Prospective Urban Rural Epidemiology (PURE) study: Baseline characteristics of the household sample and comparative analyses with national data in 17 countries

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Background The PURE study was established to investigate associations between social, behavioural, genetic, and environmental factors and cardiovascular diseases in 17 countries. In this analysis we compare the age, sex, urban/rural, mortality, and educational profiles of the PURE participants to national statistics.

Methods PURE employed a community-based sampling and recruitment strategy where urban and rural communities were selected within countries. Within communities, representative samples of adults aged 35 to 70 years and their household members (n = 424,921) were invited for participation.

Results The PURE household population compared to national statistics had more women (sex ratio 95.1 men per 100 women vs 100.3) and was older (33.1 years vs 27.3), although age had a positive linear relationship between the two data sources (Pearson's r = 0.92). PURE was 59.3% urban compared to an average of 63.1% in participating countries. The distribution of education was less than 7% different for each category, although PURE households typically had higher levels of education. For example, 37.8% of PURE household members had completed secondary education compared to 31.3% in the national data. Age-adjusted annual mortality rates showed positive correlation for men (r = 0.91) and women (r = 0.92) but were lower in PURE compared to national statistics (7.9 per 1000 vs 8.7 for men; 6.7 vs 8.1 for women).

Conclusions These findings indicate that modest differences exist between the PURE household population and national data for the indicators studied. These differences, however, are unlikely to have much influence on exposure-disease associations derived in PURE. Further, incidence estimates from PURE, stratified according to sex and/or urban/rural location will enable valid comparisons of the relative rates of various cardiovascular outcomes across countries. (Am Heart J 2013;166:636-646.e4.)

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See online Appendix D for complete listing of the PURE investigators.

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The PURE study is a large-scale community-based prospective study which between 2003 and 2009 has established cohorts in 628 urban and rural communities in 17 countries* that vary widely in political, sociocultural, and economic conditions. PURE is expected to yield important new insights on international health in the next few years[1] as it captures not only demographic and socioeconomic data on all individuals in selected households but also detailed information on cardiovascular disease (CVD) risk factors among adults between the ages of 35 and 70 years, going beyond any other existing study of CVD, non-communicable diseases and their risk factors.[2]

Given its potential to directly quantify the global burden of CVD and risk factors, especially in low- and middle-income countries where such data may not be available from other sources[3], it is important to ascertain how representative the data are of the countries in which the study sites are located. Although the communities included in PURE were not designed to be representative of the national populations of study countries, once the communities were selected, efforts were made to avoid any systematic biases when selecting individuals for enrolment compared to those who were not enrolled.[1] Nevertheless, it is likely that the PURE outcomes data such as mortality during follow-up would be compared between countries and to results from national and international studies.

To better understand how the findings of the PURE study can be applied to national populations from which they were derived, it is essential to understand how similar the PURE study sample is to the populations of the participating countries as one of the objectives of PURE is to understand the social and behavioral epidemiology of CVD in a cross-comparative manner. Further, by examining mortality in the study households relative to national death rates, an indication of the net impact of any differences in demographics can be assessed. In this paper, we examine the extent of agreement on age, sex, urban/rural locality, mortality rates, and level of education between the PURE household population and census and/or other national population statistics available from the 17 participating countries.

Methods

Data

Study data come from the household component of the PURE study conducted in 17 countries. The PURE study was designed and coordinated by the Population Health Research Institute, McMaster University and Hamilton Health Sciences, Hamilton, Ontario, Canada, and is funded through several sources including the Canadian Institutes of Health Research, the Heart and Stroke Foundation of Ontario, and several grants from pharmaceutical companies and governmental granting bodies in participating countries. A full list of the sources of funding is given in the online Appendix C. The authors are solely responsible for the design and conduct of the present study, all analyses, the drafting and editing of the paper and its final contents.

Subjects in PURE were selected in a three stage sampling process, selecting "communities", then households within them, and finally individuals within households. These methods have been described in detail elsewhere.[1] Uniquely, the communities are not only the primary sampling units but also the smallest geographical level at which social and environmental characteristics are measured through a separate assessment of health-related characteristics of the environment using both objective and perception-based measures.[4,5] This design enables identification of both individual and environmental determinants of health. Urban and rural communities were selected with the aim of achieving within-community homogeneity in demographic and socioeconomic profiles and area-level characteristics but also among-community heterogeneity in social and economic circumstances, coupled with the pragmatic requirement of optimizing the capacity of local investigators to maintain long-term follow-up of participants. Table I outlines the regions covered, years of recruitment, sampling methodology, number of communities, and number of household members for each of the participating countries in PURE.

Basic demographic and socioeconomic data are obtained using standardized questionnaires on all household members (eg, children, siblings, and other relatives or individuals living in the household) and whether any deaths had occurred during the previous 2 years. Household members number 434,970 individuals of all ages across the 628 communities in PURE. Of these, 197,332 individuals were aged between 35 and 70 years and eligible for the main PURE study and 153,996 (78%) agreed to participate and provide more extensive information on CVD risk factors.[1,6]

Comparison data for demographic indicators (age, sex, urban/rural, and mortality profiles) were drawn from the United Nations (UN) World Population Prospects.[7] Socioeconomic data were obtained from country-specific censuses and/or health surveys including the Demographic and Health Surveys,[8] the World Health Survey,[9] and Eurostat.[10] Country data were selected from time periods which corresponded to the recruitment years for PURE within those countries (see Table I). Due to the large number of international migrants in the United Arab Emirates (UAE), the PURE sampling frame was restricted to the local population (UAE nationals) and all comparative analyses were similarly restricted using the 2005 census.[11]

Analysis

We conducted comparisons between the demographic and social structure of the PURE household sample (at all ages) and national data for the following variables: age, sex, sex ratio, median age, urban population, age-adjusted annual mortality rate, and education. Age and sex distributions were compared using population pyramids. Sex ratios were calculated for the total population and at ages 0–34 years, 35–69 years, and 70+

* The countries involved in PURE are: Bangladesh, India, Pakistan, South Africa, Zimbabwe, Malaysia, China, Turkey, Iran, United Arab Emirates, Poland, Sweden, Canada, Argentina, Brazil, Chile, and Colombia.

Table I. Years of recruitment, household sampling procedures, and sample sizes for the household population in each of the 17 countries participating in PURE

Country	Years of recruitment	Region	Method of household sampling	Communities		Sample size	
				Urban	Rural	Urban	Rural
Bangladesh	2007-8	Dhaka division, Dhaka district and Manikganj district	Random sample of households	30	26	4,856	4,323
India	2003-7	• Karnataka state—Bangalore, Andhra Pradesh state—Palamaner • Haryana state—Chandigarh, Panchkula • Tamil Nadu state—Chennai, Kancheepuram and Thiruvallur Districts • Rajasthan state—Jaipur, Bikaner district • Kerala state—Trivandrum district	All households in a community	38	52	58,175	58,579
Pakistan	2008-9	Sindh province	All households in a community	2	2	3,687	2,303
China	2005-9	• Beijing—Shuni, Xicheng, Shijingshan district • Inner Mongolia—Bayannor city, Wulate and Line he district • Jiansu—Nan Jing and Changzhou city, Jianye, Yuhutai, Wujin district • Jiang Xi—Nanchang City, Qing Shan Hu and Nanchang district • Liaoning—Shenyang city, Yuhong and Shenghe district • Shaan Xi—Xian city, Yanta and Yangliang district • Shandong—Jinan city, Licheng, Lixia, Zhangqiu districts • Shanxi—Taiyuan and Xinyhou city, Xinhualing, Xiao dian districts and Yangqu and Jingle counties • Xin Jian—Hetian city, Hetian and Muyu counties		45	70	41,629	49,138
Malaysia	2007-2010	Peninsular Malaysia region—Central region and East coast region	All households in a community	53	18	20,581	21,484
South Africa	2005-2010	• North west province—Southern region and Bophirima region • Eastern Cape province—Mount Frere • Western Cape province—Cape town	Random sample of households in a community	4	4	12,467	6,731
Zimbabwe	2006-7	Mashonaland East Province—Warren Park, Seke • Mashonaland Central Province—Domboshava	All households in a community	1	2	1,948	3,080
Canada	2006-9	• Ontario—Hamilton, South-western Ontario, Ottawa • Quebec—Quebec city • British Colombia—Vancouver	All households in a community (postcode)	53	29	18,631	6,697
Sweden	2005-9	Västra Götaland County	Random sample of households in a community	28	3	6,416	1,486
Poland	2007-9	Lower Silesian Province (Voivoidship)	All households in a community	1	3	2,300	1,973
Turkey	2008-9	• Antalya Province • Aydin Province • Gaziantep Province • Istanbul city, Istanbul Province • Kocaeli Province • Malatya Province • Nevşehir Province • Samsun Province	All households in a community	31	13	7,258	3,894
Iran	2006-9	Isfahan province	Urban—Random sample of households Rural—All households in a community	11	9	8,673	8,367
UAE	2005-9	Dubai Emirate—Dubai city, Mamzer and Hatta	All households in a community; (UAE nationals only)	1	2	5,019	2,964
Argentina	2006-9	Pampas region, Santa Fe Province	All households in a community	6	14	9,030	9,054
Brazil	2005-9	South East region, Sao Paolo State	All households in a community	7	7	11,024	3,081
Colombia	2006-9	• Caribbean region—Atlántico, Bolivar and Cesar department • Andean region—Nariño, Cauca, Quindío and Caldas department • Central region—Tolima, Cundinamarca and Santander department • Eastern region—Casanare department	All households in a community	35	23	9,994	11,396
Chile	2006-9	Araucania region, Cautin Province	All households in a community	2	3	6,991	1,424

years as the number of males per 100 females. Annual mortality rates were calculated separately for men and women and age adjusted to the 2005 UN world population using the direct method of standardization.[12] Education was compared using the following categories: less than primary, primary completed, secondary/high school completed, and university (bachelor's or graduate degree). Agreement was assessed using the (Pearson) correlation coefficient (r) and the Bland and Altman limits-of-agreement procedure.[13] Analyses of the PURE household data were restricted to the sample with complete data, and 10,049 individuals (2.3%) with missing data on age and/or sex were excluded. The final analytic sample size was 424,921.

Results

Figure 1 presents the population age and sex distributions for each of the 17 participating countries derived from the UN population prospects (top row in each plot) and the PURE household sample (bottom row in each plot). In several countries (e.g. Bangladesh, India, South Africa, Colombia), the age distribution of the PURE population was found to be largely comparable to UN data across the ages of 35 to 70 years. In other countries (eg, Pakistan, Malaysia, China), however, the PURE population was found to have a more uniform distribution across these ages than the corresponding UN figures. In addition, the age distribution of the PURE population at younger and older ages (<35 or >70 years) was less comparable with UN figures, which was expected given that households were excluded from the sample if they did not have an adult between 35 and 70 years.

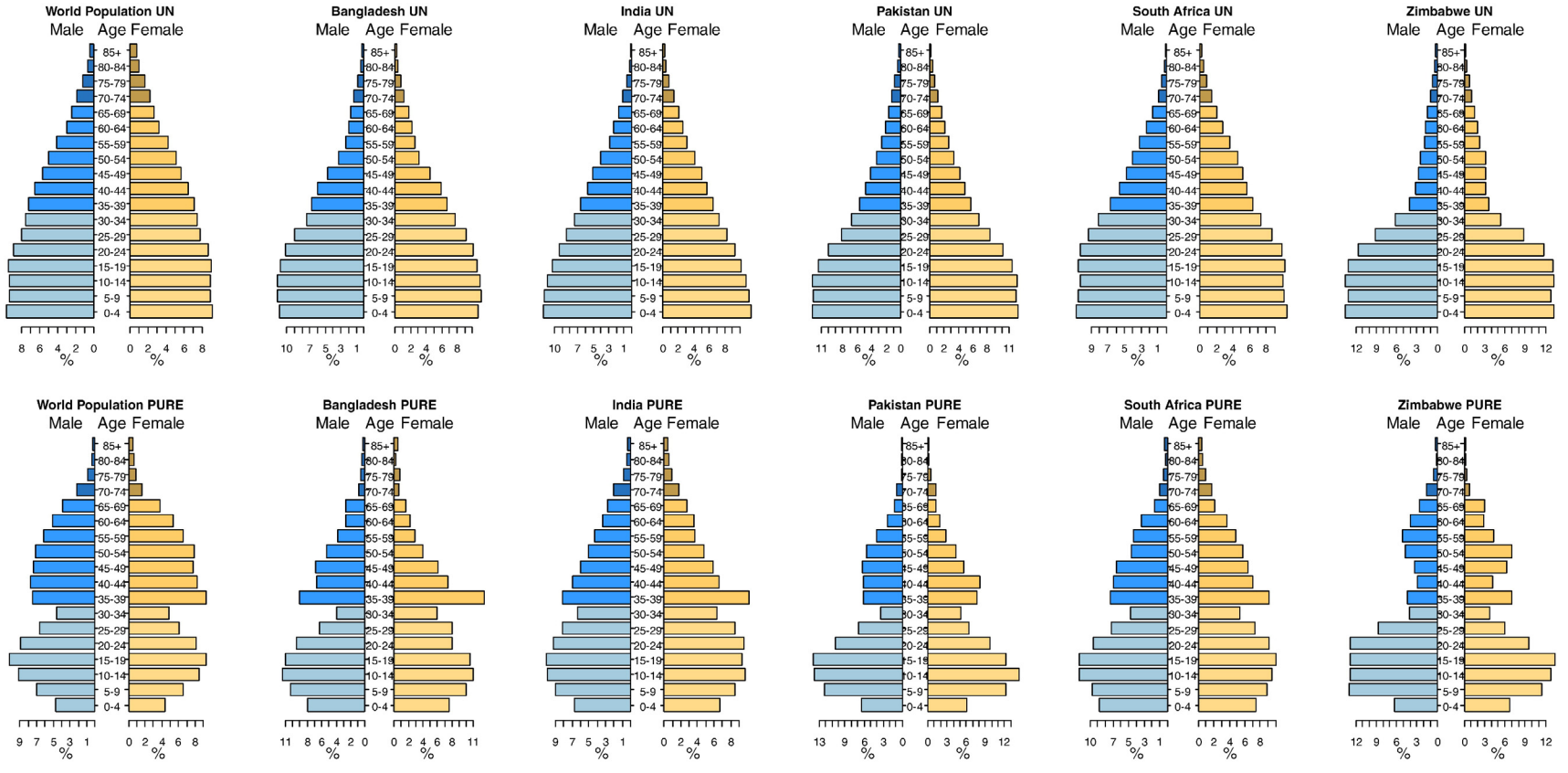
Figure 2A plots the median age from the PURE household sample against the median age of the population from the UN population prospects data for each country in PURE. In addition, the graph displays the line of equality, where all of the values would lie if there was perfect concordance between the data sources, and a reduced major axis regression line. In this plot, a majority of countries were found to lie to the left of the line of equality, indicating a higher median age in the PURE population compared to the UN statistics, with deviations appearing to be somewhat larger for countries with older age distributions. The ordering of countries, however, was largely consistent between the 2 sources of data, indicated by a high level of correlation (Pearson's r = 0.92). The reduced major axis revealed a slope greater than one (β = 1.4), indicating that the median age in PURE rose more quickly compared to UN data at higher ages. Figure 2B displays a mean difference plot, where the difference in median ages between PURE and the UN are plotted on the y-axis against their mean on the x-axis which allows for the quantification of the magnitude of the differences in ages across the two sources of data for each country. On average, across all countries the household population in PURE was 5.8 years older than the UN statistics, which was expected given the age criteria established, meaning households with adults less than 35 were excluded. The size of the differences varied from less than 1 year older in Pakistan to 14.9 years older in Brazil.

The PURE household population had more women than men, with an overall sex ratio of 95.1 males per 100 females, compared to an average sex ratio of 100.3 from the UN data for the 17 participating countries. Sex ratios by country from the UN and PURE overall and by age groups are given in the online Appendix B Supplementary Table I. Across a majority of countries, the sex ratios were lower in PURE compared to the UN figures across all ages (mean difference 5.2 SD 6.0) and among the 35-69 years group (mean difference 11.8 SD 7.8), although the sex ratios were well correlated among the 35-69 years group (r = 0.71). Among the younger ages (0-34 years), the sex ratios were similar between PURE and the UN for most countries (104.6 in PURE vs 103.8 in the UN). The sex ratios among older ages (70+ years) were found to be higher (more men) in PURE for several countries (eg, China, Malaysia, Zimbabwe, Sweden, and Iran) compared to UN national data. Sex ratios at these ages are likely reflective of the presence of older family members who are living in the same household as study participants and therefore may be different from the general elderly population in these countries.

The percentage of the population in urban areas from PURE was compared against the UN data. Although a positive relationship between the two sources was observed, the magnitude of the correlation coefficient (r = 0.55) is smaller than for median age. The urban population was found to be on average 3.8% lower in PURE compared to the national data, with differences by country varying between 41% lower in Argentina to 27% higher in Pakistan (online Appendix B Supplementary Figure). Although, as we have noted, household sampling in PURE was designed to capture a variety of urban and rural locations and not to produce a study population that was strictly representative according to urban or rural location, in 9 of 17 countries (China, South Africa, Zimbabwe, Canada, Sweden, Poland, Turkey, Brazil, and Chile) the estimated percentage of population in urban areas was found to be within 8% of the UN data.

The distribution of the population according to level of education was compared between nationally representative household surveys and the PURE household population in the study countries (online Appendix B Supplementary Table II). In general, the educational profile was similar between PURE and the national data in many countries, with overall differences of less than 7% for each of the categories. Compared to the national data, 12 of 17 countries in PURE (Bangladesh, India, Pakistan, China, Malaysia, South Africa, Zimbabwe, Canada, Poland, Turkey, Brazil, and Chile) had a greater proportion of individuals who had attained secondary and/or higher levels of education. These differences varied from

Figure 1



Population pyramids by country. *UAE nationals only; excludes international migrants.

Figure 1

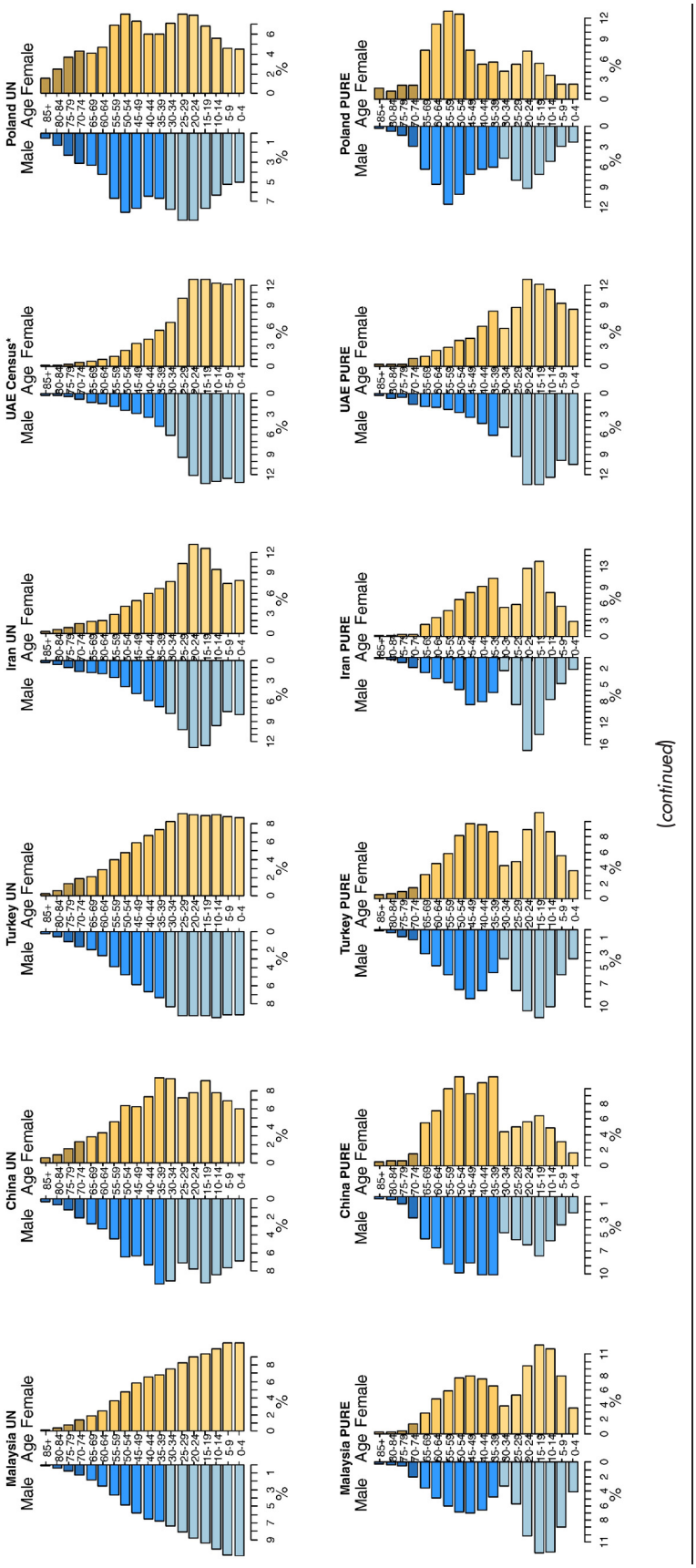


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Figure 1

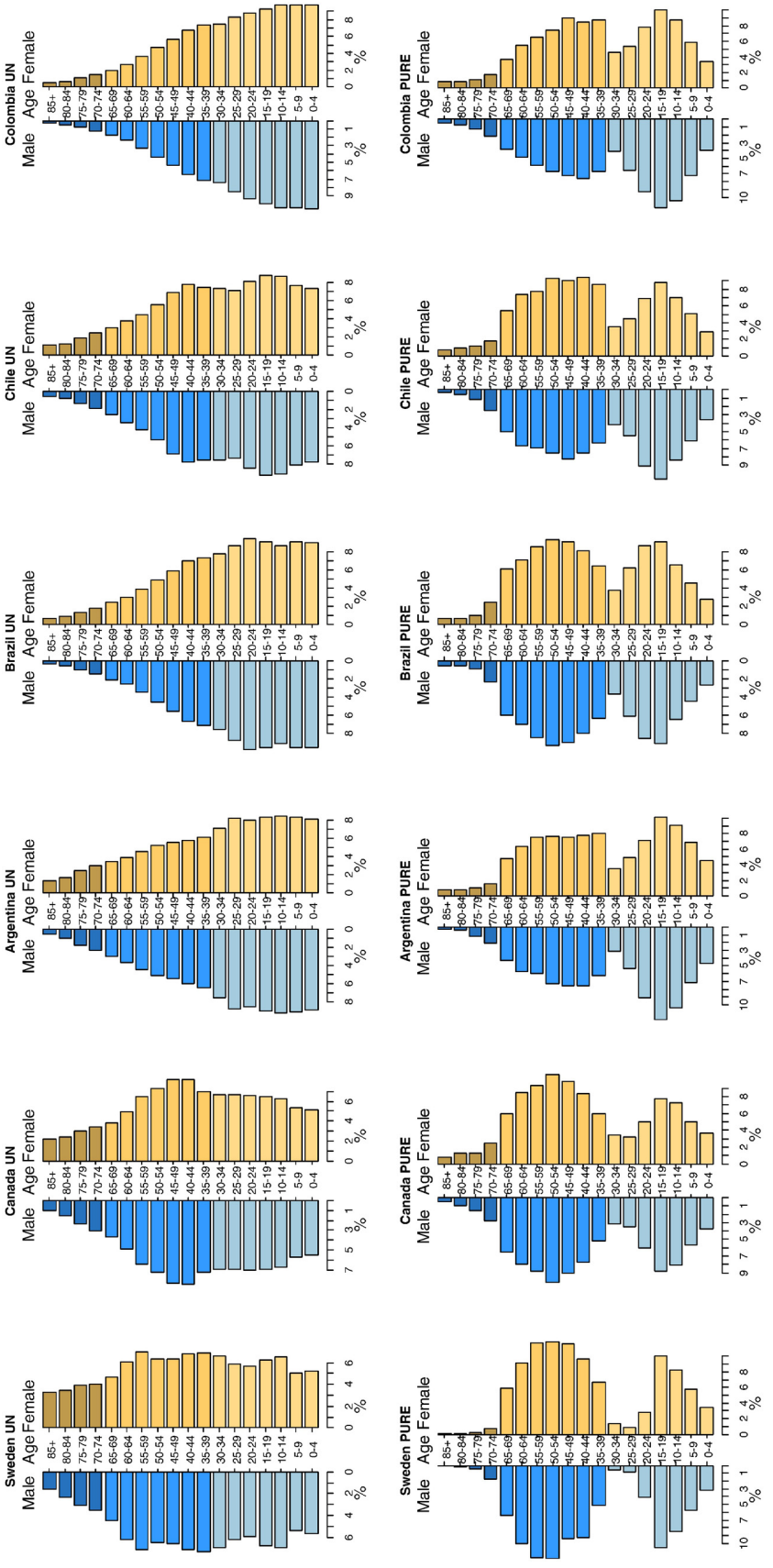

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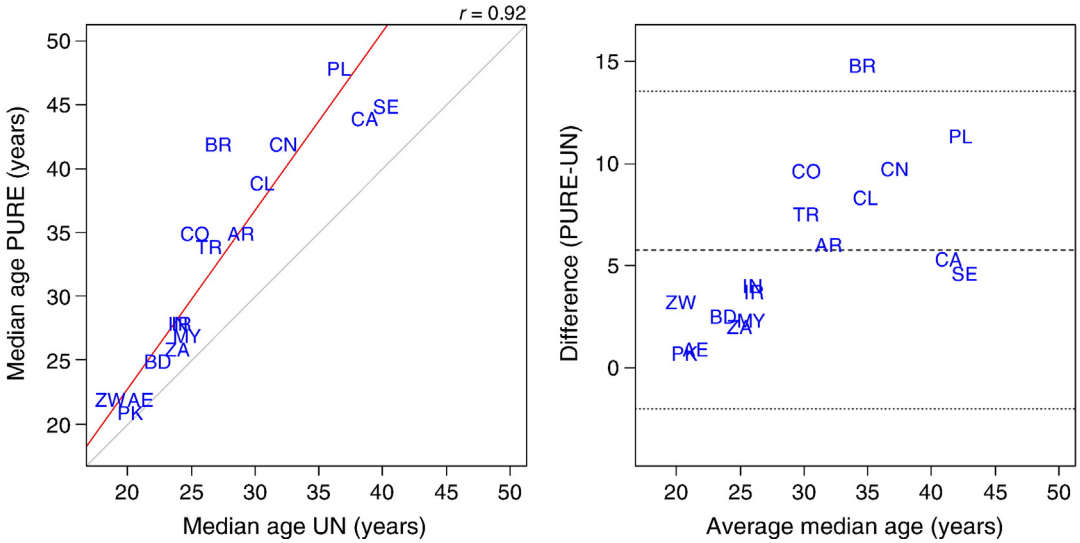
Figure 2



Agreement in median age between household data collected in the PURE study and national data from the UN population prospects (2010 revision) for 17 participating countries. In the left panel, the grey line represents the line of equality and the red line a reduced major axis regression line. In the right panel the center horizontal dotted line represents the mean difference and the 2 outer lines represent the 95% limits-of-agreement. List of country name abbreviations given in the online Appendix A.

2.7% greater for higher education in Malaysia to 25.3% for secondary education in Iran.

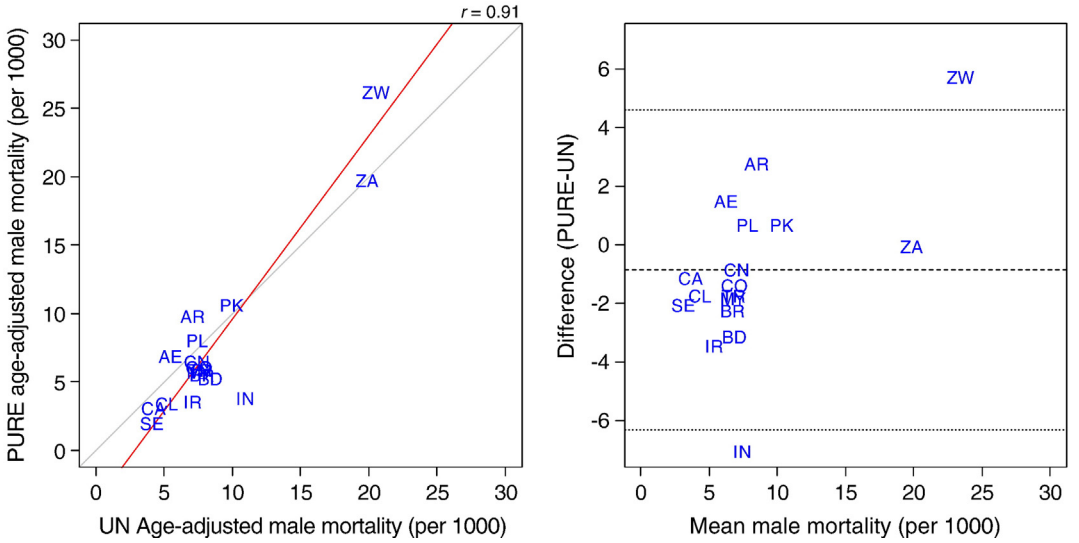
Figures 3 and 4 show agreement between annual rates of male and female mortality, respectively, obtained from the PURE household data and the UN statistics for participating countries. Mortality rates demonstrated a strong positive correlation in men ($r = 0.91$) and women ($r = 0.92$) although the absolute rates were somewhat lower in PURE compared to national statistics (7.9 per 1000 vs 8.7 for men; mean difference −0.8 [SE 0.7] and 6.7 vs 8.1 for women; mean difference −1.4 [SE 0.5]). The lower mortality rates in PURE may be related to obtaining deaths in the previous 2 years, and not a complete birth and death roster for the household, which may have resulted in an undercount of some deaths occurring further than 2 years prior to the baseline survey. In addition, due to differences in population structure between PURE and the national populations, some deaths at younger (<35 years) and older (>70 years) may have been missed.

Discussion

In this study, we found relatively good concordance between the PURE household population and the national age, sex, urban/rural, education, and mortality profiles in the study countries. Although the PURE population was found to be older and have a higher proportion of women compared to the national data, there was no indication of systematic bias in the collection of the data. Rather, the higher age observed in the PURE household sample is likely the result of "younger" families being excluded from the study population, while the higher proportion of women may be due to both the older age of the PURE population and the potential for higher response rates among women or work-related absences by men since these differences were apparent in the 35-70 age group but not among the 0-34 age group. Further, the male and female mortality rates in PURE, although lower, were well correlated with the UN data. The observed differences were likely influenced by the shorter reference period during which mortality information was obtained in PURE (previous 2 years) and lack of a complete birth and death history for the household. There were differences in the population distribution at very young and older ages in PURE compared to national data which may mean that child and/or old age mortality have been underestimated compared to the UN estimates. Further, given that comprehensive cause-of-death registration systems have not been established in many of the countries in PURE,[14] uncertainty remains even in the UN mortality estimates from these countries and this may influence the extent to which these measures agree.

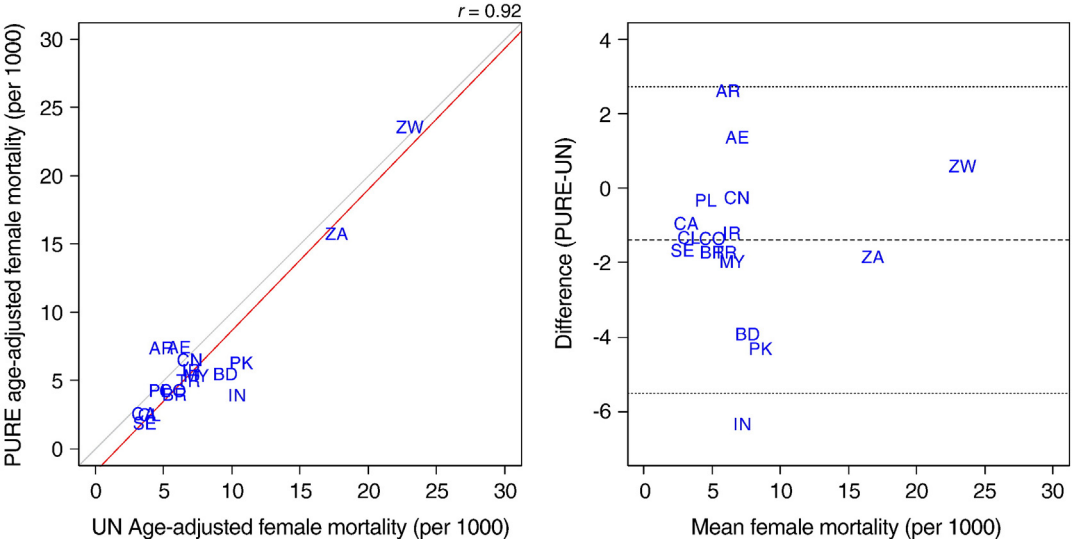
When establishing the PURE study cohort, efforts were made to select communities which represented the range of diverse socioeconomic and environmental conditions within countries while at the same time ensuring high rates of follow up, repeated assessments on participants at regular intervals, and the ability to process biological

Figure 3



Agreement in annual male mortality from household data collected in the PURE study and national data from the UN population prospects (2010 revision) for 17 participating countries. In the left panel, the grey line represents the line of equality and the red line a reduced major axis regression line. In the right panel the center horizontal dotted line represents the mean difference and the 2 outer lines represent the 95% limits-of-agreement. List of country name abbreviations given in online Appendix A.

Figure 4



Agreement in annual female mortality from household data collected in the PURE study and national data from the UN population prospects (2010 revision) for 17 participating countries. In the left panel, the grey line represents the line of equality and the red line a reduced major axis regression line. In the right panel the center horizontal dotted line represents the mean difference and the 2 outer lines represent the 95% limits-of-agreement. List of country name abbreviations given in the online Appendix A.

samples.[1] Although this method of selecting communities has the potential to impact on the generalizability of the study findings if the communities selected were very different from the national population, this does not appear to have happened in PURE, at least for the demographic and socioeconomic indicators considered here. In addition, the

wide variety of populations, ethnicities, and environmental circumstances covered by the PURE study as a whole ensure that the study findings will be generalizable to many populations and settings worldwide as long as appropriate allowances are made for the modest differences in age, sex and distribution of urban/rural location of residence.

There are some limitations to this work. First, at the present time it was beyond the scope of this manuscript to include data on CVD and CVD-related mortality. The prospective component of PURE remains ongoing and these events continue to be collected. Second, although we were not able to assess the validity of the comparison data themselves, the UN population prospects data are generally regarded as reasonably accurate.[15] The availability of comprehensive indicators for all countries makes them one of the most important sources of data for comparative demographic analyses. The UN data, however, are estimates and it has been argued that such population estimates could be improved through the incorporation of additional dimensions including urban and rural place of residence and educational attainment.[16] In contrast, PURE data have been directly collected and include many more dimensions than are typically found in demographic datasets. PURE therefore represents an important resource for monitoring mortality and disease rates in countries where these data are not otherwise directly available except through estimates such as the Global Burden of Disease.[17] Finally, PURE was not designed to be nationally representative. Within communities, however, representative samples of adults aged 35-70 years have been included. In addition, the standard approaches for the identification of individuals, recruitment procedures, follow-up, and accurate data collection all contribute to ensuring the internal validity of PURE.[18,19]

Importantly, the higher median age of the PURE sample will likely result in a higher prevalence of cardiovascular risk factors in PURE as it is an older population. The eligibility criteria meant that households without an adult in the age group of interest were excluded. The most obvious age group which appears to be under-enumerated compared to national data, and thus missing from mortality follow-up is adults aged 30-34 years, although mortality and event rates are likely to be low among these ages. The relative ranking of countries is generally preserved between PURE and national data for demographic and mortality comparisons, indicating that comparisons of risk factors and outcomes in PURE will likely be valid.

PURE will help to elucidate the associations between socioeconomic, environmental, and other contextual factors on the development of CVD/risk factors—the so-called "causes of the causes".[20] Given that the majority of communities and participants in PURE are from low- and middle-income countries, there are potentially important contributions that the cross-sectional analyses of baseline data can make to the quantification of CVD and risk factor burden in these settings.[21] When drawing inferences from these estimates, however, it will be essential to do so in light of the present analyses which highlight certain differences between the study population and general population in several countries. This potential limitation in PURE will not carry through to the follow-up phases where the inferential goal will be to both identify causal relationships between community and individual level factors and risk factors/outcomes and to compare the relative rates of various cardiovascular events between different countries. Our data on mortality suggest that the relative rates of various events between countries can be compared with reasonable confidence that they reflect the relative rankings between countries. In this regard, the PURE study will provide unique information on the relationship of risk factors in explaining international variations in rates of CVD. High levels of cooperation, participation, follow-up, and accurate measurements will be needed to ensure high levels of validity during follow up.[22]

In conclusion, the findings of this study indicate that although there were some differences with national data for the indicators studied, such differences will be unlikely to distort exposure-disease associations or estimates of relative event rates in different countries derived during the follow-up phases in PURE. Estimates of the prevalence of cardiovascular risk factors derived from the PURE baseline data, however, will likely differ from comparable national estimates given the older age and higher levels of education in this sample. Further, CVD prevalence estimates may be less generalizable in countries with high levels of income poverty as preliminary analyses suggest such populations may be underrepresented in PURE.[23] Future analyses from PURE, appropriately stratified according to age, sex, and/or urban/rural location will enable valid comparisons of the relative rates of various cardiovascular outcomes across countries.

Disclosures

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Conflict of Interest: Authors declare no conflict of interest.

Contributions: DJC, SVS, and SY conceptualized the specific analyses contained in this report. The overall PURE study was conceptualized and implemented by SY and colleagues at PHRI. DJC led the collection of comparison data, analysis, interpretation, and wrote the first draft of this manuscript. SVS, MM, CC, and SY contributed to the analysis, interpretation of the results, and writing. JC, GD, RD, RK, AK, FL, PLJ, PM, AA, AO, AR, AS, LW, KY, AY, SR, KT provided critical comments and contributed to the writing. SVS provided overall supervision to the study.

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Appendix A

Country abbreviations used in figures: Argentina (AR) Bangladesh (BD) Brazil (BR) Canada (CA) Chile (CL) China CN Colombia (CO) India (IN) Iran (IR) Malaysia (MY) Pakistan (PK) Poland (PL) S. Africa (ZA) Sweden (SE) Turkey (TR) UAE (AE) Zimbabwe (ZW).

Appendix B

Supplementary Table I. Sex ratio (number of males per 100 females) of the total population and by age groups according to the UN population prospects and PURE household populations in 17 countries

	Sex ratio (males per 100 females)			
Country	**Total**	**0-34 years**	**35-69 years**	**70+ years**
Total				
National	100	104	98	84
PURE	95	105	86	117
Bangladesh				
National	104	104	103	112
PURE	101	101	102	105
India				
National	107	109	106	91
PURE	99	101	97	96
Pakistan				
National	104	104	103	110
PURE	105	106	104	70
China				
National	108	111	106	84
PURE	95	109	87	129
Malaysia				
National	103	104	103	89
PURE	98	104	90	129
South Africa				
National	98	102	91	57
PURE	79	86	71	46
Zimbabwe				
National	98	101	89	80
PURE	90	100	70	132
Canada				
National	98	104	99	72
PURE	95	104	89	95
Sweden				
National	98	105	102	70
PURE	99	102	95	233
Poland				
National	93	104	93	56
PURE	88	113	79	61
Turkey				
National	100	103	97	78
PURE	101	114	89	84
Iran				
National	104	104	103	116
PURE	109	114	97	339
UAE				
National	103	102	101	130
PURE	95	102	76	134
Argentina				
National	96	102	93	62
PURE	92	103	82	84
Brazil				
National	97	102	92	75
PURE	94	109	87	76
Colombia				
National	97	102	90	74
PURE	93	106	80	93
Chile				
National	98	103	96	68
PURE	84	103	72	80

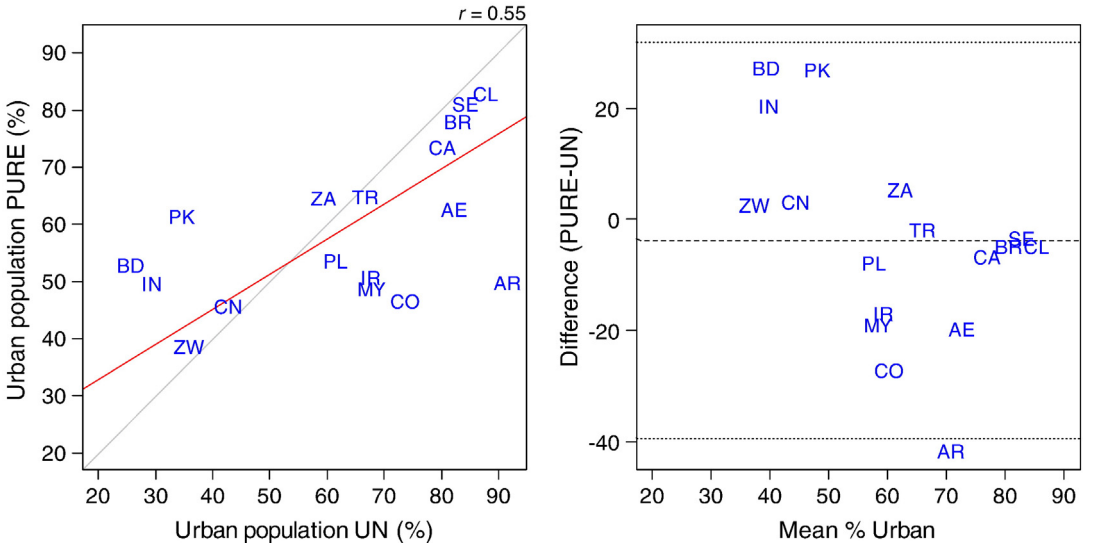
Note: bars represent sex ratio (males per 100 females) for national data (blue) and the PURE study (red).

Supplementary Table II. Distribution of the population according to level of education derived from nationally representative surveys and the PURE household populations in 17 countries

	Education (%)			
Country	**Less than primary**	**Primary complete**	**Secondary**	**Higher**
Total				
National	23.2	32.8	31.3	12.7
PURE	17.4	29.8	37.8	14.9
Bangladesh				
National	35.1	33.8	23.5	7.6
PURE	34.7	32.1	26.7	6.5
India				
National	35.0	23.2	34.0	7.8
PURE	23.8	21.8	39.2	15.2
Pakistan				
National	50.0	25.2	17.7	7.2
PURE	30.1	26.3	26.6	17.0
China				
National	12.9	24.8	51.6	10.7
PURE	12.4	22.2	55.0	10.4
Malaysia				
National	28.7	26.4	35.6	9.3
PURE	17.5	21.5	49.0	12.0
South Africa				
National	33.2	43.5	20.8	2.5
PURE	21.5	36.1	40.4	1.9
Zimbabwe				
National	25.7	41.3	30.8	2.3
PURE	12.7	34.5	51.0	1.8
Canada				
National	2.6	13	37	46
PURE	4.9	13.1	38.3	43.7
Sweden				
National	6.2	18.1	41.7	32.5
PURE	6.1	25.9	40.0	28.0
Poland				
National	6.5	23.2	50.6	19.6
PURE	8.7	16.2	49.2	26.0
Turkey				
National	26.0	40.3	26.4	7.3
PURE	15.6	44.7	31.9	7.8
Iran				
National	18.2	54.0	21.2	6.5
PURE	13.9	25.7	46.6	13.8
UAE				
National	15.9	30.5	27.1	26.5
PURE	21.9	27.5	28.5	22.1
Argentina				
National	31.9	42.2	21.7	4.3
PURE	24.5	50.4	21.5	3.6
Brazil				
National	18.9	38.7	30.0	12.4
PURE	18.2	33.0	25.2	23.7
Colombia				
National	20.1	36.6	33.5	9.8
PURE	21.8	40.3	29.3	8.7
Chile				
National	26.9	41.8	27.6	3.7
PURE	7.8	35.7	44.6	11.9

Note: bars represent percentage in each educational category for national data (blue) and the PURE study (red).

Supplementary Figure



Agreement in percentage of population living in urban areas between household family census data collected in the PURE study and national data from the UN population prospects (2010 revision) for 17 participating countries. In the left panel, the grey line represents the line of equality and the red line a reduced major axis regression line. In the right panel the center horizontal dotted line represents the mean difference and the 2 outer lines represent the 95% limits-of-agreement.

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