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Population-level risks of alcohol consumption by amount, geography, age, sex, and year: a systematic analysis for the Global Burden of Disease Study 2020

GBD 2020 Alcohol Collaborators

2022-07-16

GBD 2020 Alcohol Collaborators, Bryazka, D, Reitsma, MB, Griswold, MG, Kivimäki, M, Lallukka, T& Meretoja, A 2022, 'Population-level risks of alcohol consumption by amount, geography, age, sex, and year: a systematic analysis for the Global Burden of Disease Study 2020', Lancet, vol. 400, no. 10347, pp. 185-235. https://doi.org/10.1016/S0140-6736(22)00847-9

http://hdl.handle.net/10138/347889 https://doi.org/10.1016/S0140-6736(22)00847-9

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Summary

Background The health risks associated with moderate alcohol consumption continue to be debated. Small amounts of alcohol might lower the risk of some health outcomes but increase the risk of others, suggesting that the overall risk depends, in part, on background disease rates, which vary by region, age, sex, and year.

Methods For this analysis, we constructed burden-weighted dose–response relative risk curves across 22 health outcomes to estimate the theoretical minimum risk exposure level (TMREL) and non-drinker equivalence (NDE), the consumption level at which the health risk is equivalent to that of a non-drinker, using disease rates from the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2020 for 21 regions, including 204 countries and territories, by 5-year age group, sex, and year for individuals aged 15–95 years and older from 1990 to 2020. Based on the NDE, we quantified the population consuming harmful amounts of alcohol.

Findings The burden-weighted relative risk curves for alcohol use varied by region and age. Among individuals aged 15–39 years in 2020, the TMREL varied between 0 (95% uncertainty interval 0–0) and 0.603 (0.400-1.00) standard drinks per day, and the NDE varied between 0.002 (0–0) and 1.75 (0.698-4.30) standard drinks per day. Among individuals aged 40 years and older, the burden-weighted relative risk curve was J-shaped for all regions, with a 2020 TMREL that ranged from 0.114 (0-0.403) to 1.87 (0.500-3.30) standard drinks per day and an NDE that ranged between 0.193 (0-0.900) and 6.94 (3.40-8.30) standard drinks per day. Among individuals consuming harmful amounts of alcohol in 2020, 59.1% (54.3-65.4) were aged 15–39 years and 76.9% (73.0-81.3) were male.

Interpretation There is strong evidence to support recommendations on alcohol consumption varying by age and location. Stronger interventions, particularly those tailored towards younger individuals, are needed to reduce the substantial global health loss attributable to alcohol.

Funding Bill & Melinda Gates Foundation.

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Introduction

Alcohol use accounted for 1.78 million (95% uncertainty interval [UI] 1.39-2.27) deaths in 2020 and was the leading risk factor for mortality among males aged 15-49 years (Bryazka D, unpublished). The relationship between moderate alcohol use and health is complex, as shown in multiple previous studies. 1-6 Alcohol consumption at any level is associated with health loss from several diseases, including liver cirrhosis, breast cancer, and tuberculosis, as well as injuries.7-10 At the same time, some studies have found that consumption of small amounts of alcohol lowers the risk of cardiovascular diseases and type 2 diabetes.11-13 As a corollary, the amount of alcohol that minimises health loss is likely to depend on the distribution of underlying causes of disease burden in a given population. Since this distribution varies widely by geography, age, sex, and time, the level of alcohol consumption associated with the lowest risk to health would depend on the age structure and disease composition of that population.14-16

Two quantities are crucially relevant when formulating effective, evidence-based guidelines and alcohol-control policies: the theoretical minimum risk exposure level (TMREL), which represents the level of consumption that minimises health loss from alcohol for a population, and the non-drinker equivalence (NDE) level, which measures the level of alcohol consumption at which the risk of health loss for a drinker is equivalent to that of a nondrinker. The majority of studies to date consider one or a small subset of health outcomes associated with alcohol consumption at a time, although several broader systematic meta-analyses have been done. 1,4,17-19 Findings from these studies vary in their estimates of the TMREL. Several studies have found evidence of a I-shaped relationship between alcohol use and all-cause mortality.3,18,20 However, others have reported that the allcause or attributable cause burden weighted TMREL of alcohol is zero standard drinks per day.^{1,21} Uncertainty about the effect of alcohol on all-cause health loss results from differences in the relative disease composition between studies, conflicting studies on individual health Lancet 2022; 400: 185-235

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*Collaborators are listed at the end of the Article

Correspondence to:
Prof Emmanuela Gakidou,
Institute for Health Metrics
and Evaluation, University
of Washington,
Seattle, WA 98195 USA
qakidou@uw.edu

Research in context

Evidence before this study

The risks of moderate alcohol use on health outcomes have been widely studied and debated for many years. Studies have considered the health impacts associated with alcohol consumption through a variety of approaches, ranging from exploring the effects on a single disease, to considering multiple health outcomes, to using all-cause mortality as an outcome. Several systematic reviews have also been published on this topic, and in recent years several publications have used Mendelian randomisation to explore the association between alcohol use and health outcomes. Overall, the findings have varied, which partly contributes to this topic being controversial and a subject of debate. Several studies have found evidence of a J-shaped relationship between alcohol use and all-cause mortality or burden; in other words, at low levels of consumption, alcohol lowers the risk of all-cause mortality, whereas above some threshold it increases the risk. However, other studies, including a publication by the GBD 2016 Alcohol Collaborators in The Lancet in 2018, have reported that the level of alcohol consumption that minimises health loss is zero standard drinks per day. The apparent contradiction in findings across existing studies highlights the significance of continuing to study this topic and updating the evidence base as more information becomes available. Importantly, few previous studies analysing the effects of alcohol consumption on allcause mortality have considered how the relationship between alcohol use and health is contingent on background rates of disease. We did a systematic review of the literature in which we searched PubMed and previous published meta-analyses using search terms such as "alcohol" and "drinking behavior", terms concerning study outcomes such as "risk", "odds ratio", and "hazard ratio", and terms concerning the specific causes included in the study, such as "ischemic heart disease" or "tuberculosis". We searched for studies published up to Dec 31, 2019; the search was limited to English language publications.

Added value of this study

In this systematic analysis for the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2020, we estimated levels of alcohol consumption that minimise health loss using updated systematic reviews and meta-regressions, building on results from GBD 2016 and incorporating region-specific background rates of diseases and injuries within our assessment. To the best of

outcomes, differences in study covariates and methods, estimation of drinking patterns, as well as issues relating to selection bias.^{22,23}

Importantly, no study to date has examined the variation in the theoretical minimum risk of alcohol consumption by geography, age, sex, and time, conditioned on background rates of disease. National dietary guidelines on low-risk drinking, such as those in the USA, UK, France, and Australia, base recommendations on studies of the risk of alcohol use on all-cause mortality and some

our knowledge, this is the first study to consider the implications of background rates of disease on levels of alcohol consumption that minimise health loss. We updated the previously published systematic review and meta-regressions to consider all published studies through to December, 2019, reporting on the association between alcohol and the six alcohol-attributable health outcomes accounting for the highest number of global disability-adjusted life-years. We found insufficient evidence for an association between alcohol use and one of these outcomes and subsequently omitted it from further analysis. This analysis has yielded updated relationships on the relative risk of mortality for five causes, at various levels of alcohol consumption, which we combined with relative risk estimates from GBD 2016 for an additional 17 outcomes. We used this information, along with information on the burden of disease from these 22 diseases and injuries, to estimate the level of alcohol consumption that minimises health loss separately for each age group, sex, year, and region. In addition to estimating the level of consumption that is associated with minimising health loss, known as the theoretical minimum risk exposure level (TMREL), we also estimated the level of alcohol consumption at which the risk to health for a drinker is equivalent to that of a non-drinker—a quantity we refer to as the non-drinker equivalence.

Implications of all the available evidence

Our results are consistent with previous findings at the global level, and at the same time the more nuanced analysis done in this study strongly suggests that statements, guidelines, and recommendations on the optimal level of alcohol consumption need to take into consideration the background rates of diseases and injuries for each population. We provide clear evidence that the level of alcohol consumption that minimises health loss varies significantly across populations and remains zero or very close to zero for several population groups, particularly young adults. At the same time, small amounts of alcohol consumption are associated with improved health outcomes in populations that predominantly face a high burden of cardiovascular diseases, particularly older adults in many world regions. Given these findings, we recommend a modification of existing policy quidelines to focus on emphasising differential optimal consumption levels by age, rather than the current practice of recommending different consumption levels by sex. This study highlights the importance of prioritising interventions targeted at minimising alcohol consumption among young adults.

cause-specific outcomes.²⁴⁻²⁷ This complicates interpretation of the risk of alcohol use on mortality, given three aspects of all-cause mortality. First, causal pathways between alcohol use and cause-specific outcomes can differ, creating multiple confounding structures that are not readily adjustable when embedded within models analysing the effects of alcohol use on all-cause mortality.²⁸ Second, all-cause mortality includes non-causally related outcomes, further increasing the threat to internal validity for evidence produced from analysing the effects of alcohol

use on all-cause mortality. Third, and most importantly for the present study, the composition of causes within all-cause mortality can differ substantially between populations, changing the proportional risk of mortality due to alcohol use across these populations. ^{1,29} In tandem, these features limit the applicability of determining minimum risk exposures on the basis of observational data on alcohol use and all-cause mortality.

In this study, we used the distribution of causes of disability-adjusted life-years (DALYs) in each population, along with alcohol consumption patterns from the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2020, to estimate the TMREL and NDE for each region, age group, sex, and year from 1990 to 2020. Using these estimates, we quantified the proportion of the population consuming alcohol in amounts exceeding these thresholds by location, age, sex, and year, serving as a guide for targeting alcohol control efforts.

This manuscript was produced as part of the GBD Collaborator Network and in accordance with the GBD Protocol.³⁰

Methods

Overview

GBD is the most comprehensive effort to date to understand the changing health challenges around the world.31 In the most recent revision, GBD 2020, estimates were produced for the mortality and health burden from 287 causes of death, 370 diseases and injuries, and 88 risk factors in 204 countries and territories by 5-year age groups and sex from 1990 to 2020. As part of GBD 2020, we estimated the TMREL and NDE of alcohol consumption for 21 regions by 5-year age group, sex, and year for individuals aged 15-95 years and older from 1990 to 2020 (Bryazka D, unpublished). Using the comparative risk assessment framework, we also quantified the population consuming alcohol in harmful amounts, by 5-year age group, country or territory, sex, and year. In the following sections, we provide an overview of our methods. This study adheres to the Guidelines for Accurate and Transparent Health Estimates Reporting (GATHER) statement.32

Estimating dose-response relative risks

As part of GBD, a previous systematic literature review and meta-analysis was published in 2018 that included 592 cohort and case-control studies across 23 outcomes associated with alcohol use. These outcomes included ischaemic stroke, intracerebral haemorrhage, ischaemic heart disease, hypertensive heart disease, atrial fibrillation and flutter, lip and oral cavity cancer, nasopharynx cancer, other pharynx cancer, oesophageal cancer, larynx cancer, colon and rectum cancer, breast cancer, liver cancer, type 2 diabetes, cirrhosis and other chronic diseases of the liver, pancreatitis, idiopathic epilepsy, tuberculosis, lower respiratory infection, transport injuries, unintentional injuries, self-harm, and

interpersonal violence. As part of this previous metaanalysis, dose–response relative risk curves for each of these outcomes were estimated through use of a Bayesian meta-regression tool, DisMod ODE.^{1,33}

For GBD 2020, we updated this review for the six alcoholattributable outcomes that accounted for the greatest number of global DALYs: ischaemic heart disease, ischaemic stroke, intracerebral haemorrhage, type 2 diabetes, tuberculosis, and lower respiratory infection. Through the update, we included 71 additional studies. After evaluating all available evidence, we found insufficient evidence for a relationship between alcohol use and lower respiratory infection. Based on these results, we removed this as a risk-outcome pair for GBD 2020 and from this analysis, resulting in 22 remaining relative risk curves. Further details of the systematic review, including search strings, inclusion criteria, Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagrams, and relative risk curves are provided in appendix 1 (pp 18–47).

Using the updated data for these five outcomes, we revised the relative risk curves associated with each using the meta-regression Bayesian, regularised, trimmed (MR-BRT) meta-regression tool. MR-BRT is a tool that is well suited to the complex task of estimating the dose-response risk association between alcohol and health because it is does not enforce a log-linear functional form, instead parameterising the log relative risk as a B-spline (Zheng P, Institute for Health Metrics and Evaluation, personal communication). It uses an ensemble approach for knot selection of splines based on level of exposure, and incorporates unexplained between-study heterogeneity into the uncertainty of the relative risk estimates. To adjust for aspects of study design that contribute to bias in relative risks, we included covariates for study reference group, adjustment for sick quitter bias, sex, age, population representativeness, outcome reporting method, exposure measurement timing, geographical representativeness, outcome measure (incidence versus mortality), and adjustment for confounders in risk estimation. The MR-BRT tool uses a generalised Lasso approach to select the most relevant bias covariates to adjust for in the final model. A full list of the confounders tested and included in each of these five models is summarised on in appendix 1 (p 15). Consistent with the previous systematic review,1 we utilised a reference group of non-drinkers. We estimated parameter uncertainty using 1000 draws from the posterior distribution, sampled at 1 g intervals of pure alcohol consumption between 0 g and 100 g per day. Further details of the meta-regression approach are available in appendix 1 (pp 14–16).

Estimating TMREL and NDE

The TMREL and NDE are based on aggregate, burdenweighted relative risk curves across health outcomes associated with alcohol use. Burden was quantified with See Online for appendix 1

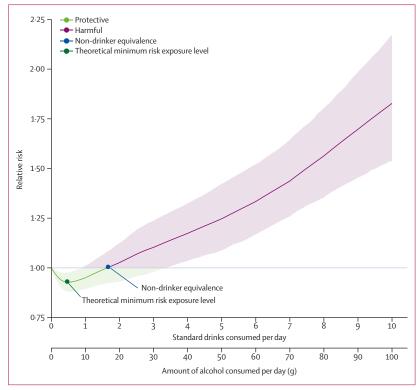


Figure 1: Exemplifying a weighted all-attributable cause alcohol relative risk curve
Points mark the theoretical minimum risk exposure level and non-drinker equivalence level. The shaded areas denote consumption levels with a lower risk (green) and greater risk (purple), compared to no consumption.
The solid line indicates the mean aggregate relative risk estimate, whereas the shaded area reflects the 95% uncertainty interval of the aggregate relative risk estimate. One standard drink is equivalent to 10 g of pure ethanol.

DALY rates for each region, age, sex, and year obtained from GBD 2020 (Bryazka D, unpublished). DALYs are the sum of years of life lost (capturing the effect of premature mortality) and years lived with disability (capturing the effect of morbidity). For each region, age, sex, and year, we produced all-attributable cause relative risk curves as a weighted average of cause-specific relative risk curves, with weights based on the share of the overall DALY rates from each cause. The step-by-step process and formula for computing the weighted all-attributable cause curves are provided in appendix 1 (p 16). Using these estimates, we computed the TMREL and NDE by region, age, sex, and year. Uncertainty in the relative risk curve, based on 1000 draws of each cause-specific relative risk curve and 1000 draws of DALY rates used for weighting, was propagated to the estimates of TMREL and NDE. All estimates are presented to three significant figures. An example of a weighted all-attributable cause alcohol relative risk curve, for all 22 alcohol associated causes combined, is shown in figure 1.

Since alcohol use contributes to the DALY rates that are used as weighting factors when constructing the TMREL and NDE, we did a sensitivity analysis that utilised risk-deleted DALY rates as alternative weights. We generated risk-deleted DALY rates by multiplying the DALY rate of

each cause by the complement of the cause-specific population-attributable fraction due to alcohol (Bryazka D, unpublished). Additionally, our weighted attributablecause relative risk curves were based on only 22 of 24 health outcomes since no relative risk curves could be computed for alcohol use disorder or alcoholic cardiomyopathy due to the paucity of studies on doseresponse relative risks. To assess whether inclusion of these two outcomes could potentially affect the TMREL and NDE levels, we did a second sensitivity analysis in which we generated conservative hypothetical relative risk functions for alcohol use disorder and alcoholic cardiomyopathy and re-computed TMREL and NDE levels that reflect all 24 alcohol-associated outcomes. Additional details of the sensitivity analyses are presented in the appendix (p 17).

Estimating prevalence of alcohol use and alcohol consumption

To estimate the proportion of the population consuming alcohol in excess of the NDE, estimates of alcohol consumption in units of grams of pure ethanol consumed per day, on average, by current drinkers for 204 countries and territories, by age, sex, and year, were obtained from GBD 2020 (Bryazka D, unpublished). Briefly, this process combines supply-side data, household survey data, and administrative data, which allows us to adjust for underreporting due to self-report bias in surveys, account for unrecorded alcohol consumption, and adjust for consumption among tourists. Current drinkers were defined as individuals who had consumed at least one standard drink in the past 12 months. To facilitate interpretation, we report estimates in terms of standard drinks per day, where one standard drink is defined as 10 g of pure ethanol, consistent with previous GBD publications (Bryazka D, unpublished).1 Further details on estimation of the prevalence of alcohol use and alcohol consumption have been published previously.1

Role of the funding source

The funder of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

Results

The distribution of DALYs arising from outcomes associated with alcohol by GBD super-region, age, and sex for 2020 are shown in figure 2. The TMREL and NDE by region, age, and sex for 2020 are shown in figure 3. Overall, we found that the TMREL remained low regardless of geography, age, sex, or time, varying between 0 (95% UI 0–0) and 1·87 (0·500–3·30) standard drinks per day. As a result of the differences in the cause distributions across world regions, both the TMREL and NDE varied by region. The TMREL and NDE did not vary significantly by sex or year. There was significant variation in the TMREL and the NDE across ages, with

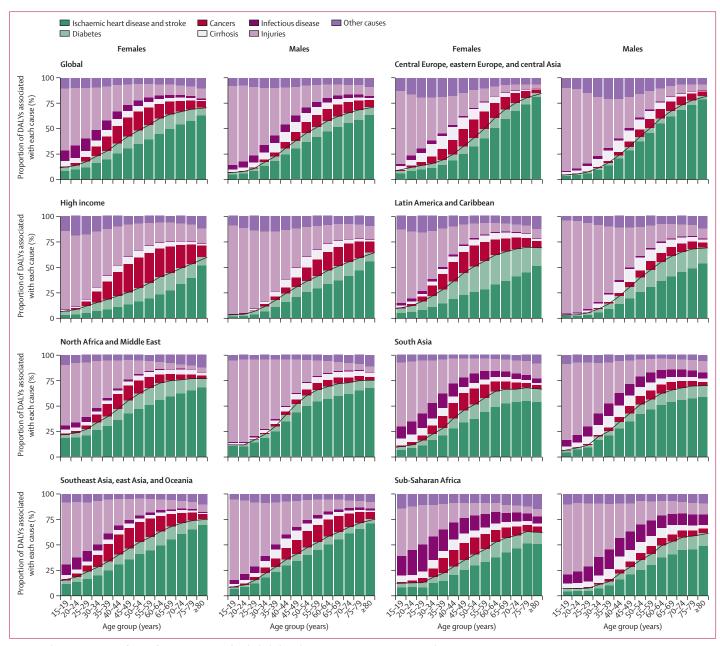


Figure 2: Relative proportions of DALYs for causes associated with alcohol use, by GBD super-region, age group, and sex, in 2020

The proportions represent the weights associated with each cause-specific relative risk curve when constructing each all-cause relative risk curve. The green shades signify causes with a lower risk at low levels of consumption, compared to no consumption. The red and purple shades signify causes with an entirely harmful effect at all levels of consumption. The black line separates causes for which moderate alcohol use lowers risk from causes with an entirely harmful effect. Diabetes includes only type 2 diabetes. Cancers include lip and oral cavity cancer, nasopharynx cancer, other pharynx cancer, oesophageal cancer, larynx cancer, colon and rectum cancer, breast cancer, and liver cancer. Cirrhosis includes cirrhosis and other chronic diseases of the liver. Infectious disease includes tuberculosis. Injuries includes transport injuries, unintentional injuries, self-harm, and interpersonal violence. Other causes include pancreatitis, idiopathic epilepsy, hypertensive heart disease, and atrial fibrillation and flutter. DALY=disability-adjusted life-year.

younger age groups having much lower TMREL and NDE levels than older adults. In 2020, the TMREL varied between 0 (0–0) and 0.603 (0.400-1.00) standard drinks per day among individuals aged 15–39 years and between 0.114 (0-0.403) and 1.87 (0.500-3.30) standard drinks per day among individuals aged 40 years and older. The NDE varied between 0.002 (0-0) and 1.75 (0.698-4.30)

standard drinks per day among individuals aged 15–39 years and between 0·193 (0–0·900) and 6·94 (3·40–8·30) standard drinks per day among individuals aged 40 years and older. This result was mainly driven by differences in the major causes of death and disease burden across ages, as seen in figure 2. Overall, we did not observe any significant differences in the TMREL

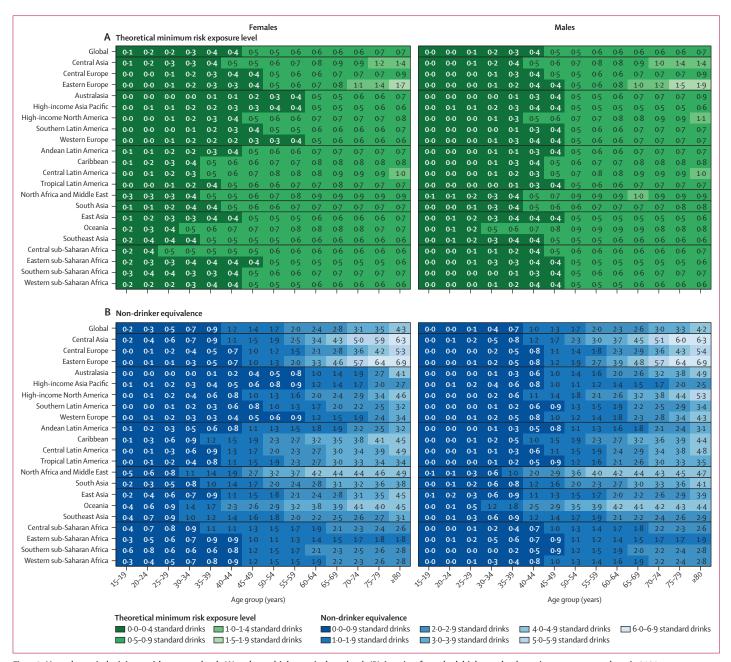


Figure 3: Mean theoretical minimum risk exposure levels (A) and non-drinker equivalence levels (B), in units of standard drinks per day, by region, age group, and sex, in 2020 One standard drink is equivalent to 10 g of pure ethanol.

and NDE between males and females in any age group. In all super-regions, among individuals aged 15–39 years, injuries accounted for the majority of alcohol-related DALYs in 2020. Globally, in this age range, all injuries accounted for $66 \cdot 3\%$ (95% UI $65 \cdot 1-67 \cdot 5$) of alcohol-related DALYs for males and $47 \cdot 9\%$ ($46 \cdot 0-49 \cdot 8$) of alcohol-related DALYs for females; transport injuries comprised $25 \cdot 9\%$ ($25 \cdot 0-27 \cdot 0$) of alcohol-related DALYs among males and $12 \cdot 7\%$ ($12 \cdot 0-13 \cdot 4$) among females, self-harm comprised $11 \cdot 7\%$ ($10 \cdot 1-13 \cdot 3$) of alcohol-related

DALYs among males and $12\cdot3\%$ ($10\cdot8-13\cdot8$) among females, and interpersonal violence comprised $12\cdot4\%$ ($11\cdot8-13\cdot0$) of alcohol-related DALYs among males and $6\cdot70\%$ ($5\cdot90-7\cdot69$) among females. The TMREL among males aged 15-39 years in 2020 was $0\cdot136$ ($0-0\cdot400$) standard drinks per day. Among females aged 15-39 years in 2020, the TMREL was $0\cdot273$ ($0-0\cdot500$) standard drinks per day. The NDE was $0\cdot249$ ($0-1\cdot00$) standard drinks per day among males and $0\cdot546$ ($0-1\cdot30$) standard drinks per day among females. The

differences in the TMREL and the NDE between females and males were not statistically significant.

In individuals aged 40-64 years, the health outcomes contributing to the alcohol-related burden shifted to chronic health conditions, including cardiovascular disease and cancer. In this population, ischaemic heart disease comprised 24·1% (95% UI 23·0-25·3) of alcoholrelated DALYs among males and 19.5% (18.0-21.0) among females, and intracerebral haemorrhage comprised 10.3% (9.61-10.9) of alcohol-related DALYs among males and 11.7% (10.7-12.8) among females, whereas injuries, such as transport or unintentional injuries, remained significant sources of burden, comprising 23.0% (21.7-24.4) of alcohol-related DALYs among males and 16.7% (15.3-18.3) of alcohol-related DALYs among females. Health outcomes for which moderate alcohol use is associated with a lower risk constituted an increasing portion of the cause distribution in this age group, resulting in a higher TMREL and NDE than in individuals aged 15-39 years. The global TMREL among individuals aged 40-64 years in 2020 was 0.527 (0.400-1.00) standard drinks per day among males and 0.562 (0.400-0.800) standard drinks per day among females. The global NDE in 2020 was 1.69 (0.800-3.20)standard drinks per day among males and 1.82 (1.00-3.10) standard drinks per day among females. As in the younger age group, the differences in the TMREL and the NDE between females and males aged 40-64 years were not statistically significant.

Among individuals aged 65 years and older, the major causes of disease burden were cardiovascular diseases. In 2020, ischaemic heart disease was responsible for 31.5% (95% UI 30.3-32.7) of all alcohol-related DALYs among males and 29.7% (28.2-31.2) among females, intracerebral haemorrhage was responsible for 11.6% (10.9-12.4) of all alcohol-related DALYs among males and 10.9% (10.1-11.8) among females, and ischaemic stroke was responsible for 14·2% (13·5-14·9) of all alcohol-related DALYs among males and 16.0% $(15 \cdot 2 - 16 \cdot 7)$ among females. As a result, in this population the TMREL was higher than in the younger age groups and was estimated to be 0.636 (0.500-1.00) standard drinks per day among males and 0.656 (0.500-1.00) standard drinks per day among females, whereas the NDE was estimated to be 3.19 (1.50-5.20) standard drinks per day among males and 3.51 (1.70-5.50) standard drinks per day among females. The differences in the TMREL and the NDE between males and females aged 65 years and older were not significant.

The distribution of the causes of disease burden for a given age group varied substantially across regions, resulting in regional variations in TMRELs and NDEs, particularly in individuals aged 40 years and older. For example, among individuals aged 55–59 years in north Africa and the Middle East, 30·7% (95% UI 27·3–34·6) of alcohol-related DALYs were due to cardiovascular disease, 12·6% (11·0–14·3) were due to cancers, and

0.37% (0.27-0.55) were due to tuberculosis. By contrast, in this same age group in central sub-Saharan Africa, 20.1% (17.2-23.8) of alcohol-related DALYs were due to cardiovascular disease, 9.80% (8.31-11.7) were due to cancers, and 10.1% (6.03-14.1) were due to tuberculosis. As a result, the TMRELs for this age group were 0.876 (0.500-2.00) standard drinks per day in north Africa and the Middle East and 0.596 (0.300-2.00) standard drinks per day in central sub-Saharan Africa. The NDEs also varied, with an NDE of 3.89 (1.50-5.90) standard drinks per day in north Africa and the Middle East and 1.53 (0.600-4.70) standard drinks per day in central sub-Saharan Africa. The TMRELs and NDEs for each region by age and sex for 1990, 2000, 2010, and 2020 are shown in appendix 2 (pp 3-31).

The distribution of the major causes of DALYs varied slightly between sexes, with injuries making up a larger share of distributions for males than for females. This resulted in mean TMRELs and NDEs that were larger among females compared to males of the same region, age, and year. When taking uncertainty into account, these differences were not significant. However, a larger proportion of males compared to females consume alcohol, and their average level of consumption is also significantly higher. As a result, young males stood out as the group with the highest level of harmful alcohol consumption (figure 4).

Globally, 1.03 billion (95% UI 0.851-1.19) males (35.1% [29·1–40·7] of the male population aged ≥15 years) and 312 million (199–432) females (10.5% [6.72-14.6] of the female population aged ≥15 years) consumed alcohol in amounts exceeding the NDE in 2020; the number and proportion of people consuming alcohol in excess of the NDE, along with the percentage change since 1990 in the proportion of people consuming alcohol in excess of the NDE, by age group, sex, and location is reported in table 1. Since 1990, the global proportion of drinkers consuming alcohol in excess of the NDE has not changed significantly. Although the proportion of the population consuming harmful amounts of alcohol stayed at the same level over the past three decades, the number of people consuming harmful amounts of alcohol increased from 983 million (718–1190) in 1990 to 1.34 billion (1.06–1.62) in 2020, driven by population growth. Overall, among individuals consuming harmful amounts of alcohol in 2020, 76.9% $(73 \cdot 0 - 81 \cdot 3)$ were male.

Harmful consumption was predominantly concentrated among individuals aged 15–39 years, who had the lowest TMRELs and NDEs (figure 4). Of the $1\cdot34$ billion (95% UI $1\cdot06-1\cdot62$) individuals consuming alcohol in excess of the NDE in 2020, $59\cdot1\%$ ($54\cdot3-65\cdot4$) were aged 15–39 years. Of these, $75\cdot5\%$ ($70\cdot3-80\cdot7$) were male (595 million [489–658]). Australasia ($83\cdot2\%$ [$71\cdot1-86\cdot9$]), western Europe ($79\cdot3\%$ [$67\cdot1-84\cdot5$]), and central Europe ($78\cdot3\%$ [$68\cdot1-83\cdot5$]) had the highest percentages of males aged 15–39 years consuming harmful amounts of alcohol (table 1). Among females in the same age group,

See Online for appendix 2

	Females			Males		
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change sinc 1990 (%)
Global						
15–39 years	195 000	13·2%	-3·89%	595 000	39·0%	-4·62%
	(124 000 to 273 000)	(8·34 to 18·4)	(-6·02 to 2·53)	(489 000 to 658 000)	(32·1 to 43·2)	(-6·27 to -2·64)
40-64 years	98 600	9·22%	-4·22%	363 000	34·0%	-2·55%
	(60 200 to 137 000)	(5·63 to 12·8)	(-6·54 to -0·279)	(274 000 to 441 000)	(25·7 to 41·4)	(-5·65 to 3·30)
≥65 years	18 400	4·49%	-1·96%	69 900	20·6%	-1·39%
	(8990 to 32 600)	(2·20 to 7·99)	(-3·63 to -0·448)	(47 000 to 98 500)	(13·8 to 29·0)	(-5·12 to 2·61)
Central Asia						
15–39 years	2200	11·9%	-2·93%	8420	44·5%	-4·11%
	(1320 to 3610)	(7·16 to 19·5)	(-6·61 to 0·104)	(6710 to 9580)	(35·4 to 50·6)	(-9·08 to 0·506)
40–64 years	824	6·52%	-0·985%	3740	32·2%	3·29%
	(494 to 1280)	(3·90 to 10·1)	(-3·34 to 0·956)	(2720 to 4910)	(23·4 to 42·3)	(-2·37 to 9·14)
≥65 years	27·3	0·841%	-0·147%	263	12·0%	2·42%
	(8·21 to 91·9)	(0·253 to 2·83)	(-0·881 to 0·407)	(171 to 477)	(7·81 to 21·8)	(0·0992 to 4·88)
Armenia						
15–39 years	64·8	11·8%	1·36%	325	59·3%	-5·32%
	(30·9 to 126)	(5·63 to 23·1)	(−3·88 to 6·39)	(242 to 383)	(44·1 to 69·9)	(-13·7 to 2·88)
40–64 years	22·5	4·50%	1·68%	137	31·9%	7·96%
	(9·50 to 44·6)	(1·90 to 8·89)	(-0·424 to 3·81)	(87·4 to 199)	(20·3 to 46·3)	(-0·927 to 16·6)
≥65 years	0·657	0·285%	0·176%	13·9	8·84%	3·63%
	(0·0590 to 3·52)	(0·0256 to 1·53)	(0·00923 to 0·877)	(6·82 to 32·1)	(4·33 to 20·4)	(0·491 to 6·98)
Azerbaijan						
15–39 years	191	9·19%	-1·76%	890	41·0%	0·163%
	(124 to 278)	(5·97 to 13·4)	(-5·24 to 1·44)	(743 to 1010)	(34·2 to 46·6)	(−5·15 to 5·35)
40–64 years	77·9	4·75%	-0·919%	502	33·3%	2·46%
	(43·9 to 113)	(2·67 to 6·91)	(-3·33 to 1·22)	(357 to 624)	(23·7 to 41·3)	(-3·73 to 8·66)
≥65 years	2·92	0·806%	-0·0175%	45·1	16·8%	1·92%
	(0·698 to 6·65)	(0·193 to 1·84)	(-0·786 to 0·629)	(25·0 to 69·5)	(9·31 to 25·9)	(-3·77 to 6·91)
Georgia						
15–39 years	133	23·6%	2·46%	427	71·9%	1·18%
	(55·0 to 270)	(9·76 to 48·0)	(-7·88 to 12·8)	(340 to 486)	(57·3 to 81·7)	(-6·60 to 9·21)
40–64 years	37·6	6·04%	2·61%	235	42·6%	13·5%
	(13·0 to 82·6)	(2·09 to 13·3)	(−1·19 to 6·51)	(161 to 321)	(29·2 to 58·2)	(2·02 to 25·7)
≥65 years	1·14	0·342%	0·190%	34·6	17·2%	8·13%
	(0·0390 to 6·83)	(0·0117 to 2·05)	(−0·0872 to 1·11)	(17·7 to 71·7)	(8·82 to 35·6)	(0·630 to 15·7)
Kazakhstan						
15–39 years	933	26·9%	-5·14%	1910	55.6%	-4·33%
	(570 to 1530)	(16·5 to 44·0)	(-13·0 to 3·37)	(1490 to 2220)	(43.3 to 64.6)	(-12·1 to 2·87)
40–64 years	386	14·4%	-3·39%	871	36·5%	-2·92%
	(227 to 590)	(8·45 to 22·0)	(-10·1 to 2·64)	(599 to 1190)	(25·1 to 49·9)	(-10·6 to 5·52)
≥65 years	16·6	1·91%	-0·957%	68·2	13·9%	-3·78%
	(4·32 to 55·5)	(0·496 to 6·38)	(-3·73 to 0·747)	(39·9 to 130)	(8·15 to 26·5)	(-10·9 to 2·50)
Kyrgyzstan						
15–39 years	139	10·4%	0·00207%	529	39·0%	-1·29%
	(75·6 to 253)	(5·63 to 18·8)	(-3·95 to 4·51)	(415 to 619)	(30·6 to 45·7)	(-6·83 to 4·25)
40–64 years	51·8	6·58%	1·05%	221	31·2%	1·90%
	(27·7 to 85·8)	(3·52 to 10·9)	(-1·44 to 3·64)	(161 to 290)	(22·7 to 40·8)	(-4·13 to 8·73)
≥65 years	0.834	0·418%	0·0640%	12·7	9·82%	1·19%
	(0.137 to 3.28)	(0·0687 to 1·64)	(-0·315 to 0·567)	(7·97 to 22·2)	(6·16 to 17·1)	(-2·05 to 4·50)
Mongolia						
15–39 years	157	25·0%	5·71%	350	55·1%	7·58%
	(100 to 243)	(16·0 to 38·7)	(-1·72 to 12·0)	(282 to 398)	(44·5 to 62·7)	(1·06 to 14·4)
40-64 years	62·5	14·4%	7·08%	163	41·9%	21·2%
	(38·4 to 95·1)	(8·86 to 22·0)	(2·93 to 11·3)	(122 to 210)	(31·3 to 53·9)	(12·8 to 29·5)
≥65 years	1·57	1·88%	1·48%	8·92	16·5%	12·0%
	(0·462 to 4·64)	(0·555 to 5·58)	(0·476 to 3·54)	(5·45 to 16·6)	(10·1 to 30·8)	(7·81 to 16·8)
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	Females			Males		
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)
(Continued from previo	ous page)					
Tajikistan						
15–39 years	28·8	1·42%	-0·182%	489	23·4%	-0.934%
	(17·2 to 45·0)	(0·847 to 2·22)	(-0·845 to 0·466)	(397 to 578)	(19·0 to 27·6)	(-5.56 to 3.47)
40–64 years	6·72	0·671%	-0·0827%	172	17·6%	-1·54%
	(3·98 to 10·6)	(0·397 to 1·06)	(-0·441 to 0·245)	(131 to 221)	(13·5 to 22·6)	(-5·75 to 2·40)
≥65 years	0·137	0·0814%	-0·0218%	3·75	2·54%	-0·259%
	(0·0370 to 0·364)	(0·0219 to 0·216)	(-0·133 to 0·0600)	(2·25 to 6·18)	(1·52 to 4·18)	(-1·38 to 0·969)
Turkmenistan						
15-39 years	123	12·7%	2·66%	533	48·3%	5·39%
	(64·2 to 218)	(6·62 to 22·4)	(-2·83 to 7·36)	(417 to 619)	(37·7 to 56·0)	(-1·05 to 12·2)
40-64 years	44·4	6·92%	3·70%	210	34·0%	15·4%
	(20·8 to 78·1)	(3·25 to 12·2)	(0·910 to 6·99)	(146 to 284)	(23·5 to 45·8)	(7·25 to 23·4)
≥65 years	0·974	0·620%	0·482%	14·5	13·0%	8·29%
	(0·126 to 3·74)	(0·0802 to 2·38)	(0·0614 to 1·70)	(8·06 to 27·3)	(7·23 to 24·4)	(4·05 to 13·3)
Uzbekistan						
15–39 years	426	6·20%	-0·215%	2970	42·4%	-0·720%
	(234 to 728)	(3·41 to 10·6)	(-3·48 to 2·46)	(2340 to 3460)	(33·4 to 49·3)	(-7·28 to 5·87)
40-64 years	135	3·12%	0·981%	1220	30·4%	7·90%
	(72-7 to 228)	(1·68 to 5·28)	(-0·604 to 2·44)	(876 to 1650)	(21·7 to 40·9)	(-0·290 to 16·2)
≥65 years	2·43	0·289%	0·194%	61·4	9·73%	4·90%
	(0·436 to 9·45)	(0·0519 to 1·12)	(0·0193 to 0·683)	(35·3 to 113)	(5·60 to 17·9)	(1·64 to 8·69)
Central Europe						
15–39 years	8440	49·6%	2·04%	14 000	78·3%	3·80%
	(5820 to 10 900)	(34·2 to 63·7)	(-3·03 to 7·63)	(12 200 to 14 900)	(68·1 to 83·5)	(0·745 to 7·05)
40–64 years	5350	26·8%	5·49%	11 900	60·6%	10·3%
	(3770 to 8180)	(18·9 to 41·0)	(1·43 to 10·2)	(9880 to 14 400)	(50·4 to 73·7)	(3·79 to 17·4)
≥65 years	769	6·00%	2·01%	2980	33·9%	7·44%
	(341 to 1620)	(2·66 to 12·6)	(0·632 to 3·48)	(2160 to 4330)	(24·5 to 49·2)	(3·57 to 10·9)
Albania						
15-39 years	112	24·3%	-1·18%	289	57·0%	6·40%
	(58-3 to 158)	(12·7 to 34·4)	(-9·18 to 6·39)	(238 to 319)	(46·9 to 62·7)	(-0·567 to 13·6)
40–64 years	33·5	7·41%	3·86%	169	40·6%	21·2%
	(16·5 to 65·2)	(3·64 to 14·4)	(1·16 to 7·14)	(123 to 227)	(29·5 to 54·4)	(12·6 to 27·5)
≥65 years	2·35	1·12%	0·993%	36.6	18·9%	14·8%
	(0·353 to 7·73)	(0·168 to 3·68)	(0·164 to 2·97)	(19.5 to 65.2)	(10·1 to 33·7)	(8·78 to 20·9)
Bosnia and Herzegovii	na					
15–39 years	125	24·2%	3·65%	357	65·1%	6·16%
	(82·4 to 166)	(16·0 to 32·3)	(-2·87 to 10·1)	(311 to 389)	(56·8 to 71·1)	(0·147 to 11·9)
40–64 years	69·6	11·5	4·92	284	48·6	17·0
	(43·7 to 114)	(7·21 to 18·8)	(0·916 to 8·92)	(233 to 353)	(39·8 to 60·4)	(7·31 to 26·1)
≥65 years	6.95	2·01%	1·44%	62·9	24·7%	13·9%
	(2.39 to 15.8)	(0·690 to 4·56)	(0·417 to 3·14)	(42·8 to 93·5)	(16·8 to 36·7)	(8·01 to 19·5)
Bulgaria						
15–39 years	488	52·1%	3·64%	798	79·9%	4·62%
	(351 to 624)	(37·5 to 66·6)	(-4·86 to 12·2)	(706 to 851)	(70·7 to 85·2)	(0·386 to 9·03)
40–64 years	382	31·1%	8·55%	798	64·8%	13·4%
	(283 to 541)	(23·0 to 44·0)	(3·07 to 14·6)	(680 to 947)	(55·3 to 77·0)	(5·56 to 22·4)
≥65 years	62·3	6·98%	3·19%	230	38·7%	11·4%
	(28·3 to 120)	(3·17 to 13·5)	(0·735 to 6·12)	(170 to 326)	(28·6 to 54·7)	(4·57 to 17·3)
Croatia						
15–39 years	315	50·8%	-0·297%	513	79·2%	1·08%
	(193 to 417)	(31·1 to 67·4)	(-8·93 to 8·88)	(435 to 555)	(67·2 to 85·7)	(−3·76 to 5·60)
40–64 years	183	24·5%	1·78%	401	55·0%	4·54%
	(111 to 290)	(14·9 to 39·0)	(-5·68 to 9·38)	(313 to 512)	(42·9 to 70·2)	(-3·74 to 14·7)
					(T:	able 1 continues on next page

	Females			Males		
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change sinc 1990 (%)
(Continued from previo	us page)					
≥65 years	28·3	5·47%	0·141%	110	30·4%	1·72%
	(8·87 to 68·4)	(1·72 to 13·2)	(−3·90 to 3·53)	(67·5 to 175)	(18·6 to 48·4)	(-6·72 to 10·1)
Czech Republic						
15–39 years	963	66·2%	-0·371%	1310	85·3%	1·81%
	(704 to 1210)	(48·4 to 82·9)	(-7·38 to 7·53)	(1170 to 1390)	(76·2 to 90·6)	(-1·91 to 5·41)
40-64 years	708	38·3%	5·25%	1300	68·1%	7·53%
	(521 to 1040)	(28·2 to 56·1)	(-0·408 to 11·6)	(1100 to 1540)	(58·0 to 81·1)	(1·20 to 15·1)
≥65 years	127	10·1%	2·87%	391	42·5%	6·30%
	(60⋅0 to 250)	(4·75 to 19·8)	(-0·351 to 6·19)	(291 to 546)	(31·6 to 59·3)	(0·884 to 11·4)
Hungary						
15–39 years	695	50·7%	-2·77%	1100	77·4%	-0·0753%
	(474 to 898)	(34·6 to 65·5)	(-10·5 to 5·60)	(972 to 1180)	(68·2 to 82·8)	(-4·81 to 4·02)
40-64 years	450	25·4%	-0·0407%	1010	59·5%	3·11%
	(309 to 716)	(17·4 to 40·3)	(-6·20 to 6·71)	(833 to 1220)	(49·1 to 71·9)	(-2·87 to 10·1)
≥65 years	73·2	5·99%	-0·294%	262	34·6%	1·74%
	(30·1 to 155)	(2·46 to 12·6)	(-3·88 to 2·47)	(179 to 379)	(23·6 to 50·1)	(-4·33 to 7·33)
Montenegro						
15–39 years	33·9	33·4%	-2·75%	70·1	65·6%	-0·548%
	(22·2 to 45·6)	(21·8 to 44·8)	(-10·6 to 5·04)	(60·3 to 76·1)	(56·4 to 71·2)	(-5·57 to 5·10)
40–64 years	18·0	17·1%	1·20%	52·5	51·5%	6·14%
	(11·3 to 28·9)	(10·7 to 27·4)	(-4·59 to 6·82)	(41·4 to 65·8)	(40·6 to 64·5)	(-2·11 to 16·3)
≥65 years	2·37	4·36%	1·42%	11·9	29·5%	6·39%
	(0·774 to 5·54)	(1·42 to 10·2)	(-1·12 to 4·38)	(7·55 to 18·3)	(18·7 to 45·3)	(−2·19 to 15·5)
North Macedonia						
15–39 years	115	36·1%	-4·09%	251	76·7%	-0·507%
	(68·7 to 162)	(21·5 to 50·8)	(-12·4 to 5·66)	(212 to 272)	(64·8 to 83·3)	(-6·11 to 4·17)
40–64 years	45·2	14·0%	-1·37%	169	54·9%	0·976%
	(24·5 to 86·3)	(7·60 to 26·7)	(-7·27 to 4·30)	(131 to 218)	(42·6 to 70·7)	(-6·26 to 8·99)
≥65 years	3·54	2·37%	-0·276%	34·0	29·3%	-0·672%
	(0·728 to 10·2)	(0·487 to 6·81)	(-2·89 to 1·63)	(21·5 to 53·5)	(18·6 to 46·2)	(-7·80 to 6·31)
Poland						
15–39 years	3330	54·8%	4·15%	5150	81·8%	5·91%
	(2270 to 4340)	(37·4 to 71·6)	(-3·89 to 12·3)	(4460 to 5530)	(70·9 to 87·9)	(1·45 to 10·7)
40–64 years	1970	29·7%	8·70%	4060	63·0%	13·8%
	(1350 to 3060)	(20·3 to 46·1)	(3·00 to 14·8)	(3390 to 4900)	(52·5 to 76·0)	(5·48 to 22·4)
≥65 years	254	6·04%	3·32%	939	33·6%	11·8%
	(105 to 551)	(2·49 to 13·1)	(1·09 to 5·88)	(685 to 1360)	(24·5 to 48·7)	(5·68 to 16·7)
Romania						
15–39 years	1310	48·5%	2·36%	2290	80·2%	3·29%
	(862 to 1740)	(31·9 to 64·3)	(-5·77 to 11·3)	(2010 to 2460)	(70·4 to 85·9)	(−1·10 to 7·50)
40–64 years	921	26·9%	6·36%	2110	61·9%	11·0%
	(619 to 1420)	(18·0 to 41·6)	(-0·371 to 13·0)	(1750 to 2560)	(51·1 to 75·0)	(2·97 to 19·9)
≥65 years	141	6·32%	2·37%	519	34·4%	8·33%
	(54⋅9 to 300)	(2·46 to 13·4)	(-0·162 to 5·16)	(350 to 757)	(23·2 to 50·2)	(1·91 to 14·7)
Serbia						
15–39 years	285	21·2%	-1·90%	904	63·1%	2·53%
	(194 to 384)	(14·5 to 28·6)	(-8·11 to 4·37)	(792 to 980)	(55·3 to 68·4)	(-2·55 to 7·65)
40-64 years	186	12·6%	1·47%	763	53·6%	9·12%
	(125 to 277)	(8·46 to 18·8)	(-4·04 to 6·49)	(629 to 921)	(44·2 to 64·7)	(-0·412 to 21·3)
≥65 years	30·0	3·26%	1·18%	212	30·0%	6·74%
	(11·8 to 61·6)	(1·28 to 6·70)	(-1·52 to 3·55)	(151 to 297)	(21·4 to 42·1)	(-2·46 to 16·6)
Slovakia						
15–39 years	524	61·5%	-2·67%	724	80·9%	-0·197%
	(353 to 684)	(41·4 to 80·3)	(-10·5 to 6·55)	(625 to 781)	(69·8 to 87·2)	(-5·04 to 3·74)
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	Females			Males		
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)
(Continued from previous page	ge)					
40-64 years	309	32·1%	1·92%	600	62·8%	2·45%
	(209 to 483)	(21·7 to 50·1)	(-3·90 to 9·21)	(497 to 735)	(52·0 to 76·9)	(-3·26 to 9·04)
≥65 years	31·4	5·73%	0·852%	142	39·1%	0·980%
	(10·3 to 77·9)	(1·88 to 14·2)	(-2·00 to 3·55)	(101 to 204)	(27·7 to 56·1)	(-3·64 to 6·44)
Slovenia						
15–39 years	151	54·0%	-5·61%	234	77·4%	-3·83%
	(77·7 to 220)	(27·8 to 78·7)	(-17·7 to 8·13)	(180 to 265)	(59·7 to 87·8)	(-13·5 to 2·26)
40-64 years	68·3	18·6%	-5.52%	165	43·0%	-9·03%
	(23·4 to 145)	(6·37 to 39·6)	(-14·1 to 3·61)	(88.8 to 257)	(23·1 to 66·9)	(-20·6 to 1·11)
≥65 years	5·77	2·35%	-2·20%	34·3	18·8%	-11·3%
	(0·255 to 20·7)	(0·104 to 8·41)	(-7·29 to 0·192)	(8·90 to 71·5)	(4·88 to 39·2)	(-20·7 to -3·09)
Eastern Europe						
15-39 years 40-64 years	18 200 (12 300 to 22 700) 9930	54·7% (36·8 to 68·1) 25·6%	-5·33% (-16·7 to 4·98) 2·92%	25 000 (21 300 to 27 000) 17 000	73·5% (62·5 to 79·4) 51·3%	-2·15% (-8·36 to 2·10)
≥65 years	9930 (6560 to 15500) 408	(16·9 to 39·9) 1·87%	(-2·26 to 8·65) 0·237%	(13 200 to 22 100) 2210	(39·9 to 66·7) 19·7%	3·75% (-2·51 to 11·2) 1·09%
. 5 /	(127 to 1420)	(0.583 to 6.51)	(-0.514 to 1.32)	(1510 to 4190)	(13·4 to 37·3)	(-2·53 to 4·42)
Belarus						
15–39 years	907	61·8%	-2·17%	1200	78·8%	-0·148%
	(592 to 1130)	(40·3 to 77·2)	(-15·9 to 10·1)	(982 to 1300)	(64·5 to 85·4)	(-7·94 to 5·27)
40-64 years	556	30·9%	3.69%	825	53·4%	3·12%
	(359 to 853)	(19·9 to 47·4)	(-3.19 to 11.6)	(610 to 1100)	(39·5 to 71·2)	(-4·07 to 12·0)
≥65 years	32·2	3·27%	0·184%	107	21·8%	0·262%
	(10·6 to 105)	(1·07 to 10·7)	(-1·79 to 2·53)	(67·5 to 208)	(13·7 to 42·4)	(-5·63 to 5·59)
Estonia	427	74.204	4.000	475	0.4.00	0.7004
15-39 years 40-64 years	137 (97·8 to 163) 79·9	71·3% (50·9 to 84·5) 35·9%	-1·86% (-14·0 to 9·83) 11·9%	175 (152 to 187) 120	84·9% (73·5 to 90·3) 57·6%	0·709% (-5·10 to 5·39) 13·8%
≥65 years	79·9 (55·3 to 119) 4·77	(24·8 to 53·4) 2·74	(4·74 to 18·3) 1·68	(92·0 to 155) 19·0	(43·9 to 74·3) 20·6	(4·88 to 23·1) 9·21
20) years	(1·25 to 17·7)	(0.720 to 10.2)	(0·402 to 5·12)	(12·3 to 39·1)	(13·3 to 42·6)	(4·63 to 14·2)
Latvia						
15-39 years	179	66·8%	-4·22%	232	82·6%	0·817%
	(130 to 212)	(48·4 to 79·1)	(-15·4 to 7·48)	(205 to 245)	(73·0 to 87·1)	(-3·58 to 5·69)
40-64 years	122	35·5%	12·7%	187	61·4%	17·2%
	(85·0 to 175)	(24·6 to 50·8)	(6·14 to 18·5)	(151 to 232)	(49·7 to 76·2)	(6·96 to 27·6)
≥65 years	9·25	3·54%	2·51%	37·0	28·6%	14·3%
	(3·42 to 29·6)	(1·31 to 11·3)	(0·974 to 6·09)	(27·8 to 61·4)	(21·6 to 47·6)	(9·87 to 18·6)
Lithuania					-	
15–39 years	296	73.8%	-2·41%	359	85·3%	1·01%
	(201 to 355)	(50.0 to 88.4)	(-15·1 to 9·58)	(307 to 382)	(72·9 to 90·7)	(-4·81 to 5·79)
40-64 years	173	33·4%	8.67%	259	57·2%	11·2%
	(113 to 268)	(21·8 to 51·5)	(1.56 to 15.5)	(196 to 343)	(43·3 to 75·8)	(1·82 to 20·8)
≥65 years	12·3	3·35%	1·79%	40.9	21·8%	8·46%
	(3·87 to 44·5)	(1·05 to 12·1)	(0·415 to 4·74)	(26.9 to 82.4)	(14·3 to 43·8)	(4·09 to 13·0)
Moldova						
15–39 years	366	58·9%	-1·16%	526	80·8%	-0·983%
	(257 to 447)	(41·3 to 71·9)	(-13·8 to 9·36)	(447 to 565)	(68·7 to 86·8)	(-8·09 to 4·18)
40-64 years	211	31·1%	0·128%	334	55·7%	-0·201%
	(147 to 303)	(21·6 to 44·6)	(-7·71 to 7·63)	(255 to 438)	(42·6 to 73·1)	(-8·14 to 9·58)
≥65 years	13·0	3·91%	-1·29%	45·3	22·1%	-5·49%
	(4·50 to 40·4)	(1·35 to 12·1)	(-4·80 to 1·65)	(28·3 to 89·8)	(13·8 to 43·9)	(-13·4 to 2·44)
					(T.	able 1 continues on next page)

	Females M			Males		
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)
(Continued from previous pa	ge)					
Russia						
15–39 years	12 400	53·1%	-5·67%	17 100	71·6%	-2·71%
	(8350 to 15 600)	(35·7 to 66·8)	(-16·6 to 5·08)	(14 700 to 18 400)	(61·7 to 77·4)	(-8·47 to 2·07)
40–64 years	6720	25·0%	2·57%	11 900	52·0%	3·08%
	(4460 to 10 500)	(16·6 to 39·0)	(-3·44 to 8·74)	(9490 to 15 100)	(41·5 to 66·2)	(-3·45 to 10·7)
≥65 years	243	1·64%	0·263%	1550	20·5%	0·925%
	(57·8 to 875)	(0·390 to 5·91)	(-0·680 to 1·74)	(1050 to 2820)	(13·9 to 37·3)	(−3·79 to 5·54)
Ukraine						
15–39 years	3900	56·4%	-4·74%	5470	76·5%	-0·693%
	(2420 to 4980)	(35·0 to 71·9)	(-18·3 to 7·58)	(4350 to 6030)	(60·9 to 84·4)	(-8·78 to 4·87)
40–64 years	2070	24·5%	2·95%	3380	47·3%	4·14%
	(1280 to 3370)	(15·1 to 39·9)	(-3·55 to 9·68)	(2340 to 4790)	(32·8 to 67·0)	(-4·15 to 13·0)
≥65 years	92·6	1·89%	0·0302%	410	16·0%	-0·119%
	(24·6 to 320)	(0·501 to 6·53)	(−1·30 to 1·45)	(223 to 921)	(8·69 to 35·9)	(-5·36 to 5·13)
Australasia						
15-39 years	3910	77·7%	-4·37%	4210	83·2%	-2·38%
	(3290 to 4130)	(65·3 to 82·0)	(-12·8 to 1·58)	(3600 to 4400)	(71·1 to 86·9)	(-9·26 to 0·990)
40–64 years	2700	57·0%	4·33%	2830	62·3%	7·69%
	(1870 to 3650)	(39·5 to 77·2)	(-6·08 to 14·6)	(2140 to 3630)	(47·2 to 80·0)	(-1·03 to 15·4)
≥65 years	536	20·3%	10·5%	772	33.6%	8·12%
	(283 to 865)	(10·7 to 32·7)	(2·07 to 16·7)	(504 to 1230)	(21.9 to 53.4)	(0·525 to 15·0)
Australia						
15-39 years	3280	78·1%	–3·65%	3500	83.5%	-2·07%
	(2740 to 3490)	(65·3 to 83·2)	(−12·7 to 2·99)	(3000 to 3670)	(71.5 to 87.4)	(-9·33 to 1·66)
40-64 years	2230	56·7%	4.88%	2380	63.0%	8·04%
	(1530 to 3050)	(38·7 to 77·5)	(-6.07 to 15.6)	(1810 to 3050)	(47.9 to 80.7)	(-0·866 to 15·9)
≥65 years	439	19·7%	10·7%	656	34·0%	8·35%
	(226 to 726)	(10·2 to 32·6)	(2·85 to 17·2)	(431 to 1040)	(22·3 to 53·8)	(0·612 to 15·4)
New Zealand						
15-39 years	634	75·6%	-7·92%	709	81·7%	-3·88%
	(546 to 665)	(65·1 to 79·3)	(-14·7 to -2·74)	(605 to 742)	(69·8 to 85·5)	(-10·5 to -0·412)
40–64 years	463	58·2%	1·44%	446	58·7%	6·04%
	(348 to 607)	(43·6 to 76·2)	(-8·62 to 10·8)	(330 to 589)	(43·5 to 77·6)	(-3·22 to 13·7)
≥65 years	97·8	23·4%	9·97%	116	31·5%	6·85%
	(57·5 to 149)	(13·7 to 35·7)	(-0·197 to 17·0)	(72·2 to 189)	(19·7 to 51·5)	(-1·20 to 14·4)
High-income Asia Pacific				0		
15-39 years	12 800	51·3%	0·211%	17 800	66-9%	-3·96%
	(7820 to 15 200)	(31·4 to 61·1)	(-12·8 to 10·9)	(12 400 to 20 000)	(46-6 to 75-1)	(-19·1 to 4·23)
40-64 years	12 000	36·5%	-2·79%	17700	52·3%	-6·77%
	(9160 to 16 700)	(27·7 to 50·7)	(-8·44 to 3·88)	(14100 to 22600)	(41·8 to 66·9)	(-13·3 to -0·928)
≥65 years	3390	13·2%	-0·103%	6110	30·6%	-2·03%
	(2210 to 4870)	(8·61 to 19·0)	(-3·77 to 3·58)	(4340 to 8250)	(21·7 to 41·3)	(-7·53 to 3·57)
Brunei				0 - 0		
15-39 years	2·35	2·50%	-1·01%	6·36	5·78%	-4·43%
	(1·14 to 3·29)	(1·22 to 3·52)	(-2·44 to 0·248)	(2·75 to 8·58)	(2·50 to 7·79)	(-7·49 to -2·20)
40-64 years	1·02	1·68%	-1·04%	2·08	3·22%	-4·92%
	(0·395 to 1·66)	(0·655 to 2·76)	(-2·42 to 0·0405)	(0·331 to 3·84)	(0·511 to 5·94)	(-7·44 to -2·81)
≥65 years	0.0632	0·533%	-0·397%	0·135	1·23%	-2·31%
	(0.00798 to 0.119)	(0·0673 to 1·01)	(-1·01 to 0·158)	(0·00400 to 0·263)	(0·0364 to 2·40)	(-3·88 to -0·898)
lapan						. 0.6
15–39 years	9850	62·2%	1·84%	12 100	73·2%	-2·86%
	(5760 to 11 900)	(36·4 to 75·2)	(-16·3 to 15·2)	(7770 to 13 800)	(47·0 to 83·6)	(-21·8 to 6·97)
40-64 years	9370	43·9%	0·924%	12 000	55.6%	-5·46%
	(6930 to 13 400)	(32·5 to 62·9)	(-6·35 to 9·81)	(9070 to 16 000)	(42.1 to 74.3)	(-12·7 to 1·52)
≥65 years	2910	14·1%	0·197%	4920	30·7%	-2·14%
	(1820 to 4260)	(8·81 to 20·7)	(-3·97 to 4·47)	(3280 to 6840)	(20·5 to 42·7)	(-7·99 to 4·04)
					(Tal	ole 1 continues on next page

	Females			Males			
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	
(Continued from previo	ous page)						
South Korea							
15–39 years	2630	33·0%	-0.638%	5280	58·7%	-3·27%	
	(1860 to 3230)	(23·4 to 40·5)	(-9.15 to 8.51)	(4370 to 5810)	(48·5 to 64·5)	(-11·3 to 3·06)	
40–64 years	2520	23·7%	–1·21%	5460	49·4%	-3·98%	
	(2000 to 3230)	(18·8 to 30·4)	(–7·71 to 5·20)	(4810 to 6240)	(43·4 to 56·3)	(-9·71 to 1·87)	
≥65 years	469	10·1%	-0·0438%	1160	32·1%	-0·965%	
	(337 to 627)	(7·25 to 13·5)	(-3·93 to 3·88)	(960 to 1380)	(26·6 to 38·2)	(-7·45 to 5·41)	
Singapore							
15–39 years	286	28·8%	8·01%	435	42·4%	-1·38%	
	(126 to 384)	(12·8 to 38·8)	(-3·57 to 17·4)	(200 to 568)	(19·4 to 55·2)	(-18·8 to 8·97)	
40–64 years	157	15·3%	4·07%	260	23·0%	-1·70%	
	(98·3 to 262)	(9·61 to 25·6)	(-0·107 to 10·2)	(154 to 431)	(13·6 to 38·1)	(-8·43 to 4·16)	
≥65 years	10·9	2·85%	0·826%	27·7	8·08%	0·941%	
	(5·86 to 17·9)	(1·54 to 4·71)	(-0·460 to 2·36)	(14·2 to 44·3)	(4·13 to 12·9)	(-2·00 to 4·00)	
High-income North A							
15–39 years	32 200	53·0%	-7·72%	41 000	66·2%	-7·17%	
	(21 700 to 38 700)	(35·6 to 63·7)	(-14·1 to -1·78)	(34 300 to 44 300)	(55·4 to 71·5)	(-11·3 to -4·16)	
40–64 years	18 500	30·9%	2·00%	25 700	44·6%	5·93%	
	(13 500 to 26 000)	(22·5 to 43·4)	(-5·74 to 6·46)	(19 800 to 33 100)	(34·4 to 57·5)	(-1·10 to 11·0)	
≥65 years	4110	12·0%	6·43%	6120	22·0%	7·62%	
	(2270 to 7140)	(6·63 to 20·9)	(3·67 to 9·71)	(4050 to 9890)	(14·6 to 35·6)	(3·52 to 11·5)	
Canada							
15–39 years	3420	60·1	2·39	4340	75·1	1·33	
	(2170 to 4240)	(38·1 to 74·3)	(-7·63 to 12·5)	(3540 to 4710)	(61·4 to 81·6)	(-4·50 to 5·65)	
40–64 years	2060	32·8%	2·60%	2870	47·5%	7·20%	
	(1460 to 3010)	(23·3 to 47·8)	(-4·85 to 8·87)	(2170 to 3730)	(36·0 to 61·6)	(0·309 to 12·3)	
≥65 years	425	11·5%	5·77%	708	22·7%	7·51%	
	(209 to 780)	(5·67 to 21·2)	(2·53 to 9·72)	(453 to 1170)	(14·5 to 37·5)	(3·07 to 12·1)	
Greenland							
15-39 years	5·26	52·9%	-5·57%	7·13	67·8%	-3·25%	
	(3·31 to 6·50)	(33·3 to 65·4)	(-15·5 to 4·19)	(5·76 to 7·77)	(54·9 to 74·0)	(-9·06 to 1·69)	
40–64 years	2·40	27·9%	0·312%	4·41	43·3%	6·42%	
	(1·42 to 3·62)	(16·5 to 42·0)	(-11·2 to 11·3)	(2·86 to 5·87)	(28·0 to 57·6)	(-5·08 to 19·4)	
≥65 years	0·249	10·5%	6·04%	0.615	22·8%	10·4%	
	(0·0861 to 0·475)	(3·62 to 20·0)	(-0·0437 to 12·6)	(0.307 to 1.02)	(11·3 to 37·6)	(-1·09 to 21·3)	
USA							
15–39 years	28 800	52·2%	-8·78%	36 600	65·3%	-8·04%	
	(19 500 to 34 700)	(35·4 to 63·0)	(-14·9 to -2·88)	(30 600 to 39 600)	(54·6 to 70·5)	(-12·3 to -4·89)	
40–64 years	16 500	30·7%	1·93%	22 800	44·3%	5·78%	
	(12 000 to 23 000)	(22·4 to 43·0)	(-5·70 to 6·52)	(17 600 to 29 400)	(34·1 to 57·1)	(-1·65 to 11·1)	
≥65 years	3690	12·1%	6·51%	5420	21·9%	7·62%	
	(2040 to 6340)	(6·69 to 20·8)	(3·70 to 9·77)	(3570 to 8690)	(14·5 to 35·2)	(3·29 to 11·7)	
Southern Latin Ameri	ca						
15–39 years	7500	59·0%	4·31%	9690	76·7%	-0·186%	
	(5340 to 8610)	(42·0 to 67·8)	(-3·75 to 12·4)	(8560 to 10 200)	(67·7 to 80·5)	(-3·91 to 3·05)	
40–64 years	3200	32·6%	-1·25%	4790	52·3%	-3·31%	
	(2350 to 4670)	(24·0 to 47·6)	(-6·45 to 5·38)	(3790 to 6170)	(41·4 to 67·4)	(-7·73 to 1·70)	
≥65 years	556	12·2%	-0.0526%	979	29·1%	-3·24%	
	(322 to 863)	(7·05 to 18·9)	(-3.56 to 3.17)	(666 to 1360)	(19·8 to 40·6)	(-7·62 to 1·76)	
Argentina							
15–39 years	5290	60·5%	3·21%	6700	77·7%	-1·40%	
	(3750 to 6190)	(42·9 to 70·7)	(-6·09 to 12·6)	(5890 to 7060)	(68·4 to 81·9)	(-5·71 to 2·81)	
40-64 years	2050	32·3%	-3·06%	3070	51·6%	-6·09%	
	(1460 to 3060)	(23·0 to 48·2)	(-9·65 to 4·67)	(2400 to 3980)	(40·3 to 67·0)	(-11·3 to 0·455)	
					(Ta	able 1 continues on next pag	

	Females			Males		
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)
(Continued from previo	ous page)					
≥65 years	343	11·5%	-1·72%	603	27·8%	-6·87%
	(187 to 565)	(6·27 to 18·9)	(-5·99 to 2·50)	(397 to 856)	(18·3 to 39·5)	(-12·1 to −1·57)
Chile						
15–39 years	1950	57·9%	5·69%	2600	76·0%	1.58%
	(1370 to 2280)	(40·7 to 67·8)	(-3·64 to 15·6)	(2310 to 2740)	(67·5 to 80·1)	(-3.14 to 6.33)
40–64 years	1000	34·3%	2·19%	1490	54·8%	2·21%
	(752 to 1410)	(25·7 to 48·1)	(-4·80 to 8·83)	(1210 to 1860)	(44·5 to 68·5)	(-2·46 to 7·34)
≥65 years	178	14·1%	3·83%	318	32·5%	4·90%
	(106 to 268)	(8·38 to 21·2)	(-0·526 to 7·63)	(223 to 431)	(22·8 to 44·2)	(-0·805 to 10·6)
Uruguay						
15–39 years	264	43·6%	4·20%	395	66·2%	0·745%
	(189 to 314)	(31·2 to 51·9)	(-5·20 to 13·5)	(345 to 423)	(57·9 to 71·0)	(−4·29 to 5·94)
40–64 years	146	27·5%	1·67%	231	47·8%	1·51%
	(107 to 214)	(20·1 to 40·4)	(-4·43 to 8·32)	(183 to 294)	(37·9 to 60·9)	(−3·45 to 7·00)
≥65 years	34·6	11·1%	2·03%	57·9	27·4%	1·88%
	(19·3 to 55·4)	(6·16 to 17·7)	(-2·02 to 5·89)	(39·5 to 80·4)	(18·7 to 38·1)	(-3·43 to 7·51)
Western Europe						
15–39 years	41 000	64·3%	-4·40%	52 600	79·3%	-3·15%
	(28 300 to 47 000)	(44·3 to 73·6)	(-15·8 to 3·08)	(44 500 to 56 000)	(67·1 to 84·5)	(-9·01 to -0·0908)
40–64 years	36 000	48·0%	–1·03%	45 300	61·4%	-0·157%
	(26 600 to 50 900)	(35·4 to 67·8)	(–7·36 to 5·93)	(36 700 to 57 300)	(49·7 to 77·6)	(-4·75 to 4·95)
≥65 years	9340	18·9%	4·92%	14300	36·5%	2·80%
	(6000 to 13 900)	(12·1 to 28·1)	(0·0743 to 8·75)	(10200 to 20700)	(25·9 to 52·7)	(-1·86 to 6·59)
Andorra						
15–39 years	8·28	66·9%	–5·56%	10·5	80·5%	-3·86%
	(5·59 to 9·89)	(45·1 to 79·8)	(−19·7 to 4·71)	(8·71 to 11·4)	(66·6 to 87·4)	(-10·3 to 0·358)
40–64 years	8·56	50·5%	-1·18%	11·4	61·5%	-0·478%
	(6·04 to 12·2)	(35·7 to 72·1)	(-10·6 to 8·82)	(9·00 to 14·6)	(48·7 to 78·9)	(-7·38 to 6·96)
≥65 years	1·26	19·3%	4·90%	2·28	35.6%	2·85%
	(0·751 to 1·94)	(11·5 to 29·7)	(−2·99 to 11·6)	(1·53 to 3·42)	(23.8 to 53.3)	(-5·91 to 11·8)
Austria						
15–39 years	874	63·8%	-6·59%	1160	79·9%	-3·48%
	(612 to 1030)	(44·6 to 75·3)	(-18·1 to 3·50)	(982 to 1250)	(67·7 to 85·9)	(-9·90 to 0·603)
40–64 years	774	49·1%	-1·47%	959	61·4%	-0·293%
	(567 to 1070)	(35·9 to 68·1)	(-9·42 to 7·35)	(780 to 1200)	(50·0 to 76·7)	(-5·47 to 5·32)
≥65 years	187	19·5%	3·68%	259	35·3%	2·06%
	(116 to 275)	(12·1 to 28·7)	(-2·40 to 8·83)	(179 to 378)	(24·5 to 51·5)	(-3·46 to 7·57)
Belgium						
15–39 years	1160	66·8%	-3·76%	1400	79·1%	-2·61%
	(810 to 1370)	(46·5 to 78·5)	(-16·0 to 5·81)	(1190 to 1500)	(67·7 to 85·0)	(-8·21 to 1·53)
40–64 years	966	50·9%	0·230%	1160	60·6%	-0·459%
	(700 to 1380)	(36·9 to 72·9)	(−8·05 to 10·0)	(923 to 1470)	(48·3 to 76·8)	(-5·74 to 5·14)
≥65 years	247	20·1%	5·15%	336	34·5%	1·25%
	(146 to 381)	(11·9 to 30·9)	(-0·207 to 10·8)	(222 to 503)	(22·9 to 51·7)	(-4·32 to 6·50)
Cyprus						
15–39 years	136	54·8%	-6·12%	212	83·1%	-0·761%
	(84·0 to 171)	(33·9 to 68·8)	(-19·5 to 5·30)	(172 to 230)	(67·4 to 90·1)	(-8·12 to 3·36)
40–64 years	81·6	36·1%	0·596%	124	61·1%	3·41%
	(49·8 to 126)	(22·1 to 55·8)	(−8·51 to 10·1)	(96·9 to 162)	(47·8 to 79·8)	(-2·93 to 9·34)
≥65 years	11·3	11·2%	4·60%	30·1	33·0%	7·14%
	(5·66 to 18·4)	(5·60 to 18·2)	(0·0601 to 8·89)	(19·6 to 44·6)	(21·5 to 48·9)	(0·266 to 13·0)
Denmark						
15–39 years	666	75·1%	-3·91%	790	85·2%	-2·19%
	(439 to 779)	(49·5 to 87·9)	(-18·5 to 6·36)	(645 to 852)	(69·6 to 91·9)	(-9·90 to 1·69)
						able 1 continues on next pag

	Females	Females				
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)
(Continued from previo	ous page)					
40-64 years	525	55·4%	-2·26%	564	59·3%	-1·42%
	(358 to 775)	(37·8 to 81·9)	(-10·8 to 8·23)	(417 to 774)	(43·9 to 81·3)	(-7·31 to 5·42)
≥65 years	144	23·0%	6.78%	180	33·8%	2·35%
	(83·8 to 230)	(13·4 to 36·7)	(-0.0593 to 13.2)	(110 to 292)	(20·7 to 54·9)	(-3·87 to 8·27)
Finland						
15–39 years	572	70·6%	-4·73%	683	79·6%	-3·33%
	(379 to 676)	(46·8 to 83·4)	(-18·5 to 5·81)	(562 to 741)	(65·4 to 86·2)	(-9·16 to 0·782)
40-64 years	442	51·1%	1·40%	514	58·7%	3·64%
	(307 to 658)	(35·6 to 76·1)	(–7·09 to 10·2)	(398 to 680)	(45·5 to 77·7)	(-2·83 to 9·90)
≥65 years	112	15·9%	7·64%	155	27·8%	7·77%
	(59·6 to 184)	(8·42 to 26·0)	(2·59 to 12·6)	(91·0 to 250)	(16·3 to 44·8)	(1·20 to 13·5)
France						
15–39 years 40–64 years	6510 (4450 to 7700) 5420	65·4% (44·8 to 77·4) 50·2%	-5·31% (-17·1 to 4·05) -1·65%%	8040 (6870 to 8590) 6640	81·0% (69·2 to 86·5) 64·0%	-3·18% (-8·52 to 0·837) -0·712%
≥65 years	(3890 to 7720)	(36·0 to 71·5)	(-9·67 to 7·07)	(5410 to 8370)	(52·1 to 80·7)	(-5·72 to 4·54)
	1500	19·5%	4·73%	2430	41·4%	1·29%
	(897 to 2270)	(11·7 to 29·6)	(-1·33 to 10·0)	(1740 to 3470)	(29·6 to 59·0)	(-4·39 to 6·92)
Germany						
15–39 years	8470	70·8%	-5·45%	11100	83.6%	-2·97%
	(6000 to 9820)	(50·2 to 82·1)	(-17·4 to 3·86)	(9550 to 11700)	(72.2 to 88.8)	(-8·45 to 0·596)
40–64 years	8080	54·9%	-1·41%	9900	66·7%	-0.556%
	(6090 to 10 900)	(41·4 to 74·1)	(-8·98 to 6·50)	(8350 to 11 900)	(56·2 to 80·1)	(-5.44 to 4.74)
≥65 years	2440	23·8%	5·24%	3450	42·7%	1·53%
	(1620 to 3580)	(15·7 to 34·9)	(-1·12 to 11·0)	(2550 to 4700)	(31·6 to 58·3)	(-3·99 to 7·04)
Greece 15–39 years	999	67.0%	-4.87%	1240	81-1%	-3·18%
40–64 years	(629 to 1210)	(42·2 to 81·1)	(-19·6 to 6·49)	(1020 to 1350)	(66·6 to 88·2)	(-11·3 to 1·61)
	778	40·6%	0·187%	1070	58·3%	-0·685%
≥65 years	(481 to 1240)	(25·1 to 64·5)	(-8·23 to 10·6)	(815 to 1410)	(44·6 to 77·0)	(-7·00 to 5·94)
	123	9·64%	2·13%	304	29·5%	-0·997%
203 years	(56·6 to 220)	(4·44 to 17·3)	(-2·39 to 5·91)	(189 to 482)	(18·3 to 46·7)	(-6·15 to 4·53)
Iceland						
15–39 years	38·5	66·5%	-4·38%	48·0	77·3%	0·215%
	(24·4 to 46·1)	(42·1 to 79·6)	(-18·6 to 9·44)	(38·6 to 52·4)	(62·1 to 84·3)	(-5·41 to 7·05)
40–64 years	26·0	49·1%	9·38%	30·5	56.6%	18·1%
	(17·6 to 38·9)	(33·3 to 73·4)	(-1·35 to 18·2)	(22·8 to 41·0)	(42⋅3 to 76⋅1)	(7·34 to 26·0)
≥65 years	4·74	16·9%	12·9%	7·36	29·4%	20·3%
	(2·60 to 7·45)	(9·27 to 26·6)	(7·91 to 18·2)	(4·45 to 11·7)	(17·8 to 46·6)	(13·7 to 26·5)
Ireland		C2 =		6.0	-0	0
15–39 years	556	69·5%	-4·42%	618	78·7%	-2·38%
	(407 to 641)	(50·9 to 80·1)	(-15·9 to 4·48)	(528 to 665)	(67·2 to 84·7)	(-7·90 to 1·91)
40-64 years	412	50·8%	1·93%	459	58·0%	3·38%
	(302 to 561)	(37·2 to 69·3)	(−5·99 to 10·0)	(366 to 588)	(46·3 to 74·4)	(-2·10 to 9·41)
≥65 years	66·9	17·4%	7·05%	103	30·1%	6·45%
	(39·9 to 101)	(10·3 to 26·3)	(1·87 to 12·0)	(68·0 to 154)	(19·8 to 45·0)	(1·00 to 11·3)
Israel						
15–39 years	827	51·0%	-1·73%	1150	68·8%	1·43%
	(404 to 1060)	(24·9 to 65·6)	(-16·6 to 11·7)	(810 to 1320)	(48·6 to 79·1)	(-6·94 to 9·51)
40-64 years	378	31·0%	7·49%	407	34·4%	14·7%
	(182 to 679)	(15·0 to 55·7)	(-1·90 to 18·2)	(227 to 725)	(19·2 to 61·3)	(6·89 to 23·2)
≥65 years	35·2	5·52%	4·64%	50·2	9·61%	7·91%
	(12·6 to 68·8)	(1·98 to 10·8)	(1·84 to 8·15)	(16·4 to 116)	(3·15 to 22·2)	(2·95 to 14·6)
					(T	able 1 continues on next page)

	Females			Males		
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)
(Continued from previo	ous page)					
Italy						
15–39 years	4010	51·6%	-2·55%	5990	73·5%	-4·77%
	(2520 to 4820)	(32·4 to 61·9)	(-14·0 to 6·32)	(4880 to 6510)	(59·9 to 79·8)	(-12·7 to -0·0258)
40–64 years	4550	39·9%	-4·63%	6520	59·2%	-3·83%
	(3350 to 6300)	(29·3 to 55·2)	(-11·2 to 2·23)	(5140 to 8430)	(46·6 to 76·5)	(-9·27 to 2·47)
≥65 years	1420	18·1%	0·235%	2210	36·5%	-3·30%
	(937 to 2010)	(11·9 to 25·6)	(-5·15 to 5·33)	(1510 to 3190)	(24·9 to 52·6)	(-9·25 to 2·95)
Luxembourg						
15-39 years	71·7	67·1%	-5·55%	89·3	80·8%	-3·23%
	(47·8 to 85·6)	(44·8 to 80·2)	(-18·7 to 4·32)	(75·2 to 96·3)	(68·1 to 87·2)	(-9·49 to 0·854)
40–64 years	55·8	51·9%	-0·380%	71·9	63·4%	-0·448%
	(39·9 to 79·9)	(37·1 to 74·2)	(-9·38 to 8·85)	(58·2 to 90·2)	(51·3 to 79·5)	(-5·54 to 5·81)
≥65 years	9·99	19·7%	5·61%	17·4	41·5%	1·78%
	(5·74 to 15·9)	(11·3 to 31·4)	(-0·641 to 11·0)	(12·4 to 24·4)	(29·6 to 58·1)	(-3·66 to 7·50)
Malta						
15–39 years	40·4	61·3%	-3·90%	55·1	78·7%	-0·0659%
	(24·6 to 49·8)	(37·3 to 75·6)	(-16·9 to 7·94)	(44·5 to 60·2)	(63·6 to 85·9)	(-6·20 to 4·71)
40–64 years	25·0	35·1%	1·21%	38·4	52·6%	6·32%
	(15·7 to 39·0)	(22·1 to 54·8)	(-7·32 to 8·80)	(29·0 to 51·6)	(39·8 to 70·7)	(-1·17 to 12·9)
≥65 years	5·58	10·9%	6·09%	11·4	26·7%	10·8%
	(2·92 to 9·10)	(5·67 to 17·7)	(2·27 to 10·1)	(7·08 to 17·7)	(16·6 to 41·6)	(5·11 to 16·0)
Monaco						
15–39 years	2·99	64·0%	-4·16%	3·55	76·4%	-2·14%
	(1·38 to 3·70)	(29·5 to 79·2)	(-29·5 to 18·9)	(2·38 to 3·98)	(51·1 to 85·6)	(-19·9 to 12·9)
40–64 years	2·82	40·0%	2·47%	3·18	46·1%	5·93%
	(0·286 to 4·87)	(4·07 to 69·1)	(-35·7 to 37·2)	(0·352 to 5·16)	(5·12 to 74·9)	(-41·0 to 51·4)
≥65 years	0.665	12·6%	6·49%	0.966	22·1%	7·69%
	(0.00200 to 1.57)	(0·0381 to 29·8)	(-12·3 to 25·2)	(0.00598 to 2.14)	(0·137 to 48·8)	(-24·7 to 36·5)
Netherlands						
15–39 years	1660	63·8%	-2·73%	2100	78·4%	-2·34%
	(1110 to 1970)	(42·7 to 75·8)	(-16·0 to 7·70)	(1700 to 2280)	(63·6 to 85·1)	(-9·19 to 2·30)
40–64 years	1430	49·1%	-0·456%	1680	57·9%	1·13%
	(1010 to 2070)	(34·9 to 71·0)	(-8·76 to 8·35)	(1270 to 2240)	(43·9 to 77·2)	(-4·48 to 7·01)
≥65 years	397	21·8%	7·76%	529	33.8%	5·51%
	(246 to 598)	(13·5 to 32·8)	(1·90 to 13·2)	(341 to 820)	(21.8 to 52.3)	(-0·705 to 11·1)
Norway						
15-39 years	599	69·8%	–2·79%	730	80·2%	-0·420%
	(392 to 706)	(45·6 to 82·2)	(–17·1 to 7·98)	(583 to 796)	(64·0 to 87·4)	(-6·68 to 4·68)
40–64 years	431	50·8%	7·08%	478	53·7%	11·3%
	(287 to 658)	(33·9 to 77·6)	(-1·82 to 16·2)	(343 to 673)	(38·5 to 75·6)	(2·41 to 18·4)
≥65 years	86·6	17·1%	11·8%	111	25·2%	14·2%
	(45·2 to 144)	(8·91 to 28·5)	(6·77 to 16·9)	(59·5 to 194)	(13·6 to 44·2)	(8·74 to 19·8)
Portugal						
15–39 years	719	47·8%	-0·371%	1110	74·7%	-0·460%
	(490 to 888)	(32·6 to 59·0)	(-11·2 to 9·71)	(966 to 1200)	(64·7 to 80·2)	(-6·71 to 4·36)
40-64 years	743	36·6%	1·14%	1180	63·9%	0.890%
	(542 to 1040)	(26·7 to 51·0)	(-6·41 to 9·92)	(998 to 1410)	(54·2 to 76·7)	(-3.90 to 6.00)
≥65 years	181	13·2%	2·93%	402	39·7%	1·23%
	(112 to 263)	(8·22 to 19·2)	(–1·95 to 7·36)	(298 to 544)	(29·4 to 53·7)	(-3·96 to 6·26)
San Marino						
15–39 years	3·01	65·7%	-4·69%	3·54	79·1%	-2·37%
	(1·37 to 3·63)	(30·0 to 79·3)	(-32·1 to 15·3)	(2·42 to 3·87)	(54·1 to 86·5)	(-19·4 to 13·2)
40–64 years	3·11	47·1%	2·58%	3·32	56·2%	4·11%
	(0·0910 to 4·70)	(1·38 to 71·1)	(-38·5 to 40·9)	(0·0440 to 4·65)	(0·745 to 78·9)	(-49·1 to 58·0)
					(Ta	ble 1 continues on next pag

	Females			Males			
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	
(Continued from prev	ious page)						
≥65 years	0·658	18·0%	6·68%	1·03	33⋅0%	7·12%	
	(0 to 1·20)	(0 to 32·8)	(-13·5 to 23·5)	(0 to 1·75)	(0 to 56⋅2)	(-28·6 to 40·5)	
Spain							
15–39 years	3620	57·6%	-2·29%	4850	75·8%	-1·66%	
	(2550 to 4330)	(40·7 to 69·0)	(-13·6 to 8·29)	(4100 to 5260)	(64·1 to 82·1)	(-8·34 to 3·39)	
40-64 years	3540	40·6%	0·135%	5170	59·7%	0·144%	
	(2600 to 4870)	(29·8 to 55·9)	(-7·78 to 8·23)	(4190 to 6510)	(48·5 to 75·2)	(-5·16 to 5·98)	
≥65 years	647	12·5%	2·03%	1190	30·3%	-0·548%	
	(393 to 956)	(7·62 to 18·5)	(-2·81 to 5·85)	(805 to 1730)	(20·5 to 44·2)	(-5·79 to 4·42)	
Sweden							
15–39 years	1090	70·1%	-2·94%	1350	81·2%	-1·16%	
	(710 to 1280)	(45·7 to 82·5)	(-17·3 to 6·88)	(1080 to 1470)	(65·3 to 88·5)	(-8·29 to 3·22)	
40-64 years	857	54·9%	2·28%	920	57·4%	4·49%	
	(599 to 1250)	(38·4 to 79·9)	(-5·77 to 11·2)	(692 to 1260)	(43·2 to 78·7)	(-2·22 to 10·9)	
≥65 years	230	20·5%	9·85%	270	27·4%	8·36%	
	(134 to 361)	(11·9 to 32·1)	(5·09 to 15·0)	(158 to 457)	(16·1 to 46·5)	(2·81 to 13·9)	
Switzerland	0.5						
15-39 years	898	66·4%	-6·21%	1140	80·2%	-4·06%	
	(578 to 1080)	(42·7 to 80·0)	(-20·4 to 4·45)	(928 to 1240)	(65·2 to 87·2)	(-12·0 to 0·526)	
40-64 years	763	50·1%	-2·69%	938	60·3%	-2·80%	
	(536 to 1120)	(35·2 to 73·2)	(-10·8 to 6·12)	(734 to 1230)	(47·1 to 79·1)	(-8·28 to 3·15)	
≥65 years	179	19·5%	4·67%	258	34·5%	-0·0187%	
	(102 to 292)	(11·1 to 31·8)	(-1·63 to 10·5)	(162 to 397)	(21·7 to 53·1)	(-5·61 to 5·10)	
UK							
15–39 years	7460	69·5%	-8·82%	8710	79·8%	-4·80%	
	(5310 to 8550)	(49·5 to 79·7)	(−20·7 to 0·746)	(7420 to 9320)	(68·0 to 85·4)	(-9·99 to -1·24)	
40-64 years	5700	52·9%	3·24%	6470	61·5%	4·11%	
	(4150 to 8070)	(38·5 to 75·0)	(-4·76 to 11·0)	(5220 to 8210)	(49·6 to 78·0)	(-2·38 to 10·5)	
≥65 years	1300	19·5%	11·4%	2000	35.6%	10·9%	
	(738 to 2040)	(11·1 to 30·6)	(6·19 to 16·5)	(1320 to 3010)	(23.4 to 53.6)	(4·18 to 16·2)	
Andean Latin Americ			C = = :	0	60.50	. =0	
15–39 years	4470	34·4%	6·25%	8990	68-9%	4·58%	
	(2630 to 6290)	(20·2 to 48·3)	(-4·55 to 35·1)	(7150 to 9590)	(54-8 to 73-4)	(-1·39 to 23·9)	
40–64 years	1290	16·3%	1.04%	3810	50·4%	2·22%	
	(775 to 2050)	(9·83 to 26·0)	(-6.34 to 11.4)	(3000 to 4880)	(39·6 to 64·5)	(-5·22 to 19·7)	
≥65 years	101	3·94%	0·521%	507	21·7%	1·85%	
	(44·3 to 184)	(1·72 to 7·14)	(-2·51 to 2·93)	(343 to 682)	(14·7 to 29·2)	(-4·74 to 10·2)	
Bolivia	880	26.40/	7 300/	1670	68-3%	F 030/	
15–39 years	(477 to 1330)	36·4% (19·7 to 54·8)	7·20% (-5·61 to 38·1)	(1270 to 1820)	(51·7 to 74·4)	5.02% (-3.00 to 25.7)	
40-64 years	219	16·8%	0·348%	641	50·2%	0.532%	
	(124 to 378)	(9·45 to 28·9)	(-7·54 to 11·8)	(472 to 864)	(36·9 to 67·6)	(-7.86 to 19.0)	
≥65 years	16·0	3·97%	0·475%	85·3	24·3%	1·27%	
	(5·78 to 32·7)	(1·44 to 8·13)	(−2·76 to 3·46)	(52·1 to 122)	(14·8 to 34·8)	(-7·05 to 11·2)	
Ecuador 15, 20 years	F00	16 70/	4.400/	2040	F7 30/	F F #0/	
15–39 years	598	16·7%	4·40%	2040	57·3%	5·54%	
	(349 to 863)	(9·74 to 24·1)	(-2·05 to 16·7)	(1630 to 2250)	(45·7 to 63·1)	(-1·59 to 21·4)	
40–64 years	145	6.82%	1·35%	820	40·6%	3·94%	
	(87·4 to 236)	(4.11 to 11.1)	(-1·98 to 5·55)	(641 to 1060)	(31·8 to 52·6)	(-3·10 to 18·1)	
≥65 years	7·20	1·02%	0·435%	87·6	13·8%	3·34%	
	(3·22 to 13·6)	(0·455 to 1·92)	(-0·199 to 1·15)	(58·5 to 119)	(9·23 to 18·7)	(–1·40 to 8·79)	
Peru							
15–39 years	2990	42·7%	7·52%	5280	75·0%	4·55%	
	(1770 to 4200)	(25·3 to 59·9)	(-6·70 to 42·9)	(4220 to 5620)	(60·0 to 79·9)	(-2·32 to 23·7)	
40-64 years	922	20·7%	1·39%	2350	55·0%	2·20%	
	(549 to 1440)	(12·3 to 32·4)	(-8·86 to 14·2)	(1820 to 2980)	(42·6 to 69·7)	(-6·80 to 20·3)	
					(Ta	able 1 continues on next page	

	Females			Males			
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	
(Continued from previous	page)						
≥65 years	78·1	5·34%	0·708%	334	24·8%	1·40%	
	(32·4 to 145)	(2·21 to 9·92)	(-3·92 to 4·32)	(223 to 448)	(16·6 to 33·3)	(-7·37 to 11·7)	
Caribbean							
15–39 years	2420	26·5%	-3·25%	5990	66·1%	0.677%	
	(1480 to 3350)	(16·2 to 36·7)	(-8·37 to 1·90)	(4910 to 6440)	(54·3 to 71·2)	(-3.93 to 4.05)	
40–64 years	509	7·73%	0·282%	2240	35·7%	1·42%	
	(292 to 777)	(4·43 to 11·8)	(-1·33 to 1·78)	(1680 to 2930)	(26·8 to 46·7)	(-1·91 to 4·58)	
≥65 years	31·5	1·25%	0·361%	294	13·8%	2·66%	
	(11·7 to 71·9)	(0·466 to 2·85)	(0·0367 to 0·773)	(182 to 470)	(8·55 to 22·1)	(0·448 to 4·54)	
Antigua and Barbuda							
15–39 years	4·84	27·8%	1.74%	11·3	66·4%	6·43%	
	(2·91 to 7·26)	(16·7 to 41·6)	(-6.63 to 10.6)	(9·31 to 12·4)	(54·5 to 72·6)	(0·222 to 13·6)	
40–64 years	1·31	8·63%	5·01%	5·16	37·4%	16·3%	
	(0·708 to 2·12)	(4·68 to 14·0)	(1·98 to 8·28)	(3·94 to 6·63)	(28·6 to 48·1)	(8·32 to 23·7)	
≥65 years	0·0679	1·45%	1·23%	0·644	15·8%	11·8%	
	(0·0190 to 0·170)	(0·406 to 3·63)	(0·342 to 2·84)	(0·387 to 1·01)	(9·48 to 24·7)	(7·82 to 16·4)	
The Bahamas							
15–39 years	20·8	26·5%	-7·55%	48·5	64·7%	-4·27%	
	(10·5 to 31·8)	(13·4 to 40·5)	(-16·0 to 1·74)	(38·9 to 53·7)	(51·9 to 71·7)	(-11·5 to 1·66)	
40–64 years	4·44	7·11%	-5·09%	18·9	33·3%	-11·8%	
	(1·40 to 8·85)	(2·25 to 14·2)	(-9·51 to -0·874)	(11·6 to 26·2)	(20·5 to 46·3)	(-19·2 to -5·39)	
≥65 years	0·192	1·10%	-0·967%	1·71	12·7%	-7·42%	
	(0·0200 to 0·602)	(0·115 to 3·47)	(-2·44 to 0·0998)	(0·652 to 3·08)	(4·85 to 22·9)	(-13·0 to -2·74)	
Barbados					Ca	C	
15–39 years	16·1	32·2%	1·27%	30·4	62·1%	2·56%	
	(11·1 to 21·0)	(22·1 to 42·0)	(-6·35 to 8·66)	(27·0 to 32·8)	(55·2 to 67·0)	(-2·83 to 7·97)	
40–64 years	6.81	12·5%	2·50%	19·5	39·7%	4·77%	
	(4.67 to 9.56)	(8·54 to 17·5)	(-0·834 to 5·94)	(16·3 to 22·8)	(33·1 to 46·5)	(-0·186 to 9·40)	
≥65 years	0.770	2·94%	1·44%	4·24	20·2%	7·09%	
	(0.382 to 1.42)	(1·46 to 5·40)	(0·421 to 2·80)	(3·09 to 5·67)	(14·7 to 27·0)	(3·12 to 10·7)	
Belize		_					
15–39 years	23·1	24·6%	2·25%	53·9	59·5%	2·76%	
	(14·4 to 32·5)	(15·3 to 34·6)	(-4·59 to 9·84)	(44·3 to 58·9)	(48·8 to 64·9)	(-3·71 to 8·14)	
40-64 years	3.64	7·87%	0·894%	16·1	35·7%	0.832%	
	(2.06 to 5.62)	(4·46 to 12·2)	(-1·73 to 3·52)	(12·5 to 20·5)	(27·6 to 45·4)	(-3.91 to 5.48)	
≥65 years	0.0957	0·918%	0·166%	1·43	12·9%	0·726%	
	(0.0310 to 0.220)	(0·297 to 2·11)	(-0·499 to 0·897)	(0·889 to 2·21)	(8·06 to 20·0)	(-2·93 to 3·90)	
Bermuda 15. 20	262	40.90/	4.920/	740	94.20	1.000	
15–39 years	3.69	40·8%	-4·82%	7·13	81·3%	-1.06%	
	(2.29 to 5.27)	(25·3 to 58·2)	(-14·0 to 4·61)	(6·18 to 7·67)	(70·5 to 87·4)	(-6.70 to 2.96)	
40-64 years	1.88	15·1%	-3·33%	6·12	50·1%	-5·34%	
	(1.03 to 2.93)	(8·31 to 23·6)	(-8·52 to 1·79)	(4·77 to 7·59)	(39·1 to 62·1)	(-10·9 to 0·0248)	
≥65 years	0·226	3·11%	-0·507%	1·30	24·0%	-2·87%	
	(0·0700 to 0·501)	(0·966 to 6·91)	(-2·76 to 1·60)	(0·845 to 1·90)	(15·5 to 34·9)	(-8·59 to 2·75)	
Cuba							
15–39 years	475	27·1%	-3·32%	1220	65·9%	1·12%	
	(277 to 704)	(15·8 to 40·2)	(-12·0 to 5·07)	(997 to 1350)	(53·7 to 72·5)	(-4·95 to 6·88)	
40–64 years	160	7·52%	0·618%	713	34·9%	2·73%	
	(83·2 to 259)	(3·92 to 12·2)	(-2·23 to 3·17)	(528 to 943)	(25·8 to 46·1)	(-2·38 to 7·07)	
≥65 years	11·6	1·22%	0·492%	111	13·7%	4·06%	
	(3·51 to 28·4)	(0·367 to 2·98)	(-0·0380 to 1·26)	(67·5 to 177)	(8·35 to 21·9)	(1·02 to 7·12)	
Dominica							
15–39 years	3·76	30·0	-5·14	9·11	69∙0	-0.620	
	(2·22 to 5·51)	(17·7 to 44·0)	(-13·8 to 3·57)	(7·49 to 9·92)	(56∙7 to 75∙1)	(-7.20 to 4.66)	
					(Ta	able 1 continues on next page	

	Females			Males			
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	
(Continued from previous p	page)						
40–64 years	0·919	9·51%	-1·26%	4·09	38·5%	-3·52%	
	(0·462 to 1·51)	(4·78 to 15·6)	(-5·20 to 2·59)	(3·02 to 5·32)	(28·4 to 50·1)	(-8·66 to 2·13)	
≥65 years	0·0736	1·63%	-0·00157%	0.624	16·8%	0·258%	
	(0·0200 to 0·187)	(0·444 to 4·16)	(-1·25 to 1·14)	(0.364 to 0.988)	(9·80 to 26·6)	(−4·24 to 5·00)	
Dominican Republic							
15–39 years	752	33·6%	–5·14%	1580	68⋅8%	-2·83%	
	(486 to 1000)	(21·7 to 44·8)	(–13·0 to 2·45)	(1280 to 1730)	(56⋅0 to 75⋅4)	(-8·68 to 2·24)	
40–64 years	131	9·98%	0·130%	469	35·5%	0·870%	
	(77⋅8 to 199)	(5·93 to 15·2)	(−3·04 to 3·16)	(336 to 639)	(25·4 to 48·3)	(−3·99 to 5·83)	
≥65 years	6·30	1·49%	0·438%	42·6	11·4%	2·13%	
	(2·19 to 14·3)	(0·518 to 3·38)	(-0·333 to 1·30)	(21·9 to 77·1)	(5·85 to 20·6)	(-1·09 to 5·23)	
Grenada							
15–39 years	4·75	24·4%	-2·27%	11·2	53.0%	-0·297%	
	(3·34 to 6·35)	(17·2 to 32·7)	(-9·21 to 4·94)	(9·93 to 12·2)	(46.8 to 57.5)	(-5·72 to 5·31)	
40-64 years	1·38	9·24%	1.26%	5·29	33·0%	2·70%	
	(0·919 to 1·94)	(6·13 to 13·0)	(-1.78 to 4.31)	(4·48 to 6·16)	(28·0 to 38·5)	(-2·00 to 6·94)	
≥65 years	0·143	2·81%	1·14%	0·822	20·0%	5.63%	
	(0·0681 to 0·260)	(1·34 to 5·11)	(-0·0665 to 2·58)	(0·617 to 1·07)	(15·0 to 26·0)	(1.36 to 9.57)	
Guyana		_					
15–39 years	38·8	25·6%	-3·72%	104	71·5%	-1·73%	
	(20·7 to 58·0)	(13·6 to 38·2)	(-11·4 to 5·77)	(87·4 to 112)	(60·0 to 76·9)	(-8·59 to 3·14)	
40–64 years	5·97	6·17%	-3·55%	36·7	39.8%	-9·77%	
	(2·75 to 10·3)	(2·84 to 10·6)	(-7·02 to -0·676)	(27·7 to 47·3)	(30.1 to 51.3)	(-14·0 to -5·51)	
≥65 years	0·258	0·963%	-0·585%	3·26	14·8%	-5·74%	
	(0·0610 to 0·687)	(0·227 to 2·56)	(-1·81 to 0·187)	(1·80 to 5·54)	(8·18 to 25·1)	(-9·83 to -1·80)	
Haiti							
15–39 years	567	20·1%	1·78%	1710	65·6%	4·43%	
	(335 to 808)	(11·9 to 28·6)	(-4·61 to 8·33)	(1410 to 1860)	(54·2 to 71·4)	(-1·64 to 9·95)	
40–64 years	79·9	6·27%	0·316%	450	39·5%	2·44%	
	(43·2 to 127)	(3·39 to 9·95)	(−1·98 to 2·67)	(347 to 578)	(30·5 to 50·8)	(-1·80 to 6·65)	
≥65 years	3·63	1·37%	0·0818%	42·3	17·9%	1·17%	
	(1·25 to 8·52)	(0·471 to 3·20)	(-0·829 to 0·936)	(26·7 to 65·0)	(11·3 to 27·5)	(-2·75 to 4·95)	
amaica							
15–39 years	140	23·3%	-1·52%	383	64·5%	1·59%	
	(76·1 to 218)	(12·7 to 36·3)	(-9·45 to 5·74)	(297 to 423)	(50·1 to 71·1)	(-4·57 to 7·41)	
40–64 years	17·1	4·53%	0·125%	114	31·0%	2·42%	
	(7·43 to 30·1)	(1·97 to 8·00)	(-2·04 to 2·06)	(79·3 to 160)	(21·5 to 43·3)	(-2·34 to 7·00)	
≥65 years	0·693	0·490%	0·123%	13·0	10·5%	3·04%	
	(0·158 to 1·94)	(0·112 to 1·37)	(-0·213 to 0·539)	(6·81 to 24·0)	(5·47 to 19·3)	(0·232 to 5·70)	
Puerto Rico							
15–39 years	157	28·7%	0·768%	320	59·8%	-1·40%	
	(99·1 to 218)	(18·2 to 40·0)	(-5·98 to 7·79)	(272 to 346)	(50·9 to 64·8)	(-7·06 to 3·62)	
40-64 years	39·9	6·88%	-0·0484%	167	32·9%	-2·86%	
	(22·1 to 61·8)	(3·82 to 10·7)	(-2·89 to 2·68)	(132 to 207)	(26·0 to 40·8)	(-8·39 to 2·13)	
≥65 years	3·27	0·829%	0·106%	40·6	13·5%	0·872%	
	(1·01 to 7·75)	(0·255 to 1·96)	(-0·555 to 0·676)	(26·7 to 59·9)	(8·87 to 19·9)	(−3·56 to 4·47)	
Saint Kitts and Nevis							
15-39 years	2·54	22·4%	-8·13%	5·59	49·3%	-3·37%	
	(0·218 to 4·51)	(1·92 to 39·6)	(-25·2 to 9·90)	(3·63 to 6·54)	(32·0 to 57·6)	(-17·5 to 6·08)	
40-64 years	0.589	5·88%	-2·29%	2·02	19·3%	-6·10%	
	(0 to 1.93)	(0 to 19·2)	(-11·5 to 10·1)	(0·0120 to 4·00)	(0·114 to 38·1)	(-26·7 to 20·8)	
≥65 years	0·0352	1·25%	-0·0265%	0·194	7·75%	-1·95%	
	(0 to 0·179)	(0 to 6·36)	(-2·85 to 4·42)	(0 to 0·554)	(0 to 22·1)	(-13·3 to 11·6)	
					(Ta	ble 1 continues on next pag	

	Females A			Males		
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)
(Continued from previous pa	ge)					
Saint Lucia						
15–39 years	14·5	44·2%	-3·94%	23·3	68·6%	-0·824%
	(10·5 to 18·9)	(31·9 to 57·4)	(-12·8 to 4·68)	(19·6 to 25·2)	(57·7 to 74·2)	(-7·44 to 4·53)
40-64 years	5·99	19·8%	-0·864%	12·7	42·3%	-3·50%
	(4·18 to 8·18)	(13·9 to 27·1)	(-5·47 to 3·57)	(10·2 to 15·9)	(34·0 to 52·9)	(-8·10 to 1·07)
≥65 years	0·427	3·96%	-0·0651%	1·82	19·7%	-1·70%
	(0·209 to 0·799)	(1·94 to 7·42)	(-1·83 to 1·84)	(1·20 to 2·63)	(13·0 to 28·5)	(-5·62 to 2·46)
Saint Vincent and the Grena	adines					
15–39 years	8.69	42·5%	-0·562%	18·0	85·2%	3·29%
	(5.03 to 12.5)	(24·6 to 61·4)	(-12·0 to 10·4)	(15·1 to 19·3)	(71·5 to 91·3)	(−1·15 to 7·96)
40-64 years	2·39	14·2%	5·68%	8.75	48·3%	11·0%
	(1·24 to 3·80)	(7·34 to 22·6)	(1·91 to 9·92)	(6.60 to 11.2)	(36·4 to 61·6)	(4·11 to 16·9)
≥65 years	0·146	2·36%	1·57%	1·32	21·7%	10·8%
	(0·0410 to 0·373)	(0·664 to 6·05)	(0·385 to 3·62)	(0·792 to 2·08)	(13·0 to 34·2)	(6·45 to 15·0)
Suriname						
15–39 years	29·2	26·4%	-5·53%	72·5	66·0%	-1·62%
	(15·5 to 44·3)	(14·0 to 40·0)	(-13·7 to 3·16)	(58·2 to 79·7)	(53·0 to 72·6)	(-8·43 to 3·58)
40-64 years	5·84	6·79%	-1·80%	27·4	32·8%	-4·15%
	(2·68 to 10·1)	(3·11 to 11·7)	(-5·23 to 1·06)	(19·5 to 37·6)	(23·4 to 45·0)	(-9·46 to 0·947)
≥65 years	0·278	0·977%	-0·194%	2·69	12·2%	-1·54%
	(0·0690 to 0·782)	(0·242 to 2·75)	(-1·25 to 0·667)	(1·44 to 4·76)	(6·49 to 21·5)	(-5·91 to 1·97)
Trinidad and Tobago						
15–39 years	71·0	28·5%	-5.06%	167	65·3%	-0·408%
	(39·9 to 108)	(16·0 to 43·2)	(-13⋅3 to 3⋅09)	(135 to 185)	(52·8 to 72·6)	(-6·34 to 5·34)
40-64 years	20·6	9·43%	-0·512%	81·8	36·7%	0·564%
	(11·1 to 33·6)	(5·10 to 15·4)	(-4·39 to 3·02)	(60·8 to 108)	(27·3 to 48·3)	(−4·50 to 5·23)
≥65 years	1·69	1·82%	0·461%	13·0	16·1%	3·12%
	(0·497 to 4·29)	(0·534 to 4·62)	(-0·563 to 1·57)	(7·76 to 20·5)	(9·64 to 25·5)	(-0·733 to 6·71)
Virgin Islands						
15–39 years	4·88	31·2%	-2·91%	10·1	69·7%	2·23%
	(0·923 to 7·70)	(5·92 to 49·4)	(-27·5 to 19·0)	(7·26 to 11·2)	(50·2 to 77·4)	(-12·1 to 18·5)
40-64 years	2·17	11·7%	1·84%	5.69	35·2%	4·99%
	(0·00100 to 4·97)	(0·00541 to 26·9)	(–18·9 to 18·8)	(0.168 to 9.09)	(1·04 to 56·2)	(-37·0 to 41·9)
≥65 years	0·521	4·64%	1·96%	1·46	18·1%	6·19%
	(0 to 1·58)	(0 to 14·1)	(-7·33 to 10·9)	(0·00200 to 3·06)	(0·0248 to 37·9)	(-21·8 to 28·3)
Central Latin America						
15–39 years	11200	21·3%	-3·10%	28 300	55·6%	-4·62%
	(6490 to 14900)	(12·4 to 28·4)	(-7·93 to 1·69)	(22 600 to 29 900)	(44·4 to 58·8)	(-8·48 to -1·24)
40–64 years	1970	5.67%	-1·46%	12 300	39·2%	–7·33%
	(1130 to 3070)	(3.25 to 8.82)	(-4·00 to 0·714)	(10 300 to 15 300)	(32·8 to 48·6)	(–11·0 to –3·71)
≥65 years	111	0.988%	0·0384%	1410	15·0%	-3·05%
	(40·8 to 254)	(0.362 to 2.26)	(-0·539 to 0·493)	(1000 to 2010)	(10·6 to 21·4)	(-6·63 to 0·204)
Colombia						
15–39 years	2230	23·3%	-1·43%	5060	52·8%	-2·84%
	(1310 to 3040)	(13·6 to 31·7)	(-7·84 to 4·88)	(3990 to 5480)	(41·6 to 57·2)	(-8·65 to 2·82)
40-64 years	385	5·48%	-3·32%	1990	32·1%	-9·89%
	(207 to 614)	(2·95 to 8·74)	(-6·36 to -0·582)	(1590 to 2560)	(25·6 to 41·3)	(-14·6 to -5·14)
≥65 years	17·6	0.676%	-0·513%	199	9·59%	-6·61%
	(4·68 to 47·2)	(0.180 to 1.81)	(-1·58 to 0·133)	(117 to 326)	(5·67 to 15·7)	(-11·2 to -2·81)
Costa Rica						
15–39 years	252	25.6%	-3·41%	551	59·4%	-2·83%
	(125 to 374)	(12.8 to 38.1)	(-11·1 to 4·30)	(413 to 604)	(44·5 to 65·1)	(-10·1 to 3·50)
40-64 years	45·8	6·54%	-3·70%	247	39·5%	-11·0%
	(20·9 to 83·1)	(2·99 to 11·8)	(-8·02 to -0·400)	(190 to 331)	(30·4 to 53·0)	(-16·1 to -5·99)
					(Ta	ble 1 continues on next page)

	Females			Males		
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change sin
(Continued from previous p	page)					
≥65 years	2·99	1·19%	-0·659%	32·8	15·7%	-8·47%
	(0·672 to 8·62)	(0·267 to 3·43)	(-2·46 to 0·300)	(19·5 to 54·3)	(9·33 to 26·0)	(-13·8 to -3·63)
El Salvador						
15–39 years	107	7·84%	-0·388%	658	53·7%	-2·37%
	(54·1 to 160)	(3·97 to 11·8)	(-3·88 to 2·69)	(497 to 721)	(40·6 to 58·8)	(-8·31 to 2·89)
40–64 years	18·6	2·19%	0·236%	219	35·6%	-3·49%
	(8·88 to 32·6)	(1·05 to 3·85)	(-1·06 to 1·31)	(172 to 290)	(27·9 to 47·0)	(-9·84 to 2·46)
≥65 years	1·08	0·342%	0·142%	26·2	11·2%	-0·461%
	(0·266 to 2·87)	(0·0838 to 0·905)	(-0·0681 to 0·446)	(15·6 to 41·9)	(6·70 to 18·0)	(-5·02 to 3·12)
Guatemala						
15–39 years	331	9·46%	-0·715%	1420	43·9%	-0·428%
	(164 to 495)	(4·69 to 14·1)	(-4·42 to 2·82)	(1090 to 1570)	(33·8 to 48·6)	(-6·51 to 5·49)
40-64 years	43·4	2·72%	-1·09%	390	28·0%	-3·56%
	(18·3 to 83·9)	(1·15 to 5·25)	(-3·14 to 0·747)	(296 to 530)	(21·3 to 38·1)	(-8·67 to 1·38)
≥65 years	2·40	0·505%	-0·136%	36·8	8·72%	-3·21%
	(0·390 to 7·47)	(0·0821 to 1·57)	(-0·902 to 0·410)	(19·5 to 63·1)	(4·61 to 14·9)	(-7·14 to 0·478)
Honduras						
15–39 years	137	6·10%	-0·291%	728	35·3%	0·115%
	(82·1 to 197)	(3·64 to 8·75)	(-2·77 to 2·05)	(591 to 815)	(28·7 to 39·6)	(-4·80 to 5·23)
40–64 years	24·6	2·49%	0·251%	239	27·3%	-1·24%
	(14·0 to 39·9)	(1·41 to 4·03)	(-0·944 to 1·41)	(195 to 298)	(22·3 to 34·1)	(-5·94 to 3·27)
≥65 years	1·77	0.667%	0·253%	25·7	11·1%	0·119%
	(0·619 to 3·79)	(0.233 to 1.43)	(-0·161 to 0·738)	(17·3 to 36·8)	(7·45 to 15·9)	(−3·42 to 3·33)
Mexico						
15–39 years	6570 (3930 to 8740) 1180	25·2% (15·1 to 33·5)	-2·75% (-10·3 to 4·67)	15 000 (12 200 to 16 100)	59·7% (48·4 to 64·1)	-4·61% (-10·3 to 1·09) -5·88%
40-64 years	(659 to 1850)	6·50% (3·64 to 10·3)	-0·343% (-3·94 to 2·67)	7170 (6040 to 8670) 868	43·7% (36·8 to 52·8)	(-11·7 to -0·361)
≥65 years	69·8 (25·6 to 150)	1·26% (0·463 to 2·71)	0·498% (-0·245 to 1·23)	(630 to 1170)	18·3% (13·3 to 24·7)	-0.0786% (-4.86 to 4.23)
Nicaragua						
15–39 years	254	18·0%	-1·28%	781	55·3%	-1·14%
	(133 to 365)	(9·44 to 25·9)	(-8·09 to 4·69)	(593 to 854)	(42·0 to 60·5)	(-7·11 to 4·62)
40–64 years	36·0	4·79%	0·851%	253	38·4%	-1·55%
	(18·1 to 62·8)	(2·41 to 8·36)	(-1·69 to 2·94)	(204 to 323)	(30·9 to 48·9)	(-8·40 to 4·42)
≥65 years	1·55	0·729%	0·420%	23·6	13·6%	1·01%
	(0·396 to 4·02)	(0·186 to 1·88)	(0·0615 to 1·06)	(15·0 to 35·5)	(8·67 to 20·4)	(-3·57 to 5·08)
Panama						
15–39 years	148	19·1%	-1·65%	450	57·4%	-3·12%
	(89·5 to 207)	(11·6 to 26·8)	(-8·45 to 4·39)	(372 to 488)	(47·4 to 62·2)	(-9·17 to 2·45)
40-64 years	34·0	6·33%	-0·111%	226	42·5%	-4·62%
	(19·4 to 53·0)	(3·62 to 9·88)	(-3·08 to 2·61)	(190 to 274)	(35·7 to 51·5)	(-10·2 to 0·604)
≥65 years	2·47	1·26%	0·418%	32·0	17·8%	-0.900%
	(0·837 to 5·59)	(0·426 to 2·85)	(-0·382 to 1·24)	(22·9 to 44·6)	(12·8 to 24·9)	(-5.86 to 3.86)
Venezuela						
15–39 years	1140	17·7%	-4·60%	3640	56.0%	-6.80%
	(609 to 1670)	(9·44 to 26·0)	(-10·8 to 1·88)	(2850 to 3980)	(43.8 to 61.3)	(-13.7 to -1.22)
40-64 years	209	4·90%	-4·34%	1580	38·1%	-15·0%
	(97·9 to 364)	(2·30 to 8·53)	(-7·73 to -1·20)	(1250 to 2010)	(30·2 to 48·7)	(-19·9 to -9·10)
≥65 years	11·6	0·822%	-0·902%	165	14·4%	-10·9%
	(3·07 to 30·1)	(0·217 to 2·13)	(-2·33 to 0·0288)	(105 to 251)	(9·13 to 21·8)	(-15·8 to -6·24)
Tropical Latin America						
15–39 years	15 000	33·7%	8·93%	25 600	58·1%	3·52%
	(10 400 to 18 000)	(23·4 to 40·5)	(3·06 to 14·4)	(19 000 to 27 300)	(43·2 to 61·9)	(-1·62 to 8·47)
					(T	able 1 continues on next pa

	Females			Males		
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change sinc 1990 (%)
(Continued from previo	ous page)					
40–64 years	4000	11·7%	3·16%	12 800	40·9%	5·14%
	(2730 to 5650)	(8·00 to 16·6)	(0·355 to 6·02)	(10 600 to 15 700)	(33·8 to 50·2)	(0·613 to 9·15)
≥65 years	351	2·89%	1·09%	1680	18·0%	4·40%
	(168 to 638)	(1·39 to 5·26)	(0·0819 to 2·35)	(1180 to 2310)	(12·7 to 24·9)	(1·01 to 7·31)
Brazil						
15–39 years	14300	33·2%	9·03%	24300	57·2%	3·32%
	(10 000 to 17 200)	(23·3 to 39·9)	(3·24 to 14·5)	(18100 to 26000)	(42·5 to 61·2)	(-1·97 to 8·42)
40–64 years	3870	11·6%	3·28%	12 300	40·4%	5·26%
	(2630 to 5470)	(7·90 to 16·4)	(0·385 to 6·16)	(10 200 to 15 100)	(33·4 to 49·6)	(0·707 to 9·31)
≥65 years	339	2·86%	1·15%	1620	17·9%	4·62%
	(163 to 617)	(1·37 to 5·19)	(0·125 to 2·38)	(1140 to 2240)	(12·5 to 24·6)	(1·17 to 7·58)
Paraguay						
15–39 years	707	46·9%	-0.650%	1280	82·1%	0·843%
	(402 to 882)	(26·7 to 58·5)	(-9.47 to 7.72)	(959 to 1340)	(61·4 to 86·0)	(-7·10 to 4·87)
40–64 years	127	16·1%	-2·21%	454	57·3%	-1·01%
	(77-3 to 189)	(9·81 to 23·9)	(-7·19 to 3·05)	(369 to 558)	(46·6 to 70·4)	(-6·97 to 4·31)
≥65 years	11-7	4·63%	-0·901%	56·5	25·9%	-3·05%
	(4-63 to 23-3)	(1·83 to 9·20)	(-3·71 to 1·73)	(37·2 to 80·0)	(17·1 to 36·7)	(-8·69 to 2·85)
North Africa and Mido						
15–39 years	729	0·585%	-0·321%	7800	5·81%	-0·973%
	(433 to 1250)	(0·348 to 1·00)	(-0·653 to -0·0790)	(6060 to 9310)	(4·51 to 6·94)	(-1·59 to -0·396)
40–64 years	242	0·344%	-0·180%	2820	3.66%	-0·215%
	(104 to 444)	(0·149 to 0·632)	(-0·428 to -0·00198)	(1810 to 4160)	(2.36 to 5.40)	(-0·840 to 0·313)
≥65 years	18-5	0·111%	-0·0338%	258	1·54%	-0·0369%
	(7-26 to 48-5)	(0·0433 to 0·289)	(-0·127 to 0·0314)	(166 to 446)	(0·989 to 2·66)	(-0·454 to 0·287)
Afghanistan						
15–39 years	12·6	0·144%	0·111%	278	2·99%	2·21%
	(2·37 to 44·7)	(0·0270 to 0·509)	(0·00660 to 0·281)	(117 to 420)	(1·26 to 4·50)	(1·24 to 3·09)
40–64 years	0.673	0.0226%	0.0219%	16·2	0.505%	0.496%
	(0.0160 to 2.87)	(0.000538 to 0.0966)	(0.000538 to 0.0952)	(1·73 to 49·3)	(0.0538 to 1.53)	(0.0538 to 1.49)
≥65 years	0·0124	0·00247%	0·00221%	0·253	0·0486%	0·0476%
	(0 to 0·0821)	(0 to 0·0164)	(0 to 0·0164)	(0·00598 to 1·52)	(0·00115 to 0·292)	(0·00115 to 0·292)
Algeria						
15–39 years	37·1	0·439%	0·0377%	542	6·28%	1·12%
	(22·7 to 58·2)	(0·269 to 0·690)	(-0·200 to 0·207)	(433 to 662)	(5·02 to 7·67)	(-0·0501 to 2·44)
40–64 years	13·0	0·246%	0·0626%	210	3·91%	1·43%
	(5·52 to 24·2)	(0·104 to 0·455)	(-0·0746 to 0·189)	(147 to 285)	(2·74 to 5·31)	(0·475 to 2·32)
≥65 years	1·12	0·0834%	0.0267%	21·0	1·48%	0.694%
	(0·384 to 2·71)	(0·0285 to 0·201)	(-0.0372 to 0.0829)	(13·5 to 32·0)	(0·951 to 2·25)	(0.133 to 1.18)
Bahrain						
15-39 years	1·06	0·433%	-0·289%	32·1	6·76%	-2·73%
	(0·616 to 1·71)	(0·252 to 0·698)	(-0·557 to -0·0604)	(25·7 to 39·0)	(5·43 to 8·23)	(-4·53 to -0·983)
40–64 years	0·353	0·238%	-0·348%	13·2	4·41%	-3·19%
	(0·148 to 0·664)	(0·0997 to 0·447)	(-0·581 to -0·144)	(9·44 to 18·2)	(3·16 to 6·09)	(-4·87 to −1·57)
≥65 years	0·0179	0·0795%	-0·203%	0·490	1·79%	-1·93%
	(0·00400 to 0·0470)	(0·0178 to 0·209)	(-0·420 to -0·0411)	(0·320 to 0·771)	(1·17 to 2·82)	(-3·06 to -0·900)
Egypt						
15–39 years	34·9	0·172%	-0·00651%	466	2·18%	0·417%
	(20·9 to 57·7)	(0·103 to 0·284)	(-0·0904 to 0·0726)	(352 to 570)	(1·65 to 2·68)	(-0·0498 to 0·880)
40–64 years	9·52	0·0927%	-0.00707%	150	1·33%	0·372%
	(3·51 to 18·2)	(0·0342 to 0·177)	(-0.0769 to 0.0532)	(92·4 to 224)	(0·820 to 1·99)	(-0·0452 to 0·752)
≥65 years	0·518	0·0271%	-0·00163%	10·7	0·462%	0·194%
	(0·129 to 1·43)	(0·00674 to 0·0748)	(-0·0361 to 0·0234)	(5·32 to 19·8)	(0·230 to 0·857)	(0·00879 to 0·420)
					(Tab	le 1 continues on next pag

	Females			Males			
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change sinc 1990 (%)	
Continued from previo	ous page)						
ran							
15–39 years	76·2	0·440%	0·402%	1150	6·40%	5·28%	
	(42·4 to 119)	(0·245 to 0·689)	(0·165 to 0·609)	(912 to 1400)	(5·07 to 7·81)	(4·02 to 6·57)	
40-64 years	29·3	0·252%	0·251%	478	4·01%	4·00%	
	(10·1 to 56·2)	(0·0866 to 0·483)	(0·0866 to 0·480)	(316 to 659)	(2·65 to 5·53)	(2·65 to 5·46)	
≥65 years	2·53	0·0864%	0·0861%	42·3	1·48%	1·48%	
	(0·567 to 6·46)	(0·0194 to 0·221)	(0·0194 to 0·220)	(23·4 to 68·3)	(0·819 to 2·40)	(0·819 to 2·39)	
raq							
L5–39 years	40·5	0·576%	-0·164%	91·3	1·23%	-0·330%	
	(29·3 to 55·4)	(0·417 to 0·788)	(-0·397 to 0·0560)	(75·9 to 110)	(1·02 to 1·49)	(-0·633 to -0·00147)	
40-64 years	19·0	0·483%	-0·265%	33.6	0.826%	-0·337%	
	(12·2 to 27·5)	(0·310 to 0·700)	(-0·554 to -0·00862)	(26.9 to 41.5)	(0.662 to 1.02)	(-0·630 to -0·0748)	
≥65 years	2·12	0·241%	-0·165%	3.52	0·442%	-0·182%	
	(1·22 to 3·37)	(0·139 to 0·383)	(-0·354 to -0·0108)	(2.61 to 4.68)	(0·328 to 0·587)	(-0·359 to -0·0150)	
ordan	\	(55 to 0 505)	(- 55 10 0 0 100)	(= -= -3 + 00)	(- 3_0 :0 0 50/)	(- 555 to 0 0150)	
15–39 years	2.83	0·116%	0·00369%	54·1	1·82%	0·182%	
	(1.77 to 4.27)	(0·0725 to 0·175)	(-0·0426 to 0·0520)	(43·3 to 64·9)	(1·46 to 2·18)	(-0·241 to 0·589)	
40-64 years	1·19	0·0989%	-0.00937%	22·0	1·50%	0·148%	
	(0·511 to 2·11)	(0·0425 to 0·175)	(-0.0694 to 0.0492)	(14·7 to 30·2)	(1·00 to 2·06)	(-0·232 to 0·540)	
≥65 years	0·0683	0.0296%	-0.00589%	2·32	0·958%	0·0564%	
	(0·0200 to 0·149)	(0.00868 to 0.0646)	(-0.0394 to 0.0222)	(1·34 to 3·69)	(0·553 to 1·53)	(-0·329 to 0·457)	
Kuwait	,	,					
15–39 years	0·597	0·0588%	0·0493%	17·6	1.66%	1·30%	
	(0·00898 to 1·71)	(0·000884 to 0·169)	(0·0000985 to 0·123)	(4·32 to 27·7)	(0.407 to 2.62)	(0·331 to 1·98)	
40-64 years	0·107	0·0174%	0·0171%	3·77	0·474%	0·469%	
	(0 to 0·421)	(0 to 0·0685)	(0 to 0·0685)	(0·0170 to 10·4)	(0·00213 to 1·30)	(0·00213 to 1·28)	
≥65 years	0·00148	0·00254%	0·00250%	0.0692	0·0725%	0·0720%	
	(0 to 0·00900)	(0 to 0·0155)	(0 to 0·0155)	(0 to 0.330)	(0 to 0·346)	(0 to 0·346)	
_ebanon							
.5-39 years	26·7	3·01%	-1·69%	168	19·0%	-5·26%	
	(11·0 to 59·8)	(1·24 to 6·74)	(-4·50 to 0·0732)	(124 to 208)	(14·0 to 23·4)	(-9·02 to −1·59)	
40-64 years	4·86	0·726%	-0·544%	47·3	8·72%	-4·61%	
	(0·746 to 13·8)	(0·111 to 2·06)	(-1·61 to 0·124)	(24·7 to 79·0)	(4·57 to 14·6)	(-7·75 to -1·52)	
≥65 years	0·250	0.0859%	-0·173%	8·47	3·33%	-3·53%	
	(0·0150 to 1·27)	(0.00514 to 0.435)	(-0·720 to 0·00429)	(3·82 to 18·3)	(1·50 to 7·20)	(-6·96 to -1·22)	
_ibya							
15–39 years	1·82	0·125%	0·0867%	55·5	3·55%	2·32%	
	(0·949 to 3·14)	(0·0649 to 0·215)	(-0·0501 to 0·149)	(42·6 to 68·2)	(2·73 to 4·37)	(1·46 to 3·16)	
40-64 years	0·379	0·0405%	0·0395%	21·2	2·10%	2·05%	
	(0·119 to 0·737)	(0·0127 to 0·0788)	(0·0127 to 0·0741)	(12·9 to 31·0)	(1·28 to 3·07)	(1·27 to 2·87)	
≥65 years	0·0225	0·0133%	0.0132%	1·36	0·810%	0·808%	
	(0·00300 to 0·0650)	(0·00178 to 0·0385)	(0.00178 to 0.0385)	(0·642 to 2·39)	(0·382 to 1·42)	(0·382 to 1·40)	
Morocco	, , , , , , , , , , , , , , , , , , , ,	. 23,					
L5–39 years	3·23	0·0444%	-0.0310%	419	5·69%	-1·69%	
	(0·591 to 10·7)	(0·00811 to 0·147)	(-0.0709 to 0.00790)	(311 to 520)	(4·24 to 7·07)	(-3·20 to -0·209)	
40-64 years	0·272	0·00556%	-0.0160%	96·1	1·97%	-0·550%	
	(0·00900 to 1·10)	(0·000184 to 0·0224)	(-0.0403 to -0.00202)	(62·3 to 136)	(1·28 to 2·79)	(-1·25 to 0·0946)	
≥65 years	0·00779	0·000575%	-0.00418%	2·80	0·213%	-0·0724%	
	(0 to 0·0541)	(0 to 0·00399)	(-0.0179 to -0.000105)	(1·54 to 5·00)	(0·117 to 0·380)	(-0·188 to 0·0395)	
Oman	,,	,				, 223/	
15–39 years	1·96	0·261%	-0·0317%	68·5	4·94%	0·246%	
	(0·700 to 4·25)	(0·0930 to 0·565)	(-0·222 to 0·113)	(47·3 to 89·6)	(3·41 to 6·46)	(-0·887 to 1·22)	
40-64 years	0·311	0.0890%	-0.00643%	15·2	2·17%	0·408%	
	(0·0450 to 0·828)	(0.0129 to 0.237)	(-0.115 to 0.0716)	(6·41 to 27·1)	(0·913 to 3·86)	(-0·405 to 1·18)	
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	Females			Males			
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change sinc 1990 (%)	
(Continued from previous p	page)						
≥65 years	0·00821	0·0162%	-0·00399%	0·343	0·530%	0·143%	
	(0 to 0·0370)	(0 to 0·0731)	(-0·0536 to 0·0242)	(0·104 to 0·876)	(0·160 to 1·35)	(-0·229 to 0·474)	
Palestine							
15–39 years	5·43	0·519%	-0·100%	78·1	7·19%	-0·319%	
	(3·45 to 8·15)	(0·330 to 0·779)	(-0·389 to 0·148)	(64·8 to 92·6)	(5·96 to 8·51)	(-1·89 to 1·27)	
40–64 years	1·55	0·360%	-0·118%	24·0	5·33%	-0·418%	
	(0·765 to 2·58)	(0·177 to 0·598)	(-0·440 to 0·173)	(17·9 to 30·7)	(3·99 to 6·83)	(-2·06 to 1·30)	
≥65 years	0·132	0·146%	-0·0718%	1·85	2·36%	-0·253%	
	(0·0480 to 0·272)	(0·0533 to 0·302)	(-0·267 to 0·0878)	(1·22 to 2·61)	(1·56 to 3·33)	(-1·37 to 0·859)	
Qatar							
15-39 years	1·11	0·309%	-0·0905%	85·1	6·05%	-0·192%	
	(0·495 to 2·23)	(0·137 to 0·619)	(-0·320 to 0·0707)	(63·7 to 108)	(4·53 to 7·68)	(-1·60 to 1·16)	
40-64 years	0·247	0·139%	-0·0702%	16·7	3·05%	-0·475%	
	(0·0540 to 0·586)	(0·0304 to 0·330)	(-0·268 to 0·0563)	(9·41 to 26·1)	(1·71 to 4·75)	(-1·70 to 0·612)	
≥65 years	0.00343	0·0304%	-0·0220%	0·327	1·02%	-0·103%	
	(0 to 0.0140)	(0 to 0·124)	(-0·188 to 0·0619)	(0·144 to 0·654)	(0·449 to 2·04)	(-0·892 to 0·553)	
Saudi Arabia							
15–39 years	8·09	0·107%	-0·0926%	267	2·47%	-0.682%	
	(0·997 to 19·4)	(0·0131 to 0·256)	(-0·208 to -0·0148)	(136 to 372)	(1·26 to 3·43)	(-1.31 to 0.0870)	
40-64 years	0·842 (0·00700 to 2·61)	0·0220% (0·000183 to 0·0681)	-0.0225% (-0.0608 to -0.0000410)	55·8 (4·51 to 118)	0.905% (0.0732 to 1.91)	-0·593% (-1·09 to -0·132)	
≥65 years	0.0183	0·00493%	-0·00930%	1·53	0·256%	-0·306%	
	(0 to 0.0930)	(0 to 0·0251)	(-0·0297 to 0)	(0·0120 to 5·02)	(0·00201 to 0·841)	(-0·652 to -0·0281)	
Sudan							
15-39 years	2·13	0·0243%	-0·593%	132	1·53%	-10·7%	
	(0 to 26·1)	(0 to 0·297)	(-0·815 to -0·362)	(0 to 324)	(0 to 3·78)	(-13·4 to -8·07)	
40–64 years	0·0183	0·000561%	-0·533%	0.580	0·0175%	-11·8%	
	(0 to 0·0210)	(0 to 0·000645)	(-0·804 to -0·303)	(0 to 1.85)	(0 to 0·0558)	(-14·2 to -9·49)	
≥65 years	0·00114	0·000190%	-0·246%	0·0214	0·00280%	-6·68%	
	(0 to 0)	(0 to 0)	(-0·413 to -0·111)	(0 to 0)	(0 to 0)	(-8·73 to -5·09)	
Syria							
15-39 years	29·3	0·557	-0·283	281	5·12	-1·17	
	(12·6 to 55·6)	(0·240 to 1·06)	(-0·573 to 0·0548)	(209 to 349)	(3·80 to 6·36)	(-2·47 to 0·214)	
40–64 years	5·76	0·236%	-0·281%	81.8	3·22%	-2·35%	
	(1·06 to 13·2)	(0·0433 to 0·542)	(-0·546 to -0·0633)	(38.3 to 133)	(1·51 to 5·25)	(-3·51 to -1·23)	
≥65 years	0·278	0·0635%	-0·136%	5·75	1·24%	-1.62%	
	(0·0150 to 1·02)	(0·00343 to 0·233)	(-0·298 to -0·0262)	(1·67 to 11·9)	(0·361 to 2·58)	(-2.59 to -0.788)	
Tunisia							
15–39 years	3·22	0·145%	-0·00404%	352	16⋅3%	3·70%	
	(1·27 to 6·88)	(0·0571 to 0·309)	(-0·105 to 0·0657)	(294 to 414)	(13⋅6 to 19⋅1)	(1·07 to 6·38)	
40-64 years	0·671	0·0374%	-0·000649%	154	8·82%	2·16%	
	(0·104 to 1·93)	(0·00580 to 0·108)	(-0·0440 to 0·0299)	(119 to 193)	(6·81 to 11·1)	(0·326 to 3·89)	
≥65 years	0·0462	0·00749%	-0·00250%	18·4	3·18%	0·757%	
	(0·00200 to 0·236)	(0·000324 to 0·0382)	(-0·0266 to 0·00722)	(13·1 to 25·6)	(2·26 to 4·41)	(-0·245 to 1·67)	
Turkey							
15–39 years	408	2·59%	-0·968%	2770	17·0%	-1·14%	
	(225 to 685)	(1·43 to 4·35)	(-2·47 to 0·245)	(2110 to 3340)	(12·9 to 20·5)	(-4·16 to 1·90)	
40-64 years	147	1·20%	-0.608%	1160	9·39%	0·262%	
	(57·7 to 284)	(0·470 to 2·31)	(-1.70 to 0.135)	(699 to 1810)	(5·67 to 14·7)	(-2·32 to 2·45)	
≥65 years	11·2	0·258%	-0·101%	130	3·65%	0·412%	
	(3·29 to 31·0)	(0·0757 to 0·713)	(-0·414 to 0·104)	(75·0 to 235)	(2·11 to 6·59)	(-1·25 to 1·58)	
United Arab Emirates							
15–39 years	13·0	1·76%	-1·78%	176	16·7%	-5·29%	
	(3·24 to 36·3)	(0·437 to 4·88)	(-4·19 to -0·231)	(114 to 246)	(10·9 to 23·4)	(-8·96 to -1·62)	
					(Tabl	e 1 continues on next pag	

	Females			Males		
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change sinc 1990 (%)
(Continued from previ	ous page)					
40-64 years	3·51	0·607%	-0·984%	173	9·18%	-5·52%
	(0·209 to 13·0)	(0·0361 to 2·24)	(-2·95 to 0·0116)	(72·1 to 324)	(3·83 to 17·2)	(-10·2 to -1·23)
≥65 years	0·0376	0·0879%	-0·244%	3.76	3·26%	-2·09%
	(0 to 0·292)	(0 to 0·683)	(-1·14 to 0·0108)	(1·17 to 10·4)	(1·02 to 9·03)	(-5·79 to 0·395)
Yemen						
15–39 years	19·0	0·284%	-0·354%	307	4·54%	-3·00%
	(8·31 to 37·4)	(0·124 to 0·557)	(-0·570 to -0·160)	(215 to 401)	(3·18 to 5·93)	(-4·61 to -1·49)
40-64 years	2·64	0·109%	-0·396%	49.6	2·06%	-3·88%
	(0·617 to 6·69)	(0·0255 to 0·276)	(-0·621 to -0·213)	(23.3 to 86.4)	(0·967 to 3·58)	(-5·11 to -2·73)
≥65 years	0·112	0·0230%	-0·210%	2·37	0·504%	-2·38%
	(0·0120 to 0·501)	(0·00245 to 0·103)	(-0·394 to -0·0950)	(0·853 to 5·64)	(0·181 to 1·20)	(-3·27 to -1·66)
South Asia						
15–39 years	7260	1.90%	0·191%	92 400	23·2%	4.63%
	(3860 to 10 800)	(1.01 to 2.81)	(-0·544 to 1·45)	(73 100 to 108 000)	(18·3 to 27·0)	(0.684 to 11.6)
40–64 years	3380 (1470 to 5310)	1.63% (0.708 to 2.56) 0.612%	0·193% (-0·612 to 1·06)	41500 (26300 to 54300)	19·6% (12·4 to 25·7) 9·62%	4·76% (0·221 to 12·1) 2·82%
≥65 years	370 (124 to 727)	(0·205 to 1·20)	0·0343% (-0·500 to 0·513)	5500 (2950 to 8390)	(5·16 to 14·7)	(-1·17 to 6·56)
Bangladesh						
15–39 years	214	0·602%	-0·0289%	2150	6·59%	1·53%
	(14·9 to 369)	(0·0417 to 1·04)	(-0·571 to 0·532)	(1190 to 2750)	(3·64 to 8·42)	(-0·0384 to 3·84)
40–64 years	36·9	0·192%	0·0981%	508	2·77%	1·70%
	(0·0609 to 82·8)	(0·000317 to 0·431)	(-0·0113 to 0·251)	(14·3 to 897)	(0·0782 to 4·89)	(0·0690 to 3·08)
≥65 years	2·18	0·0417%	0·0273%	44·1	0·740%	0·539%
	(0 to 6·55)	(0 to 0·125)	(0 to 0·0873)	(0·0409 to 98·9)	(0·000686 to 1·66)	(0·000686 to 1·15)
Bhutan			- 0-	-0.		0.5
15–39 years	16·0	9·38%	-2·87%	38·1	19·7%	-8·24%
	(2·39 to 31·7)	(1·40 to 18·6)	(-8·84 to 6·36)	(16·9 to 55·0)	(8·73 to 28·4)	(-16·3 to 2·13)
40-64 years	1·98	2·48%	-6·38%	5·85	6·56%	-16·0%
	(0·0709 to 5·33)	(0·0886 to 6·66)	(-10·8 to -0·462)	(0·568 to 13·3)	(0·637 to 14·9)	(-22·5 to -4·46)
	0·0816	0·335%	-2·90%	0·272	1·11%	-10·1%
≥65 years	(0 to 0.384)	(0 to 1.58)	(-5.62 to -0.369)	(0·00400 to 1·11)	(0.0163 to 4.51)	(-15·6 to -2·71)
India						
15-39 years	5390	1·85%	0·0816%	79 900	25·7%	5·24%
	(3070 to 7860)	(1·05 to 2·69)	(-0·861 to 1·36)	(65 000 to 93 100)	(20·9 to 30·0)	(0·562 to 13·1)
40–64 years	2950	1·79%	0·155%	38 800	23·0%	5·63%
	(1360 to 4640)	(0·828 to 2·81)	(-0·820 to 1·19)	(25 400 to 50 100)	(15·1 to 29·7)	(0·240 to 14·4)
≥65 years	349	0·696%	-0·00355%	5320	11·6%	2·88%
	(121 to 685)	(0·242 to 1·37)	(-0·670 to 0·578)	(2890 to 8080)	(6·30 to 17·6)	(-2·22 to 7·56)
Nepal						
15–39 years	579	8·05%	3·17%	1990	32·8%	9·75%
	(229 to 875)	(3·18 to 12·2)	(0·0598 to 6·53)	(1310 to 2400)	(21·7 to 39·7)	(0·599 to 20·8)
40–64 years	198	5.72%	4·51%	655	21·9%	17·9%
	(46·9 to 352)	(1.36 to 10.2)	(1·27 to 7·46)	(250 to 1010)	(8·35 to 33·7)	(8·10 to 24·5)
≥65 years	12·4	1·26%	1·15%	68.7	7·72%	7·17%
	(1·09 to 31·4)	(0·110 to 3·18)	(0·109 to 2·77)	(13.1 to 142)	(1·47 to 15·9)	(1·47 to 13·6)
Pakistan						
15–39 years	1060	2·20%	0·515%	8370	17·1%	1·75%
	(299 to 1900)	(0·621 to 3·96)	(-0·509 to 2·13)	(4600 to 11 300)	(9·38 to 23·0)	(-2·43 to 8·60)
40–64 years	196	0.981%	0·218%	1560	7·37%	1·32%
	(28·4 to 425)	(0.142 to 2.12)	(-0·348 to 0·886)	(353 to 2960)	(1·66 to 14·0)	(-1·47 to 4·63)
≥65 years	6·01	0·149%	0·00294%	63·2	1·44%	0·0807%
	(0·404 to 20·1)	(0·00999 to 0·498)	(-0·196 to 0·215)	(6·21 to 190)	(0·142 to 4·33)	(−1·22 to 1·39)
					(Tabl	e 1 continues on next pag

	Females			Males		
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)
(Continued from previous p	page)					
East Asia						
15–39 years	12 400 (7510 to 20 800)	4·92% (2·98 to 8·27) 3·86%	-0.560% (-3.15 to 1.95)	123 000 (98 400 to 145 000) 118 000	45·7% (36·5 to 53·9) 42·1%	0·912% (-4·30 to 5·80) -1·61%
40-64 years	10 400 (6560 to 15 500)	(2·43 to 5·73)	-0·770% (-2·74 to 1·08)	(99300 to 140000)	(35·4 to 49·7)	(-7·42 to 3·76)
≥65 years	1700	1·65%	-0·741%	21 900	24·2%	-1·23%
	(767 to 3050)	(0·745 to 2·97)	(-1·95 to 0·434)	(16 300 to 27 800)	(18·0 to 30·6)	(-7·00 to 4·22)
China	42.000	4.04%	0.5324	440.000	45.004	4.420
15–39 years	12 000	4·91%	-0.522%	119 000	45·8%	1·13%
	(7230 to 20 100)	(2·97 to 8·25)	(-3.12 to 2.03)	(95 600 to 141 000)	(36·7 to 53·9)	(-4·12 to 6·14)
40–64 years	10 100	3·88%	-0·734%	115 000	42·4%	-1·34%
	(6360 to 15 100)	(2·43 to 5·79)	(-2·75 to 1·17)	(96 900 to 136 000)	(35·6 to 50·1)	(-7·37 to 4·16)
≥65 years	1670	1·69%	-0·721%	21 500	24·4%	-0·993%
	(754 to 2980)	(0·761 to 3·01)	(-1·97 to 0·488)	(16 000 to 27 200)	(18·2 to 31·0)	(-6·87 to 4·60)
North Korea						
15–39 years	215	4·49%	-1·25%	2180	41·4%	-4·17%
	(105 to 418)	(2·19 to 8·74)	(-4·66 to 1·51)	(1550 to 2710)	(29·3 to 51·4)	(-10·1 to 1·97)
40–64 years	128	2·89%	-1·31%	1460	33·3%	-8·12%
	(68·9 to 216)	(1·55 to 4·88)	(-3·29 to 0·290)	(1120 to 1850)	(25·6 to 42·2)	(-14·6 to -2·25)
≥65 years	13·7	0·799%	-1·08%	154	16⋅3%	-6·96%
	(4·33 to 29·7)	(0·253 to 1·73)	(-2·23 to -0·236)	(102 to 214)	(10⋅8 to 22⋅6)	(-13·0 to -1·47)
Taiwan (province of China)					
15–39 years	239	6·33%	-1·96%	1790	45·0%	-6·15%
	(129 to 423)	(3·43 to 11·2)	(-5·39 to 1·57)	(1350 to 2190)	(33·9 to 55·2)	(-13·6 to 1·01)
40–64 years	179	3·86	-2·45	1460	32·9	-11·9
	(105 to 284)	(2·26 to 6·11)	(-4·90 to -0·346)	(1150 to 1810)	(26·0 to 40·7)	(-17·6 to -6·52)
≥65 years	17·8	0·861%	-1·51%	252	14·5%	-10·4%
	(6·10 to 36·4)	(0·294 to 1·76)	(-2·71 to -0·527)	(178 to 343)	(10·2 to 19·7)	(-15·5 to -4·98)
Oceania						
15–39 years	113	4·14%	-0·838%	668	23·6%	-3·23%
	(17·3 to 192)	(0·634 to 7·05)	(-2·90 to 1·48)	(456 to 822)	(16·1 to 29·0)	(-7·19 to 0·759)
40–64 years	10·1	0·786%	-0·174%	105	7·63%	-1·60%
	(1·74 to 22·2)	(0·135 to 1·72)	(-0·718 to 0·267)	(35·4 to 181)	(2·58 to 13·2)	(-4·34 to 0·891)
≥65 years	0·353	0·151%	-0·0696%	7·97	3·20%	-0·680%
	(0·0629 to 0·988)	(0·0269 to 0·423)	(-0·298 to 0·0577)	(2·61 to 16·6)	(1·05 to 6·65)	(-2·42 to 0·631)
American Samoa						
15-39 years	0·718	6·77%	-1·22%	2·91	27·5%	-2·43%
	(0·00200 to 1·82)	(0·0189 to 17·2)	(-8·07 to 5·43)	(0·928 to 4·28)	(8·76 to 40·4)	(-12·8 to 8·95)
40–64 years	0.00950	0·133%	-0·200%	0·132	1·88%	-1·43%
	(0 to 0.0521)	(0 to 0·730)	(-1·82 to 0·520)	(0 to 0·550)	(0 to 7·84)	(-10·5 to 3·80)
≥65 years	0·000109	0·00587%	-0·0238%	0·00651	0·360%	-0·513%
	(0 to 0·00100)	(0 to 0·0539)	(-0·264 to 0·0539)	(0 to 0·0391)	(0 to 2·16)	(-4·71 to 1·36)
Cook Islands						
15-39 years	1·04	33·2%	15·1%	1·77	64·6%	25·5%
	(0·439 to 1·39)	(14·0 to 44·2)	(0·663 to 31·2)	(1·49 to 1·94)	(54·3 to 70·9)	(11·1 to 48·2)
40–64 years	0·383	13·2%	11·6%	1·20	42·8%	37·1%
	(0·188 to 0·592)	(6·47 to 20·3)	(5·61 to 17·6)	(0·842 to 1·50)	(30·1 to 53·8)	(24·9 to 48·9)
≥65 years	0·0466	3·94%	3·69%	0·287	25·9%	24·1%
	(0·0190 to 0·0842)	(1·61 to 7·12)	(1·44 to 6·70)	(0·178 to 0·395)	(16·1 to 35·6)	(15·1 to 33·2)
Federated States of Micro	nesia					
15–39 years	2·10	10·2%	-3·07%	8·29	38·0%	-6·71%
	(0·128 to 4·00)	(0·623 to 19·4)	(-9·27 to 4·02)	(5·12 to 10·6)	(23·5 to 48·7)	(-15·3 to 0·785)
40-64 years	0·129	1·06%	-1·66%	1·35	10·9%	-9·93%
	(0·00700 to 0·389)	(0·0576 to 3·20)	(-4·24 to 0·0605)	(0·267 to 2·78)	(2·15 to 22·4)	(-17·4 to -1·59)
					(Ta	able 1 continues on next page)

	Females I			Males		
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change sir 1990 (%)
(Continued from previous pa	ige)					
≥65 years	0·00297	0·116%	-0·416%	0·0905	4·46%	-5·82%
	(0 to 0·0140)	(0 to 0·549)	(-1·52 to 0·0392)	(0·0140 to 0·234)	(0·690 to 11·5)	(-12·2 to -0·392)
Fiji						
15–39 years	11·4	6·55%	1·13%	72·7	39·8%	2·74%
	(2·32 to 19·3)	(1·33 to 11·0)	(-1·69 to 4·24)	(51·3 to 87·4)	(28·1 to 47·8)	(-2·97 to 8·46)
40–64 years	1·55	1·34%	0·312%	16·5	13.8%	1·82%
	(0·266 to 3·41)	(0·229 to 2·93)	(-0·545 to 1·28)	(6·33 to 27·2)	(5.26 to 22.6)	(-2·55 to 5·89)
≥65 years	0.0584	0·190%	0·0403%	1·47	6·00%	1·23%
	(0.00600 to 0.182)	(0·0195 to 0·592)	(-0·201 to 0·274)	(0·449 to 2·96)	(1·84 to 12·1)	(-1·92 to 4·07)
Guam						
15-39 years	5·23	18·2%	3·10%	16·0	49·9%	4·96%
	(0·316 to 9·69)	(1·10 to 33·8)	(−9·72 to 16·2)	(9·72 to 20·2)	(30·4 to 63·3)	(-7·75 to 24·2)
40-64 years	0·525	2·28%	1·32%	4·44	17·9%	8·09%
	(0·00200 to 1·86)	(0·00869 to 8·09)	(-2·40 to 6·71)	(0·327 to 9·38)	(1·32 to 37·8)	(-8·53 to 26·9)
≥65 years	0.0225	0·269%	0·166%	0.602	8·38%	4·65%
	(0 to 0.128)	(0 to 1·53)	(-0·443 to 1·31)	(0.0170 to 1.62)	(0·237 to 22·5)	(-5·13 to 17·5)
Kiribati	· ,	/	· /	,		
15-39 years	1·02	4·04%	-1·12%	5·23	21·8%	-6·67%
	(0·0550 to 2·15)	(0·219 to 8·53)	(-4·10 to 1·87)	(2·34 to 7·58)	(9·75 to 31·6)	(-13·3 to -0·299)
40–64 years	0.0642	0·501%	-0·527%	0·401	3·49%	-4·63%
	(0 to 0.255)	(0 to 1·99)	(-1·85 to 0·172)	(0·00200 to 1·28)	(0·0174 to 11·2)	(-10·6 to -0·0262)
≥65 years	0·00219	0·0781%	-0·161%	0·0172	1·03%	-2·14%
	(0 to 0·0140)	(0 to 0·500)	(-0·826 to 0·114)	(0 to 0·0772)	(0 to 4·61)	(-6·31 to 0·0599)
Marshall Islands						
15–39 years	0·474	4·14%	0·416%	3·91	32·1%	1·55%
	(0·0620 to 0·810)	(0·541 to 7·07)	(−1·78 to 2·65)	(2·59 to 4·80)	(21·3 to 39·4)	(-5·18 to 7·74)
40-64 years	0.0456	0·737%	0·103%	0·717	11·4%	1·27%
	(0.00500 to 0.112)	(0·0808 to 1·81)	(-0·796 to 0·902)	(0·216 to 1·25)	(3·45 to 19·9)	(-4·74 to 6·83)
≥65 years	0.00151	0·143%	0·0269%	0.0585	5·12%	1·22%
	(0 to 0.00603)	(0 to 0·571)	(-0·408 to 0·475)	(0.0150 to 0.126)	(1·31 to 11·1)	(-2·73 to 5·21)
Nauru						
15-39 years	0·365	16·0%	-0·0133%	1·16	49·5%	1·61%
	(0·0551 to 0·595)	(2·42 to 26·1)	(-7·50 to 8·75)	(0·843 to 1·36)	(36·1 to 58·2)	(-5·40 to 10·6)
40-64 years	0.0364	3·59%	0·477%	0·231	24·1%	4·13%
	(0.00502 to 0.0792)	(0·496 to 7·82)	(−3·51 to 3·93)	(0·0984 to 0·360)	(10·3 to 37·7)	(-7·25 to 14·4)
≥65 years	0.00156	0·673%	0·0504%	0·0207	12·5%	2·15%
	(0 to 0.00609)	(0 to 2·62)	(−2·33 to 1·94)	(0·00616 to 0·0401)	(3·73 to 24·2)	(-8·08 to 11·1)
Niue						
15–39 years	0.0602	21·9%	0·382%	0·132	45·9%	1·91%
	(0.00709 to 0.101)	(2·57 to 36·8)	(-10·8 to 12·3)	(0·0959 to 0·159)	(33·2 to 54·9)	(-6·50 to 12·9)
40–64 years	0·0130	5·05%	0·781%	0.0642	23·7%	3·54%
	(0 to 0·0321)	(0 to 12·5)	(−5·73 to 6·99)	(0.0192 to 0.108)	(7·12 to 40·1)	(–10·5 to 17·6)
≥65 years	0·000706	0·639%	0·0969%	0·00871	11·5%	2·65%
	(0 to 0·00313)	(0 to 2·83)	(−2·31 to 2·05)	(0·00104 to 0·0179)	(1·37 to 23·6)	(-9·47 to 14·1)
Northern Mariana Islands						
15-39 years	0·795	12·2%	2·04%	3·01	42·1%	4·58%
	(0·0489 to 1·50)	(0·751 to 23·0)	(-5·80 to 10·7)	(1·76 to 3·71)	(24·6 to 51·9)	(-8·59 to 21·0)
40-64 years	0·131	1·57%	-0·0752%	1·22	13·8%	0·988%
	(0 to 0·428)	(0 to 5·13)	(-3·98 to 3·20)	(0·0509 to 2·64)	(0·574 to 29·8)	(−16·3 to 17·1)
≥65 years	0·00586	0·331%	0.0594%	0·128	7·09%	1·81%
	(0 to 0·0300)	(0 to 1·70)	(-1.19 to 1.25)	(0·00100 to 0·339)	(0·0556 to 18·8)	(-8·23 to 11·8)
Palau						
15-39 years	0·441	18·0%	-0·784%	1·64	46·3%	-0·290%
	(0·0320 to 0·852)	(1·31 to 34·7)	(-12·8 to 10·2)	(0·825 to 2·22)	(23·3 to 62·7)	(-13·7 to 12·8)

	Females N			Males		
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)
(Continued from previou	s page)					
40-64 years	0·117	3·57%	0·0146%	0·595	15·3%	2·08%
	(0·00100 to 0·375)	(0·0305 to 11·4)	(-7·43 to 6·34)	(0·0420 to 1·41)	(1·08 to 36·1)	(-15·1 to 16·9)
≥65 years	0·00576	0·671%	0·0213%	0.0548	7·29%	1·53%
	(0 to 0·0281)	(0 to 3·27)	(-2·49 to 2·33)	(0.00201 to 0.163)	(0·267 to 21·7)	(-9·04 to 12·7)
Papua New Guinea						
15-39 years	67·3	3·28%	-0·471%	442	20·6%	-2·09%
	(9·27 to 116)	(0·452 to 5·67)	(-2·27 to 1·46)	(304 to 554)	(14·2 to 25·9)	(-6·49 to 2·32)
40-64 years	5·90	0.648%	-0·295%	63.0	6·41%	-2·26%
	(0·864 to 13·3)	(0.0948 to 1.46)	(-0·913 to 0·188)	(20.2 to 110)	(2·06 to 11·2)	(-4·94 to 0·291)
≥65 years	0·164	0·114%	-0·131%	4·15	2·44%	-1·23%
	(0·0130 to 0·518)	(0·00901 to 0·360)	(-0·420 to 0·0244)	(1·15 to 8·79)	(0·680 to 5·18)	(-3·16 to 0·242)
Samoa						
15–39 years	1·58	4·14%	-0·588%	11·0	27·4%	-3·49%
	(0·194 to 2·80)	(0·508 to 7·35)	(-2·95 to 2·00)	(7·15 to 14·1)	(17·8 to 35·0)	(-8·90 to 2·30)
40-64 years	0.0965	0·487%	-0·294%	2·48	11·3%	-4·52%
	(0.00898 to 0.238)	(0·0453 to 1·20)	(-0·969 to 0·170)	(0·682 to 4·56)	(3·12 to 20·9)	(-10·1 to 0·572)
≥65 years	0·00267	0·0471%	-0·0755%	0·225	4·38%	-3·21%
	(0 to 0·0100)	(0 to 0·176)	(-0·300 to 0·0542)	(0·0469 to 0·505)	(0·914 to 9·84)	(-7·32 to 0·205)
Solomon Islands						
15–39 years	9·03	6·76%	-0·794%	42·8	31.8%	1·32%
	(0·206 to 19·7)	(0·154 to 14·7)	(-6·63 to 4·10)	(22·0 to 58·0)	(16.4 to 43.2)	(-5·85 to 9·09)
40-64 years	0·217	0·356%	0·155%	3·32	5·31%	2·47%
	(0·00300 to 0·759)	(0·00494 to 1·25)	(-0·186 to 0·751)	(0·253 to 8·44)	(0·404 to 13·5)	(0·0805 to 6·81)
≥65 years	0·00234	0·0211%	0·00919%	0·138	1·23%	0·609%
	(0 to 0·0150)	(0 to 0·136)	(-0·0444 to 0·0904)	(0·00698 to 0·500)	(0·0624 to 4·48)	(-0·274 to 2·36)
Tokelau	_					
15–39 years	0·0280	11·5%	0·0876%	0·107	42·1%	1·67%
	(0·00304 to 0·0514)	(1·24 to 21·1)	(-7·02 to 7·73)	(0·0702 to 0·133)	(27·6 to 52·2)	(−7·47 to 10·5)
40-64 years	0·00320	1·96%	0·541%	0.0286	16·8%	4·90%
	(0 to 0·0102)	(0 to 6·25)	(-2·73 to 4·36)	(0.00607 to 0.0539)	(3·57 to 31·7)	(-5·86 to 16·7)
≥65 years	0·000243	0·322%	0·00820%	0.00505	7·94%	2·38%
	(0 to 0·00207)	(0 to 2·74)	(-2·02 to 2·70)	(0 to 0.0127)	(0 to 20·0)	(-8·04 to 13·3)
Tonga						
15–39 years	0·762	3.84%	-0·444%	3·22	17·0%	-2·95%
	(0·0959 to 1·40)	(0.483 to 7.04)	(-2·89 to 1·89)	(1·89 to 4·26)	(9·98 to 22·4)	(-7·63 to 1·86)
40-64 years	0.0869	0·791%	-0·200%	0.451	4·28%	-1·44%
	(0.00600 to 0.237)	(0·0546 to 2·16)	(-1·21 to 0·827)	(0.0510 to 1.02)	(0·484 to 9·68)	(-5·16 to 1·88)
≥65 years	0·00670	0·183%	-0·150%	0.0494	1.67%	-1·05%
	(0 to 0·0251)	(0 to 0·686)	(-0·707 to 0·240)	(0.00300 to 0.143)	(0.102 to 4.84)	(-3·72 to 1·08)
Tuvalu						
15–39 years	0·233	10·2%	0·0379%	1·06	40·6%	0·275%
	(0·0120 to 0·484)	(0·529 to 21·3)	(-6·43 to 7·01)	(0·632 to 1·36)	(24·1 to 52·0)	(-7·84 to 8·87)
40-64 years	0·0128	0.942%	-0·104%	0·147	10·3%	0·843%
	(0 to 0·0431)	(0 to 3.17)	(-1·79 to 1·26)	(0·0240 to 0·323)	(1·69 to 22·7)	(-5·46 to 6·69)
≥65 years	0·000548	0·111%	-0·0387%	0·0146	3·89%	-0·250%
	(0 to 0·00402)	(0 to 0·815)	(-0·748 to 0·496)	(0·00101 to 0·0423)	(0·269 to 11·3)	(-5·88 to 3·88)
Vanuatu						
15–39 years	4·67	7·57%	-0.633%	20·3	33·7%	0·238%
	(0·680 to 7·95)	(1·10 to 12·9)	(-4.93 to 3.82)	(14·4 to 24·8)	(23·9 to 41·1)	(-5·42 to 6·74)
40-64 years	0·307	1·07%	0·0336%	3·38	11·6%	1·15%
	(0·0450 to 0·718)	(0·157 to 2·51)	(-0·937 to 0·878)	(1·20 to 5·69)	(4·13 to 19·6)	(−3·53 to 5·20)
≥65 years	0·0114	0·190%	-0·00162%	0·280	4·80%	0·594%
	(0 to 0·0381)	(0 to 0·631)	(-0·375 to 0·324)	(0·0860 to 0·576)	(1·48 to 9·89)	(−2·36 to 3·19)
					(Tal	ole 1 continues on next page

	Females			Males			
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	
(Continued from previo	ous page)						
Southeast Asia							
15–39 years	7610	5·55%	1·18%	49 500	35·0%	4·52%	
	(2560 to 12 100)	(1·87 to 8·86)	(-0·0755 to 2·85)	(39 000 to 56 500)	(27·6 to 39·9)	(1·91 to 10·4)	
40–64 years	2760	2·80%	0·330%	23 600	24·7%	8·49%	
	(1590 to 3980)	(1·61 to 4·04)	(-0·439 to 1·19)	(18 400 to 28 200)	(19·2 to 29·4)	(5·81 to 11·2)	
≥65 years	327	1·19%	0·139%	3120	14·3%	6·61%	
	(167 to 511)	(0·607 to 1·86)	(−0·322 to 0·560)	(2040 to 3950)	(9·37 to 18·2)	(4·49 to 8·43)	
Cambodia							
15-39 years	649	18·2%	8·22%	1580	43·7%	11·7%	
	(294 to 936)	(8·26 to 26·3)	(2·69 to 13·9)	(1340 to 1770)	(37·2 to 49·2)	(5·56 to 22·8)	
40-64 years	241	12·2%	8·68%	590	34·5%	20·1%	
	(150 to 335)	(7·65 to 17·0)	(5·37 to 12·2)	(489 to 674)	(28·6 to 39·5)	(12·3 to 27·1)	
≥65 years	25·4	4·56%	3·61%	69·4	20·4%	14·7%	
	(13·2 to 40·8)	(2·38 to 7·33)	(1·82 to 5·88)	(50·4 to 86·2)	(14·8 to 25·3)	(10·0 to 19·3)	
Indonesia							
15–39 years	375	0·679%	-0·0957%	4430	7·68%	0·206%	
	(72-7 to 725)	(0·132 to 1·31)	(-0·476 to 0·348)	(2430 to 6020)	(4·21 to 10·4)	(-1·71 to 2·36)	
40-64 years	140	0·358%	-0·122%	1230	3·12%	-0·560%	
	(30-2 to 283)	(0·0772 to 0·724)	(-0·391 to 0·130)	(422 to 2010)	(1·07 to 5·11)	(-1·64 to 0·574)	
≥65 years	12·4	0·138%	-0·0898%	83·7	1·05%	-0·394%	
	(1·26 to 29·8)	(0·0140 to 0·332)	(-0·259 to 0·0398)	(13·7 to 173)	(0·172 to 2·17)	(-1·08 to 0·245)	
Laos							
15-39 years	459	29·1%	3·42%	1060	66·1%	2·90%	
	(214 to 649)	(13·6 to 41·2)	(-5·69 to 17·5)	(829 to 1210)	(51·7 to 75·5)	(-3·39 to 15·9)	
40-64 years	108	14·3%	2·52%	348	46·6%	9·47%	
	(63·6 to 154)	(8·44 to 20·4)	(-3·87 to 9·10)	(252 to 430)	(33·8 to 57·7)	(-1·04 to 22·2)	
≥65 years	7·13	4·29%	1·09%	37·4	25·3%	7·30%	
	(2·92 to 12·3)	(1·76 to 7·41)	(-1·95 to 3·93)	(19·9 to 53·4)	(13·5 to 36·1)	(−1·34 to 16·3)	
Malaysia							
15–39 years	224	3·42%	-0·699%	1130	15·6%	-4·03%	
	(76·9 to 369)	(1·17 to 5·62)	(-2·43 to 1·38)	(760 to 1400)	(10·5 to 19·3)	(-7·33 to -0·266)	
40-64 years	74·6	1·97%	-1·40%	344	8.63%	-5·60%	
	(32·6 to 124)	(0·861 to 3·28)	(-2·90 to 0·116)	(200 to 483)	(5.02 to 12.1)	(-8·50 to -2·50)	
≥65 years	9·24	0·810%	-1·08%	39·2	3·59%	-3·61%	
	(3·09 to 17·9)	(0·271 to 1·57)	(-2·15 to -0·216)	(16·2 to 63·4)	(1·49 to 5·81)	(-6·01 to -1·04)	
Maldives							
15-39 years	1·88	2·13%	-0·947%	42·0	25·0%	0·412%	
	(0·0716 to 5·30)	(0·0810 to 5·99)	(-4·03 to 1·53)	(16·6 to 66·6)	(9·87 to 39·7)	(−6·97 to 9·11)	
40–64 years	0·210	0·430%	0·0295%	7.65	10·0%	4·73%	
	(0·00700 to 0·706)	(0·0143 to 1·45)	(-1·10 to 0·840)	(1.93 to 15.5)	(2·53 to 20·3)	(-2·32 to 12·1)	
≥65 years	0·00702	0·0737%	-0·0218%	0·245	2·35%	0·961%	
	(0 to 0·0330)	(0 to 0·347)	(-0·461 to 0·207)	(0·0170 to 0·676)	(0·163 to 6·50)	(-2·62 to 4·47)	
Mauritius							
15-39 years	19·8	8·67%	-4·64%	121	51·9%	-6·02%	
	(1·65 to 49·7)	(0·722 to 21·8)	(-12·0 to 3·01)	(80·9 to 151)	(34·7 to 64·7)	(-12·8 to 4·47)	
40-64 years	5·13	2·30%	-2·15%	69·2	31·4%	-7·35%	
	(0·813 to 12·4)	(0·364 to 5·55)	(-6·40 to 0·800)	(39·3 to 97·2)	(17·9 to 44·2)	(-15·1 to 3·35)	
≥65 years	0·501	0·564%	-0·762%	12·0	17·6%	-5·92%	
	(0·0360 to 1·71)	(0·0404 to 1·92)	(-2·77 to 0·224)	(4·47 to 19·3)	(6·55 to 28·2)	(-13·6 to 3·42)	
Myanmar							
15–39 years	175	1·53%	0·720%	4010	36·7%	12·6%	
	(35·9 to 333)	(0·314 to 2·92)	(-0·0487 to 1·39)	(3190 to 4650)	(29·2 to 42·5)	(5·95 to 21·9)	
40–64 years	40·3	0·525%	0·460%	1770	26·7%	18·8%	
	(10·8 to 84·7)	(0·140 to 1·10)	(0·129 to 0·912)	(1370 to 2140)	(20·8 to 32·4)	(12·8 to 23·7)	
					(Ta	able 1 continues on next page	

	Females A			Males		
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)
(Continued from previous pag	ge)					
≥65 years	1·82	0.0846%	0·0791%	191	12·6%	10·6%
	(0·338 to 4·39)	(0.0157 to 0.204)	(0·0154 to 0·188)	(116 to 259)	(7·66 to 17·1)	(6·96 to 14·4)
Philippines						
15-39 years	3910	17·2%	-1·10%	15 900	66·8%	-1·85%
	(1520 to 5960)	(6·65 to 26·1)	(-7·59 to 8·78)	(12 700 to 18 100)	(53·1 to 75·8)	(-7·52 to 6·18)
40–64 years	1330	10·6%	-0·952%	6240	48·9%	0·0388%
	(773 to 1900)	(6·17 to 15·1)	(-5·45 to 4·44)	(4760 to 7540)	(37·3 to 59·1)	(–6·26 to 10·9)
≥65 years	165	4·84%	-0·530%	671	26·5%	1·36%
	(81·9 to 266)	(2·40 to 7·80)	(-3·79 to 2·07)	(408 to 897)	(16·1 to 35·5)	(-4·89 to 9·48)
Seychelles						
15-39 years	0·815	4·73%	-0·0942%	8-90	41·9%	-0·523%
	(0·233 to 1·34)	(1·35 to 7·78)	(-2·37 to 2·61)	(7-12 to 10-3)	(33·5 to 48·7)	(-6·45 to 6·81)
40-64 years	0·401	2·50%	-0·314%	5·25	29·2%	0·300%
	(0·172 to 0·677)	(1·07 to 4·23)	(-1·83 to 1·24)	(3·94 to 6·45)	(21·9 to 35·8)	(−5·51 to 7·10)
≥65 years	0·0412	0·871%	-0·244%	0·556	14·4%	-0·0913%
	(0·0130 to 0·0821)	(0·275 to 1·74)	(-1·17 to 0·536)	(0·332 to 0·769)	(8·63 to 20·0)	(-5·14 to 5·10)
Sri Lanka						
15-39 years	39·5	0·958%	0·0624%	932	23·7%	1.61%
	(16·4 to 59·9)	(0·399 to 1·45)	(-0·430 to 0·602)	(790 to 1070)	(20·1 to 27·1)	(-2.45 to 6.44)
40-64 years	27·8	0.809%	0·147%	715	22·9%	5·06%
	(18·3 to 38·6)	(0.533 to 1.12)	(-0·203 to 0·519)	(615 to 817)	(19·6 to 26·1)	(0·797 to 9·65)
≥65 years	6·48	0·480%	0·0850%	141	14·0%	4·05%
	(3·92 to 9·35)	(0·290 to 0·692)	(-0·191 to 0·328)	(107 to 175)	(10·7 to 17·4)	(0·424 to 8·04)
Thailand						
15-39 years	679	5·62%	0·262%	5610	46·5%	-0·106%
	(269 to 1010)	(2·22 to 8·32)	(-2·06 to 3·12)	(4810 to 6280)	(39·9 to 52·1)	(-6·09 to 6·57)
40-64 years	484	3·49%	-0·234%	4500	34·7%	-0·323%
	(284 to 692)	(2·04 to 4·99)	(-1·88 to 1·36)	(3730 to 5190)	(28·9 to 40·1)	(-5·29 to 5·79)
≥65 years	71·5	1·38%	-0·287%	754	18·5%	-0·826%
	(36·7 to 112)	(0·710 to 2·16)	(-1·31 to 0·546)	(559 to 957)	(13·7 to 23·5)	(-5·72 to 4·57)
Timor-Leste						
15–39 years	4·87	1·74%	0·0953%	66·9	24·3%	1·47%
	(1·56 to 8·32)	(0·558 to 2·97)	(-0·880 to 1·06)	(51·8 to 77·6)	(18·8 to 28·2)	(-3·35 to 7·57)
40-64 years	1·78	1·63%	0·426%	26·9	22·9%	6.06%
	(0·860 to 2·87)	(0·787 to 2·63)	(-0·403 to 1·21)	(20·1 to 33·3)	(17·1 to 28·3)	(1.16 to 11.3)
≥65 years	0⋅326	0·856%	0·265%	4·54	13·0%	4·56%
	(0⋅119 to 0⋅591)	(0·313 to 1·55)	(-0·334 to 0·871)	(2·68 to 6·11)	(7·68 to 17·5)	(0·833 to 8·61)
Vietnam						
15–39 years	1070	5·65%	3·70%	14500	73·7%	23·6%
	(104 to 2410)	(0·550 to 12·8)	(0·0489 to 6·70)	(11600 to 16500)	(58·8 to 83·8)	(10·1 to 48·4)
40–64 years	300	2·03%	1·98%	7750	55·0%	48·9%
	(74·9 to 636)	(0·507 to 4·30)	(0·506 to 3·93)	(5860 to 9310)	(41·6 to 66·1)	(36·3 to 54·9)
≥65 years	26·4	0.602%	0·599%	1110	38·1%	36·7%
	(4·86 to 62·4)	(0.111 to 1.42)	(0·111 to 1·39)	(691 to 1440)	(23·7 to 49·4)	(23·6 to 45·3)
Central sub-Saharan Africa						
15-39 years	4950	18·7%	-3·66%	11 000	41·9%	-1·97%
	(110 to 6840)	(0·416 to 25·8)	(-9·61 to 7·70)	(7330 to 12 300)	(27·8 to 46·7)	(-6·62 to 9·22)
40-64 years	1200	11·9%	-0·869%	3280	33·0%	0·429%
	(100 to 2010)	(0·992 to 19·9)	(-5·39 to 4·06)	(1110 to 4730)	(11·2 to 47·6)	(-6·28 to 9·82)
≥65 years	100	5·00%	-0·944%	262	18·1%	-0·935%
	(14·6 to 194)	(0·731 to 9·71)	(-4·60 to 1·92)	(88-2 to 405)	(6·07 to 27·9)	(-7·68 to 5·97)
Angola						
15–39 years	938	15·3%	1·31%	2290	41·2%	3·47%
	(64·3 to 1270)	(1·05 to 20·8)	(-4·13 to 8·39)	(1840 to 2530)	(33·0 to 45·4)	(-2·30 to 16·3)
					(Ta	able 1 continues on next page)

	Females			Males		
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change sinc 1990 (%)
(Continued from previou	us page)					
40-64 years	313	13·4%	3·74%	872	42·2%	11·1%
	(64-7 to 457)	(2·78 to 19·6)	(-0·707 to 7·68)	(513 to 1060)	(24·8 to 51·5)	(2·97 to 21·4)
≥65 years	20·9	5·11%	1·78%	75·5	24·2%	8·96%
	(6·43 to 35·5)	(1·57 to 8·66)	(-0·746 to 4·21)	(42·7 to 99·2)	(13·7 to 31·8)	(3·14 to 14·4)
Central African Republi	c					
15–39 years	240	18·3%	-5·73%	514	40·5%	-5·50%
	(0·948 to 360)	(0·0720 to 27·3)	(-14·2 to 7·10)	(310 to 593)	(24·4 to 46·8)	(-11·7 to 4·77)
40–64 years	46·0	9·87%	-4·53%	132	27·7%	-7·74%
	(1·06 to 88·2)	(0·228 to 18·9)	(-10·6 to 1·65)	(24·1 to 210)	(5·06 to 44·1)	(-15·5 to 2·27)
≥65 years	3·03	3·98%	-3·12%	7·05	13·1%	-9·37%
	(0·127 to 7·00)	(0·166 to 9·19)	(-8·32 to 0·722)	(0·948 to 13·1)	(1·77 to 24·4)	(-17·8 to 0·313)
Congo (Brazzaville)						
15–39 years	461	41·4%	1·83%	613	58·4%	3·86%
	(13·0 to 614)	(1·17 to 55·2)	(-9·08 to 19·3)	(436 to 679)	(41·6 to 64·7)	(-3·12 to 15·6)
40-64 years	114	22·7%	5·26%	237	44·4%	8·51%
	(9.85 to 182)	(1·96 to 36·1)	(-1·96 to 12·5)	(101 to 326)	(18·9 to 61·1)	(-0·203 to 20·4)
≥65 years	9·95	10·7%	3·27%	22·8	29·2%	7·70%
	(1·55 to 18·7)	(1·67 to 20·1)	(-2·18 to 8·77)	(7·87 to 33·8)	(10·1 to 43·3)	(-0·645 to 16·3)
Democratic Republic of	fthe Congo					
15-39 years	3170	18·3%	-4·87%	7280	41·0%	-3·50%
	(8·39 to 4640)	(0·0485 to 26·9)	(-12·8 to 7·51)	(4390 to 8340)	(24·7 to 47·0)	(-9·62 to 6·66)
40-64 years	680	10·4%	-2·46%	1920	29·1%	-2·98%
	(17·6 to 1250)	(0·270 to 19·1)	(-8·33 to 3·05)	(397 to 2990)	(6·00 to 45·2)	(-11·1 to 7·17)
≥65 years	60·0	4·42%	-1·59%	142	14·8%	-4·00%
	(3·43 to 137)	(0·253 to 10·0)	(-6·33 to 2·11)	(22·3 to 250)	(2·32 to 26·0)	(-12·5 to 4·31)
Equatorial Guinea						
15–39 years	61·2	20·8%	-2·12%	173	46·1%	2·59%
	(3·67 to 84·9)	(1·25 to 28·9)	(-10·8 to 9·54)	(139 to 192)	(37·2 to 51·1)	(-4·50 to 16·4)
40–64 years	16·9	16·5%	3·91%	37·5	43·7%	13·0%
	(2·92 to 25·5)	(2·85 to 24·9)	(-3·01 to 10·4)	(20·1 to 47·1)	(23·5 to 54·9)	(2·66 to 25·1)
≥65 years	1·85	9·51%	3·92%	4·03	29·8%	12·2%
	(0·513 to 3·17)	(2·63 to 16·3)	(-1·16 to 8·66)	(1·92 to 5·48)	(14·2 to 40·5)	(3·12 to 20·8)
Gabon						
15-39 years	82·4	21·1%	-4·78%	165	48·0%	-3·77%
	(5·92 to 112)	(1·52 to 28·7)	(-12·9 to 7·76)	(131 to 182)	(38·1 to 52·9)	(-9·78 to 4·73)
40–64 years	29.6	17·2%	-2·79%	76.6	44·8%	-3·07%
	(5.46 to 44.1)	(3·17 to 25·6)	(-9·58 to 4·64)	(42.2 to 93.8)	(24·7 to 54·9)	(-9·76 to 6·50)
≥65 years	4·16	10·3%	-2·47%	11·1	32·9%	-4·05%
	(1·17 to 6·81)	(2·89 to 16·9)	(-8·50 to 2·99)	(5·88 to 14·3)	(17·4 to 42·3)	(-11·8 to 6·07)
Eastern sub-Saharan Af	frica					
15–39 years	12 800	14·4%	0·00659%	31 200	36·8%	1·13%
	(2610 to 19 800)	(2·93 to 22·3)	(−5·55 to 11·1)	(19 900 to 35 500)	(23·5 to 41·8)	(-3·78 to 18·9)
40-64 years	3280	10·9%	0·923%	9360	31·8%	3·22%
	(1440 to 5280)	(4·76 to 17·5)	(-3·16 to 5·68)	(5420 to 13 000)	(18·4 to 44·2)	(-2·82 to 14·5)
≥65 years	372	5·98%	0·864%	1150	21·2%	3·18%
	(184 to 558)	(2·96 to 8·97)	(-0·731 to 2·48)	(705 to 1490)	(13·0 to 27·5)	(-0·226 to 7·80)
Burundi						
15-39 years	244	10·0%	-1·74%	891	39·1%	-6·31%
	(62-3 to 362)	(2·55 to 14·8)	(-6·69 to 5·84)	(629 to 1020)	(27·6 to 44·7)	(-12·5 to 6·43)
40–64 years	67·4	8·86%	-3·20%	315	37·4%	-10·2%
	(29·6 to 104)	(3·89 to 13·7)	(-7·77 to 2·31)	(204 to 391)	(24·3 to 46·5)	(-17·0 to 0·683)
≥65 years	6·35	4·12%	-2·94%	40·4	24·2%	-9·85%
	(2·76 to 10·3)	(1·79 to 6·71)	(-6·11 to 0·220)	(26·5 to 52·2)	(15·8 to 31·2)	(-16·1 to -2·42)
					(T:	able 1 continues on next pag

	Females			Males			
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	
(Continued from previou	us page)						
Comoros							
15–39 years	4·29	2·87%	-0·300%	13·2	8·73%	0·559%	
	(1·43 to 6·96)	(0·958 to 4·66)	(-2·90 to 2·57)	(8·41 to 16·3)	(5·56 to 10·8)	(−2·61 to 5·06)	
40-64 years	0.609	0·794%	0·0975%	3·17	4·23%	1·54%	
	(0.195 to 1.05)	(0·254 to 1·37)	(-0·533 to 0·676)	(1·41 to 4·50)	(1·88 to 6·00)	(-0·0562 to 3·54)	
≥65 years	0·111	0·503%	0·140%	0.448	2·65%	1·26%	
	(0·0300 to 0·208)	(0·135 to 0·940)	(-0·322 to 0·500)	(0.155 to 0.707)	(0·918 to 4·19)	(0·0471 to 2·57)	
Djibouti							
15–39 years	13·0	5·32%	-3·44%	61·9	22·7%	-7·53%	
	(0·0120 to 36·6)	(0·00491 to 15·0)	(-9·02 to 3·91)	(11·4 to 93·2)	(4·21 to 34·3)	(-16·3 to 11·4)	
40-64 years	1.61	1·44%	–3·84%	8·57	6·42%	-14·4%	
	(0.0190 to 6.57)	(0·0170 to 5·87)	(–8·60 to 0·180)	(0·167 to 31·0)	(0·125 to 23·2)	(-23·6 to 0·0189)	
≥65 years	0.0378	0·209%	-1·67%	0·204	0·994%	-8·53%	
	(0 to 0.165)	(0 to 0·914)	(-4·22 to -0·0104)	(0·00400 to 0·745)	(0·0195 to 3·63)	(-15·7 to -0·373)	
Eritrea							
15–39 years	191	12·2%	-1·31%	567	34·8%	1·01%	
	(1·76 to 480)	(0·112 to 30·5)	(-10·2 to 12·1)	(269 to 714)	(16·5 to 43·8)	(-6·47 to 19·1)	
40-64 years	19·0	2·90%	-1·66%	125	20·4%	-3·70%	
	(0·148 to 90·1)	(0·0226 to 13·7)	(-7·97 to 2·35)	(27·7 to 233)	(4·52 to 37·9)	(-12·0 to 7·61)	
≥65 years	0·550	0·443%	-0·662%	7·18	9·19%	-4·30%	
	(0·00198 to 2·40)	(0·00159 to 1·93)	(-3·07 to 0·249)	(1·32 to 13·8)	(1·69 to 17·7)	(-11·3 to 2·49)	
Ethiopia							
15–39 years	5860	25·9%	3·08%	10 600	47·9%	5·41%	
	(734 to 9310)	(3·25 to 41·2)	(-8·38 to 20·8)	(6560 to 12 200)	(29·7 to 55·4)	(-3·89 to 29·0)	
40-64 years	1220	17·0%	4·98%	2700	37·0%	10·2%	
	(312 to 2150)	(4·35 to 30·0)	(-2·98 to 12·9)	(1260 to 3910)	(17·3 to 53·7)	(-0·315 to 24·7)	
≥65 years	123	8·16%	3·17%	362	22·4%	7·84%	
	(31·2 to 224)	(2·07 to 14·9)	(-0·951 to 7·31)	(161 to 527)	(9·92 to 32·6)	(0·327 to 14·8)	
Kenya							
15-39 years	754	6·96%	0·0298%	4300	41·5%	2·65%	
	(155 to 1150)	(1·43 to 10·6)	(-3·04 to 4·95)	(2570 to 5000)	(24·9 to 48·3)	(-3·71 to 18·5)	
40–64 years	279	7·20%	-1·64%	1700	43·0%	-2·56%	
	(134 to 425)	(3·47 to 11·0)	(-5·18 to 2·55)	(987 to 2260)	(25·0 to 57·3)	(-10·2 to 13·7)	
≥65 years	50·4	5.60%	-0·711%	219	30·3%	-2·12%	
	(21·0 to 80·3)	(2.33 to 8.92)	(-3·75 to 2·18)	(126 to 288)	(17·4 to 39·8)	(-8·70 to 6·12)	
Madagascar							
15–39 years	516	8.83%	-1·40%	1760	31·7%	-2·33%	
	(32·8 to 921)	(0.563 to 15.8)	(-6·90 to 6·63)	(891 to 2170)	(16·1 to 39·2)	(-9·59 to 16·4)	
40-64 years	122	5·58%	-1·87%	485	23·1%	-4·95%	
	(24·2 to 255)	(1·11 to 11·7)	(-6·46 to 2·72)	(166 to 792)	(7·90 to 37·8)	(-12·3 to 9·04)	
≥65 years	7·84	2·21%	-1·18%	35·1	11·1%	-4·58%	
	(1·46 to 17·2)	(0·412 to 4·85)	(-3·75 to 1·02)	(11·8 to 57·6)	(3·73 to 18·1)	(-11·2 to 2·69)	
Malawi							
15-39 years	112	2·72%	0·307%	1050	27·7%	5·12%	
	(31·5 to 170)	(0·764 to 4·12)	(-1·04 to 2·10)	(750 to 1220)	(19·8 to 32·2)	(0·0193 to 17·4)	
40-64 years	43·8	3·45%	0·426%	336	27·3%	5·44%	
	(20·3 to 68·2)	(1·60 to 5·36)	(−1·36 to 2·31)	(217 to 427)	(17·6 to 34·7)	(-0·756 to 15·8)	
≥65 years	7·74	2·47%	0·0339%	34·9	15·4%	2·54%	
	(3·29 to 12·8)	(1·05 to 4·09)	(−1·71 to 1·64)	(21·1 to 46·4)	(9·33 to 20·5)	(-2·57 to 8·10)	
Mozambique							
15-39 years	1120	18·2%	3·01%	2550	47·1%	7·07%	
	(30·4 to 2100)	(0·492 to 33·9)	(-8·39 to 17·6)	(1210 to 3140)	(22·4 to 58·0)	(-3·80 to 29·1)	
40–64 years	180	8·78%	4·24%	542	29·8%	13·4%	
	(24·5 to 423)	(1·19 to 20·6)	(-0·980 to 9·75)	(134 to 968)	(7·35 to 53·3)	(0·708 to 24·5)	
		. ,	· · · · · · · · · · · · · · · · · · ·			ble 1 continues on next page	

	Females			Males			
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	
(Continued from previ	ous page)						
≥65 years	9·92	2·27%	1·56%	44·5	13·9%	8·84%	
	(1·24 to 24·3)	(0·285 to 5·56)	(0·107 to 3·84)	(13·1 to 79·5)	(4·10 to 24·8)	(2·60 to 15·5)	
Rwanda							
15–39 years	688	24·3%	-5·29%	1400	51·2%	-6·67%	
	(182 to 1010)	(6·43 to 35·6)	(-15·3 to 15·3)	(1090 to 1590)	(39·6 to 57·9)	(-14·5 to 17·6)	
40-64 years	204	17·7%	-4·11%	433	44·9%	-7·40%	
	(93·8 to 306)	(8·13 to 26·5)	(-11·8 to 7·91)	(297 to 525)	(30·8 to 54·5)	(-15·0 to 13·2)	
≥65 years	19·5	7·39%	-2·20%	49·7	28·3%	-8.01%	
	(8·60 to 31·7)	(3·27 to 12·1)	(-7·48 to 2·46)	(33·0 to 62·7)	(18·8 to 35·7)	(-15.2 to 3.09)	
Somalia							
15–39 years	127	2·50%	0·120%	495	9·01%	0.903%	
	(0 to 569)	(0 to 11·2)	(−5·31 to 6·09)	(0 to 919)	(0 to 16·7)	(-3.80 to 8.31)	
40-64 years	1·96	0·118%	-0·0693%	9.96	0·599%	-0.0297%	
	(0 to 0·00100)	(0 to 0·0000599)	(0 to 0)	(0 to 185)	(0 to 11·1)	(-2.41 to 0.00395)	
≥65 years	0·0127	0·00491%	-0·00252%	0·0141	0·00829%	-0·0152%	
	(0 to 0)	(0 to 0)	(0 to 0)	(0 to 0)	(0 to 0)	(0 to 0)	
South Sudan							
15–39 years	132	5·51%	-0·912%	541	22·1%	-1·20%	
	(0·0785 to 341)	(0·00327 to 14·2)	(-6·27 to 5·91)	(108 to 786)	(4·43 to 32·2)	(-9·10 to 13·3)	
40–64 years	12·0	1·49%	-0·676%	51·7	6·23%	-2·25%	
	(0·0958 to 51·0)	(0·0119 to 6·31)	(-4·07 to 1·67)	(0·482 to 197)	(0·0581 to 23·8)	(-10·1 to 4·94)	
≥65 years	0·259	0·228%	-0·190%	1·23	0·917%	-1·16%	
	(0·00100 to 1·26)	(0·000881 to 1·11)	(-1·22 to 0·372)	(0·00998 to 4·97)	(0·00746 to 3·72)	(-4·95 to 0·702)	
Tanzania							
15–39 years	1030	8-60%	-0·286%	2170	20·2%	0·103%	
	(508 to 1370)	(4-25 to 11-4)	(-3·89 to 5·28)	(1700 to 2510)	(15·8 to 23·4)	(-4·36 to 7·96)	
40–64 years	566	12·8%	0.609%	1140	27·5%	1·69%	
	(390 to 730)	(8·81 to 16·5)	(-4.05 to 6.29)	(879 to 1330)	(21·3 to 32·3)	(-3·71 to 10·3)	
≥65 years	87·4	9·40%	1·05%	204	24·0%	2·90%	
	(58·2 to 116)	(6·25 to 12·5)	(-2·88 to 4·54)	(154 to 246)	(18·2 to 29·0)	(-2·11 to 9·22)	
Uganda							
15–39 years	1480	17·2%	-2·76%	3170	39·5%	-3·59%	
	(588 to 2030)	(6·81 to 23·6)	(-12·9 to 13·1)	(2560 to 3560)	(31·9 to 44·3)	(-12·0 to 20·3)	
40–64 years	410	15·3%	1·01%	981	41·0%	2·61%	
	(249 to 549)	(9·26 to 20·4)	(-6·16 to 10·2)	(776 to 1140)	(32·4 to 47·5)	(-6·69 to 22·5)	
≥65 years	43·6	7·57%	1·85%	105	25·7%	4·57%	
	(26·5 to 64·1)	(4·61 to 11·1)	(-2·04 to 5·21)	(78·5 to 125)	(19·3 to 30·7)	(-2·66 to 14·0)	
Zambia							
15–39 years	547	13·6%	-1·47%	1610	42·2%	-1·41%	
	(109 to 822)	(2·71 to 20·4)	(-8·62 to 9·52)	(1140 to 1820)	(30·0 to 47·9)	(-8·91 to 21·4)	
40–64 years	148	11·8%	-1·34%	526	39·5%	1·57%	
	(59·2 to 232)	(4·74 to 18·5)	(-7·80 to 6·43)	(326 to 657)	(24·5 to 49·3)	(-7·03 to 19·5)	
≥65 years	14·9	6·05%	-0·643%	48·4	23·7%	1·29%	
	(5·85 to 24·7)	(2·37 to 10·0)	(-4·72 to 2·87)	(30·6 to 62·3)	(15·0 to 30·5)	(-5·31 to 10·4)	
Southern sub-Saharai	n Africa						
15–39 years	2680	15·8%	0·718%	7940	47·1%	1·39%	
	(476 to 3350)	(2·80 to 19·7)	(-3·09 to 4·30)	(7070 to 8460)	(41·9 to 50·1)	(-2·54 to 5·40)	
40–64 years	1100	12·0%	-2·46%	3400	42·1%	-3·07%	
	(681 to 1430)	(7·49 to 15·7)	(-5·68 to 0·784)	(2240 to 3940)	(27·7 to 48·8)	(-7·67 to 1·85)	
≥65 years	166	6·44%	-1·68%	437	25·8%	-1·92%	
	(110 to 221)	(4·27 to 8·57)	(-4·15 to 0·589)	(283 to 542)	(16·7 to 31·9)	(-6·07 to 2·73)	
Botswana							
15–39 years	77·2	14·5%	-0·0329%	198	37·5%	2·15%	
	(8·89 to 103)	(1·67 to 19·3)	(-4·97 to 4·61)	(173 to 218)	(32·9 to 41·4)	(-3·17 to 7·19)	
					/Tala	le 1 continues on next page	

	Females Males					
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)
(Continued from previous page	ge)					
40-64 years	21·8 (11·1 to 30·4)	8·40% (4·29 to 11·7)	0.0552% (-2.99 to 3.08)	73·6 (43·9 to 89·9)	30·2% (18·0 to 36·9) 13·8%	0·425% (-5·25 to 6·03) -0·856%
≥65 years	1·61 (0·807 to 2·59)	2·70% (1·36 to 4·35)	-0·297% (-2·06 to 1·42)	5.63 (3.24 to 7.66)	(7.92 to 18.8)	-0·650% (-5·20 to 3·62)
Eswatini						
15–39 years	18·0	6.90%	-0·370%	67·3	27·5%	1·97%
	(3·24 to 23·7)	(1.24 to 9.08)	(-2·98 to 1·82)	(59·2 to 74·8)	(24·2 to 30·5)	(-2·30 to 6·54)
40-64 years	6·49	6.57%	-1·38%	23·9	26·8%	-1·44%
	(3·80 to 8·67)	(3.84 to 8.76)	(-4·28 to 1·19)	(17·2 to 28·0)	(19·3 to 31·5)	(-6·35 to 4·27)
≥65 years	1·34	5·09%	-1·54%	2.68	18·1%	-0·297%
	(0·847 to 1·89)	(3·21 to 7·19)	(-4·37 to 0·997)	(1.94 to 3.33)	(13·1 to 22·4)	(-5·11 to 4·46)
Lesotho						
15–39 years	83·5	20·0%	-1·30%	202	49·2%	2·87%
	(3·16 to 113)	(0·759 to 27·1)	(-8·48 to 4·48)	(169 to 220)	(41·4 to 53·6)	(-2·63 to 8·45)
40-64 years	21·1	12·0%	-0·947%	61·0	41·6%	0·264%
	(7·27 to 32·8)	(4·13 to 18·6)	(-5·77 to 3·69)	(25·5 to 77·3)	(17·4 to 52·7)	(-7·01 to 8·37)
≥65 years	2·08	3·64%	0·0748%	6·21	20·2%	1·46%
	(0·729 to 3·79)	(1·28 to 6·63)	(-2·30 to 2·47)	(2·41 to 9·29)	(7·85 to 30·3)	(-5·62 to 8·40)
Namibia						
15–39 years	141	26·8%	-1·90%	265	52·6%	2·46%
	(23·2 to 180)	(4·40 to 34·1)	(-10·3 to 5·90)	(236 to 287)	(46·9 to 56·9)	(-3·62 to 8·70)
40-64 years	53·8	22·6%	4·00%	92.6	44·2%	7·04%
	(33·1 to 71·4)	(13·9 to 30·0)	(-4·19 to 11·8)	(54.8 to 111)	(26·1 to 53·0)	(-2·07 to 19·1)
≥65 years	9·06	13·7%	5·07%	12·3	28·4%	9·28%
	(4·97 to 13·7)	(7·52 to 20·7)	(-1·62 to 11·7)	(6·74 to 16·2)	(15·6 to 37·4)	(-0·537 to 18·4)
South Africa						
15–39 years	2150	18·0%	2·37%	5800	47·4%	3·68%
	(424 to 2740)	(3·54 to 22·9)	(-2·50 to 7·36)	(5210 to 6270)	(42·6 to 51·3)	(-1·68 to 8·72)
40–64 years	931	13·2%	-2·66%	2680	42·7%	-3·30%
	(599 to 1220)	(8·51 to 17·3)	(-6·68 to 1·21)	(1880 to 3090)	(30·0 to 49·2)	(-8·99 to 2·60)
≥65 years	143	6·91%	-2·14%	366	26·8%	-2·45%
	(96·1 to 193)	(4·64 to 9·31)	(-5·03 to 0·576)	(247 to 446)	(18·1 to 32·7)	(-7·29 to 2·50)
Zimbabwe						
15–39 years	210	6·38%	-4·42%	1410	47·6%	-7·83%
	(8·03 to 298)	(0·244 to 9·07)	(-8·05 to 0·000822)	(1200 to 1540)	(40·5 to 51·8)	(-13·4 to −2·02)
40–64 years	61·1	4·76%	-3·79%	468	42·1%	-4·31%
	(22·0 to 95·0)	(1·72 to 7·40)	(-7·75 to -0·0770)	(200 to 590)	(17·9 to 53·1)	(-11·5 to 5·58)
≥65 years	8-91	2·95%	-1·41%	45.0	22·2%	-3·21%
	(3-35 to 16-3)	(1·11 to 5·41)	(-4·24 to 0·831)	(18.2 to 65.5)	(8·99 to 32·4)	(-11·0 to 5·42)
Western sub-Saharan Africa	11 000	11.40/	0.6750	27700	24.5%	0.5700
15–39 years	11 000	11·4%	-0.675%	27700	31·5%	0·576%
	(6610 to 16 500)	(6·83 to 17·1)	(-4.29 to 5.43)	(21700 to 30 400)	(24·6 to 34·6)	(-2·91 to 10·2)
40-64 years	4050	11·5%	0.584%	9890	30.5%	2·34%
	(2730 to 5620)	(7·73 to 15·9)	(-2.35 to 4.22)	(7470 to 12 100)	(23.0 to 37.3)	(-2·21 to 10·5)
≥65 years	470	6·74%	-0·154%	1360	21·2%	1·14%
	(250 to 694)	(3·59 to 9·95)	(-2·84 to 2·52)	(918 to 1710)	(14·3 to 26·5)	(-2·88 to 6·32)
Benin						
15–39 years	351	13·4%	-1·40%	765	31·4%	-0·863%
	(150 to 593)	(5·72 to 22·6)	(-8·57 to 8·17)	(530 to 903)	(21·8 to 37·0)	(-7·20 to 14·7)
40-64 years	94·1	10·5%	1·60%	216	25·8%	2·05%
	(40·2 to 160)	(4·47 to 17·8)	(-3·92 to 6·55)	(120 to 303)	(14·4 to 36·2)	(-6·34 to 13·2)
≥65 years	4·68	2·38%	0·245%	18·7	11·5%	1·62%
	(0·679 to 10·2)	(0·345 to 5·19)	(-1·97 to 2·35)	(7·31 to 29·8)	(4·49 to 18·3)	(-3·80 to 7·19)
					(T	Table 1 continues on next page)

	Females	Females			Males			
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)		
(Continued from previo	ous page)							
Burkina Faso								
15–39 years	505	11·2%	-0·510%	1330	34·2%	-3·74%		
	(351 to 680)	(7·80 to 15·1)	(-5·17 to 6·11)	(1130 to 1510)	(29·0 to 38·7)	(-9·95 to 6·50)		
40–64 years	175	11·5%	1·37%	430	30·2%	-2·96%		
	(123 to 230)	(8·10 to 15·1)	(−3·24 to 5·70)	(340 to 512)	(23·9 to 35·9)	(-10·1 to 9·86)		
≥65 years	18·5	5·15%	0·483%	97·4	30·4%	0·326%		
	(9·89 to 29·0)	(2·75 to 8·04)	(-2·35 to 3·04)	(66·6 to 121)	(20·8 to 37·7)	(−7·58 to 11·5)		
Cameroon								
15–39 years	1670	26·3%	0·0192%	3200	52·4%	2·80%		
	(872 to 2670)	(13·7 to 41·9)	(–9·87 to 14·6)	(2550 to 3560)	(41·8 to 58·2)	(-3·68 to 20·4)		
40–64 years	512	23·4%	4·13%	1060	48·3%	6.65%		
	(285 to 765)	(13·1 to 35·0)	(-4·14 to 12·9)	(758 to 1280)	(34·7 to 58·8)	(-1.88 to 22.8)		
≥65 years	43·6	9·94%	1·98%	119	29·9%	5·90%		
	(13·3 to 77·5)	(3·02 to 17·6)	(-3·63 to 6·77)	(73·3 to 156)	(18·4 to 39·3)	(-2·12 to 15·4)		
Cape Verde								
15–39 years	14·7	12·2%	-0·969%	85·1	65·6%	3·50%		
	(6·42 to 25·2)	(5·34 to 21·0)	(-6·88 to 6·49)	(65·2 to 94·5)	(50·3 to 72·9)	(-3·61 to 19·5)		
40-64 years	5.66	8·94%	0·465%	32·5	50·8%	4·13%		
	(2.62 to 9.30)	(4·13 to 14·7)	(–3·66 to 4·58)	(21·3 to 42·4)	(33·3 to 66·3)	(-5·29 to 21·0)		
≥65 years	0·531	2·68%	-0·295%	3.60	29·4%	2·01%		
	(0·116 to 1·12)	(0·586 to 5·64)	(-2·64 to 1·76)	(1.72 to 5.21)	(14·0 to 42·5)	(-7·74 to 12·6)		
Chad								
15–39 years	701	22·1%	1·82%	1310	45·7%	5·37%		
	(166 to 1260)	(5·24 to 39·8)	(–10·6 to 13·9)	(842 to 1520)	(29·3 to 53·0)	(-2·82 to 20·4)		
40–64 years	139	14·5%	6·55%	293	29·2%	12·1%		
	(30·9 to 264)	(3·22 to 27·5)	(0·293 to 13·4)	(131 to 427)	(13·0 to 42·5)	(3·12 to 21·9)		
≥65 years	7.89	4·39%	2·54%	30·6	13·4%	7·71%		
	(0·378 to 20·6)	(0·210 to 11·5)	(0·0582 to 6·53)	(6·70 to 55·6)	(2·93 to 24·3)	(1·87 to 13·8)		
Côte d'Ivoire								
15–39 years	918	16·9%	-3·41%	2720	48·9%	-1·19%		
	(476 to 1450)	(8·77 to 26·8)	(-12·4 to 9·26)	(2190 to 3040)	(39·4 to 54·6)	(-7·97 to 14·4)		
40–64 years	277	14·6%	-0·178%	977	42·7%	4·43%		
	(145 to 431)	(7·62 to 22·7)	(-8·00 to 7·24)	(719 to 1200)	(31·4 to 52·5)	(-4·20 to 19·3)		
≥65 years	29·7	8·71%	1·03%	115	31·6%	5·31%		
	(8·59 to 54·8)	(2·52 to 16·0)	(-5·01 to 6·34)	(69·9 to 151)	(19·3 to 41·7)	(-4·44 to 15·5)		
The Gambia								
15–39 years	53·5	10·6%	-0·644%	153	32·9%	1·15%		
	(23·8 to 91·8)	(4·71 to 18·2)	(-6·83 to 6·21)	(108 to 179)	(23·3 to 38·5)	(-4·97 to 15·4)		
40–64 years	14·3	9·08%	2·33%	45·8	28·7%	7·08%		
	(6·65 to 23·1)	(4·22 to 14·6)	(-2·26 to 6·33)	(28·5 to 63·0)	(17·9 to 39·4)	(-1·60 to 17·9)		
≥65 years	1·43	3·66%	1·32%	5·61	16·7%	5·97%		
	(0·315 to 2·88)	(0·809 to 7·39)	(−1·19 to 3·87)	(2·41 to 8·49)	(7·17 to 25·2)	(-0·811 to 12·3)		
Ghana								
15–39 years	1310	18·0%	-2·41%	2760	41·3%	0.651%		
	(524 to 2210)	(7·22 to 30·4)	(-10·9 to 8·99)	(2050 to 3140)	(30·7 to 46·9)	(−5.38 to 15.5)		
40–64 years	385	12·7%	-1·17%	1060	40·2%	0·897%		
	(168 to 635)	(5·56 to 21·0)	(-6·44 to 4·32)	(707 to 1360)	(26·8 to 51·6)	(−5·32 to 14·4)		
≥65 years	33.6	4·98%	-1·40%	122	24·3%	-0·331%		
	(6.52 to 69.6)	(0·968 to 10·3)	(-5·33 to 1·46)	(61·6 to 174)	(12·3 to 34·7)	(-6·33 to 6·89)		
Guinea								
15–39 years	47·8	1·81%	-0·399%	621	28·2%	-0.837%		
	(11·4 to 106)	(0·430 to 4·01)	(-2·08 to 0·990)	(364 to 750)	(16·5 to 34·0)	(-7.35 to 11.6)		
40–64 years	12·5	1·39%	0·0202%	161	19·5%	2·33%		
	(4·06 to 24·1)	(0·452 to 2·69)	(−1·32 to 0·941)	(69-2 to 257)	(8·41 to 31·2)	(-4·97 to 10·3)		
					(Ta	able 1 continues on next page		

	Females		Males			
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change sinc 1990 (%)
(Continued from previous pa	age)					
≥65 years	1·09	0·532%	-0·157%	20·2	9·05%	1·54%
	(0·105 to 2·78)	(0·0513 to 1·36)	(-1·05 to 0·389)	(5·06 to 38·6)	(2·27 to 17·3)	(-3·89 to 6·32)
Guinea-Bissau						
15–39 years	55·4	12·9%	-0·401%	121	31·0%	0·974%
	(26·0 to 87·8)	(6·03 to 20·3)	(-5·93 to 6·85)	(92·9 to 140)	(23·7 to 35·8)	(-4·66 to 11·4)
40–64 years	17·3	12·1%	0·389%	36·9	29·3%	0·217%
	(9·49 to 25·7)	(6·66 to 18·0)	(-4·48 to 5·69)	(24·9 to 47·6)	(19·8 to 37·8)	(-6·03 to 10·7)
≥65 years	1·10	4·20%	-1·00%	3.65	17·1%	-1·70%
	(0·328 to 2·05)	(1·25 to 7·79)	(-4·88 to 1·80)	(2.05 to 5.15)	(9·61 to 24·2)	(-8·12 to 5·88)
Liberia						
15-39 years	162	16·3%	0·0744%	378	39·8%	0.832%
	(98⋅0 to 236)	(9·84 to 23·7)	(−5·47 to 7·79)	(285 to 429)	(30·0 to 45·2)	(-5.12 to 11.7)
40–64 years	47·7	13·9%	-0·930%	120	33·1%	-3·12%
	(31·1 to 66·0)	(9·07 to 19·2)	(-5·76 to 4·23)	(78·9 to 155)	(21·9 to 42·9)	(-9·55 to 6·12)
≥65 years	3·46	5·11%	-1·81%	11·4	16·7%	-5·19%
	(1·52 to 5·77)	(2·25 to 8·51)	(-5·41 to 1·19)	(5·52 to 16·3)	(8·07 to 23·8)	(-11·7 to 1·55)
Mali						
15–39 years	93.6	2·08%	-0·334%	273	6.59%	-0·897%
	(56.2 to 140)	(1·25 to 3·10)	(-1·43 to 1·09)	(211 to 330)	(5.09 to 7.95)	(-2·82 to 1·87)
40-64 years	31·7	2·21%	-0·342%	99·5	6.74%	-1·05%
	(19·5 to 45·7)	(1·36 to 3·19)	(-1·65 to 0·861)	(71·7 to 127)	(4.86 to 8.57)	(-3·78 to 2·60)
≥65 years	5.08	1.68%	-0·621%	20·6	6·26%	-1·56%
	(2.21 to 8.30)	(0.729 to 2.74)	(-2·18 to 0·657)	(12·0 to 29·0)	(3·66 to 8·84)	(-4·83 to 2·14)
Mauritania						
15–39 years	10·9	1·27%	-0·875%	55·7	7·02%	-1·49%
	(0 to 57·2)	(0 to 6·63)	(-5·20 to 1·26)	(0 to 90·4)	(0 to 11·4)	(-4·88 to 2·63)
40-64 years	0·114	0.0337%	-0·0206%	0·385	0·123%	-0·0788%
	(0 to 0·00615)	(0 to 0.00183)	(-0·102 to 0)	(0 to 7·65)	(0 to 2·44)	(-1·02 to 0)
≥65 years	0	0%	-0·0000223%	0	0%	-0·00574%
	(0 to 0)	(0 to 0)	(0 to 0)	(0 to 0)	(0 to 0)	(0 to 0)
Niger						
15-39 years	234	5·38%	-1·23%	917	22·0%	0·529%
	(18·4 to 675)	(0·423 to 15·5)	(-7·79 to 2·88)	(255 to 1240)	(6·13 to 29·9)	(−6·23 to 10·5)
40–64 years	25·3	1·78%	0·585%	76.8	5.98%	1·98%
	(1·99 to 89·8)	(0·140 to 6·33)	(-1·21 to 2·53)	(4.32 to 248)	(0.336 to 19.3)	(-3·24 to 6·86)
≥65 years	0.599	0·210%	0·112%	2·79	1·03%	0·584%
	(0.000975 to 2.99)	(0·000341 to 1·04)	(-0·175 to 0·735)	(0·0430 to 10·6)	(0·0158 to 3·91)	(-0·304 to 2·65)
Nigeria						
15-39 years	4350	9·39%	-0·224%	11 300	27·9%	1·22%
	(2990 to 5920)	(6·47 to 12·8)	(-3·76 to 4·76)	(9530 to 12 700)	(23·5 to 31·4)	(-3·95 to 8·81)
40–64 years	2160	12·4%	-0·236%	4870	32·4%	2·77%
	(1530 to 2810)	(8·76 to 16·1)	(-4·76 to 4·69)	(3910 to 5660)	(26·1 to 37·7)	(-3·46 to 11·5)
≥65 years	307	9·71%	0·351%	754	26·0%	1.69%
	(177 to 443)	(5·59 to 14·0)	(–4·42 to 5·20)	(540 to 928)	(18·6 to 32·0)	(-4.74 to 8.86)
ão Tomé and Príncipe						
15–39 years	5·61	12·6%	-1·67%	16·7	37·6%	0.651%
	(3·14 to 8·62)	(7·08 to 19·4)	(-7·84 to 6·62)	(13·6 to 19·0)	(30·5 to 42·7)	(−5.32 to 11.4)
40-64 years	2·36	12·4%	0·447%	7·42	37·9%	3·20%
	(1·41 to 3·46)	(7·40 to 18·2)	(-4·97 to 5·99)	(5·70 to 8·86)	(29·1 to 45·3)	(−3·99 to 15·1)
≥65 years	0·272	6·52%	0·291%	0.925	26·7%	2·79%
	(0·0920 to 0·460)	(2·21 to 11·0)	(−3·71 to 3·82)	(0.575 to 1.21)	(16·6 to 34·8)	(-4·85 to 11·5)
Senegal						
15–39 years	191	6·04%	-3·01%	799	25·5%	-3·84%
	(22·0 to 501)	(0·695 to 15·9)	(-8·74 to 2·90)	(286 to 1050)	(9·13 to 33·5)	(-10·6 to 7·93)
					/T ₂	ble 1 continues on next pag

	Females	Females			Males		
	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	Number (thousands)	Proportion of population (%)	Percentage change since 1990 (%)	
(Continued from previo	us page)						
40-64 years	30·5	2·44%	-1·80%	99.6	8·60%	-5·39%	
	(3·23 to 91·1)	(0·259 to 7·30)	(-5·71 to 0·853)	(10.8 to 258)	(0·933 to 22·2)	(-12·6 to 1·88)	
≥65 years	1·09	0·365%	-0·742%	5·37	1·96%	-3·19%	
	(0·00900 to 4·77)	(0·00302 to 1·60)	(-2·83 to 0·101)	(0·187 to 16·9)	(0·0683 to 6·17)	(-9·13 to 0·188)	
Sierra Leone							
15–39 years	94·4	5·04%	-1·87%	353	20·0%	-3·52%	
	(59·0 to 137)	(3·15 to 7·34)	(-4·69 to 1·82)	(289 to 403)	(16·4 to 22·9)	(-7·65 to 1·38)	
40-64 years	42·3	7·05%	-2·02%	156	24·4%	-3·69%	
	(28·3 to 57·6)	(4·71 to 9·58)	(-5·30 to 1·37)	(121 to 185)	(18·9 to 28·9)	(-8·88 to 3·13)	
≥65 years	4·44	3·24%	-1·53%	20·2	15·2%	-4·01%	
	(2·10 to 7·09)	(1·53 to 5·19)	(-3·90 to 0·577)	(13·3 to 26·4)	(9·99 to 19·8)	(-8·94 to 1·05)	
Togo							
15–39 years	275	16·2%	-1·68%	493	31·2%	-0.635%	
	(123 to 454)	(7·24 to 26·7)	(-8·02 to 7·84)	(332 to 574)	(21·0 to 36·3)	(-6.23 to 8.69)	
40-64 years	82·8	11·3%	-1·09%	156	23·5%	-2·07%	
	(39·9 to 130)	(5·46 to 17·9)	(-6·63 to 4·41)	(91·1 to 218)	(13·7 to 32·8)	(-8·12 to 7·34)	
≥65 years	5·47	3·60%	-1·29%	11·4	11·7%	-2·78%	
	(1·33 to 11·0)	(0·877 to 7·23)	(-4·53 to 1·39)	(4·84 to 18·1)	(4·95 to 18·5)	(-8·52 to 3·24)	

Data in parentheses are 95% uncertainty intervals. All data are presented to three significant figures.

Table 1: Number and proportion of population consuming in excess of the non-drinker equivalence, and percentage change since 1990 by country, age group, and sex, for 2020

Australasia (77·7% [65·3–82·0]), western Europe (64·3% [44·3–73·6]), and southern Latin America (59·0% [42·0–67·8]) had the highest rates of harmful alcohol consumption. By contrast, only 6·55% (4·79–8·43) of individuals consuming alcohol in excess of the NDE globally were older than 65 years (appendix 2 pp 54–83). Between 1990 and 2019, 14 countries had significant increases in the prevalence of harmful alcohol consumption, 55 countries had significant decreases, and in 135 countries the prevalence did not change significantly (table 1).

Importantly, these results were not sensitive to our approach to constructing the weighted attributablecause relative risk curves that are used to calculate the TMREL and NDE. The TMREL and NDE for each of the sensitivity scenarios are shown in appendix 2 (pp 39-41). By including additional risk to health from alcohol use disorders and alcoholic cardiomyopathy, which are 100% attributable to alcohol use, the TMREL decreased by an average of 0.058(95% UI 0.00-0.30) standard drinks per day in scenario A (for alcohol use disorder and alcoholic cardiomyopathy, relative risks linearly increase with consumption to a maximum relative risk of three at four standard drinks per day, at which point they plateau through ten standard drinks), 0.092 (0.00-0.50) standard drinks per day in scenario B (relative risks linearly increase with consumption to a maximum of five, at four standard drinks per day for alcohol use disorder and alcoholic cardiomyopathy), and 0.146 (0.00-0.60) standard drinks per day in scenario C (relative risks linearly increase with consumption to a maximum of 10, at four standard drinks per day for alcohol use disorder and alcoholic cardiomyopathy), whereas the NDE decreased by an average of 0.188 (0.00-0.90) standard drinks per day in scenario A, 0.310 (0.00-1.30) standard drinks per day in scenario B, and 0.508 (0.00-2.10) standard drinks per day in scenario C. The greatest differences were observed in males in eastern Europe, where alcohol use disorder is especially prevalent, as well as in individuals aged 30-54 years, among whom DALY rates from alcohol use disorder are the greatest (appendix 2 pp 39-41; Bryazka D, unpublished).

Our results were not sensitive to the changes in relative risk estimates for the five updated outcomes, compared to the entire set of relative risk estimates published in GBD 2016 (appendix 2 pp 43–53).¹ The global, age-standardised, both-sexes TMREL based on the full set of GBD 2016 relative risk estimates and GBD 2020 DALY rates was 0.534 (95% UI 0.00-1.00) standard drinks per day, compared to 0.511 (0.400-0.700) standard drinks per day based on the GBD 2020 relative risk estimates and GBD 2020 DALY rates, whereas the previously published global, age-standardised, both-sexes TMREL was 0.00 (0.00-0.80) standard drinks per day in 2016 based on GBD 2016 relative risk estimates and GBD 2016 DALY rates (table 2).¹

Discussion

We show that the estimation of the health effects associated with alcohol use requires consideration of

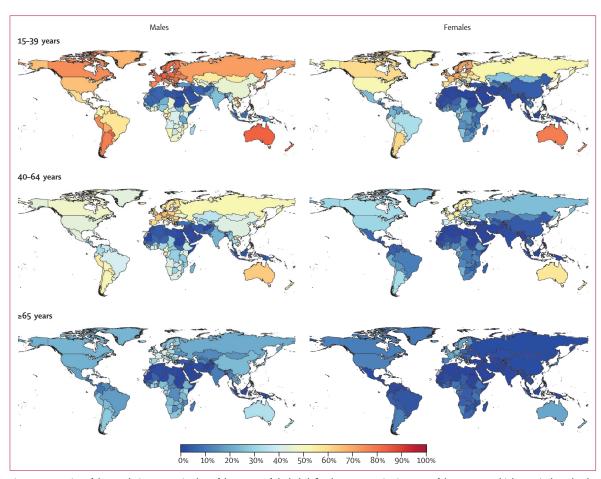


Figure 4: Proportion of the population consuming harmful amounts of alcohol, defined as consumption in excess of the mean non-drinker equivalence level, by sex and age group, in 2020

both the relationship between alcohol consumption and disease outcomes, and the observed disease rates in each population. We found that the population-level health risks associated with low levels of alcohol consumption varied across regions and were greater for younger populations than for older populations. Although we did not find significant differences in the risks of ill health by sex or by year, we did find that males made up 76.9% (95% UI 73.0-81.3) of the population consuming harmful amounts of alcohol in 2020. Notably, 1.03 billion (0.851-1.19) males and 312 million (199-432) females drank harmful amounts of alcohol in excess of the NDE in 2020. Harmful use of alcohol was particularly concentrated in males aged 15-39 years, primarily in Australasia, western Europe, and central Europe. These findings highlight the need for tailored guidelines that discourage alcohol consumption among young people, as well as alcohol control policies and interventions that are targeted especially towards young males.

Understanding the variation in the level of alcohol consumption that minimises the risk of ill health for populations can aid in setting effective consumption guidelines, supporting alcohol control policies,

monitoring progress in reducing harmful alcohol use, and designing public health risk messaging. 3,16,34–40 Most alcohol consumption guidelines for the general population combine recommendations to avoid alcohol use with the definition of lower-risk alcohol consumption thresholds, which tend to vary between 8 g and 42 g of alcohol per day for females, and between 10 g and 52 g of alcohol per day for males. 41 Generally, thresholds are one standard drink greater for men than for women, and some lower-risk thresholds are framed in units of weekly consumption that come with a recommendation to avoid alcohol entirely for several days of the week.

In our analysis, the population-specific TMRELs ranged between 0 (95% UI 0–0) and 0.603 (0.400-1.00) standard drinks per day among individuals aged 15–39 years across world regions, and the NDEs ranged between 0 (0–0) and 1.75 (0.698-4.30) standard drinks per day among individuals aged 15–39 years across world regions in 2020. Even if a conservative approach is taken and the lower bound of the uncertainty interval is used to set policy recommendations rather than the mean, this implies that the recommended level of alcohol consumption in existing

low consumption recommendations is too high for younger populations. Our estimates, based on currently available evidence, also do not support low consumption guidelines that differ by sex. Given the known difficulties associated with translating evidence into changes in consumer behaviour, clear messaging around updates to drinking guidelines will be crucial to ensure the full improvements are realised.

One key distinction between this study and existing recommendations on alcohol consumption is that our estimates focus on minimising health loss across all alcohol-attributable outcomes in a population. Thresholds exist for different purposes; in terms of injury prevention, several countries have moved to a zero-tolerance threshold that is consistent with evidence of the entirely harmful effect of alcohol consumption on injuries. Furthermore, individual-level as opposed to populationlevel risk minimisation will depend on individual-level factors, including comorbid conditions and the use of pharmaceuticals, which are more prevalent among older populations. Our results for older adults should be interpreted in the context of their additional uncertainty. 42,43 Approaches to minimising individual-level risk are beyond the scope of this study and need to take into consideration not only alcohol use and specific health outcomes, but also interactions between environmental, genetic, and behavioural factors, as well as the societal and health system context of individuals.

Broadly, this analysis highlights the need to consider the existing prevalence of diseases and injuries for specific populations when determining the total harms posed by a risk factor. Although the biological effects of alcohol are unlikely to change across populations, except in the case of specific genetic interactions such as variants in alcohol dehydrogenase, disease rates vary substantially across regions, age, sex, and time.44 For example, alcohol use poses a greater risk to population health in areas with a high prevalence of tuberculosis than in areas with low prevalence. Although this consideration is perhaps most important for setting effective policy recommendations for risks with both harmful and protective relationships with disease, such as alcohol use and red meat consumption, it has implications for all risk factors. As countries navigate the epidemiological transition and their background rates of disease evolve from infectious diseases and injuries to non-communicable diseases, policy recommendations will need to evolve as well.

It is important to consider our findings in the context of those published by the GBD 2016 Alcohol Collaborators in 2018.¹ Compared to that report, the analysis presented here includes three major changes: we updated five of the relative risk curves; we weighted the relative risk curves using DALY rates estimated as part of GBD 2020 rather than GBD 2016; and we estimated the TMREL separately for each region, age, sex, and year. Although the GBD 2016 Alcohol Collaborators found that the global, age-standardised,

	Previously published (GBD 2016 relative risk and GBD 2016 DALY rates)	GBD 2016 relative risk and GBD 2020 DALY rates	GBD 2020 relative risk and GBD 2020 DALY rates
Theoretical minimum risk exposure level	0 (0-0.800)	0.534 (0–1.00)	0.511 (0.400-0.700)
Non-drinker equivalence	NA	0.669 (0-1.40)	1.72 (0.80–3.30)

Data in parentheses are 95% uncertainty intervals. Data are reported to three significant figures. GBD=Global Burden of Diseases, Injuries, and Risk Factors Study. DALY=disability-adjusted life-year. NA=not applicable.

Table 2: Global, age-standardised, both-sexes theoretical minimum risk exposure level and non-drinker equivalence estimates based on various iterations of GBD estimates

both-sexes TMREL was zero standard drinks per day, computing the global TMREL with the first two of these updates, we found that the global TMREL was still quite low, at 0.511 (95% UI 0.400-0.700) standard drinks per day. Re-estimating the TMREL with updated 2020 DALY weights but the former relative risk curves suggests a global TMREL of 0.534 (0-1.00) standard drinks per day. Region-specific, age-specific, and sex-specific differences between these approaches are summarised in appendix 2 (pp 45-55). Importantly, the differences across TMREL by region and age hold even with the relative risk curves estimated in 2016. The more nuanced analysis in the present study, where we explored the risks to ill health by age and region, represents a major step forward in our understanding of how to minimise health loss due to alcohol consumption across the world.

One challenge associated with using observational studies to measure the causal effect of alcohol consumption on health is the potential for the introduction of various forms of bias, including reverse causation, selection bias, and residual confounding. Mendelian randomisation is a method that attempts to mitigate bias by using genetic variation as a proxy for risk exposure.5,6 Although a small number of Mendelian randomisation studies have been done on alcohol use to date, a recent meta-analysis reported that those done on cardiovascular disease and diabetes had varied in their findings, with 67% of studies on cardiovascular disease and 75% of studies on diabetes reporting a null association with alcohol.6 However, only five of 24 studies examined whether alcohol had a non-linear relationship with these health outcomes. As additional Mendelian randomisation studies from diverse populations are increasingly published, they have the potential to improve the evidence base, and estimates should be regularly revised to reflect new evidence.

This study had various limitations that should be taken into account when interpreting the findings. First, we did not incorporate patterns of drinking, and therefore did not distinguish between individuals who infrequently engage in heavy episodic drinking and those who consume the same amount of alcohol over several days.⁴⁵ Manthey and colleagues⁴⁶ estimated that in 2018, 20% of adults engaged

in heavy episodic drinking—the consumption of 60 g or more of alcohol on a single occasion—over the past month. Second, due to a paucity of studies reporting a dose-response relationship between the risk of alcohol use and incidence of and mortality from alcohol use disorders, the burden of alcohol use disorders was not included in the TMREL calculation. As shown by the sensitivity analyses, which used conservative hypothetical relative risk curves for alcohol use disorder and alcoholic cardiomyopathy, inclusion of these diseases results in slightly lower estimates of TMREL and NDE, particularly among males in eastern Europe and in individuals aged 30-54 years globally. The decreases in the TMREL and NDE in the sensitivity scenarios were found to be quite small, since the risk of these two conditions is likely to be concentrated at higher levels of consumption and in younger adults, resulting in minimal impact on estimates of the TMREL and NDE. Third, although we attempted to adjust for the impacts of confounding and bias in our meta-regressions, it is possible that relative risk estimates did not account and adjust for all sources of bias, including measurement bias and selection bias, as well as the potential impacts of reverse causality. Fourth, studies reporting the relative risks of alcohol use were based on self-reported alcohol consumption, which is subject to social desirability and recall biases. Fifth, we did not consider differences in risk by type or quality of alcohol. Sixth, the weights used within the weighted alcoholattributable relative risk curve used DALY estimates that could be due to alcohol use. However, this limitation would only have had a marginal effect on estimates of the TMREL and NDE. Seventh, our estimates of the proportion of the population consuming alcohol in excess of the NDE were derived from alcohol consumption data collected through 2019. Because of delays in routine data collection on risk factors caused by the COVID-19 pandemic, we forecasted our estimates to obtain a time series through 2020. As a result, the estimates do not reflect changes in consumption patterns associated with the pandemic.47 Last, our results did not include health conditions with burgeoning evidence indicating a relationship with alcohol use, such as major depressive disorder, generalised anxiety disorder, or dementia, given the current scarcity of sufficient evidence to support a meta-analysis and the potential for reverse causality. Inclusions of these outcomes would possibly reduce estimates of the TMREL and NDE.

In conclusion, the relationship between moderate alcohol use and health is complex and has raised a great deal of controversy in the scientific literature. Given that the available evidence suggests that low levels of alcohol consumption are associated with a lower risk of some disease outcomes and an increased risk of others, alcohol consumption recommendations should take into account the full epidemiological profile that includes the background rates of disease within populations. The findings of this study support the development of

tailored guidelines and recommendations on alcohol consumption by age and across regions and highlight that existing low consumption thresholds are too high for younger populations in all regions. Additionally, our results suggest that guidelines should not incorporate sex-specific recommendations, given the absence of variation in TMREL and NDE by sex across geographies and locations. Finally, recognising that the majority of the world's population consuming harmful amounts of alcohol are young adults and predominantly young males, in order to minimise health loss due to alcohol consumption it is important to prioritise interventions targeted at these demographic groups.

GBD 2020 Alcohol Collaborators

Dana Bryazka, Marissa B Reitsma, Max G Griswold, Kalkidan Hassen Abate, Cristiana Abbafati, Mohsen Abbasi-Kangevari, Zeinab Abbasi-Kangevari, Amir Abdoli, Mohammad Abdollahi, Abu Yousuf Md Abdullah, E S Abhilash, Eman Abu-Gharbieh, Juan Manuel Acuna, Giovanni Addolorato, Oladimeji M Adebayo, Victor Adekanmbi, Kishor Adhikari, Sangeet Adhikari, Oorinah Estiningtyas Sakilah Adnani, Saira Afzal, Wubetu Yimam Agegnehu, Manik Aggarwal, Bright Opoku Ahinkorah, Araz Ramazan Ahmad, Sajjad Ahmad, Tauseef Ahmad, Ali Ahmadi, Sepideh Ahmadi, Haroon Ahmed, Tarik Ahmed Rashid, Chisom Joyqueenet Akunna, Hanadi Al Hamad, Md Zakiul Alam, Dejene Tsegaye Alem, Kefyalew Addis Alene, Yousef Alimohamadi, Atiyeh Alizadeh, Kasim Allel, Jordi Alonso, Saba Alvand, Nelson Alvis-Guzman, Firehiwot Amare, Edward Kwabena Ameyaw, Sohrab Amiri, Robert Ancuceanu, Jason A Anderson, Catalina Liliana Andrei, Tudorel Andrei, Jalal Arabloo, Muhammad Arshad, Anton A Artamonov, Zahra Aryan, Malke Asaad, Mulusew A Asemahagn, Thomas Astell-Burt, Seyyed Shamsadin Athari, Desta Debalkie Atnafu, Prince Atorkey, Alok Atreya, Floriane Ausloos, Marcel Ausloos, Getinet Ayano, Martin Amogre Ayanore, Olatunde O Ayinde, Jose L Ayuso-Mateos, Sina Azadnajafabad, Melkalem Mamuye Azanaw, Mohammadreza Azangou-Khyavy, Amirhossein Azari Jafari, Ahmed Y Azzam, Ashish D Badiye, Nasser Bagheri, Sara Bagherieh, Mohan Bairwa, Shankar M Bakkannavar, Ravleen Kaur Bakshi, Awraris Hailu Balchut/Bilchut, Tilxrnighausen, Fabio Barra, Amadou Barrow, Pritish Baskaran, Luis Belo, Derrick A Bennett, Isabela M Bensenor Akshaya Srikanth Bhagayathula Neerai Bhala Ashish Bhalla, Nikha Bhardwaj, Pankaj Bhardwaj, Sonu Bhaskar, Krittika Bhattacharyya, Vijayalakshmi S Bhojaraja, Bagas Suryo Bintoro, Elena A Elena Blokhina, Belay Boda Abule Bodicha, Archith Boloor, Cristina Bosetti, Deiana Braithwaite, Hermann Brenner, Nikolay Ivanovich Briko, Andre R Brunoni, Zahid A Butt, Chao Cao, Yin Cao, Rosario Cárdenas, Andre F Carvalho, Márcia Carvalho, Joao Mauricio Castaldelli-Maia, Giulio Castelpietra, Luis F S Castro-de-Araujo, Maria Sofia Cattaruzza, Promit Ananyo Chakraborty, Jaykaran Charan, Vijay Kumar Chattu, Akhilanand Chaurasia, Nicolas Cherbuin, Dinh-Toi Chu, Nandita Chudal, Sheng-Chia Chung, Chuchu Churko, Liliana G Ciobanu, Massimo Cirillo, Rafael M Claro, Simona Costanzo, Richard G Cowden, Michael H Criqui, Natália Cruz-Martins, Garland T Culbreth, Berihun Assefa Dachew, Omid Dadras, Xiaochen Dai, Giovanni Damiani, Lalit Dandona, Rakhi Dandona, Beniam Darge Daniel, Anna Danielewicz, Jiregna Darega Gela, Kairat Davletov, Jacyra Azevedo Paiva de Araujo, Antonio Reis de Sá-Junior, Sisay Abebe Debela, Azizallah Dehghan, Andreas K Demetriades, Meseret Derbew Molla, Rupak Desai, Abebaw Alemayehu Desta, Diana Dias da Silva, Daniel Diaz, Lankamo Ena Digesa, Mengistie Diress, Milad Dodangeh. Deepa Dongarwar, Fariba Dorostkar, Haneil Larson Dsouza, Bereket Duko, Bruce B Duncan, Kristina Edvardsson, Michael Ekholuenetale, Frank J Elgar, Muhammed Elhadi, Mohamed A Elmonem, Aman Yesuf Endries, Sharareh Eskandarieh, Azin Etemadimanesh, Adeniyi Francis Fagbamigbe,

Ildar Ravisovich Fakhradiyev, Fatemeh Farahmand, Carla Sofia e Sá Farinha, Andre Faro, Farshad Farzadfar, Ali Fatehizadeh, Nelsensius Klau Fauk, Valery L Feigin, Rachel Feldman, Xiaoqi Feng, Zinabu Fentaw, Simone Ferrero, Lorenzo Ferro Desideri, Irina Filip, Florian Fischer, Joel Msafiri Francis, Richard Charles Franklin, Peter Andras Gaal Mohamed M Gad Silvano Gallus Fabio Galvano, Balasankar Ganesan, Tushar Garg, Mesfin Gebrehiwot Damtew Gebrehiwot, Teferi Gebru Gebremeskel, Mathewos Alemu Gebremichael, Tadele Regasa Gemechu, Lemma Getacher, Motuma Erena Getachew, Abera Getachew Obsa, Asmare Getie, Amir Ghaderi, Mansour Ghafourifard, Alireza Ghajar, Seyyed-Hadi Ghamari, Lilian A Ghandour, Mohammad Ghasemi Nour, Ahmad Ghashghaee, Sherief Ghozy, Franklin N Glozah, Ekaterina Vladimirovna Glushkova, Justyna Godos, Amit Goel, Salime Goharinezhad, Mahaveer Golechha, Pouya Goleij, Mohamad Golitaleb, Felix Greaves, Michal Grivna, Giuseppe Grosso, Temesgen Worku Gudayu, Bhawna Gupta, Rajeev Gupta, Sapna Gupta, Veer Bala Gupta, Vivek Kumar Gupta, Nima Hafezi-Nejad, Arvin Haj-Mirzaian, Brian J Hall, Rabih Halwani, Tiilahun Beyene Handiso, Graeme J Hankey, Sanam Hariri, Josep Maria Haro, Ahmed I Hasaballah, Hossein Hassanian-Moghaddam, Simon I Hay, Khezar Hayat, Golnaz Heidari, Mohammad Heidari, Delia Hendrie, Claudiu Herteliu, Demisu Zenbaba Hevi, Kamal Hezam, Mbuzeleni Mbuzeleni Hlongwa, Ramesh Holla, Md Mahbub Hossain, Sahadat Hossain, Seyed Kianoosh Hosseini, Mehdi Hosseinzadeh, Mihaela Hostiuc, Sorin Hostiuc, Guoqing Hu, Junjie Huang, Salman Hussain, Segun Emmanuel Ibitoye, Irena M Ilic, Milena D Ilic, Mustapha Immurana, Lalu Muhammad Irham, M Mofizul Islam, Rakibul M Islam, Sheikh Mohammed Shariful Islam, Hiroyasu Iso, Ramaiah Itumalla, Masao Iwagami, Roxana Jabbarinejad, Louis Jacob, Mihajlo Jakovljevic, Zahra Jamalpoor, Elham Jamshidi, Sathish Kumar Jayapal, Umesh Umesh Jayarajah, Ranil Jayawardena, Rime Jebai, Seyed Ali Jeddi, Alelign Tasew Jema, Ravi Prakash Jha, Har Ashish Jindal, Jost B Jonas, Tamas Joo, Nitin Joseph, Farahnaz Joukar, Jacek Jerzy Jozwiak, Mikk Jürisson, Ali Kabir, Robel Hussen Kabthymer, Bhushan Dattatray Kamble, Himal Kandel, Girum Gebremeskel Kanno, Neeti Kapoor, Ibraheem M Karaye, Salah Eddin Karimi, Bekalu Getnet Kassa, Rimple Jeet Kaur, Gbenga A Kayode, Mohammad Keykhaei, Himanshu Khajuria, Rovshan Khalilov, Imteyaz A Khan, Moien AB Khan, Hanna Kim, Jihee Kim, Min Seo Kim, Ruth W Kimokoti, Mika Kivimäki, Vitalii Klymchuk, Ann Kristin Skrindo Knudsen, Ali-Asghar Kolahi, Vladimir Andreevich Korshunov, Ai Koyanagi, Kewal Krishan, Yuvaraj Krishnamoorthy, G Anil Kumar, Narinder Kumar, Nithin Kumar, Ben Lacey, Tea Lallukka, Savita Lasrado, Jerrald Lau, Sang-woong Lee, Wei-Chen Lee, Yo Han Lee, Lee-Ling Lim, Stephen S Lim, Stany W Lobo, Platon D Lopukhov, Stefan Lorkowski, Rafael Lozano, Giancarlo Lucchetti, Farzan Madadizadeh, Áurea M Madureira-Carvalho, Soleiman Mahjoub, Ata Mahmoodpoor, Rashidul Alam Mahumud, Alaa Makki, Mohammad-Reza Malekpour, Narayana Manjunatha, Borhan Mansouri, Mohammad Ali Mansournia, Jose Martinez-Raga, Francisco A Martinez-Villa, Richard Matzopoulos, Pallab K Maulik, Mahsa Mayeli, John J McGrath, Jitendra Kumar Meena, Entezar Mehrabi Nasab, Ritesh G Menezes, Gert B M Mensink, Alexios-Fotios A Mentis, Atte Meretoja, Bedasa Taye Merga, Tomislav Mestrovic, Junmei Miao Jonasson, Bartosz Miazgowski, Ana Carolina Micheletti Gomide Nogueira de Sá, Ted R Miller, GK Mini, Andreea Mirica, Antonio Mirijello, Seyyedmohammadsadeq Mirmoeeni, Erkin M Mirrakhimov, Sanjeev Misra, Babak Moazen, Maryam Mobarakabadi, Marcello Moccia, Yousef Mohammad, Esmaeil Mohammadi, Abdollah Mohammadian-Hafshejani, Teroj Abdulrahman Mohammed, Nagabhishek Moka, Ali H Mokdad, Sara Momtazmanesh, Yousef Moradi, Ebrahim Mostafavi, Sumaira Mubarik, Erin C Mullany, Beemnet Tekabe Mulugeta, Efrén Murillo-Zamora, Christopher J L Murray, Julius C Mwita, Mohsen Naghavi, Mukhammad David Naimzada, Vinay Nangia, Biswa Prakash Nayak, Ionut Negoi, Ruxandra Irina Negoi, Seyed Aria Nejadghaderi, Samata Nepal, Sudan Prasad Prasad Neupane, Sandhya Neupane Kandel, Yeshambel T Nigatu, Ali Nowroozi, Khan M Nuruzzaman, Chimezie Igwegbe Nzoputam,

Kehinde O Obamiro, Felix Akpojene Ogbo, Ayodipupo Sikiru Oguntade, Hassan Okati-Aliabad, Babayemi Oluwaseun Olakunde, Gláucia Maria Moraes Oliveira, Ahmed Omar Bali, Emad Omer, Doris V Ortega-Altamirano, Adrian Otoiu, Stanislav S Otstavnov, Bilcha Oumer, Mahesh P A, Alicia Padron-Monedero, Raffaele Palladino, Adrian Pana, Songhomitra Panda-Jonas, Anamika Pandey, Ashok Pandey, Shahina Pardhan, Tarang Parekh, Eun-Kee Park, Charles D H Parry, Fatemeh Pashazadeh Kan, Jay Patel, Siddhartha Pati, George C Patton, Uttam Paudel, Shrikant Pawar, Amy E Peden, Ionela-Roxana Petcu, Michael R Phillips, Marina Pinheiro, Evgenii Plotnikov, Pranil Man Singh Pradhan, Akila Prashant, Jianchao Quan, Amir Radfar, Alireza Rafiei, Pankaja Raghav Raghav, Vafa Rahimi-Movaghar, Azizur Rahman, Md Mosfequr Rahman, Mosiur Rahman, Amir Masoud Rahmani, Shayan Rahmani, Chhabi Lal Ranabhat, Priyanga Ranasinghe, Chythra R Rao, Drona Prakash Rasali, Mohammad-Mahdi Rashidi, Zubair Ahmed Ratan, David Laith Rawaf, Salman Rawaf, Lal Rawal, Andre M N Renzaho, Negar Rezaei, Saeid Rezaei, Mohsen Rezaeian, Seyed Mohammad Riahi, Esperanza Romero-Rodríguez, Gregory A Roth, Godfrey M Rwegerera, Basema Saddik, Erfan Sadeghi, Reihaneh Sadeghian, Umar Saeed, Farhad Saeedi, Rajesh Sagar, Amirhossein Sahebkar, Harihar Sahoo, Mohammad Ali Sahraian, KM Saif-Ur-Rahman, Sarvenaz Salahi, Hamideh Salimzadeh, Abdallah M Samy, Francesco Sanmarchi, Milena M Santric-Milicevic, Yaser Sarikhani, Brijesh Sathian, Ganesh Kumar Saya, Mehdi Sayyah, Maria Inês Schmidt, Aletta Elisabeth Schutte, Michaël Schwarzinger, David C Schwebel, Abdul-Aziz Seidu, Nachimuthu Senthil Kumar, SeyedAhmad SeyedAlinaghi, Allen Seylani, Feng Sha, Sarvenaz Shahin, Fariba Shahraki-Sanavi, Shayan Shahrokhi, Masood Ali Shaikh, Elaheh Shaker, Murad Ziyaudinovich Shakhmardanov, Mehran Shams-Beyranvand, Sara Sheikhbahaei, Rahim Ali Sheikhi, Adithi Shetty, Jeevan K Shetty, Damtew Solomon Shiferaw, Mika Shigematsu, Rahman Shiri, Reza Shirkoohi, K M Shivakumar, Velizar Shivarov, Parnian Shobeiri, Roman Shrestha, Negussie Boti Sidemo, Inga Dora Sigfusdottir, Diego Augusto Santos Silva, Natacha Torres da Silva, Jasvinder A Singh, Surjit Singh, Valentin Yurievich Skryabin, Anna Aleksandrovna Skryabina, David A Sleet, Marco Solmi, YONATAN SOLOMON, Suhang Song, Yimeng Song, Reed J D Sorensen, Sergey Soshnikov, Ireneous N Soyiri, Dan J Stein, Sonu Hangma Subba, Miklós Szócska, Rafael Tabarés-Seisdedos, Takahiro Tabuchi, Majid Taheri, Ker-Kan Tan, Minale Tareke, Elvis Enowbeyang Tarkang, Gebremaryam Temesgen, Worku Animaw Temesgen, Mohamad-Hani Temsah, Kavumpurathu Raman Thankappan, Rekha Thapar, Nikhil Kenny Thomas, Chalachew Tiruneh, Jovana Todorovic, Marco Torrado, Mathilde Touvier, Marcos Roberto Tovani-Palone, Mai Thi Ngoc Tran, Sergi Trias-Llimós, Jaya Prasad Tripathy, Alireza Vakilian, Rohollah Valizadeh, Mehdi Varmaghani, Shoban Babu Varthya, Tommi Juhani Vasankari, Theo Vos, Birhanu Wagaye, Yasir Waheed, Mandaras Tariku Walde, Cong Wang, Yanzhong Wang, Yuan-Pang Wang, Ronny Westerman, Nuwan Darshana Wickramasinghe, Abate Dargie Wubetu, Suowen Xu, Kazumasa Yamagishi, Lin Yang, Gesila Endashaw E Yesera, Arzu Yigit, Vahit Yiğit, Ayenew Engida Ayenew Engida Yimaw, Dong Keon Yon, Naohiro Yonemoto, Chuanhua Yu, Siddhesh Zadey, Mazyar Zahir, Iman Zare, Mikhail Sergeevich Zastrozhin, Anasthasia Zastrozhina, Zhi-Jiang Zhang, Chenwen Zhong, Mohammad Zmaili, Yves Miel H Zuniga, Emmanuela Gakidou.

Affiliations

Institute for Health Metrics and Evaluation (D Bryazka BA, M B Reitsma BS, J A Anderson BS, R Feldman BS, E C Mullany BA, G T Culbreth PhD, X Dai PhD, Prof L Dandona MD, Prof R Dandona PhD, Prof V L Feigin PhD, Prof S I Hay FMedSci, Prof S S Lim PhD, Prof R Lozano MD, T Mestrovic PhD, A H Mokdad PhD, Prof C J L Murray DPhil, Prof M Naghavi PhD, G A Roth MD, R J D Sorensen PhD, Prof T Vos PhD, Prof E Gakidou PhD), Department of Health Metrics Sciences, School of Medicine (X Dai PhD, Prof R Dandona PhD, Prof S I Hay FMedSci, Prof S S Lim PhD, Prof R Lozano MD, A H Mokdad PhD, Prof C J L Murray DPhil, Prof M Naghavi PhD, G A Roth MD,

Prof T Vos PhD, Prof E Gakidou PhD), Division of Cardiology (G A Roth MD), Department of Global Health (R J D Sorensen PhD), University of Washington, Seattle, WA, USA; Social and Economic Welfare Unit (M G Griswold MA), RAND Corporation, Santa Monica, CA, USA; Department of Nutrition and Dietetics (K H Abate PhD), Jimma University, Jimma, Ethiopia; Department of Juridical and Economic Studies (C Abbafati PhD), Department of Public Health and Infectious Diseases (M S Cattaruzza PhD), La Sapienza University, Rome, Italy: Social Determinants of Health Research Center (M Abbasi-Kangevari MD, Z Abbasi-Kangevari BSc, M Azangou-Khyavy MD, S Ghamari MD, Prof H Hassanian-Moghaddam MD, A Kolahi MD, M Rashidi MD), Department of Epidemiology (A Ahmadi PhD), School of Advanced Technologies in Medicine (S Ahmadi PhD), Department of Pharmacology (A Haj-Mirzaian MD), Obesity Research Center (A Haj-Mirzaian MD), Functional Neurosurgery Research Center (E Jamshidi PharmD), Department of Health & Community Medicine (A Kolahi MD), School of Medicine (S Nejadghaderi MD), Student Research Committee (S Rahmani MD), Medical Ethics and Law Research Center (M Taheri PhD), Shahid Beheshti University of Medical Sciences, Tehran, Iran; Non-Communicable Diseases Research Center (NCDRC) (Z Abbasi-Kangevari BSc, Z Aryan MD, S Azadnajafabad MD, M Azangou-Khyavy MD, Prof F Farzadfar DSc, S Ghamari MD, M Keykhaei MD, M Malekpour MD, S Momtazmanesh MD, S Rahmani MD, M Rashidi MD, N Rezaei PhD, M Varmaghani PhD), The Institute of Pharmaceutical Sciences (TIPS) (Prof M Abdollahi PhD), School of Pharmacy (Prof M Abdollahi PhD), Department of Epidemiology and Biostatistics (Y Alimohamadi PhD, M Mansournia PhD), Liver and Pancreatobiliary Diseases Research Center (S Alvand MD), Multiple Sclerosis Research Center (S Eskandarieh PhD, Prof M Sahraian MD), Department of Pathology (A Etemadimanesh MD), School of Medicine (N Hafezi-Nejad MD, M Mayeli MD, S Momtazmanesh MD, A Nowroozi BMedSc), Digestive Diseases Research Institute (S Hariri MD, H Salimzadeh PhD), Department of Psychiatry (R Jabbarineiad MD, S Shahrokhi MD) Students' Scientific Research Center (SSRC) (M Keykhaei MD), Tehran Heart Center (E Mehrabi Nasab MD), Faculty of Medicine (E Mohammadi MD, E Shaker MD, P Shobeiri MD), Sina Trauma and Surgery Research Center (Prof V Rahimi-Movaghar MD), Endocrinology and Metabolism Research Institute (N Rezaei PhD), Iranian Research Center for HIV/AIDS, Iranian Institute for Reduction of High Risk Behaviors (S SeyedAlinaghi PhD), Cancer Research Center (R Shirkoohi PhD), Cancer Biology Research Center (R Shirkoohi PhD), Department of Pharmacology, School of Medicine (M Zahir MD), Tehran University of Medical Sciences, Tehran, Iran; Zoonoses Research Center (A Abdoli PhD), Department of Public Health (Y Sarikhani PhD), Jahrom University of Medical Sciences, Jahrom, Iran; School of Planning, Faculty of Environment (A Abdullah MSc), School of Public Health and Health Systems (Z A Butt PhD), University of Waterloo, Waterloo, ON, Canada; Department of Botany (E S Abhilash PhD), Sree Narayana Guru College Chelannur, Kozhikode, India; Clinical Sciences Department (E Abu-Gharbieh PhD, Prof R Halwani PhD), College of Medicine (Prof R Halwani PhD), Mass Communication Department (A Makki PhD), Sharjah Institute for Medical Research (B Saddik PhD), University of Sharjah, Sharjah, United Arab Emirates; Department of Epidemiology and Population Health (Prof I M Acuna MD), Khalifa University, Abu Dhabi, United Arab Emirates; FIU Robert Stempel College of Public Health & Social Work (Prof J M Acuna MD), Department of Epidemiology (R Jebai MPH), Florida International University, Miami, FL, USA; Department of Internal Medicine (Prof G Addolorato MD), Catholic University of Rome, Rome, Italy; College of Medicine (O M Adebayo MD), Psychiatry Department (O O Ayinde MSc), Department of Medicine (A S Oguntade MSc), University College Hospital, Ibadan, Ibadan, Nigeria (O O Ayinde MSc); Department of Obstetrics and Gynecology (V Adekanmbi PhD), The Office of Health Policy & Legislative Affairs (W Lee PhD), University of Texas, Galveston, TX, USA; School of Public Health & Department of Community Medicine (K Adhikari PhD), Chitwan Medical College & Teaching Hospital, Bharatpur, Nepal; Public Health Section (K Adhikari PhD), Himalavan Environment and Public Health Network (HEPHN), Chitwan, Nepal; Biodesign Center for Environmental Health Engineering (S Adhikari MS), Arizona State University, Tempe, AZ,

USA; Faculty of Medicine (Q E S Adnani PhD), Universitas Padjadjaran (Padjadjaran University), Bandung, Indonesia; Department of Community Medicine (Prof S Afzal PhD), King Edward Memorial Hospital, Lahore, Pakistan; Department of Public Health (Prof S Afzal PhD), Public Health Institute, Lahore, Pakistan; Public Health Department (W Y Agegnehu BHlthSci), Mizan-Tepi University, Mizan-Teferi, Ethiopia; Department of Internal Medicine (M Aggarwal MD), Department of Cardiovascular Medicine (M M Gad MD), Heart and Vascular Institute (M Zmaili MD), Cleveland Clinic, Cleveland, OH, USA: The Australian Centre for Public and Population Health Research (ACPPHR) (B O Ahinkorah MPH, E K Ameyaw MPhil), University of Technology Sydney, Sydney, NSW, Australia; College of Nursing (A R Ahmad PhD), International Relations & Diplomacy, Ranya - Al Sulaimaniyah, Iraq; Department of International Relations & Diplomacy (A R Ahmad PhD), Tishk International University, Erbil, Iraq; Department of Health and Biological Sciences (S Ahmad PhD), Abasyn University, Peshawar, Pakistan; Department of Epidemiology and Health Statistics (T Ahmad MS), Southeast University, Nanjing, China; Department of Epidemiology and Biostatistics (A Ahmadi PhD, A Mohammadian-Hafshejani PhD), Community-Oriented Nursing Midwifery Research Center (M Heidari PhD), Medical Plants Research Center, Basic Health Sciences Institute (R Sadeghian PhD), Department of Health in Disasters and Emergencies (R Sheikhi BHlthSci), Shahrekord University of Medical Sciences, Shahrekord, Iran; Department of Biosciences (H Ahmed PhD), COMSATS Institute of Information Technology, Islamabad, Pakistan; Department of Computer Science and Engineering (T Ahmed Rashid PhD), University of Kurdistan Hewler, Erbil, Iraq; Department of Public Health (C J Akunna DMD), The Intercountry Centre for Oral Health (ICOH) for Africa, Jos, Nigeria; Department of Public Health (C J Akunna DMD), Federal Ministry of Health, Garki, Nigeria; Geriatric and Long Term Care Department (H Al Hamad MD, B Sathian PhD), Rumailah Hospital (H Al Hamad MD), Hamad Medical Corporation, Doha, Qatar; Department of Population Sciences (M Alam MSS), University of Dhaka, Dhaka, Bangladesh; Department of Nursing (D T Alem MSc), Debre Markos University, Debremarkos, Ethiopia: Faculty of Health Sciences (K A Alene MPH), School of Public Health (G Ayano MSc, B A Dachew PhD, B Duko MPH, D Hendrie PhD, T R Miller PhD), Curtin University, Perth, WA, Australia; Wesfarmers Centre of Vaccines and Infectious Diseases (K A Alene MPH), Telethon Kids Institute, Perth, WA, Australia; Pars Advanced and Minimally Invasive Medical Manners Research Center (Y Alimohamadi PhD), Health Management and Economics Research Center (J Arabloo PhD), School of Medicine (M Dodangeh MD), Department of Medical Laboratory Sciences (F Dorostkar PhD), Preventive Medicine and Public Health Research Center (S Goharinezhad PhD), Minimally Invasive Surgery Research Center (A Kabir MD, S Salahi MD), The Five Senses Health Institute (S Rezaei MD), Trauma and Injury Research Center (M Taheri PhD), Department of Epidemiology (R Valizadeh PhD), Iran University of Medical Sciences, Tehran, Iran (F Pashazadeh Kan BSN); Department of Pharmacognosy (A Alizadeh MSc), Tehran University of Medical Sciences, tehran, Iran; Department of Disease Control (K Allel MSc), Department of Non-Communicable Disease Epidemiology (M Iwagami PhD). Department of Non-communicable Disease Epidemiology (S Trias-Llimós PhD), London School of Hygiene & Tropical Medicine, London, UK; Institute for Global Health (K Allel MSc), Department of Health Informatics (S Chung PhD), Department of Epidemiology and Public Health (Prof M Kivimäki PhD), Institute of Cardiovascular Science (A S Oguntade MSc), University College London, London, UK; Research Program of Epidemiology and Public Health (J Alonso MD), Pompeu Fabra University, Barcelona, Spain; Department of Experimental and Health Sciences (J Alonso MD), Biomedical Research Networking Center in Epidemiology and Public Health (CiberESP), Madrid, Spain; Research Group in Hospital Management and Health Policies (Prof N Alvis-Guzman PhD), Universidad de la Costa (University of the Coast), Barranquilla, Colombia; Research Group in Health Economics (Prof N Alvis-Guzman PhD), University of Cartagena, Cartagena, Colombia; School of Pharmacy (F Amare MSc), School of Public Health (B T Merga MPH), Department of Psychiatry (M T Walde MSc), Haramaya University, Harar, Ethiopia; Behavioral

Sciences Research Center (S Amiri PhD), Baqiyatallah University of Medical Sciences, Tehran, Iran; Pharmacy Department (Prof R Ancuceanu PhD), Cardiology Department (C Andrei PhD), Internal Medicine Department (M Hostiuc PhD), Department of Legal Medicine and Bioethics (S Hostiuc PhD), Department of General Surgery (I Negoi PhD), Department of Anatomy and Embryology (R I Negoi PhD), Carol Davila University of Medicine and Pharmacy, Bucharest, Romania; Department of Statistics and Econometrics (Prof T Andrei PhD, Prof M Ausloos PhD, Prof C Herteliu PhD, A Mirica PhD, A Otoiu PhD, A Pana MD, I Petcu PhD), Bucharest University of Economic Studies, Bucharest, Romania; Center of Biotechnology and Microbiology (M Arshad PhD), University of Peshawar, Peshawar, Pakistan; Department of Biophysics (A A Artamonov PhD), Russian Academy of Sciences, Moscow, Russia; Brigham and Women's Hospital (Z Aryan MD), T.H. Chan School of Public Health (Prof T W Bärnighausen MD, P M S Pradhan MD), Harvard University, Boston, MA, USA; Department of Plastic Surgery (M Asaad MD), University of Texas, Houston, TX, USA; School of Public Health (M A Asemahagn PhD), Department of Health System and Health Economics (D D Atnafu MPH), Department of Psychiatry (M Tareke MSc), Department of Nursing (W A Temesgen PhD), Bahir Dar University, Bahir Dar, Ethiopia; School of Health and Society (Prof T Astell-Burt PhD, Z Ratan MSc), University of Wollongong, Wollongong, NSW, Australia; Menzies Centre for Health Policy (Prof T Astell-Burt PhD), Chapter of Addiction Medicine (Prof H Hassanian-Moghaddam MD), Sydney Medical School (S Islam PhD), Save Sight Institute (H Kandel PhD), NHMRC Clinical Trials Centre (R A Mahumud PhD), Department of Public Health (K Nuruzzaman PhD), University of Sydney, Sydney, NSW, Australia; Department of Immunology (S Athari PhD), Zanjan University of Medical Sciences, Zanjan, Iran; School of Medicine and Public Health (P Atorkey MPhil), University of Newcastle, Newcastle, NSW, Australia; Hunter New England Population Health, Wallsend, NSW, Australia (P Atorkey MPhil); Department of Forensic Medicine (A Atreya MD), Lumbini Medical College, Palpa, Nepal; Gastroenterology Department (F Ausloos MD), University of Liège, Liège, Belgium; School of Business (Prof M Ausloos PhD), University of Leicester, Leicester, UK; School of Indigenous Studies (G Ayano MSc), Medical School (Prof G J Hankey MD), University of Western Australia, Perth, WA, Australia; Department of Health Policy Planning and Management (M A a Ayanore PhD), Institute of Health Research (M Immurana PhD), Department of Population and Behavioural Sciences (E E Tarkang PhD), University of Health and Allied Sciences, Ho, Ghana; Department of Health Economics (M A a Ayanore PhD), Centre for Health Policy Advocacy Innovation & Research in Africa (CHPAIR-Africa), Accra, Ghana; Department of Psychiatry (Prof J L Ayuso-Mateos PhD), Universidad Autónoma de Madrid (Autonomous University of Madrid), Madrid, Spain; Biomedical Research Networking Center for Mental Health Network (CiberSAM) (Prof J L Ayuso-Mateos PhD), National School of Public Health (A Padron-Monedero PhD), Institute of Health Carlos III, Madrid, Spain; Department of Public Health (M M Azanaw MPH), Department of Midwifery (B G Kassa MSc), Debre Tabor University, Debre Tabor, Ethiopia; School of Medicine (A Azari Jafari MD, S Mirmoeeni MD), Shahroud University of Medical Sciences, Shahroud, Iran; Faculty of Medicine (A Y Azzam MBBCh), October 6 University, 6th October City, Egypt; Department of Forensic Science (A D Badiye MSc, N Kapoor MSc), Government Institute of Forensic Science, Nagpur, India; Research School of Population Health (N Bagheri PhD, Prof N Cherbuin PhD), Australian National University, Canberra, ACT, Australia; Health Research Institute (N Bagheri PhD), University of Canberra, Canberra, ACT, Australia; School of Medicine (S Bagherieh BSc), Department of Environmental Health Engineering (A Fatehizadeh PhD), Research Institute for Primordial Prevention of Non-Communicable Disease (S Hariri MD), Department of Biostatistics and Epidemiology (E Sadeghi PhD), Isfahan University of Medical Sciences, Isfahan, Iran; Centre for Community Medicine (M Bairwa MD), Department of Preventive Oncology (J K Meena MD), Department of Psychiatry (Prof R Sagar MD), All India Institute of Medical Sciences, New Delhi, India; Department of Forensic Medicine and Toxicology (S M Bakkannavar MD), Kasturba Medical College, Mangalore (R Holla MD), Department of Community Medicine

(C R Rao MD), Manipal Academy of Higher Education, Manipal, India; Division of Reproductive Biology Maternal, Child Health & Nutrition (RBMCH&N) (R K Bakshi MD), Indian Council of Medical Research, New Delhi, India (Prof L Dandona MD); Department of Public Health (A H Balchut/Bilchut PhD, L Getacher MPH), Department of Psychiatry (A D Wubetu MSc), Debre Berhan University, Debre Berhan, Ethiopia; Heidelberg Institute of Global Health (HIGH) (Prof T W Bärnighausen MD, B Moazen MSc), Heidelberg University, Heidelberg, Germany; Academic Unit of Obstetrics and Gynecology (F Barra MD), Department of Neurosciences, Rehabilitation, Ophthalmology, Genetics, Maternal and Child Health (DINOGMI) (Prof S Ferrero PhD), University Eye Clinic (L Ferro Desideri MD), University of Genoa, Genoa, Italy; Department of Public & Environmental Health (A Barrow MPH). University of The Gambia, Brikama, The Gambia; Epidemiology and Disease Control Unit (A Barrow MPH), Ministry of Health, Kotu, The Gambia; Department of Community Medicine and Family Medicine (P Baskaran MD, P Bhardwaj MD, Prof P R Raghav MD), Department of Anatomy (Prof N Bhardwaj MD), School of Public Health (P Bhardwaj MD), Department of Pharmacology (J Charan MD, R J Kaur PhD, S Singh DM, S B Varthya MD), Department of Surgical Oncology (Prof S Misra MCh), All India Institute of Medical Sciences, Jodhpur, India; Biological Sciences Department (L Belo PhD), Research Unit on Applied Molecular Biosciences (UCIBIO) (L Belo PhD, M Carvalho PhD), Department of Medicine (Prof N Cruz-Martins PhD), Laboratory of Toxicology (Prof D Dias da Silva PhD), Associated Laboratory for Green Chemistry (LAQV) (Á M Madureira-Carvalho PhD), Department of Chemistry (M Pinheiro PhD), University of Porto, Porto, Portugal; Nuffield Department of Population Health (D A Bennett PhD, B Lacey PhD), University of Oxford, Oxford, UK; Department of Internal Medicine (I M Bensenor PhD, Prof A R Brunoni PhD), Department of Psychiatry (Prof A R Brunoni PhD, Prof J Castaldelli-Maia PhD, Y Wang PhD), University of São Paulo, São Paulo, Brazil; Department of Social and Clinical Pharmacy (A S Bhagavathula PharmD), Charles University, Hradec Kralova, Czech Republic; Institute of Public Health (A S Bhagavathula PharmD), College of Medicine and Health Sciences (Prof M Grivna PhD), Family Medicine Department (M A Khan MSc), United Arab Emirates University, Al Ain, United Arab Emirates; Institutes of Applied Health Research and Translational Medicine (N Bhala PhD), Queen Elizabeth Hospital Birmingham, Birmingham, UK: Institute of Applied Health Research (N Bhala PhD), University of Birmingham, Birmingham, UK; Department of Internal Medicine (Prof A Bhalla MD), Post Graduate Institute of Medical Education and Research, Chandigarh, India; Neurovascular Imaging Laboratory (S Bhaskar PhD), NSW Brain Clot Bank, Sydney, NSW, Australia; Department of Neurology and Neurophysiology (S Bhaskar PhD), South West Sydney Local Heath District and Liverpool Hospital, Sydney, NSW, Australia; Department of Statistical and Computational Genomics (K Bhattacharyya MSc), National Institute of Biomedical Genomics, Kalyani, India; Department of Statistics (K Bhattacharyya MSc), University of Calcutta, Kolkata, India; Department of Anatomy (V S Bhojaraja MD), Department of Biochemistry (J K Shetty MD), Royal College of Surgeons in Ireland Medical University of Bahrain, Busaiteen, Bahrain; Department of Health Behaviour, Environment and Social Medicine (B Bintoro MD), Gadjah Mada University (Universitas Gadjah Mada), Sleman, Indonesia; Center of Health and Behavior and Promotion (B Bintoro MD), Universitas Gadjah Mada (Gadjah Mada University), Sleman, Indonesia; Valdman Institute of Pharmacology (E A E Blokhina MD), First Pavlov Medical University of St.Petersburg, St. Petersburg, Russia; Biomedical Sciences Department (B B A Bodicha MSc), School of Public Health, College of Medicine and Health Sciences (C Churko MPH, N B Sidemo MPH), College of Medicine and Health Sciences (B D Daniel MSc), Department of Comprehensive Nursing (L E Digesa MSc), Department of Epidemiology and Biostatistics (M A Gebremichael MPH), Health Informatics Department (B T Mulugeta MSc), Department of Midwifery (B Oumer MPH, G Temesgen MSc), School of Nursing, College of Medicine and Health Sciences (G E E Yesera MSc), Arba Minch University, Arba Minch, Ethiopia; Department of Internal Medicine (A Boloor MD), Department of Forensic Medicine and Toxicology, Kasturba Medical College Mangalore (H L Dsouza MD), Department of

Community Medicine (N Joseph MD, N Kumar MD, R Thapar MD), Department of Obstetrics and Gynaecology (A Shetty MS), Manipal Academy of Higher Education, Mangalore, India; Department of Oncology (C Bosetti PhD), Department of Environmental Health Sciences (S Gallus DSc), Mario Negri Institute for Pharmacological Research, Milan, Italy; Department of Epidemiology (D Braithwaite PhD), University of Florida, Gainesville, FL, USA; Cancer Population Sciences Program (D Braithwaite PhD), University of Florida Health Cancer Center, Gainesville, FL, USA; Division of Clinical Epidemiology and Aging Research (Prof H Brenner MD), German Cancer Research Center, Heidelberg, Germany; Department of Epidemiology and Evidence-Based Medicine (Prof N I Briko DSc, E V Glushkova PhD V A Korshunov PhD, P D Lopukhov PhD), Institute for Leadership and Health Management (S Soshnikov PhD), I.M. Sechenov First Moscow State Medical University, Moscow, Russia; Al Shifa School of Public Health (Z A Butt PhD), Al Shifa Trust Eye Hospital, Rawalpindi, Pakistan; Program in Physical Therapy (C Cao MPH), Washington University in St. Louis, St. Louis, MO, USA; Department of Surgery (Y Cao DSc), Washington University in St. Louis, Saint Louis, MO, USA; Department of Health Care (Prof R Cárdenas DSc), Metropolitan Autonomous University, Mexico City, Mexico; IMPACT Strategic Research Center (the Institute for Mental and Physical Health and Clinical Translation) (A F Carvalho MD), School of Medicine (V Gupta PhD), Deakin University, Geelong, VIC, Australia; Faculty of Health Sciences (M Carvalho PhD), University Fernando Pessoa, Porto, Portugal; Department of Medicine (G Castelpietra PhD), University of Udine, Udine, Italy; Department of Mental Health (G Castelpietra PhD), Healthcare Agency "Friuli Occidentale", Pordenone, Italy; Department of Psychiatry (LFS Castro-de-Araujo PhD), School of Health Sciences (A Meretoja MD), Department of Pediatrics (Prof G C Patton MD), University of Melbourne, Melbourne, VIC, Australia; School of Population and Public Health (P A Chakraborty MPH, D P Rasali PhD), University of British Columbia, Vancouver, BC, Canada; Department of Community Medicine (V Chattu MD), Datta Meghe Institute of Medical Sciences, Sawangi, India; Saveetha Medical College (V Chattu MD), Saveetha University, Chennai, India; Department of Oral Medicine and Radiology (A Chaurasia MD), King George's Medical University, Lucknow, India; Center for Biomedicine and Community Health (D Chu PhD), VNU-International School, Hanoi, Vietnam; Department of Medical Science (N Chudal Medical Student), Medical University of Vienna, Vienna, Austria; Health Data Research UK, London, UK (S Chung PhD); Adelaide Medical School (L G Ciobanu PhD), University of Adelaide, Adelaide, SA, Australia; School of Pharmacy and Medical Sciences (L G Ciobanu PhD), University of South Australia, Adelaide, SA, Australia: Department of Public Health (Prof M Cirillo MD. R Palladino MD), University of Naples Federico II, Naples, Italy; Department of Nutrition (Prof R M Claro PhD), Department of Maternal and Child Nursing and Public Health (Prof A C Micheletti Gomide Nogueira de Sá MSc), Federal University of Minas Gerais, Belo Horizonte, Brazil; Department of Epidemiology and Prevention (S Costanzo PhD), IRCCS Neuromed, Pozzilli, Italy; Department of Psychology (R G Cowden PhD), University of the Free State, Park West, South Africa; Department of Family Medicine and Public Health (Prof M H Criqui MD), University of California San Diego, La Jolla, CA, USA: Health sciences (Prof N Cruz-Martins PhD), Institute of Research and Advanced Training in Health Sciences and Technologies (CESPU), Famalicão, Portugal; Department of Epidemiology (B A Dachew PhD), Department of Biochemistry (M Derbew Molla MSc), Department of Surgical Nursing (A A Desta MSc), Department of Human Physiology (M Diress MSc), Department of Clinical Midwifery (T W Gudayu MPH), School of Midwifery (A E A Yimaw MSc), University of Gondar, Gondar, Ethiopia; School of Public Health (O Dadras DrPH), Walailak University, Thai Buri, Thailand; Department of Global Public Health and Primary Care (O Dadras DrPH), University of Bergen, Bergen, Norway; IRCCS Istituto Ortopedico Galeazzi (Galeazzi Orthopedic Institute IRCCS) (G Damiani MD), University of Milan, Milan, Italy; Department of Dermatology (G Damiani MD), Case Western Reserve University, Cleveland, OH, USA; Department of Research (A Pandey PhD), Public Health Foundation of India, Gurugram, India (Prof L Dandona MD, Prof R Dandona PhD, G Kumar PhD); Department of Human Nutrition (A Danielewicz PhD), Uniwersytet Warmińsko-Mazurski w Olsztynie

(University of Warmia and Mazury in Olsztyn), Olsztyn, Poland; Department of Public Health (J Darega Gela MPH), Ambo University, Ambo, Ethiopia; Health Research Institute (K Davletov PhD), Al Farabi Kazakh National University, Almaty, Kazakhstan; Department of Psychiatry (J A P de Araujo MD), Federal University of São Paulo, São Paulo, Brazil; Department of Psychiatry (J A P de Araujo MD), Centro de Estudos Clínica APICE, Salvador, Brazil; Department of Medical Clinic (Prof A R de Sá-Junior PhD), Department of Physical Education (Prof D A S Silva PhD), Federal University of Santa Catarina, Florianópolis, Brazil; School of Public Health (S Debela MPH), Salale University, Fiche, Ethiopia; Department of Epidemiology and Community Medicine (A Dehghan PhD), Non-Communicable Diseases Research Center (NCDRC), Fasa, Iran; Department of Neurosurgery (A K Demetriades MD), Global Health Governance Programme (J Patel), University of Edinburgh, Edinburgh, UK; Neurosurgery Department (A K Demetriades MD), National Health Service (NHS) Scotland, Edinburgh, UK; Division of Cardiology (R Desai MBBS), Atlanta Veterans Affairs Medical Center, Decatur, GA, USA; Center of Complexity Sciences (Prof D Diaz PhD), National Autonomous University of Mexico, Mexico City, Mexico; Faculty of Veterinary Medicine and Zootechnics (Prof D Diaz PhD), Autonomous University of Sinaloa, Culiacán Rosales, Mexico; Center of Excellence in Health Equity, Training and Research (D. Dongarwar MS), Baylor College of Medicine, Houston, TX, USA; Forensic Medicine and Toxicology (H L Dsouza MD), Kasturba Medical College Mangalore, Mangalore, India; School of Public Health (B Duko MPH), Hawassa University, Hawassa, Ethiopia; Postgraduate Program in Epidemiology (Prof B B Duncan MD, Prof M I Schmidt MD), Federal University of Rio Grande do Sul, Porto Alegre, Brazil; College of Science, Health and Engineering (K Edvardsson PhD), La Trobe University, Bundoora, VIC, Australia; Department of Epidemiology and Medical Statistics (M Ekholuenetale MSc, A F Fagbamigbe PhD), Faculty of Public Health (M Ekholuenetale MSc), Department of Health Promotion and Education (S E Ibitoye MPH), University of Ibadan, Ibadan, Nigeria; School of Population and Global Health (Prof F J Elgar PhD), McGill University, Montreal, QC, Canada; Faculty of Medicine (M Elhadi MD), University of Tripoli, Tripoli, Libya; Egypt Center for Research and Regenerative Medicine (ECRRM), Cairo, Egypt (M A Elmonem PhD); Public Health Department (A Y Endries MPH), St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia; Population and Behavioural Sciences Division (A F Fagbamigbe PhD), University of St Andrews, St Andrews, UK; Head of the Laboratory of Experimental Medicine (I R Fakhradiyev PhD), Kazakh National Medical University, Almaty, Kazakhstan; Department of Literature and Humanities (F Farahmand BSc), Islamic Azad University, Kermanshah, Iran; Dissemination Division (C S e Farinha MSc), National Institute of Statistics, Lisbon, Portugal; Activity Planning and Control Unit (C S e Farinha MSc), Directorate-General of Health (DGS), Lisbon, Portugal; Department of Psychology (Prof A Faro PhD), Federal University of Sergipe, São Cristóvão, Brazil; Torrens University Australia, Adelaide, SA, Australia (N K Fauk MSc); Institute of Resource Governance and Social Change, Kupang, Indonesia (N K Fauk MSc); National Institute for Stroke and Applied Neurosciences (Prof V L Feigin PhD), Auckland University of Technology, Auckland, New Zealand; Research Center of Neurology, Moscow, Russia (Prof V L Feigin PhD); School of Population Health (X Feng PhD), School of Medicine (P K Maulik PhD), School of Public Health and Community Medicine (A E Peden PhD, Prof A E Schutte PhD), University of New South Wales, Sydney, NSW, Australia; National Institute of Environmental Health (X Feng PhD), Chinese Center for Disease Control and Prevention, Beijing, China; Department of Epidemiology and Biostatistics (Z Fentaw MPH), Department of Environmental Health (M G D Gebrehiwot PhD), Department of Anatomy, College of Medicine and Health Sciences (C Tiruneh MSc), College of Medicine and Health Sciences School of Public Health Department of Public Health Nutrition (B Wagave MPH), Wollo University, Dessie, Ethiopia; Psychiatry Department (I Filip MD), Kaiser Permanente, Fontana, CA, USA; School of Health Sciences (I Filip MD), A.T. Still University, Mesa, AZ, USA: Institute of Public Health (F Fischer PhD), Charité Universitätsmedizin Berlin (Charité Medical University Berlin), Berlin, Germany; Department of Family Medicine

and Primary Care (J M Francis PhD), University of the Witwatersrand, Johannesburg, South Africa; School of Public Health, Medical, and Veterinary Sciences (R C Franklin PhD), James Cook University, Douglas, QLD, Australia; Health Services Management Training Centre (P A Gaal PhD, T Joo MSc), Faculty of Health and Public Administration (M Szócska PhD), Semmelweis University, Budapest, Hungary; Department of Applied Social Sciences (P A Gaal PhD), Sapientia Hungarian University of Transylvania, Târgu-Mureș, Romania; Gillings School of Global Public Health (M M Gad MD), University of North Carolina Chapel Hill, Chapel Hill, NC, USA; Department of Biomedical and Biotechnological Sciences (Prof F Galvano PhD, G Grosso PhD), University of Catania, Catania, Italy; Neurorehabilitation and Robotics Laboratory, Department of Biomedical Engineering (B Ganesan PhD), Jockey Club School of Public Health and Primary Care (J Huang MD, C Zhong MD), The Chinese University of Hong Kong, Hong Kong, China; Department of Occupational Therapy (B Ganesan PhD), Mahatma Gandhi Occupational Therapy College, Jaipur, India; Department of Radiology (T Garg MBBS), King Edward Memorial Hospital, Mumbai, India; Department of Reproductive & Family Health (T G Gebremeskel MPH), Aksum University, Axum, Ethiopia; Medical Biochemistry Department (T R Gemechu MSc), Anatomy Department (D S Shiferaw MSc), Department of Biomedical Science (D S Shiferaw MSc), Madda Walabu University, Goba, Ethiopia; Department of Public Health (M E Getachew MPH), Wollega University, Nekemte, Ethiopia; School of Psychology (A Getachew Obsa MA), Addis Ababa University, Addis Ababa, Ethiopia; School of Nursing, College of Medicine and Health Sciences (A Getie MSc), Arba Minch University, Arbaminch, Ethiopia; Department of Addiction Studies (A Ghaderi PhD), Kashan University of Medical Sciences, Kashan, Iran; Department of Medical Surgical Nursing (M Ghafourifard PhD), Social Determinants of Health Research Center (S Karimi PhD), Anesthesiology and Critical Care Department (Prof A Mahmoodpoor MD), Tabriz University of Medical Sciences, Tabriz, Iran; Mount Auburn Hospital (A Ghajar MD), Harvard Medical School, Cambridge, MA, USA; Department of Epidemiology and Population Health (L A Ghandour PhD), American University of Beirut, Beirut, Lebanon; E-Learning Center, Faculty of Health (M Ghasemi Nour MD), Applied Biomedical Research Center (A Sahebkar PhD), Biotechnology Research Center (A Sahebkar PhD), Social Determinants of Health Research Center (M Varmaghani PhD), Mashhad University of Medical Sciences, Mashhad, Iran; School of Public Health (A Ghashghaee BSc), Qazvin University of Medical Sciences, Qazvin, Iran; Department of Radiology (S Ghozy MD), Mayo Clinic, Rochester, MN, USA; Department of Social and Behavioural Sciences (F N Glozah PhD), University of Ghana, Accra, Ghana; Department of Laboratories (J Godos PhD), Oasi Research Institute, Troina, Italy; Department of Gastroenterology (Prof A Goel DM), Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, India; Health Systems and Policy Research (M Golechha PhD), Indian Institute of Public Health, Gandhinagar, India; Department of Genetics (P Goleij MSc), Sana Institute of Higher Education, Sari, Iran; Department of Nursing (M Golitaleb PhD), Arak University of Medical Sciences, Arak, Iran; Department of Primary Care and Public Health (F Greaves PhD, R Palladino MD, Prof S Rawaf MD), WHO Collaborating Centre for Public Health Education and Training (D L Rawaf MD), Imperial College London, London, UK; Health Improvement Directorate (F Greaves PhD), Academic Public Health England (Prof S Rawaf MD), Public Health England, London, UK; Department of Public Health and Preventive Medicine (Prof M Grivna PhD), Charles University, Prague, Czech Republic; Department of Public Health (B Gupta PhD), Torrens University Australia, Melbourne, VIC, Australia; Department of Preventive Cardiology (Prof R Gupta MD), Eternal Heart Care Centre & Research Institute, Jaipur, India; Department of Medicine (Prof R Gupta MD), Mahatma Gandhi University Medical Sciences, Jaipur, India; Toxicology Department (S Gupta MSc), Shriram Institute for Industrial Research, Delhi, Delhi, India; Department of Clinical Medicine (Prof V K Gupta PhD), Macquarie University, Sydney, NSW, Australia; Department of Radiology and Radiological Science (N Hafezi-Nejad MD, S Sheikhbahaei MD), Johns Hopkins University, Baltimore, MD, USA; NYU Shanghai, Shanghai, China (B J Hall PhD); School of Public Health (T B Handiso MPH), Wolaita Sodo University, Wolaita Sodo,

Ethiopia; Department of Neurology (Prof G J Hankey MD), Sir Charles Gairdner Hospital, Perth, WA, Australia; Research Unit (J M Haro MD), University of Barcelona, Barcelona, Spain; Biomedical Research Networking Center for Mental Health Network (CiberSAM), Barcelona, Spain (J M Haro MD); Department of Zoology and Entomology (A I Hasaballah PhD), Al Azhar University, Cairo, Egypt; Institute of Pharmaceutical Sciences (K Hayat MS), University of Veterinary and Animal Sciences, Lahore, Pakistan; Department of Pharmacy Administration and Clinical Pharmacy (K Hayat MS), Xian Jiaotong University, Xian, China; Independent Consultant, Santa Clara, CA, USA (G Heidari MD); School of Business (Prof C Herteliu PhD), London South Bank University, London, UK; Public Health, Environmental Health, Epidemiology and Health Education Department (D Z Heyi MPH), Madda Walabu University, Robe, Goba Town, Ethiopia; Department of Applied Microbiology (K Hezam PhD), Taiz University, Taiz, Yemen; Department of Microbiology (K Hezam PhD), Nankai University, Tianjin, China; School of Nursing and Public Health Medicine (M M Hlongwa PhD), University of KwaZulu-Natal, Durban, South Africa; Social and Environmental Health Research (M Hossain MPH), Nature Study Society of Bangladesh, Khulna, Bangladesh; Department of Health Promotion and Community Health Sciences (M Hossain MPH), Texas A&M University, College Station, TX, USA; Department of Public Health and Informatics (S Hossain MS), Jahangirnagar University, Dhaka, Bangladesh; Department of Interventional Cardiology (S Hosseini MD), Hamedan University of Medical Sciences, Hamadan, Iran; Pattern Recognition and Machine Learning Lab (M hosseinzadeh PhD), Gachon University, 1342 Seongnamdaero, Sujeonggu, Seongnam 13120, South Korea; Clinical Legal Medicine Department (S Hostiuc PhD), National Institute of Legal Medicine Mina Minovici, Bucharest, Romania; Department of Epidemiology and Health Statistics (Prof G Hu PhD), Central South University, Changsha, China; Czech National Centre for Evidence-Based Healthcare and Knowledge Translation (S Hussain PhD), Institute of Biostatistics and Analyses (S Hussain PhD), Masaryk University, Brno, Czech Republic; Faculty of Medicine (I M Ilic PhD, Prof M M Santric-Milicevic PhD), School of Public Health and Health Management (Prof M M Santric-Milicevic PhD), Faculty of Medicine, Institute of Social Medicine (J Todorovic PhD), University of Belgrade, Belgrade, Serbia; Department of Epidemiology (Prof M D Ilic PhD), University of Kragujevac, Kragujevac, Serbia; Faculty of Pharmacy (L M Irham BPharm), University of Ahmad Dahlan, Yogyakarta, Indonesia; School of Psychology and Public Health (M Islam PhD), La Trobe University, Melbourne, VIC, Australia; Department of Epidemiology and Preventive Medicine (R M Islam PhD), Monash University, Melbourne, VIC, Australia; Institute for Physical Activity and Nutrition (S Islam PhD), Deakin University, Burwood, VIC, Australia; Public Health Department of Social Medicine (Prof H Iso MD), Graduate School of Medicine (Prof K Yamagishi MD), Osaka University, Suita, Japan; Department of Health Management (R Itumalla PhD), University of Hail, Hail, Saudi Arabia; Department of Health Services Research (M Iwagami PhD), Research and Development Center for Health Services (Prof K Yamagishi MD), University of Tsukuba, Tsukuba, Japan; Department of Physical Medicine & Rehabilitation (R Jabbarinejad MD), Northwestern University, Chicago, IL, USA; Research and Development Unit (L Jacob MD), Biomedical Research Networking Center for Mental Health Network (CiberSAM), Sant Boi de Llobregat, Spain; Faculty of Medicine (L Jacob MD), University of Versailles Saint-Quentin-en-Yvelines, Montigny-le-Bretonneux, France; Institute of Advanced Manufacturing Technologies (Prof M Jakovljevic PhD), Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia; Institute of Comparative Economic Studies (Prof M Jakovljevic PhD), Hosei University, Tokyo, Japan; Trauma Research Center (Z Jamalpoor PhD), Aja University of Medical Sciences, Tehran, Iran; Division of Pulmonary Medicine (E Jamshidi PharmD), Lausanne University Hospital (CHUV), Lausanne, Switzerland; Centre of Studies and Research (S Jayapal PhD), Ministry of Health, Muscat, Oman; Postgraduate Institute of Medicine (U U Jayarajah MD), Department of Physiology (R Jayawardena PhD), Department of Pharmacology (P Ranasinghe PhD), University of Colombo, Colombo, Sri Lanka; Department of Surgery (U U Jayarajah MD), National Hospital, Colombo, Sri Lanka; School of

Exercise and Nutrition Sciences (R Jayawardena PhD), School of Public Health and Social Work (M T N Tran PhD), Queensland University of Technology, Brisbane, QLD, Australia; Department of Laboratory Sciences, School of Allied Medical Sciences (S Jeddi MSc), Abadan University of Medical Sciences, Abadan, Iran; Department of Public Health (A Jema MPH), Madda Walabu University, Bale Goba, Ethiopia; Department of Community Medicine (R P Jha MSc), Dr. Baba Saheb Ambedkar Medical College & Hospital, Delhi, India; Department of Community Medicine (R P Jha MSc, B D Kamble MD), Banaras Hindu University, Varanasi, India; National Health System Resource Centre (H Jindal MD), Ministry of Health & Family Welfare, New Delhi, India; Institute of Molecular and Clinical Ophthalmology Basel, Basel, Switzerland (Prof J B Jonas MD); Department of Ophthalmology (Prof J B Jonas MD), Heidelberg University, Mannheim, Germany; Gastrointestinal and Liver Diseases Research Center (F Joukar PhD), Caspian Digestive Disease Research Center (F Joukar PhD), Guilan University of Medical Sciences, Rasht, Iran; Department of Family Medicine and Public Health (J J Jozwiak PhD), University of Opole, Opole, Poland; Institute of Family Medicine and Public Health (M Jürisson PhD), University of Tartu, Tartu, Estonia; School of Public Health (R H Kabthymer MSc, G G Kanno MSc), Dilla University, Dilla, Ethiopia; Department of Community Medicine and Family Medicine (B.D. Kamble MD). All India Institute of Medical Sciences, Hyderabad. India; Sydney Eye Hospital (H Kandel PhD), South Eastern Sydney Local Health District, Sydney, NSW, Australia; School of Health Professions and Human Services (I M Karaye MD), Hofstra University, Hempstead, NY, USA; International Research Center of Excellence (G A Kayode PhD), Institute of Human Virology Nigeria, Abuja, Nigeria; Julius Centre for Health Sciences and Primary Care (G A Kayode PhD), Utrecht University, Utrecht, Netherlands; Amity Institute of Forensic Sciences (H Khajuria PhD, B P Nayak PhD), Amity University, Noida, India; Department of Biophysics and Biochemistry (Prof R Khalilov PhD), Baku State University, Baku, Azerbaijan; Russian Institute for Advanced Study (Prof R Khalilov PhD), Moscow State Pedagogical University, Moscow, Russia; Department of Pediatrics (I A Khan MD), Rutgers University, New Brunswick, NJ, USA; Primary Care Department (M A Khan MSc), NHS North West London, London, UK; College of Medicine (H Kim BN), Ewha Womans University, Seoul, South Korea; Department of Preventive Medicine (J Kim MSc), Korea University, Seoul, South Korea; Department of Genomics and Digital Health (M Kim MD), Samsung Advanced Institute for Health Sciences & Technology (SAIHST), Seoul, South Korea; Public Health Center (M Kim MD), Ministry of Health and Welfare, Wando, South Korea; Department of Nutrition (R W Kimokoti MD), Simmons University, Boston, MA, USA; Department of Public Health (Prof M Kivimäki PhD, Prof T Lallukka PhD), University of Helsinki, Helsinki, Finland; Community-based Services Development (V Klymchuk DSc), Mental Health for Ukraine Project, Lviv, Ukraine; Laboratory of Social Psychology (V Klymchuk DSc), Institute of Social and Political Psychology, Kyiv, Ukraine; Department of Disease Burden (A S Knudsen PhD), Norwegian Institute of Public Health, Bergen, Norway; Biomedical Research Networking Center for Mental Health Network (CIBERSAM) (A Koyanagi MD), San Juan de Dios Sanitary Park, Sant Boi de Llobregat, Spain; Catalan Institution for Research and Advanced Studies (ICREA), Barcelona, Spain (A Kovanagi MD); Department of Anthropology (Prof K Krishan PhD), Panjab University, Chandigarh, India; Community Medicine Department (Y Krishnamoorthy MD), Employees' State Insurance Model Hospital, Chennai, India; Department of Orthopaedics (Prof N Kumar MS), Medanta Hospital, Lucknow, India; National Institute for Health Research (NIHR) Oxford Biomedical Research Centre, Oxford, UK (B Lacey PhD); Department of Otorhinolaryngology (S Lasrado MS), Father Muller Medical College, Mangalore, India; Department of Surgery (J Lau MPH, K Tan PhD), National University of Singapore, Singapore, Singapore; Pattern Recognition and Machine Learning Lab (Prof S Lee PhD), Gachon University, Seongnam, South Korea; Graduate School of Public Health (Y Lee PhD), Ajou University, Suwon-si, South Korea; Department of Medicine (L Lim MRCP), University of Malaya, Kuala Lumpur, Malaysia; Department of Medicine and Therapeutics (L Lim MRCP), The Chinese University of Hong Kong, Shatin, China; Department of Professional and Medical Education (S W Lobo PhD),

Biomedical Sciences (S W Lobo PhD), Mercer University, Macon, GA, USA; Institute of Nutritional Sciences (Prof S Lorkowski PhD), Friedrich Schiller University Jena, Jena, Germany; Competence Cluster for Nutrition and Cardiovascular Health (nutriCARD), Jena, Germany (Prof S Lorkowski PhD); School of Medicine (Prof G Lucchetti PhD), Federal University of Juiz de Fora, Juiz de Fora, Brazil; Department of Biostatistics and Epidemiology (F Madadizadeh PhD), Yazd University of Medical Sciences, Yazd, Iran; Instituto de Investigação e Formação Avançada em Ciências e Tecnologias da Saúde (Institute for Research and Advanced Training in Health Sciences and Technologies) (Á M Madureira-Carvalho PhD), Instituto Universitário de Ciências da Saúde (University Institute of Health Sciences), Gandra, Portugal; Cellular and Molecular Biology Research Center, Health Research Institute (Prof S Mahjoub PhD), Department of Clinical Biochemistry (Prof S Mahjoub PhD), Babol University of Medical Sciences, Babol, Iran; Department of Psychiatry (N Manjunatha MD), National Institute of Mental Health and Neurosciences, Bengalore, India; Substance Abuse Prevention Research Center (B Mansouri PhD), Kermanshah University of Medical Sciences, Kermanshah, Iran; Psychiatry Department (J Martinez-Raga PhD), Hospital Universitario Doctor Peset, Valencia, Spain; Department of Medicine (J Martinez-Raga PhD, Prof R Tabarés-Seisdedos PhD), University of Valencia, Valencia, Spain; Teaching Department (Prof F A Martinez-Villa MSc), Mexican Institute of Social Security, Culiacan Rosales, Mexico; Burden of Disease Research Unit (R Matzopoulos PhD), Alcohol, Tobacco & Other Drug Research Unit (Prof C D H Parry PhD), Risk and Resilience in Mental Disorders Unit (Prof D J Stein MD), South African Medical Research Council, Cape Town, South Africa; School of Public Health and Family Medicine (R Matzopoulos PhD), University of Cape Town, Cape Town, South Africa; Research Division (P K Maulik PhD), The George Institute for Global Health, New Delhi, India; Queensland Brain Institute (Prof J J McGrath MD), The University of Queensland, Brisbane, QLD, Australia; National Centre for Register-based Research (Prof J J McGrath MD), Aarhus University, Aarhus, Denmark; Forensic Medicine Division (Prof R G Menezes MD), Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia; Department of Epidemiology and Health Monitoring (G B M Mensink PhD), Robert Koch Institute, Berlin, Germany; University Research Institute (A A Mentis MD), National and Kapodistrian University of Athens, Athens, Greece; Neurology Unit (A Meretoja MD), Helsinki University Hospital, Helsinki, Finland; University Centre Varazdin (T Mestrovic PhD), University North, Varazdin, Croatia; School of Public Health and Community Medicine (J Miao Jonasson PhD), University of Gothenburg, Gothenburg, Sweden; Center for Innovation in Medical Education (B Miazgowski MD), Pomeranian Medical University, Szczecin, Poland (B Miazgowski MD); Pacific Institute for Research & Evaluation, Calverton, MD, USA (T R Miller PhD); Global Institute of Public Health (Prof G Mini PhD), Ananthapuri Hospitals and Research Institute, Trivandrum, India; Women's Social and Health Studies Foundation, Trivandrum, India (Prof G Mini PhD); Department of Medical Sciences (A Mirijello MD), IRCCS Casa Sollievo della Sofferenza General Hospital (IRCCS Home for the Relief of Suffering General Hospital), San Giovanni Rotondo, Italy; Internal Medicine Programme (Prof E M Mirrakhimov PhD), Kyrgyz State Medical Academy, Bishkek, Kyrgyzstan; Department of Atherosclerosis and Coronary Heart Disease (Prof E M Mirrakhimov PhD), National Center of Cardiology and Internal Disease, Bishkek, Kyrgyzstan: Institute of Addiction Research (ISFF) (B Moazen MSc), Frankfurt University of Applied Sciences, Frankfurt, Germany; Noncommunicable Disease Research Center (M Mobarakabadi MD), Hamadan University of Medical Sciences, Tehran, Iran; Department of Neurosciences (M Moccia PhD), Federico II University, Naples, Italy; Internal Medicine Department (Y Mohammad MD), Pediatric Intensive Care Unit (M Temsah MD), King Saud University, Riyadh, Saudi Arabia; Department of Epidemiology (S Nejadghaderi MD, E Shaker MD), Epidemiology Department (S Shahin MD), Department of International Studies (P Shobeiri MD), Non-Communicable Diseases Research Center (NCDRC), Tehran, Iran (E Mohammadi MD); Dental Basic Sciences Department (T A Mohammed MSc), University of Duhok, Duhok, Iraq; Oncology Department (N Moka MD), Appalachian Regional Healthcare,

Meharry Medical College, Nashville, TN, USA; Department of

Hazard, KY, USA; Internal Medicine (N Moka MD), University of Kentucky, Lexington, KY, USA: Social Determinants of Health Research Center (Y Moradi PhD), Kurdistan University of Medical Sciences, Kurdistan, Iran; Department of Medicine (E Mostafavi PhD), Stanford Cardiovascular Institute (E Mostafavi PhD), Stanford University, Palo Alto, CA, USA; Department of Epidemiology and Biostatistics (S Mubarik MS, Prof C Yu PhD), School of Medicine (Z Zhang PhD), Wuhan University, Wuhan, China; Epidemiology, Family Medicine Unit 19 (E Murillo-Zamora PhD), Mexican Institute of Social Security, Colima, Mexico; Postgraduate Program in Medical Sciences (E Murillo-Zamora PhD), Universidad de Colima, Colima, Mexico; Department of Internal Medicine (J C Mwita MD, G M Rwegerera MD), University of Botswana, Gaborone, Botswana; Laboratory of Public Health Indicators Analysis and Health Digitalization (M Naimzada MD, S S Otstavnov PhD), Moscow Institute of Physics and Technology, Dolgoprudny, Russia; Experimental Surgery and Oncology Laboratory (M Naimzada MD), Kursk State Medical University, Kursk, Russia; Suraj Eye Institute, Nagpur, India (V Nangia MD); Department of General Surgery (I Negoi PhD), Emergency Hospital of Bucharest, Bucharest, Romania; Cardio-Aid, Bucharest, Romania (R I Negoi PhD); Department of Community Medicine (S Nepal MD), Kathmandu University, Palpa, Nepal; National Centre for Suicide Research and Prevention (S P Neupane PhD), University of Oslo, Norway; Specialist Oral Health Center for Western Norway Department (S P Neupane PhD), Oral Health Center of Expertise in Rogaland, Rogland, Norway; Estia Health Blakehurst (S Neupane Kandel BSN), Estia Health, Sydney, NSW, Australia; Institute for Mental Health and Policy (Y T Nigatu PhD), Centre for Addiction and Mental Health, Toronto, ON, Canada; Department of Population Science (K Nuruzzaman PhD), Jatiya Kabi Kazi Nazrul Islam University, Mymensingh, Bangladesh; Center of Excellence in Reproductive Health Innovation (CERHI) (C I Nzoputam MPH), University of Benin, Benin City, Nigeria; Centre for Rural Health (K O Obamiro PhD), University of Tasmania, Hobart, TAS, Australia; Translational Health Research Institute (F A Ogbo PhD), Western Sydney University, Sydney, NSW, Australia; Health Promotion Research Center (H Okati-Aliabad PhD, F Shahraki-Sanavi PhD), Zahedan University of Medical Sciences, Zahedan, Iran; Community Prevention and Care Services (B O Olakunde PhD), National AIDS Control Committee, Abuja, Nigeria; Cardiology Department (G M M Oliveira PhD), Federal University of Rio de Janeiro, Rio de Janeiro, Brazil; Diplomacy and Public Relations Department (A Omar Bali PhD), University of Human Development, Sulaymaniyah, Iraq; Mass Communication Department (E Omer PhD), Aiman University, Dubai, United Arab Emirates: Health Systems Research Center (D V Ortega-Altamirano DrPH), National Institute of Public Health, Cuernavaca, Mexico; Department of Project Management (S S Otstavnov PhD), National Research University Higher School of Economics, Moscow, Russia; Department of Respiratory Medicine (Prof M P A DNB), Jagadguru Sri Shivarathreeswara Academy of Health Education and Research, Mysore, India; Department of Health Metrics (A Pana MD), Center for Health Outcomes & Evaluation, Bucharest, Romania; Privatpraxis, Heidelberg, Germany (S Panda-Jonas MD); Research Department (A Pandey MPH), Research Section (U Paudel PhD), Nepal Health Research Council, Kathmandu, Nepal; Research Department (A Pandey MPH), Public Health Research Society Nepal. Kathmandu, Nepal; Vision and Eye Research Institute (Prof S Pardhan PhD), Anglia Ruskin University, Cambridge, UK; Department of Health Administration and Policy (T Parekh MSc), George Mason University, Fairfax, VA, USA; Department of Medical Humanities and Social Medicine (Prof E Park PhD), Kosin University, Busan, South Korea; Department of Psychiatry (Prof C D H Parry PhD), Stellenbosch University, Cape Town, South Africa; School of Dentistry (J Patel), University of Leeds, Leeds, UK; Skills Innovation and Academic Network (SIAN) Institute (S Pati PhD), Association for Biodiversity Conservation and Research (ABC), Odisha, India; Population Health Theme (Prof G C Patton MD), Murdoch Childrens Research Institute, Melbourne, VIC, Australia; Faculty of Humanities and Social Sciences (U Paudel PhD), Department of Community Medicine, Institute of Medicine (P M S Pradhan MD), Tribhuvan University, Kathmandu, Nepal; Department of Genetics (S Pawar PhD), Department of Internal Medicine (R Shrestha PhD), Yale University, New Haven, CT, USA;

College of Public Health, Medical and Veterinary Sciences (A E Peden PhD), James Cook University, Townsville, NSW, Australia; Shanghai Mental Health Center (Prof M R Phillips MD), Shanghai Jiao Tong University, Shanghai, China; Department of Psychiatry (Prof M R Phillips MD), Department of Health and Behavior Studies (Prof I D Sigfusdottir PhD), Columbia University, New York, NY, USA; Research School of Chemistry and Applied Biomedical Sciences (E Plotnikov PhD), Tomsk Polytechnic University, Tomsk, Russia; Mental Health Research Institute (E Plotnikov PhD), Tomsk National Research Medical Center of the Russian Academy of Sciences, Tomsk, Russia; Department of Biochemistry (Prof A Prashant PhD), Jagadguru Sri Shivarathreeswara University, Mysuru, India; School of Public Health (J Quan MD), University of Hong Kong, Hong Kong, China; College of Medicine (A Radfar MD), University of Central Florida, Orlando, FL, USA; Department of Immunology (Prof A Rafiei PhD), Molecular and Cell Biology Research Center (Prof A Rafiei PhD), Mazandaran University of Medical Sciences, Sari, Iran; Data Mining Research Unit (DaMRA) (A Rahman PhD), Charles Sturt University, Wagga Wagga, NSW, Australia; Department of Population Science and Human Resource Development (Prof M Rahman PhD, M Rahman DrPH), University of Rajshahi, Rajshahi, Bangladesh; Future Technology Research Center (A Rahmani PhD), National Yunlin University of Science and Technology, Yunlin, Taiwan (province of China); Research Department (C L Ranabhat PhD), Policy Research Institute, Kathmandu, Nepal; Health and Public Policy Department (C L Ranabhat PhD), Global Center for Research and Development, Kathmandu, Nepal; Data Analytic Services Department (D P Rasali PhD), British Columbia Centre for Disease Control, Vancouver, BC, Canada; Department of Biomedical Engineering (Z Ratan MSc), Khulna University of Engineering and Technology, Khulna, Bangladesh; University College London Hospitals, London, UK (D L Rawaf MD); School of Health, Medical and Applied Sciences (L Rawal PhD), CQ University, Sydney, NSW, Australia; School of Medicine (Prof A M N Renzaho PhD), Translational Health Research Institute (Prof A M N Renzaho PhD), Western Sydney University, Campbelltown, NSW, Australia; Eye and Skull Base Research Centers (S Rezaei MD), Rassoul Akram Hospital, Tehran, Iran; Department of Epidemiology and Biostatistics (Prof M Rezaeian PhD), Department of Neurology (A Vakilian MD), Non-communicable Diseases Research Center (A Vakilian MD), Rafsanjan University of Medical Sciences, Rafsanjan, Iran; Cardiovascular Diseases Research Center (S Riahi PhD, F Saeedi MD). Birjand University of Medical Sciences, Birjand, Iran; Clinical and Epidemiological Research in Primary Care (GICEAP) (E Romero-Rodríguez PhD), Maimonides Biomedical Research Institute of Cordoba (IMIBIC), Cordoba, Spain; Research and Development (Prof U Saeed PhD), Islamabad Diagnostic Center Pakistan, Islamabad, Pakistan; Biological Production Division (Prof U Saeed PhD), National Institute of Health, Islamabad, Pakistan; Department of Development Studies (H Sahoo PhD), International Institute for Population Sciences, Mumbai, India; Health Systems and Population Studies Division (K Saif-Ur-Rahman MPH), International Centre for Diarrhoeal Disease Research, Bangladesh, Dhaka, Bangladesh; Department of Public Health and Health Systems (K Saif-Ur-Rahman MPH), Nagoya University, Nagoya, Japan; Advanced Therapy Medicinal Products Department (S Salahi MD), Royan Institution, Tehran, Iran; Department of Entomology (A M Samy PhD), Ain Shams University, Cairo, Egypt; Department of Biomedical and Neuromotor Sciences (F Sanmarchi MD), University of Bologna, Bologna, Italy; Health Policy Research Center (Y Sarikhani PhD), Shiraz University of Medical Sciences, Shiraz, Iran; Faculty of Health & Social Sciences (B Sathian PhD), Bournemouth University, Bournemouth, UK; Department of Preventive and Social Medicine (G Saya MD), Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry, India; Education Development Center (M Sayyah MD), Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran; The George Institute for Global Health, Sydney, NSW, Australia (Prof A E Schutte PhD); Department of Methodology and Innovation in Prevention (M Schwarzinger MD), University Hospital of Bordeaux, France, Bordeaux, France; University of Bordeaux, Inserm UMR 1219-Bordeaux Population Health (M Schwarzinger MD), Inserm, Bordeaux, France; Department of Psychology (D C Schwebel PhD),

School of Medicine (Prof J A Singh MD), University of Alabama at Birmingham, Birmingham, AL, USA; Department of Population and Health (A Seidu MPhil), University of Cape Coast, Cape Coast, Ghana; College of Public Health, Medical and Veterinary Sciences (A Seidu MPhil), James Cook University, Townsville, QLD, Australia; Department of Biotechnology (Prof N Senthil Kumar PhD), Mizoram University, Aizawl, India; National Heart, Lung, and Blood Institute (A Seylani BS), National Institute of Health, Rockville, MD, USA; Center for Biomedical Information Technology (F Sha PhD), Shenzhen Institutes of Advanced Technology, Shenzhen, China; Neuroimmunulogy Department (S Shahrokhi MD), Universal Scientific Research Network (USERN), Tehran, Iran; Independent Consultant, Karachi, Pakistan (M A Shaikh MD); Infectious Diseases Department (Prof M Z Shakhmardanov PhD), Department of Infectious Diseases and Epidemiology (A A Skryabina MD), Pirogov Russian National Research Medical University, Moscow, Russia; School of Medicine (M Shams-Beyranvand MSc), Alborz University of Medical Sciences, Karaj, Iran; National Institute of Infectious Diseases, Tokyo, Japan (M Shigematsu PhD): Finnish Institute of Occupational Health. Helsinki, Finland (R Shiri PhD); Public Health Dentistry Department (Prof K M Shivakumar PhD), Krishna Institute of Medical Sciences Deemed to be University, Karad, India; Department of Clinical Immunology and Hematology (V Shivarov PhD), Sofiamed University Hospital, Sofia, Bulgaria; Department of Genetics (V Shivarov PhD), Sofia University "St. Kliment Ohridiski", Sofia, Bulgaria; Department of Psychology (Prof I D Sigfusdottir PhD), Reykjavik Ūniversity, Reykjavik, Iceland; Portuguese Institute of Sport and Youth, Lisbon, Portugal (N T d Silva MPsych); Medicine Service (Prof J A Singh MD), US Department of Veterans Affairs (VA), Birmingham, AL, USA; Department No.16 (V Y Skryabin MD), Moscow Research and Practical Centre on Addictions, Moscow, Russia; Division of Injury Prevention (Prof D A Sleet PhD), The Bizzell Group, Atlanta, GA, USA; Rollins School of Public Health (Prof D A Sleet PhD), Emory University, Atlanta, GA, USA; Department of Psychiatry (M Solmi MD), University of Ottawa, Ottawa, ON, Canada; Department of Nursing (Y SOLOMON MSc), Dire Dawa University, Dire Dawa, Ethiopia; Taub Institute for Research on Alzheimer's Disease and the Aging Brain (S Song PhD), Columbia University Medical Center, New York, NY, USA; Department of Land Surveying and Geo-Informatics (Y Song PhD), Hong Kong Polytechnic University, Hong Kong, China; Laboratory of Public Health Indicators Analysis and Health Digitalization (S Soshnikov PhD), Moscow Institute of Physics and Technology, Moscow, Russia; Hull York Medical School (I N Soyiri PhD), University of Hull, Hull City, UK; Department of Community Medicine and Family Medicine (Prof S H Subba MD), All India Institute of Medical Sciences, Bhubaneswar, Bhubaneswar, India; Carlos III Health Institute (Prof R Tabarés-Seisdedos PhD), Biomedical Research Networking Center for Mental Health Network (CiberSAM), Madrid, Spain; Cancer Control Center (T Tabuchi MD), Osaka International Cancer Institute, Osaka, Japan; HIV Health Promotion Division (E E Tarkang PhD), HIV/AIDS Prevention Research Network, Cameroon, Kumba, Cameroon; Department of Public Health and Community Medicine (Prof K R Thankappan MD), Central University of Kerala, Kasaragod, India; Gastroenterology Department (N K Thomas MD), PSG Institute of Medical Sciences and Research, Coimbatore, India; Psychiatry and Medical Psychology Department (M Torrado PhD), University of Lisbon, Lisbon, Portugal; Child and Adolescent Mental Health Services (CAMHS) (M Torrado PhD), Hospital Garcia de Orta, Almada, Portugal; Nutritional Epidemiology Research Team EREN (M Touvier PhD), National Institute for Health and Medical Research INSERM, Paris, France; Health, Medicine and Human Biology (M Touvier PhD), Sorbonne Paris Nord University, Bobigny, France; Department of Pathology and Legal Medicine (M R Tovani-Palone PhD), University of São Paulo, Ribeirão Preto, Brazil; Modestum LTD, London, UK (M R Tovani-Palone PhD); Health Informatic Department, Nursing and Midwifery Faculty (M T N Tran PhD), Hanoi Medical University, Ha Noi, Vietnam; Department of Community Medicine (J P Tripathy MD), All India Institute of Medical Sciences, Nagpur, India; UKK Institute, Tampere, Finland (Prof T J Vasankari MD); Faculty of Medicine and Health Technology (Prof T J Vasankari MD), Tampere University, Tampere, Finland; Infection Prevention & Control and Water,

Sanitation and Hygiene Unit (B Wagaye MPH), Ethiopian Public Health Institute, Addis Ababa, Ethiopia; Foundation University Medical College (Prof Y Waheed PhD), Foundation University Islamabad, Islamabad, Pakistan; Department of Medicine (C Wang MPH), Vanderbilt University, Nashville, TN, USA; School of Population Health and Environmental Sciences (Y Wang PhD), King's College London, London, UK; Competence Center of Mortality-Follow-Up of the German National Cohort (R Westerman DSc), Federal Institute for Population Research, Wiesbaden, Germany; Department of Community Medicine (N D Wickramasinghe MD), Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka; Department of Endocrinology, First Affiliated Hospital (Prof S Xu PhD), University of Science and Technology of China, Hefei, China; School of Medicine and Dentistry (Prof S Xu PhD), University of Rochester, Rochester, NY, USA; Cancer Epidemiology and Prevention Research (L Yang PhD), Alberta Health Services, Calgary, BC, Canada; Department of Oncology (L Yang PhD), University of Calgary, Calgary, AB, Canada; Department of Health Management (A Yigit PhD, V Yiğit PhD), Süleyman Demirel Üniversitesi (Süleyman Demirel University), Isparta, Turkey; Department of Pediatrics (D Yon MD), Kyung Hee University, Seoul, South Korea; Department of Neuropsychopharmacology (N Yonemoto PhD), National Center of Neurology and Psychiatry, Kodaira, Japan; Department of Public Health (N Yonemoto PhD), Juntendo University, Tokyo, Japan; Duke Global Health Institute (S Zadey MS), Duke University, Durham, NC, USA; Faculty of Medicine (M Zahir MD), Islamic Azad University, Tehran, Iran; Research and Development Department (I Zare BSc), Sina Medical Biochemistry Technologies, Shiraz, Iran; Department of Bioengineering and Therapeutic Sciences (Prof M S Zastrozhin PhD), University of California San Francisco, San Francisco, CA, USA; Addictology Department (Prof M S Zastrozhin PhD), Russian Medical Academy of Continuous Professional Education, Moscow, Russia; Peoples' Friendship University of Russia, Moscow, Russia (A Zastrozhina PhD); Health Technology Assessment Unit (Y H Zuniga BS), Department of Health Philippines, Manila, Philippines; #MentalHealthPH, Inc., Quezon City, Philippines (Y H Zuniga BS).

Contributors

Please see appendix 1 (pp 50–55) for more detailed information about individual author contributions to the research, divided into the following categories: managing the overall research enterprise; writing the first draft of the manuscript; primary responsibility for applying analytical methods to produce estimates; primary responsibility for seeking, cataloguing, extracting, or cleaning data; designing or coding figures and tables; providing data or critical feedback on data sources; developing methods or computational machinery; providing critical feedback on methods or results; drafting the manuscript or revising it critically for important intellectual content; and managing the estimation or publications process. Members of the core research team for this topic area had full access to the underlying data used to generate estimates presented in this Article. All other authors had access to and reviewed estimates as part of the research evaluation process, which includes additional stages of formal review.

Declaration of interests

O M Adebayo reports grants or contracts from Merck Foundation and Servier Nigeria; payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from Merck Foundation; support for attending meetings or travel from Servier Nigeria; and a leadership or fiduciary role in a board, society, committee or advocacy group, paid or unpaid, with the Nigerian Association of Resident Doctors; all outside the submitted work. S Afzal reports honorary participation on the Institutional Review Board of King Edward Medical University (Lahore, Pakistan), the Quality Enhancement Cell at Fatima Jinnah Medical University (Lahore, Pakistan), and the Corona Expert Advisory Group (Pakistan); an unpaid leadership or fiduciary role in board, society, committee or advocacy group, with the Pakistan Society of Community Medicine & Public Health, Pakistan Association of Medical Editors, and Pakistan Society of Medical Infectious Diseases; all outside the submitted work. R Ancuceanu reports consulting fees from AbbVie; payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing or educational events from AbbVie, B. Braun Medical, Sandoz, and Laropharm; all outside the submitted

work. P Atorkey reports support for the present manuscript via funding from the School of Medicine and Public Health, The University of Newcastle (Callaghan, NSW, Australia), and infrastructure support from Hunter New England-Population Health and Hunger Medical Research Institute, Australia. M Ausloos reports a research grant from the Romanian National Authority for Scientific Research and Innovation, CNDS-UEFISCDI (project number: PN-III-P4-ID-PCCF-2016-0084, title: "Understanding and modelling time-space patterns of psychology-related inequalities and polarization") outside the submitted work. T Bärnighausen reports grants from the European Union (Horizon 2020 and EIT Health), German Research Foundation (DFG), US National Institutes of Health, German Ministry of Education and Research, Alexander von Humboldt Foundation Else-Kröner-Fresenius-Foundation, Wellcome Trust, Bill & Melinda Gates Foundation, KfW, Joint United Nations Programme on HIV/AIDS (UNAIDS), World Health Organization; consulting fees from KfW for the OSCAR initiative in Vietnam; participation on a Data Safety Monitoring Board or Advisory Board with National Institutes of Health (US)-funded study "Healthy Options" (PIs: Smith Fawzi, Kaaya) as Chair of the Data Safety and Monitoring Board, with the German National Committee on the "Future of Public Health Research and Education", as chair of the scientific advisory board to the EDCTP Evaluation, as a member of the UNAIDS Evaluation Expert Advisory Committee, as a National Institutes of Health (US) Study Section Member on Population and Public Health Approaches to HIV/AIDS (PPAH), with the US National Academies of Sciences, Engineering, and Medicine's Committee for the "Evaluation of Human Resources for Health in the Republic of Rwanda under the President's Emergency Plan for AIDS Relief (PEPFAR)", with the University of Pennsylvania Population Aging Research Center (PARC) as an External Advisory Board Member; leadership or fiduciary role in a board, society, committee or advocacy group, paid or unpaid, with the Global Health Hub Germany (which was initiated by the German Ministry of Health) as a co-chair; all outside the submitted work. S M M Bhaskar reports grants or contracts from the NSW Ministry of Health, Australia; a leadership or fiduciary role in a board, society, committee or advocacy group, paid or unpaid, with the Rotary Club of Sydney as board director, with the International Rotary Fellowship of Healthcare Professionals (UK) as board director, with Global Health & Migration Hub Community, Global Health Hub Germany, Berlin as a chair or manager; all outside the submitted work. J M Castaldelli-Maia reports grants or contracts from Pfizer (Independent Grants for Learning and Change) and the French National Institute for Cancer (INCa); consulting fees from L'Oreal Mental Health Wellness International Board; all outside the submitted work. S Costanzo reports a research grant from the European Foundation for Alcohol Research (ERAB) (ID EA1767; 2018-2020); payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing or educational events from The Dutch Beer Institute Foundation - The Brewers of Europe as a member of the Organizing Committee and speaker for the 9th European Beer and Health Symposium (Bruxelles 2019), and for giving a lecture at the 13th European Nutrition Conference FENS 2019 (Dublin), sponsored by the Beer and Health Initiative (The Dutch Beer Institute foundation - The Brewers of Europe); all outside the submitted work. I Filip reports financial or non-financial support from the Avicenna Medical and Clinical Research Institute (California, USA). R C Franklin reports leadership or fiduciary role in board, society, committee or advocacy group, paid or unpaid with Kidsafe, Farmsafe, Royal Life Saving Society -Australia, and PHAA - Injury Prevention SIG outside the submitted work. C Herteliu reports research grants from the Romanian Ministry of Research Innovation and Digitalization, MCID (ID-585-CTR-42-PFE-2021, Jan 2022-Jun 2023, "Enhancing institutional performance through development of infrastructure and transdisciplinary research ecosystem within socio-economic domain - PERFECTIS"), the Romanian National Authority for Scientific Research and Innovation, CNDS-UEFISCDI (PN-III-P4-ID-PCCF-2016-0084, October, 2018, to September, 2022, "Understanding and modelling time-space patterns of psychology-related inequalities and polarization"; PN-III-P2-2.1-SOL-2020-2-0351, June, 2020, to October, 2020, "Approaches within public health management in the context of COVID-19 pandemic"), and the Ministry of Labour and Social Justice, Romania (30/PSCD/2018, September, 2018, to June, 2019, "Agenda for skills Romania 2020-2025"),

all outside the submitted work. J J Jozwiak reports payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing or educational events from Teva Pharmaceuticals, Amgen, Synexus, Boehringer Ingelheim, ALAB Laboratories, and Zentiva, outside the submitted work. M Kivimäki reports support for the present manuscript from the Wellcome Trust (221854/Z/20/Z), the UK Medical Research Council (MR/S011676/1), the US National Institute on Aging (R01AG056477), and the Academy of Finland (350426) in the form of research grants to their institution. K Krishan reports non-financial support from the UGC Centre of Advanced Study (Phase II), Department of Anthropology, Panjab University, Chandigarh, India, outside the submitted work. S Lorkowski reports grants or contracts paid to his institution from Akcea Therapeutics Germany; consulting fees from Danone, Novartis Pharma, Swedish Orphan Biovitrum (SOBI), and Upfield; payment or honoraria for lectures, presentations, speaker's bureaus, manuscript writing, or educational events from Akcea Therapeutics Germany, Amarin Germany, Amedes Holding, Amgen, Berlin-Chemie, Boehringer Ingelheim, Daiichi Sankyo Deutschland, Danone, Hubert Burda Media Holding, Janssen-Cilag, Lilly Deutschland, Novartis, Novo Nordisk, F Hoffmann-La Roche (Roche), Sanofi-Aventis, SYNLAB Holding Deutschland, and SYNLAB Akademie; support for attending meetings or travel from Amgen; and participation on a data safety monitoring board or advisory board for Akcea Therapeutics Germany, Amgen, Daiichi Sankyo Deutschland, Novartis, and Sanofi-Aventis; all outside the submitted work. A M Madureira-Carvalho reports grants or contracts from Instituto Universitário de Ciências da Saúde (Gandra, Portugal); consulting fees from Albert Labs and Eurox Pharma paid to her and her institution; a leadership or fiduciary role in a board, society, committee or advocacy group, paid or unpaid, with the Portuguese Association of Forensic Sciences (APCF); all outside the submitted work. A-F A Mentis reports grants or contracts from "MilkSafe: A novel pipeline to enrich formula milk using omics technologies", a research co-financed by the European Regional Development Fund of the European Union and Greek national funds through the Operational Program Competitiveness, Entrepreneurship and Innovation, under the call RESEARCH - CREATE - INNOVATE (project code: T2EDK-02222), as well as from ELIDEK (Hellenic Foundation for Research and Innovation, MIMS-860): stock or stock options in a family winery; and support from BGI Group as a scientific officer; all outside the submitted work. C D H Parry reports grants or contracts from the South African Medical Research Council paid to their institution; consulting fees paid to them from the World Health Organization (WHO) and the University of Cape Town (Cape Town, South Africa); payment or honoraria for a lecture on alcohol & NCDs in 2020 from the University of Cape Town; support for attending meetings or travel from UCT African Union 2022, UN Office on Drugs & Crime 2019, and WHO meeting on alcohol in Uganda 2021; participation on a Data Safety Monitoring Board or Advisory Board with the UK SPECTRUM Project (multi university) Global Advisory Board, and the UN Office on Drugs & Crime WDR Scientific Advisory Board, both unpaid; all outside the submitted work. G A Roth reports support for the present manuscript from the Bill & Melinda Gates Foundation via a research grant to their institution. G A Roth reports grants or contracts from the American Heart Association, the American College of Cardiology, and the National Heart, Lung, and Blood Institute paid to their institution, outside the submitted work V Shivarov reports financial support from ICON plc. J A Singh reports consulting fees from Crealta/ Horizon, Medisys, Fidia, PK Med, Two Labs, Adept Field Solutions, Clinical Care Options, Clearview Healthcare Partners, Putnam Associates, Focus Forward, Navigant Consulting, Spherix, MedIQ, Jupiter Life Science, UBM, Trio Health, Medscape, WebMD, and Practice Point Communications, the National Institutes of Health, and the American College of Rheumatology; payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing, or educational events from Simply Speaking; support for attending meetings or travel from the steering committee of OMERACT; participation on a Data Safety Monitoring Board or Advisory Board with the US Food and Drug Administration Arthritis Advisory Committee; leadership or fiduciary role in board, society, committee or advocacy group, paid or unpaid, with OMERACT as a steering committee member, with the Veterans Affairs Rheumatology Field Advisory Committee as Chair (unpaid), and with the

UAB Cochrane Musculoskeletal Group Satellite Center on Network Meta-analysis and editor and director (unpaid); stock or stock options in TPT Global Tech, Vaxart Pharmaceuticals, Aytu BioPharma, Adaptimmune Therapeutics, GeoVax Labs, Pieris Pharmaceuticals, Enzolytics, Seres Therapeutics, Tonix Pharmaceuticals and Charlotte's Web Holdings, and previously owned stock options in Amarin, Viking, and Moderna Pharmaceuticals; all outside the submitted work.

Data sharing

For access to the data used for this specific analysis before the full publication of GBD 2020, please contact Emmanuela Gakidou at gakidou@uw.edu.

Acknowledgments

Research reported in this publication was supported by the Bill & Melinda Gates Foundation. S Afzal acknowledges the support for intellectual contributions to this manuscript by the Department of Community Medicine and Epidemiology at King Edward Medical University, Lahore, Pakistan. T Bärnighausen was supported by the Alexander von Humboldt Foundation through the Alexander von Humboldt Professor award, funded by the German Federal Ministry of Education and Research. L Belo acknowledges support from FCT in the scope of the project UIDP/04378/2020 and UIDB/04378/2020 of UCIBIO and the project LA/P/0140/2020 of i4HB. D Bennett is supported by the UK Medical Research Council Population Health Research Unit at the University of Oxford (Oxford, UK). M Carvalho acknowledges support from FCT in the scope of the project UIDP/04378/2020 and UIDB/04378/2020 of UCIBIO and the project LA/P/0140/2020 of i4HB. L Castro-de-Araujo was funded by the Medical Research Council (UK), Grant no. MR/T03355X/1 and by the National Institute of Mental Health Grant no. R01MH128911. FJ Elgar is supported by the Canada Research Chairs program. F Greaves acknowledges support from the NIHR Applied Research Collaboration for NW London. V K Gupta acknowledges funding support from the National Health and Medical Research Council (NHMRC), Australia. VB Gupta acknowledges funding support from the National Health and Medical Research Council (NHMRC), Australia. C Herteliu is partially supported by a grant from the Romanian National Authority for Scientific Research and Innovation. CNDS-UEFISCDI, project number PN-III-P4-ID-PCCF-2016-0084. C Herteliu is partially supported by a grant from the Romanian Ministry of Research Innovation and Digitalization, MCID, project number ID-585-CTR-42-PFE-2021. S Hussain was supported by the Operational Programme Research, Development and Education - Project, Postdoc2MUNI "(No. CZ.02.2.69/0.0/0.0/18_053/0016952). S M S Islam is funded by the National Health and Medical Research Council and received funding from the National Heart Foundation of Australia. The Serbian part of this GBD-related contribution has been co-financed through Grant OI 175 014 of the Ministry of Education Science and Technological Development of the Republic of Serbia. M Kivimaki was supported by the Wellcome Trust (221854/Z/20/Z), the UK Medical Research Council (MR/S011676/1), the US National Institute on Aging (R01AG056477), and the Academy of Finland (350426). K Krishan is supported by the UGC Centre of Advanced Study (Phase II), awarded to the Department of Anthropology, Panjab University, Chandigarh, India. B Lacey acknowledges support from the UK Biobank, funded largely by the UK Medical Research Council and Wellcome, S Lorkowski acknowledges institutional support from the Competence Cluster for Nutrition and Cardiovascular Health (nutriCARD) Halle-Jena-Leipzig (Germany; German Federal Ministry of Education and Research; grant agreement number 01EA1808A). G Lucchetti received a productivity scholarship from the Brazilian National Council for Scientific and Technological Development — CNPq (Level 1D). J McGrath was supported by the Danish National Research Foundation (Niels Bohr Professor). J McGrath is employed by the Queensland Centre for Mental Health Research (Australia), which receives support from the Queensland Health Department. C Parry acknowleges the South African Medical Research Council, A Peden is supported by a National Health and Medical Research Council Emerging Leadership Fellowship (Grant ID: APP2009306). M R Phillips was supported in part by the Global Alliance for Chronic Diseases - National Natural Science Foundation of China (NSFC. No. 81761128031). M Pinheiro acknowledges FCT for funding through program DL 57/2016 - Norma transitória. A Rahman

acknowledges the support from the Data Science Research Unit in Charles Sturt University (Bathurst, NSW, Australia). U Saeed would like to acknowledge the International Center of Medical Sciences Research (ICMSR), Islamabad, Pakistan. A M Samy acknowledges support from Ain Shams University (Cairo, Egypt) and the Egyptian Fulbright Mission Program. N Senthil Kumar acknowledges the DBT, New Delhi sponsored Advanced State Level Biotech Hub (BT/NER/143/ SP44475/2021), Mizoram University (Aizawl, Mizoram, India) for facilitating this work. F Sha is supported by the Shenzhen Science and Technology Program (Grant No. KQTD20190929172835662). A Shetty acknowledges Kasturba Medical College (Mangalore, India) and Manipal Academy of Higher Education (Manipal, India) for all the academic support. R Shrestha acknowledges a career development award from the National Institutes of Health (K01DA051346). D Silva was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior—Brazil (CAPES)—Finance Code 001 and is supported in part by CNPq - Brazil (309589/2021-5). D Sleet acknowledges partial support from Veritas Management Group, Inc and The Bizzell Group, LLC. S Trias-Llimós acknowledges research funding from the Juan de la Cierva-Formación program of the Spanish Ministry of Science and Innovation (FJC-2019-039314-I).

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References

- 1 Griswold MG, Fullman N, Hawley C, et al. Alcohol use and burden for 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet* 2018; 392: 1015–35.
- Shield K, Manthey J, Rylett M, et al. National, regional, and global burdens of disease from 2000 to 2016 attributable to alcohol use: a comparative risk assessment study. *Lancet Public Health* 2020; 5: e51–61.
- 3 Wood AM, Kaptoge S, Butterworth AS, et al. Risk thresholds for alcohol consumption: combined analysis of individual-participant data for 599 912 current drinkers in 83 prospective studies. *Lancet* 2018; 391: 1513–23.
- 4 Rehm J, Gmel GE Sr, Gmel G, et al. The relationship between different dimensions of alcohol use and the burden of disease-an update. Addiction 2017; 112: 968–1001.
- Millwood IY, Walters RG, Mei XW, et al. Conventional and genetic evidence on alcohol and vascular disease aetiology: a prospective study of 500 000 men and women in China. *Lancet* 2019; 393: 1831–42.
- 6 van de Luitgaarden IAT, van Oort S, Bouman EJ, et al. Alcohol consumption in relation to cardiovascular diseases and mortality: a systematic review of Mendelian randomization studies. Eur J Epidemiol 2021; published online Aug 22. https://doi.org/10. 1007/s10654-021-00799-5.
- 7 Liu Y, Nguyen N, Colditz GA. Links between alcohol consumption and breast cancer: a look at the evidence. Womens Health 2015; 11: 65-77.
- 8 Imtiaz S, Shield KD, Roerecke M, Samokhvalov AV, Lönnroth K, Rehm J. Alcohol consumption as a risk factor for tuberculosis: meta-analyses and burden of disease. Eur Respir J 2017; 50: 50.
- 9 Taylor B, Irving HM, Kanteres F, et al. The more you drink, the harder you fall: a systematic review and meta-analysis of how acute alcohol consumption and injury or collision risk increase together. Drug Alcohol Depend 2010; 110: 108–16.
- 10 Roerecke M, Vafaei A, Hasan OSM, et al. Alcohol consumption and risk of liver cirrhosis: a systematic review and meta-analysis. Am J Gastroenterol 2019; 114: 1574–86.
- 11 Roerecke M, Rehm J. Alcohol consumption, drinking patterns, and ischemic heart disease: a narrative review of meta-analyses and a systematic review and meta-analysis of the impact of heavy drinking occasions on risk for moderate drinkers. BMC Med 2014; 12:182
- 12 Pietraszek A, Gregersen S, Hermansen K. Alcohol and type 2 diabetes. A review. Nutr Metab Cardiovasc Dis 2010; 20: 366–75.
- Ding C, O'Neill D, Bell S, Stamatakis E, Britton A. Association of alcohol consumption with morbidity and mortality in patients with cardiovascular disease: original data and meta-analysis of 48,423 men and women. BMC Med 2021; 19: 167.

- 14 Sherk A, Gilmore W, Churchill S, Lensvelt E, Stockwell T, Chikritzhs T. Implications of cardioprotective assumptions for national drinking guidelines and alcohol harm monitoring systems. Int J Environ Res Public Health 2019; 16: E4956.
- 15 Sherk A, Thomas G, Churchill S, Stockwell T. Does drinking within low-risk guidelines prevent harm? Implications for high-income countries using the international model of alcohol harms and policies. J Stud Alcohol Drugs 2020; 81: 352–61.
- WHO. Global status report on alcohol and health 2018. Sept 27, 2018. https://www.who.int/publications/i/ item/9789241565639 (accessed May 9, 2022).
- 17 Corrao G, Bagnardi V, Zambon A, La Vecchia C. A meta-analysis of alcohol consumption and the risk of 15 diseases. *Prev Med* 2004; 38: 613–19.
- 18 Xi B, Veeranki SP, Zhao M, Ma C, Yan Y, Mi J. Relationship of alcohol consumption to all-cause, cardiovascular, and cancer-related mortality in U.S. adults. J Am Coll Cardiol 2017; 70: 913–22.
- 19 Ma H, Li X, Zhou T, et al. Alcohol consumption levels as compared with drinking habits in predicting all-cause mortality and causespecific mortality in current drinkers. Mayo Clin Proc 2021; 96: 1758–69.
- 20 Patra J, Buckley C, Kerr WC, Brennan A, Purshouse RC, Rehm J. Impact of body mass and alcohol consumption on all-cause and liver mortality in 240 000 adults in the United States. Drug Alcohol Rev 2021; 40: 1061–70.
- 21 Habtemichael LH, Djekic D, Rosengren AR, et al. Alcohol consumption in young men and risk of heart failure and all-cause mortality—a cohort study. Eur Heart J 2021; 42 (suppl 1): ehab724.0830.
- 22 Fillmore KM, Stockwell T, Chikritzhs T, Bostrom A, Kerr W. Moderate alcohol use and reduced mortality risk: systematic error in prospective studies and new hypotheses. *Ann Epidemiol* 2007; 17 (suppl): S16–23.
- 23 Wallach JD, Serghiou S, Chu L, et al. Evaluation of confounding in epidemiologic studies assessing alcohol consumption on the risk of ischemic heart disease. BMC Med Res Methodol 2020; 20: 64.
- 24 Dietary Guidelines Advisory Committee. Scientific Report of the 2020 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Agriculture and Secretary of Health and Human Services. Washington, DC: US Department of Agriculture, Agricultural Research Service, 2020.
- 25 UK Department of Health. UK Chief Medical Officers' Alcohol Guidelines Review. Summary of the proposed new guidelines. January, 2016. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/489795/summary. pdf (accessed May 9, 2022).
- 26 Santé Publique France. Alcool et santé: améliorer les connaissances et réduire les risques. March 26, 2019. https://www. santepubliquefrance.fr/presse/2019/alcool-et-sante-ameliorer-lesconnaissances-et-reduire-les-risques (accessed March 20, 2022).
- 27 NHMRC. Australian guidelines to reduce health risks from drinking alcohol. Canberra: National Health and Medical Research Council, 2020
- 28 Stockwell T, Zhao J, Panwar S, Roemer A, Naimi T, Chikritzhs T. Do "moderate" drinkers have reduced mortality risk? A systematic review and meta-analysis of alcohol consumption and all-cause mortality. J Stud Alcohol Drugs 2016; 77: 185–98.
- 29 Rehm J. Why the relationship between level of alcohol-use and all-cause mortality cannot be addressed with meta-analyses of cohort studies. *Drug Alcohol Rev* 2019; 38: 3–4.

- 30 Institute for Health Metrics and Evaluation. Protocol for the global burden of diseases, injuries, and risk factors study (GBD). February 26, 2018. http://www.healthdata.org/sites/default/files/ files/Projects/GBD/GBD_Protocol.pdf (accessed May 9, 2022).
- 31 Murray CJL, Aravkin AY, Zheng P, et al. Global burden of 87 risk factors in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet* 2020; 396: 1223–49.
- 32 Stevens GA, Alkema L, Black RE, et al. Guidelines for Accurate and Transparent Health Estimates Reporting: the GATHER statement. Lancet 2016; 388: e19–23.
- 33 Flaxman AD. An integrative metaregression framework for descriptive epidemiology, 1st edn. Seattle, WA: University of Washington Press, 2015.
- 34 Rehm J, Crépault J-F, Wettlaufer A, Manthey J, Shield K. What is the best indicator of the harmful use of alcohol? A narrative review. Drug Alcohol Rev 2020; 39: 624–31.
- 35 Chisholm D, Moro D, Bertram M, et al. Are the "best buys" for alcohol control still valid? An update on the comparative costeffectiveness of alcohol control strategies at the global level. J Stud Alcohol Drugs 2018; 79: 514–22.
- 36 Brand DA, Saisana M, Rynn LA, Pennoni F, Lowenfels AB. Comparative analysis of alcohol control policies in 30 countries. PLoS Med 2007; 4: e151.
- 37 Ferreira-Borges C, Esser MB, Dias S, Babor T, Parry CDH. Alcohol control policies in 46 African countries: opportunities for improvement. Alcohol Alcohol 2015; 50: 470–76.
- 38 Burton R, Henn C, Lavoie D, et al. A rapid evidence review of the effectiveness and cost-effectiveness of alcohol control policies: an English perspective. *Lancet* 2017; 389: 1558–80.
- 39 Howard SJ, Gordon R, Jones SC. Australian alcohol policy 2001–2013 and implications for public health. BMC Public Health 2014; 14: 848.
- 40 Neufeld M, Ferreira-Borges C, Gil A, Manthey J, Rehm J. Alcohol policy has saved lives in the Russian Federation. *Int J Drug Policy* 2020; 80: 102636.
- 41 Kalinowski A, Humphreys K. Governmental standard drink definitions and low-risk alcohol consumption guidelines in 37 countries. Addiction 2016; 111: 1293–98.
- 42 Moore AA, Whiteman EJ, Ward KT. Risks of combined alcohol/ medication use in older adults. Am J Geriatr Pharmacother 2007; 5: 64–74.
- 43 Ryan M, Merrick EL, Hodgkin D, et al. Drinking patterns of older adults with chronic medical conditions. *J Gen Intern Med* 2013; 28: 1326–32.
- 44 Edenberg HJ. The genetics of alcohol metabolism: role of alcohol dehydrogenase and aldehyde dehydrogenase variants. Alcohol Res Health 2007; 30: 5–13.
- 45 Chrystoja BR, Rehm J, Manthey J, Probst C, Wettlaufer A, Shield KD. A systematic comparison of the global comparative risk assessments for alcohol. *Addiction* 2021; 116: 2026–38.
- 46 Manthey J, Shield KD, Rylett M, Hasan OSM, Probst C, Rehm J. Global alcohol exposure between 1990 and 2017 and forecasts until 2030: a modelling study. *Lancet* 2019; 393: 2493–502.
- 47 Grossman ER, Benjamin-Neelon SE, Sonnenschein S. Alcohol consumption during the COVID-19 pandemic: a cross-sectional survey of US adults. Int J Environ Res Public Health 2020; 17: 9189.