

Disability-based disparity in outpatient health system responsiveness among the older adults in low- to upper-middle-income countries

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Accepted on 13 February 2019

Abstract

Health system responsiveness (HSR) has been identified as one of the intrinsic goals of health systems for improvement in health and well-being of population. The HSR deals with the non-medical, legitimate expectations of a population in its interaction with the health system. It becomes essential in case of vulnerable groups like older adults with disability, who are more sensitive and risk-prone to the adversities of healthcare challenges. This paper uses data from the Study on Global Ageing and Adult Health conducted in China, Ghana, India, Mexico, Russia and South Africa during 2007–10 and examines the disability-based disparity in outpatient HSR among the older adults in the above-mentioned countries. Disability and HSR scores have been constructed using Item Response Theory Partial Credit Model. Also, the paper uses bivariate and multivariate analysis and finds that the HSR is significantly and substantially lower among the disabled and severely disabled older adults in all the study countries (except Ghana) as compared with those older adults who are not (or mildly) suffering from any form of disability. The policy efforts in the studied countries should focus on monitoring and reducing these disparities for improving HSR in order to make it inclusive.

Keywords: Disability-based disparity, health system responsiveness, older adults, SAGE, low- and middle-income countries

Key Messages

- This paper uses data from the Study on Global Ageing and Adult Health conducted in China, Ghana, India, Mexico, Russia and South Africa during 2007–10 and examines the disability-based disparity in health system responsiveness (HSR) among the older adults in the above-mentioned countries.
- HSR is significantly and substantially lower among the disabled and severely disabled older adults in all the study countries (except Ghana) as compared with those older adults who are not (or mildly) suffering from any form of disability.
- The policy efforts in China, India, Mexico, Russia and South Africa should focus on monitoring and reducing disability-based disparities for improving HSR in order to make it inclusive

Introduction

‘Health System Responsiveness’ (HSR) has been recognized as one of the essential goals of healthcare systems, alongside outcomes of health and fairness in the financial contributions [World Health

Organization (WHO), 2000]. It relates to health system’s ability to respond to the legitimate expectations of potential users about non-health enhancing aspects of care (Murray and Frenk, 2000). It can also be described as the environment in which the patients are

treated and the way in which patients are treated, encompassing the view of a patient's experience of communication with the health system (Valentine *et al.*, 2003). The concept of HSR can also be envisaged as a tool to study the response of health system for the non-medical, legitimate expectations of a population in its interactions with the health system (Darby *et al.*, 2000). Further, the concept has been categorized into two parts where the first part focuses on the respect, autonomy, confidentiality and the clarity of communication between the receivers and the service providers (Murray and Frenk, 2000), whereas, the later part emphasizes on access, amenities, support and client orientation (Murray and Frenk, 1999). Over the years, the HSR has also been conceptualized as an integrated approach by the WHO to engrain it among the existing health systems (Valentine *et al.*, 2003).

Talking about the integrated approach, the WHO has operationalized the integrated framework of HSR through measurement across eight domains that aim to differentiate between aspects of health systems related to how the system meets the needs of patients as clients of the system (e.g. quality of healthcare facilities) and aspects connected to the rights of individuals as human beings (e.g. domain of dignity; Valentine *et al.*, 2003; Robone *et al.*, 2011). This is relatively a new development because earlier, the HSR was evaluated in terms of traditional indicators, such as mortality, morbidity and utilization statistics apart from health system functioning. Although the holistic concept of HSR is still at an early phase of development, it embraces facets of respect of human rights, such as, respecting patient autonomy and self-respect, in addition to interpersonal aspects of care, such as the quality of basic facilities. Seen in this light, the existing scholarship also indicates that the patients' experience and personnel satisfaction are considerably important and have a substantial impact on improvement of quality of healthcare services and better responsiveness of the healthcare (Ware, 1995).

Given the discourse on the HSR and human rights, it is a basic agreed principle of public health that all individuals of a society should have a right to access dignified healthcare (Mann *et al.*, 1999). However, the above principle generally does not hold in most of the societies specially the developing ones where the equality between marginalized and non-marginalized groups can be questioned as far as the right to better HSR is concerned (Jones *et al.*, 2011; Malhotra and Do, 2013). That said the disparities in HSR and its consequences affect the marginalized groups relatively more because of their socio-economic status, race/ethnicity, gender, geographic location or some combination of these. Individuals in such groups not only experience worst form of HSR but also tend to have less access to healthcare services (Jones *et al.*, 2011; Malhotra and Do, 2013). Clearly, the narrative about the 'disparity' in HSR and its consequences revolves around socio-economic disparities with disparity based on other factors, such as disability almost missing from the debate as well as the research agenda dealing with disparities in HSR.

One study worth noting in this regard is Brennan *et al.* (2008), which argues that equity in HSR, in public health literature and practice, is when everyone has the opportunity to get good response from health system and no one is disadvantaged from achieving this because of their disability status, social position or other socially determined circumstances. We are putting emphasis on evidence on disability-based disparities in HSR because of multiple reasons: first, though limited, but socio-economic disparities in HSR have already been studied for multiple countries from different parts of the world (Jones *et al.*, 2011; Malhotra and Do, 2013 and the references therein) but to the best of our search we could not find any study dealing with disability-based disparity in HSR. Second, to evaluate HSR from human rights point of view, one has to examine it through the

lens of how is it towards the disabled compared with the non-disabled individuals. Third, >1 billion people in the world are living presently with some form of disability, out of which nearly 200 million experience considerable difficulties in functioning (WHO, World Bank, 2011) with statistics suggesting substantial variations in the prevalence of disability across the globe. The study by World Health Survey reveals that about 38% of the world's 60+ years aged population is suffering from disability with the figures varying from 30% in high-income countries to 43% in low-income countries (WHO, World Bank, 2011). The prevalence of disability is particularly an important concern in developing countries. The WHO reports that 80% of the persons with disabilities live in low-income nations and that most of them are poor (WHO, 2010). Also, the disability prevalence among people aged 50 years and over in low-income countries is higher than in high-income countries (WHO, World Bank, 2011). More than three-fourths of the population aged 50 and over are suffering from disability in countries like China, Ghana, India, Mexico, Russia and South Africa (He *et al.*, 2012). Last but not the least, poor HSR decreases patient's satisfaction with healthcare providers (Bleich *et al.*, 2009), which in turn may reduce utilization of healthcare services (Bhandari and Kannan, 2010), ultimately leading to poorer health. Therefore, prevalence of disability-based disparities in HSR may be detrimental in sustaining confidence of the disabled in the healthcare system.

Though there is a prevalence of disability among all the age groups, we in this paper are focusing (on disability-based disparities in outpatient HSR) on older adults (above 50 years) because of primarily two reasons: (1) the population of the world is ageing fast and as per the U.S. Census Bureau (2012), the proportion of 50+ population in the countries (India, China, Ghana, Russia, Mexico and South Africa) covered in the present study will be somewhere in the range of 28–50% by 2050; and (2) the prevalence of disability is substantially higher among the older adults compared with the other age groups, e.g. approximately, >75% of the population aged 50 and over in the above-mentioned countries are suffering from some forms of disability (He *et al.*, 2012).

The countries included in the present study are from four different regions of the world [the four world regions are based on United Nations classifications—Africa (Ghana, South Africa), Asia (China, India), Europe (Russia), and Latin America and the Caribbean (Mexico; United Nations, 2013)]. The share of the aforementioned countries in the world's total population is ~42%. Similarly, the share of 50+ populations of these countries in the world's 50+ population is also about 42% (United Nations, 2013). In addition to the consideration of geographic range and population size, these countries are representative of low- to upper-middle-income countries (He *et al.*, 2012). According to the World Bank (2011), during 2007–10, China was classified as a lower-middle-income country; Ghana as low income; India as low- to lower-middle income; and Mexico, Russia and South Africa as upper-middle-income countries (World Bank, 2011) and were at different stages of the demographic and epidemiological transitions.

Materials and methods

Data

The present study is based on data from the 'Study on Global Ageing and Adult Health (SAGE)'. SAGE was implemented in six countries—China, Ghana, India, Mexico, Russia and South Africa—during 2007–10. SAGE is a longitudinal, cross-sequential, household face-to-face survey (He *et al.*, 2012). The survey uses a multistage sampling design, and the data have been collected using similar interview

schedules in all the countries. The goals of SAGE are to promote a better understanding of the association of ageing with well-being, examine the health status of individuals aged 50 years and above and changes, trends and pattern that occur over time, and to improve the capacity of researchers to analyse the effects of social, economic, healthcare and policy changes on current and future health of population from low- to upper-middle-income countries (He *et al.*, 2012). SAGE data collection domains include self-reported assessments of health linked to anchoring vignettes for improved comparability across individuals, communities and populations; assessment of perceptions of well-being and quality of life; self-reported assessment of functioning with measured performance test on a range of different health domains and; biomarkers, etc. (He *et al.*, 2012). The SAGE is also designed to provide results that are comparable to ageing studies in high-income countries, such as the US Health and Retirement Study, the English Longitudinal Study on Ageing and the Collaborative Research on Ageing in Europe Project (Kowal *et al.*, 2012, p. 1640). SAGE interviewed 13 158 older persons (50 years or older) in China, 4305 in Ghana, 6560 in India, 2301 in Mexico, 3938 in Russia and 3836 in South Africa (He *et al.*, 2012).

Outcome variable: HSR

The outcome of interest in the present study is outpatient HSR. The analytical sample of this examination is comprised of those older adults who have visited outpatient services in the last 12 months preceding the survey. Outcome variable includes the seven HSR domains, namely: prompt attention (the amount of waiting time), dignity (experience of being treated respectfully), clarity of information (how clearly the healthcare providers explained things), autonomy (experience of being involved in making decisions for own treatment), confidentiality (being able to talk privately to providers), choice (being able to see a healthcare provider of own choice) and quality of basic amenities (cleanliness of health facility). Respondents were asked to rate their experience in each domain on a five-point ‘Likert’ scale ranging from ‘very bad’ to ‘very good’.

A HSR (henceforth should be read as outpatient HSR) score has been generated for each older adult covered in the survey by using an Item Response Theory (IRT) Partial Credit Model (PCM). The description of the method (IRTPCM) has been provided below and has been adopted from Zheng and Rabe-Hesketh (2007, pp. 314–315; kindly see the above paper for details; the notations have been retained for coherence and ease of readers).

The PCM is an extension of the Rasch model to polytomous items with ordered response categories 1,, 5 (it is 1–5 because in our case, we are having five response categories) for item (or question) *i*. The PCM specifies the probability of responding in the *j*th category of item *i* for person *n* as a function of the person ability θ_n and step parameters δ_{ij} ($j > 1$):

$$\Pr(x_{in} = j|\theta_n) = \frac{\exp \sum_{l=1}^j (\theta_n - \delta_{il})}{\sum_{k=1}^{m_i} \exp \sum_{l=1}^k (\theta_n - \delta_{il})} \quad j = 1, \dots, 5 \quad (1)$$

where, $\sum_{l=1}^1 (\theta_n - \delta_{il}) = 0$. This is a special case of a multinomial logit model, namely, an adjacent category logit model (Agresti, 2002) with

$$\ln \frac{\Pr(x_{in} = j|\theta_n)}{\Pr(x_{in} = j - 1|\theta_n)} = \theta_n - \delta_{ij}. \quad (2)$$

The parameter δ_{ij} is known as the step difficulty associated with category *j* of item *i*. It represents the added difficulty when moving the step from category *j* – 1 to category *j* (Embretson and Reise,

2000; Wilson, 2004). A two-parameter logit (2PL) PCM (Muraki, 1992) can also be specified by including a slope parameter, λ_i , that allows each item to have a different discrimination.

In the PCM, the linear predictors v_{ijn} represent the logarithm of the numerators of the response probabilities:

$$\Pr(x_{in} = j|\theta_n) = \frac{\exp(v_{ijn})}{\sum_{k=1}^{m_i} \exp(v_{ikn})} \quad j = 1, \dots, 5 \quad (3)$$

Using the multiple items (for measuring HSR), five response categories to each item and the above discussed IRTPCM method (which uses the multiple items and multiple response categories to each item), a HSR score (continuous) has been generated for each older adult having utilized the outpatient services in the last 12 months and ranges from 0 (health system is completely non-responsive) to 100 (health system is fully responsive).

Main independent and control variables

In this study, disability is the main independent variable of interest. For this purposes, a disability score for each older adult has been constructed based on questions grouped into eight health and functioning domains: vision; mobility; self-care; cognition; interpersonal activities; pain and discomfort; sleep and energy; and affect. The questions asked to respondents were—‘Overall in the last 30 days, how much difficulty did you have. . .’ in the aforementioned health and functioning domains. Self-reported response categories to these questions (items) were: ‘no difficulty’, ‘mild difficulty’, ‘moderate difficulty’, ‘severe difficulty’ and ‘extreme difficulty’. Similar to the process of generating HSR scores, the disability scores for all the older adults have also been generated using the multiple items (of disability), multiple responses to the items and the IRTPCM. As in the case of HSR, the disability score also ranges from 0 (no disability) to 100 (complete disability). Based on these disability scores, the older adults have been categorized into three groups—first, ‘no to mildly disabled (the lowest 33%) based on disability score’; second, ‘disabled (the middle 33%)’; and third, ‘severely disabled (the top 33%)’.

There is a growing body of literature that indicates that in addition to disability, several other socio-economic and demographic variables have a substantial sway on HSR. Therefore, the present analysis is also adjusted for multiple pertinent socio-economic and demographic predictors of HSR in the analysis, such as, age (categorized into three categories—50–59, 60–69 and 70+ years); sex (male and female); schooling (categorized into four categories—no schooling, up to primary, above primary to secondary and above secondary); place of residence (categorized into two categories—rural and urban); marital status (categorized into three categories—currently married, widowed and others); work status (categorized into three categories—never worked, currently working and currently not working); household structure (categorized into two categories—nuclear and non-nuclear); religion [categorized into two categories—majority and minority (majority is the religion which is followed by the highest number of people in the population, whereas the remaining fall into minority)]; and economic status of household (captured by wealth index).

Statistical analysis

First, we describe the selected demographic and socio-economic characteristics of the population. Then we calculate the aggregate mean Health System Responsiveness Score (HSRS) for the selected countries; it is followed by the mean HSRS by the disability status for the selected countries. Next, we present mean HSRS by various socio-economic and demographic variables across the countries.

Table 1 Distribution of selected socio-economic and demographic characteristics of older adults (percentage) in selected countries, 2007–10

	China	Ghana	India	Mexico	Russia	South Africa
Age						
50–59	44.93	39.74	48.61	48.05	44.14	49.90
60–69	31.86	27.50	30.89	25.59	26.73	30.60
70+	23.20	32.76	20.50	26.36	29.13	19.50
Sex						
Male	49.75	52.45	50.99	46.80	41.91	44.10
Female	50.25	47.55	49.01	53.20	58.09	55.90
Marital status						
Currently married	84.79	58.17	76.93	68.16	56.55	49.54
Widowed	12.28	26.36	21.85	15.03	26.37	23.47
Others	2.93	15.47	1.22	16.81	17.08	26.99
Educational attainment						
No formal education	24.42	55.50	51.78	20.82	3.77	39.82
Up to primary	24.89	8.28	19.03	36.58	5.22	17.15
6–10	36.60	27.00	19.10	33.20	35.60	29.60
10+	14.10	9.20	10.10	9.40	57.40	13.40
Work status						
Never worked	8.94	1.61	27.00	38.49	0.43	14.69
Currently working	43.64	69.09	43.17	37.40	42.35	30.06
Currently not working	47.43	29.29	29.83	24.11	57.22	55.24
Wealth quintile						
1	16.27	18.24	18.18	15.30	13.32	20.71
2	18.13	19.09	19.50	24.71	17.13	19.89
3	20.49	20.46	18.79	16.79	19.56	18.23
4	23.36	20.66	19.64	16.61	22.15	19.83
5	21.75	21.56	23.90	26.60	27.85	21.34
Residence						
Urban	47.35	41.09	28.91	78.80	70.08	64.90
Rural	52.65	58.91	71.09	21.20	29.92	35.10
Household structure						
Nuclear	67.48	33.84	22.97	10.44	72.69	43.33
Non-nuclear	32.52	66.16	77.03	89.56	27.31	56.67
Religion						
Majority	93.24	69.56	84.30	91.37	75.31	86.14
Minority	6.76	30.44	15.70	8.63	24.69	13.86

Finally, we fit multiple regression models (OLS) to assess the association between disability and HSR after adjusting for socio-economic, demographic and cultural characteristics. The multiple regressions have been carried out at two levels—first, at the pooled level (all countries together) after controlling for country effects and second, for each countries separately. The pooled level analysis helps us in understanding the association between disability and HSR in a better way as it has a much larger sample size. Whereas, the country level analysis will inform us how HSR varies across the disability categories and other socio-economic and demographic variables across the selected countries.

We have used the survey weights provided by SAGE in the data itself in both the bivariate as well as multivariate analyses.

Results

The percentage distribution of the sample

The percentage distribution of sample by selected socio-economic and demographic characteristics for all the six countries namely China, Ghana, India, Mexico, Russia and South Africa is presented in Table 1. The proportion of the population (henceforth population

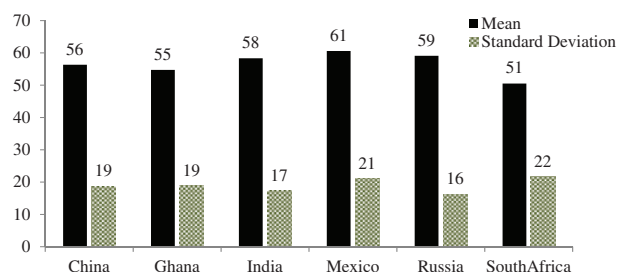


Figure 1 Mean HSR score along with standard deviation among the older adults in the six selected countries.

means 50 plus older adults) currently not working is substantially higher in the sampled population of Russia and South Africa. The proportion of the population who never worked is highest in Mexico (38%) while it is lowest in Russia (0.4%). More than one-fifth of the sampled population is widowed in four countries namely Ghana, India, Russia and South Africa. Currently married population is also varying significantly across the countries. In three countries namely Mexico, Russia and South Africa, the proportion of female population is relatively high in the sampled population.

Prevalence of education (more than high school) is highest in Russia; about 57% of the respondents reported that they have a level of education which is above high school. This percentage is around 14% in China and South Africa, and almost 10% in rest of the countries. Also, Rural–urban residence varied considerably across the countries. The percentage of urban older adults ranged between as low as 29% in the Indian sample to as high as 79% in the Mexican sample. The proportion of non-nuclear families is more in Ghana, India, Mexico and South Africa whereas in China and Russia opposite trend has been observed.

Mean HSR scores among the older adults

The Mexican health system is found to be the most responsive towards the older adults among the selected countries (Figure 1). The mean HSRS in Mexico was 61. The South African older adults seem to be least happy with the responsiveness of the health system among the study countries and the mean HSRS was only 50. There is only one point difference in mean HSRS in India and Russia, whereas the score for China is found to be 56 followed by Ghana at 55 points.

Mean HSR score by disability

Figure 2 describes the bivariate association between disability and mean HSRS among the older adults in the selected low- to upper-middle-income countries. The mean HSRS is found to be lower for the disabled and the severely disabled older adults as compared with the no-to-mildly disabled older adults in all the countries except Mexico and Ghana. Among the severely disabled older adults, the highest mean HSRS is in Mexico (64) and lowest in South Africa (47). The highest difference in mean HSRS between no-to-mildly disabled and severely disabled older adults is found in South Africa (eight points) followed by Indian (six points) and Russia (four points).

Mean HSRS by selected demographic and socio-economic characteristics

The Table 2 shows the mean HSRS by selected demographic and socio-economic characteristics among the older adults in selected low- and upper-middle-income countries. The result in the table indicates almost equal mean HSRS among different age groups across the selected countries except Mexico. Mean HSRS is almost

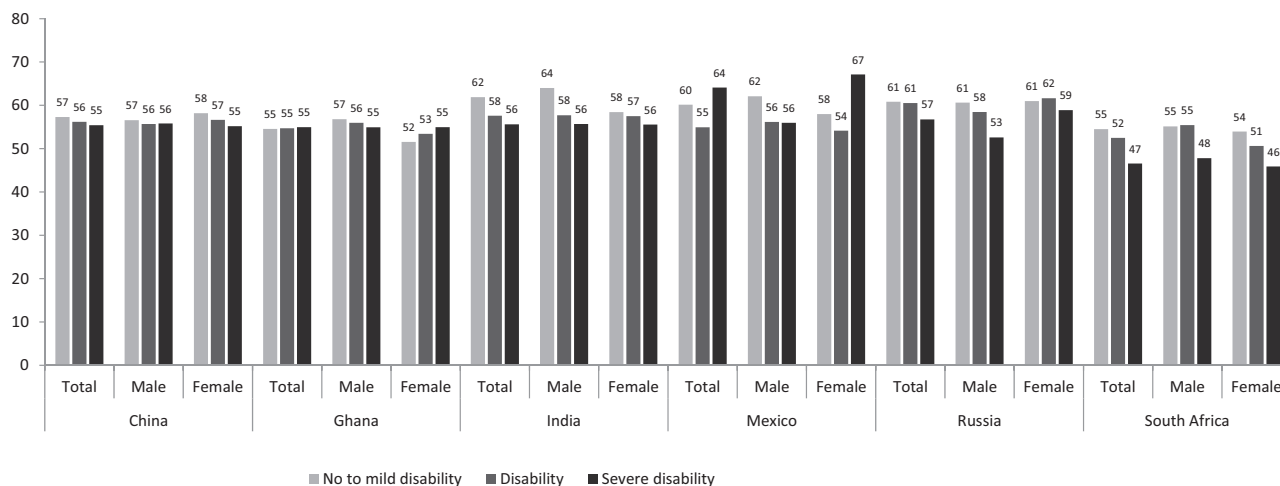


Figure 2 Mean HSR score by disability and sex among older adults in the six selected countries.

10 points less among 60–69 age group as compared with 50–59 age group in Mexico. The mean HSR score has found to be equally distributed among males and females in China whereas about three points gap is found between males and females in all the other studied countries. The mean HSR score is higher for males in India, South Africa and Ghana whereas the reverse trend has been observed in Russia and Mexico which might reflect the presence of gender-based discrimination in India, Ghana and South Africa.

The mean HSR score in currently married older adults is higher as compared with the remaining categories of marital status in most of the countries except China and Russia where it has been found to be lower for currently married older adults. While looking at educational attainment, we find that there is not much difference in mean HSR score across categories of education though it shows a slight increase with increase in educational levels. There is no urban–rural difference in mean HSR score in China and Mexico. Mean HSR score is substantially higher (10 points) among rural Russian older adults than their urban counterparts. Older adults living in urban areas of India and South Africa also enjoy a three point higher mean HSR score as compared with their rural counterpart.

Multivariate analysis: disability-based disparity in HSR

First, we have conducted a pooled regression and controlled for country effects as well as various socio-economic and demographic factors. The findings (presented in Table 3) indicate that older adults who are disabled or severely disabled have a significantly lower HSR score compared with the older adults who either have no disability or mild disability. Some additional interesting findings from the table are China, India, Mexico and Russia have significantly higher HSR score compared with Ghana (economically the least developed among the study countries). Also, the HSR score towards the currently married older adults is significantly higher compared with the widowed older adults. Further, HSR score increases substantially with education and wealth.

In the next step, we have conducted OLS regressions separately for each country to understand how the relationship between HSR and disability varies across socio-economic and demographic factors across the countries (Table 4). Table 4 represents the association between disability and HSR after controlling for the pertinent socio-economic and demographic factors. The inverse relationship between HSR and disability is highly significant for all countries except Ghana. The difference (5.4 points) in HSR score between those who

are no-to-mildly disabled and those who are severely disabled is highest (and significant) in the case of South Africa. We also see that HSR score is higher among the older adults of advanced ages (70+) as compared with the older adults of age Group 50–59 in all countries except Ghana and India. While looking at educational Attainment and HSR score, we find that education plays a highly significant positive role in the case of India. The HSR score is almost six points higher among the older adults who have 10+ years of formal education as compared with those who don't have any formal education in India. Also, HSR score shows a significant increase with the increase in wealth status of the older adults in all the study countries.

Discussion

The present study, perhaps the first in examining the disability-based disparity in HSR (henceforth HSR should be read as outpatient HSR) and among a few to focus on HSR in the low- to upper-middle-income countries context shows that there is a significant disability-based disparity in HSR in the study countries (except Ghana) comprising of China, Ghana, India, Mexico, Russia and South Africa. The disparities are substantial and significant even after controlling for various pertinent socio-economic and demographic factors.

To explain the disability-based disparity in HSR, a cue can be taken from the study Malhotra and Do (2013), which has identified the possible reasons for socio-economic disparities in HSR in low- to upper-middle-income countries. As per the above study the three possible reasons for the socio-economic disparities in HSR relate to—disparity in access to quality health services, factors related to patients and factors related to providers. If we see the first possible reason (differential access to quality health services) in the context of disabled vs non-disabled older adults, it has been observed that >80% of the persons with disabilities belong to poorer sections (WHO, 2010) and majority of the poorer older adults in the low- to upper-middle-income countries access public health facilities (compared with private health facilities) due to lower overall cost of care in accessing the former (Ager and Pepper, 2005; Levesque *et al.*, 2007; Malhotra and Do, 2013); and public health facilities have lower responsiveness compared with private health facilities in low- to upper-middle-income countries (Bhatia and Cleland, 2004; Malhotra and Do, 2013). If the above points are seen together, it can be safely inferred that differential access to quality health

Table 2. Mean HSR score by selected socio-economic and demographic characteristics among the older adults in the selected countries

	China	Ghana	India	Mexico	Russia	South Africa
Age						
50–59	56.17 (18.53)	54.94 (18.61)	59.27 (16.99)	66.49 (23.03)	60.09 (17.23)	49.95 (21.49)
60–69	56.59 (18.24)	54.47 (19.09)	58.30 (17.88)	56.59 (17.03)	58.24 (15.15)	50.33 (21.25)
70+	56.22 (19.32)	54.79 (18.84)	56.33 (16.54)	53.85 (17.77)	58.68 (15.82)	51.91 (22.13)
Sex						
Male	56.08 (18.59)	55.93 (19.28)	59.86 (17.06)	59.05 (18.88)	57.11 (14.81)	52.43 (21.89)
Female	56.53 (18.67)	53.63 (18.31)	56.90 (17.24)	61.59 (22.21)	60.32 (16.90)	49.25 (21.25)
Marital status						
Currently married	56.15 (18.65)	54.74 (18.75)	59.14 (17.15)	63.55 (21.23)	57.85 (15.90)	52.96 (21.78)
Widowed	57.21 (18.31)	54.63 (18.79)	55.78 (17.30)	53.43 (18.93)	59.42 (15.19)	49.55 (19.29)
Others	57.47 (19.79)	55.03 (19.23)	55.78 (14.85)	53.32 (18.11)	62.14 (17.96)	46.64 (22.75)
Educational attainment						
No formal education	56.78 (18.07)	54.51 (18.06)	55.60 (16.43)	58.16 (19.77)	54.67 (14.36)	47.92 (21.33)
Up to primary	57.46 (18.91)	55.59 (19.86)	58.83 (17.03)	66.04 (23.70)	55.87 (15.94)	46.67 (18.99)
6–10	56.10 (18.76)	54.63 (18.99)	61.06 (17.55)	55.81 (16.23)	60.05 (15.37)	51.24 (21.55)
10+	53.90 (18.59)	55.69 (21.32)	66.97 (17.33)	58.71 (21.24)	58.96 (16.70)	61.33 (21.85)
Work status						
Never worked	55.07 (19.11)	46.66 (16.63)	57.01 (16.73)	65.79 (23.02)	46.14 (12.58)	48.57 (20.80)
Currently working	56.89 (18.97)	55.97 (18.47)	59.36 (17.08)	58.33 (17.44)	61.55 (17.80)	52.61 (22, 31)
Currently not working	55.88 (18.24)	52.75 (19.38)	58.18 (17.75)	55.96 (20.05)	57.69 (14.95)	50.13 (21.12)
Wealth quintile						
1	55.28 (17.21)	52.86 (17.73)	54.26 (16.08)	53.05 (15.99)	57.21 (15.94)	44.30 (20.81)
2	55.94 (18.49)	53.86 (16.70)	54.72 (15.87)	61.16 (19.40)	58.73 (17.15)	46.70 (19.03)
3	58.31 (19.76)	57.25 (19.15)	58.75 (17.04)	74.02 (26.10)	58.84 (15.33)	45.76 (19.02)
4	56.64 (19.81)	54.04 (18.95)	58.40 (16.67)	54.11 (16.23)	62.16 (16.99)	52.10 (21.17)
5	55.72 (16.68)	55.01 (20.26)	63.84 (18.02)	58.24 (17.52)	57.53 (15.23)	60.78 (22.69)
Residence						
Urban	54.26 (17.31)	54.54 (20.12)	60.28 (17.18)	60.90 (21.77)	56.69 (15.34)	51.71 (22.81)
Rural	57.92 (19.46)	54.92 (17.79)	57.52 (17.17)	59.48 (17.91)	65.55 (16.72)	48.16 (18.67)
Household structure						
Nuclear	56.17 (19.20)	55.60 (18.50)	58.96 (17.02)	54.10 (17.40)	60.31 (16.66)	53.96 (23.57)
Non-nuclear	56.61 (17.40)	54.35 (18.97)	58.17 (17.27)	61.44 (21.28)	56.04 (14.60)	48.32 (19.88)
Religion						
Majority	56.23 (18.66)	54.53 (19.01)	58.45 (17.29)	61.02 (21.36)	59.57 (16.09)	50.89 (21.98)
Minority	57.62 (17.46)	55.59 (18.20)	57.76 (16.76)	53.84 (12.55)	57.85 (16.51)	49.78 (17.65)

Standard deviation in parenthesis.

Table 3. Pooled ordinary least squares regression estimating effects of disability on HSR of older adults

	Coefficients
Disability (no to mild ^a)	
Disabled	-2.17***
Severely disabled	-3.14***
Control variables	
Country (Ghana ^a)	
China	-1.14*
India	3.20***
Mexico	0.38
Russia	4.10***
South Africa	-6.98***
Age (50–59 ^a)	
60–69	0.89**
70+	2.18***
Sex (male ^a)	
Female	0.45
Marital status (currently married ^a)	
Widowed	0.74*
Others	0.50
Educational attainment (no formal education ^a)	
Up to primary	1.74***
6–10	1.68***
10+	2.59***
Work status (never worked ^a)	
Currently working	0.90
Currently not working	-0.41
Wealth quintile (1 ^a)	
2	0.80
3	2.83***
4	2.51***
5	4.77***
Residence (urban ^a)	
Rural	1.80***
Household structure (nuclear ^a)	
Non-nuclear	-1.19***
Religion (majority ^a)	
Minority	0.41

The estimates presented are robust, adjusted for complex survey design.

^aReference category.

*** $P < 0.001$, ** $P < 0.01$, * $P < 0.05$.

services by disabled and non-disabled older adults is one of the reasons for disability-based disparity in HSR.

Coming to disability-based disparity in HSR due to patient- and provider-related factors, as a majority of the disabled older adults belong to poorer sections, they are less likely to involve in decision-making process, have few queries and have difficulty in understanding the medical information provided by the care provider (Malhotra and Do, 2013; Willems *et al.*, 2005). On the other hand, the scholarship on HSR finds that the healthcare providers look at the patients of lower socio-economic status more negatively compared with those of higher socio-economic status (van Ryn and Burke, 2000; Malhotra and Do, 2013). Besides, the poorer patients who are also likely to be less educated are many times unable to understand the instructions clearly and therefore end up asking for clarifications multiple times. This sometimes leads to unsettling of service providers, which in turn is likely to negatively affect the quality of care provided, thus leading to a vicious cycle (Joseph, 1989).

Some other reasons for disability-based disparity among older adults might be related to factors, like negative attitude towards

disability at the places of healthcare, lack of client orientation and cultural adversity. For example, Krahn *et al.* (2015) highlights that the lack of proper healthcare responsiveness is caused by the underlying disability which is mostly reflected in the nature of services provided as well as the health personnel behaviour. Further, Altman and Bernstein (2008) found that individuals with disabilities report HSR four times poorer as compared with individuals without having any disability.

Another possible reason for disability-based disparity among the older adults in low- to upper-middle-income countries is the general lack of skilled care providers with respect to the disabled population (especially the older adults), and improper referral systems (Habibullah, 2012). The lack of skilled care providers with respect to the disabled population is more likely to happen in poorer neighbourhoods (Das and Hammer, 2007) which the disabled from poorer sections are more likely to access due to the lower transportation costs (Ager and Pepper, 2005).

Having discussed the possible reasons behind the disability-based disparity in HSR among the older adults; it is time to ponder upon why such disparities are detrimental. Such disparities are detrimental because they increase the overall healthcare disparities and decrease the trust and belief in the system, thus, reducing the benefits provided through the services. It is well established in the literature that the patients who have positive experiences with the health system prefer to use them for a longer time period (Aharony and Strasser, 1993; Gilson *et al.*, 1994; McPake and Banda, 1994). Similarly, negative healthcare experiences have been found to lead to disruption in the use of health services (Mishima *et al.*, 2010; Roblin and Roberts, 2010).

As the disability-based disparities in HSR are detrimental to the disabled, they need to be countered by appropriate policies. Development of disabled friendly public health facilities with better quality of basic disability friendly amenities and prompt attention by care providers which might have cost implications (Malhotra and Do, 2013) can be considered as the first step. Reduction of patient waiting time (prompt attention) in public health facilities may be achieved by the development of a concurrent system for performing secondary functions and using separate providers to perform the functions related to the evaluation of the status of the patient (Johnson and Rosenfeld, 1968). Widening the choice of healthcare providers including the private providers by providing health insurance and subsidies in cost of care for poorer sections can be another step for reducing disability-based differential access to healthcare services.

Development of public health facilities with better quality of basic amenities and prompt attention is one aspect of improvement in HSR towards the disabled and improvement in HSR in the dimensions of dignity, autonomy and confidentiality is another; which might require more focus on provider–patient communication. Engraining the significance of dignity, autonomy and confidentiality to healthcare providers during their basic and continuous medical education training, including engagement with patients with poor socio-economic backgrounds and who are hesitant in asking questions, can be one initiative. The periodical monitoring of quality of healthcare provided on the above-mentioned dimensions and the evaluation of such monitoring can be the second step (Malhotra and Do, 2013).

One more finding of our study which needs to be discussed is that Mexico has the highest HSR score. The public health policies (in light of disability) in Mexico are inclusive and target oriented when compared with other countries included in this paper. Mexico has effectively promoted disability rights and has implemented the U.N. Convention on the Rights of Persons with Disabilities (CRPD)

Table 4. Ordinary least squares regression model estimating effects of disability on HSR of older adults in selected countries, 2007–10

	China	Ghana	India	Mexico	Russia	South Africa
Disability (No to mild ^a)						
Disabled	−2.42***	0.38	−2.56***	−4.47**	−2.97***	−1.57
Severely disabled	−3.52***	1.86	−3.82***	−3.25**	−4.87***	−5.39***
Control variables						
Age (50–59 ^a)						
60–69	1.04	0.15	−0.03	3.2*	1.28	0.31
70+	2.13**	0.52	−0.23	5.61**	2.92*	3.16*
Sex (male ^a)						
Female	1.31*	−2.71**	−0.24	1.45	1.67*	−0.49
Marital status (currently married ^a)						
Widowed	1.61*	2.52*	0.57	−2.00	0.74	−0.14
Others	1.99	2.03	−1.66	−0.43	0.48	0.61
Educational attainment (no formal education ^a)						
Up to Primary	1.06	1.36	2.16**	0.26	−1.68	2.69
6–10	0.86	−0.24	3.39***	−1.27	−1.91	2.61
10+	0.45	0.49	6.44***	3.11	−3.07	11.1***
Work status (never worked ^a)						
Currently working	−2.44	4.91	−0.48	3.14	9.55*	3.06
Currently not working	−1.01	1.46	−0.17	−0.48	7.19	0.67
Wealth quintile (1 ^a)						
2	0.78	0.66	0.48	2.91	2.14	0.19
3	3.75***	4.47***	2.52**	0.34	3.39**	−0.88
4	2.52**	1.51	2.48**	3.45	3.35**	2.31
5	3.27***	1.86	5.68***	4.9*	3.37**	10.90***
Residence (urban ^a)						
Rural	5.09***	0.46	−1.39**	1.31	3.24**	1.82
Household structure (nuclear ^a)						
Non-nuclear	−0.52	−0.70	−0.68	−0.76	−1.04	−3.24**
Religion (majority ^a)						
Minority	0.48	0.61	−1.11	−2.53	0.36	0.41

The estimates presented are robust, adjusted for complex survey design.

^aReference category.

*** $P < 0.001$, ** $P < 0.01$, * $P < 0.05$.

and can be taken as an example which the other countries can follow. Mexico reformed the CRPD in 2007; and in 2011 framed it into a law—'General Law for the Inclusion of People with Disabilities' (LGPID). This new law calls for the government to promote, protect and guarantee the use of human rights and liberties of people with disabilities. Moreover, LGPID also ensures the full inclusion of disabled into society with respect, equality and guaranteeing opportunities on an equal basis. A national programme for the Development of People with Disabilities from 2013 to 2018 has also been framed which outlines the government's plans to promote legislative and administrative actions that guarantee the rights of people with disabilities to exercise their full rights as citizens.

Lessons can also be drawn from policies employed in Scandinavian countries which are quite equitable when it comes to HSR. In Denmark, Finland and Sweden, the public-operated hospitals and health centres were restructured into various forms of public firms, to achieve enhanced efficiency, effectiveness and responsiveness to patients across different socio-economic groups (Saltman, 1992). Also, Netherlands and Sweden have gone beyond reforms aimed at directing spending growth to focus on responsiveness to patients of different domains and efficiency in use of resources, among other things (Ham and Brommels, 1994). The experiences of these countries offer lessons for policymakers of other countries, specifically on the role of government in healthcare and the need to hold providers accountable to patients. Further, Scandinavian healthcare systems are built on the principles of

universalism, strongly expressing a goal of equal access to services regardless of social class, income or place of residence (Magnussen, 2009). To reach this goal, the Scandinavian model has relied on public ownership and control, limited use of market-based incentives such as choice or competition, and rationing in the form of waiting lists. Out-of-pocket payments play a minor role and are also accompanied by safety nets in the form of maximum annual outlays (Magnussen, 2009). Furthermore, the Scandinavian countries provide healthcare within a decentralized public model; i.e. a model where local—municipal or county—political bodies are responsible for providing both necessary healthcare services to their population and managing the healthcare providers (Magnussen, 2009).

Our study has a few strengths, such as it is perhaps the first attempt at examining the disability-based disparity in older adults from low- to upper-middle-income countries spread over across the globe; it is based on data from population-based nationally representative sample surveys to depict disability-based disparities in HSR in the countries included in the study, population-based large-scale surveys have advantage over institution-based studies (i.e. studies based on institutionalized population) in terms of their representativeness of the population as a whole; also, our study uses a comprehensive and holistic conceptualization of disability as well as HSR; the framework of disability developed by the International Classification of Functioning Disability and Health (ICF) which has been used in our study is considered as a bio-psycho-social model of

disability and includes eight health and functioning domains; similarly the HSR is based on seven domains. Having mentioned about the advantages, this study also has a few limitations. Though our study uses a composite score of HSR, some researchers might be more interested in domain specific HSR. That said a detailed examination of disability-based disparity in domain specific HSR can be taken as a future study and is a natural candidate of how to take this research agenda forward.

Conclusions

There is substantial disability-based disparity in HSR among the older adults in China, Ghana, India, Mexico, Russia and South Africa. The disparity is significant even after controlling for pertinent socio-economic and demographic factors. The results have important implications for the disabled older adults, especially from the lower strata as far as HSR is concerned. As, the issue of disability-based disparity among the older adults is going to be crucial in near future where the proportion of older adults is going to increase exponentially, it is high time that the policy-makers pay special attention to the HSR towards the disabled older adults. That said, based on the findings of our analysis and the review of scholarship presented in our study, we have made some policy recommendations which might be useful in developing a plan for improving HSR in the low- to upper-middle-income countries.

Acknowledgements

The authors would like to express their gratitude to the three reviewers for providing comments and suggestions on the earlier drafts. The authors would also like to thank Akanksha Choudhary and Upasak Das for comments and suggestions on earlier drafts.

Conflict of interest statement. None declared.

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