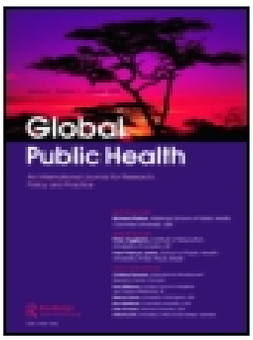

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Health systems responsiveness among older adults: Findings from the World Health Organization Study on global AGEing and adult health

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ABSTRACT

Health system responsiveness is an indicator that can be used for evaluating how well healthcare systems respond to people's needs in non-clinical areas such as communication, autonomy and confidentiality. This study analyses health system responsiveness from the perspective of community-dwelling adults aged 50 and over in China, Ghana, India, the Russian Federation and South Africa using cross-sectional data from the World Health Organization Study on global AGEing and adult health. The aim is to assess and compare how individual, health condition and healthcare factors impact differently on outpatient and inpatient responsiveness.

Poor responsiveness is measured according to participants' responses to questions on a five-point Likert scale. Five univariate and multiple logistic regression models test associations between individual, health condition and healthcare factors and poor responsiveness. The final model adjusts for country.

Key results are that travel time is a major contributor to poor responsiveness across all countries. Similarly there are wealth inequalities in responsiveness. However no clear difference in responsiveness was observed in presentations for chronic versus other types of conditions.

This study provides an interesting baseline on older patients' perceived treatment within outpatient and inpatient facilities in five diverse low- and middle-income countries.

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Non-clinical; quality of care; developing countries; global; ageing populations

Introduction

The world's populations are ageing. By 2050, the United Nations predicts that persons aged 60 and over will account for sizeable percentages of regional populations (34%, 28% and 25% respectively in Europe, Northern America and Asia) (Beard et al., 2012; United Nations, 2017). People are living

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longer than previous generations and new patterns of illness and disability are emerging. The ways in which governments respond to changes in this demographic shift and associated population health demands will be crucial for sustainable economic development. Raising awareness of how people are treated and the environment in which they are cared for, termed by the World Health Organization (WHO) as 'health system responsiveness', is tantamount to focusing on fair and just management, regardless of social status or individual differences. Aligning operational aspects of healthcare systems to meet the non-clinical needs of patients is one way of facilitating timely and effective use of health care in low resource settings (Jones et al., 2011; Mirzoev & Kane, 2017). Collecting and analysing population-level information on the views of individuals in relation to their healthcare experiences will become increasingly important for policy and planning, and will also contribute to achieving the Sustainable Development Goals (Coulter & Jenkinson, 2005; de Silva, 2000; Kowal et al., 2011; Murray & Frenk, 2000; Peltzer & Phaswana-Mafuya, 2012; Valentine et al., 2007; Valentine & Bonsel, 2016).

These demographic and epidemiologic changes, which began in high-income countries, are now occurring more rapidly in developing countries. Low- and middle-income countries (LMICs) are 'becoming older before they are becoming richer' (Beard et al., 2012; World Health Organization, 2011, 2015; World Health Organization, 2015). In high-income countries such as France, Sweden and the United Kingdom (UK) for example, it took more than 70 years for the population over 60 years to increase from 7% to 14%, whereas developing countries such as China and Thailand have taken less than 35 years (United Nations, 2015). Between 2015 and 2025, the proportion of the population aged 50 and over in LMICs will increase by 20%, compared with just 8% in high-income countries (United Nations, 2016; World Bank, 2016). A closer examination of health system responses by older adults in LMICs is thus warranted.

WHO identified 'health system responsiveness' as a universal health system goal, and an indicator that can be used for evaluating how well healthcare systems respond to people's needs in non-clinical domains such as communication, autonomy and confidentiality (Kowal et al., 2011; Malhotra & Do, 2017; Valentine et al., 2007; World Health Organization, 2000, 2011). According to the WHO health systems performance model, responsive health systems contribute to improved health outcomes (Murray & Frenk, 2000). The WHO Multi-Country Survey Study on Health and Health System's Responsiveness (MCSS) launched in 2000–2001, and the subsequent World Health Surveys (WHS) in 2002–2003, both facilitated the development of standardised universal methods of data collection and measurement for health systems responsiveness in country populations (Letkovicova et al., 2005; Üstün et al., 2001; Valentine et al., 2007; Valentine et al., 2008).

This study analyses health systems responsiveness for the first time from the perspective of community-dwelling adults aged 50 and above in five LMICs (based on the World Bank classification https://www.worldbank.org/) at different stages of social and economic development.

The WHO Discussion paper (de Silva, 2000) defined health system responsiveness as 'the outcome that can be achieved when institutions and institutional relationships are designed in such a way that they are cognizant and respond appropriately to the universally legitimate expectations of individuals … whether they are perceived as consumers or patients' (de Silva, 2000). The total healthcare experience comprises a multitude of interactions covering not only the utilisation of the healthcare service per se, but also the physical environment and broader institutional arrangements. A common set of agreed domains provide the conceptual framework for measuring responsiveness. These domains are: prompt attention, dignity, communication, autonomy, confidentiality, choice of healthcare provider and quality of basic amenities for both inpatient and outpatient care, and access to social support for inpatient care only (de Silva, 2000; Letkovicova et al., 2005; Valentine et al., 2008; World Health Organization, 2002).

Health system responsiveness takes into account the fact that contextual factors, associated with both the system and the individual, shape the overall experience (Jung et al., 2003; Mirzoev & Kane, 2017; Valentine & Bonsel, 2016). For example, service providers, managers and policy makers can all

impact on the experience as well as structural properties like travel time, out-of-pocket expenses and room furnishings (Coulter & Jenkinson, 2005; Lodenstein et al., 2017; Mirzoev & Kane, 2017). Studies show that individual or 'personal' characteristics, such as being younger, and having relatively higher educational levels and wealth are associated with higher responsiveness in a range of countries and settings (Malhotra & Do, 2012; Mohammed et al., 2013). Some argue that tackling inequalities in health system responsiveness is an important area of inequalities that has received less attention compared with tackling inequalities in health (Jones et al., 2011). Robust evidence is therefore needed so that policies can be put in place to raise awareness of how people are being treated in a non-clinical sense, and to mitigate unfair discriminatory behaviours in the delivery of care (Gostin et al., 2003; Jones et al., 2011; Kerssens et al., 2004; Valentine et al., 2008).

The aim of this study is to assess and compare how individual, health condition and healthcare factors impact differently on outpatient and inpatient responsiveness, as reported by adults, aged 50 and above, in: China (Human Development Index (HDI) (2010) 0.706; High Development Category); Ghana (HDI (2010) 0.554; Medium Development Category); India (HDI (2010) 0.581; Medium Development Category); the Russian Federation (Russia) (HDI (2010) 0.78; High Development Category) and South Africa (HDI (2010) 0.649); Medium Development Category (United Nations Development Programme: http://hdr.undp.org/en/data).

Several studies already show the relevance of responsiveness across multiple and different settings (Robone et al., 2011; Valentine & Bonsel, 2016). However, these studies do not specifically address older populations. The descriptive hypothesis in this cross-sectional study is that responsiveness is relevant to health systems serving older populations in LMICs, and that observable patterns in regard to their fair and just treatment are seen in social status, geographic location and other individual differences.

If it is of relevance, then responsiveness can be a useful metric for assessing the fair and just management of older persons in healthcare settings.

Methods

Data source

The data source is the WHO Study on global AGEing and adult health (SAGE) Wave 1 (2007–2010). WHO-SAGE is a cohort study of health and well-being conducted in six LMICs - China, Ghana, India, Mexico, Russia and South Africa. Due to data limitations and availability in the Mexican sample, this cross-sectional analysis of responsiveness was conducted on national data from China, Ghana, India, Russia and South Africa. The cohorts comprise nationally representative samples of adults aged 50 years and over. Using self-report questionnaires, information is gathered on health and its determinants, healthcare utilisation and health system responsiveness by trained personnel through face-to-face interviews conducted in household settings (Kowal et al., 2012).

WHO-SAGE employed multistage stratified random sampling in all countries. Stratification was based on the size of the first unit of selection (e.g. province or region) and urban or rural locality. The strata ensure representation of a range of living conditions and urban and rural localities in each country. The probability proportional to size sampling method was used to select primary sampling units from which households were randomly selected. Country-specific household-level and person-level analysis weights are made available by WHO. Further details are published elsewhere (Kowal et al., 2012; Naidoo, 2012).

Data collection

The short version of the WHO WHS responsiveness questionnaire designed in 2002–03, and extensively assessed for feasibility reliability, and validity properties (Valentine et al., 2010) was used as the

basis for measurement of responsiveness in WHO-SAGE (Kowal et al., 2012). The responsiveness domain questions addressed seven domains identified by WHO (see Table 1), covering both inpatient and outpatient interactions (excluding the eighth domain, access to social support). Six of the seven questions used were from the WHS (four identical, two with minor editorial but not conceptual adaptations). The question used for the choice domain, which had an adapted response scale to conform with other questions response scales, was taken from the MCSS questionnaire. This was also previously tested and found to have adequate psychometric properties (albeit with a higher ceiling effect possibly owing to the 'problem' response scale used) (Kowal et al., 2012; Valentine et al., 2007). The purpose of the domain questions was to elicit responses regarding patient's non-clinical experiences during their most recent interactions with health services (Darby et al., 2000; de Silva, 2000; Letkovicova et al., 2005; Murray & Frenk, 2000; Valentine, 2018; Valentine et al., 2003; Valentine & Bonsel, 2016). There are two parallel sets of questions, referring to the most recent occasion of inpatient care (in the previous 3 years) and the most recent occasion of outpatient care (in the previous 12 months). The definition of outpatient care includes care received at hospitals, health centres, clinics, or private offices, provided there was no overnight stay, and also includes at-home care delivered by healthcare workers. It was not possible to differentiate between care delivered in the home and care delivered in outpatient settings in these data.

Outcome variable

Poor responsiveness is measured as a dummy variable for each individual's experience, separately for inpatients and outpatients. Information is captured according to participants' responses on a five-point Likert scale with categories: very bad = 5; bad = 4; moderate = 3; good = 2 and very good = 1. If respondents chose 'bad' or 'very bad' in any one of the seven domain questions they were assigned a 'poor' responsiveness score = 1. If respondents chose 'moderate', 'good' or 'very good' in any one of the seven domain questions they were assigned a responsiveness score = 0.

Covariates

Respondents' individual socioeconomic and demographic characteristics were categorised as: age (50–59, 60–69, 70–79 and 80+); sex (male or female); area of residence (urban or rural) and educational level (no primary education versus completed primary school versus completed secondary or high school, versus completed college or university education). Individuals were assigned a wealth score based on their household's ownership of durable goods (including chairs, tables, cars, television, fixed and mobile telephones, washing machine and access to electricity), dwelling characteristics (types of floors, walls and cooking facilities) and access to services such as clean water, sanitation and cooking fuel. A hierarchical ordered probit model was used to develop a relative index of household wealth from which country-specific wealth quintiles were statistically generated and assigned to individuals (Ferguson et al., 2003).

Table 1. Healthcare responsiveness groupings by questions referring to most recent outpatient[1] and inpatient[2] visits.

Aspect	Domain	Question
Structural	Prompt attention	… the amount of time you waited before being attended to?
Interpersonal	Dignity	… your experience of being treated respectfully?
	Communication	… how clearly healthcare providers explained things to you?
	Autonomy	… your experience of being involved in making decisions for your treatment?
	Confidentiality	… the way the health services ensured that you could talk privately to providers?
Structural	Choice of care provider	… the ease with which you could see a healthcare provider you were happy with?
Structural	Quality of basic amenities	… the cleanliness in the health facility?

[1] Most recent outpatient visit up to 1 year prior to the survey.
[2] Most recent inpatient visit up to 3 years prior to the survey.

Information on the characteristics of the health condition for the last healthcare visit was captured and coded for outpatient and inpatient visits according to: 'duration of condition' (chronic, acute/new disorder for outpatients and non-communicable diseases (NCDs), acute and other for inpatients) and 'type of condition' (somatic, psychiatric or undefined). Respondents were asked to select from a list of 18 possible conditions that best described their last visit to an outpatient or inpatient facility. See Supplementary file 4. Using this and other self-reported information, responses were categorised according the reasons for last healthcare visit and types of care (chronic, acute/new, psychiatric or somatic). See Supplementary file 5.

Information on healthcare factors were: facility type (public versus private versus other); travel time to the facility (< = 1 hour versus > 1 hour) and country of residence with China as the reference group.

Data preparation and study sample

The study population comprised all respondents aged 50 years and above who completed the individual questionnaires in SAGE Wave 1. Outpatient and inpatient study samples were conditioned on whether respondents reported having received outpatient care (defined as outside the home) at least once during the previous 12 months, or inpatient care (defined as at least one overnight stay) during the previous 3 years, and had answered one or more of the outpatient or inpatient questions on responsiveness. Outpatient country samples were estimated at: China 5971; Ghana 2507; India 4954; Russia 2130, South Africa 1836 and 17,398 pooled. Inpatient country samples were estimated at: China 1368; Ghana 277; India 598; Russia 590, South Africa 222 and 3055 pooled.

Statistical analysis

All analyses were separately conducted on inpatient and outpatient samples. Descriptive statistics are presented in Supplementary Files 1 and 2. The prevalence of poor responsiveness is compared for the pooled and individual country samples by individual, health condition and healthcare factors (Tables 2 and 3). The data were checked for collinearity and interaction. The proportion of missing observations in the covariates was less than 10% and we observed random patterns of 'missingness'. We analysed only complete cases because the main inferences and estimates of interest were not altered by missing data. Univariate logistic regression was used to test associations between individual, health condition and healthcare factors and poor responsiveness (Model 0). Four multiple logistic regressions show associations between: individual (non-health) characteristics and poor responsiveness (Model 1); individual and health condition factors (Model 2), and individual, health condition and healthcare factors with an interaction term for health facility and health condition (Model 3). Model 4 repeats Model 3 with the inclusion of a dummy country variable (with China as the reference group).

All analyses include survey sampling weights. Statistical significance was set at $p < 0.05$. STATA Version 13 statistical software was used.

Ethics statement

The SAGE study was approved by the following bodies: the Ethics Review Committee, World Health Organization, Geneva, Switzerland; Ethics Committee, Shanghai Municipal Centre for Disease Control and Prevention, Shanghai, China; Ethical Committee, University of Ghana Medical School, Accra, Ghana; Institutional Review Board, International Institute of Population Sciences, Mumbai, India; Ethics Committee; Ethics Committee, School of Preventive and Social Medicine, Russian Academy of Medical Sciences, Moscow, Russia, and the Research Ethics Committee, Human Sciences Research Council, Pretoria, South Africa. This approval covered all procedures undertaken as part of the study. Written informed consent was freely obtained from each individual participant. Confidential records of participants' consent are maintained by SAGE country teams.

Results

Characteristics of the outpatient and inpatient responsiveness analytical samples stratified by country are given in Supplementary files 1 and 2. Of the 17,398 individuals who reported responsiveness for outpatient care, 54% were female, 47% were in the age group 50–59 years, 48% belonged in the lowest educational level and 60% were rural dwellers. For the 3055 individuals who reported responsiveness for inpatient care, 51% were female, 43% were in the 50–59 year age group, 44% were in the lowest educational level and 55% were rural dwellers. There were country differences for both samples. In Russia, for example, 65% and 62% were females in the outpatient and inpatient samples respectively. Most outpatient attendances (70%) were for somatic conditions, similarly for inpatients. Psychiatric disorders were rare (0.5–1%). For outpatients about half used public facilities, albeit with large variations (India 23%–Russia 96%). For inpatient visits public facilities were more common (overall 82%, range 38% India–99% Russia). About 12% of the respondents reported a travel time of more than 1 hour for an outpatient visit and a third of inpatients.

In Tables 2 and 3, the proportion of individuals reporting poor responsiveness by individual, health condition and healthcare factors are summarised for outpatients and inpatients respectively. Overall, 7.5% of outpatients and 9.1% of inpatients reported poor healthcare responsiveness. For all

Table 2. Prevalence (%) of outpatient[1] poor responsiveness by sample characteristics, country and pooled, adults aged 50+, WHO-SAGE Wave 1 2007–2010.

	Pooled	China	Ghana	India	Russia	South Africa
Characteristics						
Age group (years)	*n* = 17,398	*n* = 5971	*n* = 2507	*n* = 4954	*n* = 2130	*n* = 1836
50–59	7.1	3.9	23.9	9.8	14.3	31.7
60–69	8.1	4.0	26.8	10.9	17.8	27.8
70–79	7.6	3.6	26.4	10.2	14.7	24.6
80+	7.2	2.8	22.7	8.2	16.9	21.4
Sex	*n* = 17,398	*n* = 5971	*n* = 2507	*n* = 4954	*n* = 2130	*n* = 1836
Male	6.8	3.8	24.0	8.7	15.6	25.8
Female	8.1	3.8	26.0	11.4	15.5	30.7
Area of residence	*n* = 17,397	*n* = 5971	*n* = 2507	*n* = 4954	*n* = 2130	*n* = 1835
Urban	8.5	6.0	25.6	7.0	17.6	29.4
Rural	6.8	2.4	24.8	11.6	9.8	27.5
Education	*n* = 17,098	*n* = 5971	*n* = 2496	*n* = 4954	*n* = 2128	*n* = 1549
No primary education	7.4	2.8	23.6	11.3	22.7	35.7
Primary	6.1	3.5	23.3	9.8	14.8	28.5
Secondary/high school	7.6	4.9	29.9	7.7	14.5	21.2
College/University	10.3	8.7	28.1	5.6	19.6	1.7
Household wealth	*n* = 17,349	*n* = 5946	*n* = 2503	*n* = 4952	*n* = 2129	*n* = 1829
Quintile 1 Poorest	7.9	3.4	21.1	10.1	19.7	40.9
Quintile 2	8.5	3.3	24.9	13.0	14.9	29.6
Quintile 3	7.6	3.7	23.2	11.5	12.8	32.8
Quintile 4	7.6	3.4	28.1	10.6	20.6	28.9
Quintile 5 Richest	6.3	4.7	26.8	6.4	12.4	14.8
Duration of condition	*n* = 17,311	*n* = 5904	*n* = 2499	*n* = 4948	*n* = 2129	*n* = 1831
Chronic disease	8.3	3.9	29.1	11.6	16.1	29.8
Acute/new disorder	6.7	3.5	21.9	9.3	14.2	24.5
Type of condition	*n* = 17,331	*n* = 5904	*n* = 2507	*n* = 4954	*n* = 2130	*n* = 1836
Somatic	7.3	3.2	25.1	9.9	15.5	28.9
Psychiatric	11.4	3.0	NA	4.6	16.4	52.7
Undefined	8.1	5.4	26.5	12.0	15.7	24.3
Type of facility	*n* = 16,630	*n* = 5971	*n* = 2277	*n* = 4743	*n* = 1857	*n* = 1836
Public	8.1	3.8	30.2	16.7	16.0	35.8
Private	6.4	3.5	12.9	8.1	7.9	16.8
Other	7.2	2.7	23.6	9.6	20.3	9.1
Time travelled	*n* = 16,638	*n* = 5866	*n* = 2269	*n* = 4892	*n* = 1790	*n* = 1821
<1= hour	6.5	3.4	25.8	8.8	16.3	28.4
>1 hour	11.6	6.4	25.4	13.6	15.1	30.1
Poor responsiveness	7.5	3.8	25.2	10.1	15.6	28.8

[1] Most recent outpatient visit up to 1 year prior to the survey. Survey sampling weights applied.

Table 3. Prevalence (%) of inpatient[1] poor responsiveness by sample characteristics, country and pooled, adults aged 50+, WHO-SAGE Wave 1 2007–2010.

	Pooled	China	Ghana	India	Russia	South Africa*
Characteristics						
Age group (years)	*n* = 3055	*n* = 1368	*n* = 277	*n* = 598	*n* = 590	*n* = 222
50–59	8.6	4.8	28.4	15.1	15.2	39.3
60–69	9.4	6.5	20.1	9.8	23.6	30.0
70–79	9.8	5.4	32.5	13.0	27.2	18.8
80+	9.2	7.5	19.9	6.9	17.7	11.3
Sex	*n* = 3055	*n* = 1368	*n* = 277	*n* = 598	*n* = 590	*n* = 222
Male	9.6	6.3	21.0	12.8	24.9	31.0
Female	8.7	4.9	31.7	12.4	19.0	31.3
Area of residence	*n* = 3055	*n* = 1368	*n* = 277	*n* = 598	*n* = 590	*n* = 222
Urban	10.4	7.7	23.9	8.9	20.8	29.6
Rural	8.1	4.0	28.0	14.6	22.6	37.2
Education	*n* = 3022	*n* = 1368	*n* = 274	*n* = 598	*n* = 590	*n* = 192
No primary education	8.8	4.6	22.8	14.7	58.1	38.3
Primary	9.3	6.6	21.9	16.2	12.7	20.5
Secondary/high school	8.8	5.5	36.3	5.3	20.3	21.8
College/University	12.2	10.9	31.2	2.3	21.2	48.5
Household wealth	*n* = 3042	*n* = 1368	*n* = 277	*n* = 597	*n* = 590	*n* = 220
Quintile 1 Poorest	12.3	4.1	33.6	24.3	35.8	41.8
Quintile 2	9.7	3.8	22.0	15.8	29.1	60.2
Quintile 3	9.4	8.0	18.9	9.7	15.3	28.0
Quintile 4	8.6	6.1	22.9	13.9	12.2	29.0
Quintile 5 Richest	7.1	5.9	30.9	4.2	20.4	20.4
Duration of condition	*n* = 3001	*n* = 1355	*n* = 266	*n* = 595	*n* = 588	*n* = 197
NCD	10.8	4.9	30.4	20.2	25.6	20.7
Acute	12.2	13.6	21.9	9.6	32.0	NA
Other	7.6	5.4	25.9	10.6	14.2	35.2
Type of condition	*n* = 3018	*n* = 1356	*n* = 275	*n* = 596	*n* = 589	*n* = 202
Somatic	9.8	4.8	28.7	14.9	23.3	28.3
Psychiatric	7.9	14.7	NA	NA	NA	NA
Undefined	7.4	7.2	4.6	6.8	11.2	28.1
Type of facility	*n* = 3015	*n* = 1359	*n* = 271	*n* = 583	*n* = 584	*n* = 218
Public	9.0	5.3	29.5	18.5	21.3	33.6
Private	8.0	11.0	3.3	7.3	2.6	26.7
Other	5.2	38.2	54.5	54.8	NA	NA
Time travelled	*n* = 2900	*n* = 1309	*n* = 237	*n* = 594	*n* = 543	*n* = 217
<=1 hour	9.5	6.5	24.4	11.5	23.7	29.5
>1 hour	8.4	2.7	32.7	13.5	13.1	29.8
Poor responsiveness	9.1	5.6	25.9	12.6	21.2	31.2

[1] Most recent inpatient visit up to 3 years prior to the survey. Survey sampling weights applied.

countries, inpatient responsiveness was consistently worse than outpatient responsiveness. The prevalence of poor outpatient responsiveness was highest in South Africa (28.8%) and Ghana (25.2%) and lowest in China (3.8%). The prevalence of poor inpatient responsiveness was similarly highest in Africa (31.2%) and Ghana (25.9%) and lowest in China (5.6%).

For outpatients, regression analyses are summarised in Table 4. We found a higher risk for poor responsiveness among females in the univariate regression analyses (Model 0: OR 1.21 95% CI 1.02–1.44)). This remained when adjusting for other individual, health condition and healthcare visit factors (Model 3) but when introducing the country dummy variable (Model 4) the result was no longer statistically significant. A lower risk for poor responsiveness was seen for rural dwellers compared to urban in the univariate analysis, with similar changes in the adjusted models (Model 3 and 4) as for sex. No evidence of association for education was found. The richest quintile of households had a lower risk of poor responsiveness (Model 4: 0.70 95% OR 0.50–0.98). The univariate regression suggested that having an acute/new health condition as the reason for attendance, was preferable compared to a chronic disorder but when adjusting for the other covariates the findings were statistically non-significant. Regarding the healthcare facility, a lower risk for poor responsiveness was observed for private compared to public facilities and there was an interaction between type of condition and

Table 4. Logistic regression models showing factors associated with poor healthcare responsiveness for self-reported most recent[1] outpatient visits, adults aged 50+, WHO-SAGE Wave 1 2007–2010[2].

Factors	Model 0 OR (95% CI)	Model 1 (*N* = 17,049) OR (95% CI)	Model 2 (*N* = 16,963) OR (95% CI)	Model 3 (*N* = 15,8188) OR (95% CI)	Model 4 (*N* = 15,818) OR (95% CI)
Age group (N = 17,398)					
50–59	Reference	Reference	Reference	Reference	Reference
60–69	1.16 (0.95,1.41)	1.16 (0.95,1.41)	1.16 (0.95,1.41)	1.17 (0.95,1.43)	1.12 (0.90,1.39)
70–79	1.08 (0.84,1.39)	1.04 (0.79,1.35)	1.02 (0.78,1.33)	1.01 (0.76,1.31)	0.96 (0.73,1.26)
80+	1.02 (0.71,1.47)	1.00 (0.68,1.46)	0.98 (0.66,1.44)	0.92 (0.60,1.41)	0.81 (0.51,1.28)
Sex (N = 17,398)					
Male	Reference				
Female	1.21 (1.02,1.44)	1.22 (1.03,1.45)	1.22 (1.02,1.45)	1.19 (1.00,1.43)	1.17 (0.96,1.42)
Area of residence (N = 17,397)					
Urban	Reference	Reference	Reference	Reference	Reference
Rural	0.79 (0.62,1.00)	0.78 (0.61,0.99)	0.78 (0.61,1.01)	0.72 (0.55,0.94)	0.79 (0.60,1.06)
Education (N = 17,098)					
No primary education	Reference	Reference	Reference	Reference	Reference
Primary	0.81 (0.60,1.10)	0.86 (0.64,1.17)	0.85 (0.62,1.15)	0.84 (0.61,1.15)	0.96 (0.69,1.32)
Secondary/high school	1.03 (0.81,1.30)	1.08 (0.82,1.43)	1.02 (0.77,1.35)	1.03 (0.77,1.37)	0.99 (0.72,1.36)
College/University	1.43 (0.89,2.29)	1.60 (1.00,2.56)	1.51 (0.93,2.44)	1.44 (0.86,2.40)	1.18 (0.66,2.11)
Household wealth (N = 17,349)					
Quintile 1 Poorest	Reference	Reference	Reference	Reference	Reference
Quintile 2	1.08 (0.83,1.42)	1.08 (0.82,1.42)	1.08 (0.83,1.42)	1.11 (0.85,1.44)	1.12 (0.86,1.47)
Quintile 3	0.97 (0.73,1.28)	0.93 (0.69,1.24)	0.91 (0.68,1.22)	0.98 (9.73,1.32)	1.02 (0.76,1.37)
Quintile 4	0.96 (0.71,1.30)	0.91 (0.66,1.23)	0.88 (0.64,1.21)	0.93 (0.68,1.27)	1.01 (0.75,1.36)
Quintile 5 Richest	0.79 (0.57,1.09)	0.66 (0.47,0.92)	0.66 (0.47,0.92)	0.68 (0.49,0.94)	0.70 (0.50,0.98)
Duration of condition (N = 17,311)					
Chronic disease	Reference	Reference	Reference	Reference	Reference
Acute/new disorder	0.79 (0.66,0.94)		0.82 (0.68,0.98)	1.24 (0.82,1.88)	1.36 (0.88,2.09)
Type of condition (N = 17,331)					
Somatic	Reference		Reference	Reference	Reference
Psychiatric	1.65 (0.70,3.87)		1.55 (0.64,3.74)	1.27 (0.49,3.33)	1.28 (0.46,3.60)
Undefined	1.12 (0.94,1.35)		1.13 (0.93,1.37)	1.07 (0.88,1.31)	1.31 (1.07,1.61)
Type of facility (N = 16,630)					
Public	Reference			Reference	Reference
Private	0.77 (0.61,0.97)			1.15 (0.74,1.77)	0.89 (0.56,1.40)
Other	0.87 (0.57,1.34)			1.95 (0.72,5.28)	1.73 (0.63,4.72)
Time travelled (N = 16,638)					
<1 hour	Reference			Reference	Reference
>1 hour	1.88 (1.51,2.35)			2.01 (1.58,2.56)	1.58 (1.23,2.03)
Condition*facility (*N* = 16,578)	0.89 (0.82,0.97)			0.79 (0.59,1.04)	
Country (N = 17,398)					

China	Reference	Reference
India	2.83 (2.17,3.69)	3.88 (2.83,5.31)
Russian Federation	4.63 (3.13,6.83)	4.09 (2.52,6.62)
South Africa	10.15 (7.72,13.34)	9.61 (6.88,13.42)
Ghana	8.44 (6.50,10.97)	9.65 (7.13,13.06)

[1] Refers to most recent outpatient visit up to 1 year prior to the survey. [2]Pooled country data set comprises China, Ghana, India, South Africa and Russian Federation. Model 0 is univariate model. Model 1 includes only age, sex, area of residence, education, household wealth. Model 2 additionally includes duration of condition, type of condition. Model 3 additionally includes type of facility, time travelled and the interaction term type of condition*type of facility. Model 4 additionally includes country. Survey sampling weights applied. Red highlight with bold and underline indicates statistical significance at $p \leq 0.05$.

facility. When adding the interaction to the model (Model 3) the difference disappeared. Among those who had travelled for more than 1 hour a higher risk for poor responsiveness was seen (Model 4: OR 1.58 95% CI 1.23–2.03). The variation in outpatient responsiveness between countries was large. The lowest proportion of poor responsiveness was seen in China (3.8% of outpatients) and the highest in South Africa where approximately one third reported poor responsiveness (Table 2). Between country differences were evident in the logistic regression Model 4 where, compared to China, a higher risk for poor responsiveness was observed for all countries even after adjusting for individual, health condition and healthcare facility factors (Table 4). The likelihood of poor outpatient responsiveness in South Africa and Ghana was over nine times higher than in China.

In Table 5, the regression analyses for the last inpatient visit are summarised. We found no impact of individual factors on the risk for poor healthcare responsiveness in our sample. A lower risk of poor responsiveness in the richest quintile was suggested (Model 3: 0.40 95% OR 0.19–0.87) but did not remain in Model 4 which adjusted for country. There were indications of dose-response trends for age and household wealth with lower risk for poor responsiveness among the eldest and the richest quintile, respectively. Similar trends were suggested also in the outpatient sample. Neither health condition nor type of facility were significantly associated with poor responsiveness. Travel time for more than 1 hour was associated with lower risk of poor responsiveness for inpatients (Model 4: OR 0.66 95% CI 0.44–1.00). Similarly, as for the outpatient sample the risk for poor responsiveness was higher in all countries compared to China after adjusting for all other variables (Table 5). Compared with China, the likelihood of poor inpatient responsiveness in Ghana was six times higher and nine times higher in South Africa.

Holding all other variables constant, travel time and country were the only variables significantly associated with both inpatient and outpatient responsiveness (Tables 4 and 5). The effects of travel time were in opposing directions for outpatient and inpatient responsiveness, with a higher likelihood of poor responsiveness for outpatients and a lower likelihood of poor responsiveness for inpatients when travel time exceeded 1 hour.

Discussion

The delivery of health care to patients comprises a multitude of interactions involving not only the point of service with a particular healthcare provider, but also the physical environment, its cues and the broader institutional arrangements.

This study is important for a number of reasons. First, the sample comprises only people aged 50 and over. Previous studies have examined responsiveness spanning a wider age range, and increasing responsiveness has been reported for elderly populations (Valentine & Bonsel, 2016). One possible reason is that chronic diseases are more prevalent in older people and patients with chronic needs adapt to their care processes. However it is relevant to examine the behaviour of the same responsiveness measures specifically in older adults as, given the epidemiological and demographic transitions occurring in all regions of the world, evidence of such can be useful for health policy and planning. Second, the examination of older populations in five LMICs is relevant to a broader group of developing countries experiencing a similar a demographic transition and increasing NCDs but not necessarily also having large investments in healthcare services (Mirzoev & Kane, 2017). This paper argues that measurement and evidence of responsiveness can be used by governments to re-evaluate health reforms (Kowal et al., 2011; Malhotra & Do, 2012; Peltzer & Phaswana-Mafuya, 2012; Valentine et al., 2008) and can help promote more effective access, service use and quality of care (Mirzoev & Kane, 2017). Evaluations of reforms can assess whether there has been a positive or negative change for responsiveness, as compared with other aspects important to management, e.g. costs. Specific measures introduced to improve services can be assessed on multiple criteria, including responsiveness for the patient's experience.

The first key finding from this study was that older adult populations pooled across five LMICs experienced less responsive outpatient health services associated with difficulties in travel time. This

Table 5. Logistic regression models showing factors associated with poor healthcare responsiveness for self-reported most recent[1] inpatient visits, adults aged 50+, WHO-SAGE Wave 1 2007–2010[2].

Factors	Model 0 OR (95% CI)	Model 1 (*N* = 3009) OR (95% CI)	Model 2 (*N* = 2959) OR (95% CI)	Model 3 (*N* = 2771) OR (95% CI)	Model 4 (*N* = 2771) OR (95% CI)
Age group (N = 3055)					
50–59	Reference	Reference	Reference	Reference	Reference
60–69	1.11 (0.70,1.77)	1.04 (0.63,1.69)	1.02 (0.62,1.67)	1.06 (0.64,1.74)	1.00 (0.60,1.63)
70–79	1.17 (0.72,1.90)	1.03(0.62,1.72)	1.02 (0.60,1.74)	0.92 (0.55,1.54)	0.86 (0.53,1.49)
80+	1.09 (0.55,2.14)	0.95 (0.45,2.01)	0.92 (0.42,2.00)	0.87 (0.39,1.95)	0.71 (0.31,1.60)
Sex (N = 3,055)					
Male	Reference	Reference	Reference	Reference	Reference
Female	0.89 (0.61,1.30)	0.90 (0.61,1.35)	0.90 (0.62,1.34)	0.94 (0.63,1.40)	0.82 (0.56,1.20)
Area of residence (N = 3055)					
Urban	Reference	Reference	Reference	Reference	Reference
Rural	0.76 (0.53,1.08)	0.69 (0.42,1.12)	0.72 (0.45,1.15)	0.76 (0.46,1.26)	0.88 (0.57,1.35)
Education (N = 3022)					
No primary education	Reference	Reference	Reference	Reference	Reference
Primary	1.06 (0.61,1.85)	1.06 (0.61,1.84)	1.09 (0.62,1.90)	1.10 (0.62,1.97)	1.09 (0.64,1.85)
Secondary/high school	1.01 (0.68,1.50)	1.01 (0.60,1.71)	1.04 (0.62,1.75)	1.03 (0.60,1.77)	0.73 (0.44,1.21)
College/University	1.45 (0.88,2.37)	1.49 (0.81,2.76)	1.54 (0.83,2.87)	1.65 (0.87,3.12)	1.05 (0.57,1.93)
Household wealth (N = 3042)					
Quintile 1 Poorest	Reference	Reference	Reference	Reference	Reference
Quintile 2	0.76 (0.40,1.45)	0.75 (0.39,1.43)	0.73 (0.38,1.42)	0.68 (0.37,1.24)	0.72 (0.41,1.28)
Quintile 3	0.74 (0.38,1.44)	0.66 (0.31,1.41)	0.64 (0.30,1.35)	0.64 (0.30,1.37)	0.71 (0.34,1.48)
Quintile 4	0.67 (0.37,1.21)	0.57 (0.29,1.15)	0.58 (0.29,1.16)	0.53 (0.26,1.09)	0.62 (0.32,1.22)
Quintile 5 Richest	0.54 (0.29,1.01)	0.43 (0.20,0.91)	0.42 (0.20,0.90)	0.40 (0.19,0.87)	0.50 (0.24,1.03)
Duration of condition N = 3001)					
NCD	Reference		Reference	Reference	Reference
Acute	1.14 (0.68,1.92)		1.25 (0.74,2.08)	0.94)0.44,1.98)	0.82 (0.36,1.86)
Other	0.68 (0.44,1.05)		0.74 (0.45,1.22)	0.39 (0.11,1.34)	0.40 (0.11,1.47)
Type of condition (N = 3018)					
Somatic	Reference		Reference	Reference	Reference
Psychiatric	0.79 (0.10,6.19)		1.60 (0.18,14.55)	1.81 (0.13,26.33)	1.32 (0.11,15.83)
Undefined	0.74 (0.46,1.18)		0.91 (0.54,1.56)	1.05 (0.62,1.79)	1.22 (0.70,2.13)
Type of facility (N = 3015)					
Public	Reference			Reference	Reference
Private	0.89 (0.54,1.47)			0.47 (0.09,2.54)	0.30 (0.04,1.88)
Other	11.04 (2.0,60.94)			2.88 (0.10,80.62)	2.08 (0.06,76.0)
Time travelled (N = 2900)					
<1 hour	Reference			Reference	Reference
>1 hour	0.88 (0.55,1.39)			0.85 (0,54,1.33)	0.66 (0.44,1.00)
*Condition*facility(N = 2961)*	0.99 (0.83,1.19)			1.26 (0.79,2.03)	1.20 (0.74,1.96)
Country (N = 3055)					

(*Continued*)

Table 5. Continued.

Factors	Model 0 OR (95% CI)	Model 1 (N = 3009) OR (95% CI)	Model 2 (N = 2959) OR (95% CI)	Model 3 (N = 2771) OR (95% CI)	Model 4 (N = 2771) OR (95% CI)
China	Reference				Reference
India	2.44 (1.63,3.67)				3.52 (2.01,6.17)
Russian Federation	4.56 (3.00,6.92)				4.92 (2.95,8.19)
Ghana	5.91 (3.76,9.28)				6.29 (3.15,12.57)
South Africa	7.67 (4.35,13,52)				8.92 (4.64,17.15)

[1] Refers to most recent inpatient visit up to 3 years prior to the survey. [2]Pooled country data set comprises China, Ghana, India, South Africa and Russian Federation. Model 0 is univariate model. Model 1 includes only age, sex, area of residence, education, household wealth. Model 2 additionally includes duration of condition, type of condition. Model 3 additionally includes type of facility, time travelled and the interaction term type of condition*type of facility. Model 4 additionally includes country. Survey sampling weights applied. Red highlight with bold and underline indicates statistical significance at $p \leq 0.05$.

finding applied to all of the studied countries regardless of levels of expenditures for health services. See Supplementary file 3. An ecological study (Valentine & Bonsel, 2016) of general populations in 57 countries associated worse health outcomes with poor responsiveness in prompt attention, independent of healthcare expenditures. A study from Canada found more frequent positive assessments of the care experience by rural primary care users compared to their urban counterparts (Lamarche et al., 2010). Responsiveness scores for several Asian countries (Kowal et al., 2011) show different patterns for urban and rural residents reflecting a range of various factors that are related to area of residence. In this study rural residence was associated with poorer responsiveness in the outpatient models but attenuated to non-significance when country of residence was added, implying a stronger system-wide impact on responsiveness.

With regard to inpatient responsiveness, it is worrying that populations requiring hospitalisation found more responsive hospital care after travelling further. In reality, this could also imply some attrition in those needing inpatient services and unmet need. This phenomenon of unmet need has been one of the criticisms of population-based measures of responsiveness based on actual experiences. Other scholars have outlined approaches to address this such as sampling specific ill populations (Valentine et al., 2010).

A second strong key finding is related to inequities. The wealthiest quintile in the populations are the only group across all five countries experiencing higher responsiveness. Inequities in responsiveness have been found in high-income countries, such as The Netherlands (Van der Kooy et al., 2017). However, it is remarkable that a gap between the wealthiest and the rest of the population is observed across LMICs. It is possible that this is in part due to a commonality in the patterns of health system organisation and policy. This could be further examined with variables such as the extent of publicly financed health services as studied elsewhere (Rice et al., 2012).

As regards inequities in general, it is also interesting to observe that in the pooled data without the country variable there was a general tendency for women to experience worse responsiveness although this association attenuated once the country variable was included. The Gender Inequality Index measured in 2010 by the United Nations Development Program for at least four of these countries is roughly in the bottom of the 50% worst rankings (see: http://hdr.undp.org/en/content/gender-inequality-index).

The study cannot explain why a subset of 15% of undefined conditions show worse responsiveness in outpatient services. One hypothesis could be that these conditions carry some form of social stigma. Overall, it was surprising that responsiveness across all five countries health services was not associated with medical conditions, at least for the older population groups. An interesting further analysis could be to investigate the different in responsiveness between older and younger population groups, where different patterns of medical conditions are more or less prevalent. On the other hand, it would seem that both chronic and acute (or new) health disorders are similarly dealt with by the health systems in these countries.

Finally, readers will observe that the likelihood of poor responsiveness differs by country, in descending order for outpatients China, India, Russia, South Africa and Ghana and for inpatients China, India, Russia, Ghana and South Africa. As with self-reported health, responsiveness measures contain elements of differential reporting behaviour. A study of differential reporting (Valentine et al., 2015) shows a scale shift for older populations. Using the dichotomised variable from the five-point Likert scale would have adjusted for some, but not all of this bias at the individual level. Cultural and broader social norms can also influence the scale of the shift. If country comparisons had been the focus of this paper, the statistical methods would have included multi-level analysis and, or, vignette-based adjustments as others have done (Rice et al., 2012).

Follow-up studies should investigate whether the scenario of rural-urban inequities has changed since these WHO-SAGE surveys were conducted. Over the period 2007–2010 the Gross Domestic Product in these countries has grown and investments in health care have increased. The use of responsiveness-type measurements is increasing, as seen in national performance frameworks that incorporate patient reported experience measures, or 'PREMs' (e.g. the National Health Service

Framework in the UK (NHS, 2016)). As these measures are increasingly adopted by healthcare organisations, including insurers, we can expect larger investments to be made in data collection systems. Considering this, it will be important to stress the use of these measures to understand barriers to access and inequalities, given the important role of the acceptability of care in ensuring coverage (Valentine et al., 2003; Valentine et al., 2010).

Strengths and limitations

While building on previous patient satisfaction literature, the literature on health systems responsiveness is still relatively new, especially for older populations in LMICs. The earlier literature by WHO showed comparisons across countries, including LMICs, but did not delve into responsiveness metrics for older populations (Ortiz et al., 2003; Valentine et al., 2003).

A cursory review revealed that of the papers on this topic published since 2000, the year the WHO concept was launched, approximately two thirds were published between 2014 and 2018. This suggests an increasing recognition of the importance of measuring patients' perceptions of their use of health care in the academic community, along with the transfer to health service organisations via PREM metrics, as mentioned earlier. Evidence from research such as this can be used, not only to meet needs and improve healthcare outcomes, but also to address barriers responsible for inequalities in access and service use.

One of the limitations of this study however is that these SAGE countries dedicated between 4% and 8% of their Gross Domestic Product and between 63 and 524 US Dollars (2015) to total health expenditure http://apps.who.int/nha/database. The results are therefore not generalisable to high-income countries in which healthcare systems are better resourced in terms of infrastructure and workforce. Furthermore, we did not adjust for the way in which health care was financed in these LMICs and we acknowledge that this may have influenced responsiveness.

There are further limitations which must be acknowledged. Healthcare responsiveness was estimated on the sample of people who attended a facility within the given time frame (1 year for outpatients and 3 years for inpatients). However it is possible that negative experiences in previous years may have deterred people from subsequent healthcare facility seeking such that they were not included in the sample. Also the survey questions did not allow us to identify individuals who may have received home care. This is a cross-sectional analysis and therefore we cannot attribute causation. The data are self-reported and therefore subject to response bias. Medical records were not checked. We do not know whether the 'complete cases' were a true random sample of all possible cases. We also acknowledge that these data can be analysed from a multi-level perspective however this study is a first step for future much needed work on health system responsiveness.

Our paper did not describe the literature regarding service interventions that are shown to have positive impacts on responsiveness, as this was not the main focus of the study. Some of these are referenced elsewhere and include giving providers checklists that cover the patient's background more comprehensively and improving the cultural awareness of staff (Bastemeijer et al., 2019).

Conclusion

Responsive health systems adapt to change, both internal and external, while adhering to an overarching responsibility to deliver rewarding and satisfying healthcare experiences. These findings provide an evidence platform to further investigate health systems responsiveness in older adults in LMICs.

This study focuses attention on generally overlooked aspects of healthcare responsiveness in older adults in LMICs. The tendency observed by which wealthier populations experience better responsiveness, is worrying in the era of the Sustainable Development Agenda promising 'No-one Left Behind'. On the contrary, it would seem 80% are left behind. If not better addressed, organisational and interpersonal aspects of quality of care will continue to present major challenges for healthcare

systems in dealing with the growing numbers and proportions of older adults and the increasing prevalence of NCDs. Transport and access to health services presents as a key challenge. Yet other responsiveness domains such as discrimination, dignity and stigma need to be addressed and are part of the total response. Policies are urgently needed to address issues of concern across the domains of responsiveness in order to ensure that the goals of universal health coverage are achieved.

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Availability of data and materials

The anonymised datasets are in the public domain: http://apps.who.int/healthinfo/systems/surveydata/index.php/catalog/central. SAGE is committed to the public release of study instruments, protocols and meta- and micro-data: access is provided upon completion of the Users Agreement available through WHO's SAGE website: www.who.int/healthinfo/systems/sage. The questionnaires and other materials can be found at: http://www.who.int/healthinfo/sage/cohorts/en/index2.html

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