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SPECIAL PAPER

Mental health information systems in resource-challenged countries: experiences from India

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Mental health information systems are increasingly being used to measure the effectiveness of mental health interventions. Little or no data is available for mental health service availability and service uptake in low- and middle-income countries. Through a narrative review, this paper illustrates the importance of routine monitoring data and suggests methods for developing, implementing and evaluating mental health indicators in low- and middle-income countries with a primary focus on India.

Only 2% of people with mental disorders in low- and middle-income countries (LMICs) – where 85% of the world's population lives – receive treatment (Eaton *et al*, 2011). In India, one in ten people receive evidence-based interventions for such disorders (Charlson *et al*, 2016) and for every 100 000 people in India there are 0.6 mental health professionals, delivering care through mental hospitals (43 in the country) and primary care settings (WHO, 2011). Less than 1% of the national healthcare budget is allocated to mental health in countries such as India and China (Patel *et al*, 2016). In India, even with a favourable policy environment and a national programme in

place, there is poor service provision and therefore negligible data available for future planning, implementation and research (Shidhaye *et al*, 2015). In an effort to decrease the 'gap between the true prevalence of a disorder and the number of affected people who receive treatment – called the 'treatment gap' – the scaling up of mental health services has been advocated in LMICs. Scalability implies the capacity to expand a health intervention to a large scale without reducing its effectiveness. However, insufficient evaluation of how best to deliver services and poor availability of adequate information for decision making are hindering the scaling up of mental health services in LMICs (Eaton *et al*, 2011).

Mental health information systems (MHIS), used for measuring and managing mental health service delivery, have become increasingly important in improving the effectiveness of mental healthcare (Jordans *et al*, 2016). Health management information systems (HMIS), including those for mental health, ensure the collection, processing and reporting of data and are specifically designed to assist health management policy and planning (WHO, 2004).

These systems are described as the building blocks of a health system and they can consistently provide accurate information enabling planning and evaluation of mental health service delivery (WHO, 2004). Furthermore, when combined with

epidemiological surveys, routine monitoring data can be used to measure the proportion of people receiving mental health services in relation to the number of people in need of those services to estimate treatment coverage; an important measure of mental health system performance (De Silva *et al*, 2014).

In the above context, this paper illustrates the importance of MHIS for low resource settings and presents possible measures for improving the implementation of mental health indicators, given the complex nature of health systems in LMICs. This paper draws perspectives from various LMICs and uses the Indian health system as a primary example. A narrative review has been undertaken to synthesise evidence for this special issue paper. Secondary literature available on the subject was reviewed from government reports, policy briefs, academic articles, and reports prepared by non-governmental organisations and government bodies.

Momentum for better information in global mental health

The World Health Organization (WHO) has published the Mental Health Global Action Plan for 2013–2020 (WHO, 2013). One of its four objectives focuses on evidence-informed decision making through strengthening of information systems. Its target is for most (80%) of the member states to report core mental health indicators through their routine monitoring systems by 2020.

Previous research has indicated that mental health information is often of the lowest priority in HMIS within LMICs. Mental health indicators are either absent or minimally included in routine health monitoring and are generally confined to out-patient attendance and in-patient occupancy rate (Jordans *et al*, 2016). To elaborate on the WHO Global Action Plan, Chisholm *et al* (2007) and Jordans *et al* (2016) have developed a list of indicators for MHIS. Tools such as the WHO Assessment Instrument for Mental Health Systems (WHO-AIMS) and the WHO Mental Health Atlas are used periodically to assess the progress towards internationally agreed goals by WHO member states (WHO, 2005). These tools not only assess the extent of service availability but also map data on resources, governance and information systems.

These initiatives have led to an increased availability of information about mental health systems at the country level. With the publication of the WHO Mental Health Atlas in 2001, 60% of countries reported a set of five core indicators that covered mental health policy and law, promotion and prevention programmes, service availability and mental health workforce (WHO, 2014). Many countries have reported an increase in mental health policy and plan formulation since the inception of the WHO Mental Health Atlas in 2001. Overall, calls are mounting on the United Nations to include mental health targets, measurable indicators on suicide, service availability and

uptake for mental disorders, for example from the FundaMentalSDG initiative (Thornicroft & Patel, 2014).

Through these initiatives, mental health data are reported at the country level through public and private health facilities and through general health statistics. Although for the year 2011–13 the response rate from LMICs for the WHO Atlas was 80%, only 31% came from public health information systems (WHO, 2014). For India, the WHO Atlas reports from 2001 to 2014 suggest a modest increase in the number of mental health policies and plans, even though mental health service uptake remains unreported. There is hardly any evidence in the literature that suggests that mental health outcomes improve due to the strengthening of MHIS. However, in other programmes such as immunisation, a 15.2% increase in fully immunised children was observed after HMIS-informed tools such as the Regular Appraisal of Performance of Immunization in District (RAPID) were introduced to the system. Such results led to the upscaling of the RAPID intervention throughout many districts in Jharkhand, India (Strachan *et al*, 2013).

Historically, mental health service provision has emerged from the deinstitutionalisation of hospital-based care, i.e. from treatment in general and mental hospitals to services delivered through primary care facilities and community-based care. Strong evidence exists in the literature for integrating mental health with general health services at the primary level (Lund *et al*, 2012). This integration requires the development of shared systems with which to generate, compile and analyse data. In countries such as Ghana and South Africa, integration of routine monitoring for mental health and other services has been achieved within hospital settings and at the district health information system level, respectively (Ahuja *et al*, 2016). However, information on delivering mental health services at the level of primary care and community care is collected in fewer countries. With an increasing focus on integrated mental health service provision at the primary level, obtaining indicators that are disaggregated by primary, secondary and tertiary levels is essential. There are constraints on the extent to which the WHO Mental Health Atlas and similar initiatives such as WHO-AIMS can provide us with exhaustive data. For example in countries such as India, WHO-AIMS covers only two states within the country (Uttarakhand and Gujarat). Such country and state level data are both less representative and less informative for district level planning.

Resource constraints also hinder the monitoring of information systems by preventing the generation of much needed evidence that could directly inform service delivery. For instance, a recent situational analysis from Madhya Pradesh – a state in India with relatively poor health indicators and high rates of poverty – reported that mental health indicators only classify disorders into minor,

moderate and severe categories rather than employ ICD-10 (1992) classifications (Shidhaye *et al*, 2015). This indicates a weak HMIS at the district level (and below). This has been attributed to a lack of human resources and expertise in designing and monitoring data collection strategies. As illustrated by these examples, vigorous methods are clearly required to monitor MHIS at each level of the health system, which will then enhance service delivery.

Despite the gaps and inconsistencies in HMIS, efforts are underway in India to develop, implement and evaluate indicators for mental health (Jacob *et al*, 2007). One promising example comes from a community mental health project, called the Mental Health and Poverty Project (MHAPP, 2005–2010), in which mental health indicators that can be collected through routine information systems were developed and implemented in Ghana, Zambia, Uganda and South Africa (Ahuja *et al*, 2016). Coordination between stakeholders in the design phase and supervision and facilitation in the implementation cycle has been highlighted for overcoming implementation challenges in Ghana and South Africa.

Not only do HMIS ease the data extraction process (WHO, 2004), but upgrading them can be a lucrative investment. The cost effectiveness of investing in HMIS has been demonstrated in Tanzania. Conservative estimates show that as a result of better resource allocation resulting from the new HMIS, Tanzania gained USD68.50 per disability-adjusted life year for child health (Stanfield *et al*, 2006).

Even though the use of HMIS in planning is unequivocally beneficial, challenges in terms of data completeness, accuracy and use persist in LMICs. In established programmes such as maternal and child health, recording systems suffered poor quality, over-reporting, selective misuse and incompleteness (Verma & Prinja, 2007).

In many health programmes, highlighted challenges relate to additional staff responsibilities (Sharma *et al*, 2016) and procedural issues that lead to minimal use of the data despite the efforts required to collect them. Aqil *et al* (2009) argue that these factors have contributed to HMIS being seen as time consuming and ineffective in LMICs, and suggest that household surveys should be conducted to obtain a less biased result.

Indeed, enormous challenges exist for the implementation of HMIS in many LMICs (Ahuja *et al*, 2016). These challenges are not just related to developing appropriate indicators. As seen in the examples above, these challenges also arise from poor monitoring of routine data. In India, efforts are being made to improve the quality of HMIS data for other types of health services that are considered higher priority, such as maternal and child health (e.g. Sharma *et al*, 2016), but such attempts are still lacking for mental health, partly due to the lack of MHIS on the ground or vice versa. However, in research projects such as Emerald, continuous monitoring of case records is assisting in the implementation of mental health indicators (Jordans *et al*, 2016).

Evaluation of MHIS

There is considerable literature on the evaluation of data systems for health, for example the Framework and Standards for Country Health Information Systems developed by the WHO's Health Metrics Network, and other evaluation frameworks such as the Guideline for Good Evaluation Practice in Health Informatics (GEP-HI) by the Medical Informatics Association (Ahuja *et al*, 2016). Evaluation research has emerged from assessing human elements of HMIS implementation, such as the effect of decision support systems on doctors' performance (Hunt *et al*, 1988), as well as from more recent frameworks where performance is assessed by incorporating the technological, organisational, human and behavioural aspects of an HMIS. For instance, the Routine Information System Management framework has been adapted at the national level in Pakistan, Haiti, Mexico, China and South Africa (Aqil *et al*, 2009). The Human, Organization, and Technology–Fit model has also been used in evaluating data from an imaging system at the primary care level in the UK (Aqil *et al*, 2009). Methodologies such as cross-sectional household surveys have been used to assess the completeness and quality of HMIS data for reproductive child health services in states like Haryana in India (Sharma *et al*, 2016). The design and implementation of MHIS has been examined in greater depth elsewhere (Ahuja *et al*, 2016) but less research has been conducted into developing robust monitoring and evaluation methods for the mental health data systems themselves. This would improve their implementation on an ongoing basis and assist in upscaling mental health service delivery.

Conclusion

In conclusion, policies, plans and laws exist in many countries – India included – to prevent and reduce the mental health burden. Cross-country level tools such as the WHO Mental Health Atlas or WHO-AIMS are not sufficient to assess progress made by countries given the complexity of their health systems. MHIS can be used to measure the quality of services delivered to inform policy and planning decisions. To assess the performance of mental health programmes, coordinated action is needed to map existing monitoring efforts and develop common indicators for routine monitoring and evaluation in LMICs. Common assessment platforms at the cross-country and country levels can enable joint advocacy measures. At the country level, new methods to track performance at various levels of the health system (such as at primary, secondary and tertiary care level) can and should be explored. International agreements require countries to report data on core mental health indicators in formats that can enable comparison and

assessment relative to agreed targets. If, as hoped, indicators for mental health are included within the sustainable development goals for 2015–2030, these would provide a valuable cross-country framework to encourage data collection. At the inception stage, national, state and district level MHIS should be routinely monitored and evaluated. It is pertinent to emphasise both the process of MHIS implementation (such as availability of data collection forms) as well as outcomes (such as effective coverage) during evaluation. The need for convergent actions from planners, implementers and researchers towards prioritising monitoring and evaluation of mental health data systems cannot be over-emphasised.

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PANDORA'S BOX

Pandora searches the world literature for evidence, news and other sources on matters of interest (doesn't shy away from controversy) to bring to the reader. She welcomes comments

Beware! Dim light can make you a dimwit!

We all know that the short days in wintertime can make us depressed, and that extending the daylight period by daily exposure to bright light can restore normal mood. We also know that bright lighting improves cognitive performance in the young and in adults, as well as in the early stages of dementia. We didn't know, however, at least until now, how this happens.

Grass rats (who experience similar diurnal variations to humans) placed in dim light (50 lux) showed impaired spatial memory after 4 weeks, compared with those placed in bright light (1000 lux). The deficit was remedied when the rats were placed in bright lighting conditions for another 4 weeks. Under the dim lighting conditions, brain-derived neurotrophin – which is important in brain neuroplasticity – was decreased in the hippocampus, and there were associated neuronal changes, with a reduction in dendritic spine