of the rating forms of the first and second Delphi survey for three quality indicators. All quality indicators and their refinement are shown in table 4 and in table 5 in appendix 2.

# 4 Additional results – criterion data collection effort

The results section of the publication of this Delphi study (Lehmann et al. 2018, p. 200-203) shows the results of the quality indicator ratings for the criteria relevance, validity and data availability. In addition to these results, further descriptive analyses were conducted for the criterion data collection effort (Table 3). The Delphi panelists were asked to only rate data collection effort, when they had rated that data are not likely to be available for a quality indicator. Table 3 shows the quality indicators ranked in descending order according to data collection effort ratings (first column), the amount of "NO" ratings for data availability per indicator (second column), and the amount of "YES" ratings for data collection effort per indicator (third column). Two indicators ("availability of mental health service facilities" and "total beds for mental health care per 100,000 population") do not have any "NO" ratings for data availability and are listed at the bottom of the ranking.

The range for the ratings "NO" for data availability is 6% (QI "equity" and "mental health legislation") to 61% (QI "integration of care" and "assisted housing"). The range for the ratings "YES" for data collection effort, i.e., additional data collection efforts are justifiable, is 0% ("Utilization and coverage of mental health services (anxiety disorder and depression)" to 100% ("Health budget", "Total national expenditure on mental health services per capita", "Human resources in mental health facilities per capita", "Availability and content of a mental health action plan document", "Equity" and "Mental health legislation"). Of the 20 ranked indicators for data collection effort, 19 are rated with "YES", i.e., additional data collections for these indicators are justifiable, by 50% or more of the panelists (Table 3).

**Table 3: Results for the criterion "data collection effort"**

| Ranking | QI (ranking according to *data collection effort* ratings) | Ratings for *data availability* „NO“* (Population: all panelists, n=18) [n; %] | Ratings for *data collection effort* “YES”** (Population: panelists, who rated “NO” for *data availability*) [n; %] |
|---|---|---|---|
| 1 | Health budget | n=5; 28% | n=5; 100% |
| 2 | Total national expenditure on mental health services per capita per year | n=5; 28% | n=5; 100% |
| 3 | Human resources in mental health facilities per capita | n=3; 17% | n=3; 100% |
| 4 | Availability and content of a mental health action plan document | n=2; 11% | n=2; 100% |
| 5 | Equity | n=1; 6% | n=1; 100% |
| 6 | Mental health legislation | n=1; 6% | n=1; 100% |
| 7 | User associations and mental health policies, plans or legislation | n=8; 44% | n=7; 88% |
| 8 | Assisted housing | n=11; 61% | n=9; 82% |
| 9 | Involuntary inpatient admissions | n=5; 28% | n=4; 80% |
| 10 | Utilization and coverage of mental health services (alcohol use disorder) | n=5; 28% | n=4; 80% |
| 11 | Utilization and coverage of mental health services (substance-use disorder, other than alcohol) | n=5; 28% | n=4; 80% |
| 12 | Follow-up of visits after mental health-related hospitalization | n=9; 50% | n=7; 78% |
| 13 | Anti-stigma movement | n=8; 44% | n=6; 75% |
| 14 | Utilization and coverage of mental health services (bipolar disorder and schizophrenia) | n=3; 17% | n=2; 67% |
| 15 | Multi-disciplinary community mental health teams | n=5; 28% | n=3; 60% |
| 16 | Utilization and coverage of mental health services (children and adolescents with intellectual disabilities) | n=5; 28% | n=3; 60% |
| 17 | Utilization and coverage of mental health services (dementia) | n=7; 39% | n=4; 57% |
| 18 | Integration of care | n=11; 61% | n=6; 55% |

| | | | |
|---|---|---|---|
| 19 | Utilization and coverage of mental health services (children and adolescents with conduct disorder) | n=6; 33% | n=3; 50% |
| 20 | Utilization and coverage of mental health services (anxiety disorders and depression) | n=6; 33% | n=0; 0% |
| n/a | Availability of mental health service facilities | n=0; 0% | n=0; 0% |
| n/a | Total beds for mental health care per 100,000 population | n=0; 0% | n=0; 0% |

*The rating “NO” indicates that it is not likely that data needed to measure a QI are routinely collected electronically (i.e., in country-specific statistics, data documentations in mental healthcare, questionnaires) and are available from a database/databases.

**The rating “YES” indicates that additional efforts for electronic collection of data for a QI are justifiable.

# 5 Discussion

## 5.1 Summary of main results

This study focuses on developing a set of mental health system indicators for monitoring and evaluating mental healthcare reforms, their status and impact on the quality of mental healthcare.

Quality indicators for the mental healthcare systems of Bulgaria, the Czech Republic, Hungary and Serbia were developed by means of a consensus-based process. An international multidisciplinary group of experts rated the quality indicators with the criteria relevance, validity, data availability and data collection effort.

The results show that validity and relevance ratings are significantly correlated and that there are no differences between countries in these ratings. Two quality indicator rankings in descending order for relevance and validity show that seven of the total 22 quality indicators are ranked within both top ten rankings for both relevance and validity. Regarding data availability, there is a statistically significant difference in one indicator ("Utilization and coverage of mental health services (alcohol use disorder)") for the Czech Republic. For 20 quality indicators, at least one panelist appraised that it is not likely that routinely collected electronic data are available to measure these QI (rating "NO" for the criterion "data availability"). In 19 of these indicators, 50% or more of the panelists agree that the data collection effort for electronic data collection of these QI is justifiable.

## 5.2 Quality domains – first research question

To discuss the first research question *"What are important quality domains for mental healthcare systems in the Danube region countries covered under this study?"* the indicators rated highly for relevance are of explicit interest, as this criterion captures the importance of an indicator for mental healthcare planning and monitoring. The following quality domains are included in the top ten quality indicators rated for relevance:

- Availability, accessibility and utilization of care service structures (5 QI)
- Mental health policies and legislation (2 QI)
- Financing and costs of mental healthcare (1 QI)
- Workforce (1 QI)
- Patient safety (1 QI)

### 5.2.1 Discussion of quality domains with the highest relevance ratings

Mental health policies and legislation form the framework for the formulation of mental healthcare aims, strategies and their implementation (WHO 1997). All four countries have established mental health legislation, either as stand-alone law or integrated into other healthcare laws. This is an important prerequisite for prioritizing mental healthcare on the political agenda (WHO 1997). However, the mere existence of mental healthcare policies and legislation may be insufficient, as their implementation status and content are also crucial. A comprehensive budget needs to be allocated to mental healthcare to properly implement legislation. In the Czech Republic, for example, in addition to existing mental health legislation, a "Ministry of Health's Strategy for Reform of Mental Health Care" in 2013 led to the formulation of concrete strategies and goals and provided incentives for quality improvements in mental healthcare (Alexa et al. 2015).

The financing of mental healthcare, especially regarding the proportion of the health budget allocated to mental healthcare services, is also an important prerequisite for high-quality mental healthcare services (WHO Regional Office for Europe 2013). While mental disorders are among the most prevalent disorders in all four countries, the budget share allocated to mental healthcare is still considered too low (WHO 2001). The expenditures for mental healthcare are only below 6% of the total health budget in Bulgaria, the Czech Republic and Hungary (WHO Regional Office for Europe 2008). Therefore, this domain is an important structural requirement for mental healthcare systems providing high-quality mental healthcare services.

The domain “availability, accessibility and utilization of care service structures” focuses on the availability of different care services, such as community care and inpatient care structures; the accessibility of these services, e.g., in terms of geographical distribution, waiting times or cooperation between providers; and the acceptance of psychiatric care services and the help-seeking behavior of persons with mental disorders (utilization). This quality domain is especially relevant to the four countries, because they have a high proportion of rural areas and a concentration of the population in urban areas. For example, 73% of the total population in the Czech Republic (Alexa et al. 2015) and 71% of the total population in Bulgaria (Dimova et al. 2012) is living in urban areas. To enable equal access, mental healthcare structures need to be available geographically according to need.

Workforce in mental healthcare is a very relevant topic, as in many European countries, there is generally a declining number of professionals in the workforce (Bitter & Kurimay 2012, Dimova et al. 2012, Katschnig 2010). This is due to medical professionals migrating to other countries and a shortage of students pursuing a career in the psychiatric field (Bitter & Kurimay 2012, Höschl & van Niekerk 2010, Katschnig 2010). In Hungary, for example, the motivations of Hungarian psychiatrists for migrating to other countries include “low salary, quality of life, working environment, future prospects of Hungarian healthcare, social prestige, professional opportunities and learning a foreign language” (Bitter & Kurimay 2012, p. 311). Reasons for students not choosing psychiatry include an “overall loss in prestige of the medical establishment, unsatisfactory working conditions and low financial compensation.” (Bitter & Kurimay 2012, p. 311). Moreover, the stigmatization of psychiatrists is another issue that contributes to decreasing numbers in the mental health workforce (Lecic Tosevski et al. 2007). Therefore, workforce can be regarded as an essential quality domain.

Patient safety is one of the key quality domains in the transformation of mental healthcare systems towards improved quality (Arah et al. 2006, Institute of Medicine 2006, WHO 2013). The overall mental healthcare system needs to have the proper structures to provide safe services without harming patients. In a broader definition of

safety, safety of care providers and the environment are included (Arah et al. 2006, Veillard et al. 2005).

### 5.2.2 Quality domains in comparison to other studies

In this study, the focus was mostly on structural quality domains as they can depict structural changes due to reform processes. Other quality indicator development processes focused more on process and/or outcome quality domains than on structural aspects. For example, in the OECD-mental health indicator project by Hermann and colleagues (2006), the included quality domains are treatment, continuity, coordination and outcome. In our study, the quality domain "continuity, coordination and cooperation" is included (QI 14 "Follow-up visits after mental health-related hospitalization"), but it does not fall under the top ten of the most relevant indicators as rated by the panelists from the four participating countries. Thus, this domain is not regarded as highly relevant to mental healthcare system planning and monitoring by the panelists in comparison to the domains "availability, accessibility and utilization of care service structures", "mental health policies and legislation", "financing and costs of mental healthcare" and "workforce" and "patient safety". The reason may be that there is a perceived priority in scaling up the number of mental healthcare service structures throughout different regions in the participating countries as well as in scaling up scarce financial and human resources. Coordination and cooperation become more relevant, as more care structures in different care settings are available. For example, although there are still regional differences, community mental healthcare services are being established in the participating countries due to efforts to deinstitutionalize mental healthcare services (Bitter & Kurimay 2012, Dimova et al. 2012, Höschl et al. 2012, Lecic Tosevski et al. 2007). From a healthcare system perspective, prioritizing mental healthcare on the political agenda and making appropriate care structures and funding available is a prerequisite for improving coordination and cooperation between these services.

The mental healthcare indicator project by the IIMHL identified 17 quality domains with 80 sub-domains that are covered by the quality indicators from the countries participating in their study (Fisher et al. 2013). The final quality indicator set of the IIMHL also includes the quality domains of access, patient safety, continuity and cooperation and utilization. Otherwise, their focus is mostly on process and outcome domains (Parameswaran et al. 2015). The reason may be that the IIMHL focused on high-income industrialized countries with high levels of mental healthcare resources and established mental healthcare structures but with high priorities in improving the delivery of care (Parameswaran et al. 2015). Thus, these countries focus mostly on quality on the meso- and micro-level of mental healthcare as well as on process and outcome quality.

Finally, the Delphi study from Jordans and colleagues (2016) focuses on identifying quality indicators for measuring effective coverage of mental health treatment in low- and middle-income settings. The aim is to inform policy makers on indicators to move towards universal health coverage. Therefore, this project group focuses on the following quality domains (Jordans et al. 2016):

- need of service (i.e., persons in the population with mental health related problems),
- utilization of services (i.e., number of persons receiving mental healthcare),
- quality of care (i.e., the treatment leads to intended benefits regarding effectiveness, responsiveness and safety), and
- financial protection (i.e., persons using mental health services are financially protected).

Regarding the quality domains that emerged as most relevant in the Delphi study of Jordans et al. (2016) and in our Delphi study (Lehmann et al. 2018) the quality domains of availability, accessibility and utilization of care service structures and financing of mental healthcare are overlapping. This supports that these domains are important in the national monitoring of mental healthcare coverage.

Overall, our study focuses mostly on structural quality of mental health systems, which led to certain overlaps with other quality indicator development processes, but also to the inclusion of different quality domains. This indicates that there they may be different priorities and varying current statuses of mental healthcare systems. The quality indicator sets for highly-developed, high-income countries, such as from the IIMHL (Fisher et al. 2013, Parameswaran et al. 2015) and the OECD (Hermann & Mattke 2004, Hermann et al. 2006) include many process and outcome domains, indicating that structure quality is largely developed. In turn, the quality indicator set of Jordans et al. (2016) focuses on the coverage of mental health services indicating that there is a higher need to develop mental healthcare structures in low-income countries. While the mental healthcare systems of Bulgaria, the Czech Republic, Hungary and Serbia have already established a certain level of structure quality, they are still transforming towards the common goals of improving mental healthcare as defined by the WHO (WHO 2013, WHO Regional Office for Europe 2013). However, they still share many of the same issues as Western countries, especially regarding decreasing numbers in the mental health workforce. Therefore, there is some degree of overlap of relevant quality domains.

## 5.3 Quality indicators – Second research question

In this section, the results of the analyses of the quality indicator ratings are discussed to focus on the second research question "*From the perspective of a multidisciplinary international expert panel, including patient and caregiver representatives, which quality indicators are considered valid, feasible and relevant, and can be recommended for measuring quality in mental healthcare in the Danube region countries covered under this study?"*

In this study, all quality indicators were rated by means of the same criteria: relevance, validity and feasibility. Feasibility was divided into the criteria data availability and data collection effort (Lehmann et al. 2018). In the following, the results of the analyses for the criteria relevance and validity (5.3.1), and the results for the criteria data availability

and data collection effort (5.3.2) are discussed. This is followed by a discussion on the degree of achieved consensus on the quality indicators' relevance, validity and feasibility and by recommendations for measuring the quality indicators (5.3.3.).

### 5.3.1 Relevance and validity of quality indicators

Quality indicator relevance and validity ratings are significantly correlated and there are no significant country differences in the relevance and validity ratings (Lehmann et al. 2018). This overlap points to an implicit consensus among the Delphi panel experts regarding the relevance and validity of single quality indicators. It demonstrates that these countries deal with the same issues in the transformation of their healthcare systems towards improved quality, and that they share similar goals in reform processes as well as share equal understanding on the definition of quality indicators (Lehmann et al. 2018).

The relevance of the quality indicators is rated higher than validity as shown by the Wilcoxon signed-rank test. This may indicate that while indicators measure important topics their definitions need to be more clear or specific as the criterion validity focused on the clarity of indicators' definitions (Lehmann et al. 2018). A clear and unambiguous definition is an important prerequisite for the assessment of quality indicators to generate meaningful results through reliable measurements (Reiter et al. 2007). Besides a clear title and a specified calculation of an indicator, additional definitions are important to systematically measure quality indicators in practice. These definitions include (Reiter et al. 2007):

- Needed data and data sources
- Data collection methods
- Clear presentation and reporting of indicator results
- Intended purpose

In the project meeting between Delphi surveys with the project group members (Table 1 in Lehmann et al. 2018, p. 200), for example, there were discussions about the

definition of mental healthcare and the inclusion of social care, as mental health services, e.g. rehabilitation services, are also provided in social sectors. This poses challenges in information exchange and comprehensive data collections. Overall, it may be that the Delphi panelists considered the calculations of the indicators themselves vague and that additional information was needed on the calculation of the indicators.

### 5.3.2 Data availability and data collection effort to measure quality indicators

Data availability of the quality indicators is rated within a wide range of 6% to 94% for "YES", i.e., it is likely that data are already collected electronically (Lehmann et al. 2018). Analyses for the seven indicators that overlapped in the top ten ranks of the relevance and validity rankings show that there are no statistically significant differences between the four countries in data availability, except in the case of one indicator ("Utilization and coverage of mental health services (alcohol disorder)").

These results on data availability imply the following:

1. For some indicators, data are likely to be already available across the four countries. This improves overall feasibility, because there is no burden from collecting additional data for quality assurance purposes. However, it needs to be analyzed further if data are available on a larger (national) scale, especially if they are available electronically and can be collated into a central database.
2. For some indicators, it is necessary to collect additional data. However, the benefits of measuring an indicator should outweigh the efforts of additional data collections.
3. It is likely that more data are available in the Czech Republic, as there are national registers available on healthcare utilization as well as results from community-based epidemiologic surveys (Lehmann et al. 2018). It therefore may be possible that the other utilization and coverage indicators from our proposed indicator set for bipolar disorder and schizophrenia, anxiety disorder and depression, dementia, children and adolescents with intellectual disability, and substance-

use disorders, other than alcohol, can also be measured in the Czech Republic with current data availabilities (Lehmann et al. 2018).

The additional criterion of data collection effort is rated in 20 indicators. It is noteworthy that for six of these 20 indicators, all panelists, who believe electronic data collections are not available, agree that it is justifiable to collect additional data. For 12 indicators there are levels of agreement of 55% to 88% that additional data collections are justifiable. These results indicate that there are high levels of agreement of the panelists to the benefits of measuring the proposed indicators. For one indicator "Utilization and coverage of mental health services (anxiety and depression)" all six panelists, who rated that data are not likely to be available, rated that it is not justified to collect additional data for this indicator. This is a discrepancy to the high relevance rating of this quality indicator and indicates that while the indicator may be considered relevant, data collection efforts may exceed the benefits of measuring this indicator. Overall, availability of data is likely to be a challenge for implementing some indicators.

### 5.3.3 Consensus about quality indicators

Consensus about an indicator was categorized as shown in Table 2. Of the 22 quality indicators, 16 indicators have mean scores between 7 and 9 for both, relevance and validity (Table 4, QI-Ranks 1-16 in Lehmann et al. 2018, p. 202) indicating a consensus about these indicators. Among these, however, there is a wide range between 17% and 94% of panelists rating that data are likely to be already collected electronically (rating "YES" for data availability). Thus, pilot testing of these indicators is crucial to determine their actual practicability. Overall, the high agreement of panelists that additional data collection efforts are justified underlines the relevance of most indicators, even if data are not likely to be available. The highest ratings for data availability are given for the following indicators that are all included in the top six quality indicators ranked for relevance (Table 3 in Lehmann et al. 2018, p. 201):

- Availability of mental health service facilities (94% of panelists rated "YES")

- Mental health legislation (83% of panelists rated “YES”)
- Total beds for mental healthcare per 100,000 population (94% of panelists rated “YES”)

These indicators are not included in the other international quality indicator projects (Hermann et al. 2006, Jordans et al. 2016, Parameswaran et al. 2015). Nevertheless, the WHO (2018) recognizes them as key quality domains in mental healthcare. Mental health legislation is regarded as a key component of mental health governance. Moreover, indicators on the number of beds for mental healthcare and on the availability of different types of mental health service structures allow for statements on the transformation of mental healthcare systems towards community-based care services (WHO 2018). This is an important reform goal in all four countries.

Six indicators had at least one mean score of relevance or validity in the middle tercile from 4 to 6 (Table 4, QI ranks 17-22 in Lehmann et al. 2018, p. 202), which signifies that for these indicators consensus is uncertain. It may be that further refinement of their definitions is necessary to improve their relevance and validity.

Overall, consensus is the strongest for indicators that are rated in the upper tercile of the 9-point Likert scale ratings for relevance and validity. Sixteen indicators fall within this category and they can be strongly recommended for pilot testing and implementation in the four countries. The other six indicators are rated above 6, thus in the upper range of the middle tercile of the 9-point Likert scale, indicating uncertainty about relevance or validity, but with a tendency towards agreement. The relevance of indicators is supported by the data collection effort ratings that had a high agreement amongst the panelists that additional data collections are justifiable. Therefore, these six indicators can also be recommended for pilot testing in the four countries. Especially these indicators may need further refinement of their definition.

The feasibility ratings have a wide range, indicating that it is unlikely that all indicators can be measured without additional data collection efforts. For some indicators there is a gap between their rated relevance and validity in comparison to their rated feasibility.

Therefore, specifications on the feasibility need to be more detailed, including needed data, data sources and data collection methods. The quality indicators need to be tested practically to determine these specifications, their practical feasibility and comparability between countries.

## 5.4 Delphi study and its limitations

In our study, we applied a Delphi process, which is an established and common method for developing quality indicators (Campbell et al. 2002). Moreover, we included aspects of the RAND/UCLA Appropriateness Methods, because there were systematic ratings of quality indicators by means of predefined criteria.

### 5.4.1 Expert panel

A premise for trustworthy results in a Delphi study is a careful selection of competent and knowledgeable experts in the researched topic (Hsu & Sandford 2007, Vorgrimler & Wübben 2003). For sustainable results, panelists, who can support the implementation of the Delphi study results, should be selected (Delbecq et al. 1975, Hsu & Sandford 2007). In our study, the project partners from Bulgaria, the Czech Republic, Hungary and Serbia selected knowledgeable experts in the field of quality and mental healthcare systems, who were willing to share their expertise. The panel members represented many key professions in mental healthcare on different levels, such as psychiatrists, psychologists, mental healthcare managers, researchers, government representatives and a service user. The multidisciplinary composition of the panel allowed for the consideration of different and wide-ranging perspectives and is likely to improve acceptance of the proposed quality indicators. However, the perspective of caregivers for persons with mental disorders was not included, so that ratings from this stakeholder group are not available at present. This may be a limitation of our study. After our invitation to EUFAMI to participate in this study, however, the Bulgarian family carer association (BGFAMI) much later responded that it recognizes the development of

quality indicators for mental healthcare as valuable and is interested in future collaborations.

There are no guidelines for the number of panelists that should be included in a Delphi study, as it depends on the scope of the research topic (Vorgrimler & Wüben 2003). While reliability of the study results may be limited by very low numbers of panelists, very high numbers of panelists may decrease the feasibility of a Delphi study (Hsu & Sandford 2007). In our study, the participation of four to five panelists from each of the four countries plus one expert with overarching healthcare system knowledge on all four national mental healthcare systems was feasible and adequate for capturing a broad range of perspectives from each country. In comparison to the quality indicator development processes of the OECD and the IIMHL, which included seven to twelve experts in their panels and focused on a higher number of countries, our panel was larger and the number of panelists representing each country was well balanced (Lehmann et al. 2018). Only the Delphi study of Jordans and colleagues (2016) included a much higher number of panelists and had 93 persons completing their Delphi survey. However, the inclusion of such a high number of panelists is uncommon in quality indicator development processes (Boulkedid et al. 2011) and would have not been feasible in our study.

### 5.4.2 Further refinement of quality indicators in the Delphi process

Between both Delphi surveys, our project group (Table 1 in Lehmann et al. 2018, p. 200) met and developed the second Delphi survey based on the pseudonymous comments of the panelists. Thus, the Delphi panelists, who were not part of the project group, were not included in the discussions to develop the quality indicators for the second Delphi survey. Thereby, the anonymity of these panelists was maintained, as is typical for a Delphi study (Hsu & Sandford 2007). However, it may be a limitation that we could not apply a step from the RAND/UCLA-appropriateness method, which includes inviting all panelists to discuss the results and then immediately re-rate the revised quality indicators according to the results of the discussion (Fitch et al. 2001, Parameswaran et

al. 2015). However, the members of the project group represented each of the four countries. They had multidisciplinary and regarding the care system multi-level perspectives on the quality of mental healthcare in their respective countries. This enhanced the reliability of their decisions in the development of quality indicators in-between Delphi surveys. For example, while diagnosis-specific indicators were not planned to be included in the scope of this study, the project group agreed that indicators on the utilization and coverage on mental healthcare services are most useful when separated by diagnostic groups (Lehmann et al. 2018). This decision was based on a comment from a panelist asking for specification of diagnoses to identify specific treatment gaps.

### 5.4.3 Number of Delphi surveys

We only conducted two Delphi surveys. This may have adversely affected the degree of achieved consensus. With further refinements of indicator definitions, especially the validity ratings, but also the relevance ratings, may have improved. However, conducting more than two Delphi surveys can be very time consuming and infeasible. Additionally, drop-out rates of Delphi panelists may become a problem (Hsu & Sandford 2007). In our study, there was a drop-out of four persons between the first and second Delphi survey (Figure 1 in Lehmann et al. 2018, p. 198). Thus, it is likely that there would have been further drop-outs in following Delphi surveys decreasing the overall reliability of results.

## 5.5 Quality indicators in mental healthcare – limitations

While quality measurement is a key component in transforming health systems towards improved care, quality indicators may have limitations. These could include poorly developed quality indicators which may (AQUA-Institut 2015)

- foster a fragmented and unilateral view on mental healthcare,
- focus on easily measurable aspects of care and neglect aspects that are more difficult to measure,

- be too expensive and time-consuming in their development,
- be difficult to interpret, e.g., differences in quality indicator outcomes could relate to random variances in care,
- promote accusations and thereby lower the motivation of persons affected by the indicators such as medical professionals,
- induce a focus on measured quality aspects and pursuing short-term goals rather than inducing a focus on a long-term strategy.

While these limitations need to be considered in the development and implementation of quality indicators, they can be tackled with counteractions. Our study aimed at creating a quality indicator set that is comprehensive by including different aspects of mental healthcare systems, thus avoiding a unilateral view on mental healthcare. When quality indicators are met, e.g., when the indicator on the mental health legislation shows that all countries have established mental healthcare legislation that complies with current standards for human rights, the measurement of this indicator may be set aside or terminated. In turn, other indicators that may exhibit quality issues can be measured instead. Because indicators measure only partial aspects of care systems, there is a flexibility in further developing quality indicator sets towards improved relevance, validity and feasibility (Großimlinghaus 2018). Quality indicator development and implementation is therefore an iterative process with a constant re-evaluation of the quality indicators and a clear communication on the purpose and aims of the quality indicators (Großimlinghaus 2018). Quality indicator results often need to be interpreted together to avoid disincentives. For example, our indicator on the availability of mental health service facilities differentiated by types of institutions should be interpreted together with our indicator on human resources in mental health facilities. Together, both indicators may allow for appraisals of nationwide coverage of mental healthcare and quality deficits such as understaffed services and regional differences in accessibility.

Moreover, long-term goals of mental healthcare reform processes have already been defined in all four countries, and our quality indicators can aid as monitoring tools for these goals.

### 5.5.1 Challenges of implementing quality indicators

Challenges to the implementation of quality indicators may include a lack of evidence-base for some mental healthcare structures and processes, a lack of precision of mental healthcare quality indicators and a lack of comprehensive electronic health information databases (Kilbourne et al. 2010).

Definitions of quality indicators and their acceptance can be improved through the involvement of multiple stakeholders in the development and implementation of quality indicators (Kilbourne et al. 2010). Consensus-based approaches, such as Delphi methods, can fill evidence gaps. In our study, we involved relevant stakeholders and end-users of quality indicators, such as care managers, care providers from different care settings, and persons working in or for healthcare government agencies (Table 2 in Lehmann et al. 2018, p. 200). The inclusion of a caregiver representative would have increased the multi-perspective approach of our Delphi study.

The availability of electronic databases that collect comparable data facilitates performance measurement through quality indicators. Enhanced information technology and refined data definitions can make quality indicators more feasible and more comparable across mental healthcare systems. While the feasibility ratings in our study provided first appraisals, the actual feasibility of quality indicators needs to be further evaluated in a practical pilot test. This would include thorough analyses of available data, their electronic availability and evaluability.

Relating to the Plan-Do-Check-Act (PDCA)-Cycle (Großimlinghaus et al. 2017b) the implementation of quality indicators can be run in iterative phases (Großimlinghaus 2018):

- PLAN: Development of an implementation concept including responsibilities; definition of data sources; evaluation of available data and data sources;

creation of technical requirements, when additional data are needed; information and motivation of affected stakeholders

- DO: Pilot test of quality indicators, i.e., data documentations and retrospective analyses
- CHECK: Continuous plausibility checks of results, feedback from involved stakeholders and joint discussions
- ACT: Optimization and further refinement of indicators, e.g., further specification of indicators, technical improvements, re-allocation of responsibilities

### 5.5.2 Comprehensive quality indicator sets

A comprehensive quality indicator set should include process and outcome indicators in addition to structure indicators (Kilbourne et al. 2010). While process indicators measure the actual delivery of care, outcome indicators capture the outcomes of care interventions and thereby may reflect high-quality structures and processes (Mant 2001). Outcome indicators that incorporate the patient's perspective are nowadays regarded as essential to comprehensive quality assessments (Thornicroft & Slade 2014). From the patient's subjective perspective, either *patient rated experience measures* (PREMs) or *patient rated outcome measures* (PROMs) can be measured. PREMs measure the experience of patients using mental health services, whereas PROMs assess the health improvement of a patient (Thornicroft & Slade 2014, Trujlos et al. 2012). However, according to Donabedian (1988) the prerequisite of outcome quality is that high-quality structures are established, which can be measured by our proposed quality indicator set. Moreover, outcome indicators require higher methodological considerations than structure or process indicators, because variation in outcome indicators may be caused by factors that cannot be influenced by care providers, such as different patient characteristics. These influencing factors need to be accounted for by appropriate risk adjustment methods (Hermann & Palmer 2002). Therefore, while the focus of our study was to develop quality indicators for mental healthcare systems,

additional process and outcome indicators may be included in further steps to establish comprehensive national quality measurements.

A comprehensive quality assurance system includes additional methods and instruments besides quality indicators, such as guidelines, patient pathways, patient- and family-sided assessments, and organizational assessment methods, for example the European Foundation for Quality Management (EFQM)-tool (Gaebel et al. 2015, Großimlinghaus et al. 2017a, Øvretveit 2005). Therefore, our quality indicators may be seen as a useful evaluation tool for amending and upgrading existing quality assurance programs and methods in all four countries.

Finally, mental healthcare is not only delivered in the specialized mental healthcare sector, but also in primary care settings (WHO 2001) and as social services, e.g., community care services (Alexa et al. 2015, Bitter & Kurimay 2012, Höschl et al. 2012). Therefore, the implementation of mental health quality indicators may be warranted for these care settings as well. Moreover, the integration of mental healthcare services into primary care is a desirable patient-centered goal for deinstitutionalizing services (WHO 2001).

# 6 Conclusion and outlook

In this study, quality indicators were developed to measure mental healthcare systems' quality in Bulgaria, the Czech Republic, Hungary and Serbia. The relevance of this research topic is supported by the WHO's goal of strengthening information systems (WHO 2013, WHO Regional Office for Europe 2013, WHO 2018). It supports the WHO target to routinely collect and report a set of key mental health indicators on national levels by the year 2020 (WHO 2013, WHO 2018).

The four countries are currently in the process of transforming their mental healthcare systems towards improved quality, including amongst others, improved population coverage, deinstitutionalized services, higher number of professionals in the workforce and improved patient safety. Quality indicators thus focused mostly on quality domains on macro- and meso-levels of care and structural quality domains. This is an important distinction to other international quality indicator processes that included European countries and focused more on process and outcome domains. Quality domains that were most relevant according to the quality indicator rankings for relevance were "availability, accessibility and utilization of care service structures", "mental health policies and legislation", "financing and costs of mental healthcare", "workforce", and "patient safety". It can be concluded that our Delphi panel perceived quality deficiencies within these domains, which was confirmed by literature on the status of mental healthcare in Bulgaria, the Czech Republic, Hungary and Serbia as well as by the strategic goals the WHO formulated in the European Mental Health Action Plan (2013) and the global Mental Health Action Plan (2013).

Of the 22 quality indicators that were rated in the second Delphi survey, 16 indicators were rated in the upper tercile of the 9-point Likert scale for relevance and validity indicating a consensus of our multinational and multidisciplinary Delphi panel to those indicators (Table 4, QI-Ranks 1-16 in Lehmann et al. 2018, p. 202). Agreement to the other six indicators was not that strong, because either their relevance or validity ratings were rated in the upper range of the middle tercile indicating uncertainty to the indicators' relevance or validity with a tendency towards agreement (Table 4, QI-Ranks

17-22 in Lehmann et al. 2018, p. 202). Especially for these indicators, further specification of their definition is warranted. Appraisals for data availability were very different between indicators with a broad range between 6% and 94%. Ratings for data collection effort in turn were mostly high, supporting that for most indicators the effort of collecting additional data to measure these indicators for quality assurance purposes would be justifiable.

The fact that no significant differences were detected between the participating countries in the rating results points to the generalizability of the quality indicator set and its potential to be implemented in other countries besides Bulgaria, the Czech Republic, Hungary and Serbia.

It is recommended that all 22 indicators are further evaluated for their usefulness as quality measurement instruments. A pilot test of all quality indicators to determine their feasibility and comparability of results between countries has been initiated, and results regarding their feasibility and comparability are pending.

Further research is needed to continue to test practically and refine the proposed quality indicators and to increase their consensus base. Involvement of high-level mental healthcare managers and government representatives is recommended to disseminate the quality indicators and information on the importance of quality indicators as quality assurance instruments. It is recommended to create indicator profiles that specify at least the following information per indicator:

1. Quality goal,
2. Definition of indicator, i.e., numerator/denominator,
3. Responsibility for documentation,
4. Specification of calculation, i.e., data sources/bases, data variables,
5. Evidence- and/or consensus-base.

In pilot tests, data availability and reliability of measurements of the quality indicators need to be evaluated. Electronic databases utilizing standardized data collection methods should be implemented.

Moreover, to increase the consensus base and acceptance to the quality indicators, it is preferable to seek additional agreement of caregiver representatives as the subjective perspective of both patients and caregivers is of increasing importance in developing and implementing quality assurance measures.

Finally, quality indicators should be continuously further developed, revised, refined and adapted to any prevailing quality deficiencies in mental healthcare systems.

# 7 References

Alexa J, Recka L, Votapkovka J, van Ginneken E, Soranger A, Wittenbecher F (2015) Czech Republic: Health system review. Health Systems in Transition. 17(1):115-117.

Altenhofen L, Brech W, Brenner G, Geraedts M, Gramsch E, Kolkmann FW, Krumpasky G, Lorenz W, Oesingmann U, Ollenschläger G, Rheinberger P, Selbmann HK, von Stillfried D, Stobrawa F, Thole H (2002) Beurteilung klinischer Messgrößen des Qualitätsmanagements-Qualitätskriterien und -indikatoren in der Gesundheitsversorgung. Konsenspapier von BÄK, KBV und AWMF. Z Arztl Fortbild Qualitatssich. 96(5):2-15.

AQUA-Institut (2015) Allgemeine Methoden im Rahmen der sektorenübergreifenden Qualitätssicherung im Gesundheitswesen nach § 137a SGB V. Version 4.0, Stand: 17. Februar 2015. Göttingen: AQUA - Institut für angewandt Qualitätsförderung und Forschung im Gesundheitswesen GmbH [Retrieved on 2nd August 2018]. URL: https://www.sqg.de/sqg/upload/CONTENT/Hintergrund/Methodenpapier/AQUA-Methodenpapier-4.0.pdf

Arah OA, Westert GP, Hurst J, Klazinga NS (2006) A conceptual framework for the OECD Health Care Quality Indicators Project. Int J Qual Health Care. 18:Suppl.1:5-13.

Armesto SG, Medeiros H, Wei L (2008) Information availability for measuring and comparing quality of mental health care across OECD countries. OECD Technical Papers No. 20, DELSA/ELSA/WD/HTP(2008)2 [Retrieved on 2nd August 2018]. URL: http://www.oecd.org/els/health-systems/41243838.pdf

Bitter I & Kurimay T (2012) State of psychiatry in Hungary. Int Rev Psychiatry. 24(4):307-313.

Blumenstock G (2009) 5. Entwicklung von Qualitätsindikatoren. In: Ärztliches Zentrum für Qualität in der Medizin (ÄZQ), Ed. Programm für Nationale VersorgungsLeitlinien - Qualitätsindikatoren - Manual für Autoren. Berlin: ÄZQ, 2-3 [Retrieved on 1st August 2018]. URL: https://www.aezq.de/mdb/edocs/pdf/schriftenreihe/schriftenreihe36.pdf

Boulkedid R, Abdoul H, Loustau M, Sibony O, Alberti C (2011) Using and reporting the Delphi method for selecting healthcare quality indicators: a systematic review. PLoS One. 6(6):e20476. doi: 10.1371/journal.pone.0020476.

Campbell SM, Braspenning J, Hutchinson A, Marshall M (2002) Research methods used in developing and applying quality indicators in primary care. Qual Saf Health Care. 11:358-364.

Correll CU, Detraux J, De Lepeleire J, De Hert M (2015) Effects of antipsychotics, antidepressants and mood stabilizers on risk for physical diseases in people with schizophrenia, depression and bipolar disorder. World Psychiatry. 14(2):119-36.

Delbecq AL, Van de Ven AH, Gustafson DH (1975) Group techniques for program planning. Glenview, IL: Scott, Foresman, and CO.

Dimova A, Rohova M, Moutafova E, Atanasova E, Koeva S, Panteli D, van Ginneken E (2012) Bulgaria: Health system review. Health Systems in Transition. 14(3):1-186. [Retrieved on 2nd July 2018]. URL: http://www.euro.who.int/__data/assets/pdf_file/0006/169314/E96624.pdf

Donabedian A (1966) Evaluating the quality of medical care. Milbank Q. 44(3): 166–203. Reprinted in The Milbank Memorial Fund Quarterly 2005; 83(4):691-729.

Donabedian A (1988) The quality of care – how can it be assessed? JAMA. 260:1743-1748.

Fisher CE, Spaeth-Rublee B, Pincus HA for the IIMHL Clinical Leaders Group (2013) Developing mental health-care quality indicators: toward a common framework. Int J Qual Health Care. 25(1):75-80.

Fitch K, Bernstein SJ, Aguilar MD, Burnand B, LaCalle JR, Lázaro P, van het Loo M, McDonnell J, Vader JP, Kahan JP (2001) The RAND/UCLA Appropriateness Method User's Manual. Santa Monica, Arlington: RAND, [Retrieved on 2nd August 2018]. URL: https://www.rand.org/content/dam/rand/pubs/monograph_reports/2011/MR1269.pdf

Gaebel W, Becker T, Janssen B, Munk-Jorgensen P, Musalek M, Rössler W, Sommerlad K, Tansella M, Thornicroft G, Zielasek Z (2012) EPA guidance on the quality of mental health services. Eur Psychiatry. 27:87-113.

Gaebel W, Großimlinghaus I, Heun R, Janssen B, Johnson B, Kurimay T, Montellano P, Muijen M, Munk-Jorgensen P, Rössler W, Ruggeri M, Thornicroft G, Zielasek J (2015) European Psychiatric Association (EPA) guidance on quality assurance in mental healthcare. Eur Psychiatry. 30:360-387.

Großimlinghaus I, Falkai P, Gaebel W, Janssen B, Reich-Erkelenz D, Wobrock T, Zielasek J (2013) Entwicklungsprozess der DGPPN-Qualitätsindikatoren. Nervenarzt. 84:350-365.

Großimlinghaus I, Falkai P, Gaebel W, Hasan A, Jänner M, Janssen B, Reich-Erkelenz D, Grüber L, Böttcher V, Wobrock T, Zielasek J und der LVR-Klinikverbund (2015) Erhebung von Qualitätsindikatoren anhand von Routinedaten. Darstellung eines Machbarkeitstests in zehn Fachkliniken für Psychiatrie und Psychotherapie. Nervenarzt. 86:1393-1399.

Großimlinghaus I, Janssen B, Gaebel W (2017a) Qualitäts- und Risikomanagement. In: Deister A, Pollmächer T, Falkai P, Erk K, Eds. Krankenhausmanagement in Psychiatrie und Psychotherapie. Berlin: Medizinisch Wissenschaftliche Verlagsgesellschaft, 409-417.

Großimlinghaus I, Janssen B, Philipp M, Laux G, Gaebel W (2017b) Qualitätsmanagement in der Psychiatrie. In: Möller HJ, Laux G, Kapfhammer H-P, Eds. Psychiatrie, Psychosomatik, Psychotherapie. Band 2 - Allgemeine Psychiatrie 2, 5th edition. Berlin: Springer Reference Medizin, 1339-1348. doi: 10.1007/978-3-662-49295-6_56.

Großimlinghaus I (2018) Debatte: Pro & Kontra: Evidenzbasierte sektorübergreifende Qualitätsindikatoren sind praktikabel – Pro. Psychiat Prax. 45:62-63.

Hermann RC & Palmer RH (2002) Common Ground: A Framework for Selecting Core Quality Measures for Mental Health and Substance Abuse Care. Psychiatric Services. 53:281–287.

Hermann R & Mattke S (2004) Selecting Indicators for the Quality of Mental Health Care at the Health Systems Level in OECD Countries. OECD Health Technical Papers, No. 17, OECD Publishing [Retrieved on 1st August 2018]. URL: http://dx.doi.org/10.1787/388745076135

Hermann RC, Mattke S, Somekh D, Silfverhielm H, Goldner E, Glover G, Pirkies J, Mainz J, Chan JA (2006) Quality indicators for international benchmarking of mental health care. Int J Qual Health Care. 18:Suppl.1:31-38.

Höschl C & van Niekerk J (2010) Recruitment of psychiatrists: The key role of education. In: Gask L, Coskun B, Baron D, Eds. Teaching Psychiatry: Putting Theory into Practice. Chichester: Wiley, 5-18.

Höschl C, Winkler P, Pec O (2012) The state of psychiatry in the Czech Republic. Int Rev Psychiatry. 24(4):278-85.

Hsu C-C & Sandford BA (2007) The Delphi Technique: Making Sense of Consensus. Practical Assessment, Research & Evaluation. 12(10):1-8.

Institute of Medicine (2006) Improving the Quality of Health Care for Mental and Substance-Use Conditions. Washington DC: The National Academies Press.

Jäckel WH (2009) 2. Definition und Typen von Qualitätsindikatoren. In: Ärztliches Zentrum für Qualität in der Medizin (ÄZQ), Ed. Programm für Nationale VersorgungsLeitlinien - Qualitätsindikatoren - Manual für Autoren. Berlin: ÄZQ, 2-3 [Retrieved on 1st August 2018]. URL: https://www.aezq.de/mdb/edocs/pdf/schriftenreihe/schriftenreihe36.pdf

JCAHO - Joint Commission on Accreditation of Healthcare Organizations (1989) Characteristics of clinical indicators. Qual Rev Bull. 163;6401-6406.

Jordans MJD, Chisholm D, Semrau M, Upadhaya N, Abdulmalik J, Ahuja S, Alem A, Hanlon C, Kigozi F, Mugisha J, Petersen I, Shidhaye R, Lund C, Thornicroft G, Gureje O (2016) Indicators for routine monitoring of effective mental healthcare coverage in low- and middle-income settings: a Delphi study. Health Policy Plan. 31:1100-1106.

Katschnig H (2010) Are psychiatrists an endangered species? Observations on internal and external challenges to the profession. World Psychiatry. 9:21-28.

Kilbourne AM, Keyser D, Pincus HA (2010) Challenges and Opportunities in Measuring the Quality of Mental Health Care. Can J Psychiatry. 55(9):549-557.

Kopp I, Geraedts M, Jäckel WH, Altenhofen L, Thomeczek C, Ollenschläger G (2007) Nationale VersorgungsLeitlinien - Evaluation durch Qualitätsindikatoren. Med Klin. 102:678-82.

Kopp IB (2011) Von Leitlinien zur Qualitätssicherung. Bundesgesundheitsbl. 54:160-165.

Lecic Tosevski D, Pejovic Milovancevic M, Popovic Deusic S (2007) Reform of mental health care in Serbia: ten steps plus one. World Psychiatry. 6:115-117.

Lehmann I, Chisholm D, Hinkov H, Höschl C, Kapócs G, Kurimay T, Lecic-Tosevski D, Nakov V, Winkler P, Réthelyi JM, Zielasek J, Gaebel W, (2018) Development of quality indicators for mental healthcare in the Danube Region. Psychiatria Danubina. 30: 197-206.

Lohr KN, Yordy KD, Their SD (1988) Current issues in quality of care. Health Affairs. 7(1):5-18.

Mainz J (2003) Defining and classifying clinical indicators for quality improvement. Int J Qual Health Care. 15(6):523-530.

Mant J (2001) Process versus outcome indicators in the assessment of quality of health care. Int J Qual Health Care. 13(6):475-480.

Muche-Borowski C & Kopp I (2011) Wie eine Leitlinie entsteht. Z Herz- Thorax-Gefäßchir. 25:217-223.

Nothacker M, Reiter A (2009) 6. Qualitätsindikatoren für Nationale VersorgungsLeitlinien. In: Ärztliches Zentrum für Qualität in der Medizin (ÄZQ), Ed. Programm für Nationale VersorgungsLeitlinien - Qualitätsindikatoren - Manual für

Autoren. Berlin: ÄZQ, 18-31 [Retrieved on 1st August 2018]. URL: https://www.aezq.de/mdb/edocs/pdf/schriftenreihe/schriftenreihe36.pdf

Øvretveit J (2005) What are the advantages and limitations of different quality and safety tools for health care? Copenhagen: WHO Regional Office for Europe [Retrieved on 26th July 2018]. URL: http://www.euro.who.int/document/e87577.pdf

Parameswaran SG, Spaeth-Rublee B, Pincus HA (2015) Measuring the Quality of Mental Health Care: Consensus Perspectives from Selected Industrialized Countries. Adm Policy Ment Health. 42:288-295.

Reerink E (1990) Defining quality of care: mission impossible? Qual Assur Health Care. 2(3-4):197-202.

Reiter A, Fischer B, Kötting J, Geraedts M, Jäckel WH, Berlag H, Döbler K (2007) QUALIFY: Instrument for the Assessment of Quality Indicators. Version 1.0 (English). Bundesgeschäftsstelle Qualitätssicherung gGmbH [Retrieved on 3rd August 2018]. URL: https://www.researchgate.net/publication/267256474_QUALIFY_Instrument_for_the_Assessment_of_Quality_Indicators

Shekelle PG, MacLean CH, Morton SC, Wenger NS (2001) Assessing Care of Vulnerable Elders: Methods for Developing Quality Indicators. Ann Intern Med. 135:647-652.

Spaeth-Rublee B, Pincus HA, Huynh PT and the IIMHL Clinical Leaders Group, Mental Health Quality Indicator Project (2010) Measuring quality of mental health care: a review of initiatives and programs in selected countries. Can J Psychiatry. 55:539-548.

Thornicroft G & Slade M (2014) New trends in assessing the outcomes of mental health interventions. World Psychiatry. 13:118-124.

Veillard J, Champagne F, Klazinga N, Kazandijan V, Arah OA, Guisset AL (2005) A performance assessment framework for hospitals: the WHO Regional Office for Europe PATH project. Int J Qual Health Care. 17:487-496.

Vorgrimler D & Wübben D (2003) Die Delphi-Methode und ihre Eignung als Prognoseinstrument. In: Statistisches Bundesamt, Ed. Wirtschaft und Statistik 8/2003. Wiesbaden: Statistisches Bundesamt, 763-774 [Retrieved on 2nd August 2018]. URL: https://www.destatis.de/DE/Publikationen/WirtschaftStatistik/Monatsausgaben/WistaAugust03.pdf?__blob=publicationFile

WHO (1997) Quality Assurance in Mental Health Care – Checklists and Glossaries. Division of Mental Health and Prevention of Substance Abuse, 1 and 2 [Retrieved on 3rd August 2018] from http://apps.who.int/iris/handle/10665/66931

WHO (2001) The World Health Report 2001 – Mental Health: New Understanding, New Hope. Geneva: World Health Organization [Retrieved on 5th August 2017]. URL: http://www.who.int/whr/2001/en/whr01_en.pdf

WHO (2005) World Health Organization Assessment Instrument for Mental Health Systems, WHO-AIMS, Version 2.2. Geneva: World Health Organization, Geneva [Retrieved on 24th July 2018]. URL: http://www.who.int/mental_health/publications/who_aims_instrument/en/

WHO (2006) Quality of Care. A process for making strategic choices in health systems. Geneva: World Health Organization [Retrieved on 11 March 2018]. URL: http://apps.who.int/iris/handle/10665/43470

WHO (2013) Mental Health Action Plan 2013 – 2020. Geneva: World Health Organization [Retrieved on 26th July 2018]. URL: http://www.who.int/mental_health/publications/action_plan/en/

WHO (2018) Mental Health Atlas 2017. Geneva: World Health Organization [Retrieved on 26th July]. URL: http://www.who.int/mental_health/evidence/atlas/mental_health_atlas_2017/en/

WHO Regional Office for Europe (2008) Policies and practices for mental health in Europe. Copenhagen: WHO Regional Office for Europe [Retrieved on 26th July] URL: http://www.euro.who.int/en/publications/abstracts/policies-and-practices-for-mental-health-in-europe.-meeting-the-challenges

WHO Regional Office for Europe (2013) European Mental Health Action Plan 2013-2020. Copenhagen: World Health Organization [Retrieved on 3rd January 2018] from http://www.euro.who.int/__data/assets/pdf_file/0020/280604/WHO-Europe-Mental-Health-Acion-Plan-2013-2020.pdf

# 8 Appendix 1 Exemplary Delphi survey rating forms

For exemplary presentation of the Delphi survey rating forms that were sent to the panelists, in the following, the rating forms of the first Delphi survey and the second Delphi survey are shown for the quality indicators of the quality domain “mental health policies and legislation”. Additionally, the letters to the panelists are shown. The detailed description of all quality indicators and their revisions from the first Delphi survey to the second Delphi survey can be found in the tables 4 and 5 in appendix 2.

In the second Delphi survey, the quality indicators and results of the first Delphi survey were presented together with the corresponding quality indicators of the second Delphi survey or with the reasons for exclusion. For the second Delphi survey, each form was individualized by filling out the column “Your own scores” for each panelist.

**1st Delphi survey, August 2017**

Dear Sir or Madam,

Thank you for agreeing to participate in this Delphi survey. This survey is part of a two-stage Delphi study on the identification of mental healthcare quality indicators for the countries of Bulgaria, Czech Republic, Hungary and Serbia.

This questionnaire is the first of up to two Delphi surveys. Please rate all quality indicators (n=26), even though we anticipate that not all panelists have in depth knowledge of all quality indicators.

Once we have received responses from all panelists, we will collate and summarize the findings and formulate the second Delphi survey. In the second survey, you will have the opportunity to rate the retained indicators.

The included quality indicators were extracted from the scientific literature and defined as key measuring concepts by the research team.

In the following, please rate all quality indicators with regard to your country (Bulgaria, Czech Republic, Hungary or Serbia). Please score the following criteria:

1. **Relevance:**
    - **In your opinion, the indicator captures a topic that is or should be relevant to mental healthcare planning and monitoring with the aim to assure and improve quality of mental healthcare**

    - Rating guideline:
    - When rating "relevance" please first get an overview of all quality indicators within one quality domain, so that you can rate the relevance of one indicator in comparison to other indicators within one domain.
    - Score 1 indicates "Strongly disagree", score 9 indicates "Strongly agree":
        - Scores 1-3: disagree
        - Scores 4-6: uncertain/equivocal
        - Scores 7-9: agree
2. **Validity:**
    - **In your opinion, the indicator is defined clearly and unambiguously.**

    - Rating guideline: 1 indicates "Strongly disagree", 9 indicates "Strongly agree":
        - Scores 1-3: disagree
        - Scores 4-6: uncertain/equivocal
        - Scores 7-9: agree

3. **Data availability and data collection effort (feasibility):**
    - **Data availability: In your opinion, it is likely that data needed to measure this indicator are routinely collected electronically (i.e. in country-specific statistics, data documentations in mental healthcare, questionnaires) and are available from a database/databases.**
        - Answer possibilities: Yes, No, Uncertain

    - Additional criterion if answer to data availability is "No":
    - **Data collection effort: In your opinion, the additional effort for electronic collection of data for this indicator would be justifiable.**
        - Answer possibilities: Yes, No, Uncertain

Moreover, with each indicator there is the option to make a comment, which will be used by our project group to further develop the quality indicator definitions for the second Delphi survey.

**Please check all that applies and fill in as appropriate:**

Gender:

☐ male
☐ female

Age:

☐ 18-24
☐ 25-34
☐ 35-44
☐ 45-59
☐ 60 and older

Country of residence (and employment):

☐ Bulgaria
☐ Czech Republic
☐ Hungary
☐ Serbia
☐ Other:
Please specify "other": *Click here to add comment*

Profession/main area of expertise (multiple choice possible):

☐ Government official
☐ Mental healthcare manager, please specify sector:
☐ Inpatient care
☐ Outpatient care
☐ Community care
☐ Other:
Please specify "other": *Click here to add comment*

☐ Mental health professional, please specify clinical background:
- ☐ Psychiatrist
- ☐ Psychologist
- ☐ Nurse
- ☐ Social worker
- ☐ Other:

Please specify "other": *Click here to add comment*

☐ Mental healthcare researcher
☐ Service user/consumer representative
☐ Care-giver/family representative
☐ Other

Please specify "other": *Click here to add comment*

<u>Years of work experience in relevant profession(s):</u>

☐ ≤ 5 years
☐ 5-14 years
☐ 15-24 years
☐ 25-39 years
☐ 40 or more years

## 1st Delphi survey - example of QI rating form

## QI-DOMAIN 1: Mental health policies and legislation (n=3)

| | Quality indicators | Rating criteria |
|---|---|---|
| 1 | **Presence of mental health legislation**<br><br>A national mental health legislation* is existing.<br><br>*(*Mental health legislation refers to specific legal provisions that are primarily related to mental health. These provisions typically focus on issues such as: civil and human rights protection of people with mental disorders, treatment facilities, personnel, professional training and service structure.)* | **Relevance**<br>1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐<br>Strongly disagree … Strongly agree<br><br>**Validity**<br>1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐<br>Strongly disagree … Strongly agree<br><br>**Data availability**<br>☐ Yes ☐ No ☐ Uncertain<br>*Data collection effort – If no, the additional effort for electronic data collection for this indicator would be justifiable.*<br>☐ Yes ☐ No ☐ Uncertain |
| | Comment of rater: *Click here to add comment* | |
| 2 | **Presence of a mental health policy document** (either as a separate mental health policy document or incorporated within a general health policy document)<br><br>A mental health policy document* is existing.<br><br>*(*Mental health policy refers to an organized set of values, principles, and objectives to improve mental health and reduce the burden of mental disorders in a population)* | **Relevance**<br>1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐<br>Strongly disagree … Strongly agree<br><br>**Validity**<br>1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐<br>Strongly disagree … Strongly agree<br><br>**Data availability**<br>☐ Yes ☐ No ☐ Uncertain<br>*Data collection effort – If no, the additional effort for electronic data collection for this indicator would be justifiable.*<br>☐ Yes ☐ No ☐ Uncertain |
| | Comment of rater: *Click here to add comment* | |
| 3 | **Presence of a mental health plan**<br><br>A mental health plan* is existing.<br><br>*(*A mental health plan is a detailed scheme for action on mental health, which usually includes setting priorities for strategies and establishing timelines and resource requirements. A mental health plan usually includes action for promoting mental health, preventing mental disorders and treating people with mental illnesses.)* | **Relevance**<br>1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐<br>Strongly disagree … Strongly agree<br><br>**Validity**<br>1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐<br>Strongly disagree … Strongly agree<br><br>**Data availability**<br>☐ Yes ☐ No ☐ Uncertain<br>*Data collection effort – If no, the additional effort for electronic data collection for this indicator would be justifiable.*<br>☐ Yes ☐ No ☐ Uncertain |
| | Comment of rater: *Click here to add comment* | |

**2nd Delphi survey, November 2017**

Dear Sir or Madam,

In the first Delphi survey 22 panelists from Bulgaria, the Czech Republic, Hungary, Serbia and WHO Regional Office for Europe participated and rated all 26 quality indicators.

All ratings and comments from the first Delphi round were collectively and thus anonymously analyzed. According to these results of the first Delphi survey, the project group (incl. the project leader and employees in Düsseldorf, and one representative from each country of Bulgaria, Czech Republic, Hungary, Serbia and WHO Regional Office) discussed the summarized ratings and comments. Accordingly, the quality indicators were further developed for the second Delphi survey. This included excluding indicators (n=13, no rating in second survey), adapting indicators or integrating indicators with each other (n=18) and including new indicators to improve the comprehensiveness of the quality indicator set (n=4). Overall, in this second Delphi survey 22 indicators have to be rated. The excluded indicators can be found in the appendix.

In the following, please rate all quality indicators with regard to your country (Bulgaria, Czech Republic, Hungary or Serbia). Please score the following criteria:

1. **Relevance:**
    - **In your opinion, the indicator captures a topic that is or should be relevant to mental healthcare planning and monitoring with the aim to assure and improve quality of mental healthcare**

    - Rating guideline:
    - When rating “relevance” please first get an overview of all quality indicators within one quality domain, so that you can rate the relevance of one indicator in comparison to other indicators within one domain.
    - Score 1 indicates “Strongly disagree”, score 9 indicates “Strongly agree”:
        - Scores 1-3: disagree
        - Scores 4-6: uncertain/equivocal
        - Scores 7-9: agree

2. **Validity:**
    - **In your opinion, the indicator is defined clearly and unambiguously.**

    - Rating guideline: 1 indicates “Strongly disagree”, 9 indicates “Strongly agree”:
        - Scores 1-3: disagree
        - Scores 4-6: uncertain/equivocal
        - Scores 7-9: agree

3. **Data availability and data collection effort (feasibility):**
    - **Data availability: In your opinion, it is likely that data needed to measure this indicator are routinely collected electronically (i.e. in country-specific statistics, data documentations in mental healthcare, questionnaires) and are available from a database/databases.**
        - Answer possibilities: Yes, No, Uncertain

    - Additional criterion if answer to data availability is “No”:
    - **Data collection effort: In your opinion, the additional effort for electronic collection of data for this indicator would be justifiable.**
        - Answer possibilities: Yes, No, Uncertain

Moreover, with each indicator there is the option to make a comment.

## 2nd Delphi survey - example of QI rating form

## QI-DOMAIN 1: Mental health policies and legislation (n=2)

| QI from first Delphi survey | Ratings first Delphi survey | | Comments of panelists (summarized) |
|---|---|---|---|
| | Total (n=22 panelists) | Your own scores | |
| **QI 1 Presence of mental health legislation**<br><br>A national mental health legislation* is existing.<br><br>(*Mental health legislation refers to specific legal provisions that are primarily related to mental health. These provisions typically focus on issues such as: civil and human rights protection of people with mental disorders, treatment facilities, personnel, professional training and service structure.) | **Relevance:**<br>**8,0** (1,38), 4-9* | **Relevance:** | • Focus on quality and comprehensiveness of the legislation, it should be in line with latest thinking and international covenants.<br>• Legislation should be in line with CRPD (Convention on the Rights of Persons with Disabilities) or something comparable to make it possible to evaluate the existing legislation.<br>• It is necessary to define mental health legislation more precisely, i.e., replace „issues such as“ with „the following issues“.<br>• Mental health related provisions may not be independent, but incorporated in a legal codex. |
| | **Validity:**<br>**7,4** (1,43), 5-9*<br><br>***Mean** (SD), Min.-Max. | **Validity:** | |
| | **Data availability:**<br><br>No: n=5<br>Yes: n=16<br>Uncertain: n=1 | **Data availability:** | |
| | **Data collection effort:**<br>Yes: n=4<br>No: n=1 | **Data collection effort:** | |

| | Resulting QI for second Delphi survey | Rating criteria |
|---|---|---|
| 1 | **QI 1**<br>**Mental health legislation**<br>a. A national mental health legislation* is available. (Yes/No)<br><br>b. National mental health legislation complies with current standards for human rights. (Yes/No)<br><br>c. A dedicated organization** exists for the inspection of compliance to safety standards. (Yes/No)<br><br>(*Mental health legislation refers to specific legal provisions that are primarily related to mental health. These provisions typically focus on the following issues: civil and human rights protection of people with mental disorders, treatment facilities, personnel, professional training and service structure. It can be independent legislation or integrated into a general legislation.<br>** This organization/commission/agency may not specifically be limited to mental healthcare.)<br>Comment of rater: *Click here to add comment* | **Relevance**<br>1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐<br>**Strongly disagree** … **Strongly agree**<br><br>**Validity**<br>1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐<br>**Strongly disagree** … **Strongly agree**<br><br>**Data availability**<br>☐ Yes ☐ No ☐ Uncertain<br>*Data collection effort – If no, the additional effort for electronic data collection for this indicator would be justifiable.*<br>☐ Yes ☐ No ☐ Uncertain |

| QI from first Delphi survey | Ratings first Delphi survey | | Comments of panelists (summarized) |
|---|---|---|---|
| | **Total (n=22 panelists)** | **Your own scores** | |
| **QI 2 Presence of a mental health policy document**<br>(either as a separate mental health policy document or incorporated within a general health policy document)<br><br>A mental health policy document* is existing.<br><br>(*Mental health policy refers to an organized set of values, principles, and objectives to improve mental health and reduce the burden of mental disorders in a population) | **Relevance:**<br>**7,9** (1,64),<br>3-9* | **Relevance:** | • The articulation/conceptualization of the policy is important.<br>• Clearer definition for the term "policy" is needed to enable an evaluation of the concerned policy document.<br>• Countries may use definitions of „policy" (QI 2) and „health plan" (QI 3) interchangeably, therefore they should be summarized in one QI. |
| | **Validity:**<br>**7,1** (1,64),<br>4-9*<br><br>***Mean** (SD),<br>Min.-Max. | **Validity:** | |
| | **Data availability:**<br><br>No: n=5<br>Yes: n=15<br>Uncertain: n=2 | **Data availability:** | |
| | **Data collection effort:**<br><br>Yes: n=3<br>No: n=1<br>Uncertain: n=1 | **Data collection effort:** | |
| **QI 3 Presence of a mental health plan**<br>A mental health plan* is existing.<br><br>(*A mental health plan is a detailed scheme for action on mental health, which usually includes setting priorities for strategies and establishing timelines and resource requirements. A mental health plan usually includes action for promoting mental health, preventing mental disorders and treating people with mental illnesses.) | **Relevance:**<br>**7,8** (1,62),<br>4-9* | **Relevance:** | • This is an indicator of action rather than intent, which is more valuable.<br>• As external validation method of the fulfillment of this QI there could be a peer review between the countries. |
| | **Validity:**<br>**7,0** (1,84),<br>4-9*<br><br>***Mean** (SD),<br>Min.-Max. | **Validity:** | |
| | **Data availability:**<br><br>No: n=5<br>Yes: n=12<br>Uncertain: n=5 | **Data availability:** | |
| | **Data collection effort:**<br><br>Yes: n=4<br>Uncertain: n=1 | **Data collection effort:** | |

| | Resulting QI for second Delphi survey | Rating criteria |
|---|---|---|
| 2/3 | **Availability and content of a mental health policy/action plan document** (either as a separate mental health policy document or incorporated within a general health policy document)<br><br>A mental health policy document* or action plan** is available. (Yes/No)<br><br>If yes, it is in line with the values, principles and objectives of the WHO European Mental Health Action Plan:<br>• Everyone has an equal opportunity to realize mental wellbeing throughout their lifespan, particularly those who are most vulnerable or at risk (Yes/No)<br>• People with mental health problems are citizens whose human rights are fully valued, respected and promote (Yes/No)<br>• Mental health services are accessible, competent and affordable, available in the community according to need (Yes/No)<br>• People are entitled to respectful, safe and effective treatment (Yes/No)<br>• Health systems provide good physical and mental health care for all (Yes/No)<br>• Mental health systems work in well coordinated partnership with other sectors (Yes/No)<br>• Mental health governance and delivery are driven by good information and knowledge (Yes/No)<br><br>(*Mental health policy refers to an organized set of values, principles, and objectives to improve mental health and reduce the burden of mental disorders in a population)<br><br>(**A mental health plan is a detailed scheme for action on mental health, which usually includes setting priorities for strategies and establishing timelines and resource requirements. A mental health plan usually includes action for promoting mental health, preventing mental disorders and treating people with mental illnesses.) | **Relevance**<br>1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐<br>**Strongly disagree** … **Strongly agree**<br><br>**Validity**<br>1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐<br>**Strongly disagree** … **Strongly agree**<br><br>**Data availability**<br>☐ Yes ☐ No ☐ Uncertain<br>*Data collection effort – If no, the additional effort for electronic data collection for this indicator would be justifiable.*<br>☐ Yes ☐ No ☐ Uncertain |

Comment of rater: *Click here to add comment*

# 9 Appendix 2 Detailed description of the refinement of the quality indicators

**Table 4: Description of QI refinement after first Delphi survey**

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| **Quality domain: Mental health policies and legislation** | | |
| **QI 1**<br>**Presence of mental health legislation**<br><br>A national mental health legislation* is existing.<br><br>*(*Mental health legislation refers to specific legal provisions that are primarily related to mental health. These provisions typically focus on issues such as: civil and human rights protection of people with mental disorders, treatment facilities, personnel, professional training and service structure.)* | • Focus on quality and comprehensiveness of the legislation, it should be in line with latest thinking and international covenants.<br>• Legislation should be in line with CRPD (Convention on the Rights of Persons with Disabilities) or something comparable to make it possible to evaluate the existing legislation.<br>• It is necessary to define mental health legislation more precisely, i.e., replace „issues such as" with „the following issues".<br>• Mental health related provisions may not be independent, but incorporated in a legal codex. | **QI 1**<br>**Mental health legislation**<br><br>a. A national mental health legislation* is available. (Yes/No)<br>b. National mental health legislation complies with current standards for human rights. (Yes/No)<br>c. A dedicated organization** exists for the inspection of compliance to safety standards. (Yes/No)<br><br>(*Mental health legislation refers to specific legal provisions that are primarily related to mental health. These provisions typically focus on the following issues: civil and human rights protection of people with mental disorders, treatment facilities, personnel, professional |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| | | training and service structure. It can be independent legislation or integrated into a general legislation.<br><br>** This organization/commis-sion/agency may not specifically be limited to mental healthcare.) |
| **QI 2**<br>**Presence of a mental health policy document** (either as a separate mental health policy document or incorporated within a general health policy document)<br><br>A mental health policy document* is existing.<br><br>*(*Mental health policy refers to an organized set of values, principles, and objectives to improve mental health and reduce the burden of mental disorders in a population)* | • The articulation/conceptualization of the policy is important.<br>• Clearer definition for the term "policy" is needed to enable an evaluation of the concerned policy document.<br>• Countries may use definitions of „policy" (QI 2) and „health plan" (QI 3) interchangeably, therefore they should be summarized in one QI. | **QI 2/3**<br>**Availability and content of a mental health policy/action plan document** (either as a separate mental health policy document or incorporated within a general health policy document)<br><br>A mental health policy document* or action plan** is available. (Yes/No)<br><br>If yes, it is in line with the values, principles and objectives of the WHO European Mental Health Action Plan:<br>• Everyone has an equal opportunity to realize mental wellbeing throughout their lifespan, particularly those |
| **QI 3**<br>**Presence of a mental health plan**<br><br>A mental health plan* is existing.<br><br>*(*A mental health plan is a detailed scheme for action* | • This is an indicator of action rather than intent, which is more valuable.<br>• As external validation method of the fulfillment of this QI there could be a peer | |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| *on mental health, which usually includes setting priorities for strategies and establishing timelines and resource requirements. A mental health plan usually includes action for promoting mental health, preventing mental disorders and treating people with mental illnesses.)* | review between the countries. | who are most vulnerable or at risk (Yes/No)<br>• People with mental health problems are citizens whose human rights are fully valued, respected and promote (Yes/No)<br>• Mental health services are accessible, competent and affordable, available in the community according to need (Yes/No)<br>• People are entitled to respectful, safe and effective treatment (Yes/No)<br>• Health systems provide good physical and mental health care for all (Yes/No)<br>• Mental health systems work in well coordinated partnership with other sectors (Yes/No)<br>• Mental health governance and delivery are driven by good information and |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| | | knowledge (Yes/No)<br><br>*(*Mental health policy refers to an organized set of values, principles, and objectives to improve mental health and reduce the burden of mental disorders in a population) (**A mental health plan is a detailed scheme for action on mental health, which usually includes setting priorities for strategies and establishing timelines and resource requirements. A mental health plan usually includes action for promoting mental health, preventing mental disorders and treating people with mental illnesses.)* |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| **Quality domain: Financing and costs of mental healthcare** | | |
| **QI 4**<br>**Health budget allocated to mental health services**<br><br>Proportion of national health budget allocated to mental health services<br><br>Numerator:<br>National health budget allocated to mental health services (in Euro or local currency)<br><br>Denominator:<br>Total national health budget (in Euro or local currency) | • Relying on budgetary allocations rather than estimation of actual expenditure is more feasible, but may give an incomplete expression of the total mental health service activity in the country also including e.g. social care, education, criminal justice, etc.<br>• Because of different budget structures, it may be difficult to obtain a clear overview of the actual budget. The term "mental health services" needs further specification.<br>• The change in budgetary allocation over time should be measured.<br>• Focus only on health budget, or social budget for budget lines that are specifically allocated to mental health disorders/mental health treatment. | **QI 4 new**<br>**Health budget**<br><br>a. Total value of national health budget (in Euro or local currency; specify).<br>b. Total value of national health budget allocated to mental health services (in Euro or local currency; specify).<br>c. Proportion of national health budget allocated to mental health services over time:<br><br>Numerator:<br>(National health budget allocated to mental health services* (in Euro or local currency) in the year of assessment) – (National health budget allocated to mental health services (in Euro or local currency) one year before)<br><br>Denominator:<br>Total national health budget (in Euro or local currency) one year before the assessment |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| | | *Mental health services include:<br>a. Mental hospitals<br>b. Psychiatric departments in general hospitals<br>c. Mental health outpatient facilities<br>d. Mental health day treatment facilities<br>e. Community mental health centers<br>f. Non-hospital-based long-term mental health facilities<br>g. Rehabilitation units/facilities for mental health |
| **QI 5**<br>**Total national expenditure on mental health services**<br><br>Numerator:<br>Total expenditure on mental health services per capita (Euros spent or local currency)<br><br>Denominator:<br>Number of total population | • The numerator needs to be changed from "per capita" to "per year", to get the result "Total expenditure on mental health services per capita per year ".<br>• The term "mental health services" needs to be defined clearly | **QI 5 new**<br>**Total national expenditure on mental health services per capita per year**<br><br>Numerator:<br>Total expenditure on mental health services* per year (Euros spent or local currency)<br><br>Denominator:<br>Number of total population<br><br>*Mental health services incl.<br>a. Mental hospitals |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| | | b. Psychiatric departments in general hospitals<br>c. Mental health outpatient facilities<br>d. Mental health day treatment facilities<br>e. Community mental health centers<br>f. Non-hospital-based long-term mental health facilities<br>g. Rehabilitation units/facilities for mental health |
| **Quality domain: Availability, accessibility and utilization of mental healthcare** | | |
| **QI 6**<br>**Total beds for mental health care specialties per 100,000 population**<br><br>Numerator:<br>The number of beds for mental health care specialties (adjusted for cross- boundary flow*)<br><br>Denominator:<br>Total number of persons in the general population divided by 100,000<br><br>**Definition cross-boundary flow: allocated plus borrowed beds minus lent/temporary beds* | • Given how much of overall mental healthcare services are still provided in inpatient care, this is a relevant and feasible indicator that can be tracked over time.<br>• The measurement of beds for cross-boundary flow is not necessary and overly complicated, decreasing the QI's feasibility.<br>• The term "mental healthcare" needs to be specified. | **QI 6 new**<br>**Total beds for mental health care per 100,000 population**<br><br>Numerator:<br>The number of beds for mental health care specialties differentiated by:<br>a. Number of beds in mental hospitals<br>b. Number of beds in psychiatric departments in general hospitals<br>c. Number of beds in mental health outpatient facilities<br>d. Number of beds/places in |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| | | mental health day treatment facilities<br>e. Number of beds in community mental health centers<br>f. Number of beds in non-hospital-based long-term mental health facilities<br>g. Number of places in rehabilitation units/facilities for mental health<br><br>Denominator:<br>Total number of persons in the general population divided by 100,000 |
| **QI 7**<br>**Number of various mental health services structures**<br><br>Numerator variants:<br>a. Number of mental hospitals and departments for mental health services<br>b. Number of mental health outpatient facilities<br>c. Number of mental health day treatment facilities<br>d. Number of community mental health centers | • This is an indicator of service availability.<br>• Define mental health treatment facilities clearly to improve comparability between countries.<br>• Include long-term social institutions that care for people with mental health problems. | **QI 7 new**<br>**Availability of mental health service facilities**<br><br>Numerator variants:<br>a. Number of mental hospitals<br>b. Number of psychiatric departments in general hospitals<br>c. Number of mental health outpatient facilities<br>d. Number of mental health day treatment facilities<br>e. Number of community mental health centers |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| Denominator:<br>Number of total population divided by 100,000 | | f. Number of non-hospital-based long-term mental healthcare facilities<br><br>Denominator:<br>Number of total population divided by 100,000 |
| **QI 8**<br>**Utilization of mental health service structures**<br><br>Numerator:<br>Number of persons with any mental disorder who received mental health treatment<br><br>Denominator:<br>All persons diagnosed with a mental disorder within a defined period of time | • This is highly relevant, but may be difficult to measure accurately without good quality clinical information systems.<br>• The outcome of the indicator would be 1 (100%), because only diagnosed people receive in-patient and out-patient mental health treatment, therefore denominator needs to be changed.<br>• Further specification of concerned diagnoses and separation of QI is necessary for meaningful outcomes and identification of diagnosis-specific treatment gaps. | **QI 8a new**<br>**Utilization of mental health services**<br><br>Numerator:<br>Number of persons with bipolar disorder and schizophrenia who received mental health treatment<br><br>Denominator:<br>All persons with bipolar disorder and schizophrenia within a defined period of time<br><br>**QI 8b new**<br>**Utilization of mental health services**<br><br>Numerator:<br>Number of persons with anxiety disorder and depression who received mental health treatment |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| | | Denominator:<br>All persons with anxiety disorder and depression within a defined period of time<br><br>**QI 8c new**<br>**Utilization of mental health services**<br><br>Numerator:<br>Number of persons with dementia who received mental health treatment<br><br>Denominator:<br>All persons with dementia within a defined period of time<br><br>**QI 8d new**<br>**Utilization of mental health services**<br><br>Numerator:<br>Number of persons with alcohol-use disorders who received mental health treatment<br><br>Denominator:<br>All persons with alcohol-use disorders within a defined period of time |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| | | **QI 8e new**<br>**Utilization of mental health services**<br><br>Numerator:<br>Number of persons with substance-use disorders (other than alcohol use) who received mental health treatment<br><br>Denominator:<br>All persons with substance-use disorders (not alcohol use) within a defined period of time<br><br>**QI 8f new**<br>**Utilization of mental health services**<br><br>Numerator:<br>Number of children and adolescents with intellectual disabilities who received mental health treatment<br><br>Denominator:<br>All children and adolescents with intellectual disabilities within a defined period of time |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| | | **QI 8g new**<br>**Utilization of mental health services**<br><br>Numerator:<br>Number of children and adolescents with conduct disorder who received mental health treatment<br><br>Denominator:<br>All children and adolescents with conduct disorder within a defined period of time |
| **QI 9**<br>**Mental health mobile clinic teams**<br><br>Proportion of mental health outpatient facilities that have mental health mobile clinic teams that provide regular mental health care outside of the mental health facility<br><br>Numerator:<br>Number of mental health outpatient facilities that have mental health mobile clinic teams that provide regular mental health care outside of the mental health facility<br><br>Denominator:<br>Number of mental health outpatient facilities | • More precise definition of "mobile clinic team" needed, i.e. it should be multidisciplinary and may include a psychiatrist.<br>• The QI definition is more meaningful when it relates to the number of the population.<br>• "Assertive community team" is a more common term than "mobile clinic team". | **QI 9 new**<br>**Assertive community teams**<br><br>Proportion of mental health outpatient facilities that have assertive community teams that provide regular mental health care outside of the mental health facility<br><br>Numerator:<br>Number of mental health outpatient facilities that have an assertive community team that may but not necessarily include a psychiatrist and provide regular mental health care outside of the mental health facility, i.e. at the patients' home |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| | | Denominator:<br>Number of total population divided by 100,000 |
| **Quality domain: Mental health reporting and monitoring** | | |
| **QI 10**<br>**Number of persons diagnosed with mental disorders**<br><br>Numerator:<br>Number of persons diagnosed with any mental disorder (all health system)<br><br>Denominator:<br>All persons receiving healthcare services (all health system) | • This indicator falls between the more important measures of overall prevalence and treated prevalence, i.e. QI 8. It is clinical in orientation and difficult to measure.<br>• The quality goal of this QI is unclear, "QI 8 Utilization of mental health services" is more specific and should be measured instead | Excluded |
| **QI 11**<br>**Mental health reporting and monitoring**<br><br>Presence of a mental health information system providing annually updated information of the number of mental healthcare facilities, their regional distribution, their staffing and use (numbers of patients per diagnosis per year and per service) | • This QI is not very incisive for quality of (mental) health system.<br>• QI seems redundant, it should be fulfilled by implementation of this QI Set. | Excluded |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| **QI 12**<br>**Formally defined minimum data set items**<br><br>There is a formally defined list of individual data items that ought to be collected by all mental health facilities. | • Difficult to define and implement within and across countries. | Excluded<br>(QI can be seen as meta-level indicator that can be used to determine if all data for the indicators of the proposed final QI set are being collected) |
| **Quality domain: Continuity, coordination and cooperation** | | |
| **QI 13**<br>**Interaction of primary health care doctors with mental health services**<br><br>Numerator:<br>Number of primary health care doctors interacting with a mental health professional at least monthly in the last year<br><br>Denominator:<br>Number of all primary health care doctors | • Difficult to measure consistently.<br>• Might depend on numerous factors – difficult to interpret.<br>• Not feasible to measure routinely, quality goal unclear. | Excluded |
| **QI 14**<br>**Provision of follow-up community care**<br><br>Proportion of mental health outpatient facilities that provide routine follow-up community care<br><br>Numerator:<br>Number of mental health outpatient facilities that | • This is about continuity of care, which is already included in QI 15.<br>• The term "routine follow-up community care" is unclear.<br>• Not feasible due to doubtful reliability of data collection and reporting on this QI. | Excluded |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| provide routine follow-up community care<br><br>Denominator:<br>Number of mental health outpatient facilities | | |
| **QI 15**<br>**Continuity of visits after mental health-related hospitalization**<br><br>Numerator:<br>Number of persons with at least one visit per month for six months following hospitalization.<br><br>Denominator:<br>Number of persons hospitalized for psychiatric or substance-related disorder. | • Feasible, but should to relate to "cases" rather than "persons".<br>• Data of social and private services can be missing.<br>• Follow-up visits should be psychiatric | **QI 15 new**<br>**Follow-up of visits after mental health-related hospitalization**<br><br>Numerator:<br>Number of cases with at least one psychiatric visit within 14 days after discharge from hospitalization (excluding discharge against advice, death, discharge due to need for acute physical healthcare).<br><br>Denominator:<br>Number of cases hospitalized for psychiatric or substance-related disorder. |
| **Quality domain: Workforce in mental healthcare** | | |
| **QI 16**<br>**Human resources in mental health facilities per capita**<br><br>Number of human resources working in or for mental health facilities or private practice per | • An important and useful measure of overall mental health system inputs, but may be difficult to count (e.g. full time versus part time, persons working in different jobs/places). | **QI 16 new**<br>**Human resources in mental health facilities per capita**<br><br>Number of human resources working in or for mental health facilities* per 100,000 population by profession |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| 100,000 population by profession<br><br>Numerator:<br>Number of human resources (per capita)<br><br>Denominator:<br>Total number of people in the general population divided by 100,000 | • Human resources is a very general term that needs further differentiation. | Numerator:<br>Number of human resources working in or for mental health facilities in full time equivalents (FTE's) differentiated by profession:<br>• Psychiatrists<br>• Psychologists<br>• Nurses<br>• Psychiatric nurses<br>• Social workers<br>• Occupational therapists<br><br>Denominator:<br>Total number of persons in the general population divided by 100,000<br><br>*Mental health facilities<br>a. Mental hospitals<br>b. Psychiatric departments in general hospitals<br>c. Mental health outpatient facilities<br>d. Mental health day treatment facilities<br>e. Community mental health centers<br>f. Non-hospital-based long-term mental health facilities<br>g. Rehabilitation units/facilities for mental health |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| **QI 17**<br>**Staff working in mental hospitals**<br><br>Number of full-time or part-time mental health professionals per mental hospital bed<br><br>Numerator:<br>Number of mental health professionals<br><br>Denominator:<br>Number of mental hospital beds | • QI is restricted, as it only concerns mental hospitals.<br>• It seems redundant and can be integrated into QI 16. | Excluded |
| **QI 18**<br>**Professionals graduated last year**<br><br>Number of professionals graduated in the last year in academic and educational institutions, per 100,000 general population<br><br>Numerator:<br>Number of professionals* graduated in the last year<br><br>Denominator:<br>Number of people in the general population divided by 100,000<br><br>**Professionals:* | • No direct QI for mental healthcare quality, since it is not clear if professionals stay in their countries and work in their field. Another, more direct QI is available (QI16 on human resources in mental health facilities). | Excluded |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| *1. Medical doctors; 2. Nurses; 3. Psychiatrists; 4. Psychologists with at least 1 year training in mental health care; 5. Nurses with at least 1 year training in mental health care; 6. Social workers with at least 1 year training in mental health care; 7. Occupational therapists with at least one year training in mental health care* | | |
| **Quality domain: Promotion of mental health, and preventing mental disorders, stigma and discrimination** | | |
| **QI 19**<br>**Coordinating bodies for public education and awareness campaigns on mental health**<br><br>Existence of coordinating bodies (e.g. committees, boards, offices) that coordinate and oversee public education and awareness campaigns on mental health and mental disorders | • Just having a coordinating body might not amount to very much.<br>• This should focus more specifically on anti-stigma activities. | **QI 19 new**<br>**Anti-stigma movement**<br><br>Availability of an official/government supported anti-stigma movement per country (Yes/No) |
| **QI 20**<br>**Population targeted by specific education and awareness campaigns on mental health**<br><br>Public education and awareness campaigns on | • The term "campaign" is unclear.<br>• It seems infeasible to evaluate the impact of campaigns on the target groups.<br>• Differentiation of target groups does | Excluded |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| mental health targeted at the general population and specific groups within the general population in the last five years<br><br>Campaigns exist targeted at:<br>1. The general population; 2. Children; 3. Adolescents; 4. Women; 5. Trauma survivors; 6. Ethnic groups; 7. Other vulnerable or minority groups | seem to make QI unnecessarily complicated. | |
| **QI 21**<br>**Professional groups targeted by specific education and awareness campaigns on mental health**<br><br>Public education and awareness campaigns on mental health targeted at professional groups linked to the health sector in the last five years<br><br>Campaigns exist targeted at:<br>1. Health care providers (conventional, modern, allopathic)<br>2. Complementary/alternative/traditional sector<br>3. Teachers<br>4. Social services staff | • The term "campaign" is unclear.<br>• Implementation and measurement of this QI could be difficult. | Excluded |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| 5. Leaders and politicians<br>6. Other professional groups linked to the health sector | | |
| **Quality domain: Integration of research and innovation into mental healthcare** | | |
| **QI 22**<br>**Availability of technological equipment for assessment and treatment**<br><br>Numerator: Number of mental health care in- and out-patient services, which provide access to major evidence-based diagnostic and therapeutic technologies* within 72 hours for non-acute cases and immediate access for acute cases<br><br>Denominator: The number of in- and out-patient services without such a provision<br><br>*Including technologies:<br>ECG<br>Chest X-ray<br>Laboratory tests<br>EEG<br>MRI<br>CT | • Too specialist oriented and difficult to measure and follow-up.<br>• Technologies vary strongly between countries and relate to the economy and regulations.<br>• Feasibility and reliability of measurement of this QI is unlikely. | Excluded |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| **QI 23**<br>**Evidence-based medicine**<br><br>Numerator:<br>Numbers of mental health services (in- and out-patient) with implemented standard operating procedures ascertaining obedience to the rules of evidence-based medicine<br><br>Denominator:<br>The number of mental health services (in- and out-patient) without such implemented standard operating procedures) | • Difficult to define this QI and get agreement within and across countries.<br>• Standard operating procedures may be outdated and should be changed first, e.g. consider multidisciplinary approaches.<br>• Not feasible due to doubtful reliability of data collection.<br>Highly evidence-based services may still be too specialist oriented and fragmented, users' experience-basis or patient safety should be evaluated instead. | Excluded |
| **Quality domain: Recovery, participation and integration of persons with mental disorders** | | |
| **QI 24**<br>**Supported housing**<br><br>Numerator: Number of persons with severe mental illness (SMI) that live independently with assistance that is in accordance with their needs<br><br>Denominator: Number of persons with severe mental illness (SMI) that | • This is a good indicator of rehabilitation/ reintegration but is difficult to measure as it depends on an assessment of need. "Supported" should be changed to "assisted", because this term is more comprehensive and clear.<br>• The measurement of this QI may be influenced by a lack of flats/houses with | **QI 24 new**<br>**Assisted housing**<br><br>Numerator: Number of places in assisted housing for persons with bipolar disorder and schizophrenia<br><br>Denominator: Number of persons with bipolar disorder and schizophrenia in mental hospitals or long-term |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| can live independently with some assistance | assisted living, therefore this QI should focus on the availability of assisted housing instead.<br>• Definition of "live independently" is unclear. Specify indicator further to ease data collection and comparability across countries, e.g. focus on severe mental illness | facilities for longer than a year |
| **QI 25**<br>**Legislative provision for employment**<br><br>Existence of legislative provisions concerning a legal obligation for employers to hire a certain percentage of employees that are disabled due to a mental disorder | • Such legislation is available in some countries, but it is not implemented in practice.<br>• QI may not be feasible, because it is usually not differentiated between mental disorders and other (physical) disabilities. | Excluded |
| **QI 26**<br>**Legislative provision against discrimination at work**<br><br>Existence of legislative provisions concerning protection from discrimination (dismissal, lower wages) solely on | • Legislation focusing on all forms of discrimination of people in general, including people with disabilities is available in some countries, but its implementation is doubtful.<br>• QI may not be feasible, because it is usually | Excluded |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| account of mental disorder | not differentiated between mental disorders and other (physical) disabilities. | |
| | • The quality of legislation and policies would also be determined by the involvement of users in political decision-making processes.<br><br>➔ **New QI to increase comprehensive-ness of QI-Set, quality domain: mental health policies and legislation** | **QI 27 new**<br>**User associations and mental health policies, plans or legislation**<br><br>Involvement of user/consumer associations in the formulation or implementation of mental health policies, plans or legislation in the last two years. (Yes/No) |
| | • To further analyze service availability, regional differences should be detected.<br><br>➔ **New QI to increase comprehensive-ness of QI-Set, quality domain: availability, accessibility and utilization of care service structures** | **QI 28 new**<br>**Equity**<br><br>Numerator: Number of psychiatrists, and psychiatric beds/places<br><br>Denominator: Number of people in the general population divided by 100,000<br><br>(Calculate QI across country and within defined regions to capture geographical inequality) |

| QI definition at first Delphi survey (QI: n= 26) | Panelists' comments (summarized) | Refined QI definition at second Delphi survey (QI: n=22) |
|---|---|---|
| | • Collaboration of different care providers should be supported officially and with funding mechanisms to support integrated care.<br><br>➔ **New QI to increase comprehensive-ness of QI-Set, quality domain: continuity, coordination and cooperation** | **QI 29 new**<br>**Integration of care**<br><br>Is there any regulation and funding in each country for the collaboration between different providers of mental healthcare with the goal of optimization of patient pathways? (Yes/No) |
| | • Users' experience-basis or patient safety should be evaluated.<br>• There is consensus that coercive admissions and treatment should be avoided as much as possible.<br><br>➔ **New QI to increase comprehensive-ness of QI-Set, quality domain: patient safety** | **QI 30 new**<br>**Involuntary inpatient admissions**<br><br>Numerator: Number of patients with involuntary admissions to psychiatric hospitals and psychiatric departments<br><br>Denominator: All admissions of patients to psychiatric hospitals and psychiatric departments |

**Table 5: Description of QI refinement after second Delphi survey**

| QI definition at second Delphi survey (QI: n=22) | Panelists' comments (summarized) | Refined QI wording after second Delphi survey |
|---|---|---|
| **Quality domain: Mental health policies and legislation** | | |
| **QI 1**<br>**Mental health legislation**<br><br>a. A national mental health legislation* is available. (Yes/No)<br>b. National mental health legislation complies with current standards for human rights. (Yes/No)<br>c. A dedicated organization** exists for the inspection of compliance to safety standards. (Yes/No)<br><br>(*Mental health legislation refers to specific legal provisions that are primarily related to mental health. These provisions typically focus on the following issues: civil and human rights protection of people with mental disorders, treatment facilities, personnel, professional training and service structure. It can be independent legislation or integrated into a general legislation. | • More precise definition of "current standards for human rights" needed, i.e. "National mental health legislation explicitly includes provisions for the civil and human rights protection of persons with mental disorders".<br>• QI could initiate further analyses of legal topics that are included or missing/excluded in mental health legislation. | **QI 1**<br>**Mental health legislation**<br><br>a. A national mental health legislation* is available. (Yes/No)<br>b. National mental health legislation explicitly includes provisions for the civil and human rights protection of persons with mental disorders. (Yes/No)<br>c. A dedicated organization exists for the inspection of compliance to safety standards. (Yes/No)<br><br>(*Mental health legislation refers to specific legal provisions that are primarily related to mental health. These provisions typically focus on the following issues: civil and human rights protection of people with mental disorders, treatment facilities, personnel, professional training and service structure. It can be independent legislation or integrated into a general legislation.) |

| QI definition at second Delphi survey (QI: n=22) | Panelists' comments (summarized) | Refined QI wording after second Delphi survey |
|---|---|---|
| ** This organization/commission/ agency may not specifically be limited to mental healthcare.) | | |
| **QI 2/3**<br>**Availability and content of a mental health policy/action plan document** (either as a separate mental health policy document or incorporated within a general health policy document)<br><br>A mental health policy document* or action plan** is available. (Yes/No)<br><br>If yes, it is in line with the values, principles and objectives of the WHO European Mental Health Action Plan:<br>• Everyone has an equal opportunity to realize mental wellbeing throughout their lifespan, particularly those who are most vulnerable or at risk (Yes/No)<br>• People with mental health problems are citizens whose | • Only referring to a "plan" would be more specific, since countries are likely to use "policy" and "action plan" interchangeably. | **QI 2/3**<br>**Availability and content of a mental health action plan** (either as a separate document or incorporated within a general policy/action plan)<br><br>A mental health action plan* is available. (Yes/No)<br><br>If yes, it is in line with the values, principles and objectives of the WHO European Mental Health Action Plan:<br>• Everyone has an equal opportunity to realize mental wellbeing throughout their lifespan, particularly those who are most vulnerable or at risk (Yes/No)<br>• People with mental health problems are citizens whose human rights are fully valued, respected and promote (Yes/No) |

| QI definition at second Delphi survey (QI: n=22) | Panelists' comments (summarized) | Refined QI wording after second Delphi survey |
|---|---|---|
| human rights are fully valued, respected and promote (Yes/No)<br>• Mental health services are accessible, competent and affordable, available in the community according to need (Yes/No)<br>• People are entitled to respectful, safe and effective treatment (Yes/No)<br>• Health systems provide good physical and mental health care for all (Yes/No)<br>• Mental health systems work in well coordinated partnership with other sectors (Yes/No)<br>• Mental health governance and delivery are driven by good information and knowledge (Yes/No)<br><br>(*Mental health policy refers to an organized set of values, principles, and objectives to improve mental health and reduce | | • Mental health services are accessible, competent and affordable, available in the community according to need (Yes/No)<br>• People are entitled to respectful, safe and effective treatment (Yes/No)<br>• Health systems provide good physical and mental health care for all (Yes/No)<br>• Mental health systems work in well coordinated partnership with other sectors (Yes/No)<br>• Mental health governance and delivery are driven by good information and knowledge (Yes/No)<br><br>*Mental health action plan refers to an organized set of values, principles, and objectives to improve mental health and reduce the burden of mental disorders in a population ***and/or*** a mental health action plan |

| QI definition at second Delphi survey (QI: n=22) | Panelists' comments (summarized) | Refined QI wording after second Delphi survey |
|---|---|---|
| the burden of mental disorders in a population) (**A mental health plan is a detailed scheme for action on mental health, which usually includes setting priorities for strategies and establishing timelines and resource requirements. A mental health plan usually includes action for promoting mental health, preventing mental disorders and treating people with mental illnesses.) | | is a detailed scheme for action on mental health, which usually includes setting priorities for strategies and establishing timelines and resource requirements. A mental health plan usually includes action for promoting mental health, preventing mental disorders and treating people with mental illnesses. |
| **Quality domain: Financing and costs of mental healthcare** | | |
| **QI 4 new**<br>**Health budget**<br><br>a. Total value of national health budget (in Euro or local currency; specify).<br>b. Total value of national health budget allocated to mental health services (in Euro or local currency; specify).<br>c. Proportion of national health budget allocated to mental health services over time. | • QI is based on the premise that the national health budget for mental health services increases with each year. If it stays the same, QI result would be zero. Therefore, feasibility of this QI needs to be tested.<br>• Indicator can be calculated in conjunction with QI 5, to get an overview of both, allocated budget to mental health services and actual expenditure on mental health services. | No revisions.<br><br>However, feasibility of this QI needs to be tested to determine whether the proportion of national health budget allocated to mental health services over time is feasible and provides meaningful results.<br><br>Otherwise the proportion of national health budget allocated to mental health services may be measured instead and after multiple measurements of this QI a trend in the development of the budget allocated to mental health services can be depicted. |

| QI definition at second Delphi survey (QI: n=22) | Panelists' comments (summarized) | Refined QI wording after second Delphi survey |
|---|---|---|
| Numerator:<br>(National health budget allocated to mental health services* (in Euro or local currency) in the year of assessment) – (National health budget allocated to mental health services (in Euro or local currency) one year before)<br><br>Denominator:<br>Total national health budget (in Euro or local currency) one year before the assessment<br><br>*Mental health services include.<br>a. Mental hospitals<br>b. Psychiatric departments in general hospitals<br>c. Mental health outpatient facilities<br>d. Mental health day treatment facilities<br>e. Community mental health centers<br>f. Non-hospital-based long-term mental health facilities<br>g. Rehabilitation units/facilities for mental health | | |
| **QI 5 new**<br>**Total national expenditure on mental** | • Indicator can be calculated in conjunction with QI 4, to get an overview of | No revisions. |

| QI definition at second Delphi survey (QI: n=22) | Panelists' comments (summarized) | Refined QI wording after second Delphi survey |
|---|---|---|
| **health services per capita per year**<br><br>Numerator:<br>Total expenditure on mental health services* per year (Euros spent or local currency)<br><br>Denominator:<br>Number of total population<br><br>*Mental health services incl.<br>a. Mental hospitals<br>b. Psychiatric departments in general hospitals<br>c. Mental health outpatient facilities<br>d. Mental health day treatment facilities<br>e. Community mental health centers<br>f. Non-hospital-based long-term mental health facilities<br>g. Rehabilitation units/facilities for mental health | both, allocated budget to mental health services and actual expenditure on mental health services. | Measure and interpret QI in conjunction with QI 4 new. |

| QI definition at second Delphi survey (QI: n=22) | Panelists' comments (summarized) | Refined QI wording after second Delphi survey |
|---|---|---|
| **Quality domain: Availability, accessibility and utilization of mental healthcare** | | |
| **QI 6 new**<br>**Total beds for mental health care per 100,000 population**<br><br>Numerator:<br>The number of beds for mental health care specialties differentiated by:<br>a. Number of beds in mental hospitals<br>b. Number of beds in psychiatric departments in general hospitals<br>c. Number of beds in mental health outpatient facilities<br>d. Number of beds/places in mental health day treatment facilities<br>e. Number of beds in community mental health centers<br>f. Number of beds in non-hospital-based long-term mental health facilities<br>g. Number of places in rehabilitation units/facilities for mental health<br><br>Denominator:<br>Total number of persons in the general population divided by 100,000 | • At points c. and e., the number of places should be added for comprehensiveness; at point g., beds could be relevant as well.<br>• Point f. should also refer to social care residential facilities that care for people with mental disorders. | **QI 6 new**<br>**Total beds for mental health care per 100,000 population**<br><br>Numerator:<br>The number of beds for mental health care specialties differentiated by:<br>a. Number of beds in mental hospitals<br>b. Number of beds in psychiatric departments in general hospitals<br>c. Number of beds/places in mental health outpatient facilities<br>d. Number of beds/places in mental health day treatment facilities<br>e. Number of beds/places in community mental health centers<br>f. Number of beds in non-hospital-based long-term mental health/social care residential facilities (e.g. social care institutions in which persons with mental disorders reside)<br>g. Number of beds/places in |

| QI definition at second Delphi survey (QI: n=22) | Panelists' comments (summarized) | Refined QI wording after second Delphi survey |
|---|---|---|
| | | rehabilitation units/facilities for mental health<br><br>Denominator:<br>Total number of persons in the general population divided by 100,000 |
| **QI 7 new**<br>**Availability of mental health service facilities**<br><br>Numerator variants:<br>a. Number of mental hospitals<br>b. Number of psychiatric departments in general hospitals<br>c. Number of mental health outpatient facilities<br>d. Number of mental health day treatment facilities<br>e. Number of community mental health centers<br>f. Number of non-hospital-based long-term mental healthcare facilities<br><br>Denominator:<br>Number of total population divided by 100,000 | • Point f. should also refer to social care residential facilities that take care of people with different disabilities including mental disorders. | **QI 7 new**<br>**Availability of mental health service facilities**<br><br>Numerator variants:<br>a. Number of mental hospitals<br>b. Number of psychiatric departments in general hospitals<br>c. Number of mental health outpatient facilities<br>d. Number of mental health day treatment facilities<br>e. Number of community mental health centers<br>f. Number of beds in non-hospital-based long-term mental health/social care residential facilities (e.g. social care institutions in which persons with mental disorders reside) |

| QI definition at second Delphi survey (QI: n=22) | Panelists' comments (summarized) | Refined QI wording after second Delphi survey |
|---|---|---|
| | | Denominator:<br>Number of total population divided by 100,000 |
| **QI 8a new**<br>**Utilization of mental health services**<br><br>Numerator:<br>Number of persons with bipolar disorder and schizophrenia who received mental health treatment<br><br>Denominator:<br>All persons with bipolar disorder and schizophrenia within a defined period of time<br><br>**QI 8b new**<br>**Utilization of mental health services**<br><br>Numerator:<br>Number of persons with anxiety disorder and depression who received mental health treatment<br><br>Denominator:<br>All persons with anxiety disorder and depression within a defined period of time | • Routine mental healthcare data may only be available for numerators. For denominators epidemiological data may be used to measure these QI. | No revisions |

| QI definition at second Delphi survey (QI: n=22) | Panelists' comments (summarized) | Refined QI wording after second Delphi survey |
|---|---|---|
| **QI 8c new**<br>**Utilization of mental health services**<br><br>Numerator:<br>Number of persons with dementia who received mental health treatment<br><br>Denominator:<br>All persons with dementia within a defined period of time<br><br>**QI 8d new**<br>**Utilization of mental health services**<br><br>Numerator:<br>Number of persons with alcohol-use disorders who received mental health treatment<br><br>Denominator:<br>All persons with alcohol-use disorders within a defined period of time<br><br>**QI 8e new**<br>**Utilization of mental health services**<br><br>Numerator:<br>Number of persons with substance-use disorders (other than alcohol use) who received mental health treatment<br><br>Denominator: | | |

| QI definition at second Delphi survey (QI: n=22) | Panelists' comments (summarized) | Refined QI wording after second Delphi survey |
|---|---|---|
| All persons with substance-use disorders (not alcohol use) within a defined period of time<br><br>**QI 8f new**<br>**Utilization of mental health services**<br><br>Numerator:<br>Number of children and adolescents with intellectual disabilities who received mental health treatment<br><br>Denominator:<br>All children and adolescents with intellectual disabilities within a defined period of time<br><br>**QI 8g new**<br>**Utilization of mental health services**<br><br>Numerator:<br>Number of children and adolescents with conduct disorder who received mental health treatment<br><br>Denominator:<br>All children and adolescents with conduct disorder within a defined period of time | | |

| QI definition at second Delphi survey (QI: n=22) | Panelists' comments (summarized) | Refined QI wording after second Delphi survey |
|---|---|---|
| **QI 9 new**<br>**Assertive community teams**<br><br>Proportion of mental health outpatient facilities that have assertive community teams that provide regular mental health care outside of the mental health facility<br><br>Numerator:<br>Number of mental health outpatient facilities that have an assertive community team that may but not necessarily include a psychiatrist and provide regular mental health care outside of the mental health facility, i.e. at the patients' home<br><br>Denominator:<br>Number of total population divided by 100,000. | • The term assertive community team is associated with a particular service model. Use 'multi-disciplinary community mental health teams' instead. | **QI 9 new**<br>**Multi-disciplinary community mental health teams**<br><br>Proportion of mental health outpatient facilities that have multi-disciplinary community mental health teams that provide regular mental health care outside of the mental health facility<br><br>Numerator:<br>Number of mental health outpatient facilities that have a multi-disciplinary community mental health team that may, but not necessarily, include a psychiatrist and provide regular mental health care outside of the mental health facility, i.e. at the patients' home<br><br>Denominator:<br>Number of total population divided by 100,000. |
| **Quality domain: Continuity, coordination and cooperation** | | |
| **QI 15 new**<br>**Follow-up of visits after mental health-related hospitalization**<br><br>Numerator: Number of cases with at least one psychiatric visit within 14 | • Expand the numerator to a range of 14-28 days. Many patients are followed up but later than within 14 days.<br>• Change "psychiatric or substance-related | **Follow-up of visits after mental health-related hospitalization**<br><br>Numerator: Number of cases with at least one psychiatric visit within 14 to 28 days after discharge |

| QI definition at second Delphi survey (QI: n=22) | Panelists' comments (summarized) | Refined QI wording after second Delphi survey |
|---|---|---|
| days after discharge from hospitalization (excluding discharge against advice, death, discharge due to need for acute physical healthcare).<br><br>Denominator: Number of cases hospitalized for psychiatric or substance-related disorder. | disorder" in denominator to "mental disorder" (terminology should be consistent throughout overall QI-set). | from hospitalization (excluding discharge against advice, death, discharge due to need for acute physical healthcare).<br><br>Denominator: Number of cases hospitalized for a mental disorder. |
| **Quality domain: Workforce in mental healthcare** | | |
| **QI 16 new**<br>**Human resources in mental health facilities per capita**<br><br>Number of human resources working in or for mental health facilities* per 100,000 population by profession<br><br>Numerator:<br>Number of human resources working in or for menta health facilities in full time equivalents (FTE's) differentiated by profession:<br>• Psychiatrists<br>• Psychologists<br>• Nurses<br>• Psychiatric nurses<br>• Social workers<br>• Occupational therapists | None | No revisions |

| QI definition at second Delphi survey (QI: n=22) | Panelists' comments (summarized) | Refined QI wording after second Delphi survey |
|---|---|---|
| Denominator:<br>Total number of persons in the general population divided by 100,000<br><br>*Mental hospitals, psychiatric departments in general hospitals, mental health outpatient facilities, mental health day treatment facilities, community mental health centers, non-hospital-based long-term mental healthcare facilities<br><br>(QI should be measured on national level but also on regional level to detect regional variation) | | |
| **Quality domain: Promotion of mental health, and preventing mental disorders, stigma and discrimination** | | |
| **QI 19 new**<br>**Anti-stigma movement**<br><br>Availability of an official/government supported anti-stigma movement per country (Yes/No) | • Define support and system level of the movement. | **QI 19 new**<br>**Anti-stigma movement**<br><br>Availability of an official/government practically, ideationally or financially supported anti-stigma movement per country either on a national, regional or local level. (Yes/No) |
| **Quality domain: Recovery, participation and integration of persons with mental disorders** | | |
| **QI 24 new**<br>**Assisted housing** | • This is a ratio that may be difficult to interpret. It may at a later stage be | No revisions. |

| QI definition at second Delphi survey (QI: n=22) | Panelists' comments (summarized) | Refined QI wording after second Delphi survey |
|---|---|---|
| Numerator: Number of places in assisted housing for persons with bipolar disorder and schizophrenia<br><br>Denominator: Number of persons with bipolar disorder and schizophrenia in mental hospitals or long-term facilities for longer than a year | necessary to formulate a proportion. | |
| **QI 27 new**<br>**User associations and mental health policies, plans or legislation**<br><br>Involvement of user/consumer associations in the formulation or implementation of mental health policies, plans or legislation in the last two years. (Yes/No) | • QI should focus on a formal involvement of user and carer representatives. | **QI 27 new**<br>**User associations and mental health policies, plans or legislation**<br><br>Formal involvement of user/consumer and carer representatives in the formulation or implementation of mental health policies, plans or legislation in the last two years. (Yes/No) |
| **QI 28 new**<br>**Equity**<br><br>Numerator: Number of psychiatrists, and psychiatric beds/places<br><br>Denominator: Number of people in the general population divided by 100,000 | • Psychiatrists and beds/places should be differentiated more clearly. | **QI 28 new**<br>**Equity**<br><br>Numerator<br>a. Number of psychiatric beds and places<br>b. Number of psychiatrists<br><br>Denominator: Number of people in the general population divided by 100,000 |

| QI definition at second Delphi survey (QI: n=22) | Panelists' comments (summarized) | Refined QI wording after second Delphi survey |
|---|---|---|
| (Calculate QI across country and within defined regions to capture geographical inequality) | | (Calculate QI across country and within defined regions to capture geographical inequality) |
| **QI 29 new**<br>**Integration of care**<br><br>Is there any regulation and funding in each country for the collaboration between different providers of mental health care with the goal of optimization of patient pathways? (Yes/No) | • "Goal of optimization of patient pathways" should be rephrased as it may be considered unclear. | **QI 29 new**<br>**Integration of care**<br><br>Is there any regulation and funding in each country for the collaboration between different providers of mental health care with the goal to improve continuity of mental healthcare for patients? (Yes/No) |
| **QI 30 new**<br>**Involuntary inpatient admissions**<br><br>Numerator: Number of patients with involuntary admissions to psychiatric hospitals and psychiatric departments<br><br>Denominator: All admissions of patients to psychiatric hospitals and psychiatric departments | None | No revisions. |

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