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Using mobile phone surveys to measure **levels, trends, and disparities in mental health**

This Policy Brief summarizes and presents policy recommendations based on research in "**Measurement of population mental health: Evidence from mobile phone survey in India,**" a research paper by Diane Coffey, Payal Hathi, Nazar Khalid and Amit Thorat. Read the full paper at riceinstitute.org.

This brief draws on Social Attitudes Research, India (SARI), a mobile phone survey that interviews adults aged 18 to 65. In Bihar, Jharkhand, & Maharashtra, SARI measured respondents' mental health using two different sets of questions. This is the first time a survey has measured population mental health in India with a phone survey.

key findings:

- Mobile phone surveys can provide a valuable medium through which to incorporate mental health measurement into population level surveys.
- Ask about physical symptoms of poor mental health, such as in the Self-Reporting Questionnaire, rather than emotional ones, such as in the Kessler-6. Those who are vulnerable to poor mental health, including women, older adults, poor and less educated find it difficult to respond to Kessler-6 on the phone.

action steps:

- Incorporate mental health questions into mobile phone surveys to to measure levels, trends, and disparities in the mental health of populations. Ensure the sample size is large enough to capture disparities in the mental health of different social groups.

Background

Measuring mental health in low and middle-income countries

Measurement of population mental health is uncommon in low- and middle-income countries (LMICs). In the face of high mortality rates and widespread infectious disease in LMICs, it is not unreasonable for governments and researchers to prioritize measuring physical health. The high cost of face-to-face data collection is another reason that mental health often goes unmeasured.

However, as data becomes increasingly less costly to collect, there are emerging opportunities to measure, understand, and address poor mental health in LMICs. In particular, the project of measuring population mental health may be facilitated by the use of mobile phone surveys, which are less costly than face-to-face surveys.

According to India's National Mental Health Survey (NMHS) 2015-16, which collected information in 12 states, nearly 10% of the population suffered from common mental disorders (CMDs) such as anxiety, depression and substance use. At the same time, many community-level studies in India have found much higher rates of poor mental health compared to the NMHS. Women, those with lower educational levels, Muslims, lower castes and poor people often report worse mental health outcomes.

With India's household level mobile phone coverage now over 90%, mobile phone survey methods are a promising way to measure population mental health.[1] The Social Attitudes Research, India (SARI) tests the performance of two different questionnaires to measure mental health using phones for data collection.

[1] Leo et al 2015 find that representative samples are increasingly attainable in phone surveys in the developing country context.

Key findings

Asking about mental health in a phone survey

The goal of this research is to assess the performance of two mental health questionnaires in a population representative mobile phone survey of Bihar, Jharkhand and Maharashtra. The Self-Reported Questionnaire (SRQ), developed by the World Health Organization (WHO), focuses on physical symptoms that are easy to understand and has been shown to detect CMDs with reasonable accuracy. The second questionnaire, the Kessler-6, is designed to measure psychological distress based on questions related to respondents' emotional states. It was developed by the researchers in the United States.[2]

In SARI, respondents were randomly assigned to receive an adapted version of the SRQ questions or an adapted version of the Kessler-6 questions: answer options for the Kessler-6 questionnaire were reduced from five to three and only six out of 20 questions were selected from the original SRQ.

Table 1 lists the questions that were asked in SARI. Answers to SRQ questions were recorded either as "yes" or "no" while those of Kessler-6 were recorded as "always", "sometimes" or "never".

Table 1: adapted SRQ and Kessler questions

SRQ -Is your appetite poor? -Do you have trouble sleeping? -Do you have trouble thinking clearly -Do you find it difficult to make decisions? -Do you feel tired at all times? -Has the thought of ending your life been on your mind?
Kessler About how often during past 30 days did you feel -nervous -hopeless -worthless -restless or fidgety -that everything was an effort -depressed that nothing could cheer you up

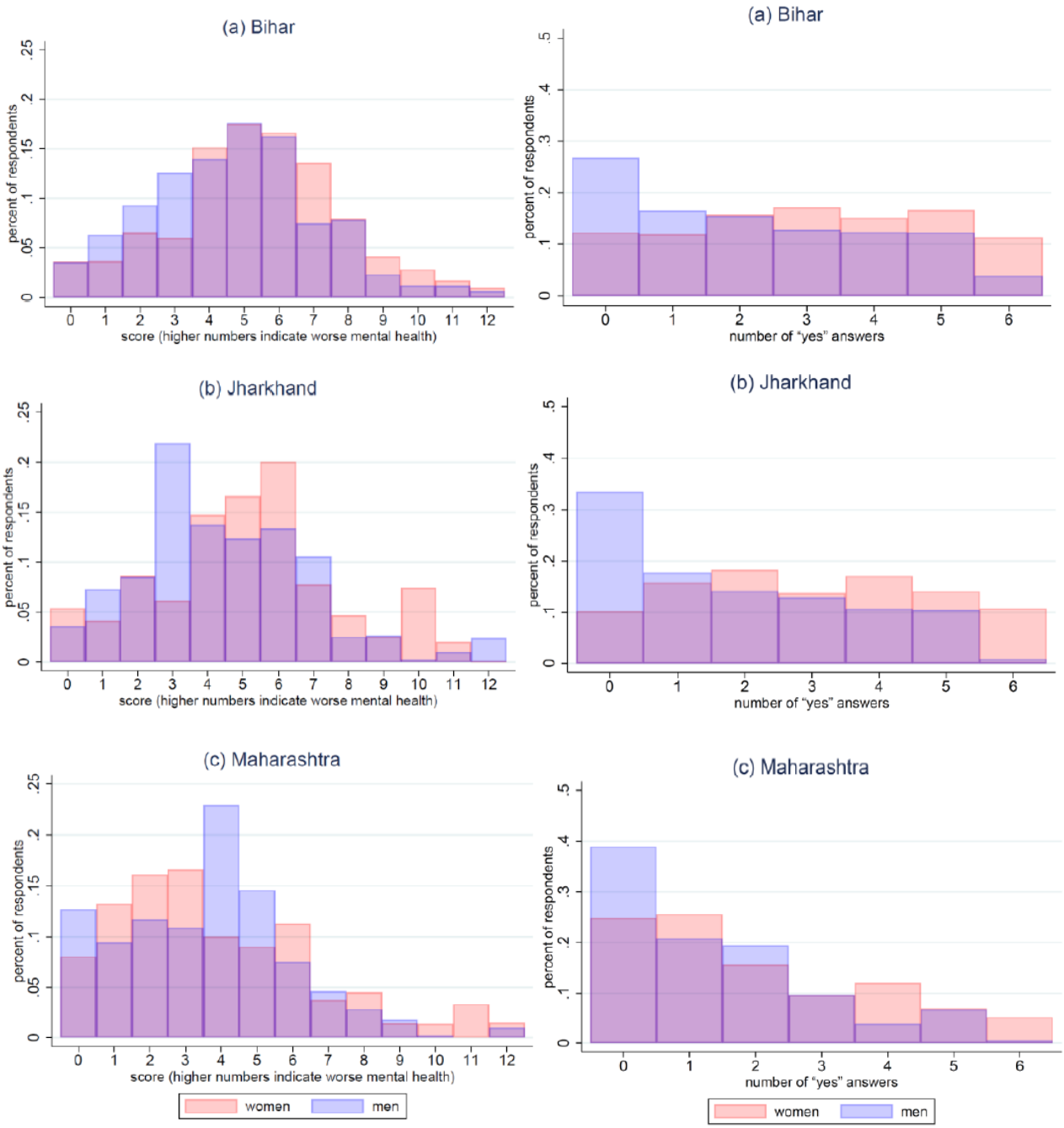
[2] Kessler et al 2003 describes the development of the SRQ, which has been validated in various low- and middle-income country contexts.

General trends in mental health

Significant social and economic disparities exist between Maharashtra on one hand and Bihar and Jharkhand on the other. In particular, Maharashtra has lower levels of caste and gender discrimination, and individuals there are, on average, healthier, richer, and better educated compared to Bihar and Jharkhand. Prior research has shown that all these factors are negatively correlated with mental health outcomes among the population. In addition, Bihar and Jharkhand also have higher Muslim and lower caste populations, both of which are populations shown to have worse mental health outcomes.[3]

Both the adapted SRQ and Kessler-6 identify regional disparities in mental health consistent with these differences in human development measures and various community studies: both questionnaires find

Figure 1: mental health scores by sex



[3] Gupta & Coffey 2019 describe mental health gaps between low-caste and Muslim individuals compared to upper caste Hindus, and show that they persist even after accounting for differences in socioeconomic status.

worse mental health among people in Bihar and Jharkhand compared to Maharashtra.

Prior studies find that across different countries, women are shown to have worse mental health outcomes than men.[4] Figure 1 below shows histograms for the mental health score by sex, covering both of the questionnaires used in SARI and splits the results out by state. SRQ classified women as having worse mental health outcomes than men in each state.

In the paper, we find that SRQ more often identifies disparities by education: across states, the difference between a person with no education and one with 13 or more years of education is more consistently apparent in the SRQ than in the Kessler-6. However, neither questionnaire captures correlations between caste and religion and mental health that have been identified by prior literature.

SRQ achieves higher response rates

In order to understand how well a questionnaire performed, we consider the proportion of respondents who answered all metal health questions. Table 2 shows the response rates separately for each questionnaire. It is clear that the adapted SRQ has higher response rates than the adapted Kessler across all three states.

table 2: response rates by questionnaire & state

	Adapted SRQ	Adapted Kessler
Bihar	93	76
Jharkhand	89	73
Maharashtra	95	87
Sample Size	2903	2964

There are some compelling reasons why the response rate for adapted SRQ is higher. The fact that SRQ questions required respondents to answer either "yes" or "no" made it easier for them to respond. The nature of the questions in each questionnaire is also crucial. In adapted Kessler-6, the questions are related to emotions, which may be difficult for people to express. For instance, research has shown that there may be stigma associated with expressing emotional problems.[5] Moreover, asking emotional questions requires interviewers to give substantial explanations about what the question is asking, and what the differences are between the different emotions (nervous/ hopeless/ restless/ depressed/ etc.), which slows the survey and frustrates respondents.

In the case of the adapted SRQ, respondents are more forthcoming with answers as the questions are related to physical symptoms. We hypothesize that physical symptoms, like those asked in the SRQ, may be more likely to be part of day-to-day conversations than emotional symptoms.

Kessler suffers from selective non-response

A questionnaire suffers from selective non-response if people with certain characteristics are less likely to respond to them. We find that selective non-response is more pronounced for the Kessler-6 than for the SRQ.

Women and older adults (ages 45-65) are more likely not to respond compared to men and younger adults; likewise, individuals with less years of education (fewer than 8 years) and those living in households with less than 2 assets are more likely to be non-respondents.

Policy implications

Mental health remains under researched relative to its high prevalence and the hardship that it causes. Therefore, it is an important and urgent goal to include appropriate mental health questions in nationally representative population health surveys to advocate for better mental health services and track changes in mental health.

The findings of this study contribute to efforts to measure levels, trends, and disparities in the mental health of populations in two ways. First, it shows that mobile phone surveys may be a valuable medium through which to incorporate mental health

[4] Across different country contexts, including India, Chile, Brazil, Zimbabwe, Russia, Ghana, and Mexico, Patel et al 1999, Anand 2015, and Das et al 2012 all find that women report worse mental health than men.

[5] For example, Raguram et al. (1996) finds that patients in Bangalore view reporting depressive symptoms, but not somatic symptoms, as socially disadvantageous because physical symptoms seem similar to illnesses that even people in good mental health could experience. Similarly, Pereira et al (2007) show that women diagnosed with depression expressed their problems primarily through somatic complaints.

measurement into population level surveys. Second, it shows that it may be better to ask about physical symptoms rather than emotional ones. It may also be advisable to avoid phone survey measurements of mental health with emotion-based questionnaires in countries like India until vulnerable populations are found to respond at similar rates to others.

Finally, the absence of association between mental health and caste and religion in SARI data maybe due to small sample sizes. In order to better understand how membership in different caste and religious groups relates to mental health in India, surveys with both larger samples and a wider array of mental health questions are needed.

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