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

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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 (0·0–0·900) 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.

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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[UI] 1·39–2·27) deaths in 2020 and was the leading risk factor for mortality among males aged 15–49 years (Bryazka D, unpublished).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 non-drinker. 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 J-shaped relationship between alcohol use and all-cause mortality.1,6,8 However, others have reported that the all-cause or attributable cause burden weighted TMREL of alcohol is zero standard drinks per day.11–13 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
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 all-cause 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 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 guidelines 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.

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 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. 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.

Methods

Overview

GBD is the most comprehensive effort to date to understand the changing health challenges around the world. 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 and 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 risk exposure within 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. 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.

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 meta-analysis, dose–response relative risk curves for each of these outcomes were estimated through use of a Bayesian meta-regression tool, DisMod ODE.

For GBD 2020, we updated this review for the six alcohol-attributable 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 outcome 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 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, 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, burden-weighted relative risk curves across health outcomes associated with alcohol use. Burden was quantified with...
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 attributable-cause 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 dose-response 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). Further details on estimation of the prevalence of alcohol use and alcohol consumption have been published previously.

### 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
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 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.
One standard drink is equivalent to 10 g of pure ethanol.

Mean theoretical minimum risk exposure levels (Δ) and non-drinker equivalence levels (B), in units of standard drinks per day, by region, age group, and sex, in 2020:

| Region                      | Age group (years) | Females | Males |
|-----------------------------|-------------------|---------|-------|
| North Africa and Middle East| 0·1 – 0·9         | 0·1     | 0·0   |
| South Asia                  | 0·2               | 0·2     | 0·2   |
| Central Europe              | 0·3               | 0·3     | 0·3   |
| Eastern Europe              | 0·4               | 0·4     | 0·4   |
| Australia                   | 0·5               | 0·5     | 0·5   |
| High-income Asia Pacific    | 0·6               | 0·6     | 0·6   |
| Southern Latin America      | 0·7               | 0·7     | 0·7   |
| Western Europe              | 0·8               | 0·8     | 0·8   |
| Andean Latin America        | 0·9               | 0·9     | 0·9   |
| Central Latin America       | 1·0               | 1·0     | 1·0   |
| Tropical Latin America      | 1·1               | 1·1     | 1·1   |
| North Africa and Middle East| 1·2               | 1·2     | 1·2   |
| South Asia                  | 1·3               | 1·3     | 1·3   |
| East Asia                   | 1·4               | 1·4     | 1·4   |
| Southeast Asia              | 1·5               | 1·5     | 1·5   |
| Central sub-Saharan Africa  | 1·6               | 1·6     | 1·6   |
| Eastern sub-Saharan Africa  | 1·7               | 1·7     | 1·7   |
| Southern Latin America      | 1·8               | 1·8     | 1·8   |
| Western sub-Saharan Africa  | 1·9               | 1·9     | 1·9   |

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 66·3% (95% UI 65·1–67·5) of alcohol-related DALYs for males and 47·9% (46·0–49·8) of alcohol-related DALYs for females; transport injuries comprised 25·9% (25·0–27·0) of alcohol-related DALYs in 2020. Globally, in this age range, all injuries accounted for 66·3% (95% UI 65·1–67·5) of alcohol-related DALYs among males and 12·7% (12·0–13·4) among females, self-harm comprised 11·7% (10·1–13·3) of alcohol-related DALYs among males and 12·3% (10·8–13·8) among females, and interpersonal violence comprised 12·4% (11·8–13·0) of alcohol-related DALYs among males and 6·70% (5·90–7·69) among females. The TMREL among males aged 15–39 years in 2020 was 0·136 (0–0·400) standard drinks per day. Among females aged 15–39 years in 2020, the TMREL was 0·273 (0–0·500) standard drinks per day. The NDE was 0·249 (0–1·00) standard drinks per day among males and 0·546 (0–1·30) 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 alcohol-related DALYs among males and 19·5% (18·0–21·0) among females, and intracerebral haemorrhage comprised 10·3% (9·6–10·9) 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, and intracerebral haemorrhage 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, resulting in a higher TMREL and NDE than in individuals aged 15–39 years. The global TMREL for this age group was 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 males compared to females 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% [6·7–14·6] 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% (73·0–81·3) were male. Harmful consumption was predominantly concentrated among individuals aged 15–39 years, who had the lowest TMRELs and NDEs (figure 4). Of the 1·34 billion (95% UI 1·06–1·62) individuals consuming alcohol in excess of the NDE in 2020, 59·1% (54·3–65·4) were aged 15–39 years. Of these, 75·5% (70·3–80·7) were male (595 million [489–658]), Australasia (83·2% [71·1–86·9]), western Europe (79·3% [67·1–84·5]), and central Europe (78·3% [68·1–83·5]) had the highest percentages of males aged 15–39 years consuming harmful amounts of alcohol (table 1). Among females in the same age group,
### Table 1

| Age Group | Number (thousands) | Proportion of Population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of Population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|------------------------------|----------------------------------|--------------------|------------------------------|----------------------------------|
| **Global** |                    |                              |                                  |                    |                              |                                  |
| 15–39 years | 195,000            | 33%                          | -4.0%                            | 595,000            | 39%                          | -4.62%                           |
| 40–64 years | 98,600             | 22.5%                        | -4.22%                           | 274,000            | 34%                          | -2.55%                           |
| ≥65 years   | 18,400             | 4.49%                        | -0.63%                           | 69,900             | 20%                          | -3.19%                           |
| **Central Asia** |            |                              |                                  |                    |                              |                                  |
| 15–39 years | 2200               | 11.9%                        | -2.93%                           | 8420               | 44.5%                        | -1.11%                           |
| 40–64 years | 824                | 4.52%                        | -0.48%                           | 3740               | 32.2%                        | -2.39%                           |
| ≥65 years   | 27                 | 0.84%                        | -0.94%                           | 263                | 12.0%                        | -4.22%                           |
| **Armenia** |                    |                              |                                  |                    |                              |                                  |
| 15–39 years | 648                | 11.8%                        | -1.76%                           | 890                | 41.0%                        | 0.163%                           |
| 40–64 years | 675                | 30.8%                        | -2.16%                           | 502                | 33.3%                        | 2.46%                            |
| ≥65 years   | 2                   | 0.32%                        | -0.19%                           | 45                 | 16.8%                        | 1.92%                            |
| **Azerbaijan** |                |                              |                                  |                    |                              |                                  |
| 15–39 years | 191                | 9.19%                        | -1.6%                            | 890                | 41.0%                        | 0.163%                           |
| 40–64 years | 77                 | 4.75%                        | -0.91%                           | 502                | 33.3%                        | 2.46%                            |
| ≥65 years   | 2                   | 0.32%                        | -0.19%                           | 45                 | 16.8%                        | 1.92%                            |
| **Georgia** |                    |                              |                                  |                    |                              |                                  |
| 15–39 years | 131                | 23.6%                        | -2.46%                           | 427                | 71.9%                        | 1.18%                            |
| 40–64 years | 375                | 8.64%                        | -2.61%                           | 357                | 33.3%                        | 2.46%                            |
| ≥65 years   | 1                   | 0.32%                        | -0.19%                           | 24                 | 17.2%                        | 8.12%                            |
| **Kazakhstan** |                |                              |                                  |                    |                              |                                  |
| 15–39 years | 931                | 26.9%                        | -5.14%                           | 1910               | 55.6%                        | -4.33%                           |
| 40–64 years | 386                | 14.4%                        | -3.39%                           | 871                | 36.5%                        | -2.92%                           |
| ≥65 years   | 16                  | 1.91%                        | -0.95%                           | 68                 | 13.9%                        | -3.78%                           |
| **Kyrgyzstan** |                |                              |                                  |                    |                              |                                  |
| 15–39 years | 139                | 10.4%                        | -2.00%                           | 529                | 39.0%                        | -1.29%                           |
| 40–64 years | 51                 | 6.8%                         | -1.05%                           | 221                | 31.2%                        | 1.90%                            |
| ≥65 years   | 8                   | 0.8%                         | -0.78%                           | 12                 | 9.82%                        | -0.20%                           |
| **Mongolia** |                    |                              |                                  |                    |                              |                                  |
| 15–39 years | 157                | 25.0%                        | -5.71%                           | 350                | 55.1%                        | 7.58%                            |
| 40–64 years | 62                  | 14.4%                        | -0.78%                           | 163                | 41.9%                        | 21.2%                            |
| ≥65 years   | 1                   | 0.8%                         | -0.80%                           | 8                   | 8.92%                        | 12.0%                            |

*Table 1 continues on next page*
| Country       | Age Group 1 | Age Group 2 | Age Group 3 | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|--------------|------------|------------|------------|-------------------------------|----------------------------------|-------------------|-------------------------------|----------------------------------|
| Tajikistan   | 15–39 years | 28.8       | 1.42%      | -0.182%                       | -0.0845 to 0.466                 | 0.137 (0.017/0.036) | 0.0214%                      | -0.133%                         | -0.0614 to 0.0600                | 3.75 (2.25 to 6.18) | 1.54%                        | -0.259%                         | -0.128 to 0.187                |
| Turkmenistan | 15–39 years | 123        | 12.7%      | 2.66%                         | -2.8 to 7.36                     | 533                             | 4.83%                         | 17%                            | 23.4%                           | 17.6%                         | 5.39%                         | 19.0%                           | 5.56 to 3.47                  |
| Uzbekistan   | 15–39 years | 426        | 6.20%      | -0.235%                       | -3.48 to 2.46                    | 2970                            | 42.4%                         | 37.7%                          | 70.6%                           | 33.4%                         | -0.720%                       | -28.5%                          | 5.87                       |
| Albania      | 15–39 years | 112        | 24.3%      | -0.178%                       | -9.18 to 6.39                    | 289                             | 57.0%                         | 56.9%                          | 46.9%                           | 60.6%                         | -0.60%                        | -56.7%                          | 13.6                      |
| Bosnia and Herzegovina | 15–39 years | 125        | 62.6%      | 3.91%                         | 1.61 to 7.14                     | 357                             | 65.1%                         | 56.8%                          | 70.5%                           | 70.6%                         | -1.26%                        | -12.6%                          | 27.5                      |
| Bulgaria     | 15–39 years | 488        | 52.1%      | 3.64%                         | -2.8 to 12.2                     | 798                             | 79.9%                         | 20.7%                          | 70.2%                           | 70.7%                         | -0.45%                        | -28.5%                          | 4.93                      |
| Croatia      | 15–39 years | 315        | 50.8%      | -0.297%                       | -8.93 to 8.88                    | 513                             | 79.3%                         | 1.08%                          | 69.7%                           | 70.8%                         | 3.76%                         | -15.7%                          | 5.60                      |
|               | 40–64 years | 183        | 24.5%      | 1.78%                         | -5.68 to 9.38                    | 401                             | 55.0%                         | 4.94%                          | 64.7%                           | 64.8%                         | 5.45%                         | -14.7%                          | 4.54                      |

(Continued from previous page)
| Country          | 15–39 years | 40–64 years | ≥65 years |
|------------------|-------------|-------------|----------|
| Montenegro       | 33.9        | 17.1        | 1.2%     |
| North Macedonia  | 3.5%        | 3.6%        | 3.0%     |
| Poland           | 3.3%        | 2.9%        | 3.3%     |
| Romania          | 1.3%        | 2.6%        | 1.1%     |
| Serbia           | 2.8%        | 2.1%        | 1.9%     |
| Slovakia         | 1.5%        | 3.2%        | 1.7%     |

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| Country        | Females | Males |
|----------------|---------|-------|
|                | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|                | (≥65 years) | (40–64 years) | (15–39 years) | (≥65 years) | (40–64 years) | (15–39 years) |
| **Eastern Europe** |         |       |        |         |       |        |
| **Slovenia**   |         |       |        |         |       |        |
| 15–39 years    | 151     | 54.0% | (17.7 to 78.7) | -5.6% | 12.3 | -3.3% | (78.7 to 18.1) |
| 40–64 years    | 68.3    | 18.6% | (6.37 to 39.6) | -5.52% | 14.0 | -3.07% | (39.6 to 14.0) |
| ≥65 years      | 7.75    | 2.35% | (0.104 to 8.41) | -2.20% | 1.92 | -1.3% | (8.41 to 1.92) |
| **Belarus**    |         |       |        |         |       |        |
| 15–39 years    | 190     | 61.8% | (40.7 to 77.2) | -2.37% | 12.0 | -1.7% | (77.2 to 12.0) |
| 40–64 years    | 55.6    | 30.9% | (19.9 to 47.4) | 3.69% | 9.27 | 0.2% | (47.4 to 9.27) |
| ≥65 years      | 3.22    | 3.27% | (1.07 to 10.7) | -1.79% | 1.90 | -0.79% | (10.7 to 1.90) |
| **Estonia**    |         |       |        |         |       |        |
| 15–39 years    | 137     | 71.3% | (50.9 to 84.5) | -1.86% | 12.2 | -1.02% | (84.5 to 12.2) |
| 40–64 years    | 79.9    | 35.9% | (24.8 to 53.4) | 11.9% | 9.27 | 0.9% | (53.4 to 9.27) |
| ≥65 years      | 4.75    | 2.74% | (0.720 to 10.2) | 1.68% | 1.90 | 0.68% | (10.2 to 1.90) |
| **Latvia**     |         |       |        |         |       |        |
| 15–39 years    | 179     | 68.6% | (48.4 to 79.1) | -4.22% | 12.2 | -3.5% | (79.1 to 12.2) |
| 40–64 years    | 122     | 35.5% | (24.6 to 50.8) | 12.7% | 9.27 | 1.7% | (50.8 to 9.27) |
| ≥65 years      | 9.25    | 3.54% | (1.31 to 11.3) | 2.51% | 3.27 | 0.51% | (11.3 to 3.27) |
| **Lithuania**  |         |       |        |         |       |        |
| 15–39 years    | 296     | 73.8% | (50.0 to 88.4) | -2.41% | 12.8 | -1.3% | (88.4 to 12.8) |
| 40–64 years    | 173     | 33.4% | (21.8 to 51.5) | 8.67% | 12.7 | 0.8% | (51.5 to 12.7) |
| ≥65 years      | 12.3    | 3.35% | (1.05 to 12.1) | 1.79% | 1.90 | 0.17% | (12.1 to 1.90) |
| **Moldova**    |         |       |        |         |       |        |
| 15–39 years    | 366     | 58.9% | (41.7 to 71.9) | -1.16% | 13.8 | -0.9% | (71.9 to 13.8) |
| 40–64 years    | 211     | 31.1% | (21.6 to 44.6) | 0.328% | 7.13 | 0.2% | (44.6 to 7.13) |
| ≥65 years      | 13.0    | 3.93% | (1.35 to 12.1) | -1.29% | 4.53 | -0.49% | (12.1 to 4.53) |

(Continued 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) Russia | | | | | | |
| 15–39 years | 12,400 (8350 to 15,600) | 53.1% (35.7 to 66.8) | -5.67% (-16.6 to 5.08) | 17,100 (14,700 to 18,400) | 71.6% (61.7 to 77.4) | -2.71% (-8.47 to 2.07) |
| 40–64 years | 6,720 (4,460 to 10,500) | 25.0% (16.6 to 39.0) | 2.57% (-3.44 to 8.74) | 11,900 (9,490 to 15,100) | 52.0% (41.5 to 66.2) | 3.08% (-3.45 to 10.7) |
| ≥65 years   | 2,430 (578 to 875) | 1.64% (0.39 to 5.91) | 0.26% (-0.68 to 1.74) | 1,550 (1050 to 2,820) | 20.5% (13.8 to 37.3) | 0.925% (-3.79 to 5.54) |
|             |         |                                   |       |                                   |         |                               |
| Ukraine     |         |                                   |       |                                   |         |                               |
| 15–39 years | 3,900 (2,420 to 4,980) | 56.4% (35.0 to 71.9) | -4.74% (-18.3 to 7.58) | 5,470 (4,350 to 6,030) | 76.5% (60.9 to 84.4) | -0.693% (-8.78 to 4.87) |
| 40–64 years | 2,070 (1,280 to 3,370) | 24.5% (15.1 to 39.9) | -3.55% (-9.68 to 6.68) | 3,380 (2,340 to 4,790) | 47.3% (32.8 to 67.0) | 4.14% (-4.55 to 13.0) |
| ≥65 years   | 926 (24.6 to 320) | 1.89% (0.501 to 6.53) | 0.032% (-1.30 to 1.45) | 410 (223 to 921) | 16.0% (8.69 to 35.9) | -0.119% (-5.36 to 5.13) |
| Australia   |         |                                   |       |                                   |         |                               |
| 15–39 years | 3,180 (2,740 to 3,940) | 78.1% (65.3 to 82.0) | -3.65% (-12.7 to 2.99) | 3,500 (3,000 to 3,670) | 83.5% (71.5 to 87.4) | -2.07% (-9.33 to 1.66) |
| 40–64 years | 2,230 (1,530 to 3,050) | 56.7% (38.7 to 77.5) | 4.33% (-6.08 to 1.54) | 2,380 (1,810 to 3,050) | 63.0% (47.9 to 80.7) | 8.04% (-0.865 to 15.9) |
| ≥65 years   | 439 (226 to 726) | 19.7% (10.2 to 32.6) | 10.7% (2.07 to 16.7) | 656 (431 to 1,040) | 34.0% (22.2 to 53.8) | 8.35% (0.612 to 15.4) |
| New Zealand | 634 (546 to 665) | 75.6% (65.1 to 79.3) | -7.92% (-14.7 to -2.74) | 709 (605 to 742) | 81.7% (69.8 to 85.5) | -3.88% (-10.5 to -0.412) |
| 40–64 years | 463 (348 to 607) | 58.2% (43.6 to 76.2) | 1.44% (-8.62 to 10.8) | 446 (330 to 589) | 58.7% (43.5 to 77.6) | 6.04% (-3.22 to 13.7) |
| ≥65 years   | 97 (57.5 to 149) | 23.4% (13.7 to 35.7) | 9.97% (-0.197 to 17.0) | 116 (72.2 to 189) | 31.5% (19.7 to 51.5) | -6.85% (-1.20 to 14.4) |
| High-income Asia Pacific | | | | | | |
| 15–39 years | 12,800 (7,820 to 15,200) | 51.3% (31.4 to 61.1) | 0.211% (-12.8 to 10.9) | 17,800 (12,400 to 20,000) | 66.9% (46.6 to 75.1) | -3.96% (-19.1 to 4.23) |
| 40–64 years | 12,000 (9,160 to 16,700) | 36.5% (27.7 to 50.7) | -2.79% (-8.44 to 3.88) | 17,700 (14,100 to 22,600) | 52.3% (41.4 to 66.9) | -6.77% (-13.3 to -0.928) |
| ≥65 years   | 3,390 (2,210 to 4,870) | 12.2% (8.61 to 19.0) | -3.32% (-3.77 to 3.58) | 6,110 (4,340 to 8,250) | 30.6% (21.7 to 41.3) | -2.03% (-7.53 to 3.57) |
| Brunei      | 2.35 (1.4 to 3.29) | 25.0% (12.2 to 3.52) | -1.01% (-2.24 to 0.248) | 6.36 (2.75 to 8.58) | 5.78% (2.50 to 7.79) | -4.43% (-7.49 to -2.20) |
| 40–64 years | 1.02 (0.395 to 1.66) | 16.8% (0.655 to 2.76) | -1.04% (-2.42 to 0.405) | 2.08 (0.311 to 3.94) | 3.22% (0.511 to 5.94) | -4.92% (-7.44 to -2.81) |
| ≥65 years   | 0.062 (0.007 to 0.119) | 5.33% (0.067 to 1.01) | -0.397% (-1.011 to 0.158) | 0.135 (0.004 to 0.263) | 1.23% (0.0364 to 2.40) | -2.31% (-3.88 to -0.898) |
| Japan       | 9,850 (5,760 to 11,900) | 62.2% (36.4 to 75.2) | 1.84% (-16.3 to 15.2) | 12,100 (7,770 to 13,800) | 73.2% (47.0 to 83.6) | -2.86% (-21.8 to 6.97) |
| 40–64 years | 9,370 (6,930 to 13,400) | 43.9% (32.5 to 62.9) | 0.924% (-6.35 to 9.81) | 12,000 (9,070 to 16,000) | 55.6% (42.1 to 74.3) | -5.46% (-12.7 to 15.2) |
| ≥65 years   | 2,910 (1,820 to 4,260) | 14.1% (8.81 to 20.7) | 0.357% (-3.97 to 4.47) | 4,920 (2,180 to 6,840) | 30.7% (20.5 to 42.7) | -2.14% (-7.99 to 4.04) |

(Table 1 continues on next page)
### Articles

(Continued from previous page)

| Age & Region | Females | Males |
|--------------|---------|-------|
| **South Korea** |         |       |
| 15–39 years | 2630 (1860 to 3230) | 5560 (3420 to 8610) |
| 40–64 years | 5280 (4570 to 5810) | 3420 (2060 to 4240) |
| ≥65 years | 1160 (960 to 1380) | 1040 (840 to 1240) |
| **Singapore** |         |       |
| 15–39 years | 286 (126 to 384) | 435 (200 to 568) |
| 40–64 years | 157 (98 to 262) | 260 (154 to 431) |
| ≥65 years | 10.9 (5.86 to 17.9) | 26.0 (14.2 to 44.3) |
| **High-income North America** |         |       |
| 15–39 years | 32200 (21700 to 38700) | 41000 (34300 to 44300) |
| 40–64 years | 18500 (12300 to 26000) | 25700 (18000 to 32100) |
| ≥65 years | 4120 (2270 to 7140) | 6120 (4050 to 9890) |
| **Canada** |         |       |
| 15–39 years | 3420 (2170 to 4240) | 4340 (3540 to 4730) |
| 40–64 years | 2060 (1460 to 3010) | 2870 (2170 to 3730) |
| ≥65 years | 425 (209 to 780) | 708 (453 to 1170) |
| **Greenland** |         |       |
| 15–39 years | 5.26 (3.31 to 6.59) | 7.13 (5.76 to 7.77) |
| 40–64 years | 2.4 (1.42 to 3.62) | 4.41 (2.86 to 5.87) |
| ≥65 years | 0.249 (0.0861 to 0.475) | 0.615 (0.307 to 1.02) |
| **USA** |         |       |
| 15–39 years | 28800 (19900 to 34700) | 36600 (29800 to 43600) |
| 40–64 years | 16500 (12000 to 23300) | 22800 (17600 to 29400) |
| ≥65 years | 3590 (2040 to 6340) | 5420 (3570 to 8690) |
| **Southern Latin America** |         |       |
| 15–39 years | 7500 (5340 to 8610) | 9690 (8560 to 10700) |
| 40–64 years | 3200 (2350 to 4670) | 4790 (3790 to 6700) |
| ≥65 years | 556 (322 to 863) | 979 (666 to 1360) |
| **Argentina** |         |       |
| 15–39 years | 5290 (3750 to 6190) | 6700 (5890 to 7960) |
| 40–64 years | 2050 (1460 to 2600) | 3070 (2400 to 3980) |

(Table 1 continues on next page)
### Articles

**Table 1 (Continued from previous page)**

| Females          | Males          |
|------------------|----------------|
| Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
| ≥65 years        | 343 (187 to 565) | 11.5% (6.27 to 18.9) | -1.72% (-5.92 to 2.50) | 603 (397 to 856) | 27.8% (18.3 to 39.5) | -6.87% (-12.1 to -1.57) |
| 40–64 years      | 1000 (752 to 1410) | 34.3% (25.7 to 48.1) | 2.39% (-4.80 to 8.83) | 2600 (2230 to 2740) | 76.0% (67.5 to 80.1) | 1.58% (-3.14 to 6.33) |
| ≥65 years        | 178 (106 to 268) | 14.1% (8.38 to 21.2) | 3.83% (-0.52 to 7.63) | 318 (223 to 431) | 32.5% (22.8 to 44.2) | 4.90% (-0.005 to 10.6) |
| **Western Europe** |               |                          |                      |                   |                          |                             |
| 15–39 years      | 264 (189 to 314) | 43.6% (31.2 to 51.9) | 4.20% (-5.20 to 13.5) | 395 (345 to 423) | 66.2% (57.9 to 71.0) | 0.745% (-4.29 to 5.94) |
| 40–64 years      | 146 (107 to 214) | 27.5% (20.1 to 40.4) | 1.67% (-4.43 to 8.32) | 231 (183 to 294) | 47.8% (37.9 to 60.9) | 1.51% (-3.45 to 7.00) |
| ≥65 years        | 34.6 (19.3 to 55.4) | 11.1% (6.16 to 17.7) | 2.03% (-2.02 to 5.89) | 57.9 (39.5 to 80.4) | 27.4% (18.7 to 38.1) | 1.88% (-4.33 to 7.51) |
| **Andorra**      |               |                          |                      |                   |                          |                             |
| 15–39 years      | 8.28 (5.59 to 9.89) | 66.9% (45.1 to 79.8) | -5.56% (-10.97 to 4.71) | 10.5 (8.71 to 11.4) | 80.5% (66.6 to 87.4) | -3.96% (-10.3 to 0.358) |
| 40–64 years      | 8.56 (6.04 to 12.2) | 50.5% (35.7 to 72.1) | -1.18% (-10.60 to 8.82) | 1.4 (9.0 to 14.6) | 35.6% (25.9 to 52.7) | 2.85% (-1.86 to 6.59) |
| ≥65 years        | 1.26 (0.73 to 1.94) | 19.3% (11.0 to 29.7) | 4.90% (-0.92 to 11.6) | 2.28 (1.53 to 3.42) | 35.6% (23.8 to 53.3) | 2.85% (-9.51 to 11.8) |
| **Austria**      |               |                          |                      |                   |                          |                             |
| 15–39 years      | 8.74 (6.12 to 10.30) | 63.8% (44.6 to 75.3) | -6.59% (-18.10 to 3.50) | 11.6 (9.82 to 1250) | 79.9% (67.7 to 85.9) | -3.48% (-9.90 to 0.603) |
| 40–64 years      | 7.74 (5.67 to 10.70) | 49.1% (35.9 to 68.1) | -1.47% (-9.42 to 7.35) | 0.95 (7.80 to 1200) | 61.4% (50.7 to 76.7) | -0.70% (-5.00 to 4.53) |
| ≥65 years        | 1.87 (1.16 to 2.75) | 19.5% (12.1 to 28.7) | 3.68% (-2.40 to 8.83) | 2.59 (1.79 to 378) | 35.3% (24.5 to 51.5) | 2.06% (-3.46 to 7.57) |
| **Belgium**      |               |                          |                      |                   |                          |                             |
| 15–39 years      | 11.60 (8.10 to 13.70) | 66.8% (46.5 to 78.5) | -3.76% (-16.00 to 5.81) | 14.00 (11.90 to 1500) | 79.1% (67.7 to 85.0) | -2.61% (-8.21 to 1.53) |
| 40–64 years      | 9.66 (7.00 to 1380) | 50.9% (36.9 to 72.9) | 0.23% (-8.05 to 10.0) | 1.16 (9.23 to 1470) | 60.6% (48.3 to 76.8) | -0.549% (-5.74 to 5.54) |
| ≥65 years        | 2.47 (1.46 to 3.81) | 20.1% (11.9 to 30.9) | 5.35% (-0.92 to 10.87) | 3.36 (2.22 to 503) | 34.5% (22.9 to 51.7) | 1.25% (-4.32 to 6.50) |
| **Cyprus**       |               |                          |                      |                   |                          |                             |
| 15–39 years      | 13 (8.40 to 17.1) | 54.8% (33.9 to 68.8) | -6.12% (-19.95 to 5.20) | 212 (172 to 230) | 83.1% (67.4 to 90.1) | -9.76% (-8.12 to 3.36) |
| 40–64 years      | 8.6 (4.98 to 12.6) | 36.1% (22.1 to 55.8) | 0.596% (-8.51 to 10.1) | 124 (96.8 to 162) | 61.1% (47.8 to 79.8) | -2.93% (-9.83 to 9.34) |
| ≥65 years        | 11.3 (5.66 to 18.4) | 11.2% (5.60 to 18.2) | 4.60% (0.0601 to 8.89) | 30 (19.6 to 44.6) | 33.0% (21.5 to 48.9) | 7.14% (0.206 to 13.0) |
| **Denmark**      |               |                          |                      |                   |                          |                             |
| 15–39 years      | 666 (439 to 779) | 75.1% (49.5 to 87.9) | -3.91% (-18.5 to 6.36) | 790 (645 to 852) | 85.2% (69.6 to 91.9) | -2.19% (-9.90 to 1.66) |
| Country | 40–64 years | ≥65 years | Finland | 15–39 years | 40–64 years | ≥65 years | France | 15–39 years | 40–64 years | ≥65 years | Germany | 15–39 years | 40–64 years | ≥65 years | Greece | 15–39 years | 40–64 years | ≥65 years | Iceland | 15–39 years | 40–64 years | ≥65 years | Ireland | 15–39 years | 40–64 years | ≥65 years | Israel | 15–39 years | 40–64 years | ≥65 years |
|---------|-------------|-----------|---------|-------------|-------------|-----------|--------|-------------|-------------|-----------|---------|-------------|-------------|-----------|--------|-------------|-------------|-----------|----------|-------------|-------------|-----------|----------|-------------|-------------|-----------|----------|-------------|-------------|-----------|
|         | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Number (thousands) | Proportion of population (%) | Proportion of population (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
| Greece | 15–39 years | 999 | 67.0% | (629 to 1210) | -5.81% | (-17.0 to 4.10) | 11,100 | 83.6% | (69.2 to 88.8) | -2.97% | (-4.8 to 0.59) | 1990 | (96.0 to 1010) | -1.72% | (-3.3 to 0.90) | 15–39 years | 556 | 69.5% | (50.6 to 80.1) | -4.42% | (-15.9 to 4.48) | 618 | 78.7% | (67.2 to 84.7) | -2.38% | (-7.9 to 1.99) | 40–64 years | 412 | 50.8% | (37.2 to 69.3) | -1.93% | (-6.0 to 2.28) | 459 | 58.0% | (46.0 to 74.0) | 3.38% | (-2.1 to 9.4) | ≥65 years | 66.9 | 74.9% | (10.3 to 26.3) | 7.05% | (-1.3 to 18.2) | 103 | 30.1% | (19.9 to 45.0) | 6.45% | (1.0 to 11.3) | ≥65 years | 35.2 | 55.2% | (1.9 to 10.8) | 4.64% | (-2.3 to 16.1) | 16.4 | 61.6% | (3.15 to 22.2) | 7.9% | (9.5 to 14.6) | (Table 1 continues on next page)
### Comparative Analysis of Percentage Change in Population

| Country   | Females                                      | Males                                      |
|-----------|----------------------------------------------|--------------------------------------------|
|           | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|           |                  |                                |                             |                  |                                |                             |
| **Italy** | 15-39 years     | 4010                           | 51.6%                        | 32 to 61.9       | -2.55%                        | 140 to 6.32                 |
|           |                  |                                |                              |                  |                              |                             |
|           | 40-64 years      | 4530                           | 39.9%                        | 29 to 55.2       | -4.83%                        | 11.2 to 2.23                |
|           |                  |                                |                              |                  |                              |                             |
|           | ≥65 years        | 1420                           | 18.1%                        | 11 to 25.6       | 0.23%                         | -5.15 to 5.33               |
| **Luxembourg** |                  |                                |                              |                  |                              |                             |
|           | 15-39 years      | 717                            | 67.1%                        | 44 to 80.2       | -5.55%                        | -18.7 to 4.22               |
|           |                  |                                |                              |                  |                              |                             |
|           | 40-64 years      | 568                            | 51.9%                        | 37 to 74.2       | -0.38%                        | -9.38 to 8.85               |
|           |                  |                                |                              |                  |                              |                             |
|           | ≥65 years        | 99                             | 19.7%                        | 11 to 31.4       | 5.61%                         | -0.641 to 11.0              |
| **Malta** | 15-39 years      | 40.4                           | 61.3%                        | 37 to 76.5       | -3.90%                        | -16.9 to 7.94               |
|           |                  |                                |                              |                  |                              |                             |
|           | 40-64 years      | 25                             | 35.1%                        | 23 to 54.8       | 1.21%                         | 7.32 to 8.80                |
|           |                  |                                |                              |                  |                              |                             |
|           | ≥65 years        | 5.3                            | 10.5%                        | 5 to 17.7        | 6.09%                         | 2.27 to 10.1                |
| **Monaco** | 15-39 years      | 2.9                            | 64.0%                        | 29 to 79.2       | -4.16%                        | -29.5 to 18.9               |
|           |                  |                                |                              |                  |                              |                             |
|           | 40-64 years      | 2.8                            | 40.0%                        | 40 to 69.3       | 2.47%                         | -35.7 to 37.2               |
|           |                  |                                |                              |                  |                              |                             |
|           | ≥65 years        | 0.665                          | 12.6%                        | 1 to 29.8        | 6.49%                         | -12.3 to 25.2               |
| **Netherlands** |                  |                                |                              |                  |                              |                             |
|           | 15-39 years      | 1660                           | 68.8%                        | 47 to 75.8       | -2.73%                        | -16.0 to 7.70               |
|           |                  |                                |                              |                  |                              |                             |
|           | 40-64 years      | 1430                           | 49.1%                        | 34 to 71.0       | -0.46%                        | -8.76 to 8.35               |
|           |                  |                                |                              |                  |                              |                             |
|           | ≥65 years        | 397                            | 21.8%                        | 13 to 32.8       | 7.76%                         | -1.9 to 13.2                |
| **Norway** | 15-39 years      | 599                            | 69.8%                        | 45 to 82.2       | -2.79%                        | -17.1 to 7.98               |
|           |                  |                                |                              |                  |                              |                             |
|           | 40-64 years      | 431                            | 50.8%                        | 33 to 77.6       | 7.08%                         | -1.82 to 16.2               |
|           |                  |                                |                              |                  |                              |                             |
|           | ≥65 years        | 86.6                           | 17.1%                        | 8 to 28.5        | 11.8%                         | 6.77 to 16.9                |
| **Portugal** | 15-39 years      | 719                            | 47.8%                        | 32 to 59.0       | -0.371%                       | -11.2 to 9.71               |
|           |                  |                                |                              |                  |                              |                             |
|           | 40-64 years      | 743                            | 36.6%                        | 26 to 51.0       | 1.34%                         | -6.41 to 9.92               |
|           |                  |                                |                              |                  |                              |                             |
|           | ≥65 years        | 318                            | 22.6%                        | 8 to 19.2        | 2.93%                         | -9.95 to 7.36               |
| **San Marino** | 15-39 years      | 3.01                           | 65.7%                        | 30 to 79.3       | -4.69%                        | -12.1 to 15.3               |
|           |                  |                                |                              |                  |                              |                             |
|           | 40-64 years      | 3.11                           | 47.1%                        | 12 to 71.1       | 2.58%                         | -38.3 to 40.9               |
| (Table 1 continues on next page)
(Continued from previous page)

|                  | Females |                                             | Males |                                             |
|------------------|---------|----------------------------------------------|-------|----------------------------------------------|
|                  | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|                  | (0 to 1·20) | (0 to 32·8) | (–13·5 to 23·5) | (0 to 1·75) | (0 to 56·2) | (–18·6 to 40·5) |
| Switzerland     |         |                                             |       |                                             |                             |
| 15–39 years     | 3500    | (2550 to 4330) | (40·7 to 69·0) | 7·6% | (1·3 to 7·9) | (0·3 to 2·7) | 76·3 | (4·1 to 12·9) | (3·2 to 7·3) |
| 40–64 years     | 3400    | (2600 to 4870) | (29·9 to 55·9) | 8·6% | (7·78 to 8·23) | (7·08 to 8·12) | 4850 | (1400 to 5260) | (64·1 to 82·1) |
| ≥65 years       | 670     | (391 to 956) | (7·2 to 18·5) | 1·5% | (8·21 to 5·85) | (1·75 to 5·34) | 5170 | (1910 to 6510) | (48·5 to 75·2) |
|                  |         |                                             |       |                                             |                             |
| Spain            |         |                                             |       |                                             |                             |
| 15–39 years     | 1590    | (1200 to 1980) | (15·7 to 80·0) | 4·3% | (1·67 to 6·3) | (1·57 to 7·07) | 1350 | (920 to 1740) | (65·2 to 88·5) |
| 40–64 years     | 875     | (593 to 1250) | (38·4 to 79·9) | 5·4% | (5·75 to 11·2) | (5·70 to 11·2) | 920  | (692 to 1260) | (43·2 to 78·7) |
| ≥65 years       | 230     | (134 to 361) | (11·1 to 32·1) | 3·8% | (9·85 to 15·0) | (9·85 to 15·0) | 270  | (158 to 457)  | (21·7 to 46·5) |
|                  |         |                                             |       |                                             |                             |
| Sweden           |         |                                             |       |                                             |                             |
| 15–39 years     | 898     | (578 to 1080) | (42·7 to 80·0) | 6·4% | (6·21 to 4·45) | (6·21 to 4·45) | 1140 | (928 to 1240) | (65·2 to 87·2) |
| 40–64 years     | 763     | (536 to 1120) | (35·2 to 72·3) | 5·0% | (5·10 to 11·6) | (5·10 to 11·6) | 720  | (692 to 1260) | (43·2 to 78·7) |
| ≥65 years       | 179     | (102 to 292) | (11·1 to 31·8) | 4·67% | (1·67 to 10·5) | (1·67 to 10·5) | 250  | (162 to 397)  | (21·7 to 53·1) |
|                  |         |                                             |       |                                             |                             |
| UK               |         |                                             |       |                                             |                             |
| 15–39 years     | 7400    | (5310 to 8550) | (45·7 to 92·5) | 6·9% | (6·82 to 7·8) | (6·82 to 7·8) | 8710 | (7420 to 9320) | (68·0 to 85·4) |
| 40–64 years     | 5700    | (4150 to 8070) | (38·4 to 75·0) | 5·2% | (5·24 to 7·65) | (5·24 to 7·65) | 6470 | (5220 to 8210) | (49·6 to 78·0) |
| ≥65 years       | 1300    | (1738 to 2040) | (11·1 to 30·6) | 14·4% | (11·1 to 16·5) | (11·1 to 16·5) | 2000 | (1320 to 3010) | (23·4 to 51·3) |
|                  |         |                                             |       |                                             |                             |
| Andean Latin America |    |                                             |       |                                             |                             |
| 15–39 years     | 4470    | (3630 to 6290) | (20·2 to 48·3) | 34·4% | (34·4 to 35·1) | (34·4 to 35·1) | 8990 | (7150 to 9590) | (54·8 to 73·4) |
| 40–64 years     | 1290    | (775 to 2050) | (9·83 to 26·0) | 16·3% | (1·04 to 11·4) | (1·04 to 11·4) | 3810 | (3000 to 4880) | (39·8 to 64·5) |
| ≥65 years       | 101     | (44·3 to 184) | (1·72 to 7·14) | 3·94% | (2·51 to 2·93) | (2·51 to 2·93) | 507  | (343 to 682)  | (21·7 to 29·2) |
|                  |         |                                             |       |                                             |                             |
| Bolivia          |         |                                             |       |                                             |                             |
| 15–39 years     | 880     | (477 to 1330) | (19·7 to 54·8) | 36·4% | (3·61 to 38·1) | (3·61 to 38·1) | 1670 | (1270 to 1820) | (51·7 to 74·4) |
| 40–64 years     | 219     | (124 to 378) | (9·45 to 28·9) | 16·8% | (7·54 to 11·8) | (7·54 to 11·8) | 641  | (472 to 864)  | (36·9 to 67·6) |
| ≥65 years       | 160     | (578 to 327) | (3·97 to 8·13) | 3·97% | (2·76 to 3·46) | (2·76 to 3·46) | 853  | (448 to 1348) | (24·3 to 34·8) |
|                  |         |                                             |       |                                             |                             |
| Ecuador          |         |                                             |       |                                             |                             |
| 15–39 years     | 598     | (349 to 863) | (9·74 to 24·1) | 16·7% | (4·40 to 16·7) | (4·40 to 16·7) | 2040 | (1630 to 2250) | (45·7 to 63·1) |
| 40–64 years     | 145     | (87 to 236) | (4·11 to 31·1) | 6·82% | (1·35 to 5·55) | (1·35 to 5·55) | 820  | (641 to 1060) | (39·8 to 52·6) |
| ≥65 years       | 720     | (322 to 136) | (0·455 to 1·92) | 1·02% | (0·199 to 1·15) | (0·199 to 1·15) | 876  | (585 to 1193) | (9·23 to 18·7) |
|                  |         |                                             |       |                                             |                             |
| Peru             |         |                                             |       |                                             |                             |
| 15–39 years     | 2990    | (1700 to 4200) | (25·3 to 59·9) | 42·7% | (6·70 to 42·9) | (6·70 to 42·9) | 5280 | (4220 to 5620) | (60·0 to 79·9) |
| 40–64 years     | 922     | (549 to 1440) | (12·3 to 32·4) | 20·7% | (8·86 to 14·2) | (8·86 to 14·2) | 2350 | (1820 to 2980) | (42·6 to 69·7) |

(Continued from previous page)
### The Bahamas ≥65 years

| Age Group | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|------------------------------|---------------------------------|
| ≥65 years | 2420 (1480 to 3350) | 26.5%                        | (−3.25% to 1.90)                |
|           | 599 (292 to 777)    | 7.7%                         | (0.28% to −1.78)                |
| ≥65 years | 31.5 (11.7 to 71.9)  | 1.25%                        | (0.361% to 0.773)               |

### Cuba

| Age Group | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|------------------------------|---------------------------------|
| 15–39 years | 475 (277 to 704)  | 27.1%                        | (−3.32% to 1.07)                |
| 40–64 years | 160 (83 to 258)   | 7.5%                         | (0.61% to −2.17)                |
| ≥65 years  | 11.6 (3.5 to 28.4) | 1.2%                         | (0.492% to −0.526)              |

### Dominica

| Age Group | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|------------------------------|---------------------------------|
| 15–39 years | 3.76 (2.2 to 5.5)  | 30.0                         | (−5.34% to −1.8)                |

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### Caribbean

| Age Group | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|------------------------------|---------------------------------|
| 15–39 years | 202 (124 to 314)  | 5.34%                        | (−3.92 to 4.32)                |
| 40–64 years | 334 (223 to 448)  | 24.8%                        | (16.6 to 33.3)                 |

### Antigua and Barbuda

| Age Group | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|------------------------------|---------------------------------|
| 15–39 years | 484 (291 to 726)  | 27.8%                        | (−6.63 to 10.6)                |
| 40–64 years | 131 (208 to 212)  | 8.63%                        | (1.98 to 8.28)                 |
| ≥65 years  | 0.0679 (0.059 to 0.170) | 1.23%                        | (0.0342 to 0.873)              |

### Barbados

| Age Group | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|------------------------------|---------------------------------|
| 15–39 years | 208 (105 to 213)  | 26.5%                        | (−7.55% to 1.74)                |
| 40–64 years | 4.44 (2.25 to 14.2) | 7.1%                         | (−9.51 to −0.874)               |
| ≥65 years  | 0.192 (0.020 to 0.602) | 1.10%                        | (−0.967% to 0.0998)             |

### Belize

| Age Group | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|------------------------------|---------------------------------|
| 15–39 years | 231 (14.4 to 32.5) | 24.6%                        | (−6.35 to 8.86)                |
| 40–64 years | 681 (4.67 to 9.56) | 12.5%                        | (−0.934 to 5.94)               |
| ≥65 years  | 0.770 (0.282 to 1.42) | 1.94%                        | (−0.921 to 2.80)               |

### Bermuda

| Age Group | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|------------------------------|---------------------------------|
| 15–39 years | 3.69 (2.29 to 7.27) | 40.8%                        | (−4.82 to −1.4)                |
| 40–64 years | 1.88 (1.03 to 3.93) | 35.1%                        | (−8.52 to 1.79)                |
| ≥65 years  | 0.226 (0.070 to 0.501) | 3.11%                        | (−0.507% to 2.66)              |

### Cuba

| Age Group | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|------------------------------|---------------------------------|
| 15–39 years | 475 (277 to 704)  | 27.1%                        | (−3.32% to 1.07)                |
| 40–64 years | 160 (83 to 258)   | 7.5%                         | (0.61% to −2.17)                |
| ≥65 years  | 11.6 (3.5 to 28.4) | 1.2%                         | (0.492% to −0.526)              |

(Continued on next page)
### Females

| Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|--------------------|-------------------------------|----------------------------------|
| 40–64 years        | 0.919 (0.462 to 1.51)         | -2.6% (-5.20 to 2.59)            |
| ≥65 years          | 0.074 (0.020 to 0.187)         | -0.0057% (-1.25 to 1.14)         |

### Males

| Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|--------------------|-------------------------------|----------------------------------|
| 40–64 years        | 4.09 (3.02 to 5.32)           | 38.5% (28.4 to 50.1)             |
| ≥65 years          | 0.624 (0.364 to 0.988)        | 16.8% (9.0 to 26.6)              |

### Dominican Republic

| Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|--------------------|-------------------------------|----------------------------------|
| 40–64 years        | 15.80 (12.80 to 17.30)        | 68.8% (56.0 to 75.4)             |
| ≥65 years          | 469 (336 to 639)              | 35.5% (25.4 to 48.3)             |

### Grenada

| Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|--------------------|-------------------------------|----------------------------------|
| 40–64 years        | 11.2 (9.93 to 12.2)           | 53.0% (46.8 to 57.5)             |
| ≥65 years          | 0.822 (0.617 to 1.07)         | 20.0% (15.0 to 26.0)             |

### Guyana

| Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|--------------------|-------------------------------|----------------------------------|
| 40–64 years        | 304 (277.4 to 331.6)          | 75.5% (60.0 to 76.9)             |
| ≥65 years          | 3.26 (2.77 to 4.73)           | 14.8% (8.18 to 25.1)             |

### Haiti

| Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|--------------------|-------------------------------|----------------------------------|
| 40–64 years        | 1710 (1410 to 1860)           | 65.6% (54.2 to 71.4)             |
| ≥65 years          | 36 (27.7 to 47.3)             | 38.8% (30.5 to 51.3)             |

### Jamaica

| Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|--------------------|-------------------------------|----------------------------------|
| 40–64 years        | 1710 (1410 to 1860)           | 65.6% (54.2 to 71.4)             |
| ≥65 years          | 36 (27.7 to 47.3)             | 38.8% (30.5 to 51.3)             |

### Puerto Rico

| Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|--------------------|-------------------------------|----------------------------------|
| 40–64 years        | 320 (272.7 to 342.3)          | 59.8% (50.6 to 68.4)             |
| ≥65 years          | 40.6 (26.7 to 65.0)           | 13.5% (8.8 to 21.9)              |

### Saint Kitts and Nevis

| Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|--------------------|-------------------------------|----------------------------------|
| 40–64 years        | 5.59 (3.63 to 6.54)           | 49.3% (32.0 to 57.6)             |
| ≥65 years          | 2.02 (0.120 to 4.00)          | 19.3% (0.114 to 3.81)            |

### Table 1 (continued on next page)
**Table 1**

(Continued from previous page)

|                | Females |                       | Males |                       |
|----------------|---------|------------------------|-------|------------------------|
|                | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
| Saint Lucia    |         |                        |       |                        |                       |
| 15–39 years    | 14.5    | (10.5 to 18.3)         | 44.2% | (31.9 to 57.4)         | -3.94%                | (12.8 to 4.68) |
| 40–64 years    | 5.99    | (4.18 to 8.18)         | 19.8% | (13.9 to 27.1)         | -0.864%               | (5.47 to 3.57) |
| ≥65 years      | 0.427   | (0.209 to 0.799)       | 3.96% | (1.94 to 7.42)         | -0.0652%              | (1.83 to 1.84) |
| Virgin Islands |         |                        |       |                        |                       |                        |
| 15–39 years    | 29.2    | (15.5 to 44.3)         | 26.4% | (14.0 to 40.0)         | -5.53%                | (13.7 to 3.16) |
| 40–64 years    | 5.84    | (2.68 to 10.1)         | 9.7%  | (2.1 to 11.7)          | -1.80%                | (1.91 to 1.06) |
| ≥65 years      | 0.278   | (0.0690 to 0.782)      | 0.97% | (0.242 to 2.75)        | -0.194%               | (0.250 to 0.667) |
| Trinidad and Tobago |      |                        |       |                        |                       |                        |
| 15–39 years    | 71.0    | (39.9 to 108)          | 28.5% | (16.0 to 43.2)         | -5.06%                | (13.3 to 3.09) |
| 40–64 years    | 20.6    | (11.1 to 33.6)         | 9.43% | (5.30 to 15.4)         | -0.512%               | (4.39 to 0.02) |
| ≥65 years      | 1.69    | (0.497 to 4.29)        | 1.82% | (0.534 to 6.42)        | 0.461%                | (0.563 to 1.57) |
| Central Latin America |        |                        |       |                        |                       |                        |
| 15–39 years    | 11200   | (6490 to 14 900)       | 21.3% | (12.4 to 28.4)         | -3.10%                | (7.93 to 1.60) |
| 40–64 years    | 1970    | (1130 to 3070)         | 5.67% | (3.25 to 8.82)         | -4.66%                | (4.00 to 7.14) |
| ≥65 years      | 111     | (40.8 to 254)          | 0.88% | (0.362 to 2.26)        | 0.0384%               | (0.539 to 0.493) |
| Colombia       |         |                        |       |                        |                       |                        |
| 15–39 years    | 2230    | (1310 to 3040)         | 23.3% | (13.6 to 31.7)         | -1.43%                | (7.84 to 4.88) |
| 40–64 years    | 385     | (207 to 664)           | 5.48% | (2.95 to 8.74)         | -3.32%                | (6.36 to 0.582) |
| ≥65 years      | 17.6    | (4.68 to 47.2)         | 0.676%| (0.380 to 1.81)        | -0.513%               | (1.58 to 0.33) |
| Costa Rica     |         |                        |       |                        |                       |                        |
| 15–39 years    | 252     | (125 to 734)           | 25.6% | (12.8 to 38.1)         | -3.41%                | (13.11 to 4.30) |
| 40–64 years    | 45.8    | (20.9 to 83.1)         | 6.54% | (2.99 to 11.8)         | -3.70%                | (8.02 to 0.400) |

(Continued on next page)
|            | Number (thousands) | Proportion of population (%) | Percentage change since 1980 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1980 (%) |
|------------|--------------------|-------------------------------|----------------------------------|--------------------|-------------------------------|----------------------------------|
| **Females** |                    |                               |                                  | **Males**          |                               |                                  |
| a65 years  | 2.99 (0.67/2.85)   | 1.19% (0.27/3.43)             | –6.59% (-2.46/0.300)            | 32.8               | 15.7% (9.33/26.0)             | –8.47% (-13.8/2.63)             |
| El Salvador | 15–39 years        | 107 (54.4/160)                | 1.85% (3.97/11.8)               | 8.2 (49.7/721)     | 53.7% (40.6/58.8)             | –2.37% (-8.3/2.89)              |
|            | 40–64 years        | 515 (8.8/32.6)                | 2.9% (1.05/85.3)                | 26.9 (172.2/290)   | 35.6% (27.9/47.0)             | –3.49% (-9.8/2.46)              |
|            | ≥65 years          | 1.08 (0.26/2.87)              | 0.34% (0.08/805)                | 2.6 (15.6/41.9)    | 11.2% (6.7/18.0)              | –0.46% (-5.02/3.12)             |
| **Guatemala** | 15–39 years        | 331 (6.4/95)                  | 1.46% (4.0/14.1)                | 14.2 (1090.0/1570) | 43.9% (33.8/48.6)             | –0.42% (-6.5/5.49)              |
|            | 40–64 years        | 454 (8.3/83.9)                | 2.7% (1.15/52)                  | 3.9 (296.0/330)    | 28.0% (21.3/38.1)             | –3.56% (-9.6/1.38)              |
|            | ≥65 years          | 2.40 (0.39/7.47)              | 0.59% (0.08/1.57)               | 0.9 (19.5/63.1)    | 8.7% (4.6/14.9)               | –3.21% (-7.4/07.8)              |
| **Honduras** | 15–39 years        | 137 (8.2/197)                 | 1.03% (1.42/8.75)               | 7.2 (591.0/815)    | 35.3% (28.7/39.6)             | 0.16% (-8.4/5.2)                |
|            | 40–64 years        | 20.4 (10.4/39.9)              | 1.41 (1.41/4.03)                | 2.3 (195.0/298)    | 23.7% (22.3/34.1)             | –1.24% (-15.9/2.37)             |
|            | ≥65 years          | 1.77 (0.61/3.79)              | 0.67% (0.23/1.43)               | 0.5 (17.3/36.8)    | 11.1% (7.4/15.9)              | 0.11% (-3.4/3.33)               |
| **Mexico** | 15–39 years        | 6570 (393/8740)               | 2.5% (15.1/33.5)                | 15.0 (122.0/16.100) | 59.7% (48.4/64.1)             | –4.61% (-10.3/1.09)             |
|            | 40–64 years        | 1180 (659/1850)               | 6.5% (3.6/10.3)                 | 7.1 (604.0/865)    | 43.7% (36.8/52.8)             | –8.8% (-11.7/0.36)              |
|            | ≥65 years          | 69.8 (25.6/150)               | 1.26% (0.46/2.71)               | 0.25 (63.0/1370)   | 18.3% (13.3/24.7)             | –0.086% (-4.8/4.23)             |
| **Nicaragua** | 15–39 years        | 254 (133/165)                 | 1.8% (9.4/25.9)                 | 7.81 (593.0/854)   | 55.3% (42.0/60.5)             | –1.14% (-7.1/4.62)              |
|            | 40–64 years        | 36.0 (18.1/628)               | 4.79% (2.41/8.36)               | 2.53 (204.0/333)   | 38.4% (30.9/48.9)             | –1.55% (-8.4/4.42)              |
|            | ≥65 years          | 1.55 (0.39/4.02)              | 0.729% (0.18/1.88)              | 0.23 (15.0/35.5)   | 11.6% (8.6/20.4)              | 1.01% (-3.5/5.08)               |
| **Panama** | 15–39 years        | 148 (89/207)                  | 1.91% (11.6/26.8)               | 4.5 (372.0/488)    | 57.4% (47.4/62.2)             | –3.12% (-9.1/7.45)              |
|            | 40–64 years        | 34.0 (19.4/55)                | 6.33% (3.6/28.8)                | 2.26 (190.0/274)   | 42.5% (35.7/51.5)             | –4.6% (-4.0/6.04)               |
|            | ≥65 years          | 2.47 (0.83/5.59)              | 1.26% (0.46/2.85)               | 0.23 (12.2/24.9)   | 17.8% (12.2/24.9)             | –9.9% (-5.8/3.86)               |
| **Venezuela** | 15–39 years        | 1140 (503/1670)               | 1.77% (9.4/26.0)                | 36.0 (2850.0/3980) | 56.0% (43.8/61.3)             | –6.8% (-13.7/1.22)              |
|            | 40–64 years        | 209 (97.9/364)                | 4.90% (2.3/8.53)                | 15.8 (1250.0/2010) | 38.1% (30.2/48.7)             | –15.0% (-19.9/9.10)             |
|            | ≥65 years          | 11.6 (3.0/30.1)               | 0.822% (0.21/2.13)              | 0.16 (105.0/251)   | 14.4% (9.1/21.8)              | –10.9% (-15.8/6.24)             |
| **Tropical Latin America** | 15–39 years        | 15000 (10,400/18,000)         | 3.37% (23.4/40.5)               | 25.6 (19000.0/27300) | 58.1% (43.2/61.9)             | 3.52% (-1.6/2.47)               |
|          | Females |                             | Males |                             |
|----------|---------|------------------------------|-------|------------------------------|
|          | Number (thousands) | Proportion of population (%) | Number (thousands) | Proportion of population (%) |
| 40–64 years | 4000 | 11.7 (8.00 to 16.6) | 12800 | 40.9 (33.8 to 50.2) |
| ≥65 years   | 351  | 2.89 (1.29 to 5.26)   | 1680  | 18.0 (12.7 to 24.9) |
| Brazil     |       |                             |       |                             |
| 15–39 years | 14300 | 32.2 (23.2 to 39.9) | 24300 | 57.2 (42.5 to 61.2) |
| 40–64 years | 3870  | 11.6 (7.90 to 16.4)   | 12300 | 40.4 (33.4 to 49.6) |
| ≥65 years   | 339   | 2.86 (1.37 to 5.19)   | 1620  | 17.9 (12.5 to 24.6) |
| Paraguay   |       |                             |       |                             |
| 15–39 years | 707   | 46.9 (26.7 to 58.5)  | 1280  | 82.1 (64.1 to 86.0) |
| 40–64 years | 127   | 16.1 (9.81 to 23.9)  | 454   | 57.3 (46.6 to 70.4) |
| ≥65 years   | 11.7  | 4.63 (1.82 to 9.20)  | 565   | 25.5 (17.7 to 26.7) |
| North Africa and Middle East |       |                             |       |                             |
| 15–39 years | 729   | 0.58% (0.348 to 1.00) | 7800  | 5.81% (4.51 to 6.94) |
| 40–64 years | 242   | 0.34% (0.149 to 0.632) | 2820  | 3.66% (2.36 to 5.40) |
| ≥65 years   | 18.5  | 0.11% (0.0433 to 0.289) | 258   | 1.54% (0.989 to 2.66) |
| Afghanistan |       |                             |       |                             |
| 15–39 years | 126   | 0.144% (0.0270 to 0.509) | 278   | 2.99% (1.26 to 4.50) |
| 40–64 years | 0.673 | 0.0226% (0.00353 to 0.0966) | 162   | 0.955% (0.0538 to 1.153) |
| ≥65 years   | 0.0124 | 0.0024% (0.00058 to 0.00952) | 0.253 | 0.0486% (0.00152 to 0.292) |
| Algeria     |       |                             |       |                             |
| 15–39 years | 371   | 0.439% (0.259 to 0.690) | 542   | 6.28% (5.02 to 7.67) |
| 40–64 years | 13.0  | 0.246% (0.104 to 0.455) | 210   | 3.91% (2.74 to 5.31) |
| ≥65 years   | 1.12  | 0.0834% (0.00285 to 0.0205) | 21.0 | 1.48% (0.951 to 2.25) |
| Bahrain     |       |                             |       |                             |
| 15–39 years | 1.06  | 0.433% (0.252 to 0.698) | 32.1  | 6.76% (5.43 to 8.23) |
| 40–64 years | 0.353 | 0.238% (0.0997 to 0.447) | 13.2  | 4.41% (3.16 to 6.09) |
| ≥65 years   | 0.0129 | 0.0795% (0.0078 to 0.209) | 0.490 | 1.79% (1.17 to 2.82) |
| Egypt       |       |                             |       |                             |
| 15–39 years | 34.9  | 0.172% (0.0303 to 0.284) | 466   | 2.18% (1.65 to 2.68) |
| 40–64 years | 9.52  | 0.0977% (0.00342 to 0.177) | 150   | 1.32% (0.820 to 1.99) |
| ≥65 years   | 0.518 | 0.0271% (0.00064 to 0.0475) | 10.7 | 0.46% (0.230 to 0.857) |

(Continued from previous page)
|                | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|----------------|-------------------|------------------------------|----------------------------------|-------------------|------------------------------|----------------------------------|
| **Iran**       |                   |                              |                                  |                   |                              |                                  |
| 15–39 years    | 762               | 0.44%                        | (0.245 to 0.689)                 | 1150              | 6.40%                        | (5.07 to 7.81)                   |
| 40–64 years    | 293               | 0.25%                        | (0.086 to 0.483)                 | 478               | 4.01%                        | (2.65 to 5.53)                   |
| ≥65 years      | 2.53              | 0.086%                       | (0.019 to 0.221)                 | 42.3              | 1.48%                        | (0.819 to 2.40)                  |
| **Iraq**       |                   |                              |                                  |                   |                              |                                  |
| 15–39 years    | 405               | 0.57%                        | (0.417 to 0.788)                 | 91.3              | 1.23%                        | (1.02 to 1.49)                   |
| 40–64 years    | 19                  | 0.483%                       | (0.310 to 0.700)                 | 33.6              | 0.826%                       | (0.662 to 1.02)                  |
| ≥65 years      | 2.12               | 0.241%                       | (0.139 to 0.383)                 | 3.52              | 0.442%                       | (0.328 to 0.587)                 |
| **Jordan**     |                   |                              |                                  |                   |                              |                                  |
| 15–39 years    | 2.83               | 0.116%                       | (0.0725 to 0.175)                | 54.1              | 1.82%                        | (1.46 to 2.18)                   |
| 40–64 years    | 1.19               | 0.0989%                      | (0.0425 to 0.175)                | 22.0              | 1.50%                        | (1.00 to 2.06)                   |
| ≥65 years      | 0.0683             | 0.0296%                      | (0.00886 to 0.0646)              | 2.32              | 0.958%                       | (0.328 to 0.457)                 |
| **Kuwait**     |                   |                              |                                  |                   |                              |                                  |
| 15–39 years    | 0.597              | 0.0588%                      | (0.000884 to 0.169)              | 17.6              | 1.66%                        | (0.407 to 2.62)                  |
| 40–64 years    | 0.107              | 0.0174%                      | (0.00685)                        | 3.77              | 0.474%                       | (0.00213 to 1.30)                |
| ≥65 years      | 0.00148            | 0.00254%                     | (0.00155)                        | 0.0692            | 0.0725%                      | (0.00346)                       |
| **Lebanon**    |                   |                              |                                  |                   |                              |                                  |
| 15–39 years    | 26.7               | 0.31%                        | (1.24 to 6.74)                   | 168               | 19.0%                        | (14.0 to 23.4)                   |
| 40–64 years    | 4.86               | 0.726%                       | (0.112 to 2.06)                  | 47.3              | 8.72%                        | (4.57 to 14.6)                   |
| ≥65 years      | 0.256              | 0.0859%                      | (0.00541 to 0.435)               | 8.47              | 3.33%                        | (1.50 to 7.20)                   |
| **Libya**      |                   |                              |                                  |                   |                              |                                  |
| 15–39 years    | 1.82               | 0.125%                       | (0.0649 to 0.215)                | 55.5              | 3.55%                        | (2.73 to 4.37)                   |
| 40–64 years    | 0.379              | 0.0405%                      | (0.0127 to 0.278)                | 21.2              | 2.0%                         | (1.28 to 3.07)                   |
| ≥65 years      | 0.0225             | 0.0133%                      | (0.00178 to 0.0385)              | 1.36              | 0.810%                       | (0.382 to 1.42)                  |
| **Morocco**    |                   |                              |                                  |                   |                              |                                  |
| 15–39 years    | 3.23               | 0.0444%                      | (0.00811 to 0.147)               | 419               | 5.69%                        | (4.24 to 7.07)                   |
| 40–64 years    | 0.272              | 0.0055%                      | (0.00018 to 0.0224)              | 96.1              | 1.97%                        | (1.28 to 2.79)                   |
| ≥65 years      | 0.0079             | 0.00075%                     | (0.00039)                        | 2.80              | 0.213%                       | (0.117 to 0.380)                 |
| **Oman**       |                   |                              |                                  |                   |                              |                                  |
| 15–39 years    | 1.96               | 0.261%                       | (0.0930 to 0.565)                | 68.5              | 4.94%                        | (3.41 to 6.46)                   |
| 40–64 years    | 0.31               | 0.0890%                      | (0.0129 to 0.237)                | 15.2              | 2.17%                        | (0.913 to 3.86)                  |

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(Table 1 continues on next page)
| Females                                                                 | Males                                                                  |
|------------------------------------------------------------------------|------------------------------------------------------------------------|
| **(Continued from previous page)**                                      | **(Continued from previous page)**                                     |
| **Number (thousands)**  | **Proportion of population (%)**                                     | **Number (thousands)** | **Proportion of population (%)** | **Percentage change since 1990 (%)** | **Percentage change since 1990 (%)** |
| ≥65 years                 | 0.0821 (0 to 0.0570)                                                   | 0.0162 (0 to 0.0731)    | -0.00399 (-0.0536 to 0.0242) | 0.343 (0 to 0.104 to 0.876)            | 0.520 (0.160 to 1.35)                   | 0.143 (-0.219 to 0.474)                     |
| 15–39 years               | 5.43 (3.45 to 8.15)                                                   | 0.519 (0.330 to 0.779)  | -0.100 (-0.39 to 0.148)        | 78.1 (64.8 to 92.6)                    | 7.18% (5.96 to 8.53)                     | -0.339 (-1.89 to 1.27)                      |
| 40–64 years               | 0.75 (0.765 to 2.58)                                                  | 0.360 (0.177 to 0.598)  | -0.115 (-0.44 to 0.173)        | 24.0 (17.9 to 30.7)                    | 5.22% (3.99 to 6.83)                     | -0.418 (-2.06 to 1.30)                      |
| ≥65 years                 | 0.132 (0.0480 to 0.272)                                               | 0.146 (0.0533 to 0.302) | -0.076 (-0.267 to 0.0878)      | 1.85 (1.22 to 2.61)                    | 2.36% (1.56 to 3.3)                      | -0.253 (-1.37 to 0.859)                     |
| **Palestine**             |                                                                        |                         |                               |                                        |                                          |                                        |
| 15–39 years               | 1.11 (0.495 to 2.23)                                                  | 0.309 (0.137 to 0.619)  | -0.0905 (-0.32 to 0.0707)      | 85.1 (63.7 to 108)                     | 6.05% (4.53 to 7.6)                      | -0.192 (-1.60 to 1.16)                      |
| 40–64 years               | 0.247 (0.0540 to 0.586)                                               | 0.139 (0.0304 to 0.339) | -0.0703 (-0.268 to 0.0563)     | 16.7 (9.41 to 26.1)                    | 3.05% (1.71 to 4.7)                      | -0.475 (-1.70 to 0.615)                     |
| ≥65 years                 | 0.00343 (0 to 0.0140)                                                 | 0.0304 (0 to 0.124)     | -0.0220 (-0.188 to 0.0619)     | 0.327 (0.144 to 0.654)                 | 1.02% (0.4449 to 2.04)                   | -0.103 (-0.892 to 0.553)                    |
| **Saudi Arabia**          |                                                                        |                         |                               |                                        |                                          |                                        |
| 15–39 years               | 8.09 (0.9937 to 15.4)                                                 | 0.107 (0.0137 to 0.619) | -0.0926 (-0.32 to 0.0707)      | 267.0 (126.0 to 372)                   | 2.47% (1.26 to 3.43)                     | -0.682 (-1.31 to 0.087)                     |
| 40–64 years               | 0.842 (0.00700 to 2.61)                                               | 0.0220 (0 to 0.0124)    | -0.0220 (-0.0608 to 0.000410)  | 55.8 (4.51 to 118)                     | 0.99% (0.0732 to 1.91)                   | -0.537 (-1.33 to -0.13)                     |
| ≥65 years                 | 0.0183 (0 to 0.0930)                                                  | 0.00493 (0 to 0.0251)   | -0.00930 (-0.0297 to 0.0)      | 1.53 (0.0120 to 5.02)                  | 0.256% (0.00201 to 0.841)                | -0.306% (-0.652 to -0.0281)                 |
| **Syria**                 |                                                                        |                         |                               |                                        |                                          |                                        |
| 15–39 years               | 2.13 (0 to 26.1)                                                     | 0.0243 (0 to 0.297)     | -0.0931 (-0.3815 to -0.362)    | 132 (0 to 324)                         | 1.53% (0 to 3.78)                        | -10.7% (-13.4 to -8.07)                     |
| 40–64 years               | 0.0183 (0 to 0.0210)                                                 | 0.00561 (0 to 0.00645)  | -0.0033 (-0.0840 to -0.303)    | 0.580 (0 to 1.85)                      | 0.017% (0 to 0.0058)                     | -11.8% (-14.2 to -9.49)                     |
| ≥65 years                 | 0.00114 (0 to 0)                                                     | 0.000190 (0 to 0)       | -0.0064 (-0.0413 to -0.111)    | 0.0014 (0 to 0)                        | 0.0028% (0 to 0)                         | -6.68% (-8.73 to -5.09)                     |
| **Tunisia**               |                                                                        |                         |                               |                                        |                                          |                                        |
| 15–39 years               | 3.22 (1.27 to 6.88)                                                  | 0.145% (0 to 0.0571)    | -0.00404 (-0.105 to 0.0657)    | 352 (294 to 414)                       | 16.3% (13.8 to 19.1)                     | 3.70% (1.07 to 6.38)                       |
| 40–64 years               | 0.617 (0.0104 to 1.93)                                               | 0.0374% (0 to 0.00580)  | -0.00064% (-0.0440 to -0.0299) | 154 (119 to 193)                       | 8.82% (6.81 to 11.1)                     | 2.16% (0.326 to 3.89)                      |
| ≥65 years                 | 0.0462 (0 to 0.0032)                                                 | 0.00479% (0 to 0.00342) | -0.00025% (0 to 0.0266 to 0.0722) | 18.4 (13.1 to 25.6)                   | 3.18% (2.56 to 4.4)                      | 0.757% (-0.245 to 1.67)                     |
| **Turkey**                |                                                                        |                         |                               |                                        |                                          |                                        |
| 15–39 years               | 4.08 (2.25 to 6.85)                                                  | 2.6% (1.42 to 4.35)     | -0.068% (-0.3247 to 0.245)     | 2770 (2110 to 3340)                    | 17.0% (12.0 to 20.5)                     | -1.14% (-4.16 to 1.90)                      |
| 40–64 years               | 147 (57.7 to 284)                                                    | 1.20% (0.470 to 2.31)   | -0.068% (-0.170 to 0.135)      | 1160 (699 to 1810)                     | 9.39% (5.67 to 14.7)                     | -0.262% (-3.22 to 2.45)                    |
| ≥65 years                 | 11.2 (3.29 to 31.0)                                                  | 0.258% (0.0757 to 0.713) | -0.0101% (-0.441 to 0.104)     | 130 (75.0 to 235)                      | 3.65% (2.11 to 6.59)                     | 0.412% (-1.25 to 1.58)                      |
| **United Arab Emirates**  |                                                                        |                         |                               |                                        |                                          |                                        |
| 15–39 years               | 13.0 (3.24 to 36.3)                                                  | 1.76% (0.437 to 4.88)   | -1.78% (-4.19 to -0.231)       | 176 (114 to 246)                       | 16.7% (10.9 to 23.4)                     | -5.29% (-8.96 to -1.62)                     |

(Table 1 continues on next page)
| Females | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Males | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|---------|-------------------|-----------------------------|----------------------------------|-------|-------------------|-----------------------------|----------------------------------|
|         |                   |                             |                                  |       |                   |                             |                                  |
| (Continued from previous page) |                   |                             |                                  |       |                   |                             |                                  |
| 40–64 years | 3.51              | 0.607%                      | -0.98%                          | 173   | 9.18%             | 2.6%                        | -5.52%                           |
| ≥65 years | 0.376             | 0.087%                      | -2.44%                          | 3.76  | 2.6%              | 2.0%                        | -2.09%                           |
| Yemen    |                   |                             |                                  |       |                   |                             |                                  |
| 15–39 years | 19.0              | 0.184%                      | -0.354%                         | 307   | 4.54%             | 3.00%                       | -3.00%                           |
| 40–64 years | 2.64              | 0.109%                      | -0.396%                         | 49.6  | 2.06%             | -3.88%                      | -3.88%                           |
| ≥65 years | 0.112             | 0.023%                      | -0.210%                         | 2.37  | 0.504%            | -2.38%                      | -2.38%                           |
| South Asia |                   |                             |                                  |       |                   |                             |                                  |
| 15–39 years | 7260              | (3860 to 10.800)            | 0.191%                          | 92400 | 23.2%             | (18.3 to 27.0)              | 4.63%                            |
| 40–64 years | 3380              | (1470 to 5310)             | 0.193%                          | 41500 | 19.6%             | (12.4 to 25.7)              | 4.7%                             |
| ≥65 years | 370               | (124 to 277)               | 0.034%                          | 5500  | 9.62%             | (5.16 to 14.7)              | 2.82%                            |
| Bangladesh |                   |                             |                                  |       |                   |                             |                                  |
| 15–39 years | 214               | (14.9 to 369)              | 0.080%                          | 2150  | 6.59%             | (3.64 to 8.42)              | 1.52%                            |
| 40–64 years | 36.9              | (0.0609 to 82.8)           | 0.0981%                         | 508   | 7.70%             | (0.972 to 3.58)             | 1.70%                            |
| ≥65 years | 2.18              | (0.0417 to 1.04)           | 0.0273%                         | 44.1  | 1.70%             | (0.000686 to 1.06)          | 0.539%                           |
| Bhutan    |                   |                             |                                  |       |                   |                             |                                  |
| 15–39 years | 16.0              | (2.39 to 31.7)             | 0.38%                           | 38.1  | 19.7%             | (8.73 to 28.4)              | -8.24%                           |
| 40–64 years | 1.98              | (0.0709 to 33)             | -2.87%                          | 38.1  | 19.7%             | (8.73 to 28.4)              | -8.24%                           |
| ≥65 years | 0.0816            | (0.0384 to 0.158)          | -2.90%                          | 0.272 | 1.11%             | (0.0163 to 4.51)            | -10.1%                           |
| India     |                   |                             |                                  |       |                   |                             |                                  |
| 15–39 years | 5390              | (3070 to 7860)             | 1.8%                            | 79.900 | 25.7%             | (20.9 to 30.0)              | 5.24%                            |
| 40–64 years | 2950              | (1360 to 4640)             | 1.78%                           | 38.800 | 23.0%             | (15.1 to 29.7)              | 5.63%                            |
| ≥65 years | 349               | (121 to 685)               | -0.0355%                        | 5120  | 11.6%             | (6.30 to 17.6)              | 2.88%                            |
| Nepal     |                   |                             |                                  |       |                   |                             |                                  |
| 15–39 years | 579               | (229 to 875)               | 8.0%                            | 1990  | 32.8%             | (21.39 to 37.9)             | 9.75%                            |
| 40–64 years | 198               | (46.9 to 352)              | 5.72%                           | 655   | 21.9%             | (8.35 to 33.7)              | 17.9%                            |
| ≥65 years | 12.4              | (109 to 31.4)              | 1.26%                           | 68.7  | 7.72%             | (1.47 to 15.9)              | 7.17%                            |
| Pakistan  |                   |                             |                                  |       |                   |                             |                                  |
| 15–39 years | 1060              | (209 to 1900)              | 2.20%                           | 8370  | 17.1%             | (9.38 to 23.0)              | 1.75%                            |
| 40–64 years | 196               | (28.4 to 427)              | 0.981%                          | 1560  | 7.37%             | (1.66 to 14.0)              | 1.32%                            |
| ≥65 years | 6.01              | (0.404 to 20.1)            | 0.149%                          | 63.2  | 1.44%             | (0.142 to 4.33)             | 0.0807%                          |

(Table 1 continues on next page)
### Articles

| Females | | | Males | | |
|---------|---------|----------------|-------|---------|----------------|
|         | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|         |         | | |         | | |
| **East Asia** | | | | | | |
| 15–39 years | 12,400 | (7510 to 20,800) | 4.92% | –0.560% | 123,000 | (98,400 to 145,000) | 45.7% | 0.912% |
| 40–64 years | 10,400 | (6550 to 15,500) | 3.86% | –0.770% | 118,000 | (99,300 to 140,000) | 42.1% | 1.612% |
| ≥65 years | 1,700 | (767 to 3,050) | 1.65% | –0.741% | 21,900 | (16,200 to 27,800) | 24.2% | –1.22% |
| **China** | | | | | | |
| 15–39 years | 12,000 | (7230 to 20,100) | 4.91% | –0.522% | 119,000 | (95,600 to 141,000) | 45.8% | 1.132% |
| 40–64 years | 10,100 | (6,360 to 15,100) | 3.88% | –0.734% | 115,000 | (96,900 to 136,000) | 42.4% | –1.342% |
| ≥65 years | 1,600 | (754 to 2,980) | 1.69% | –0.721% | 21,500 | (16,000 to 27,200) | 24.4% | –0.9932% |
| **North Korea** | | | | | | |
| 15–39 years | 215 | (105 to 418) | 4.49% | –1.25% | 2180 | (1550 to 2710) | 41.4% | –4.17% |
| 40–64 years | 128 | (68 to 216) | 2.89% | –1.31% | 1460 | (1120 to 1850) | 33.3% | –8.12% |
| ≥65 years | 13 | (4 to 29.7) | 0.799% | –1.08% | 154 | (102 to 214) | 16.3% | –6.96% |
| **Taiwan (province of China)** | | | | | | |
| 15–39 years | 239 | (129 to 423) | 6.33% | –1.96% | 1790 | (1350 to 2190) | 45.0% | –6.15% |
| 40–64 years | 179 | (105 to 284) | 3.86 | –2.45 | 1460 | (1150 to 1810) | 32.9 | –11.9 |
| ≥65 years | 17.8 | (6.10 to 36.4) | 0.861% | –1.51% | 252 | (178 to 343) | 14.5% | –10.4% |
| **Oceania** | | | | | | |
| 15–39 years | 113 | (17,3 to 192) | 4.14% | –0.838% | 668 | (456 to 822) | 23.6% | –3.23% |
| 40–64 years | 10 | (1,74 to 22.3) | 0.786% | –0.174% | 105 | (81 to 181) | 76.3% | –1.606% |
| ≥65 years | 0 | (0.00 to 0.00) | 0 | –0.0696% | 7.9 | (0.6 to 16.6) | 32.0% | –0.6804% |
| **American Samoa** | | | | | | |
| 15–39 years | 0.718 | (0.000 to 1.82) | 6.77% | –1.322% | 2.91 | (0.928 to 4.28) | 37.5% | –2.41% |
| 40–64 years | 0.00950 | (0.00 to 0.062) | 0.133% | –0.200% | 0.132 | (0.050 to 0.550) | 1.88% | –1.41% |
| ≥65 years | 0.000109 | (0.00 to 0.001) | 0.00857% | –0.0238% | 0.00651 | (0.00 to 0.0391) | 0.36% | –0.513% |
| **Cook Islands** | | | | | | |
| 15–39 years | 1.04 | (0.439 to 1.39) | 33.2% | 15.1% | 1.77 | (0.663 to 31.2) | 64.6% | 25.5% |
| 40–64 years | 0.383 | (0.188 to 0.592) | 13.2% | 11.6% | 1.20 | (0.842 to 1.50) | 42.8% | 37.1% |
| ≥65 years | 0.0466 | (0.0190 to 0.0842) | 3.94% | 3.69% | 0.287 | (0.178 to 0.395) | 35.3% | 24.1% |
| **Federated States of Micronesia** | | | | | | |
| 15–39 years | 0.210 | (0.128 to 0.400) | 10.2% | –0.50% | 8.29 | (5.12 to 10.6) | 38.0% | –6.71% |
| 40–64 years | 0.0129 | (0.00700 to 0.389) | 1.06% | –1.66% | 1.35 | (0.267 to 2.78) | 10.9% | –9.93% |

(Continued from previous page)
| Females | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Males | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|---------|--------------------|-------------------------------|----------------------------------|-------|--------------------|-------------------------------|----------------------------------|
| ≥65 years | 0·00297 | 0·116%                         | -0·416%                          | 0·0905 | 4·46%               | (0·0140 to 0·234)              | -5·82%                           |
| (0 to 0·0140) | 0·00549 |                              | -1·52%                           | (0·0140 to 0·234) | 0·0905 | 4·46% | (0·0140 to 0·234) | -5·82% |
| Fiji 15–39 years | 11·4 | 6·55% | 1·13% | 72·7 | 39·8% | (2·32 to 19·3) | (1·33 to 11·0) | (5·13 to 87·4) | (28·1 to 47·8) |
| 40–64 years | 1·55 | 1·34% | 0·312% | 16·5 | 12·8% | (0·266 to 3·41) | (0·229 to 2·93) | (6·33 to 27·2) | (5·26 to 22·6) |
| ≥65 years | 0·0584 | 0·190% | 0·0403% | 1·47 | 6·00% | (0·0600 to 1·82) | (0·0195 to 0·592) | (0·201 to 0·374) | (1·84 to 12·1) |
| Guam 15–39 years | 0·723 | 0·18% | 3·30% | 16·0 | 49·9% | (0·316 to 9·69) | (1·10 to 33·8) | (9·72 to 20·2) | (30·4 to 63·3) |
| 40–64 years | 0·525 | 0·28% | 1·32% | 4·44 | 17·9% | (0·0020 to 1·86) | (0·0086 to 8·09) | (0·237 to 9·38) | (3·12 to 37·8) |
| ≥65 years | 0·0225 | 0·069% | 0·166% | 0·602 | 3·8% | (0·0128) | (0·153) | (0·064 to 2·96) | (2·3% to 22·5) |
| Kiribati 15–39 years | 1·02 | 4·04% | -1·12% | 5·23 | 21·8% | (0·0550 to 1·35) | (0·219 to 8·53) | (2·34 to 17·8) | (9·75 to 31·6) |
| 40–64 years | 0·064 | 0·501% | -0·52% | 0·401 | 3·49% | (0·0128) | (0·199) | (0·915 to 0·172) | (1·96 to 21·7) |
| ≥65 years | 0·00219 | 0·0781% | -0·551% | 0·0172 | 1·01% | (0·0140) | (0·500) | (-0·826 to 0·114) | (0·077) |
| Marshall Islands 15–39 years | 0·474 | 4·14% | 0·416% | 3·51 | 32·1% | (0·0620 to 0·810) | (0·541 to 7·07) | (2·59 to 4·80) | (21·3 to 39·4) |
| 40–64 years | 0·0456 | 0·717% | 0·103% | 0·717 | 11·4% | (0·0050 to 0·112) | (0·0088 to 1·81) | (0·216 to 1·25) | (3·45 to 19·9) |
| ≥65 years | 0·00151 | 0·143% | 0·0269% | 0·0585 | 5·12% | (0·0603) | (0·571) | (-0·408 to 0·475) | (0·072) |
| Nauru 15–39 years | 0·365 | 16·0% | -0·0133% | 1·16 | 49·5% | (0·0521 to 0·595) | (2·42 to 26·1) | (0·841 to 1·36) | (36·1 to 58·2) |
| 40–64 years | 0·0364 | 3·59% | 0·477% | 0·231 | 24·1% | (0·0500 to 0·792) | (0·406 to 7·82) | (0·0984 to 0·360) | (3·03 to 37·7) |
| ≥65 years | 0·00356 | 0·672% | 0·0504% | 0·0070 | 12·5% | (0·00609) | (0·262) | (-2·33 to 1·94) | (3·73 to 24·2) |
| Niue 15–39 years | 0·0602 | 21·9% | -0·382% | 0·132 | 45·9% | (0·00709 to 0·101) | (2·57 to 36·8) | (0·8059 to 0·139) | (32·1 to 54·9) |
| 40–64 years | 0·0130 | 5·0% | 0·781% | 0·0642 | 23·7% | (0·0321) | (0·125) | (-5·73 to 6·99) | (7·12 to 40·1) |
| ≥65 years | 0·000706 | 0·639% | 0·0096% | 0·00871 | 11·5% | (0·00313) | (0·283) | (-2·31 to 2·05) | (1·37 to 23·6) |
| Northern Mariana Islands 15–39 years | 0·795 | 12·2% | 2·04% | 3·01 | 42·1% | (0·0489 to 1·50) | (2·75 to 23·0) | (1·76 to 3·71) | (24·6 to 51·9) |
| 40–64 years | 0·131 | 1·57% | -0·0752% | 1·22 | 13·8% | (0·428) | (0·513) | (-3·98 to 3·20) | (0·579 to 9·28) |
| ≥65 years | 0·00586 | 0·231% | 0·0594% | 0·128 | 7·09% | (0·0300) | (0·170) | (-1·19 to 1·25) | (0·056 to 1·88) |
| Palau 15–39 years | 0·441 | 18·0% | -0·784% | 1·64 | 46·3% | (0·020 to 0·852) | (1·31 to 34·7) | (0·825 to 2·22) | (23·3 to 62·7) |
| 40–64 years | 0·156 | 3·10% | -0·416% | 0·128 | 7·09% | (0·017) | (0·112) | (-1·19 to 1·25) | (0·056 to 1·88) |
| ≥65 years | 0·0186 | 0·75% | 0·605% | 0·025 | 4·6% | (0·0300) | (0·170) | (-1·19 to 1·25) | (0·056 to 1·88) |

(Table 1 continues on next page)
(Continued from previous page)

|                | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|----------------|--------------------|-------------------------------|-----------------------------------|--------------------|-------------------------------|-----------------------------------|
|                | ≥65 years          |                               |                                   | ≥65 years          |                               |                                   |
| 40–64 years    | 0.117              | 3.57% (0.0305 to 11.4)        | -0.0146% (-7.43% to 6.34)         | 0.595              |                               |                                   |
| ≥65 years      | 0.00576            | 6.71% (0.03 to 2.77)          | 0.023% (-2.49% to 2.33)           | 0.0548             |                               | 7.29% (0.002 to 0.163)           |
|                | ≥65 years          |                               |                                   | ≥65 years          |                               |                                   |
| Solomon Islands| 40–64 years        | 0.217 (0.084 to 1.3)          | 0.648% (-0.913% to 0.188)         | 0.086         |                               | 4.14% (0.094% to 4.16)           |
| ≥65 years      | 0.164              | 0.62% (0.00901 to 0.360)      | -0.38% (-0.42% to 0.044)          | 0.0472             |                               | 4.38% (0.049% to 0.75)           |
|                | ≥65 years          |                               |                                   | ≥65 years          |                               |                                   |
| Papua New Guinea| 15–39 years        | 0.797 (0.075 to 7.08)         | 4.14% (-2.37 to 1.46)             | 0.472              |                               | 19.6% (0.075 to 7.08)            |
| ≥65 years      | 0.150              |                               | -0.38% (-0.42% to 0.044)          | 0.0472             |                               | 4.38% (0.049% to 0.75)           |
|                | ≥65 years          |                               |                                   | ≥65 years          |                               |                                   |
| Samoan         | 15–39 years        | 0.797 (0.075 to 7.08)         | 4.14% (-2.37 to 1.46)             | 0.472              |                               | 19.6% (0.075 to 7.08)            |
| ≥65 years      | 0.150              |                               | -0.38% (-0.42% to 0.044)          | 0.0472             |                               | 4.38% (0.049% to 0.75)           |
|                | ≥65 years          |                               |                                   | ≥65 years          |                               |                                   |
| Tokelau        | 15–39 years        | 0.280 (0.030 to 0.051)        | 11.5% (1.24 to 21.1)              | 0.086              |                               | 4.78% (1.24 to 21.1)             |
| ≥65 years      | 0.0230             |                               | -0.93% (-2.37 to 1.04)            | 0.059              |                               | 2.48% (0.059 to 1.04)            |
|                | ≥65 years          |                               |                                   | ≥65 years          |                               |                                   |
| Tonga          | 15–39 years        | 0.869 (0.060 to 0.237)        | 3.84% (0.102 to 4.16)             | 0.018              |                               | 2.51% (0.102 to 4.16)            |
| ≥65 years      | 0.0230             |                               | -0.93% (-2.37 to 1.04)            | 0.059              |                               | 2.48% (0.059 to 1.04)            |
|                | ≥65 years          |                               |                                   | ≥65 years          |                               |                                   |
| Tuvalu         | 15–39 years        | 0.869 (0.060 to 0.237)        | 3.84% (0.102 to 4.16)             | 0.018              |                               | 2.51% (0.102 to 4.16)            |
| ≥65 years      | 0.0230             |                               | -0.93% (-2.37 to 1.04)            | 0.059              |                               | 2.48% (0.059 to 1.04)            |
|                | ≥65 years          |                               |                                   | ≥65 years          |                               |                                   |
| Vanuatu        | 15–39 years        | 0.467 (0.680 to 7.95)         | 7.57% (-4.93 to 3.82)             | 0.203              |                               | 37.7% (14.4 to 24.8)             |
| ≥65 years      | 0.0230             |                               | -0.93% (-2.37 to 1.04)            | 0.059              |                               | 2.48% (0.059 to 1.04)            |
|                | ≥65 years          |                               |                                   | ≥65 years          |                               |                                   |

(Table 1 continues on next page)
| Age Group | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|-------------------------------|----------------------------------|--------------------|-------------------------------|----------------------------------|
| **Southeast Asia** | | | | | | |
| 15–39 years | 7610 | 5.55% (1.87 to 8.86) | -1.18% (-0.075 to 2.85) | 49500 | 35.0% (27.6 to 39.9) | 4.52% (1.91 to 10.4) |
| 40–64 years | 2760 | 2.80% (1.61 to 4.04) | 0.33% (0.439 to 1.19) | 23600 | 24.7% (19.2 to 29.4) | 8.49% (5.81 to 11.2) |
| ≥65 years | 377 | 1.19% (0.607 to 1.86) | 0.219% (-0.322 to 0.560) | 2120 | 14.3% (9.37 to 18.2) | 6.61% (4.49 to 8.43) |
| **Cambodia** | | | | | | |
| 15–39 years | 649 | 18.2% (8.26 to 26.3) | 8.22% (2.69 to 13.9) | 1580 | 41.7% (37.2 to 49.2) | 11.7% (5.56 to 22.8) |
| 40–64 years | 241 | 12.2% (7.65 to 17.0) | 8.68% (5.37 to 12.2) | 590 | 34.5% (28.6 to 39.5) | 20.1% (12.3 to 27.1) |
| ≥65 years | 124 | 1.29% (2.38 to 7.33) | 3.61% (1.82 to 5.88) | 69.4 | 20.4% (14.8 to 25.3) | 14.7% (10.0 to 19.3) |
| **Indonesia** | | | | | | |
| 15–39 years | 375 | 6.67% (1.32 to 1.31) | -0.096% (-0.076 to 0.348) | 4430 | 7.68% (4.21 to 10.4) | 0.206% (-0.71 to 2.36) |
| 40–64 years | 140 | 3.58% (0.072 to 0.274) | -1.022% (0.391 to 1.30) | 1230 | 3.12% (2.07 to 5.11) | -0.56% (-2.64 to 0.574) |
| ≥65 years | 124 | 0.129% (0.014 to 0.332) | -0.259% (-0.098 to 0.039) | 83.7 | 1.05% (0.172 to 2.17) | -0.29% (-4.05 to 0.245) |
| **Laos** | | | | | | |
| 15–39 years | 459 | 29.1% (13.6 to 41.2) | 3.42% (-5.69 to 17.5) | 1060 | 66.1% (51.7 to 75.5) | 2.90% (-3.39 to 35.9) |
| 40–64 years | 108 | 14.3% (8.44 to 20.4) | 2.52% (-3.87 to 9.10) | 348 | 46.6% (33.8 to 57.7) | 9.47% (-1.04 to 22.2) |
| ≥65 years | 7.13 | 2.95% (1.76 to 7.41) | 1.09% (-0.95 to 3.93) | 37.4 | 25.3% (13.5 to 36.1) | 7.30% (-1.34 to 16.3) |
| **Malaysia** | | | | | | |
| 15–39 years | 224 | 3.42% (1.17 to 5.62) | -0.659% (-2.41 to 1.38) | 1130 | 15.6% (10.5 to 19.3) | -4.03% (-7.33 to -0.66) |
| 40–64 years | 74.6 | 1.97% (0.882 to 3.28) | -1.40% (-2.90 to 0.116) | 344 | 8.63% (5.02 to 12.1) | -5.60% (-8.50 to -2.50) |
| ≥65 years | 9.24 | 0.81% (0.271 to 1.57) | -1.08% (-2.25 to -0.216) | 39.2 | 15.9% (1.49 to 5.81) | -3.61% (-6.01 to -1.04) |
| **Maldives** | | | | | | |
| 15–39 years | 1.88 | 2.12% (0.081 to 5.99) | -0.947% (-4.03 to 1.53) | 42.0 | 25.0% (9.87 to 39.7) | 0.412% (-6.97 to 9.11) |
| 40–64 years | 0.210 | 0.42% (0.014 to 1.45) | 0.029% (-1.10 to 0.80) | 7.65 | 10.0% (2.53 to 20.3) | 4.73% (-2.32 to 12.1) |
| ≥65 years | 0.0037 | 0.07% (0.0 to 0.347) | -0.218% (-0.461 to 0.207) | 0.245 | 2.35% (0.163 to 6.50) | 0.961% (-2.62 to 4.47) |
| **Mauritius** | | | | | | |
| 15–39 years | 19.8 | 8.67% (0.722 to 21.8) | -4.84% (-12.0 to 3.01) | 121 | 51.9% (34.7 to 64.7) | -6.02% (-12.8 to 4.47) |
| 40–64 years | 5.13 | 2.30% (0.364 to 5.55) | -2.05% (-4.40 to 0.80) | 69.2 | 31.4% (17.9 to 44.2) | -7.35% (-35.1 to 3.35) |
| ≥65 years | 0.501 | 0.564% (0.0404 to 1.92) | -0.762% (-2.77 to 0.224) | 12.0 | 17.6% (6.55 to 28.2) | -5.92% (-13.6 to 3.42) |
| **Myanmar** | | | | | | |
| 15–39 years | 175 | 1.53% (0.314 to 2.94) | 0.720% (-0.0482 to 1.39) | 4010 | 36.7% (29.2 to 42.5) | 12.6% (5.95 to 21.9) |
| 40–64 years | 40.3 | 0.525% (0.140 to 1.10) | 0.460% (0.129 to 0.912) | 1770 | 26.7% (20.8 to 32.4) | 18.8% (12.8 to 23.7) |
| Country                  | 15–39 years | ≥65 years | 40–64 years | 15–39 years | ≥65 years | 40–64 years | 15–39 years | ≥65 years | 40–64 years |
|--------------------------|-------------|-----------|-------------|-------------|-----------|-------------|-------------|-----------|-------------|
| Angola                   | 214         | 40–64 years | 15–39 years | 1200        | ≥65 years | 40–64 years | 1200        | ≥65 years | 40–64 years |
| Vietnam                  | 1169        | 40–64 years | 15–39 years | 6790        | ≥65 years | 40–64 years | 6790        | ≥65 years | 40–64 years |
| Thailand                 | 15–39 years | 40–64 years | 15–39 years | 679         | 15–39 years | 40–64 years | 679         | 15–39 years | 40–64 years |
| Timor-Leste              | 15–39 years | 40–64 years | 15–39 years | 484         | 15–39 years | 40–64 years | 484         | 15–39 years | 40–64 years |
| Vietnam                  | 15–39 years | 40–64 years | 15–39 years | 1070        | 15–39 years | 40–64 years | 1070        | 15–39 years | 40–64 years |
| Central sub-Saharan Africa | 15–39 years | 40–64 years | 15–39 years | 4950        | 15–39 years | 40–64 years | 4950        | 15–39 years | 40–64 years |
| Angola                   | 15–39 years | 40–64 years | 15–39 years | 938         | 15–39 years | 40–64 years | 938         | 15–39 years | 40–64 years |

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### Central African Republic

| Age Group | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|-------------------------------|----------------------------------|--------------------|-------------------------------|----------------------------------|
| ≥65 years | 514                | (310 to 593)                  | -17·2 to 10·1                    | 872                | (513 to 1060)                 | 11·1 to 28·7                     |
| 40–64 years | 3·04               | (0·948 to 3·70)               | 1·06 to 8·7                      | 20·9               | (1·57 to 8·66)               | 47·8 to 16·8                     |
| 15–39 years | 680                | (1·66 to 9·19)                | -8·2 to 0·722                    | 13·5               | (1·08 to 1·65)               | 4·2 to 16·9                      |

### Congo (Brazzaville)

| Age Group | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|-------------------------------|----------------------------------|--------------------|-------------------------------|----------------------------------|
| ≥65 years | 514                | (310 to 593)                  | -17·2 to 10·1                    | 872                | (513 to 1060)                 | 11·1 to 28·7                     |
| 40–64 years | 3·04               | (0·948 to 3·70)               | 1·06 to 8·7                      | 20·9               | (1·57 to 8·66)               | 47·8 to 16·8                     |
| 15–39 years | 680                | (1·66 to 9·19)                | -8·2 to 0·722                    | 13·5               | (1·08 to 1·65)               | 4·2 to 16·9                      |

### Democratic Republic of the Congo

| Age Group | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|-------------------------------|----------------------------------|--------------------|-------------------------------|----------------------------------|
| ≥65 years | 514                | (310 to 593)                  | -17·2 to 10·1                    | 872                | (513 to 1060)                 | 11·1 to 28·7                     |
| 40–64 years | 3·04               | (0·948 to 3·70)               | 1·06 to 8·7                      | 20·9               | (1·57 to 8·66)               | 47·8 to 16·8                     |
| 15–39 years | 680                | (1·66 to 9·19)                | -8·2 to 0·722                    | 13·5               | (1·08 to 1·65)               | 4·2 to 16·9                      |

### Equatorial Guinea

| Age Group | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|-------------------------------|----------------------------------|--------------------|-------------------------------|----------------------------------|
| ≥65 years | 514                | (310 to 593)                  | -17·2 to 10·1                    | 872                | (513 to 1060)                 | 11·1 to 28·7                     |
| 40–64 years | 3·04               | (0·948 to 3·70)               | 1·06 to 8·7                      | 20·9               | (1·57 to 8·66)               | 47·8 to 16·8                     |
| 15–39 years | 680                | (1·66 to 9·19)                | -8·2 to 0·722                    | 13·5               | (1·08 to 1·65)               | 4·2 to 16·9                      |

### Gabon

| Age Group | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|-------------------------------|----------------------------------|--------------------|-------------------------------|----------------------------------|
| ≥65 years | 514                | (310 to 593)                  | -17·2 to 10·1                    | 872                | (513 to 1060)                 | 11·1 to 28·7                     |
| 40–64 years | 3·04               | (0·948 to 3·70)               | 1·06 to 8·7                      | 20·9               | (1·57 to 8·66)               | 47·8 to 16·8                     |
| 15–39 years | 680                | (1·66 to 9·19)                | -8·2 to 0·722                    | 13·5               | (1·08 to 1·65)               | 4·2 to 16·9                      |

### Eastern Sub-Saharan Africa

| Age Group | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|-------------------------------|----------------------------------|--------------------|-------------------------------|----------------------------------|
| ≥65 years | 514                | (310 to 593)                  | -17·2 to 10·1                    | 872                | (513 to 1060)                 | 11·1 to 28·7                     |
| 40–64 years | 3·04               | (0·948 to 3·70)               | 1·06 to 8·7                      | 20·9               | (1·57 to 8·66)               | 47·8 to 16·8                     |
| 15–39 years | 680                | (1·66 to 9·19)                | -8·2 to 0·722                    | 13·5               | (1·08 to 1·65)               | 4·2 to 16·9                      |

### Burundi

| Age Group | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|-----------|--------------------|-------------------------------|----------------------------------|--------------------|-------------------------------|----------------------------------|
| ≥65 years | 514                | (310 to 593)                  | -17·2 to 10·1                    | 872                | (513 to 1060)                 | 11·1 to 28·7                     |
| 40–64 years | 3·04               | (0·948 to 3·70)               | 1·06 to 8·7                      | 20·9               | (1·57 to 8·66)               | 47·8 to 16·8                     |
| 15–39 years | 680                | (1·66 to 9·19)                | -8·2 to 0·722                    | 13·5               | (1·08 to 1·65)               | 4·2 to 16·9                      |

(Table 1 continues on next page)
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| Country | 15–39 years | 40–64 years | ≥65 years |
|---------|--------------|-------------|-----------|
| Comoros | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|          | (154 to 696) | (10 35 to 4 66) | (-5 35 to 1 67) | (41 41 to 16 3) | (1 41 to 1 50) | (-1 50 to 1 54) |
|          | 7 55 | 5 92 | 2 75 |
| Djibouti | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|          | (0 090 to 6 57) | (0 160 to 9 87) | (-4 22 to -1 01) | (0 167 to 3 10) | (1 21 to 6 8) | (-0 01 to 1 11) |
|          | 3 50 | 2 51 | 1 00 |
| Eritrea | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|          | (7 34 to 9 13) | (3 25 to 4 12) | (-3 07 to -0 24) | (6 56 to 12 20) | (1 32 to 13 8) | (-9 12 to 14 8) |
|          | 25 60 | 47 60 | 47 60 |
| Ethiopia | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|          | (1 48 to 9 0 1) | (3 42 to 13 7) | (-2 50 to -1 29) | (1 26 to 3 9) | (1 52 to 2 6) | (-5 84 to 2 6) |
|          | 6 50 | 3 29 | 4 30 |
| Kenya | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|          | (1 76 to 4 80) | (0 17 to 0 5) | (-1 02 to 1 2) | (2 69 to 7 1 4) | (1 32 to 13 8) | (-9 12 to 14 8) |
|          | 11 6 | 2 01 | 3 01 |
| Madagascar | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|          | (3 28 to 9 21) | (0 56 to 1 58) | (-4 90 to -1 63) | (8 91 to 21 7) | (1 18 to 1 7) | (-8 47 to 1 6) |
|          | 7 19 | 3 49 | 5 32 |
| Malawi | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|          | (3 15 to 7 0) | (0 74 to 4 12) | (-1 04 to 2 10) | (2 57 to 9 00) | (1 18 to 1 7) | (-9 85 to 1 6) |
|          | 2 72 | 4 35 | 5 32 |
| Mozambique | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
|          | (3 29 to 6 2 8) | (1 07 to 1 0) | (-7 75 to -1 5) | (2 17 to 2 4) | (1 18 to 1 7) | (-8 47 to 1 6) |
|          | 4 75 | 3 70 | 4 75 |
| (Table 1 continues on next page)
## Botswana

| Age Group | Females | Males |
|-----------|---------|-------|
| ≥65 years | 19.5    | 20.4  |
| 40–64 years | 7.39   | 7.80  |

## Rwanda

| Age Group | Females | Males |
|-----------|---------|-------|
| ≥65 years | 14.9    | 15.3  |
| 40–64 years | 6.05   | 6.44  |

## Somalia

| Age Group | Females | Males |
|-----------|---------|-------|
| ≥65 years | 0.228   | 0.237 |
| 40–64 years | 0.101  | 0.104 |

## South Sudan

| Age Group | Females | Males |
|-----------|---------|-------|
| ≥65 years | 0.00491 | 0.00522|
| 40–64 years | 0.008381 | 0.00872 |

## Tanzania

| Age Group | Females | Males |
|-----------|---------|-------|
| ≥65 years | 0.00811 | 0.00872|
| 40–64 years | 0.0008811 | 0.00098 |

## Uganda

| Age Group | Females | Males |
|-----------|---------|-------|
| ≥65 years | 0.000872 | 0.00098 |
| 40–64 years | 0.0008811 | 0.00098 |

## Zambia

| Age Group | Females | Males |
|-----------|---------|-------|
| ≥65 years | 0.00098 | 0.00103|
| 40–64 years | 0.0008811 | 0.00098 |

## Southern sub-Saharan Africa

| Age Group | Females | Males |
|-----------|---------|-------|
| ≥65 years | 0.00098 | 0.00103|
| 40–64 years | 0.0008811 | 0.00098 |

(Continued from previous page)

| Age Group | Females | Males |
|-----------|---------|-------|
| ≥65 years | 0.00098 | 0.00103|
| 40–64 years | 0.0008811 | 0.00098 |

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(Continued from previous page)

|                | Females                                      | Males                                      |
|----------------|----------------------------------------------|--------------------------------------------|
|                | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
| 40–64 years    | 21 8 (11.1 to 30.4) | 8.40% (4.29 to 11.7) | 0.055% (-2.99 to 3.08) | 73.6 (43.9 to 89.9) | 30.2% (18.0 to 36.9) | 0.425% (-5.20 to 3.62) |
| ≥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) | 13.8% (7.32 to 18.8) | -0.856% (-5.20 to 3.62) |

**Equatorial Guinea**

|                | Females                                      | Males                                      |
|----------------|----------------------------------------------|--------------------------------------------|
|                | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
| 40–64 years    | 18 0 (3.24 to 23.7) | 6.90% (1.24 to 9.08) | -0.370% (-2.98 to 1.82) | 67.3 (59.2 to 74.8) | 17.5% (24.2 to 30.5) | 1.97% (-2.30 to 6.54) |
| ≥65 years      | 6.49 (3.80 to 8.67) | 2.30% (1.38 to 4.19) | -1.38% (-4.28 to 1.90) | 23.9 (17.2 to 28.0) | 26.8% (19.3 to 31.5) | 0.044% (-6.35 to 4.27) |

|                | Females                                      | Males                                      |
|----------------|----------------------------------------------|--------------------------------------------|
|                | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
| 40–64 years    | 1.34 (0.847 to 1.89) | 6.59% (3.21 to 7.19) | -1.15% (-4.37 to 0.97) | 2.68 (1.94 to 3.33) | 18.1% (13.1 to 22.4) | -0.297% (-5.11 to 4.46) |

**Lesotho**

|                | Females                                      | Males                                      |
|----------------|----------------------------------------------|--------------------------------------------|
|                | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
| 40–64 years    | 83 5 (3.16 to 113) | 20.0% (0.759 to 27.1) | -1.30% (-8.48 to 4.48) | 202 (169.2 to 220.0) | 49.2% (41.4 to 53.6) | 2.87% (-2.63 to 8.45) |
| ≥65 years      | 21 1 (7.27 to 32.8) | 12.0% (4.13 to 18.6) | -0.94% (-5.77 to 3.69) | 61.0 (25.5 to 73.7) | 41.6% (17.4 to 52.7) | 0.264% (-7.01 to 8.37) |

**Namibia**

|                | Females                                      | Males                                      |
|----------------|----------------------------------------------|--------------------------------------------|
|                | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
| 40–64 years    | 141 (2.3 to 180) | 26.8% (4.40 to 34.1) | -1.90% (-10.3 to 5.90) | 265 (236 to 287) | 52.6% (46.0 to 56.9) | 2.46% (-3.62 to 8.70) |
| ≥65 years      | 95 8 (33.1 to 71.4) | 13.0% (13.9 to 30.0) | 4.00% (1.40 to 6.10) | 92 6 (54.8 to 111) | 42.4% (26.1 to 53.0) | 0.041% (-2.07 to 19.1) |

**South Africa**

|                | Females                                      | Males                                      |
|----------------|----------------------------------------------|--------------------------------------------|
|                | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
| 40–64 years    | 250 (424 to 2740) | 18.0% (3.54 to 22.9) | 2.37% (-2.50 to 7.36) | 5800 (5210 to 6270) | 47.4% (42.6 to 51.3) | 3.68% (-1.68 to 8.72) |
| ≥65 years      | 93 1 (539 to 1220) | 10.0% (8.51 to 17.3) | -2.66% (-6.68 to 1.21) | 2680 (1880 to 3090) | 42.7% (30.0 to 49.2) | -3.30% (-8.93 to 2.60) |

**Zimbabwe**

|                | Females                                      | Males                                      |
|----------------|----------------------------------------------|--------------------------------------------|
|                | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
| 40–64 years    | 210 (8.03 to 298) | 6.28% (0.244 to 9.07) | -4.42% (-8.05 to 0.882) | 3410 (1200 to 1540) | 47.6% (40.5 to 51.8) | -7.92% (-13.4 to -2.02) |
| ≥65 years      | 61.1 (22.0 to 95.0) | 4.76% (1.72 to 7.40) | -3.79% (-7.75 to -0.070) | 468 (200 to 590) | 42.1% (17.9 to 53.1) | -4.31% (-11.5 to 5.58) |

**Western sub-Saharan Africa**

|                | Females                                      | Males                                      |
|----------------|----------------------------------------------|--------------------------------------------|
|                | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
| 40–64 years    | 11 000 (6610 to 16 500) | 11.4% (6.83 to 17.1) | -0.675% (-4.29 to 5.43) | 27 700 (21 700 to 30 400) | 31.5% (24.3 to 34.6) | 0.576% (-2.91 to 10.2) |
| ≥65 years      | 40 500 (2730 to 5620) | 11.5% (7.73 to 15.9) | 0.584% (-2.35 to 4.22) | 9890 (7470 to 12 100) | 30.5% (23.0 to 37.3) | 2.34% (-2.11 to 10.5) |

|                | Females                                      | Males                                      |
|----------------|----------------------------------------------|--------------------------------------------|
|                | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) | Number (thousands) | Proportion of population (%) | Percentage change since 1990 (%) |
| 40–64 years    | 470 (250 to 694) | 6.74% (3.59 to 9.95) | -0.544% (-2.84 to 2.52) | 1360 (918 to 1720) | 21.2% (14.3 to 26.5) | 1.14% (-2.88 to 6.32) |
| ≥65 years      | 46 8 (25.0 to 10.2) | 5.28% (3.04 to 5.19) | -1.19% (-5.34 to 2.25) | 18.7 (7.31 to 29.8) | 11.5% (4.49 to 18.3) | 1.62% (-3.80 to 7.19) |

* (Table 1 continues on next page)
### Articles

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| Females | Proportion of population (%) | Percentage change since 1990 (%) | Males | Proportion of population (%) | Percentage change since 1990 (%) |
|----------------|-------------------------------|---------------------------------|--------|-------------------------------|---------------------------------|
| Number (thousands) |                  |                                 | Number (thousands) |                  |                                 |
| Burkina Faso     |                               |                                 | Cameroon |                               |                                 |
| 15–39 years      | 505 (351 to 680)              | 11.2% (7.8 to 15.1)             | 15–39 years | 1670 (872 to 2670)            | 14.7% (7.3 to 21.9)             |
|                  | 127,5 (133 to 230)            | 14.5% (11.5 to 18.5)            | 15–39 years | 512 (283 to 765)              | 13.4% (11.3 to 19.4)            |
| ≥65 years        | 18.5 (9.8 to 29.0)            | 5.1% (2.7 to 8.0)               | 15–39 years | 43.6 (11.0 to 77.5)           | 9.9% (3.0 to 17.6)              |
|                  | 127,5 (133 to 230)            | 14.5% (11.5 to 18.5)            | ≥65 years | 7.89 (0.3 to 20.6)            | 3.9% (0.2 to 7.0)               |
| Cameroon         |                               |                                 | Chad     |                               |                                 |
| 15–39 years      | 150 (6.4 to 25.2)             | 12.4% (5.3 to 21.0)             | 15–39 years | 701 (166 to 2660)            | 21.2% (5.2 to 39.3)             |
|                  | 65 (26.4 to 90)               | 6.3% (4.5 to 10.4)              | 15–39 years | 139 (30.9 to 264)            | 14.5% (10.0 to 19.3)            |
|                  | 8.4% (5.3 to 13.4)            | -3.96% (6.7 to 14.3)            | ≥65 years | 5.31 (0.11 to 2.52)          | 2.68% (1.5 to 3.7)              |
| ≥65 years        | 4.36 (1.3 to 7.7)             | 1.3% (0.5 to 2.6)               | ≥65 years | 7.89 (0.3 to 20.6)            | 4.29% (0.2 to 7.0)              |
| Chad             |                               |                                 | Côte d'Ivoire |                               |                                 |
| 15–39 years      | 918 (476 to 1450)             | 14.9% (8.7 to 26.8)             | 15–39 years | 918 (476 to 1450)            | 19.9% (12.2 to 27.6)            |
|                  | 277 (145 to 431)              | 14.4% (7.6 to 22.7)             | 15–39 years | 277 (145 to 431)             | 14.4% (7.6 to 22.7)             |
| ≥65 years        | 29.7 (8.5 to 54.8)            | 8.7% (2.5 to 16.0)              | ≥65 years | 29.7 (8.5 to 54.8)            | 8.7% (2.5 to 16.0)              |
| ≥65 years        | 1.43 (0.1 to 2.8)             | 3.6% (0.8 to 7.3)               | ≥65 years | 1.43 (0.1 to 2.8)            | 3.6% (0.8 to 7.3)               |
| Côte d'Ivoire    |                               |                                 | The Gambia |                               |                                 |
| 15–39 years      | 52.5 (23.8 to 91.8)           | 10.6% (4.7 to 18.2)             | 15–39 years | 52.5 (23.8 to 91.8)          | 10.6% (4.7 to 18.2)             |
|                  | 14.3 (6.7 to 23.1)            | 9.0% (4.2 to 14.6)              | 15–39 years | 14.3 (6.7 to 23.1)           | 9.0% (4.2 to 14.6)              |
| ≥65 years        | 1.36 (0.08 to 2.8)            | 3.6% (1.2 to 5.9)               | ≥65 years | 1.36 (0.08 to 2.8)           | 3.6% (1.2 to 5.9)               |
| The Gambia       |                               |                                 | Ghana     |                               |                                 |
| 15–39 years      | 13.1 (5.2 to 22.1)            | 18.0% (7.2 to 30.4)             | 15–39 years | 13.1 (5.2 to 22.1)           | 18.0% (7.2 to 30.4)             |
|                  | 3.85 (168 to 635)             | 12.7% (5.6 to 21.0)             | 15–39 years | 3.85 (168 to 635)            | 12.7% (5.6 to 21.0)             |
| ≥65 years        | 3.36 (6.5 to 69.6)            | 9.8% (0.9 to 10.3)              | ≥65 years | 3.36 (6.5 to 69.6)            | 9.8% (0.9 to 10.3)              |
| Ghana            |                               |                                 | Guinea    |                               |                                 |
| 15–39 years      | 47.8 (11.4 to 106)            | 18.2% (4.3 to 4.0)              | 15–39 years | 47.8 (11.4 to 106)           | 18.2% (4.3 to 4.0)              |
|                  | 12.5 (4.0 to 24.1)            | 3.9% (0.4 to 2.6)               | 15–39 years | 12.5 (4.0 to 24.1)           | 3.9% (0.4 to 2.6)               |
| ≥65 years        | 1.8% (0.4 to 4.0)             | 0.9% (0.2 to 0.9)               | ≥65 years | 1.8% (0.4 to 4.0)            | 0.9% (0.2 to 0.9)               |

(Table 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 (%) |
| a65 years | 109 | 0.52% | -0.57% | (10.05 to 2.78) | 5.05% | 1.54% | (3.89 to 6.32) |
| Guinea-Bissau | 55 | 12% | -0.40% | (6.03 to 20.3) | 31% | 0.974% | (2.7 to 11.4) |
| 40–64 years | 173 | 12.1% | 0.289% | (6.66 to 18.0) | 26.9 | 29.3% | (19.8 to 37.8) |
| a65 years | 130 | 4.20% | -1.00% | (1.25 to 7.79) | 3.65 | 17.1% | (9.6 to 24.2) |
| Mauritania | 162 | 16% | 0.0744% | (9.84 to 23.7) | 378 | 39.8% | (30.0 to 45.2) |
| 15–39 years | 132 | 14% | -0.334% | (6.2 to 23.1) | 273 | 6.59% | (5.09 to 7.95) |
| a65 years | 58 | 1.68% | -0.621% | (0.729 to 2.74) | 20.6 | 6.26% | (3.66 to 8.84) |
| Mali | 99.6 | 16% | -0.875% | (13.97 to 19.2) | 55.7 | 7.02% | (0 to 11.4) |
| 15–39 years | 36 | 1% | -0.06% | (0.102 to 0) | 0.385 | 0.123% | (0 to 2.44) |
| a65 years | 10 | 0% | -0.0000223% | (0 to 0) | 0 | 0% | (0 to 0) |
| Mauritanian | 127 | 1% | -0.875% | (9.17 to 27.2) | 127 | 7.02% | (0.10 to 0) |
| 15–39 years | 97 | 1.27% | -0.0206% | (0.003377) | 0 | 0% | (0 to 0) |
| a65 years | 10 | 0% | -0.0000223% | (0 to 0) | 0 | 0% | (0 to 0) |
| Niger | 234 | 5% | -1.23% | (2.15 to 4.0) | 127 | 22% | (0 to 2.79) |
| 15–39 years | 25 | 1.78% | 0.58% | (0.14 to 0.63) | 76.8 | 5.98% | (0 to 1.93) |
| a65 years | 0.599 | 0.210% | 0.112% | (0.0000341 to 0.0104) | 2.79 | 1.02% | (0 to 0.0138 to 0.91) |
| Nigeria | 4390 | 9% | -0.222% | (0.42 to 6.62) | 11.30 | 27% | (2.3 to 31.4) |
| 15–39 years | 2160 | 14% | -0.26% | (8.76 to 16.1) | 487 | 32% | (26.1 to 37.7) |
| a65 years | 307 | 9.71% | 0.351% | (5.59 to 14.0) | 754 | 26% | (18.6 to 32.0) |
| São Tomé and Príncipe | 5.6 | 12% | -1.67% | (7.08 to 19.4) | 16.7 | 37% | (30 to 42.7) |
| 15–39 years | 4.6 | 12% | 0.447% | (7.08 to 19.4) | 7.42 | 37% | (29 to 45.3) |
| a65 years | 0.227 | 0.29% | (1.37 to 3.82) | (0 to 0.0129 to 0.21) | 0.95 | 26% | (16.6 to 34.8) |
| Senegal | 191 | 6% | -0.01% | (0.695 to 15.9) | 799 | 25% | (9.13 to 33.5) |
| 15–39 years | 129 | 6% | -0.01% | (0.695 to 15.9) | 799 | 25% | (9.13 to 33.5) |
| (Table 1 continues on next page) |
Discussion

We show that the estimation of the health effects associated with alcohol use requires consideration of
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. 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. 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 population-level 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.2,43 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.4 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, 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.15 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.1 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.6 Manthey and colleagues6 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 alcohol-attributable relative risk curve used DAILY 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. 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 has increased and has a great impact on 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.
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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; 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.

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