

Commentary

Validity of self-reported morbidity

Measurement of health status has been done historically using a variety of measures. More objective measures, which take an “etic” perspective¹, are performed by the clinicians on an individual basis. These methods rely on clinical assessments which may be supplemented with diagnostic investigations. However, application of these methods is often not possible in population based surveys due to logistic constraints. In such a situation, researchers have often relied on individual’s own assessment of health status, also referred to as self-reported health (SRH), which is considered to be a ‘subjective’ assessment. One of the most commonly used questions in such surveys is “how is your health in general”²? In order to do away with the bias related to binary response to this question, responses are often ordered on a 5-point scale ranging from “very poor” to “excellent”.

Self reports have been used extensively in both developed and developing countries³. Large scale demographic health surveys (DHS) have used self reported morbidity (SRM) for estimating prevalence of maternal and childhood related illnesses. In India, a number of surveys conducted by National Sample Survey Organization (NSSO) and National Centre for Applied Economic Research (NCAER) have also relied on the use of SRH⁴. Some cross-sectional surveys have also used this approach^{5,6}. These surveys report the prevalence, pattern and demographic correlates of morbidity, the type of care accessed and the cost of treatment⁴.

Community based surveys have also used self-reports for assessment of risk factors leading to ill-health⁷. More specifically, such surveys have been employed for assessing behavioural risk factors for HIV/AIDS and non-communicable diseases (NCDs). Three large scale behavioural surveys have been done by the National AIDS Control Programme, while the NCD risk factor surveillance has been initiated by the

Indian Council of Medical Research on a pilot basis under the Integrated Disease Surveillance Programme (IDSP) in seven States of India⁸. Health economists, public health researchers and social scientists have used self-reported morbidity to examine equity issues, *i.e.*, analysis has been done by income, gender, caste, region, ethnicity *etc*^{9,10}. Self-reported morbidity is also used for estimation of the demand for health care services and treatment costs. We have reported the cost of universalizing health care in India, based on the estimated demand for health care services from self-reported morbidity in the NSSO survey¹¹. Self reports have also been used in evaluating the effectiveness of interventions in clinical and community settings, using a pre- and post-intervention design^{12,13}.

In spite of the large scale use of self reports in population surveys validity of SRH or SRM has been continuously put to question. Proponents of SRH/SRM support its usage by highlighting it as a tool which has stability, consistency and good test retest reliability². It has been especially recommended for population studies when individual level data are not available. And it also finds a place in different bio-psychosocial constructs that are not captured by many other tools¹⁴. SRM has been found to be significantly associated with all the 6 patient reported outcomes, *i.e.*, general health status, physical well-being, emotional well-being, fewer financial constraints, less overwhelmed and self-efficacy as compared to other tools¹⁵. Association of SRH has been established with mortality in almost 100 population level studies conducted across different age groups, gender, cultures, and ethnicities^{2,16}. SRH emerges as a constant predictor of mortality in different population groups and is also used to identify people at increased risk of death. Self-reporting has also been shown to be able to detect changes in health status as a result of a health promoting intervention and hence its use in health impact assessment has been advocated¹³.

Amartya Sen has highlighted the limitation of self reports in case of Indian States¹⁷, which have very diverse medical conditions, mortality rates, educational achievements, *etc.* The State of Kerala which has the highest levels of literacy (nearly universal for the young) and longevity (a life expectancy of about 74 years) has the highest rate of self-reported morbidity among all Indian States. At the other extreme, Bihar, which has low longevity, and performs poor in terms of medical and educational facilities, has the lowest rates of reported morbidity. Indeed, the rate of self reported morbidity runs almost fully in the opposite direction to life expectancy, in inter-State comparisons. Sen explains this situation in terms of what he calls 'positional objectivity', *i.e.*, the 'position' of the individual matters (in terms of education, income, *etc.*) in responding to questions related to self report¹⁸. According to him, an individual's assessment of his/her health is directly contingent on the social experience; socially disadvantaged individuals fail to perceive and report the presence of illness or health deficits. For instance, an individual with no formal knowledge of diseases but residing in an area with substantial disease burden that has inadequate social facilities may be inclined to perceive disease symptoms as "normal" given his/her lack of awareness, and therefore, health expectations. Sen, therefore, reasons that perceptions and self-reports of health - which he refers to as the "internal" view of health can be "extremely misleading" as these obscure the true extent of health deprivation more likely to be captured through "objective" or "external" assessments¹⁷. However, contrary to the thesis put forth by Sen, analysis from two rounds of the National Family Health Survey and National Sample Survey by Subramanian *et al*¹⁹ shows that the use of self-rated ill-health has face validity as assessed via its relationship with the socio-economic status.

Another possible explanation of the dichotomy between observed (life expectancy) and self reported morbidity levels between Kerala and Bihar - two developmentally disparate communities - could be the stage of epidemiological transition. While Kerala is experiencing chronic non-communicable diseases, Bihar is still grappling with communicable diseases. Due to chronic nature of NCDs, there is a likelihood of increased reporting of morbidity in Kerala. This is supported by the fact that communicable diseases among children and reproductive health problems among women are reported more in Bihar than in Kerala²⁰. Further, an analysis of NSSO data from Kerala shows that acute ailments are reported to be similar in richest and poorest households⁵. On the

other hand, the richest 25 per cent population report 2.4 times higher chronic ailments than the poorest. Hence, advancement of epidemiological transition resulting in higher prevalence of NCDs in Kerala could explain higher self-reported morbidity in Kerala than in Bihar.

Self reporting of behavioural risk factors pose problems related to 'social desirability bias'. People are likely to respond in a way which is socially desirable, when interviewed face-to-face. As an illustration, there is a bias towards higher reporting of personal hygiene measures, lower reporting of risky sexual behaviour, *etc.* However, in a study from south India, a insignificant difference of 8-11 per cent in condom use during last sex was found when results from face-to-face interview were compared with a confidential polling booth method²¹. Confidential methods such as audio-assisted method or a polling booth method have been tried in settings where social desirability bias is suspected to be high²².

The interpretation of results from self reports can be improved by the use of case studies or vignettes²³. A vignette is a description of a health state that respondents are asked to evaluate with respect to the same question and on the same categorical response scale as the main self-report question. A vignette depicts a health state's domain, so that for that vignette, differences in responses across socio-demographic or regional groups may be attributed to differences in cut-points for the response categories. The response category cut-points are estimated by use of a statistical model - the hierarchical ordered probit (HOPIT) model, through a maximum likelihood procedure. These cut-point estimates are then used to calibrate the respondent's own self-report in order to make it usable for cross-population comparison. If, for example, respondents from a certain population group systematically give higher categorical responses to the vignettes than respondents from another group, this will show up as a lower cut-point for the first group in the HOPIT estimation. This calibration can also be done by using a measured test; however, the former method of vignettes has been preferred due to logistic and analytical reasons.

A second way of overcoming the problem of positional objectivity in self reported health data involves use of 'decomposition analysis'. This regression-based method of inequality assessment helps to decompose the observed inequality into its determinants, and provides the extent of inequality which is legitimate and illegitimate²⁴. Jain *et al*²⁵ in their analysis show that bivariate results on self-reported obstetric morbidity data are misleading in the

measurement of socio-economic differentials, as these failed to show existing socio-economic variations in obstetric morbidities by socio-economic standing of women. However, decomposition analysis shows that the prevalence of obstetric complications is greater among disadvantaged groups.

In conclusion, SRH/SRM remains one of the most widely used methods in clinical, public health, social and economic research. Its validity in terms of measuring ill-health, future mortality and impact of interventions aimed at improving population health has been established in different studies^{2,16}. However, doubts have been raised related to cross-population comparisons, which emanates from the objectivity of a person's judgement of his/her health. Use of vignettes during data collection and decomposition analysis at the analysis stage can be used for making valid comparisons among population sub-groups. Testing the role of epidemiological transition in attribution of differences in self reported morbidity remains a key area for future research.

**Shankar Prinja, Gursimer Jeet
& Rajesh Kumar***

School of Public Health
Postgraduate Institute of
Medical Education & Research
Chandigarh 160 012, India

*For correspondence:
dr.rajeshkumar@gmail.com

References

1. Tseng WS, editor. *Handbook of cultural psychiatry*. San Diego, California: Academic Press; 2001.
2. Idler EL, Benyamini Y. Self-rated health and mortality: a review of twenty-seven community studies. *J Health Soc Behav* 1997; 38 : 21-37.
3. Rogers RG, Crimmins EM, editors. *International handbook of adult mortality*. 1st ed. Dordrecht: Springer; 2011.
4. Gumber A, Berman P. Measurement and pattern of morbidity and the utilization of health services: some emerging issues from recent health interview surveys in India. *J Health Popul Dev Ctries* 1997; 1 : 16-43.
5. Dilip TR. Understanding levels of morbidity and hospitalization in Kerala, India. *Bull World Health Organ* 2002; 80 : 746-51.
6. Dilip TR. Age-specific analysis of reported morbidity in Kerala, India. *World Health Popul* 2007; 9 : 98-108.
7. Heistaro S, Laatikainen T, Vartiainen E, Puska P, Uutela A, Pokusajeva S, et al. Self-reported health in the Republic of Karelia, Russia and in north Karelia, Finland in 1992. *Eur J Public Health* 2001; 11 : 74-80.
8. NACO. *National Behavioural Surveillance Survey (BSS) 2006: Female sex workers (FSWs) and their clients*. New Delhi: National AIDS Control Organization (NACO), Ministry of Health and Family Welfare; 2006.
9. Kondo N, Sembajwe G, Kawachi I, van Dam RM, Subramanian SV, Yamagata Z. Income inequality, mortality, and self rated health: meta-analysis of multilevel studies. *BMJ* 2009; 339 : b4471.
10. Imlach Gunasekara F, Carter KN, Liu I, Richardson K, Blakely T. The relationship between income and health using longitudinal data from New Zealand. *J Epidemiol Commun Health* 2011; 66 : e12.
11. Prinja S, Bahuguna P, Pinto AD, Bharaj G, Sharma A, Kumar V, et al. The cost of universal health care in India: a model-based estimate. *PLoS One* 2012; 7 : e30362.
12. Perruccio AV, Davis AM, Hogg-Johnson S, Badley EM. Importance of self-rated health and mental well-being in predicting health outcomes following total joint replacement surgery for osteoarthritis. *Arthritis Care Res (Hoboken)* 2011; 63 : 973-81.
13. Perruccio AV, Badley EM, Hogg-Johnson S, Davis AM. Characterizing self-rated health during a period of changing health status. *Soc Sci Med* 2010; 71 : 1636-43.
14. Bayliss EA, Ellis JL, Steiner JF. Seniors' self-reported multimorbidity captured biopsychosocial factors not incorporated into two other data-based morbidity measures. *J Clin Epidemiol* 2009; 62 : 550-7.e1.
15. Bayliss EA, Ellis JL, Shoup JA, Zeng C, McQuillan DB, Steiner JF. Association of patient-centered outcomes with patient-reported and ICD-9-based morbidity measures. *Ann Fam Med* 2012; 10 : 126-33.
16. DeSalvo KB, Fan VS, McDonell MB, Fihn SD. Predicting mortality and healthcare utilization with a single question. *Health Serv Res* 2005; 40 : 1234-46.
17. Sen A. Health: perception versus observation. *BMJ* 2002; 324 : 860-1.
18. Sen A. Positional objectivity. *Philos Public Affairs* 1993; 22 : 126-45.
19. Subramanian SV, Subramanyam MA, Selvaraj S, Kawachi I. Are self-reports of health and morbidities in developing countries misleading? Evidence from India. *Soc Sci Med* 2009; 68 : 260-5.
20. IIPS and Macro International. *National Family Health Survey (NFHS-3) 2005-06*. Mumbai: International Institute for Population Sciences (IIPS) and Macro International; 2007.
21. Hanck SE, Blankenship KM, Irwin KS, West BS, Kershaw T. Assessment of self-reported sexual behavior and condom use among female sex workers in India using a polling box approach: a preliminary report. *Sex Transm Dis* 2008; 35 : 489-94.
22. Lenka SR, Thakur JS, Jha P, Kumar R. Performance of audio-assisted confidential voting interview for assessment of sexual behavior among young adults in Chandigarh Union Territory. *Indian J Public Health* 2011; 55 : 30-3.
23. Weller S, Davis K. Condom effectiveness in reducing heterosexual HIV transmission. *Cochrane Database Syst Rev* 2002(1): CD003255.
24. O'Donnell O, van Doorslaer E, Wagstaff A, Lindelöw M. *Analyzing health equity using household survey data: a guide to techniques and their implementation*. Washington, DC: The World Bank; 2007.
25. Jain K, Goli S, Arokiasamy P. Are self reported morbidities deceptive in measuring socio-economic inequalities. *Indian J Med Res* 2012; 136 : 750-7.