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Prevalence of unmet health care need in older adults in 83 countries – measuring progressing towards universal health coverage in the context of global population ageing

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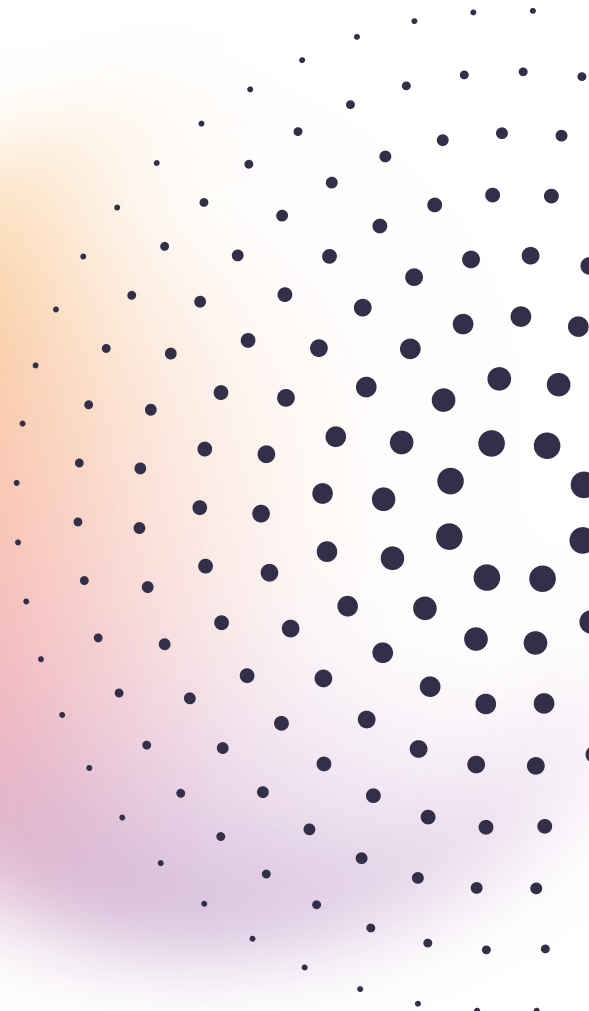
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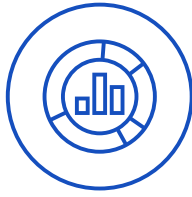

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Abstract

Current measures for monitoring progress towards universal health coverage (UHC) do not adequately account for populations that do not have the same level of access to quality care services and/or financial protection to cover health expenses for when care is accessed. This gap in accounting for unmet health care needs may contribute to underutilization of needed services or widening inequalities. Asking people whether or not their needs for health care have been met, as part of a household survey, is a pragmatic way of capturing this information.

This analysis examined responses to self-reported questions about unmet need asked as part of 17 health, social and economic surveys conducted between 2001 and 2019, representing 83 low-, middle- and high-income countries. Noting the large variation in questions and response categories, the results point to low levels (less than 2%) of unmet need reported in adults aged 60+ years in countries like Andorra, Qatar, Republic of Korea, Slovenia, Thailand and Viet Nam to rates of over 50% in Georgia, Haiti, Morocco, Rwanda, and Zimbabwe. While unique, these estimates are likely underestimates, and do not begin to address issues of poor quality of care as a barrier or contributing to unmet need in those who were able to access care. Monitoring progress towards UHC will need to incorporate estimates of unmet need if we are to reach universality and reduce health inequalities in older populations.

Keywords: health service needs and demand, health services research, adult, older adult, Africa, Americas, Asia, Europe

Introduction

The 1978 Alma Ata Declaration[1] identified health as a human right and ensuring access to health care as a primary responsibility of governments. These ground-breaking principles called for primary health care for all - with equity of access and affordability central to policies that support achieving universal health care[2]. Need was also included in the World Health Organization and UN Sustainable Development Goal (SDG) 3.8 definition of universal health *coverage* (UHC): "... people receive the health services they need without suffering financial hardship". In the global context, need is not explicitly defined, nor does unmet need have an agreed standard definition. Quantifying the levels of unmet need contributes to efforts to 'leave no one behind' as part of SDG Target 3.8 and renewed interest in equity in national policy deliberations as part of commitments to the Astana Declaration[3].

A number of definitions of health need are in use – with no agreed convention or standard definition. Care needs in adult populations are often inferred from rates of disease and disability, or administrative data on service utilization[4]. The International Labor Organization (ILO) recently defined need (for health care) related to older adults as any "*older persons aged at or above their healthy life expectancy*"[5]. Global disease estimates derived from entities like the Global Burden of Disease Study, indicate need for health care at a population level and allow comparisons between countries. These disease burden morbidity estimates can be used to forecast future health levels in different population groups or sub-groups over time, and the related health care requirements. Using this approach, need for health defined by disease burden is often invoked as a driver of demand on health care systems[6,7].

Yet 'need for health' at the population level defined using healthy life expectancy or disease burden, for example, likely differs from 'health need' at the individual level, where health need is self-perceived and may include health issues for which there are no or limited effective treatment options[8]. Asking older persons whether or not their needs for health care have been met is a pragmatic way of capturing this information in this population group – and with additional follow-on questions, can also identify barriers in access to health services and service adequacy.

Direct questions about unmet need are asked as part of a number of health and social surveys worldwide, including a range of ageing and health studies. Based on responses to these questions, prevalence of self-reported unmet need can be estimated. For instance, some surveys ask a general question about unmet need, along the lines of "*The last time you needed health care, did you get health care?*". Others include questions that seek to also identify the type of barriers people faced, for instance, cost of services, distance needed to travel to access the service, or waiting time at a facility. An example question would be, "*During the past 12 months, was there a time when you had a medical problem but did not consult with/visit a doctor because of the cost?*".

Unmet need for health care is a concern for older individuals and societies (including loss of functioning or productivity from untreated health conditions), for national policymakers who aim to ensure older population health needs are met, and for global efforts to track progress toward UHC[9,10]. For example, policies that alter financial levers to achieve UHC may not account for latent unmet need, leading to more inequities in demand and supply for older adult populations and those with multimorbidity or the most complex health concerns[11-13]. Summary indicators or indices developed to measure UHC might also need to account for unmet need[14].

Unmet need is already part of policy dialogue and data monitoring in European and OECD countries, where it is used as a measure of access to health care, and is derived from the data available through the EUROStat dashboard (see for example: https://ec.europa.eu/eurostat/web/products-datasets/-/tespm110). The European Commission included "self-reported unmet need for medical care" as one of 12 core indicators of its Social Scoreboard, and can be further disaggregated by older age groups and sex. The International Health Policy Survey carried out by

the Commonwealth Fund in 11 industrialized countries includes direct questions on unmet need in populations aged 65 years and older (https://www.commonwealthfund.org/series/international-health-policy-surveys). Beyond Europe, countries asking respondents about unmet needs in national surveys include, for instance, Canada, Chile, New Zealand, Republic of Korea, Thailand, Turkey and the United States of America. Unfortunately, much of the published literature on the topic of unmet need is limited to higher income countries.

The aims of this paper were to generate the estimates of unmet health care need prevalence for adults aged 60 years and older (60+) in 83 countries in different world regions, and assess the distribution of unmet health care need by age, sex, and location where possible – with an eye to how the definitions used to generate these results would feed into measurement of university health coverage.

Materials and Methods

Questionnaires and study materials from 18 studies covering 83 countries across all world regions, were identified and reviewed. We had sought access to a wider range of studies, but could not include more of these because we are awaiting approvals for data access, language/translation issues, or the available variables did not allow us to proceed with analyses. The total sample size for each country is available in **Appendix 1**. Questions about unmet health care need were evaluated for each study, and suitable questions were entered into a spreadsheet. This required assessment of differences in question wording, response categories and number of questions from a wide range of studies. Questions were compared and compiled across studies, with a decision tree used to define met and unmet need (**Figure 1**). Questions were evaluated to construct the variables for analysis and to generate needed numerator and denominator information for each variable and each study (**Table 1**).

Variables were harmonized to the extent possible which included assessment of question wording, question sequencing/ordering and response categories. The team faced challenges with categorizing available variables and unequal representation of different model dimensions, especially the system level factors. The existing survey data did not allow us to build and apply multi-level analytical models – with few or no suitable supply-side variables available in the data sets to adequately examine systems level/supply side components.
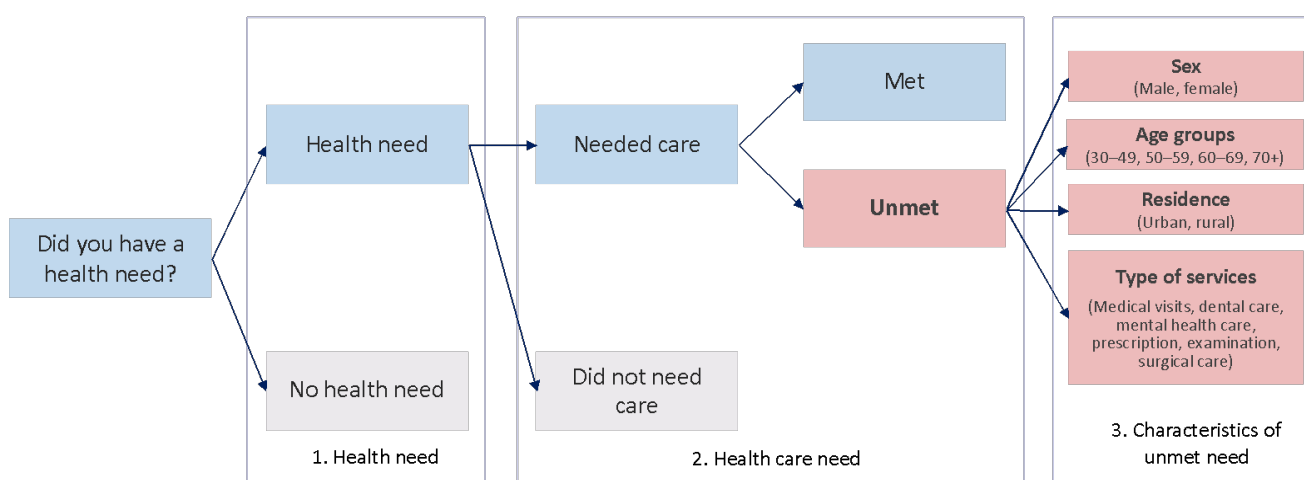
Figure 1. Decision tree for met and unmet health care need within selected surveys

Notes: Some of surveys started from the "health care need" (2) without asking respondents' health need (1). A number of surveys asked about health need, then specifically asked whether or not the respondent felt she/he/they needed care for this health need (see Cambodia and The Gambia, for example). Others incorporated health need into the question about accessing care (SAGE, for example).

Did not need health care

Definition: The proportion of respondents who reported that they did not need health care.

Met health care need

Definition: The proportion of respondents who reported that their need for health care was met.

Unmet health care need

Definition: The proportion of respondents who reported that they needed health care but did not receive it.

Table 1. Calculating unmet health care need – variable definitions used to generate prevalence estimates

In addition to the usual challenges of generating estimates from surveys with complex designs (including type of interview (phone, online, in-person), sampling, sample size, and question skip patterns), we expected variability in results between studies because of the nature of the question or questions asked about unmet need. The unmet need questions presented a number of additional challenges when looking across the different surveys, such as: single versus multiple questions; question wording; response categories; question flow and location within the interview; timeframes (open-ended versus time-specific (for instance, in last 30 days)); whether a type (or types) of health care were specified (broadly, outpatient or inpatient care); and whether the questions specified a reason within the question itself (because of cost or accessibility), or if a follow-on question was asked that allowed the respondent to share the reason. A few salient examples are described below – with more question details available in Table 2 (see also, more detailed technical notes at https://extranet.who.int/kobe_centre/en/project-details/unmet_needs).

For example, the WHO Study on global AGEing and adult health (SAGE) asked a single question about unmet need, "The last time you needed health care, did you get health care?", with an open time frame within the last three years, followed by two questions – one asking about the symptoms, illness, condition or event that was the basis for needing care, and one about the reasons for not getting that care (with 10 response categories). The Cambodia Elderly Study (CES) used four questions (see **Table 2**) before a question asking about the reason the respondent did not get health care (with 7 response categories). The Integrated Household Survey (IHS) in The Gambia also used two similar questions ("During the last 2 weeks, what symptoms has [NAME] suffered from…"? and "Did [NAME] consult a health provider for this illness/injury last 2 weeks for MAIN illness?", before asking about the reasons for not getting care (7 response categories). The Commonwealth Fund International Health Policy Survey's (CMWF) approach used four questions about unmet need related to prescription medications, medical visits, skipped tests or dentist visits - but all related to the barrier of cost (see **Table 2**).

The Thai Health and Welfare Study (THWS) asked questions about unmet need from outpatient or inpatient services: "UN1 (out-patient): Was there any time during the last 12 months when you were sick and needed a medical treatment but you did not receive it?" and "UN3 (in-patient): Was there any time during the last 12 months when you needed or were recommended by a medical doctor to admit to a health facility but you did not receive it?".

The time period covered by questions also differed: some questions did not specify a time period (SAGE), while others did (for example, in the last 24 hours (New Zealand Health Survey (NZHS)), last 2 weeks (ELSI-Brazil), last 30 days (SABE Colombia), last 12 months (Cambodia, SABE Ecuador, Myanmar 2016), or last 5 years (MHAS)). This again adds variability into the resulting estimates. The question in the NZHS was even more precise – where the 24h timeframe was further quantified as an event "in the past 12 months".

The year of data collection for the studies ranged from 2001 to 2019. Some studies implemented only one cross-sectional wave (ELSI-Brazil, Myanmar Aging Study (MAS) and Mongolia SAGE),

while some had sequential cross-sectional waves (new respondents at each wave: IHS, THWS and NZHS), while other studies had longitudinal waves of data collection (some respondents followed over time, for example, SAGE, PREHCO and MHAS).

The target study populations also varied by study – with the focus of this analysis on those aged 60 years and older. Some studies had no lower or upper age limit (THWS), while others had quite different age limits (15+ years (Tunisia Health Examination Survey), 16+ years (World Values Survey), or 65+ years (Commonwealth Fund International Health Policy Survey). A number of ageing studies were included with 50, 60 or 65 years as their lower age threshold.

These examples point to differences in the target universe of individuals used to derive the estimated prevalence of unmet health needs, which potentially reduces the comparability across studies. The question or set of questions, and wording of those questions along with response categories, likely add a degree of variability within and across countries in the final estimates – but overall point to levels of unmet need and challenges countries will face in equitably achieving UHC. Details about these questions and methods of generating the estimates are provided in **Table 2**, with additional detailed information in a Technical Note available through an author's institute (https://extranet.who.int/kobe_centre/en/project-details/unmet_needs).

In an effort to provide comparable estimates within and across studies and world regions, these analyses focused on generating prevalence estimates for adults aged 60+ years. A set of unweighted and weighted estimates of unmet need were then generated for each question set by study, and according to age group, sex, and urban or rural residence. Due to uncertainties about study weights, and sub-population analyses (older adults), we present here the unweighted prevalence estimates of unmet health care need in populations aged 60+ years. Statistical significance for sex and location differences was set at $p<0.05$.

Results

Seventeen studies covering 83 low-, middle- and high-income countries were accessed, including n=57,783 adults aged 60+ years. Using the most recent data for each country, the results point to low prevalence (less than 2%) of unmet need for the populations aged 60+ years in Andorra, Qatar, Republic of Korea, Slovenia, Thailand and Viet Nam. Twenty-two countries had prevalence estimates of 30% or higher (see **Figure 2**). The prevalence of unmet health care need exceeded 50% in four countries: Georgia, Haiti, Morocco, Rwanda, and Zimbabwe.

Results presented in **Figures 2, 3** and **4** below were grouped by WHO regions (see more information at: www.who.int/about/who-we-are/regional-offices). **Figure 2** includes the population aged 60+ years by country and region. The set of countries show gradients in unmet need within each region with the highest country prevalence above 50% in each region except the Western Pacific Region (the Philippines at 37.7%). A wide range in estimates are observed in countries in the African (18.4% to 67.4%), Eastern Mediterranean (0 to 54.5%) and European (0.5% to 50.4%) regions.

European Region

Country	Year	Unmet health care need (%)
Georgia	2010	50.2
Armenia	2010	46.0
Azerbaijan	2010	30.8
Ukraine	2017	24.9
Romania	2017	21.1
Switzerland	2017	21.0
Kazakhstan	2017	20.3
Serbia	2017	18.4
Uzbekistan	2010	15.2
Russian Federation	2017	15.0
Tajikistan	2017	14.6
Belarus	2010	14.5
Poland	2010	14.0
Germany	2017	13.0
Turkey	2017	12.5
Estonia	2010	12.2
Kyrgyzstan	2017	10.9
France	2017	10.3
United Kingdom†	2017	10.1
Netherlands	2017	9.3
Norway	2017	8.7
Greece	2017	8.2
Sweden	2017	8.0
Cyprus	2017	6.1
Spain	2010	3.7
Slovenia	2010	1.3
Andorra	2017	0.5

Western Pacific Region

Country	Year	Unmet health care need (%)
Philippines	2017	37.7
Australia	2017	24.1
Mongolia	2017	22.1
New Zealand	2018	17.8
China	2017	11.4
Malaysia	2017	10.7
Hong Kong SAR	2017	9.1
Macau SAR	2017	6.6
Taiwan ROC	2017	5.9
Japan	2017	4.6
Singapore	2010	4.5
Republic of Korea	2017	0.7
Viet Nam	2019	0.3

Region of the Americas

Country	Year	Unmet health care need (%)
Haiti	2010	50.4
Nicaragua	2017	44.6
Bolivia†	2017	43.6
Peru	2017	40.8
Chile	2017	34.6
Colombia	2017	33.0
Ecuador	2017	28.9
United States†	2017	27.5
Guatemala	2017	25.4
Brazil	2017	22.5
Canada	2017	20.5
Mexico	2018	15.7
Argentina	2017	14.6
Puerto Rico	2017	14.4
Uruguay	2010	13.7
Trinidad and Tobago	2010	12.6

Eastern Mediterranean Region

Country	Year	Unmet health care need (%)
Morocco	2010	54.5
Pakistan	2017	47.9
Iraq	2017	47.7
Egypt	2017	46.0
Tunisia	2017	38.4
Yemen	2010	37.5
Iran†	2017	32.3
Palestine	2010	29.3
Libya	2010	20.5
Jordan	2017	16.5
Lebanon	2017	13.2
Kuwait	2010	7.2
Qatar	2010	0.0

African Region

Country	Year	Unmet health care need (%)
Zimbabwe	2017	67.4
Rwanda	2010	65.0
Nigeria	2017	37.9
Ethiopia	2017	26.1
South Africa	2014	25.8
Algeria	2010	22.9
Gambia (The)	2015	21.0
Ghana	2014	18.4

South-East Asian Region

Country	Year	Unmet health care need (%)
Indonesia	2017	43.7
Bangladesh	2017	43.5
India	2010	29.6
Myanmar	2017	17.6
Cambodia	2004	4.4
Thailand	2017	1.9

†United Kingdom of Great Britain and Northern Ireland　　　†Bolivia (Plurinational State of), United States of America　　　†Iran (Islamic Republic of)

Figure 2. Prevalence of unmet health care need overall for adults aged 60+ years using the most recent study‡, by country and WHO region

Where multiple studies are available in a country, data from the most recent year was used. NOTE results are unweighted due to differences in weights provided for each study.

Results in **Figures 3a** and **3b** focus on two age groups (60-69 and 70+ years) for men and women, again with countries organized by WHO region. These figures show that the differences between women and men were generally small. Where differences were statistically significant (*) – in the 60-69 year group - five countries had higher rates of unmet need in women than men (Belarus, Kazakhstan, Mexico, Romania and Ukraine), and men in two countries, Algeria and Cyprus, had higher rates than women. In the 70+ age group, five countries had higher rates in women than men (Canada, Gambia, Mexico, New Zealand, and Romania) and men from two countries (Libya and Peru) had higher rate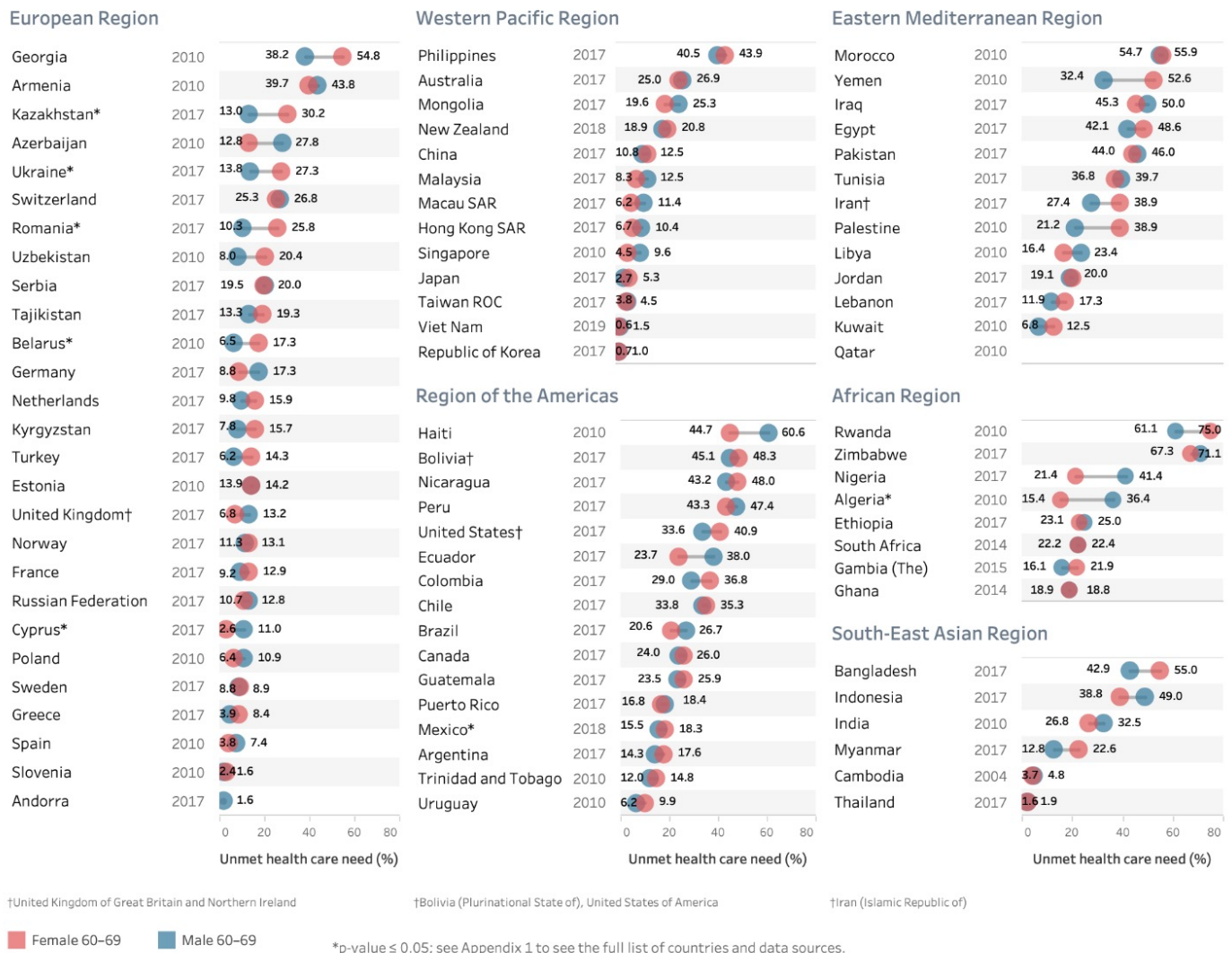s than women. A number of countries had large differences in prevalence rates between men and women – but did not reach statistical significance (likely due to low sample size in these age groups – see Appendix table).

European Region

Country	Year	Male	Female
Georgia	2010	38.2	54.8
Armenia	2010	39.7	43.8
Kazakhstan*	2017	13.0	30.2
Azerbaijan	2010	12.8	27.8
Ukraine*	2017	13.8	27.3
Switzerland	2017	25.3	26.8
Romania*	2017	10.3	25.8
Uzbekistan	2010	8.0	20.4
Serbia	2017	19.5	20.0
Tajikistan	2017	13.3	19.3
Belarus*	2010	6.5	17.3
Germany	2017	8.8	17.3
Netherlands	2017	9.8	15.9
Kyrgyzstan	2017	7.8	15.7
Turkey	2017	6.2	14.3
Estonia	2010	13.9	14.2
United Kingdom†	2017	6.8	13.2
Norway	2017	11.3	13.1
France	2017	9.2	12.9
Russian Federation	2017	10.7	12.8
Cyprus*	2017	2.6	11.0
Poland	2010	6.4	10.9
Sweden	2017	8.8	8.9
Greece	2017	3.9	8.4
Spain	2010	3.8	7.4
Slovenia	2010	2.4	1.6
Andorra	2017		1.6

Western Pacific Region

Country	Year	Male	Female
Philippines	2017	40.5	43.9
Australia	2017	25.0	26.9
Mongolia	2017	19.6	25.3
New Zealand	2018	18.9	20.8
China	2017	10.8	12.5
Malaysia	2017	8.3	12.5
Macau SAR	2017	6.2	11.4
Hong Kong SAR	2017	6.7	10.4
Singapore	2010	4.5	9.6
Japan	2017	2.7	5.3
Taiwan ROC	2017	3.8	4.5
Viet Nam	2019	0.6	1.5
Republic of Korea	2017	0.7	1.0

Region of the Americas

Country	Year	Male	Female
Haiti	2010	44.7	60.6
Bolivia†	2017	45.1	48.3
Nicaragua	2017	43.2	48.0
Peru	2017	43.3	47.4
United States†	2017	33.6	40.9
Ecuador	2017	23.7	38.0
Colombia	2017	29.0	36.8
Chile	2017	33.8	35.3
Brazil	2017	20.6	26.7
Canada	2017	24.0	26.0
Guatemala	2017	23.5	25.9
Puerto Rico	2017	16.8	18.4
Mexico*	2018	15.5	18.3
Argentina	2017	14.3	17.6
Trinidad and Tobago	2010	12.0	14.8
Uruguay	2010	6.2	9.9

Eastern Mediterranean Region

Country	Year	Male	Female
Morocco	2010	54.7	55.9
Yemen	2010	32.4	52.6
Iraq	2017	45.3	50.0
Egypt	2017	42.1	48.6
Pakistan	2017	44.0	46.0
Tunisia	2017	36.8	39.7
Iran†	2017	27.4	38.9
Palestine	2010	21.2	38.9
Libya	2010	16.4	23.4
Jordan	2017	19.1	20.0
Lebanon	2017	11.9	17.3
Kuwait	2010	6.8	12.5
Qatar	2010		

African Region

Country	Year	Male	Female
Rwanda	2010	61.1	75.0
Zimbabwe	2017	67.3	71.1
Nigeria	2017	21.4	41.4
Algeria*	2010	15.4	36.4
Ethiopia	2017	23.1	25.0
South Africa	2014	22.2	22.4
Gambia (The)	2015	16.1	21.9
Ghana	2014	18.9	18.8

South-East Asian Region

Country	Year	Male	Female
Bangladesh	2017	42.9	55.0
Indonesia	2017	38.8	49.0
India	2010	26.8	32.5
Myanmar	2017	12.8	22.6
Cambodia	2004	3.7	4.8
Thailand	2017	1.6	1.9

Unmet health care need (%)

†United Kingdom of Great Britain and Northern Ireland †Bolivia (Plurinational State of), United States of America †Iran (Islamic Republic of)

Female 60–69   Male 60–69   *p-value ≤ 0.05; see Appendix 1 to see the full list of countries and data sources.

Figure 3a. Prevalence of unmet health care need and for male and female aged 60–69 years using the most recent study‡, by country and WHO region.

Where multiple studies/waves were available in a country, data from the most recent year was used. NOTE results are unweighted.

European Region

Country	Year	Female 70+	Male 70+
Georgia	2010	54.2	50.0
Armenia	2010	53.0	39.0
Azerbaijan	2010	51.9	44.0
Ukraine	2017	34.7	19.0
Romania*	2017	29.2	16.0
Turkey	2017	28.6	20.0
Poland	2010	22.4	16.0
Kazakhstan	2017	21.4	6.2
Russian Federation	2017	20.5	18.0
Switzerland	2017	20.0	19.0
Belarus	2010	19.5	11.0
Serbia	2017	18.3	13.0
Tajikistan	2017	17.6	4.2
Uzbekistan	2010	16.0	13.0
Germany	2017	13.2	13.0
Estonia	2010	11.9	8.3
France	2017	10.8	8.4
Greece	2017	10.5	9.9
United Kingdom†	2017	10.0	9.6
Netherlands	2017	9.2	7.4
Sweden	2017	8.0	7.5
Cyprus	2017	7.7	
Kyrgyzstan	2017	7.7	6.5
Norway	2017	7.2	6.8
Spain	2010	3.1	
Slovenia	2010	1.0	
Andorra	2017		

Western Pacific Region

Country	Year	Female 70+	Male 70+
Philippines	2017	34.8	24.0
Mongolia	2017	25.9	19.9
Australia	2017	24.0	21.0
New Zealand*	2018	17.6	13.9
Malaysia	2017	16.7	
Hong Kong SAR	2017	14.0	7.0
Taiwan ROC	2017	10.0	7.5
Japan	2017	6.3	3.4
China	2017	5.0	
Macau SAR	2017	3.8	
Singapore	2010	3.7	
Viet Nam	2019	0.7	
Republic of Korea	2017		

Region of the Americas

Country	Year	Female 70+	Male 70+
Nicaragua	2017	75.0	25.0
Haiti	2010	52.0	41.0
Guatemala	2017	50.0	19.0
Bolivia†	2017	43.9	31.0
Peru*	2017	42.0	13.6
Chile	2017	39.5	29.0
Colombia	2017	37.0	29.2
Brazil	2017	26.2	17.0
United States†	2017	25.8	23.0
Ecuador	2017	22.7	19.0
Uruguay	2010	22.2	16.0
Canada*	2017	20.0	16.0
Mexico*	2018	16.8	11.9
Argentina	2017	13.0	11.4
Trinidad and Tobago	2010	12.3	9.5
Puerto Rico	2017	10.8	9.7

Eastern Mediterranean Region

Country	Year	Female 70+	Male 70+
Pakistan	2017	40.0	64.0
Egypt	2017	60.0	44.0
Iraq	2017	45.0	45.3
Tunisia	2017	34.1	45.0
Iran†	2017	27.8	39.0
Libya*	2010	4.3	39.0
Palestine	2010	20.0	38.0
Yemen	2010	30.8	36.0
Morocco	2010	29.0	
Lebanon	2017	7.5	18.8
Jordan	2017	10.0	
Kuwait	2010	6.7	
Qatar	2010		

African Region

Country	Year	Female 70+	Male 70+
Zimbabwe	2017	69.0	63.0
Rwanda	2010	63.6	55.0
Nigeria	2017	58.0	
Ethiopia	2017	33.3	33.0
South Africa	2014	23.6/32.3	
Gambia (The)*	2015	29.2	18.6
Ghana	2014	19.2	17.3
Algeria	2010	19.0	11.8

South-East Asian Region

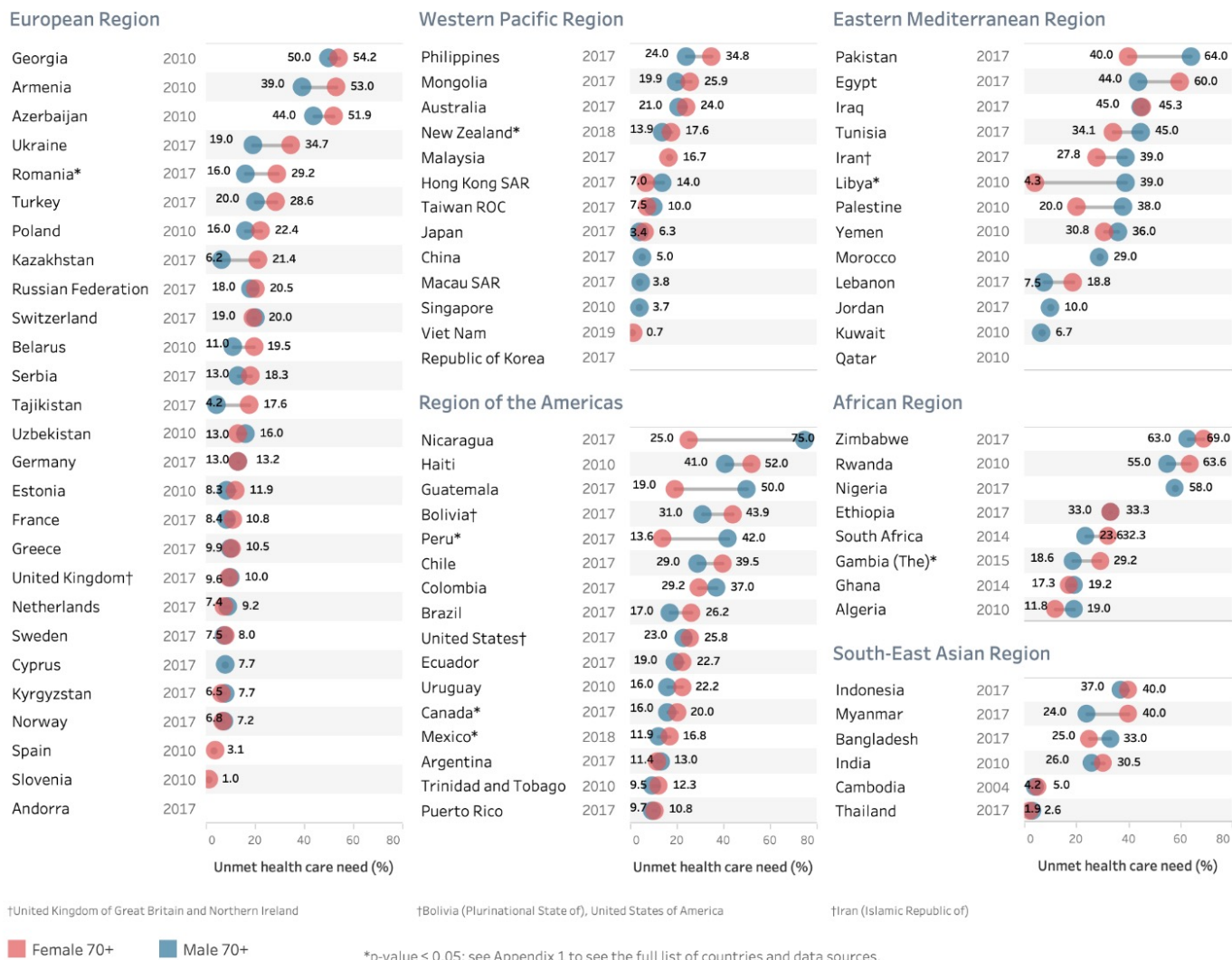| Country	Year	Female 70+	Male 70+
Indonesia	2017	40.0	37.0
Myanmar	2017	40.0	24.0
Bangladesh	2017	25.0	33.0
India	2010	30.5	26.0
Cambodia	2004	5.0	4.2
Thailand	2017	2.6	1.9

Unmet health care need (%)

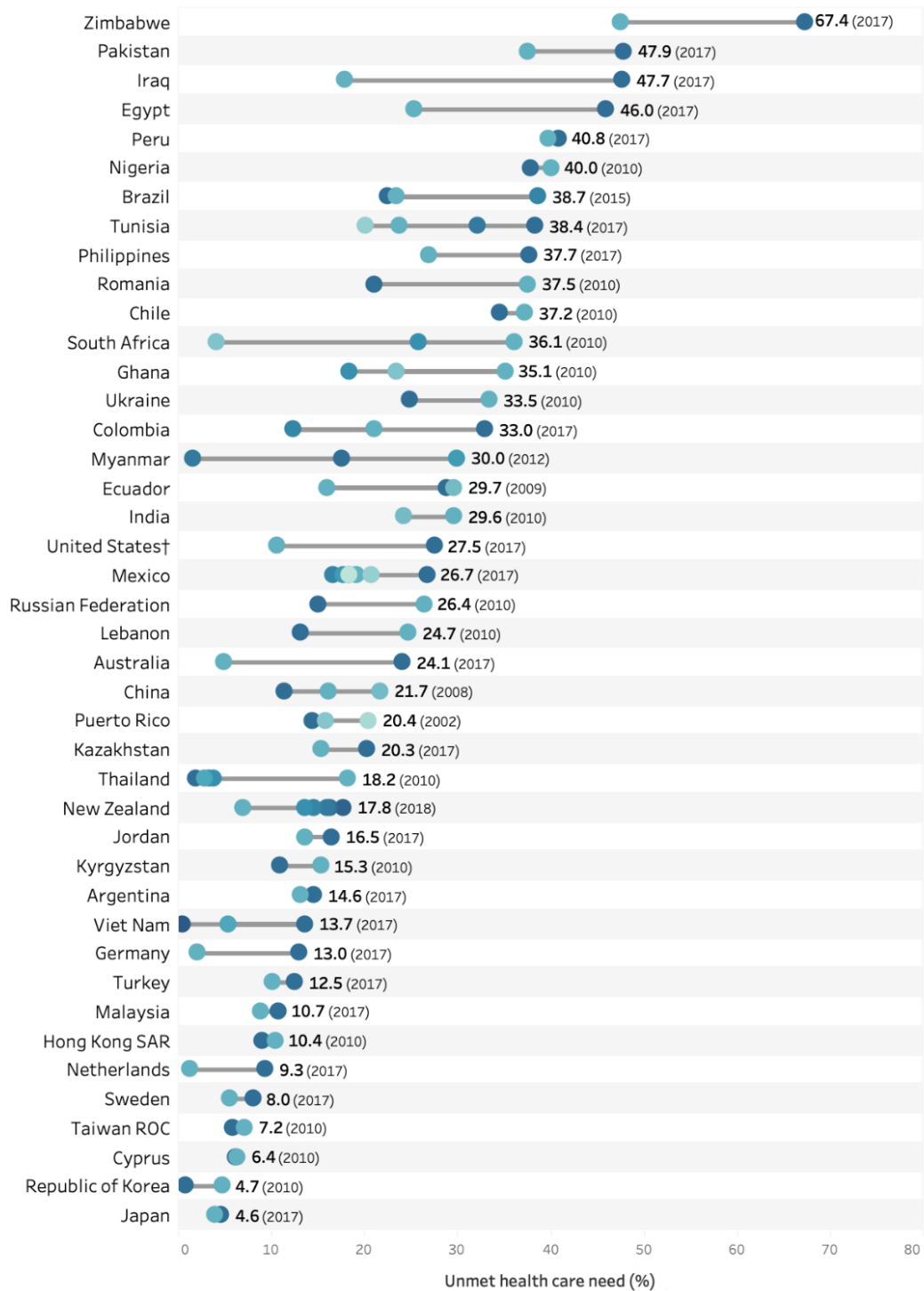†United Kingdom of Great Britain and Northern Ireland   †Bolivia (Plurinational State of), United States of America   †Iran (Islamic Republic of)

■ Female 70+   ■ Male 70+   *p-value ≤ 0.05; see Appendix 1 to see the full list of countries and data sources.

Figure 3b. Prevalence of unmet health care need for male and female aged 70+ years using the most recent study*, by country and WHO region.

Where multiple studies/waves were available in a country, data from the most recent year was used. NOTE results are unweighted

A number of studies did not include variables that allowed for examination of differences by location of residence, such as urban or rural locations. Where these data were available, many countries had small location-related differences while some had quite large differences (see **Figures 4a** and **4b**). Where statistically significant differences did exist in the 60-69 year old population (**Figure 4a**), one country had higher unmet need in urban areas (Kyrgyzstan), while four countries had higher unmet need in rural areas (Ghana, Mexico, Mongolia, South Africa). For the 70+ population (Figure 4b), higher unmet need in rural areas was seen in Mexico, Mongolia, Peru, Romania, Russia, and Tunisia.

In both age groups, the studies may have been underpowered to show statistical significance in the prevalence differences by sex and residence (see Appendix 1). Thus, the prevalence may be worth investigating further in larger study samples.

European Region

Country	Year	Urban	Rural
Kyrgyzstan*	2017	4.9	27.5
Kazakhstan	2017	18.9	26.1
Ukraine	2017	19.5	25.0
Serbia	2017	18.3	20.6
Romania	2017	19.1	20.0
Tajikistan	2017	8.0	18.5
Germany	2017	12.6	14.4
Turkey	2017	9.4	14.3
Norway	2017	11.0	13.9
Russian Federation	2017	9.3	12.4
France	2017	9.2	11.9
United Kingdom†	2017	9.0	10.0
Cyprus	2017	4.5	8.6
Greece	2017	4.1	6.7
Andorra	2017	0.9	
Netherlands	2017		
Sweden	2017		
Switzerland	2017		

Unmet health care need (%)

Western Pacific Region

Country	Year		
Philippines	2017	36.9	46.3
Mongolia*	2017	13.1	29.0
New Zealand	2018	17.8	20.4
Malaysia	2017	9.8	14.3
China	2017	11.2	12.2
Macau SAR	2017	8.7	
Hong Kong SAR	2017	8.5	
Taiwan ROC	2017	4.7	
Japan	2017	3.6	4.1
Viet Nam	2019	1.1	
Republic of Korea	2017	0.9	
Australia	2017		

Region of the Americas

Country	Year		
Nicaragua	2017	33.3	56.2
Bolivia†	2017	44.4	47.2
Peru	2017	42.9	45.6
Colombia	2017	29.6	44.8
Chile	2017	33.6	38.5
Ecuador	2017	29.1	36.4
Guatemala	2017	20.0	31.6
Brazil	2017	18.8	23.9
Mexico*	2018	14.3	21.0
Argentina	2017	15.6	18.8
Puerto Rico	2017	11.1	17.6
Canada	2017		
United States†	2017		

Unmet health care need (%)

Eastern Mediterranean Region

Country	Year		
Iraq	2017	41.0	51.5
Tunisia	2017	32.6	48.0
Egypt	2017	44.1	46.2
Pakistan	2017	44.8	45.7
Iran†	2017	29.9	41.7
Jordan	2017	18.7	22.6
Lebanon	2017	16.2	

African Region

Country	Year		
Zimbabwe	2017	66.2	78.3
Nigeria	2017	31.8	38.1
Ethiopia	2017	19.2	36.4
South Africa*	2014	19.3	32.3
Ghana*	2014	14.9	21.8
Gambia (The)	2015	16.9	19.6

South-East Asian Region

Country	Year		
Indonesia	2017	35.9	48.1
Bangladesh	2017	44.4	46.6
Myanmar	2017	15.5	16.0
Thailand	2017	1.5	1.9

Unmet health care need (%)

†United Kingdom of Great Britain and Northern Ireland

†Bolivia (Plurinational State of), United States of America

†Iran (Islamic Republic of)

■ Rural 60–69   ■ Urban 60–69   *p-value ≤ 0.05; see Appendix 1 to see the full list of countries and data sources.

Figure 4a. Prevalence of unmet health care need for urban or rural populations aged 60–69 years using the most recent study‡, by country and WHO region.

Where multiple studies were available in a country, data from the most recent year was used. NOTE results are unweighted. No plotted data means location information not available

European Region

Country	Year	Urban	Rural
Ukraine	2017	26.7	31.8
Romania*	2017	15.9	29.5
Russian Federation*	2017	15.4	28.3
Turkey	2017		25.0
Serbia	2017	7.1	19.5
Kazakhstan	2017	14.8	17.6
Germany	2017	11.4	15.7
France	2017	8.3	13.5
Kyrgyzstan	2017	12.5	
Greece	2017	6.0	11.5
Tajikistan	2017	9.1	10.5
United Kingdom†	2017	8.9	9.4
Norway	2017	5.7	9.1
Cyprus	2017	3.0	4.5
Andorra	2017		
Netherlands	2017		
Sweden	2017		
Switzerland	2017		

Western Pacific Region

Country	Year	Urban	Rural
Malaysia	2017		33.3
Mongolia*	2017	14.8	32.7
Philippines	2017	27.0	32.6
New Zealand	2018	15.8	17.8
Taiwan ROC	2017	10.3	
Hong Kong SAR	2017	10.2	
China	2017	7.1	
Japan	2017	5.5	
Macau SAR	2017	2.3	
Viet Nam	2019		0.5
Australia	2017		
Republic of Korea	2017		

Region of the Americas

Country	Year	Urban	Rural
Peru*	2017	26.9	62.5
Chile	2017	32.3	50.0
Nicaragua	2017	25.0	50.0
Guatemala	2017	8.3	40.0
Bolivia†	2017	36.8	37.9
Colombia	2017		33.3
Ecuador	2017	14.8	31.2
Brazil	2017	20.7	26.7
Puerto Rico	2017	10.1	20.0
Mexico*	2018	12.4	17.2
Argentina	2017	12.9	
Canada	2017		
United States†	2017		

Eastern Mediterranean Region

Country	Year	Urban	Rural
Pakistan	2017	50.0	61.5
Tunisia*	2017	30.0	56.0
Egypt	2017	40.0	55.6
Iran†	2017	31.6	45.5
Jordan	2017	5.1	14.3
Lebanon	2017	11.1	
Iraq	2017		

African Region

Country	Year	Urban	Rural
Zimbabwe	2017	63.6	65.6
Nigeria	2017	37.5	57.1
Ethiopia	2017	28.6	50.0
South Africa	2014	29.4	31.9
Gambia (The)	2015	17.4	24.6
Ghana	2014	17.1	18.7

South-East Asian Region

Country	Year	Urban	Rural
Myanmar	2017	22.2	50.0
Indonesia	2017	26.7	40.8
Bangladesh	2017	27.3	40.0
Thailand	2017	2.0	2.4

Unmet health care need (%)

†United Kingdom of Great Britain and Northern Ireland   †Bolivia (Plurinational State of), United States of America   †Iran (Islamic Republic of)

Rural 70+   Urban 70+   *p-value ≤ 0.05; see Appendix 1 to see the full list of countries and data sources.

Figure 4b. Prevalence of unmet health care need for urban or rural populations aged 70+ years using the most recent study‡, by country and WHO region.

Where multiple studies were available in a country, data from the most recent year was used. NOTE results are unweighted. No plotted data means location information not available

A number of studies in selected countries provided multiple years of data. Graded-colour data points are plotted for countries with data for multiple years (darker for more recent years) in **Figure 5**, with a data label for the highest prevalence and year for each country. Countries like Australia, Egypt, Germany, Iraq, Netherlands, New Zealand, Pakistan, Philippines, Tunisia, United States, and Zimbabwe had higher prevalence in more recent years of available data (**Figure 5**). Countries like China, Lebanon, Puerto Rico, Republic of Korea, Romania, Russia, and Ukraine may have lower prevalence in more recent years. Mixed patterns are seen in Ghana, Mexico, and Thailand – where a linear pattern of increasing or decreasing did not emerge and would require further investigation into the different tools and methods used to assess unmet need. An uncertain pattern emerges when comparing estimates from different studies within one country that might use different questions or study populations (for example in Brazil and Viet Nam).

Zimbabwe — 67.4 (2017)
Pakistan — 47.9 (2017)
Iraq — 47.7 (2017)
Egypt — 46.0 (2017)
Peru — 40.8 (2017)
Nigeria — 40.0 (2010)
Brazil — 38.7 (2015)
Tunisia — 38.4 (2017)
Philippines — 37.7 (2017)
Romania — 37.5 (2010)
Chile — 37.2 (2010)
South Africa — 36.1 (2010)
Ghana — 35.1 (2010)
Ukraine — 33.5 (2010)
Colombia — 33.0 (2017)
Myanmar — 30.0 (2012)
Ecuador — 29.7 (2009)
India — 29.6 (2010)
United States† — 27.5 (2017)
Mexico — 26.7 (2017)
Russian Federation — 26.4 (2010)
Lebanon — 24.7 (2010)
Australia — 24.1 (2017)
China — 21.7 (2008)
Puerto Rico — 20.4 (2002)
Kazakhstan — 20.3 (2017)
Thailand — 18.2 (2010)
New Zealand — 17.8 (2018)
Jordan — 16.5 (2017)
Kyrgyzstan — 15.3 (2010)
Argentina — 14.6 (2017)
Viet Nam — 13.7 (2017)
Germany — 13.0 (2017)
Turkey — 12.5 (2017)
Malaysia — 10.7 (2017)
Hong Kong SAR — 10.4 (2010)
Netherlands — 9.3 (2017)
Sweden — 8.0 (2017)
Taiwan ROC — 7.2 (2010)
Cyprus — 6.4 (2010)
Republic of Korea — 4.7 (2010)
Japan — 4.6 (2017)

Unmet health care need (%)

†Bolivia (Plurinational State of), Iran (Islamic Republic of), United Kingdom of Great Britain and Northern Ireland, United States of America

Legend: 2001, 2002, 2003, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019

Figure 5. Overall prevalence of unmet need in the population aged 60+ years for different years of available data, by country‡

Note: only countries with more than one data point were included. Year of highest rate labelled. Results are unweighted

To ensure an equitable path to UHC that includes older adults, a number of issues, including unmet health care need require further investigation and policy action. Leaving aside the complexity of determinants for unmet healthcare needs, currently available data can be used to examine the relationship between unmet need and UHC for policy and planning purposes. Progress toward UHC is being tracked using indices that capture both service coverage and financial protection[15]. For example, WHO's UHC Service Coverage Index incorporates 14 tracer indicators (covering reproductive, maternal, newborn and child health, infectious diseases, non-communicable diseases and service capacity and access) of service coverage into a single summary measure (www.who.int/data/gho/data/indicators/indicator-details/GHO/uhc-index-of-service-coverage). A higher index score suggests a better position for progress towards UHC. Looking at the relationship between unmet need in adults aged 60-69 years and this UHC index, the overall pattern is that levels of unmet health need tend to be lower in countries with higher values of the UHC Service Coverage Index (r=-0.49), at the global and regional levels (**Figure 6**). This supports expectations that advancing UHC would lead to reductions in unmet health needs, and conversely, that addressing unmet health needs would improve levels of UHC service coverage.

For older adults, continued investment in both health and social care systems strengthening will be required[16] to address both unmet health and social care needs and ensure no one is left behind. However, the relative efficiency with which countries can translate their health spending into improved service coverage and financial protection varies considerably across the region, even in countries at similar levels of development.
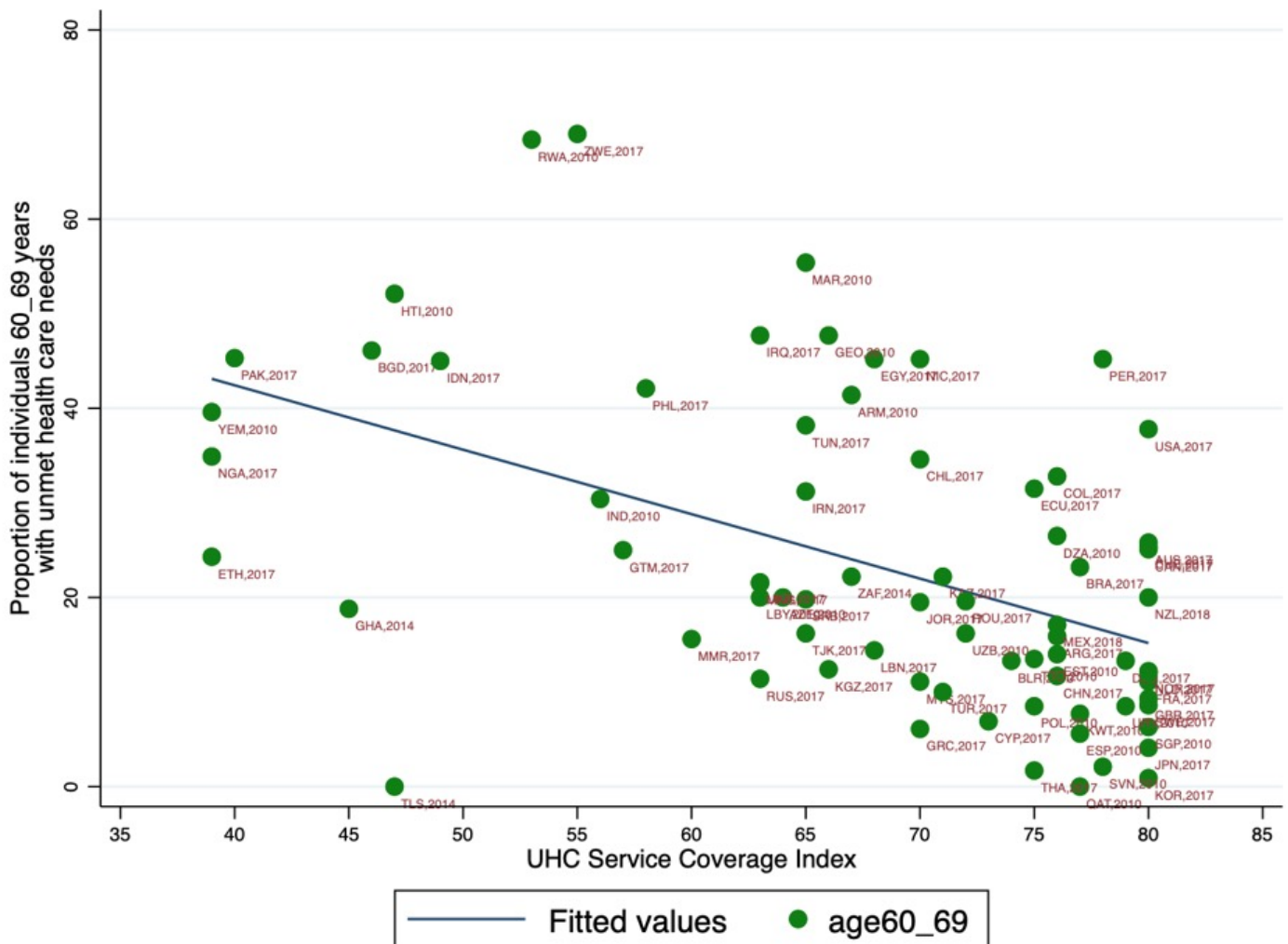
Figure 6. Point prevalence of self-reported unmet need for healthcare among adults aged 60–69 years, by UHC Service Coverage Index[*]

WHO UHC Service Coverage Index (https://www.who.int/data/gho/data/indicators/indicator-details/GHO/uhc-index-of-service-coverage)

Discussion

A key objective for health policy and health systems, especially in countries working towards universal health coverage, is to provide access to good quality services and meet population health care needs. Assessing whether health systems succeed is made difficult by not only the variation on how need is defined and measured, but also on the lack of data whether the needs were met or unmet. For certain population groups, including older adult populations, a mismatch may exist between use of health care services and what they need. This leads to policy concern about systematic under-utilization of healthcare resources relative to their level of need, particularly when the consequences are poorer health outcomes from preventable causes.

Our study indicates that older adults residing in low-, middle- and high-income countries experienced delayed and foregone care. This ranged from no unmet need to a high prevalence of 67%. These rates are consistent with results from Kenya from 2016 in the population aged 16+ years (19.6%[17]) and 14.5% in a study in the Korean population aged 19 years and older[18]. Twenty-six percent of the European Union population aged 15 years and older reported having an unmet need for health care in 2014[19]. A Korean study of those aged 65+ years reported a prevalence of 17.4%[20]. Older adults with high care needs or multiple co-morbid conditions may have higher levels of adverse consequences from not being able to access care[21]. These rates may well increase in many countries as a result of the ongoing COVID-19 pandemic, with emerging evidence about unmet health care needs[22-24].

This study did not attempt direct comparisons across studies in these analyses and did not age standardize results. The nature of the questions and methods employed across studies would make cross-country comparisons challenging – and instead the focus was on generating reliable estimates for the prevalence of unmet need for older adults (60+) for each country from the available data.

We found variation in prevalence rates in the two age groups explored in this study – but no clear patterns emerged. Separate analyses (results not included here) found that countries in the European region generally had populations aged 70+ with higher or similar unmet need than younger age groups, whereas the age-related patterns were more mixed in countries in the other regions. For example, in the Americas only Chile and Guatemala had the highest unmet need in the population aged 70+. The differences by age group were small in all countries in the Western Pacific. In the 7th European Social Survey, including populations aged 25 to 75 years of age, younger age groups reported more unmet need[25].

Only a handful of countries had significant sex differences in those aged 60-69 and 70+ (for example, Romania and Mexico). A wider number of countries had sex differences in one age group, but not the other (Algeria, Belarus, Canada, Cyprus, Libya, Peru, Kazakhstan and Ukraine). Where non-significant differences were seen between the sexes – some countries had higher levels in men than women (Azerbaijan, Haiti, Indonesia) while others had higher levels in women than men (Egypt, Rwanda) and with some switching by age group (men in 60-69 and women in 70+ in Armenia; women in 60-69, men in 70+ in Nicaragua). Yet we do not know how meaningful these differences are – when a smaller number of countries had statistically significant sex differences in prevalence estimates.

A number of countries had significant differences in prevalence by urban or rural location of residence. Similar to sex differences, a small number of countries (9) had differences that reached statistical significance. An OECD summary of results from 31 countries showed that within a society, those with lower incomes experienced more barriers to accessing care than the richer counterparts – with some variations across countries and by the set of reasons provided for unmet needs[26]. These findings of a socio-economic gradient in unmet need for health care have been consistent over time[19, 25]. Estimates for unmet need may help to show the distribution of financial hardship across different sectors of the population in a variety of countries. In those countries with substantial differences by urban or rural location, that information provides

some initial evidence to policy makers in their efforts to better target policies and programmes to ensure equal implementation of universal health coverage across different regions within countries.

These results are unique in providing estimates of unmet need for older adults in a wide range of countries from different world regions. Additional analyses for some of the studies included in this study could be undertaken to look at types of unmet need (for example, medical, dental, medication) and to examine barriers to care (cost, transport). Accessing additional longitudinal ageing and health study data, and undertaking analysis of longitudinal data, would be needed to investigate changes over time and causative factors.

Comparability of estimates across countries

A number of differences in methodologies may influence the study-specific estimates and overall results. Studies included in this paper targeted different populations, ranging from no age limits in one study to 60+ years for a number of the studies. Where possible, we excluded those who reported no health needs – and the analyses used carefully determined denominators to generate robust estimates for each study.

The question wording differed considerably by survey – where the estimates generated here were based on examination of the full sets of questions in each study. Question ordering and phrasing may also contribute to differences in final prevalence estimates[27]. The questions that asked about need/unmet need also included a variety of timeframes – from care within 24 hours in the last year, to any care in the last three years preceding the interview. The questions also ranged from health care 'in general' – without specifying the type of care – to questions that included a more specific example (or examples) of types of care (medical, dental, surgical, mental health, medications). A number of studies included foregone care due to cost within the main question – meaning the question asked about not receiving a type of care because of cost (compared to other reasons or barriers like access, travel time, or wait time).

While this study provides prevalence estimates for a wide range of countries from recent studies, the challenge of fully quantifying levels of unmet need remains, particularly when there is no consensus on a definition – and sets of questions about unmet need have inconsistently used and applied in health and/or consumption surveys in low-and-middle-income countries. Some studies, in OECD, Commonwealth and European countries, have attempted to use the same questions in multiple countries – but even the wording of these questions differ when comparing the different studies.

Limitations

While asking questions as part of health surveys is efficient, self-reported measures of unmet need for health care present a number of methodological challenges. A comprehensive approach to the issue would require: (i) an understanding of what people understand when answering a direct question about unmet need; (ii) an understanding of the nature of a person's specific needs based on her/his health status, illness and preferences; and/or (iii) an assessment of whether these needs have been adequately met according to clinical standards factoring in options effectively available to patients. To achieve one of the pillars of universal health coverage, this would also include no financial hardship as a result of paying for needed services[28-30]. The next step would be to standardize the approach, so that surveys could capture this information using similar methods: either through ex post facto secondary data harmonization processes or ex-ante agreed standards for primary data collection instruments.

Unmet health care needs in these analyses include individuals who perceived a need for healthcare but did not seek or receive treatment; those who did not perceive a need for healthcare were not included. We attempted to assess 'need' and met or unmet need where data was available. However, based on the available data and how unmet need was assessed in each study, the prevalence of unmet health care needs presented here may be underestimated to some extent. Moreover, the small sample size of older persons in some countries or studies (see Appendix 2) may reduce the statistical power and increase the margin of error, resulting in

non-significant differences in sex and area of residence. We also could not adjust for the moral hazard related to insurance coverage and perceptions about need or unmet need, which might overestimate the likelihood of unmet health care needs[31]. Finally, the validity of the estimates are influenced by the self-reported nature of the data from these health surveys. We do know what respondents have in mind when responding to these questions. Generating estimates of unmet health care need would be challenging for single diseases, and self-report does not easily lend itself to establishing a measure of (lack of) access to services for those with multi-morbidity or at a health system level for an entire population. More work is needed, but the relationship found between the unmet need estimates and UHC Service Coverage Index points to the possible validity of this measure as a rough indicator of (lack of) service access. These results can be used to begin policy dialogue about how to measure concrete progress on moving towards UHC and policy levers required to ensure does not leave any populations behind. Further to this, unmet social care need was not addressed in the results presented here, but could contribute as much or more to access issues for older people[10,32].

The estimates presented in this report were not weighted. Applying the raw weights (as provided in the datasets) to estimate the prevalence of unmet health care need for a specific sub-population of interest may result in incorrect estimates. The raw weights are usually derived using the study sample and overall population size, often covering respondents from a wider range of age groups, rather than on the actual sample size of those aged 60+ years[33]. However, we compared unweighted prevalence with weighted prevalence using sample weights included in the datasets (see Appendix 2) and saw no significant differences.

Summary

These results are unique in providing estimates of unmet need for older adults in a wide range of countries from different world regions. It also highlights the challenges with standardizing measurement and provides important groundwork for working towards an agreed definition of unmet health care need. These factors will also help to generate evidence to inform policies aimed at supporting progress towards universal health coverage by 2030 (SDG target 3.8). Current metrics used to inform policy, UHC indices, may not adequately account for unmet health need – risking universality in health coverage especially for older and vulnerable populations Additional analyses for some of the studies included here could be undertaken to look at types of unmet need (for example, medical, dental, medication) and to examine barriers to care (cost, transport) to better target policy deliberations. Accessing additional longitudinal ageing and health study data, and undertaking analysis of longitudinal data, would be welcome to investigate changes over time and causative factors to better inform policy and programming.

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Declarations

Ethics clearance

Ethical approval for this type of study was not required by our respective institutions. No ethical approval was required for this research, as we compiled results from secondary data sources using de-identified data sets.

Availability of data and materials

The data that support the findings of this study are available from each study on application/request. We applied for access to each dataset. Data are however available from the authors upon reasonable request and with permission of the respective study. Additional information will be available through https://extranet.who.int/kobe_centre/en/project-details/unmet_needs.

Competing interests

The authors declare that they have no competing interests.

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Author contributions

PK, BC, KA, NN, NM, MR, JB developed the concept and structure; BC, KA, FCDA, TLG, MTCG, WP, NTQ, HARR, AT, PMMV, NM and NN conducted analyses; PK, NN, and JB first draft; All authors revised, reviewed and approved final draft.

Abbreviations

ELSI-Brazil	Brazilian Longitudinal Study of Aging (ELSI-Brazil)
CES	Cambodia Elderly Survey
CMWF	Commonwealth Fund International Health Policy Survey
HWS	Thai Health and Welfare Study
HIHS	Integrated Household Survey
MHAS	Mexico Health and Aging Study
MAS	Myanmar Aging Study
NZHS	New Zealand Health Survey
OECD	Organization for Economic Cooperation and Development
PREHCO	Puerto Rican Elderly: Health Conditions Project
SABE	Survey on Health, Well-Being, and Aging
SAGE	Study of global AGEing and adult health
THES	Tunisian Health Examination Survey
VNAS	Vietnam Ageing Survey
WHS	World Health Survey
WVS	World Values Survey

Appendix

Table 2. Examples of unmet need questions by study

	Survey (year)	Question(s)
1	Brazilian Longitudinal Study of Aging (ELSI-Brazil) (2015)	U32: Have you looked for a health service to get an appointment related to your health, in the PAST 2 WEEKS, U34: Were you immediately taken care of on the first time you sought care in this health service in the PAST 2 WEEKS? U35: What was the reason for not being taken care of on the first time you sought care in this health service in the PAST 2 WEEKS? U36: In this latest appointment, within the PAST 2 WEEKS, were you prescribed any medication? U37: Were you able to get all the medication that was prescribed to you on your latest appointment within the PAST 2 WEEKS? U38: Why didn't you get all the medication that was prescribed to you on your latest appointment within the PAST 2 WEEKS? T6: In the PAST 30 DAYS, due to financial issues, you: (1) Had no financial issues to buy the medication(s) (2) Did not take a medication that was prescribed by a doctor or a dentist (3) Decrease the number of pills of the medication(s) that were pre-scribed by the doctor (4) Decreased the dose of the medication, breaking the pills or tak-ing less drops (5) Didn't use medication(s) (9) Didn't know/didn't answer
2	Cambodia Elderly Survey (CES) (2004)	G20: During the past year, were there any times that you were sick or injured? G21: For how many days, if any, during the last year would you say you were unable to perform your usual activities because of these illnesses or injuries? G22: Did you receive any professional treatment or take any medi-cines for these illnesses or injuries over the past year? G23: Do you think that you needed such treatment or medicines? G24: What were the reasons that you did not receive this treatment?
3	Commonwealth Fund International Health Policy Survey (CMWF) (2017)	QN810: During the past 12 months, was there a time when you: qn810_a1: Did not fill/collect a prescription for medicine, or you skipped doses of your medicine because of the cost QN810_a2: Had a medical problem but did not consult with/visit a doctor because of the cost QN810_a3: Skipped a medical test, treatment, or follow-up that was recommended by a doctor because of the cost QN810_a4: Did not visit a dentist when you needed to because of the cost

	Survey (year)	Question(s)
4	Integrated Household Survey (IHS), The Gambia (2016)	S2aq3_1: During the last 2 weeks, what symptoms has [name] suffered from? S2aq4_1: Did [NAME] consult a health provider for this illness/injury last 2 weeks for MAIN illness? S2aq5_1: What was the main reason that [NAME] did not visit a health practitioner during his/her illness? S2aq3_2: During the last 2 weeks, what symptoms has [name] suffered from? S2aq4_2: Did [NAME] consult a health provider for this illness/injury last 2 weeks for SECONDARY illness?
5	Mexican Health and Aging Study (MHAS) (2001–2018)	[2001 and 2003] D15: In the last five years, was there at least one instance when you had a serious health problem but you did not go to the doctor?
6	Myanmar Aging Study (MAS) (2012)	J41: During the past 12 months, were there any times that you were sick or injured that prevented you from performing your usual activities? J42: Because of illnesses or injuries during the last 12 months, how many days were you unable to perform your usual activities because of these? J43: Did you receive any professional treatment for these illnesses or injuries? J44: Do you think that you needed treatment?
7	Myanmar Survey on Accessing Healthcare to Older Persons (2016)	C1: During the past 12 months, were there any time that you were sick or injured and needed health care? C3: The last time you needed health care, did you get health care?
8	Study of global AGEing and adult health (SAGE) Mongolia (2018)	Q5002: The last time you needed health care, did you get health care?
9	New Zealand Health Survey (NZHS) (2015, 2016, 2017, 2018, 2019)	A2.06: In the past 12 months, has there been a time when you wanted to see a GP, nurse or other health care worker at your usual medical centre within the next 24 hours, but they were unable to see you?
10	Puerto Rican Elderly: Health Conditions (PREHCO) (2003, 2007)	J1/WJ1 Could you tell me how many medications, prescribed by a doctor, you have been taking regularly in the last year? J12/WJ12 During the last year, have you stopped taking or have you taken less of any medication that was prescribed because you could not afford it? K48/WK48 In the last twelve months, were you ever told you should get an x-ray or have laboratory tests done, not including those for a hospitalization? K49/WK49 Did you have those tests done? K60/WK60 In the last two years, have you needed medical attention that you could not get?
11	SAGE Wave 1 (Ghana, India, China, Mexico, Russia, South Africa) and Wave 2 (Ghana, Mexico, South Africa) (2007-2019)	Q5001: When was the last time that you needed health care? Q5002: The last time you needed health care, did you get health care?" Q5003a. What was the main reason you needed care, even if you did not get care? Q4067: During the last 12 months, have you had any problems with your mouth and/or teeth, including problems with swallowing? Q4068a: Have you received any medications or treatment from a dentist or other oral health specialist during the last 2 weeks? Q4068b: Have you received any medications or treatment from a dentist or other oral health specialist during the last 12 months?

	Survey (year)	Question(s)
12	Survey on Health, Well-Being, and Aging (SABE) Colombia (2015)	P902: During the last 30 days, have you had any health problems? P903: For any of the health problems you have had in the last 30 days, have you consulted or sought help? P904: What was the main reason for NOT consulting or seeking help? P905: Did you receive the requested care from your health service for the problems that you have experienced?
	SABE Ecuador (2009)	E9: In the last year – did not take medication F3_2: In the last year - did not consult even if needed it F20aL: These exams (radiographies) were performed (for people who need medical attention) C.17 In the last year have you been cared for by a dentist?
13	Thai Health and Welfare Survey (HWS) (2011, 2013, 2015, 2017)	UN1 (out-patient): Was there any time during the last 12 months when you were sick and needed a medical treatment but you did not receive it? UN3 (in-patient): Was there any time during the last 12 months when you needed or were recommended by medical doctor to admit to a health facility but you did not receive it?
14	Health Examination Survey (THES) (2016)	A5010: The last time you needed health care, did you get health care?
15	Vietnam National Aging Survey (VNAS) (2011)	I18: During the last 12 months, were there any times that you were sick or injured that prevented you from performing your usual activities? I20: Did you receive any professional treatment for these illnesses or injuries over the last 12 months? I21: Do you think that you needed treatment?
16	Survey on Older persons & Social Health Insurance (OP&SHI) (2019)	Q0604: During the last 12 months, were there any times that you were sick or injured that prevented you from performing your usual activities? Q0606: Did you receive any professional treatment for these illnesses or injuries? Q0610: Do you think that you needed treatment?
17	Tunisia World Health Survey (WHS) (2003)	Q7004: The last time you [your child] needed health care, did you get health care? A4045: During the last 12 months, have you had any problems with your mouth and/or teeth (this includes problems with swallowing)?
18	World Values Survey (WVS) Wave 6 (2010-2014)	V190: In the last 12 month, how often have you or your family gone without medicine or medical treatment that you needed?
	World Values Survey (WVS) Wave 7 (2017-2021)	Q53: In the last 12 months, how often have your or your family...gone without medicine or medical treatment that you needed?

Supplement

Appendix 1. List of countries and total samples

	Countries	Region	Survey	Year	N	N ≥ 60 years
1	Algeria	African Region	WVS*	2010/14	1200	131
2	Andorra	European Region	WVS	2017/21	1004	222
3	Argentina	Region of the Americas	WVS	2010/14	1030	222
			WVS	2017/21	1003	226
4	Armenia	European Region	WVS	2010/14	1100	272
5	Australia	Western Pacific Region	CMWF	2017	2500	600
			WVS	2010/14	1477	590
			WVS	2017/21	1813	765
6	Azerbaijan	European Region	WVS	2010/14	1002	120
7	Bangladesh	South-East Asian Region	WVS	2017/21	1200	92
8	Belarus	European Region	WVS	2010/14	1535	337
9	Bolivia (Plurinational State of)	Region of the Americas	WVS	2017/21	2067	264
10	Brazil	Region of the Americas	ELSI	2015	2067	1715
			WVS	2010/14	1486	265
			WVS	2017/21	1762	378
11	Cambodia	South-East Asian Region	SEC	2004	1762	30
12	Canada	Region of the Americas	CMWF	2017	4549	933
13	Chile	Region of the Americas	WVS	2010/14	1000	199
		Region of the Americas	WVS	2017/21	1000	205
14	China	Western Pacific Region	SAGE-W1	2008/10	15050	1288
			WVS	2010/14	2300	370
			WVS	2017/21	3036	607
15	Colombia	Region of the Americas	WVS	2010/14	1512	218
			WVS	2017/21	1520	191
			SABE	2015	3036	1,007
16	Cyprus	European Region	WVS	2010/14	1000	203
			WVS	2017/21	1000	214
17	Ecuador	Region of the Americas	WVS	2010/14	1202	187
			WVS	2017/21	1200	173
			SABE	2009	5212	1,285
18	Egypt	Eastern Mediterranean Region	WVS	2010/14	1523	224
			WVS	2017/21	1200	87

	Countries	Region	Survey	Year	N	N ≥ 60 years
19	Estonia	European Region	WVS	2010/14	1533	483
20	Ethiopia	African Region	WVS	2017/21	1230	46
21	France	European Region	CMWF	2017	750	77
22	Gambia (The)	African Region	IHS	2015	52955	153
23	Georgia	European Region	WVS	2010/14	1202	257
24	Germany	European Region	CMWF	2017	751	97
			WVS	2010/14	2046	663
			WVS	2017/21	1528	509
25	Ghana	African Region	SAGE-W1	2007/08	1528	571
			SAGE-W2	2014/15	4735	279
			WVS	2010/14	1552	74
26	Greece	European Region	WVS	2017/21	1200	404
27	Guatemala	Region of the Americas	WVS	2017/21	1203	71
28	Haiti	Region of the Americas	WVS	2010/14	1996	113
29	Hong Kong SAR	Western Pacific Region	WVS	2010/14	1000	206
			WVS	2017/21	2075	513
30	India	South-East Asian Region	SAGE-W1	2009	12198	811
			WVS	2010/14	4078	560
31	Indonesia	South-East Asian Region	WVS	2017/21	3200	316
32	Iran (Islamic Republic of)	Eastern Mediterranean Region	WVS	2017/21	1499	158
33	Iraq	Eastern Mediterranean Region	WVS	2010/14	1200	84
			WVS	2017/21	1200	107
34	Japan	Western Pacific Region	WVS	2010/14	2443	854
			WVS	2017/21	1353	581
35	Jordan	Eastern Mediterranean Region	WVS	2010/14	1200	154
			WVS	2017/21	1203	200
36	Kazakhstan	European Region	WVS	2010/14	1500	188
			WVS	2017/21	1276	143
37	Kuwait	Eastern Mediterranean Region	WVS	2010/14	1303	118
38	Kyrgyzstan	European Region	WVS	2010/14	1500	118
			WVS	2017/21	1200	165
39	Lebanon	Eastern Mediterranean Region	WVS	2010/14	1200	93
			WVS	2017/21	1200	167
40	Libya	Eastern Mediterranean Region	WVS	2010/14	2131	171
41	Macau SAR	Western Pacific Region	WVS	2017/21	1023	345
42	Malaysia	Western Pacific Region	WVS	2010/14	1300	123
			WVS	2017/21	1313	84

	Countries	Region	Survey	Year	N	N ≥ 60 years
43	Mexico	Region of the Americas	SAGE-W1	2010	2742	304
			SAGE-W2	2014	4665	479
			WVS	2010/14	2000	207
			WVS	2017/21	1739	339
			MHAS	2001	12235	1,192
			MHAS	2003	11539	1,453
			MHAS	2012	13608	1,614
			MHAS	2015	13253	1,609
			MHAS	2018	14805	1,423
44	Mongolia	Western Pacific Region	MiniSAGE	2017	983	194
45	Morocco	Eastern Mediterranean Region	WVS	2010/14	1200	121
46	Myanmar	South-East Asian Region	MAS	2012	4080	268
			Survey on Accessing Healthcare to Older Population in Myanmar	2016	1000	10
			WVS	2017/21	1200	131
47	Netherlands	European Region	CMWF	2017	750	70
		European Region	WVS	2010/14	1902	772
48	New Zealand	Western Pacific Region	CMWF	2017	500	116
			WVS	2010/14	841	282
			WVS	2017/21	1057	533
			HS	2014/15	13497	539
			HS	2015/16	13781	632
			HS	2016/17	13958	695
			HS	2017/18	13869	721
			HS	2018/19	13572	787
49	Nicaragua	Region of the Americas	WVS	2017/21	1200	74
50	Nigeria	African Region	WVS	2010/14	1759	65
			WVS	2017/21	1237	58
51	Norway	European Region	CMWF	2017	750	65
52	Pakistan	Eastern Mediterranean Region	WVS	2010/14	1200	48
			WVS	2017/21	1995	103
53	Palestine	Eastern Mediterranean Region	WVS	2010/14	1000	82
54	Peru	Region of the Americas	WVS	2010/14	1210	171
		WVS	2017/21	1400	184	
55	Philippines	Western Pacific Region	WVS	2010/14	1200	197
			WVS	2017/21	1200	228

	Countries	Region	Survey	Year	N	N ≥ 60 years
56	Poland	European Region	WVS	2010/14	966	272
57	Puerto Rico	Region of the Americas	WVS	2017/21	1127	406
			PREHCO 1	2002/03	966	872
			PREHCO 2	2006/07	966	499
58	Qatar	Eastern Mediterranean Region	WVS	2010/14	1060	70
59	Republic of Korea	Western Pacific Region	WVS	2010/14	1200	212
			WVS	2017/21	1245	278
60	Romania	European Region	WVS	2010/14	1503	440
			WVS	2017/21	1257	406
61	Russian Federation	European Region	SAGE-W1	2010	4947	560