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Second hand smoke attributable disease burden in 204 countries and territories, 1990–2021: a systematic analysis from the Global Burden of Disease Study 2021

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Abstract

Background We aimed to estimate the changes in, second hand smoke (SHS) and potential drivers of its health outcome from 1990 to 2021 worldwide.

Methods The data was derived from the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2021, which covered 204 countries and territories. We reported SHS changes by sex, year and sociodemographic index (SDI) level (a summary measure that identifies where countries or other geographic areas sit on the spectrum of development) from 1990 to 2021. We analyzed the risk-outcome pairs among all age groups to estimate disease burden attributable to SHS exposure and also did a decomposition method to attribute changes in all-cause SHS attributable deaths or disability-adjusted life years (DALYs) to population growth, population aging, and mortality change.

Results Worldwide, the age-standardized summary exposure values (SEV) of SHS exposure in 2021 was 30.6% (28.9 to 31.6) for males and 38.0% (35.5 to 39.0) for females, with a percentage change of −0.2 (−0.2 to −0.1) and −0.3 (−0.3 to −0.2), respectively, since 1990. Among the top 10 countries with the highest SEV, there were mainly high-middle SDI countries for male and low-middle SDI and middle SDI countries for female, respectively. Secondly, about 1.29 million deaths (0.68–1.90) and 34.90 million DALYs (17.95–52.21) were attributable to SHS exposure, and about half of them took place in two countries (China and India). Ischemic heart disease (IHD) (29.67%), chronic obstructive pulmonary disease (COPD) (19.04%), and lower respiratory infections (LRIs) (10.87%) were the three leading causes of SHS associated deaths. Lastly, since 2010, the number of SHS related death significantly increased due to population growth and population aging, despite a decrease in mortality attributable to SHS exposure.

Conclusion Globally, the age-standardized SEV of SHS exposure decreased from 1990 to 2021. Since 2010, the increased number of deaths attributable to SHS exposure was mainly attributable to population growth and aging.

Keywords Second hand smoke, Secular trends, Disease burden, Worldwide

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Background

Second hand smoke (SHS) exposure has caused a large number of deaths and loss of healthy life years among both children and adults worldwide [1]. World Health Organization (WHO) global report on trends in prevalence of tobacco use 2000–2025 (third edition) estimated that exposure to secondhand smoke caused about 1.2 million deaths every year [2]. According to the WHO report, about 50% of children worldwide are exposed to second hand smoke and 65,000 children deaths are attributed to second hand smoke exposure every year [3]. Furthermore, the adverse effects of SHS on health outcome has been well-established by WHO, and the WHO with recommendations that each country should build smoke-free environment to protect people from secondhand smoke exposure [4]. Exposure to SHS has been found to be associated with increased risks of respiratory tract infections, ischemic heart diseases, chronic obstructive pulmonary disease, otitis media and stroke [5–7]. According to the WHO report on the global tobacco epidemic 2021, 182 parties have ratified the WHO Framework Convention on Tobacco Control (FCTC). Article 8 of WHO FCTC stipulates that smoking and tobacco should be forbidden in all indoor areas, and on public transport, and be appropriately eliminated in other public places [4].

Timely assessment of SHS exposure and its associated health outcomes could be helpful to launch optimal intervention policies on different countries, demographic groups, and sociodemographic index (SDI) level. We searched PubMed with the terms of ("secondhand smoke exposure"OR"passive smoking") AND ("prevalence") AND ("disease burden"OR"estimates") AND ("global"OR"international") for studies published between 1/1/1990 and 20/9/2024. We identified 8 related studies that estimated global SHS prevalence and its related disease burden. In 2011 years, Mattias and colleagues firstly reported the comprehensive estimation of SHS exposure and its disease burden in children and adult non-smokers for 192 countries [3]. Then, Global Burden of Diseases (GBD) serial studies of 2010, 2013, 2016 had assessed the contribution of SHS to overall disease burden through the comparative risk assessment framework developed by Murray et al. [8–10]. In addition, based on data from the Global Youth Tobacco Survey (GYTS), researchers reported the prevalence of SHS of adolescents in 131 countries and territories from 1999 to 2005, in 68 low-income and middle-income countries from 2013 to 2016, in 142 countries and territories from 1999 to 2018, respectively [11–13]. Zhai et al. performed a detailed analysis about the global disease burden attributable to SHS exposure, based on the GBD 2019 database [1]. However, there is no available data about the secular trends of SHS exposure yet.

Therefore, in this study, we used the latest data from the GBD 2021 to update SHS summary exposure values (SEV) and SHS-attributable disease burden by sex and age group for 204 countries and territories from 1990 to 2021. We also decomposed potential drivers of SHS attributable disease burden over time in terms of population size, age structure and mortality change.

Methods

The data in this study was derived from the GBD 2021, and we focused on the disease burden attributable to SHS in the world. The methodology about the estimation process of the GBD 2021 has been fully described elsewhere [8]. In this study, we chose"Global"as the location,"All causes"as the cause,"second hand smoke"as the risk, and"death"and"disability adjusted life years (DALYs)"as the measures. Data was downloaded from the Global Health Data Exchange website (https://ghdx.healthdata.org/gbd-results-tool, accessed date: 20 Oct 2024). As a secondary analysis of publicly available data, no ethical approval from an institutional review board was required for this study.

Second hand smoke exposure

In the GBD 2021, SHS exposure was defined as non-smokers exposed to tobacco smoke by their household members, rather than using questionnaires that asked directly about exposure to SHS in surveys. GBD researchers viewed household composition as a proxy for exposure, and they assumed that all individuals living with a daily smoker were exposed to tobacco smoke. In the GBD 2021, researchers defined secondhand smoke exposure as current exposure to secondhand tobacco smoke at home, at work, or in other public places, and SHS exposure was evaluated for all age groups. In addition, non-smokers were defined as all persons who were not daily smokers. Ex-smokers and occasional smokers were also considered non-smokers [8].

Defining risk-outcome pairs

In the GBD 2021, the disease burden attributable to SHS exposure included otitis media for children aged 0–14 years, and tracheal, bronchus, and lung cancer, chronic obstructive pulmonary disease (COPD), ischemic heart disease (IHD), ischemic stroke, intracerebral hemorrhage, subarachnoid hemorrhage, breast cancer and diabetes for adults aged 25 years or more, and lower respiratory infections (LRIs) for all age groups, respectively. Detailed information about the estimation of relative risks had been previously described [8]. In the GBD 2010 study

[10], researchers estimated the second hand smoke exposure using the database such as the Demographic Health Surveys (DHS), the Multiple Indicator Cluster Surveys (MICS), and the Living Standards Measurement Surveys (LSMS); and national and subnational censuses, which included the Integrated Public Use Microdata Series (IPUMS) project and the Global Health Data Exchange catalog (GHDx). Then, Spatiotemporal Gaussian process regression was applied and the relative risks of SHS was derived from studies of US Department of Health and Human Services [14], Oono and colleagues [15], Jones and colleagues [7, 16]; the relative risks of occupational exposure to SHS was from studies of Stayner and colleagues [17]. Finally, based on exposure and relative risks, the population attributable fraction (PAF) equation was used to estimate diseases burden as follows:

$$PAF\% = p(RR-1)/[p(RR-1)+1] \times 100\%$$

where p was the proportion of SHS exposed individuals in the total population, and relative risk (RR) was the risk effect of SHS on each cause.

Indices of disease burden

In this study, the diseases burden indices included summary exposure values (SEV), deaths, DALYs, age-standardized mortality rate (ASMR), age-standardized DALYs rate (ASDR) and PAF; and attributable deaths and DALYs were estimated using the rates of death or DALYs multiplied by the PAF for second hand smoke—outcome pairs for each age, sex, causes, and locations. SEV is a measure of a population's exposure to a risk factor that takes into account the extent of exposure by risk level and the severity of that risk's contribution to disease burden. In addition, GBD researchers estimated the ASMR and ASDR trends. Briefly, they firstly used DisMod-MR 2.1 models produced country-, age-, sex-, and year-specific severity levels of diseases [18, 19]. GBD researchers also calculated the percentage changes over specified time periods and annualized rates of change (ARC) as the difference in the natural log of the values at the start and end of the time interval divided by the number of years in the interval. Age standardized prevalence (ASP) was calculated by combining the second hand smoke prevalence in each age groups, and the weights are the proportions of persons in the corresponding age groups of the WHO standard population. The values and 95% uncertainty estimation interval (UI) were obtained directly from the Global Health Data Exchange website.

Decomposition analysis

In the GBD serious studies, decomposition analysis methods are always be used to quantify the effect of the changes in population and risk factors. The changes in SHS attributable DALYs from 1990 to 2021 were attributed into three factors: population size, age structure and mortality change. Two approaches had been established and widely used in the GDB studies, however these two methods did not considered the interactions between three factors and were sensitive to the choice of reference group [20–22]. Therefore, in this study, we used the decomposition methods developed by Cheng X, et al. [23], which overcame potentially ambiguous interpretations caused by the choice of reference and bias of three-way interactions. Flowchart was seen in Figure S1.

In our analysis, we also presented results aggregated by level of socio-demographic Index (SDI), which incorporated lagged distributed income per capita, average years of education, and total fertility rate. In addition, SDI refers to a summary measure that identifies where countries or other geographic areas sit on the spectrum of development [18]. The SDI ranges from 0 to 1 [24]. Each country's income level (high (0.81–1), high middle (0.71–0.80), middle (0.61–0.70), low middle (0.47–0.60) and low (0–0.46)) was downloaded directly from the GBD website and the classification is based on the reference SDI quintile values [25].

All statistical analyses were performed using R 3.6.0.

Results

Global, regional, and national levels and trends of Second hand smoke at home

Globally, the age-standardized SEV of SHS exposure in 2021 was 34.3% (32.3%, 35.1%), and was 30.6% (28.9%, 31.6%) for male and 38.0% (35.5%, 39.0%) for female, per 100,000 (Table 1). For male, 115 countries and territories had higher SEV of SHS than the global average level, and there were 73 countries for female (Fig. 1). Furthermore, the top 5 countries with the highest SEV were North Macedonia (53.6% [49.3 to 57.6]), Montenegro (51.9% [47.3 to 55.3]), Kiribati (51.0% [46.0 to 55.3]), Serbia (49.7% [46.1 to 53.2]) and Cote d'Ivoire (49.2% [44.5 to 53.5]) among male, and Kiribati (74.7% [68.3 to 80.6]), Armenia (68.2% [63.0 to 71.0]), China (67.6% [62.7 to 70.8]), Timor-Leste (65.0% [59.4 to 70.4]) and Georgia (64.7% [59.0 to 68.2]) among female, per 100,000, respectively. Lastly, among the top 10 countries with the highest SEV, there were mainly high-middle SDI countries for male and low-middle SDI and middle SDI countries for female, respectively (Table 1, Fig. 1).

Worldwide in 2021, 2709.1 million [2544.9 to 2771.4] people were exposed to SHS, 55.1% of whom were females (1493.4 million [1393.9 to 1533.9]). The top five countries with the largest populations exposed to SHS

Table 1 Age-standardized summary exposure value of second hand smoke in 2021 and annualized rate of change in age-standardized prevalence from 1990–2021, 1990–2010, and 2010–2010 for males, females and both sexes

Country	SDI level	2021 ASP	2021 female ASP	2021 male ASP	ARC 1990–2021	ARC, female 1990–2021	ARC, male 1990–2021	ARC 1990–2000	ARC, female 1990–2000	ARC, male 1990–2000	ARC 2000–2010	ARC, female 2000–2010	ARC, male 2000–2010	ARC 2010–2021	ARC, female 2010–2021	ARC, male 2010–2021
Global	Middle	34.3 (32.3, 35.1)	38.0 (35.5, 39.0)	30.6 (28.9, 31.6)	−0.2 (−0.2, −0.2)	−0.3 (−0.3, −0.2)	−0.2 (−0.2, −0.1)	−0.05 (−0.06, −0.05)	−0.07 (−0.08, −0.06)	−0.04 (−0.05, −0.02)	−0.10 (−0.11, −0.10)	−0.12 (−0.13, −0.11)	−0.09 (−0.11, −0.07)	−0.09 (−0.10, −0.08)	−0.12 (−0.13, −0.10)	−0.09 (−0.08, −0.03)
Afghanistan	Low	29.1 (26.2, 31.7)	29.6 (26.4, 32.5)	28.6 (25.4, 31.7)	0.3 (0.2, 0.4)	0.6 (0.4, 0.8)	0.1 (−0.1, 0.2)	0.1 (0, 0.1)	0.2 (0.1, 0.3)	0 (−0.1, 0.1)	0.2 (0.1, 0.2)	0.3 (0.2, 0.4)	0.1 (0, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0.1)
Albania	Middle	48.5 (44.5, 50.6)	57.6 (52.4, 60.3)	39.4 (36.3, 41.8)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (0, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0)	0 (0, 0)	0 (0, 0)	0 (0, 0.1)	0.1 (0, 0.1)	0 (0, 0.1)
Algeria	Middle	44.7 (41.1, 47.5)	50.6 (46.2, 54.1)	38.9 (35.3, 42.2)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0 (0, 0)	0 (0, 0)	0 (−0.1, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)
American Samoa	High middle	41.7 (38.2, 45.5)	44.9 (40.7, 49.4)	38.6 (34.6, 42.9)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)
Andorra	High	35 (31.5, 37.9)	33.1 (29.2, 36)	36.8 (32.4, 40.8)	−0.2 (−0.3, −0.2)	−0.3 (−0.4, −0.2)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0)
Angola	Low middle	17.6 (15.7, 19.1)	17.7 (15.6, 19.5)	17.3 (15.6, 19.3)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0.1 (−0.1, 0.2)	−0.1 (−0.2, 0)	−0.2 (−0.2, −0.1)	0 (−0.1, 0.1)	0.1 (0, 0.1)	0.1 (0, 0.2)	0.1 (0, 0.2)	0 (0, 0.1)	0.1 (0, 0.1)	0 (−0.1, 0.1)
Antigua and Barbuda	High middle	18.9 (16.9, 20.8)	17.5 (15.2, 19.8)	20.3 (17.9, 23.1)	0 (−0.1, 0.1)	0 (−0.1, 0.2)	0 (−0.2, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)
Argentina	High middle	37.4 (34.6, 40.6)	35.5 (31.9, 38.8)	39.4 (35.8, 43.5)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, −0.1)	0 (0, 0)	0 (−0.1, 0)	0 (0, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)
Armenia	Middle	55.1 (51.6, 57.2)	68.2 (63, 71)	40.8 (38, 43.3)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (0, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0)	0 (0, 0)	0 (0, 0)	0 (0, 0)	0 (0, 0)	0 (−0.1, 0.1)
Australia	High	26.8 (24, 29.4)	22.2 (19.5, 24.9)	31.4 (27.7, 35.2)	−0.3 (−0.4, −0.3)	−0.4 (−0.5, −0.4)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, 0)
Austria	High	40.3 (37.4, 42.8)	38.7 (35.5, 41.6)	41.9 (38.1, 45.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0.1 (0.1, 0.1)	0.1 (0, 0.1)	0.1 (0, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)
Azerbaijan	Middle	52 (48.3, 54.7)	64.4 (59.1, 68)	39.3 (35.6, 42.8)	0.1 (0, 0.2)	0.1 (0.1, 0.2)	0 (−0.1, 0.1)	0 (0, 0.1)	0.1 (0, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0.1 (0, 0.1)	0 (0, 0.1)	0 (0, 0)	0 (0, 0)	0 (−0.1, 0.1)

Table 1 (continued)

Country	SDI level	2021 ASP	2021 female ASP	2021 male ASP	ARC 1990–2021	ARC, female 1990–2021	ARC, male 1990–2021	ARC 1990–2000	ARC, female 1990–2000	ARC, male 1990–2000	ARC 2000–2010	ARC, female 2000–2010	ARC, male 2000–2010	ARC 2010–2021	ARC, female 2010–2021	ARC, male 2010–2021
Bahamas	High middle	18.8 (16.9, 20.6)	17.4 (15.4, 19.5)	20.2 (17.6, 22.9)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.2, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Bahrain	High middle	35.9 (32.5, 38.8)	36.2 (32, 39.5)	36 (32.3, 39.6)	0 (−0.1, 0.1)	0 (−0.1, 0.2)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0.1)	0.1 (0, 0.1)	0 (−0.1, 0.1)	0 (0, 0.1)	0.1 (0, 0.1)	0 (−0.1, 0.1)
Bangladesh	Low middle	43.3 (40.2, 46.6)	50.3 (46.2, 54.6)	35.9 (32.8, 39)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0)	0 (−0.1, 0)	0 (0, 0.1)	0 (−0.1, 0)	0 (0, 0)	−0.1 (−0.1, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)
Barbados	High middle	12.3 (11.1, 13.6)	12.3 (11, 13.8)	12.2 (10.6, 13.7)	−0.3 (−0.3, −0.2)	−0.3 (−0.4, −0.2)	−0.2 (−0.3, −0.1)	0 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)
Belarus	High middle	44 (40.2, 46.8)	50.9 (46.2, 54.4)	36.2 (33.1, 38.9)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0)	0 (0, 0.1)	0 (−0.1, 0)
Belgium	High	30.1 (27.4, 32.7)	25.9 (23.1, 28.5)	34.2 (30.5, 38.1)	−0.3 (−0.4, −0.2)	−0.4 (−0.5, −0.4)	−0.2 (−0.3, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, 0)
Belize	Low middle	20.3 (18.7, 22)	22.6 (20.6, 24.8)	17.9 (16.2, 19.6)	−0.2 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)
Benin	Low	12.2 (11, 13.5)	12.1 (10.8, 13.4)	12.2 (11, 13.7)	−0.4 (−0.4, −0.3)	−0.4 (−0.5, −0.4)	−0.3 (−0.4, −0.3)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.3 (−0.3, −0.2)	−0.3 (−0.3, −0.3)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)
Bermuda	High	22.2 (19.9, 24.3)	22.3 (19.7, 25)	22.1 (19, 24.9)	0 (−0.1, 0.1)	0 (−0.2, 0.1)	0 (−0.2, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)
Bhutan	Low middle	23.2 (20.8, 25.8)	19.8 (17.7, 22.3)	26.2 (22.9, 29.9)	−0.1 (−0.2, 0)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Bolivia (Plurinational State of)	Low middle	20.6 (18, 22.8)	21.7 (18.7, 24.3)	19.4 (16.6, 21.8)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, 0)	−0.2 (−0.2, −0.2)	−0.3 (−0.3, −0.2)	−0.2 (−0.2, −0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)
Bosnia and Herzegovina	High middle	48.3 (44.8, 50.8)	49.7 (45.8, 53.1)	46.8 (43, 49.9)	0.1 (0, 0.1)	0.1 (0, 0.2)	0.1 (0, 0.1)	0.1 (0.1, 0.2)	0.2 (0.1, 0.3)	0.1 (0, 0.1)	0.1 (0.1, 0.1)	0.1 (0.1, 0.2)	0.1 (0, 0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)

Table 1 (continued)

Country	SDI level	2021 ASP	2021 female ASP	2021 male ASP	ARC 1990–2021	ARC, female 1990–2021	ARC, male 1990–2021	ARC 1990–2000	ARC, female 1990–2000	ARC, male 1990–2000	ARC 2000–2010	ARC, female 2000–2010	ARC, male 2000–2010	ARC 2010–2021	ARC, female 2010–2021	ARC, male 2010–2021
Botswana	Middle	31.3 (28.3, 34.5)	31 (28, 34.4)	31.6 (27.8, 35.3)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)
Brazil	Middle	25.9 (24.1, 27.8)	21.8 (19.9, 23.7)	30.2 (27.2, 33.1)	−0.5 (−0.5, −0.4)	−0.6 (−0.6, −0.5)	−0.3 (−0.4, −0.3)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.3 (−0.3, −0.3)	−0.2 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.3 (−0.3, −0.2)	−0.1 (−0.2, 0)
Brunei Darussalam	High	29.7 (26.3, 32.3)	29.8 (26.2, 33.2)	29.6 (26, 33.3)	−0.3 (−0.4, −0.3)	−0.5 (−0.5, −0.4)	−0.2 (−0.3, 0)	−0.2 (−0.2, −0.2)	−0.3 (−0.3, −0.3)	−0.1 (−0.2, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)
Bulgaria	High middle	44.7 (41.5, 47.5)	44.3 (40.3, 47.5)	45.1 (41.3, 48.7)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)
Burkina Faso	Low	22.3 (19.9, 24.2)	23.9 (21.2, 26.3)	20.4 (18, 23.1)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.1)	−0.2 (−0.3, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Burundi	Low	14.1 (12.1, 15.6)	13.9 (12, 15.5)	14.3 (12.3, 16.1)	−0.4 (−0.4, −0.3)	−0.5 (−0.5, −0.4)	−0.2 (−0.3, −0.1)	−0.3 (−0.3, −0.2)	−0.4 (−0.4, −0.3)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)
Cabo Verde	Low middle	18.3 (16.2, 20.2)	17.6 (15.4, 19.7)	19.2 (16.7, 21.8)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Cambodia	Low middle	45.4 (41.3, 48.3)	54.8 (49.6, 58.7)	34.8 (31.7, 37.7)	0.1 (0, 0.1)	0.1 (0, 0.2)	0 (−0.1, 0.1)	0.1 (0.1, 0.2)	0.2 (0.2, 0.3)	0.1 (0, 0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, −0.1)	0 (−0.1, 0)	0 (0, 0)	0 (0, 0.1)	0 (−0.1, 0.1)
Cameroon	Low middle	15.4 (14.2, 16.8)	16.2 (14.7, 18)	14.6 (13.1, 16)	−0.3 (−0.4, −0.3)	−0.4 (−0.4, −0.3)	−0.3 (−0.3, −0.2)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, 0)	−0.2 (−0.2, −0.1)	−0.2 (−0.2, −0.2)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)
Canada	High	29.9 (27, 32.1)	27 (24.4, 29.5)	32.8 (29, 36)	−0.3 (−0.4, −0.3)	−0.4 (−0.5, −0.4)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)
Central African Republic	Low	16.4 (14.8, 18.2)	16.3 (14.5, 18.4)	16.4 (14.4, 18.7)	−0.2 (−0.3, −0.2)	−0.3 (−0.4, −0.2)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)
Chad	Low	17.8 (16.2, 19.5)	18.5 (16.7, 20.5)	17 (15, 19)	−0.2 (−0.3, −0.2)	−0.3 (−0.3, −0.2)	−0.2 (−0.3, −0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)

Table 1 (continued)

Country	SDI level	2021 ASP	2021 female ASP	2021 male ASP	ARC 1990–2021	ARC, female 1990–2021	ARC, male 1990–2021	ARC 1990–2000	ARC, female 1990–2000	ARC, male 1990–2000	ARC 2000–2010	ARC, female 2000–2010	ARC, male 2000–2010	ARC 2010–2021	ARC, female 2010–2021	ARC, male 2010–2021
Chile	High middle	38.6 (35.4, 41.3)	36.4 (32.9, 39.5)	40.9 (37, 44.9)	−0.2 (−0.3, −0.2)	−0.3 (−0.3, −0.2)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)
China	Middle	54.4 (51.2, 57)	67.6 (62.7, 70.8)	41.9 (38.5, 45.3)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0 (0, 0)	0 (−0.1, 0)	0 (0, 0.1)	0 (0, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)
Colombia	Middle	19.5 (17.7, 21)	18 (16.3, 19.7)	21.1 (18.6, 23.3)	−0.4 (−0.4, −0.3)	−0.4 (−0.5, −0.4)	−0.3 (−0.4, −0.2)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.2)	−0.2 (−0.3, −0.2)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)
Comoros	Low middle	28.3 (25.4, 30.9)	30.2 (26.8, 33.1)	26.3 (23.3, 29.1)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (0, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)
Congo	Low middle	20.3 (18.4, 22.5)	21.4 (19.1, 23.8)	19.2 (16.9, 21.3)	0 (−0.1, 0.1)	0.1 (0, 0.2)	−0.1 (−0.2, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (0, 0.1)	0.1 (0, 0.1)	−0.1 (−0.1, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)
Cook Islands	High middle	36.4 (32.6, 39.9)	35 (31.3, 38.9)	37.7 (33.4, 42)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)
Costa Rica	Middle	21.1 (18.9, 23.2)	20.3 (18, 22.8)	21.9 (19.3, 24.4)	−0.4 (−0.4, −0.3)	−0.4 (−0.5, −0.4)	−0.3 (−0.4, −0.2)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.2)	−0.2 (−0.3, −0.2)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)
Cote d'Ivoire	Low	48.7 (44.7, 52.2)	48.2 (43.9, 52.2)	49.2 (44.5, 53.5)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	0 (−0.1, 0)
Croatia	High middle	32.3 (29.5, 35)	33.8 (30.8, 36.7)	30.7 (27.4, 33.6)	−0.2 (−0.3, −0.2)	−0.3 (−0.3, −0.2)	−0.2 (−0.3, −0.1)	0 (0, 0.1)	0.1 (0, 0.1)	0 (0, 0.1)	−0.2 (−0.2, −0.1)	−0.2 (−0.2, −0.2)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, 0)
Cuba	Middle	46.9 (43, 49.7)	51 (46.4, 54.7)	42.6 (38.7, 46)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (0, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0.1)	0.1 (0, 0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)
Cyprus	High	38.7 (35.4, 41.6)	36.7 (33.2, 40)	40.5 (36.5, 44.3)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)
Czechia	High	24.1 (21.7, 26.5)	24.7 (22.1, 27.4)	23.6 (20.8, 26.5)	−0.1 (−0.2, 0)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, 0)	0.2 (0.2, 0.3)	0.2 (0.2, 0.3)	0.2 (0.1, 0.3)	−0.2 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)

Table 1 (continued)

Country	SDI level	2021 ASP	2021 female ASP	2021 male ASP	ARC 1990–2021	ARC, female 1990–2021	ARC, male 1990–2021	ARC 1990–2000	ARC, female 1990–2000	ARC, male 1990–2000	ARC 2000–2010	ARC, female 2000–2010	ARC, male 2000–2010	ARC 2010–2021	ARC, female 2010–2021	ARC, male 2010–2021
Republic of Korea	Low middle	49.6 (45.3, 53.4)	59.9 (53.6, 65.1)	39.5 (35.6, 43.3)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)
Republic of the Congo	Low	19.1 (16.6, 21)	20.4 (17.7, 22.6)	17.9 (15.2, 20)	−0.2 (−0.3, −0.1)	−0.2 (−0.3, −0.1)	−0.1 (−0.3, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Denmark	High	27.9 (25, 30.1)	22.6 (20.2, 25)	33.1 (29.3, 36.4)	−0.4 (−0.5, −0.4)	−0.5 (−0.6, −0.5)	−0.3 (−0.4, −0.2)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, −0.1)	−0.3 (−0.3, −0.2)	−0.3 (−0.4, −0.3)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)
Djibouti	Low middle	42.2 (38.1, 45.3)	50.8 (45.2, 55.3)	34.6 (31.4, 37.8)	0 (−0.1, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (0, 0.1)	0 (−0.1, 0)	0 (0, 0.1)	0.1 (0, 0.1)	0.1 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)
Dominica	High middle	19.3 (17.5, 21.2)	18.6 (16.4, 20.9)	19.9 (17.3, 22.5)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Dominican Republic	Low middle	18 (16.3, 20)	17.6 (15.6, 19.6)	18.4 (16.3, 20.8)	−0.2 (−0.3, −0.1)	−0.2 (−0.3, −0.1)	−0.2 (−0.3, −0.1)	0.1 (0, 0.1)	0.1 (0, 0.2)	0.1 (0, 0.2)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, 0)
Ecuador	Middle	15.6 (13.6, 17.1)	14.9 (12.6, 16.6)	16.3 (13.8, 18.4)	−0.4 (−0.4, −0.3)	−0.4 (−0.5, −0.4)	−0.3 (−0.4, −0.2)	−0.2 (−0.2, −0.2)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)
Egypt	Middle	44.5 (40.4, 47.3)	50.8 (45.6, 54.3)	38.7 (34.9, 41.9)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0)	0 (0, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)
El Salvador	Low middle	18.3 (16.7, 20.3)	18.2 (16.2, 20.2)	18.5 (16.5, 20.7)	0.2 (0.1, 0.3)	0.3 (0.1, 0.4)	0.2 (0.1, 0.3)	0.1 (0, 0.1)	0.1 (0, 0.2)	0.1 (0, 0.2)	0.1 (0.1, 0.2)	0.2 (0.1, 0.2)	0.1 (0, 0.2)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Equatorial Guinea	Middle	34.5 (31, 37.4)	39.1 (34.2, 43)	30.1 (26.5, 33.3)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.2, 0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (0, 0.1)	0.1 (0, 0.1)	0 (−0.1, 0.1)
Eritrea	Low	18.7 (16.6, 21.2)	17.8 (15.5, 20.1)	19.7 (16.9, 22.7)	−0.1 (−0.2, 0.1)	−0.1 (−0.2, 0)	0 (−0.1, 0.2)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Estonia	High	32.1 (29.4, 34.7)	28.9 (26.1, 31.6)	35.4 (31.8, 39)	−0.3 (−0.4, −0.3)	−0.4 (−0.5, −0.4)	−0.1 (−0.2, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.2 (−0.2, −0.1)	0 (−0.1, 0)	−0.2 (−0.2, −0.2)	−0.3 (−0.3, −0.3)	−0.1 (−0.2, 0)

Table 1 (continued)

Country	SDI level	2021 ASP	2021 female ASP	2021 male ASP	ARC 1990–2021	ARC, female 1990–2021	ARC, male 1990–2021	ARC 1990–2000	ARC, female 1990–2000	ARC, male 1990–2000	ARC 2000–2010	ARC, female 2000–2010	ARC, male 2000–2010	ARC 2010–2021	ARC, female 2010–2021	ARC, male 2010–2021
Eswatini	Low middle	18.9 (16.4, 20.9)	18.2 (15.4, 20.3)	19.8 (17, 22.2)	−0.3 (−0.3, −0.2)	−0.3 (−0.4, −0.2)	−0.2 (−0.3, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)
Ethiopia	Low	13.1 (12, 14.1)	12.2 (11.1, 13.3)	14.1 (12.7, 15.3)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.1)	−0.2 (−0.3, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)
Fiji	Middle	33.9 (30.3, 36.4)	37.2 (33.2, 40.4)	30.6 (27.1, 33.5)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0.1)
Finland	High	24.6 (22.5, 26.6)	21 (18.6, 23.1)	28.1 (25.2, 31.1)	−0.3 (−0.4, −0.2)	−0.4 (−0.5, −0.3)	−0.2 (−0.3, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.3, −0.1)	−0.1 (−0.1, 0)
France	High	35.4 (32.5, 38.2)	33.5 (30.4, 36.4)	37.3 (33.6, 40.9)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (0, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)
Gabon	Middle	24.3 (22.1, 26.8)	25.6 (22.6, 28.2)	23 (20.4, 25.7)	0 (−0.1, 0.1)	0.1 (0, 0.2)	0 (−0.2, 0.1)	0.1 (0, 0.1)	0.1 (0, 0.2)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Gambia	Low	27.6 (25, 30.4)	29.5 (26.4, 32.5)	25.7 (22.8, 28.6)	−0.3 (−0.3, −0.2)	−0.4 (−0.4, −0.3)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	0 (0, 0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)
Georgia	High middle	53.6 (49.4, 56.6)	64.7 (59, 68.2)	42 (38.7, 45.4)	0.1 (0, 0.1)	0.1 (0, 0.2)	0 (−0.1, 0.1)	0 (0, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	0.1 (0.1, 0.2)	0.2 (0.1, 0.2)	0.1 (0, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)
Germany	High	32.2 (29.1, 35.1)	29.3 (26.3, 32.6)	34.9 (30.7, 38.5)	−0.2 (−0.2, −0.1)	−0.3 (−0.3, −0.2)	−0.1 (−0.2, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)
Ghana	Low middle	12.3 (11, 13.6)	12.4 (11.2, 13.9)	12.1 (10.7, 13.6)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)	−0.2 (−0.3, −0.1)	−0.2 (−0.2, −0.2)	−0.2 (−0.3, −0.2)	−0.2 (−0.2, −0.1)	0 (0, 0.1)	0.1 (0, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Greece	High middle	43 (39.5, 45.8)	41.6 (37.7, 45)	44.4 (40.7, 48)	−0.2 (−0.3, −0.2)	−0.3 (−0.4, −0.3)	−0.1 (−0.2, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (0, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	0 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)
Greenland	High middle	41.7 (37.7, 45.5)	44.6 (40.1, 49.3)	38.9 (35, 43.3)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.1)	−0.2 (−0.2, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)

Table 1 (continued)

Country	SDI level	2021 ASP	2021 female ASP	2021 male ASP	ARC 1990–2021	ARC, female 1990–2021	ARC, male 1990–2021	ARC 1990–2000	ARC, female 1990–2000	ARC, male 1990–2000	ARC 2000–2010	ARC, female 2000–2010	ARC, male 2000–2010	ARC 2010–2021	ARC, female 2010–2021	ARC, male 2010–2021
Grenada	Middle	18.9 (17, 20.7)	18.4 (16.3, 20.6)	19.4 (16.7, 21.8)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0.1)	−0.1 (−0.2, 0.1)	0 (0, 0.1)	0.1 (0, 0.2)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)
Guam	High	33.4 (30.1, 36.6)	31 (27.6, 34.8)	35.7 (31.5, 39.6)	−0.1 (−0.2, −0.1)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)
Guatemala	Low middle	19.8 (17.2, 21.5)	20.5 (17.8, 22.7)	19 (16.5, 20.9)	0 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.2, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)
Guinea	Low	22.9 (20.8, 25.2)	23.7 (21.5, 26.1)	22 (19.8, 24.6)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0)
Guinea–Bissau	Low	15.6 (13.8, 17.2)	15.7 (13.7, 17.4)	15.6 (13.5, 17.5)	0.2 (0.1, 0.4)	0.3 (0.2, 0.5)	0.2 (0, 0.4)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	0.2 (0.1, 0.2)	0.2 (0.1, 0.3)	0.1 (0, 0.2)	0.2 (0.1, 0.2)	0.2 (0.1, 0.3)	0.1 (0, 0.2)
Guyana	Middle	22 (20.2, 23.9)	23.9 (21.6, 26.2)	20.1 (18, 22)	−0.2 (−0.3, −0.2)	−0.2 (−0.3, −0.2)	−0.2 (−0.3, −0.1)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)
Haiti	Low	13.3 (12.1, 14.5)	13.6 (12.1, 15.1)	13 (11.5, 14.5)	−0.3 (−0.4, −0.3)	−0.4 (−0.4, −0.3)	−0.3 (−0.4, −0.2)	−0.2 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.2)	−0.2 (−0.3, −0.2)	−0.2 (−0.2, −0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Honduras	Low middle	27.4 (24.8, 30.2)	29.8 (26.8, 33.2)	24.8 (22.2, 27.6)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, 0)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Hungary	High middle	38.7 (35.4, 41.5)	36.5 (33, 39.9)	40.8 (36.8, 44.3)	−0.2 (−0.3, −0.2)	−0.3 (−0.3, −0.2)	−0.2 (−0.2, −0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)
Iceland	High	27.2 (24.7, 29.4)	21.5 (19.1, 23.5)	32.7 (28.8, 36.2)	−0.3 (−0.4, −0.3)	−0.4 (−0.5, −0.4)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0)
India	Low middle	30.1 (27.9, 31.9)	30.8 (28.5, 33)	29.3 (26.5, 31.7)	−0.3 (−0.3, −0.2)	−0.4 (−0.4, −0.3)	−0.2 (−0.2, −0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (0, 0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)
Indonesia	Middle	48.4 (45.6, 50.3)	61.7 (57.9, 64.4)	35.3 (33, 37.7)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0.1 (0, 0.1)	0 (0, 0.1)	0 (0, 0)	0 (0, 0)	0 (0, 0.1)	0 (0, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)

Table 1 (continued)

Country	SDI level	2021 ASP	2021 female ASP	2021 male ASP	ARC 1990–2021	ARC, female 1990–2021	ARC, male 1990–2021	ARC 1990–2000	ARC, female 1990–2000	ARC, male 1990–2000	ARC 2000–2010	ARC, female 2000–2010	ARC, male 2000–2010	ARC 2010–2021	ARC, female 2010–2021	ARC, male 2010–2021
Iran (Islamic Republic of)	Middle	30.6 (28.7, 32.5)	34 (31.1, 36.3)	27.3 (24.7, 29.9)	0 (0, 0.1)	0.1 (0, 0.2)	−0.1 (−0.2, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0.1)	0.1 (0.1, 0.2)	0 (−0.1, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)
Iraq	Middle	46.8 (43.3, 49.1)	53.9 (49.3, 56.8)	40.2 (36.9, 42.8)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, 0)	0 (0, 0)	0 (0, 0)	0 (−0.1, 0)
Ireland	High	29.5 (27.2, 31.8)	26.1 (23.5, 28.4)	32.9 (29.8, 36.1)	−0.3 (−0.4, −0.3)	−0.4 (−0.4, −0.3)	−0.3 (−0.3, −0.2)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.2 (−0.2, −0.1)	−0.2 (−0.2, −0.2)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, 0)
Israel	High middle	31.9 (28.9, 34.9)	29.6 (26.5, 32.7)	34.2 (30, 38)	−0.3 (−0.3, −0.2)	−0.3 (−0.4, −0.3)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)
Italy	High middle	35 (32.7, 37.1)	33.9 (31.1, 36.6)	36 (32.7, 39)	−0.3 (−0.3, −0.2)	−0.3 (−0.4, −0.3)	−0.2 (−0.3, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)
Jamaica	Middle	21.7 (19.6, 23.7)	22.2 (19.7, 24.7)	21.2 (18.7, 23.7)	−0.3 (−0.3, −0.2)	−0.3 (−0.4, −0.2)	−0.2 (−0.3, −0.1)	0 (0, 0)	0 (0, 0)	0 (0, 0)	−0.2 (−0.2, −0.2)	−0.2 (−0.3, −0.2)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)
Japan	High	31.3 (29.1, 33.4)	31.5 (28.5, 34.3)	31.1 (27.9, 34)	−0.4 (−0.4, −0.3)	−0.5 (−0.5, −0.4)	−0.2 (−0.3, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	0 (−0.1, 0.1)	−0.2 (−0.2, −0.2)	−0.3 (−0.3, −0.2)	−0.1 (−0.2, 0)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.1, 0)
Jordan	High middle	49.2 (45.2, 52.1)	58.8 (53.1, 62.6)	41.2 (38, 43.9)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)
Kazakhstan	High middle	40.6 (36.8, 43.4)	45.5 (40.9, 49.3)	35.2 (32.1, 38.3)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0)	0 (0, 0)	0 (0, 0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)
Kenya	Low middle	18 (16.6, 19.3)	18.8 (17.1, 20.3)	17.3 (15.4, 19)	−0.3 (−0.4, −0.3)	−0.4 (−0.4, −0.3)	−0.3 (−0.4, −0.2)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.3 (−0.3, −0.2)	−0.3 (−0.3, −0.3)	−0.2 (−0.3, −0.2)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)
Kiribati	Low middle	63.4 (58.6, 68.3)	74.7 (68.3, 80.6)	51 (46, 55.3)	0.1 (0, 0.1)	0.1 (0, 0.1)	0.1 (0, 0.2)	0.1 (0.1, 0.2)	0.1 (0.1, 0.2)	0.1 (0.1, 0.2)	0 (0, 0)	0 (0, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)
Kuwait	High	45 (41.9, 47.7)	52.5 (48.3, 56.1)	38.5 (34.9, 41.7)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0 (0, 0.1)	0 (0, 0)	0 (−0.1, 0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)

Table 1 (continued)

Country	SDI level	2021 ASP	2021 female ASP	2021 male ASP	ARC 1990–2021	ARC, female 1990–2021	ARC, male 1990–2021	ARC 1990–2000	ARC, female 1990–2000	ARC, male 1990–2000	ARC 2000–2010	ARC, female 2000–2010	ARC, male 2000–2010	ARC 2010–2021	ARC, female 2010–2021	ARC, male 2010–2021
Kyrgyzstan	Low middle	50.5 (47.3, 53.1)	61.6 (56.9, 64.5)	38.7 (35.4, 41.6)	0.1 (0, 0.2)	0.1 (0, 0.1)	0.1 (0, 0.2)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	0 (−0.1, 0)	0.1 (0.1, 0.2)	0.1 (0.1, 0.2)	0.1 (0.1, 0.2)	0.1 (0, 0.1)	0.1 (0.1, 0.2)	0 (0, 0.1)
Lao People's Democratic Republic	Low middle	47.9 (44.1, 51.4)	58.4 (53.5, 63.4)	37.3 (34.8, 39.8)	0 (0, 0)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (0, 0)	0 (0, 0)	0 (−0.1, 0)	0 (0, 0.1)	0.1 (0, 0.1)	0 (−0.1, 0)
Latvia	High	40.8 (37.5, 43.9)	43.9 (39.9, 47.9)	37.3 (33.6, 41)	−0.2 (−0.3, −0.2)	−0.3 (−0.3, −0.2)	−0.1 (−0.2, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)
Lebanon	High middle	50.3 (46, 53.5)	53.4 (48.8, 57.6)	47.1 (42.8, 50.9)	0.1 (0, 0.2)	0.2 (0.1, 0.3)	0.1 (−0.1, 0.2)	0.2 (0.1, 0.2)	0.2 (0.2, 0.3)	0.1 (0.1, 0.2)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)
Lesotho	Low middle	42 (37.7, 45.3)	49.5 (44.6, 53.8)	33.6 (30, 36.9)	0.2 (0.1, 0.3)	0.3 (0.2, 0.4)	0.1 (0, 0.2)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0.2 (0.1, 0.2)	0.2 (0.2, 0.3)	0.1 (0, 0.2)	0.1 (0, 0.1)	0.1 (0.1, 0.2)	0 (−0.1, 0.1)
Liberia	Low	15.3 (13.5, 16.7)	15.4 (13.4, 17.1)	15.2 (13.2, 16.8)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)
Libya	High middle	53.7 (49, 56.8)	62.6 (57.1, 66.4)	45.3 (40.8, 49)	0.1 (0, 0.1)	0.1 (0, 0.2)	0 (−0.1, 0.1)	0 (0, 0)	−0.1 (−0.1, 0)	0 (0, 0.1)	0.1 (0.1, 0.1)	0.2 (0.1, 0.2)	0 (0, 0.1)	0 (0, 0)	0 (0, 0)	0 (−0.1, 0)
Lithuania	High	33.9 (31.1, 37.1)	33.5 (30.2, 37.6)	34.1 (30.5, 37.7)	−0.2 (−0.3, −0.1)	−0.3 (−0.4, −0.2)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.2 (−0.2, −0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0.1)
Luxembourg	High	32.9 (29.4, 35.4)	30.4 (27.2, 33.5)	35.3 (30.8, 38.9)	−0.2 (−0.3, −0.2)	−0.3 (−0.4, −0.3)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)
Madagascar	Low	22.5 (19.1, 24.9)	24.2 (20.5, 27)	20.7 (17.7, 23.1)	−0.4 (−0.5, −0.4)	−0.5 (−0.5, −0.4)	−0.3 (−0.4, −0.3)	−0.2 (−0.2, −0.2)	−0.3 (−0.3, −0.2)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.2)	−0.2 (−0.3, −0.2)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)
Malawi	Low	22 (20, 24.1)	23.2 (20.8, 25.7)	20.6 (18.6, 23.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0.1)	0.1 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)
Malaysia	High middle	42 (38.4, 45.5)	48.1 (43.2, 53)	36.3 (32.9, 40)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0.1)	0 (0, 0)	0 (0, 0)	0 (0, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	0 (−0.1, 0)

Table 1 (continued)

Country	SDI level	2021 ASP	2021 female ASP	2021 male ASP	ARC 1990–2021	ARC, female 1990–2021	ARC, male 1990–2021	ARC 1990–2000	ARC, female 1990–2000	ARC, male 1990–2000	ARC 2000–2010	ARC, female 2000–2010	ARC, male 2000–2010	ARC 2010–2021	ARC, female 2010–2021	ARC, male 2010–2021
Maldives	Low middle	49.7 (45.9, 53.4)	61.5 (56.3, 66.6)	42.3 (39.1, 45.6)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (0, 0.1)	0.1 (0.1, 0.1)	0 (−0.1, 0.1)
Mali	Low	27.2 (24.7, 29.6)	29.4 (26.2, 32.6)	25 (22.5, 27.5)	0.2 (0.1, 0.3)	0.2 (0.1, 0.3)	0.1 (0, 0.3)	0.2 (0.1, 0.2)	0.2 (0.1, 0.3)	0.2 (0.1, 0.3)	0 (0, 0.1)	0.1 (0, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)
Malta	High middle	32.1 (29.2, 34.8)	29.3 (26.5, 32.3)	34.8 (30.6, 38.4)	−0.3 (−0.4, −0.3)	−0.4 (−0.5, −0.4)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)
Marshall Islands	Low middle	38.1 (34.5, 41.8)	42 (37.3, 46.4)	34.4 (30.9, 38.3)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (0, 0.1)	0.1 (0, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)
Mauritania	Low middle	33.2 (30.5, 36.1)	35.3 (31.9, 38.3)	31 (27.7, 34.3)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, 0)	0 (−0.1, 0)	−0.1 (−0.1, −0.1)	0 (0, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)
Mauritius	High middle	45.2 (41.4, 49.3)	54 (49.5, 59.1)	36.3 (32.3, 40.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	0 (0, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	0.1 (0, 0.1)	0.1 (0.1, 0.2)	0 (0, 0.1)
Mexico	Middle	21.4 (19.6, 23)	20.5 (18.6, 22.3)	22.2 (19.9, 24.7)	−0.5 (−0.5, −0.4)	−0.6 (−0.6, −0.5)	−0.4 (−0.5, −0.3)	−0.2 (−0.3, −0.2)	−0.3 (−0.3, −0.2)	−0.2 (−0.2, −0.1)	−0.3 (−0.3, −0.2)	−0.3 (−0.3, −0.3)	−0.2 (−0.3, −0.2)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)
Micronesia (Federated States of)	Low middle	52 (47.5, 55.8)	60 (54.2, 64.6)	44.2 (39.7, 48)	0 (0, 0.1)	0.1 (0, 0.1)	0 (−0.1, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (0, 0)	0 (0, 0)	0 (−0.1, 0.1)
Monaco	High	32.1 (28.9, 34.8)	29 (25.8, 32.1)	35.2 (31.1, 39)	−0.2 (−0.3, −0.1)	−0.3 (−0.4, −0.2)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0)
Mongolia	Low middle	46.4 (43, 49.7)	57.9 (52.9, 62.7)	34.2 (31.5, 36.8)	0.1 (0.1, 0.2)	0.2 (0.1, 0.3)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0)	0 (0, 0)	0 (−0.1, 0)	0.1 (0, 0.1)	0.1 (0.1, 0.2)	0 (0, 0.1)
Montenegro	High middle	50.6 (46.8, 53.2)	49.3 (45.5, 52.2)	51.9 (47.3, 55.3)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	0.1 (0, 0.1)	0.1 (0.1, 0.1)	0.1 (0, 0.1)	0 (0, 0)	0 (−0.1, 0)	0 (0, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)
Morocco	Low middle	35.5 (32.1, 38.4)	38.3 (34.5, 42.1)	32.7 (29.3, 36.1)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)

Table 1 (continued)

Country	SDI level	2021 ASP	2021 female ASP	2021 male ASP	ARC 1990–2021	ARC, female 1990–2021	ARC, male 1990–2021	ARC 1990–2000	ARC, female 1990–2000	ARC, male 1990–2000	ARC 2000–2010	ARC, female 2000–2010	ARC, male 2000–2010	ARC 2010–2021	ARC, female 2010–2021	ARC, male 2010–2021
Mozambique	Low	21.3 (18.5, 23.2)	22.1 (19.2, 24.4)	20.4 (17.7, 22.4)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)
Myanmar	Low middle	37.8 (33.6, 40.8)	41.3 (36.7, 44.9)	34 (30.2, 37.1)	−0.3 (−0.3, −0.3)	−0.4 (−0.4, −0.3)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.2)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)
Namibia	Middle	30.3 (26.9, 33)	29.8 (26.3, 32.7)	30.8 (26.9, 34.1)	−0.2 (−0.3, −0.2)	−0.3 (−0.3, −0.2)	−0.2 (−0.3, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)
Nauru	Middle	48.2 (43.7, 52.1)	49.6 (44.6, 54)	46.9 (41.9, 51.4)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.2, 0)	0.1 (0, 0.1)	0.1 (0, 0.1)	0.1 (0, 0.1)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)
Nepal	Low	34.2 (31.5, 36.6)	33 (30.3, 35.6)	35.6 (32.4, 38.6)	−0.3 (−0.3, −0.3)	−0.4 (−0.4, −0.3)	−0.2 (−0.3, −0.1)	0 (0, 0)	0 (0, 0)	0 (0, 0)	−0.2 (−0.2, −0.2)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)
Netherlands	High	27.8 (25.4, 30.3)	25.4 (22.4, 27.9)	30.2 (27, 33.5)	−0.3 (−0.4, −0.3)	−0.4 (−0.5, −0.3)	−0.3 (−0.4, −0.2)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, 0)
New Zealand	High	29.2 (26.6, 31.5)	25.5 (22.6, 28.1)	32.7 (28.9, 36.1)	−0.2 (−0.3, −0.2)	−0.3 (−0.4, −0.2)	−0.2 (−0.3, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)
Nicaragua	Low middle	30.4 (27.4, 33.5)	33.6 (29.9, 37.4)	26.9 (23.6, 30.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)
Niger	Low	16 (14.4, 17.5)	16.2 (14.2, 17.9)	15.8 (13.8, 17.7)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, 0)	−0.2 (−0.3, 0)	0 (−0.1, 0.1)	0 (0, 0.1)	0 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)
Nigeria	Low middle	10.3 (9.4, 11)	10 (9.1, 10.8)	10.6 (9.5, 11.7)	−0.3 (−0.3, −0.2)	−0.3 (−0.3, −0.2)	−0.2 (−0.3, −0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0)
Niue	High middle	32.9 (29.6, 36.5)	31 (27.1, 34.9)	34.7 (30.7, 38.8)	0 (−0.1, 0.1)	0 (−0.2, 0.1)	0 (−0.1, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)
North Macedonia	High middle	56.5 (52.1, 59.8)	59.5 (54.5, 63.4)	53.6 (49.3, 57.6)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0)	0 (0, 0)	0 (0, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)

Table 1 (continued)

Country	SDI level	2021 ASP	2021 female ASP	2021 male ASP	ARC 1990–2021	ARC, female 1990–2021	ARC, male 1990–2021	ARC 1990–2000	ARC, female 1990–2000	ARC, male 1990–2000	ARC 2000–2010	ARC, female 2000–2010	ARC, male 2000–2010	ARC 2010–2021	ARC, female 2010–2021	ARC, male 2010–2021
Northern Mariana Islands	High middle	38.9 (35.4, 43.1)	41.8 (37.2, 46.5)	36.5 (32.7, 40.5)	−0.1 (−0.2, 0)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0.1)	0 (0, 0.1)	0 (0, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)
Norway	High	27 (24.9, 28.9)	22.2 (20, 24.5)	31.6 (28.2, 34.7)	−0.4 (−0.4, −0.3)	−0.5 (−0.5, −0.4)	−0.3 (−0.4, −0.2)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.2 (−0.3, −0.2)	−0.3 (−0.4, −0.3)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)
Oman	High middle	29 (25.7, 31.8)	27.1 (23.6, 30.4)	30.8 (27, 34.5)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.1, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (0, 0.1)	0.1 (0, 0.2)	0 (−0.1, 0.1)
Pakistan	Low	36.9 (34, 39.5)	35.2 (32.2, 38.1)	38.5 (35.5, 41.7)	−0.3 (−0.3, −0.2)	−0.4 (−0.4, −0.3)	−0.2 (−0.2, −0.1)	0 (0, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)
Palau	High middle	31.3 (28.3, 34.5)	30.5 (27.2, 34.4)	32.4 (28.8, 36.2)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.2, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Palestine	Low middle	46.3 (42.6, 49)	54.9 (50.1, 58.1)	37.9 (34.5, 40.7)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0)	0 (0, 0.1)	0 (−0.1, 0)
Panama	Middle	15.2 (13.6, 16.9)	15.1 (13.5, 16.7)	15.3 (13.4, 17.4)	−0.4 (−0.5, −0.4)	−0.5 (−0.5, −0.4)	−0.4 (−0.4, −0.3)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.3 (−0.3, −0.2)	−0.3 (−0.3, −0.3)	−0.2 (−0.3, −0.2)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)
Papua New Guinea	Low	48.3 (44.5, 51.9)	56.2 (51.2, 61)	40.7 (37.2, 44.4)	0.1 (0, 0.2)	0.1 (0.1, 0.2)	0 (−0.1, 0.1)	0.1 (0, 0.1)	0.1 (0, 0.1)	0.1 (0, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0.1)	0.1 (0, 0.1)	0 (−0.1, 0.1)
Paraguay	Middle	28.1 (25.4, 30.8)	29.2 (26.1, 32.4)	26.9 (24.1, 30.1)	−0.3 (−0.3, −0.3)	−0.3 (−0.4, −0.3)	−0.2 (−0.3, −0.2)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, 0)	−0.2 (−0.2, −0.1)	−0.2 (−0.2, −0.2)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)
Peru	Middle	13 (11.4, 14.3)	12.1 (10.2, 13.5)	13.8 (11.8, 15.5)	−0.4 (−0.4, −0.3)	−0.4 (−0.5, −0.4)	−0.4 (−0.4, −0.3)	0 (0, 0.1)	0.1 (0, 0.1)	0 (0, 0.1)	−0.3 (−0.4, −0.3)	−0.3 (−0.4, −0.3)	−0.3 (−0.3, −0.3)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)
Philippines	Middle	40 (37, 41.7)	46 (42.4, 48.5)	34 (31.5, 36.1)	−0.2 (−0.3, −0.2)	−0.3 (−0.3, −0.2)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	0 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)
Poland	High middle	37.5 (35.3, 39.5)	35.5 (32.4, 38.2)	39.5 (36.2, 42.4)	−0.3 (−0.4, −0.3)	−0.4 (−0.5, −0.4)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.2)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)

Table 1 (continued)

Country	SDI level	2021 ASP	2021 female ASP	2021 male ASP	ARC 1990–2021	ARC, female 1990–2021	ARC, male 1990–2021	ARC 1990–2000	ARC, female 1990–2000	ARC, male 1990–2000	ARC 2000–2010	ARC, female 2000–2010	ARC, male 2000–2010	ARC 2010–2021	ARC, female 2010–2021	ARC, male 2010–2021
Portugal	High middle	35.9 (32.9, 38.8)	35.7 (32.3, 39.1)	36 (32.5, 39.4)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, −0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0)
Puerto Rico	High	15 (13.5, 16.5)	15.3 (13.4, 17)	14.7 (13, 16.7)	−0.1 (−0.2, −0.1)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Qatar	High	35.2 (32, 37.6)	38.3 (34.5, 41.3)	34.4 (31.2, 37.4)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0 (0, 0.1)	0.1 (0, 0.2)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0.1)
Republic of Korea	High	35.2 (32, 37.9)	39.2 (34.9, 43.2)	31.6 (28.2, 34.8)	−0.3 (−0.4, −0.3)	−0.4 (−0.5, −0.4)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	0 (−0.1, 0)
Republic of Moldova	High middle	39 (36.4, 41.2)	45.4 (41.5, 48.4)	32.3 (29.6, 35.2)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	0 (0, 0)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (0, 0)	0 (0, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)
Romania	High middle	41.3 (37.6, 44.5)	42.2 (38.2, 45.8)	40.4 (36.6, 44.2)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	0 (−0.1, 0)	0 (0, 0)	0 (0, 0.1)	0 (0, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)
Russian Federation	High middle	40.4 (37.9, 42.6)	44.2 (40.9, 47)	36.1 (33.1, 39)	−0.1 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	0 (−0.1, 0.1)	0.1 (0, 0.1)	0.1 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0)	−0.1 (−0.1, −0.1)	0 (0, 0.1)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.1, 0)
Rwanda	Low	20.3 (18.4, 22.4)	20.9 (18.8, 23.3)	19.6 (17.4, 22)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, 0)	0.1 (0, 0.1)	0.1 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Saint Kitts and Nevis	High middle	17.2 (15.4, 18.9)	15.5 (13.5, 17.5)	18.9 (16.4, 21.7)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0.1)	0 (0, 0.1)	0.1 (0, 0.2)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)
Saint Lucia	Middle	16.6 (15.1, 18.1)	17.2 (15.5, 19)	16 (14.2, 17.9)	−0.2 (−0.3, −0.2)	−0.2 (−0.3, −0.2)	−0.2 (−0.3, −0.1)	0 (−0.1, 0)	0 (0, 0.1)	0 (−0.1, 0)	−0.2 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)
Saint Vincent and the Grenadines	Middle	19.7 (17.8, 21.8)	19.8 (17.3, 22.4)	19.7 (17, 22.5)	−0.1 (−0.2, 0)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, 0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)
Samoa	Middle	44.3 (40.1, 47.4)	49.2 (43.8, 53.1)	39.6 (35.5, 43.5)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0.1 (0, 0.1)	0.1 (0.1, 0.2)	0 (0, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)

Table 1 (continued)

Country	SDI level	2021 ASP	2021 female ASP	2021 male ASP	ARC 1990–2021	ARC, female 1990–2021	ARC, male 1990–2021	ARC 1990–2000	ARC, female 1990–2000	ARC, male 1990–2000	ARC 2000–2010	ARC, female 2000–2010	ARC, male 2000–2010	ARC 2010–2021	ARC, female 2010–2021	ARC, male 2010–2021
San Marino	High	29.9 (27.2, 32.3)	25.7 (22.8, 28.2)	34.1 (30.4, 37.8)	−0.3 (−0.3, −0.2)	−0.4 (−0.4, −0.3)	−0.2 (−0.3, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0)
Sao Tome and Principe	Low middle	9 (8, 9.9)	8.3 (7.3, 9.2)	9.8 (8.6, 11.1)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0)	−0.1 (−0.3, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Saudi Arabia	High middle	36 (32.6, 38.7)	36.8 (32.5, 40.4)	35.7 (31.6, 39.4)	0.1 (0, 0.2)	0.1 (0, 0.3)	0 (−0.1, 0.1)	0 (0, 0.1)	0.1 (0, 0.2)	0 (−0.1, 0.1)	0 (0, 0.1)	0.1 (0, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Senegal	Low	26.7 (23.8, 29.4)	26.7 (24.1, 29.4)	26.6 (23.3, 29.7)	−0.3 (−0.4, −0.3)	−0.4 (−0.4, −0.4)	−0.3 (−0.3, −0.2)	0 (0, 0)	0 (−0.1, 0)	0 (0, 0.1)	−0.2 (−0.2, −0.2)	−0.2 (−0.3, −0.2)	−0.2 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)
Serbia	High middle	48.6 (45.4, 51.7)	47.3 (43.9, 50.9)	49.7 (46.1, 53.2)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)	0.1 (0, 0.1)	0.1 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (0, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)
Seychelles	High middle	38.8 (35.2, 42.4)	43.6 (38.4, 48.1)	35 (31.4, 38.7)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0)	0 (0, 0.1)	0 (−0.1, 0.1)
Sierra Leone	Low	27.6 (24.5, 29.6)	29.2 (25.5, 31.6)	26 (23.3, 28)	−0.2 (−0.3, −0.2)	−0.3 (−0.3, −0.2)	−0.2 (−0.3, −0.1)	0 (0, 0)	0 (−0.1, 0)	0 (0, 0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, −0.1)	−0.2 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)
Singapore	High	26.4 (24.1, 28.8)	24.2 (21.1, 27.1)	28.5 (25.5, 31.8)	−0.2 (−0.3, −0.1)	−0.3 (−0.4, −0.2)	−0.1 (−0.2, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)
Slovakia	High	41 (37.7, 44.4)	40.8 (37, 44.9)	41 (36.9, 45)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)
Slovenia	High	41.7 (38.3, 44.6)	39.3 (35.1, 42.8)	44 (40, 47.7)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	0.1 (0, 0.1)	0.1 (0, 0.1)	0 (0, 0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)
Solomon Islands	Low	49.1 (44.9, 53.5)	57.6 (51.9, 62.9)	40.8 (37.1, 45.2)	0.1 (0, 0.1)	0.1 (0, 0.2)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0.1 (0, 0.1)	0.1 (0, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0.1 (0, 0.1)	0 (0, 0.1)
Somalia	Low	22.2 (19.6, 24.6)	23 (20.1, 25.9)	21.2 (18.3, 24)	−0.1 (−0.2, 0)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)
South Africa	Middle	34 (31.5, 35.9)	35.1 (32.3, 37.4)	32.8 (30.1, 35.3)	−0.3 (−0.3, −0.3)	−0.4 (−0.4, −0.3)	−0.2 (−0.3, −0.2)	−0.2 (−0.2, −0.2)	−0.2 (−0.3, −0.2)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, −0.1)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)

Table 1 (continued)

Country	SDI level	2021 ASP	2021 female ASP	2021 male ASP	ARC 1990–2021	ARC, female 1990–2021	ARC, male 1990–2021	ARC 1990–2000	ARC, female 1990–2000	ARC, male 1990–2000	ARC 2000–2010	ARC, female 2000–2010	ARC, male 2000–2010	ARC 2010–2021	ARC, female 2010–2021	ARC, male 2010–2021
South Sudan	Low	21.1 (18.6, 23.2)	21.5 (18.5, 24.1)	20.6 (18.1, 22.9)	−0.1 (−0.2, 0)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)
Spain	High middle	36.4 (33.3, 39.3)	33.3 (30.1, 36.4)	39.3 (35.8, 43.4)	−0.3 (−0.4, −0.3)	−0.4 (−0.5, −0.4)	−0.2 (−0.3, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, −0.1)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, 0)	−0.2 (−0.2, −0.2)	−0.3 (−0.3, −0.2)	−0.1 (−0.2, −0.1)
Sri Lanka	High middle	30.6 (27.1, 33.2)	33 (28.6, 36.5)	27.9 (24.5, 30.7)	−0.3 (−0.3, −0.2)	−0.3 (−0.4, −0.3)	−0.1 (−0.3, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.2)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)
Sudan	Low middle	30.7 (28.2, 32.6)	31.5 (28.9, 33.6)	29.9 (27.3, 32.3)	−0.1 (−0.2, 0)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)
Suriname	Middle	30.4 (27.8, 33.1)	32.7 (29.5, 35.8)	28 (25.2, 31)	−0.2 (−0.3, −0.2)	−0.3 (−0.3, −0.2)	−0.2 (−0.3, −0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)
Sweden	High	22.2 (20.4, 24.1)	17.9 (16, 19.6)	26.4 (23.5, 29.2)	−0.3 (−0.3, −0.2)	−0.4 (−0.4, −0.3)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)
Switzerland	High	30.2 (27.6, 32.7)	26.5 (23.8, 29)	33.8 (29.9, 37.5)	−0.3 (−0.3, −0.2)	−0.3 (−0.4, −0.3)	−0.2 (−0.3, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0)
Syrian Arab Republic	Middle	43.3 (39.2, 46.7)	47.3 (42.1, 51.5)	38.2 (34.3, 42)	−0.2 (−0.2, −0.1)	−0.3 (−0.3, −0.2)	−0.1 (−0.2, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)
Taiwan (Province of China)	High	44.2 (40.3, 47.6)	50.6 (45.4, 55.1)	37.7 (33.9, 41.4)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)
Tajikistan	Low middle	28.1 (25.7, 29.8)	28.8 (26, 30.7)	27.4 (24.8, 29.7)	−0.3 (−0.4, −0.3)	−0.4 (−0.5, −0.4)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.2)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)
Thailand	Middle	35.3 (32.8, 38.2)	40.9 (37.3, 44.9)	29.3 (27, 31.7)	−0.3 (−0.3, −0.2)	−0.3 (−0.3, −0.3)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)
Timor–Leste	Low middle	50.8 (46.6, 54.5)	65 (59.4, 70.4)	36.6 (33.7, 39.7)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0)	0 (−0.1, 0)	0 (0, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (0, 0)	0 (0, 0)	0 (−0.1, 0)

Table 1 (continued)

Country	SDI level	2021 ASP	2021 female ASP	2021 male ASP	ARC 1990–2021	ARC, female 1990–2021	ARC, male 1990–2021	ARC 1990–2000	ARC, female 1990–2000	ARC, male 1990–2000	ARC 2000–2010	ARC, female 2000–2010	ARC, male 2000–2010	ARC 2010–2021	ARC, female 2010–2021	ARC, male 2010–2021
Togo	Low	21.1 (18.7, 22.7)	21.2 (18.7, 23)	21 (18.3, 23.1)	−0.2 (−0.3, −0.2)	−0.3 (−0.3, −0.2)	−0.2 (−0.3, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)
Tokelau	Middle	38.9 (35.7, 42.5)	41.2 (37.3, 45.1)	36.7 (32.8, 40.8)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)
Tonga	Middle	44.5 (40.1, 48.6)	50.8 (45.6, 56.2)	37.7 (33.4, 41.9)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)	0 (0, 0.1)	0.1 (0, 0.1)	0 (0, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)
Trinidad and Tobago	High middle	28.1 (25.7, 30.6)	30.3 (27.3, 33.5)	26 (23.4, 28.5)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.2 (−0.2, −0.1)	0 (−0.1, 0)	0 (−0.1, 0)	0 (0, 0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)
Tunisia	Middle	48.2 (44, 50.7)	57.7 (51.9, 61.3)	38.2 (34.9, 40.9)	−0.2 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)	0 (0, 0)	0 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)
Turkey	High middle	46.5 (42.5, 49.4)	50.6 (45.9, 54.7)	42.3 (38.2, 45.9)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	0 (−0.1, 0)	0 (0, 0)	0 (−0.1, 0)	0 (0, 0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)
Turkmenistan	Middle	36.3 (33.7, 38.2)	38.3 (35.5, 40.4)	34.6 (31.7, 37.1)	−0.2 (−0.3, −0.2)	−0.3 (−0.4, −0.3)	−0.1 (−0.2, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, −0.1)	0 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)
Tuvalu	Low middle	47.8 (43.4, 52.4)	55.6 (50, 61.5)	40.6 (36.5, 45)	0 (0, 0.1)	0.1 (0, 0.2)	0 (−0.1, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (0, 0)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)
Uganda	Low	14.6 (13.2, 15.8)	15.6 (14, 17.2)	13.5 (11.9, 14.9)	−0.2 (−0.3, −0.1)	−0.2 (−0.3, −0.2)	−0.2 (−0.3, −0.1)	0.1 (0.1, 0.2)	0.2 (0.1, 0.2)	0.1 (0, 0.2)	−0.2 (−0.2, −0.2)	−0.2 (−0.3, −0.2)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)
Ukraine	High middle	37 (34.3, 39.4)	39.1 (35.3, 42.6)	34.5 (31.6, 37.1)	−0.3 (−0.3, −0.2)	−0.4 (−0.4, −0.3)	−0.1 (−0.2, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)	−0.2 (−0.2, −0.2)	−0.3 (−0.3, −0.2)	−0.1 (−0.1, 0)
United Arab Emirates	High	37.8 (33.9, 40.9)	37.4 (33.6, 40.6)	38.5 (33.9, 42.6)	0 (−0.1, 0.1)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0.1)
United Kingdom	High	25.6 (23.7, 27.7)	21.5 (19.4, 23.8)	29.8 (26.8, 32.8)	−0.4 (−0.4, −0.3)	−0.4 (−0.5, −0.4)	−0.3 (−0.4, −0.2)	−0.2 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.3 (−0.3, −0.2)	−0.1 (−0.2, 0)

Table 1 (continued)

Country	SDI level	2021 ASP	2021 female ASP	2021 male ASP	ARC 1990–2021	ARC, female 1990–2021	ARC, male 1990–2021	ARC 1990–2000	ARC, female 1990–2000	ARC, male 1990–2000	ARC 2000–2010	ARC, female 2000–2010	ARC, male 2000–2010	ARC 2010–2021	ARC, female 2010–2021	ARC, male 2010–2021
United Republic of Tanzania	Low	19.3 (17.3, 20.8)	19.2 (16.9, 21.1)	19.4 (17.1, 21.5)	−0.4 (−0.4, −0.3)	−0.4 (−0.5, −0.4)	−0.3 (−0.3, −0.2)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	−0.2 (−0.2, −0.2)	−0.2 (−0.3, −0.2)	−0.2 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.2)	−0.1 (−0.2, 0)
United States of America	High	21.4 (20, 22.4)	20.1 (18.9, 21.4)	22.6 (20.8, 24.2)	−0.4 (−0.4, −0.3)	−0.4 (−0.4, −0.4)	−0.3 (−0.4, −0.3)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.1, −0.1)	−0.2 (−0.2, −0.2)	−0.2 (−0.2, −0.2)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)
United States Virgin Islands	High middle	18.4 (16.5, 20.2)	16.1 (14.1, 18.1)	20.7 (18.1, 23.6)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0)	−0.1 (−0.2, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Uruguay	High middle	34.6 (31.6, 37.1)	33.5 (30.1, 36.2)	35.7 (32.5, 38.9)	−0.2 (−0.2, −0.2)	−0.2 (−0.3, −0.2)	−0.2 (−0.2, −0.1)	0 (0, 0.1)	0.1 (0, 0.1)	0 (0, 0.1)	−0.2 (−0.2, −0.2)	−0.2 (−0.2, −0.2)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	−0.1 (−0.1, 0)
Uzbekistan	Middle	33.2 (30.1, 36.3)	35.8 (31.7, 39.5)	30.5 (27.2, 33.8)	0.2 (0.1, 0.3)	0.3 (0.2, 0.5)	0.2 (0, 0.3)	0.2 (0.2, 0.3)	0.3 (0.2, 0.4)	0.1 (0, 0.2)	0.1 (0, 0.1)	0.1 (0, 0.1)	0.1 (0, 0.2)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)
Vanuatu	Low middle	27.3 (24.8, 29.4)	29.4 (26.1, 32.2)	25.1 (22.3, 27.6)	−0.2 (−0.2, −0.1)	−0.2 (−0.3, −0.1)	−0.1 (−0.2, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0.1)
Venezuela (Bolivarian Republic of)	Low middle	26.8 (24.2, 29.3)	25.2 (22.1, 27.8)	28.5 (25.3, 32)	−0.3 (−0.3, −0.2)	−0.3 (−0.4, −0.3)	−0.2 (−0.3, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)
Viet Nam	Middle	46.7 (42.8, 50.5)	56.5 (51, 61.6)	36.6 (33.2, 39.7)	−0.1 (−0.2, −0.1)	−0.1 (−0.2, −0.1)	0 (−0.1, 0)	0 (0, 0.1)	0 (0, 0.1)	0.1 (0, 0.1)	−0.1 (−0.2, −0.1)	−0.2 (−0.2, −0.2)	−0.1 (−0.1, 0)	0 (0, 0)	0 (0, 0.1)	0 (−0.1, 0.1)
Yemen	Low	43.3 (39.8, 45.8)	46.7 (42.6, 49.8)	39.8 (36.2, 42.8)	0 (0, 0.1)	0 (−0.1, 0.1)	0 (−0.1, 0.1)	0 (0, 0)	0 (−0.1, 0)	0 (0, 0.1)	0 (0, 0)	0 (0, 0.1)	0 (0, 0.1)	0 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0.1)
Zambia	Low middle	24.2 (20.2, 26.7)	25.6 (21.2, 28.8)	22.9 (18.9, 25.5)	−0.2 (−0.2, −0.1)	−0.2 (−0.2, −0.1)	−0.1 (−0.2, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)
Zimbabwe	Low middle	29.3 (26.3, 32.2)	32.1 (28.5, 35.6)	25.9 (23.2, 28.7)	−0.1 (−0.1, 0)	−0.1 (−0.1, 0)	−0.1 (−0.2, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (−0.1, 0.1)	0 (−0.1, 0)	0 (−0.1, 0)	−0.1 (−0.1, 0)	0 (0, 0)	0 (0, 0.1)	0 (−0.1, 0)

* *ASP* age-standardized prevalence, *ARC* annualized rate of change

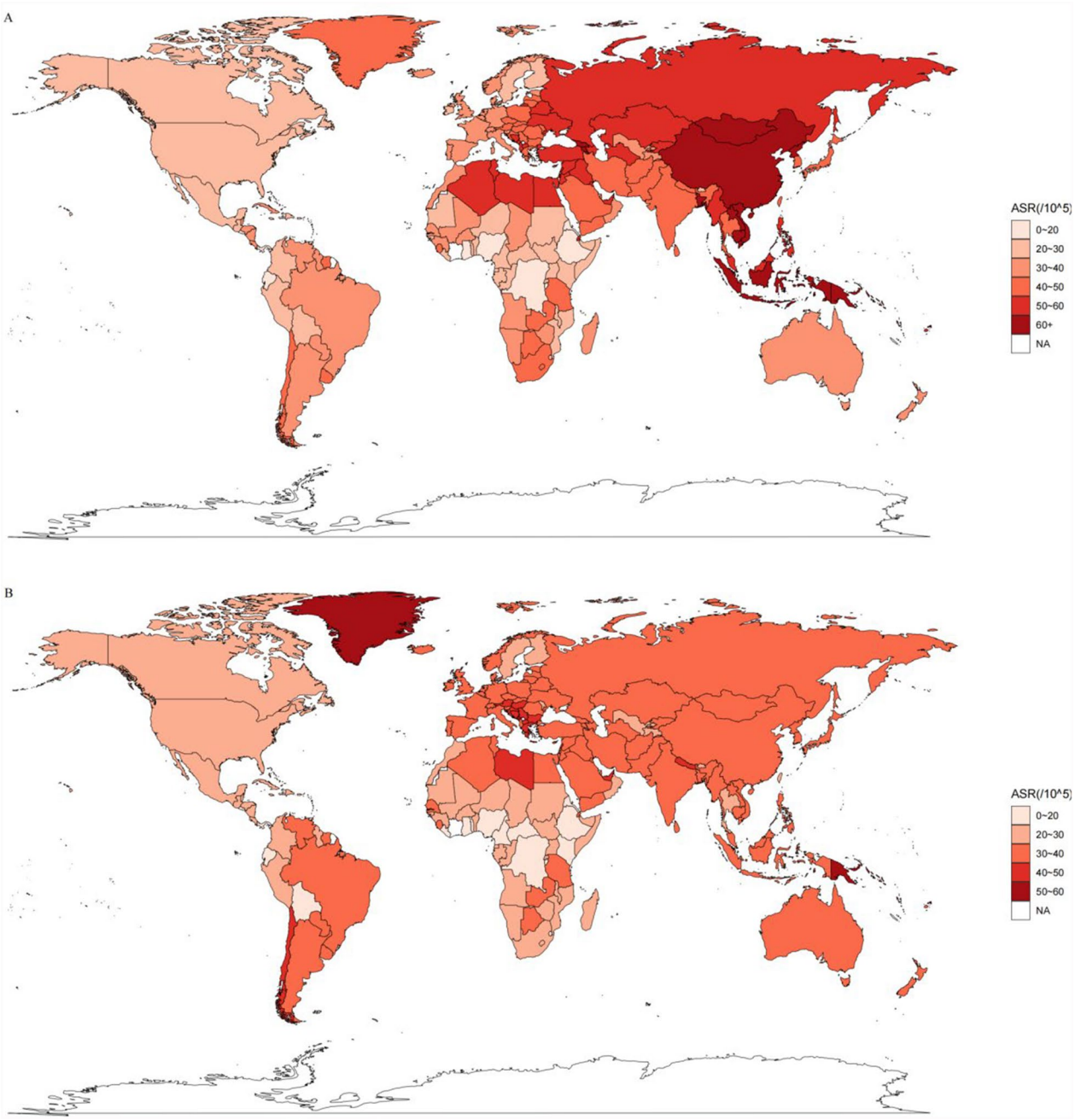

Fig. 1 Age-standardized prevalence of second hand smoke for females (**A**) and males (**B**), in 2021

were China, India, Indonesia, Pakistan and United States, accounting for 53.6% of the total number. (Table S1).

Between 1990 and 2021, the global annualized age-standardized rate of change in SEV of SHS exposure was −0.20 (−0.20 to −0.20) for both sexes, −0.30 (−0.30 to −0.20) for males and −0.20 (−0.20 to −0.10) for females, respectively (Table 1). Between 1990 and 2021, 5 countries (Mexico, Brazil, Denmark, Japan and Madagascar) showed that the fastest annualized rate of reduction in SHS ranged from −0.42 to −0.53. On the contrary, significantly increased trends were seen in Afghanistan, Guinea-Bissau, Uzbekistan, Lesotho and El Salvador ranged from 0.21 to 0.31 (Table 1). Using a cutoff of 0.05 change to define unchanged, increased, and decreased trends, since 2010, 80 (39.2%) of 204 countries were unchanged, only 7 increased, and 117 decreased.

The largest upward trend of 0.17 (0.09 to 0.26) was seen in Guinea-Bissau and the largest downward trend of −0.23 (−0.26 to −0.19) in Estonia. Similar secular trends were found in male and female (Table 1, Figure S2). We also reported the SEV of SHS in those aged < 5 years and aged < 20 years, and more details were seen in Figure S3 and S4.

Deaths and DALYs attributable to Second hand smoke at home

In 2021, about 1.29 million deaths (0.68, 1.90) and 34.90 million DALYs (17.95, 52.21) were attributable to SHS worldwide, compared to 1.21 million deaths (0.67, 1.79) and 37.10 million DALYs (18.90, 55.67) in 2010. Annual rates of change in death numbers or DALYs were −0.14 (−0.17, −0.1) or −0.19 (−0.22, −0.15) from 1990 to 2000, were −0.22 (−0.25, −0.19) or −0.26 (−0.29, −0.23) from 2000 to 2010, and were −0.21 (−0.26, −0.16) or −0.26 (−0.3, −0.21) since 2010 (Table 2**,** Fig. 2), respectively. About half of global deaths and 49.05% of global DALYs took place in two countries (China and India), and 51.16% of death and 49.95% of DALYs were in women (Table 2**)**. After dividing the cohort into 5-year-old age groups, the highest number of deaths occurred among people aged 80 to 84, and 86.75% of deaths was 50 to 94 years old. The top three age groups with the highest number of DALYs were <5 years, 65–69 years and 70–74 years (Table 2**)**.

Globally, in 2021, ischemic heart disease (IHD) (29.50%), chronic obstructive pulmonary disease (COPD) (19.42%), and lower respiratory infections (LRIs) (10.79%) were the three leading causes of SHS-attributable death numbers for male and both sexes. For SHS-attributable DALYs, the top 3 causes were IHD, LRIs and COPD for both sexes and male, but IHD, COPD and LRIs for female (Table 3 and Figure S5). And the number of YLL (Years of Life Lost) and YLD (Years lived with Disability) was shown in Table S2. The same top three ranks of death and DALYs numbers were also found in India, but top 3 causes for both death and DALYs were HID, COPD and IH in China (Table S3). For SHS-attributable deaths, the most common age group was <5 years for LRIs, 80–84 years for IHD and 80–84 years for COPD, respectively. For SHS related DALYs, there were <5 years for LRIs, 55–59 years for IHD and 70–74 years for COPD (Table S4).

Decomposing changes in attributable disease burden due to Second hand smoke at home

Overall changes in all-cause deaths attributable to SHS varied by both sexes and SDI levels. For SHS related deaths, mortality change ranged from −0.30 in low middle SDI countries to −0.19 in low-middle countries among male, and −0.38 in low middle SDI countries to −0.27 in low-middle SDI countries among female, respectively. However, both population growth and population aging led to an increase trend in all-cause death numbers attributable to SHS in each SDI level countries since 2010. For middle and above SDI countries, the increase attributed to population aging far exceeded that attributed to population growth, but there were opposite trends in low middle and low SDI countries. The maximum value of increase due to population growth was seen in low SDI countries (0.26 for male and 0.26 for female), and that of population aging was seen in middle countries (0.31 for male and 0.32 for female). For high middle countries, more pronounced sex differences emerged. Between 2010 and 2021, in high-middle countries, deaths attributable to SHS increased by 3.1% for men but decreased 5.4% for women. (Table 4).

In addition, SHS related DALYs remained decreased in high, high middle, low middle and low SDI countries or increased by less than 10% in middle SDI countries. For mortality change, there were similar trends in middle and above SDI countries and greater gains in low-middle and low SDI countries. Moreover, the pattern of changes in population aging and growth on SHS related DALYs was smaller than that on death numbers. Lastly, there was no significant gender difference between different SDI countries (Table S5).

Discussion

Although tobacco control has accomplished great progress in the past 30 years, the adverse impact of SHS on women appears to greater than in men. Specifically, since 1990, the age-standardized rate of SEV of SHS decreased from 38.8% (37.0, 39.7) to 30.6 (28.9, 31.6) in male and from 52.7% (49.8, 53.6) to 38.0 (35.5, 39.0) in female worldwide, per 100,000, respectively. The higher SHS rate among female might be related to the definition of SHS, which referred to passive smoking exposure at home in our study. Previous studies from the Eastern Mediterranean or China established that much of women's SHS probably occurred at home, while SHS exposure in men mainly occurred in public places and workplaces [26, 27].

Our data showed that there were declines in the SEV of SHS exposure in most high SDI countries, which could be mostly explained by decreased active smoking rates and well enforcement of the smoke-free regulations. In the GBD 2015 study, researchers found that the reductions of age-standardized SEV of daily smoking were especially pronounced in high SDI countries, and SHS exposure was closely related with active smoking rates where robust and extensive smoke-free indoor policies existed [28]. On the other

Table 2 Numbers and percent change of deaths and DALYs attributable to second hand smoke among all causes, by sex and age group, in China, India and worldwide between 1990 and 2021

	Numbers in death (10^6)	DALYs (10^6)	Annual rate of deaths 1990 to 2021	Annual rate of deaths 1990 to 2000	Annual rate of deaths 2000 to 2010	Annual rate of deaths 2010 to 2021	Annual rate of DALYs 1990 to 2021	Annual rate of DALYs 1990 to 2000	Annual rate of DALYs 2000 to 2010	Annual rate of DALYs 2010 to 2021
Global	1.29 (0.68, 1.90)	34.90 (17.95, 52.21)	−0.47 (−0.51, −0.42)	−0.14 (−0.17, −0.1)	−0.22 (−0.25, −0.19)	−0.21 (−0.26, −0.16)	−0.56 (−0.59, −0.51)	−0.19 (−0.22, −0.15)	−0.26 (−0.29, −0.23)	−0.26 (−0.3, −0.21)
Sex										
Males	0.63 (0.33, 0.92)	17.47 (8.94, 25.92)	−0.4 (−0.46, −0.33)	−0.11 (−0.15, −0.06)	−0.18 (−0.22, −0.13)	−0.18 (−0.25, −0.1)	−0.52 (−0.56, −0.45)	−0.17 (−0.21, −0.12)	−0.24 (−0.27, −0.19)	−0.24 (−0.29, −0.17)
Females	0.66 (0.35, 0.98)	17.43 (8.91, 26.08)	−0.51 (−0.56, −0.45)	−0.15 (−0.21, −0.1)	−0.25 (−0.29, −0.21)	−0.24 (−0.3, −0.16)	−0.59 (−0.63, −0.53)	−0.2 (−0.24, −0.15)	−0.28 (−0.32, −0.25)	−0.28 (−0.33, −0.22)
Country										
India	0.22 (0.11, 0.33)	6.47 (3.24, 9.80)	−0.35 (−0.44, −0.25)	−0.13 (−0.19, −0.06)	−0.12 (−0.18, −0.06)	−0.15 (−0.23, −0.05)	−0.49 (−0.56, −0.4)	−0.16 (−0.22, −0.07)	−0.2 (−0.26, −0.13)	−0.25 (−0.33, −0.16)
China	0.48 (0.26, 0.72)	10.65 (5.57, 15.73)	−0.54 (−0.62, −0.42)	−0.17 (−0.27, −0.08)	−0.24 (−0.31, −0.14)	−0.27 (−0.38, −0.14)	−0.62 (−0.68, −0.53)	−0.25 (−0.31, −0.16)	−0.32 (−0.38, −0.23)	−0.26 (−0.36, −0.14)
Age groups (years)										
<5	0.04 (0.01, 0.07)	3.52 (1.14, 6.05)	−0.85 (−0.87, −0.82)	−0.35 (−0.39, −0.31)	−0.44 (−0.49, −0.39)	−0.58 (−0.64, −0.51)	−0.85 (−0.87, −0.81)	−0.35 (−0.39, −0.31)	−0.44 (−0.49, −0.38)	−0.58 (−0.64, −0.51)
5–9	0.002 (0.001, 0.004)	0.21 (0.07, 0.35)	−0.77 (−0.81, −0.74)	−0.27 (−0.32, −0.19)	−0.39 (−0.45, −0.32)	−0.49 (−0.55, −0.44)	−0.75 (−0.78, −0.7)	−0.26 (−0.31, −0.18)	−0.37 (−0.43, −0.31)	−0.46 (−0.52, −0.4)
10–14	0.001 (0.001, 0.002)	0.13 (0.05, 0.23)	−0.65 (−0.69, −0.6)	−0.2 (−0.24, −0.14)	−0.27 (−0.33, −0.22)	−0.4 (−0.45, −0.34)	−0.61 (−0.66, −0.57)	−0.19 (−0.23, −0.13)	−0.26 (−0.31, −0.21)	−0.36 (−0.41, −0.31)
15–19	0.001 (0.001, 0.002)	0.09 (0.03, 0.15)	−0.55 (−0.6, −0.49)	−0.14 (−0.18, −0.08)	−0.26 (−0.31, −0.22)	−0.29 (−0.35, −0.22)	−0.55 (−0.6, −0.49)	−0.14 (−0.18, −0.08)	−0.26 (−0.31, −0.22)	−0.29 (−0.35, −0.22)
20–24	0.001 (0.001, 0.002)	0.09 (0.03, 0.15)	−0.45 (−0.52, −0.39)	−0.04 (−0.1, 0.03)	−0.23 (−0.28, −0.19)	−0.26 (−0.31, −0.2)	−0.45 (−0.52, −0.39)	−0.04 (−0.1, 0.03)	−0.23 (−0.27, −0.19)	−0.25 (−0.31, −0.2)
25–29	0.006 (0.004, 0.01)	0.52 (0.29, 0.77)	−0.39 (−0.46, −0.32)	−0.04 (−0.11, 0.03)	−0.16 (−0.21, −0.12)	−0.24 (−0.3, −0.18)	−0.33 (−0.4, −0.26)	−0.02 (−0.08, 0.04)	−0.15 (−0.19, −0.1)	−0.19 (−0.26, −0.13)
30–34	0.01 (0.01, 0.01)	0.76 (0.43, 1.11)	−0.37 (−0.44, −0.29)	−0.05 (−0.12, 0.02)	−0.16 (−0.22, −0.11)	−0.21 (−0.28, −0.14)	−0.31 (−0.38, −0.23)	−0.03 (−0.09, 0.03)	−0.15 (−0.2, −0.09)	−0.16 (−0.23, −0.09)
35–39	0.02 (0.01, 0.02)	0.98 (0.56, 1.41)	−0.42 (−0.49, −0.35)	−0.1 (−0.16, −0.04)	−0.2 (−0.25, −0.14)	−0.2 (−0.26, −0.13)	−0.36 (−0.43, −0.29)	−0.09 (−0.14, −0.02)	−0.17 (−0.22, −0.12)	−0.16 (−0.22, −0.09)
40–44	0.02 (0.01, 0.03)	1.4 (0.79, 2.02)	−0.42 (−0.48, −0.35)	−0.1 (−0.16, −0.04)	−0.21 (−0.26, −0.15)	−0.18 (−0.26, −0.11)	−0.37 (−0.44, −0.3)	−0.09 (−0.15, −0.03)	−0.19 (−0.24, −0.13)	−0.15 (−0.23, −0.08)
45–49	0.04 (0.02, 0.06)	2.01 (1.14, 2.96)	−0.44 (−0.49, −0.37)	−0.09 (−0.15, −0.03)	−0.19 (−0.25, −0.14)	−0.23 (−0.3, −0.16)	−0.39 (−0.44, −0.32)	−0.08 (−0.14, −0.02)	−0.17 (−0.22, −0.12)	−0.2 (−0.26, −0.12)
50–54	0.06 (0.04, 0.09)	2.86 (1.56, 4.11)	−0.46 (−0.52, −0.39)	−0.14 (−0.19, −0.08)	−0.22 (−0.27, −0.17)	−0.2 (−0.26, −0.11)	−0.41 (−0.48, −0.34)	−0.12 (−0.17, −0.07)	−0.2 (−0.25, −0.15)	−0.16 (−0.23, −0.08)
55–59	0.09 (0.05, 0.13)	3.52 (1.95, 5.17)	−0.45 (−0.52, −0.38)	−0.14 (−0.2, −0.08)	−0.23 (−0.28, −0.18)	−0.18 (−0.25, −0.09)	−0.41 (−0.48, −0.33)	−0.12 (−0.18, −0.07)	−0.21 (−0.26, −0.16)	−0.15 (−0.22, −0.07)

Table 2 (continued)

	Numbers in death (10^6)	DALYs (10^6)	Annual rate of deaths 1990 to 2021	Annual rate of deaths 1990 to 2000	Annual rate of deaths 2000 to 2010	Annual rate of deaths 2010 to 2021	Annual rate of DALYs 1990 to 2021	Annual rate of DALYs 1990 to 2000	Annual rate of DALYs 2000 to 2010	Annual rate of DALYs 2010 to 2021
60–64	0.11 (0.06, 0.15)	3.55 (1.92, 5.25)	−0.46 (−0.52, −0.4)	−0.12 (−0.17, −0.05)	−0.23 (−0.28, −0.18)	−0.2 (−0.27, −0.12)	−0.42 (−0.48, −0.36)	−0.1 (−0.16, −0.05)	−0.21 (−0.26, −0.16)	−0.17 (−0.24, −0.11)
65–69	0.13 (0.07, 0.2)	3.74 (1.91, 5.52)	−0.44 (−0.5, −0.36)	−0.08 (−0.15, −0.02)	−0.24 (−0.29, −0.19)	−0.2 (−0.28, −0.11)	−0.4 (−0.47, −0.33)	−0.07 (−0.13, −0.01)	−0.22 (−0.27, −0.17)	−0.17 (−0.25, −0.09)
70–74	0.16 (0.08, 0.24)	3.56 (1.79, 5.36)	−0.45 (−0.52, −0.37)	−0.12 (−0.19, −0.04)	−0.21 (−0.26, −0.14)	−0.21 (−0.29, −0.11)	−0.42 (−0.49, −0.34)	−0.11 (−0.17, −0.04)	−0.19 (−0.25, −0.13)	−0.19 (−0.27, −0.09)
75–79	0.16 (0.08, 0.24)	2.89 (1.48, 4.39)	−0.42 (−0.5, −0.32)	−0.12 (−0.19, −0.05)	−0.17 (−0.24, −0.11)	−0.2 (−0.28, −0.11)	−0.39 (−0.47, −0.3)	−0.11 (−0.17, −0.04)	−0.16 (−0.22, −0.1)	−0.19 (−0.26, −0.1)
80–84	0.18 (0.09, 0.27)	2.46 (1.26, 3.66)	−0.37 (−0.45, −0.28)	−0.08 (−0.15, −0.02)	−0.16 (−0.22, −0.1)	−0.19 (−0.28, −0.09)	−0.35 (−0.43, −0.26)	−0.07 (−0.14, −0.01)	−0.15 (−0.21, −0.09)	−0.18 (−0.26, −0.08)
85–89	0.15 (0.08, 0.24)	1.64 (0.85, 2.53)	−0.33 (−0.42, −0.23)	−0.06 (−0.12, −0.01)	−0.18 (−0.24, −0.12)	−0.12 (−0.22, −0.02)	−0.31 (−0.4, −0.21)	−0.06 (−0.12, −0.01)	−0.17 (−0.23, −0.11)	−0.11 (−0.21, −0.02)
90–94	0.08 (0.04, 0.12)	0.72 (0.37, 1.09)	−0.32 (−0.41, −0.24)	−0.1 (−0.15, −0.05)	−0.14 (−0.2, −0.08)	−0.14 (−0.22, −0.05)	−0.31 (−0.4, −0.22)	−0.09 (−0.14, −0.04)	−0.13 (−0.19, −0.07)	−0.13 (−0.21, −0.04)
95+	0.03 (0.01, 0.04)	0.23 (0.12, 0.36)	−0.38 (−0.46, −0.29)	−0.14 (−0.19, −0.09)	−0.18 (−0.23, −0.14)	−0.11 (−0.19, −0.02)	−0.37 (−0.45, −0.28)	−0.14 (−0.18, −0.09)	−0.18 (−0.23, −0.14)	−0.1 (−0.18, −0.01)

*DALYs disability adjusted life years

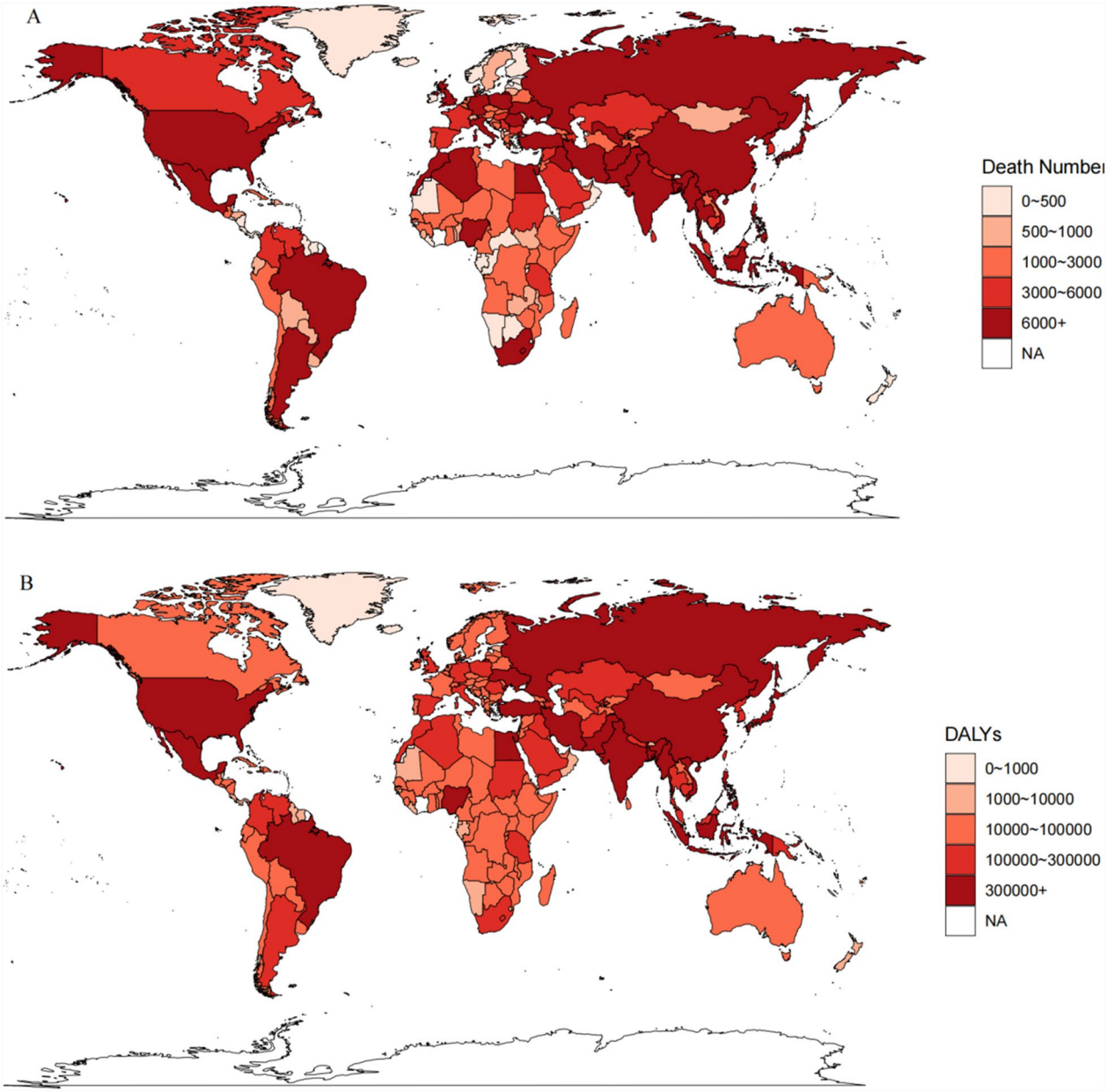

Fig. 2 Numbers of all-causes death (**A**) and DALYs (**B**) attributable to second-hand smoke for both sexes, in 2021

hand, high SDI countries such as Australia, Brazil, Canada and the USA, had enforced some smoke-free laws before World Health Organization Framework Convention on Tobacco Control (FCTC) adoption, and the WHO FCTC has provided structured approaches to tobacco control and policy for all countries since 2005 [29–32]. However, although low or low-middle SDI countries also adapted FCTC or other smoke-free legislation, the level of compliance varied by country attributable to different economic, technical or political backgrounds [33]. Therefore, we observed increased trends in some low and low-middle SDI countries including Afghanistan, Guinea-Bissau, Lesotho and El Salvador.

The effect of tobacco use including passive and active smoking has caused a large number of deaths and DALYs worldwide. In 2021, the estimated 1.29 million deaths and 34.90 million DALYs could be attributable to passive smoking, which corresponding to 3.8% of all deaths and 2.9% of all DALYs in the worldwide burden of disease.

Table 3 Global numbers of deaths and DALYs attributable to second-hand smoke by specific diseases for males, females and both sexes in 2021

Numbers in death (10^6)						Numbers in DALYs (10^6)					
Disease	**Both**	**Disease**	**Male**	**Disease**	**Female**	**Disease**	**Both**	**Disease**	**Male**	**Disease**	**Female**
IHD	0.41 (0.31, 0.53)	IHD	0.21 (0.15, 0.26)	IHD	0.21 (0.15, 0.27)	IHD	9.7 (7.26, 12.13)	IHD	5.32 (3.94, 6.74)	IHD	4.38 (3.32, 5.57)
COPD	0.27 (0.11, 0.43)	COPD	0.13 (0.05, 0.22)	COPD	0.13 (0.05, 0.22)	LRIs	6.18 (2.02, 10.51)	LRIs	3.3 (1.07, 5.65)	COPD	2.94 (1.13, 4.75)
LRIs	0.15 (0.05, 0.26)	LRIs	0.08 (0.03, 0.13)	IH	0.08 (0.05, 0.11)	COPD	5.66 (2.25, 9.08)	COPD	2.72 (1.1, 4.38)	LRIs	2.88 (0.96, 4.86)
IH	0.14 (0.09, 0.19)	IH	0.06 (0.04, 0.09)	LRIs	0.07 (0.03, 0.13)	IH	3.73 (2.55, 4.93)	IH	1.73 (1.16, 2.34)	T2DM	2.12 (0.77, 3.63)
IS	0.12 (0.08, 0.17)	TCs	0.06 (0.01, 0.11)	IS	0.07 (0.05, 0.1)	T2DM	3.69 (1.33, 6.31)	T2DM	1.56 (0.56, 2.72)	IH	2 (1.34, 2.65)
TCs	0.11 (0.01, 0.2)	TBLC	0.06 (0.01, 0.11)	TCs	0.05 (0, 0.09)	IS	2.74 (1.82, 3.68)	TCs	1.36 (0.16, 2.6)	IS	1.53 (1.03, 2.09)
TBLC	0.1 (0.01, 0.18)	IS	0.05 (0.04, 0.07)	T2DM	0.04 (0.02, 0.07)	TCs	2.61 (0.22, 5.01)	TBLC	1.36 (0.16, 2.6)	TCs	1.25 (0.07, 2.45)
T2DM	0.07 (0.03, 0.12)	T2DM	0.03 (0.01, 0.05)	TBLC	0.04 (0.01, 0.08)	TBLC	2.36 (0.29, 4.44)	IS	1.21 (0.79, 1.63)	TBLC	1 (0.14, 1.91)
SH	0.01 (0.01, 0.02)	SH	0.01 (0, 0.01)	SH	0.01 (0.01, 0.01)	SH	0.5 (0.34, 0.67)	SH	0.22 (0.14, 0.31)	SH	0.29 (0.19, 0.39)
BC	0.01 (0, 0.02)	BC	0 (0, 0)	BC	0.01 (0, 0.02)	BC	0.26 (0, 0.58)	OT	0.04 (0.02, 0.08)	BC	0.25 (0, 0.57)
OT	0 (0, 0)	OT	0 (0, 0)	OT	0 (0, 0)	OT	0.08 (0.03, 0.14)	BC	0 (0, 0.01)	OT	0.04 (0.02, 0.06)

* *IHD* ischemic heart disease, *COPD* chronic obstructive pulmonary disease, *LRIs* lower respiratory infections, *TCs* total cancers, *T2DM* diabetes mellitus type 2, *TBLC* tracheal, bronchus, and lung cancer, *IH* intracerebral hemorrhage, *IS* ischemic stroke, *BC* breast cancer, *SH* subarachnoid hemorrhage, *OT* otitis media, *DALYs* disability adjusted life years

Table 4 Decomposition of changes in all-cause death and DALYs attributable to second hand smoke from 2010 to 2021, by SDI, for men and women

	Men				Women			
	Total change	Change due to mortality change	Change due to age structure	Change due to population size	Total change	Change due to mortality change	Change due to age structure	Change due to population size
Death								
High	−0.02	−0.29	0.21	0.06	−0.10	−0.33	0.17	0.06
High-middle	0.03	−0.30	0.26	0.07	−0.05	−0.34	0.24	0.05
Middle	0.22	−0.21	0.31	0.12	0.14	−0.31	0.32	0.13
Low-middle	0.10	−0.19	0.13	0.16	0.06	−0.27	0.16	0.17
Low	−0.03	−0.30	0.01	0.26	−0.09	−0.38	0.03	0.26
DALYs								
High	−0.04	−0.24	0.13	0.07	−0.08	−0.25	0.11	0.06
High-middle	−0.05	−0.30	0.19	0.06	−0.07	−0.31	0.18	0.06
Middle	0.08	−0.24	0.20	0.12	0.05	−0.29	0.23	0.11
Low-middle	−0.10	−0.30	0.06	0.14	−0.14	−0.37	0.08	0.15
Low	−0.20	−0.43	−0.01	0.24	−0.26	−0.50	−0.01	0.25

**DALYs* disability adjusted life years, *SDI* social development index

After adding 6.2 million deaths and 165.1 million DALYs attributed to active smoking, it increased to 21.9 and 16.7%, respectively. Notably, China and India with large scale population contributed the most global tobacco related deaths and DALYs, although tobacco exposure rates in these two countries were moderate. As a result, strict and comprehensive tobacco control legislation and policies should be considered in these two countries.

Timely monitoring and reporting disease information caused by SHS was particularly pertinent to policy makers, given the harm was eminently preventable. The three most common causes of death attributable to SHS exposure were IHD, COPD and LRIs. Previous evidence suggested that children were the most vulnerable to household SHS exposure compared to other age groups [3, 34], because they could not prevent their close relatives from smoking at home. More importantly, children was the group that had the strongest evidence of harm attributable to SHS [35, 36]. These two factors called for stricter laws and policies promoting zero tolerance for SHS exposure among those younger than 5 years. Furthermore, our data showed that people aged >80 years should also be a key intervention group in preventing SHS exposure at home. According to World Bank forecast data for 2022, the aging population is increasing in some developed countries including Japan, Italy and Portugal [37]. Therefore, preventing SHS exposure at home among people aged >80 years could achieve sizeable declines in numbers of deaths attributable to SHS exposure. Lastly, setting smoke-free home policies not only reduce exposure of children and people aged >80 years to SHS, but also reduce active smoking in adults and possibly in adolescents [38–40].

We adapted a recently developed decomposition method to attribute changes in SHS related deaths to population growth, population aging and mortality change [23]. Our data showed that the effect of these three factors on changes in all cause death numbers attributable to SHS varied among sexes and SDI levels. This phenomenon may be partly related to differences in SHS exposure rates, which was supported by the data of age-standardized SHS summary exposure values by sexes and SDI countries in 2021 (Appendix Table S4). In addition, the World Bank forecast data for 2022 also showed that the speed of population aging and growth was related to national development and a country's economy [37]. Therefore, comprehensive and personalized tobacco control polices should be made to protect the public from tobacco damage worldwide. In other words, tobacco control policies should not only consider reduction in tobacco exposure of the population, but also consider changes in demographic factors. Despite the decrease in SEV of SHS exposure over the past three decades, the number of deaths attributable to SHS increased. This was attributable the effects of a large aging population on mortality. Ultimately, this finding provided us a severe challenge ahead for tobacco control in the next decades: unless progress in reducing and preventing SHS exposure at home or in public places could be greatly accelerated, population growth and aging would increase the disease deaths associated with SHS's global toll [1]. Therefore, some public health

measures should be taken to protect the children or people aged >80 years, including enacting stricter laws and regulations on smoke-free environments for schools or places where people aged >80 years gather (parks and hospital) than now; increasing tobacco taxes, especially in low-income countries or regions; enhancing public awareness of smoking cessation and establishing positive social examples by launching smoking cessation activities for healthcare workers.

This study had several strengths. First, we used the most recent GBD 2021 data from 204 countries and territories to estimated SHS SEV and attributable disease burden, and assessed the secular trends from 1990 to 2021. Furthermore, in the GBD studies, the unified definition of SHS exposure and consistent estimation of effect sizes and disease burden facilitated direct comparison across countries. Lastly, we provided important information about SHS related specific disease causes and susceptible age groups, which could be helpful to convey public health messages and advice to policy makers. However, several limitations should be considered. First, using household composition as a proxy for SHS exposure, especially in culturally diverse settings where household smoking behaviors may not reflect true exposure levels. Based on the data from the GBD 2021 study, we firstly considered secondhand tobacco smoke at work, or in other public places. Second, some factors influencing the SHS at home were not considered: tobacco type (eg, cigarettes, e-cigarettes or water piper smoking), intensity of SHS exposure (eg, duration and mean cigarettes), natural ventilation (eg, the climate allows open architectural structures or opening of windows); crowding at home (eg, numbers of bedroom) [41]. Third, the study relied on self-reported data not objective and detectable biomarkers, which could not accurately reflect the actual exposure level in the human body [42–44]. Fourth, relative risk values used for estimating the effect of SHS on health outcomes were from limited published data, which might bias our results because the values used for estimating population attributable fractions might not fully represent all possible risk-outcome pairs influenced by sex, age group, and over time. Fifth, The interaction between SHS exposure and other factors such as indoor and outdoor air pollution might potentiate the risk values [45–47]. Finally, health outcomes such as sudden infant death syndrome and low birth weight in children were not included in the GBD 2021 database [48], resulting in underestimation of the disease burden attributable to SHS exposure, especially for populations younger than 20 years.

In summary, secondhand smoke exposure and related disease burden posed a serious public health challenge worldwide over the past three decades. Since 2010, the number of deaths attributable to SHS exposure has been increased due to population growth and population aging. These findings emphasized the urgency to launch smoke-free policies worldwide.

Abbreviations

SHS	Second hand smoke
WHO	World Health Organization
FCTC	Framework Convention on Tobacco Control
GBD	Global Burden of Diseases;
GYTS	Global Youth Tobacco Survey
DALYs	Disability adjusted life years
IHD	Ischemic heart disease
COPD	Chronic obstructive pulmonary disease
T2DM	Diabetes mellitus type 2
LRIs	Lower respiratory infections
IER	Integrated exposure response curves
PAF	Population attributable fraction
RR	Relative risk
SEV	Summary exposure values
ARC	Annualized rate of change;
ASP	Age-standardized prevalence
ASMR	Age-standardized mortality rate
ASDR	Age-standardized DALYs rate
UI	Uncertainty estimation interval
SDI	Socio-demographic Index

Supplementary Information

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Additional file 1

Additional file 2

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Author contributions
Conceptualization and design, CW and DX; Data collection, XMZ, YL, XX, QQS, TFJ, WM, ZL, YX, ZXH and LZ; Formal analysis, ZS and AQC; Writing—original draft, ZS. All authors read and approved the final manuscript.

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Data availability
No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Institutional review board statement
As a secondary analysis of publicly available data, no ethical approval from an institutional review board was required for this study.

Competing interests
The authors declare no competing interests.

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