

**Trends and risk factors of mortality and disability-adjusted life year for chronic  
respiratory diseases from 1990 to 2017: systematic analysis for the Global  
Burden of Disease Study 2017**

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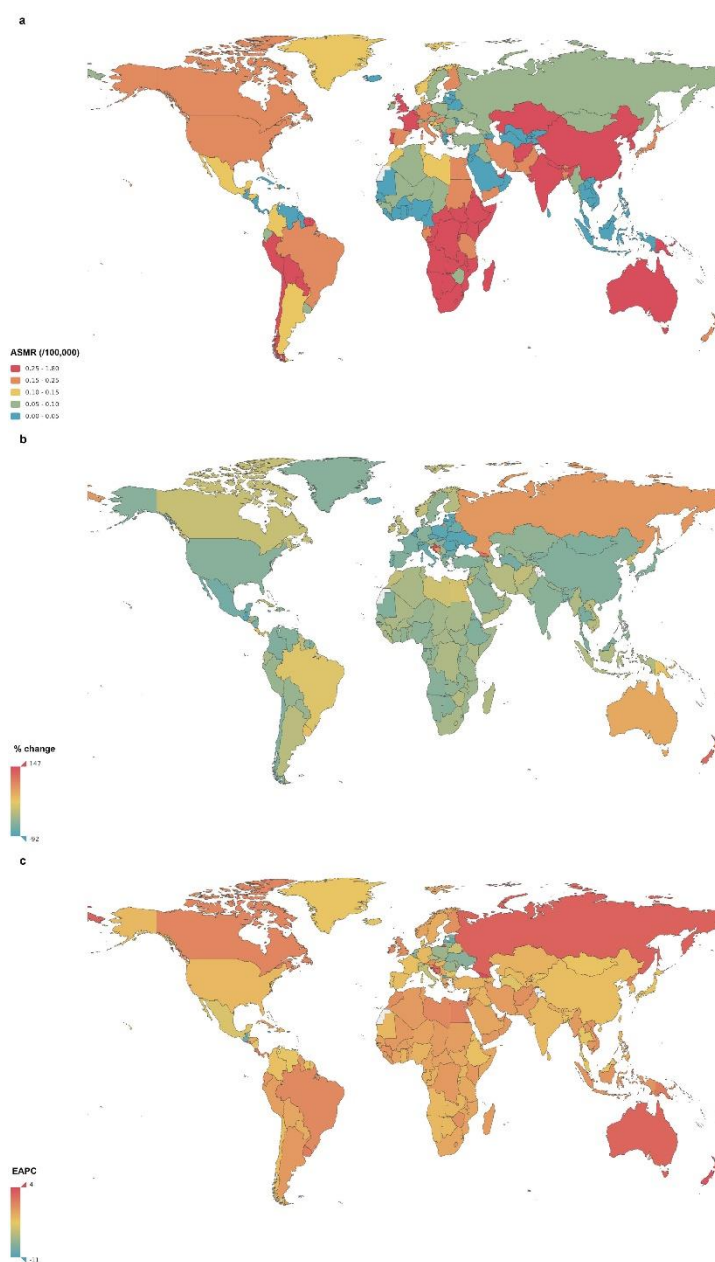


The global mortality rate of pneumoconiosis for both sexes in 195 countries and territories.

a. The age-standardized mortality rate (ASMR) of pneumoconiosis for both sexes combined in 2017.

b. The relative percentage change in the ASMR of pneumoconiosis for both sexes between 1990 and 2017.

c. The estimated annual percentage change (EAPC) in the ASMR of pneumoconiosis for both sexes from 1990 to 2017.



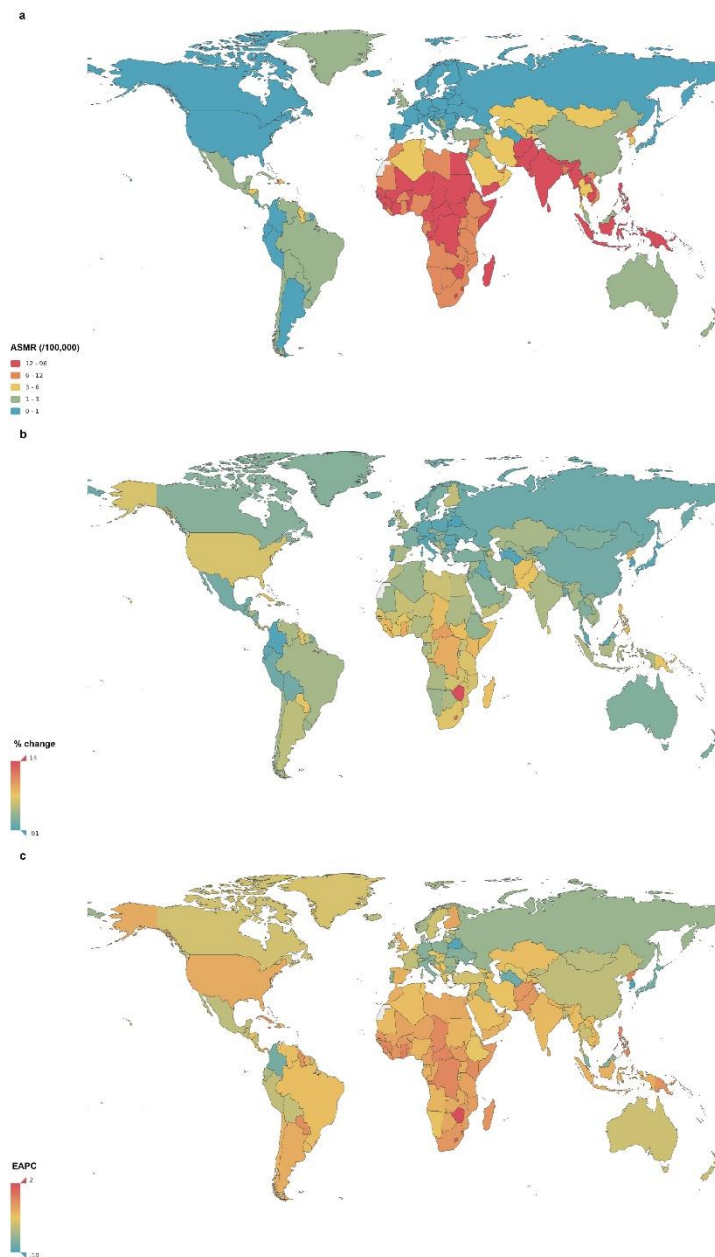
Supplemental Figure 3

The global mortality rate of asthma for both sexes in 195 countries and territories.

a. The age-standardized mortality rate (ASMR) of asthma for both sexes combined in 2017.

b. The relative percentage change in the ASMR of asthma for both sexes between 1990 and 2017.

c. The estimated annual percentage change (EAPC) in the ASMR of asthma for both sexes from 1990 to 2017.



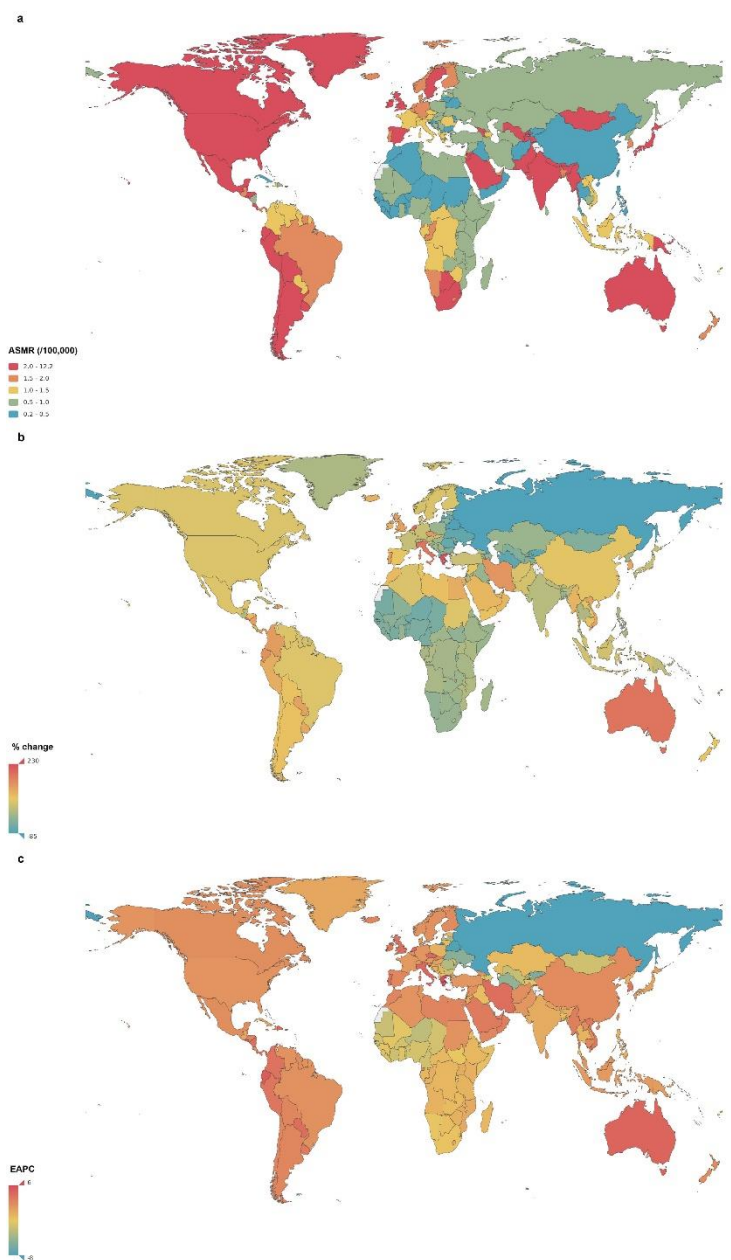
Supplemental Figure 4

The global mortality rate of interstitial lung disease and pulmonary sarcoidosis for both sexes in 195 countries and territories.

a. The age-standardized mortality rate (ASMR) of interstitial lung disease and pulmonary sarcoidosis for both sexes combined in 2017.

b. The relative percentage change in the ASMR of interstitial lung disease and pulmonary sarcoidosis for both sexes between 1990 and 2017.

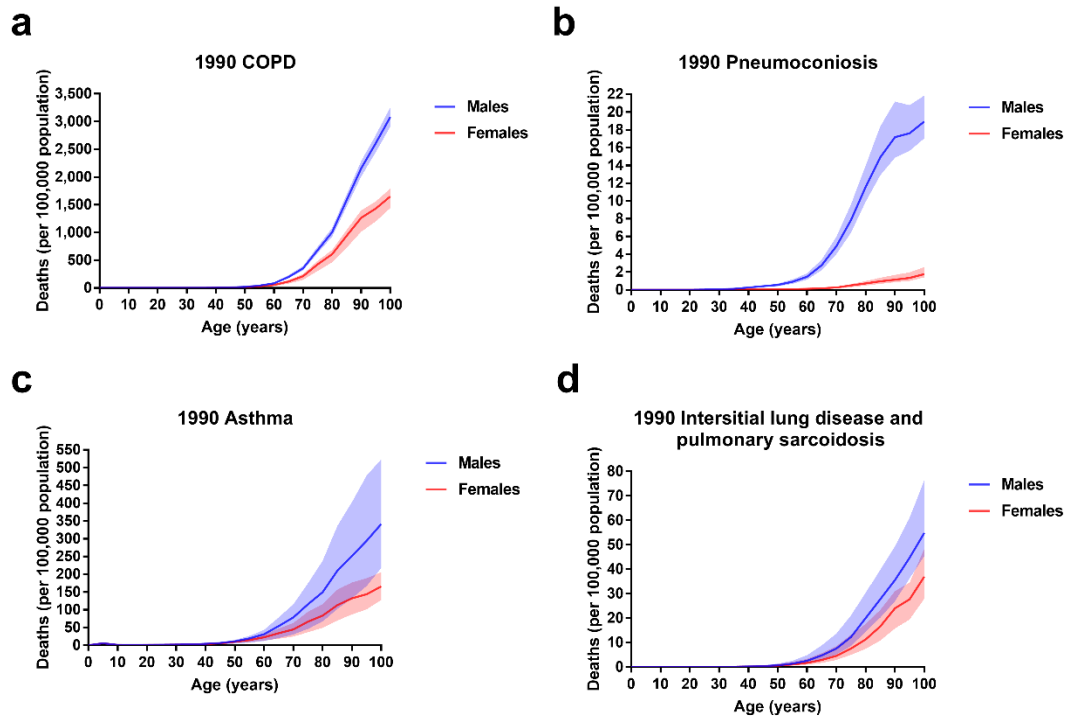
c. The estimated annual percentage change (EAPC) in the ASMR of interstitial lung disease and pulmonary sarcoidosis for both sexes from 1990 to 2017.



Supplemental Figure 5

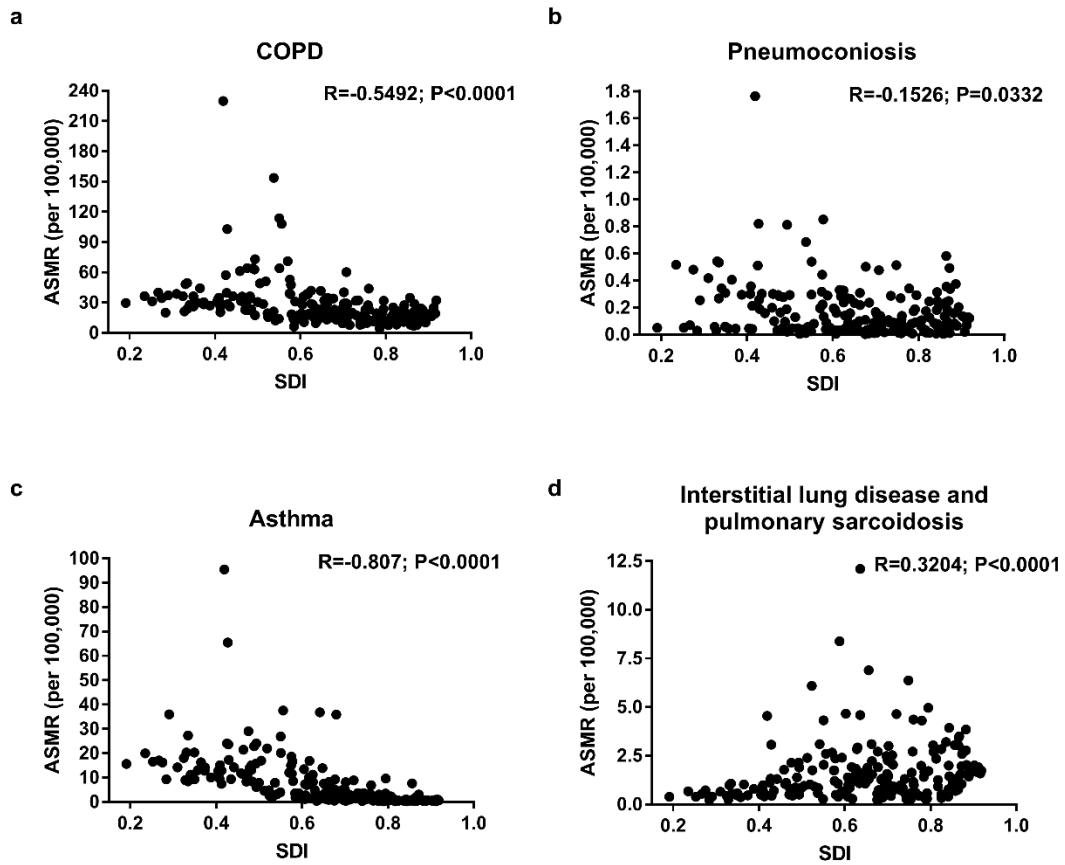
The global mortality rates of chronic obstructive pulmonary disease (COPD) (a), pneumoconiosis (b), asthma (c), and interstitial lung disease and pulmonary sarcoidosis (d) by age and sex in 1990.

The shading indicates 95% uncertainty intervals.



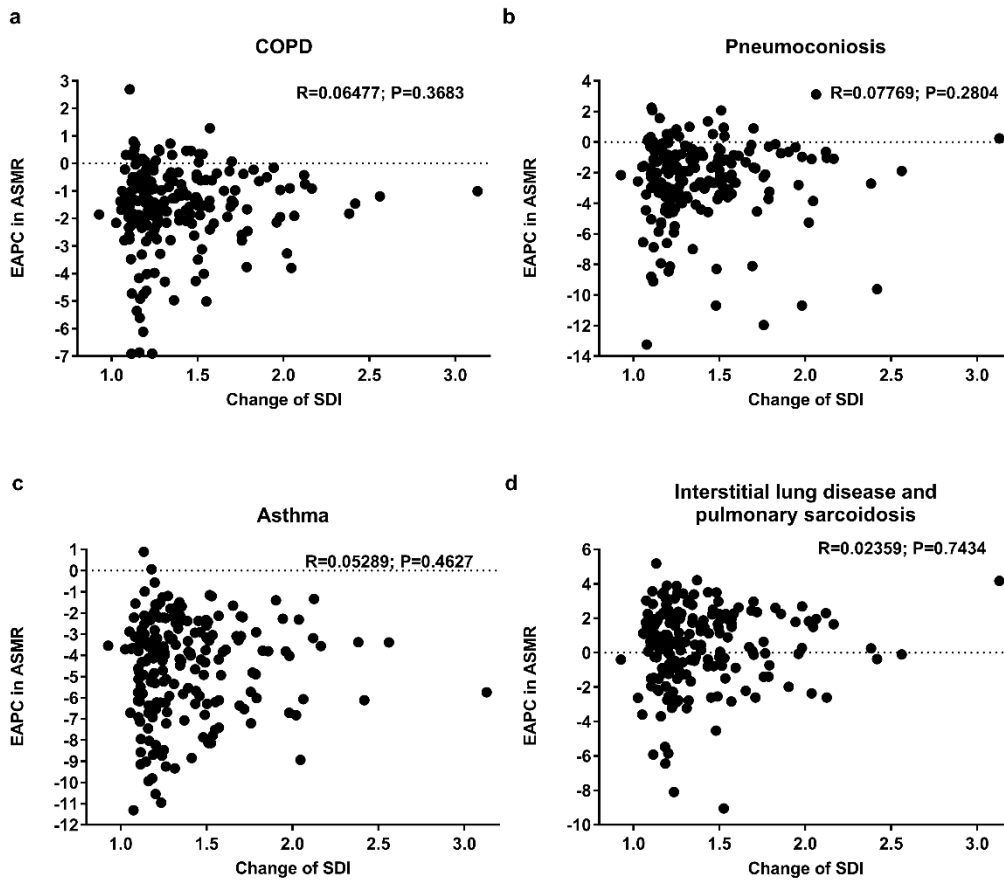
Supplemental Figure 6

The correlation between the sociodemographic index (SDI) and age-standardized mortality rates (ASMRs) of chronic obstructive pulmonary disease (COPD) (a), pneumoconiosis (b), asthma (c) and interstitial lung disease and pulmonary sarcoidosis (d) in 2017.



Supplemental Figure 7

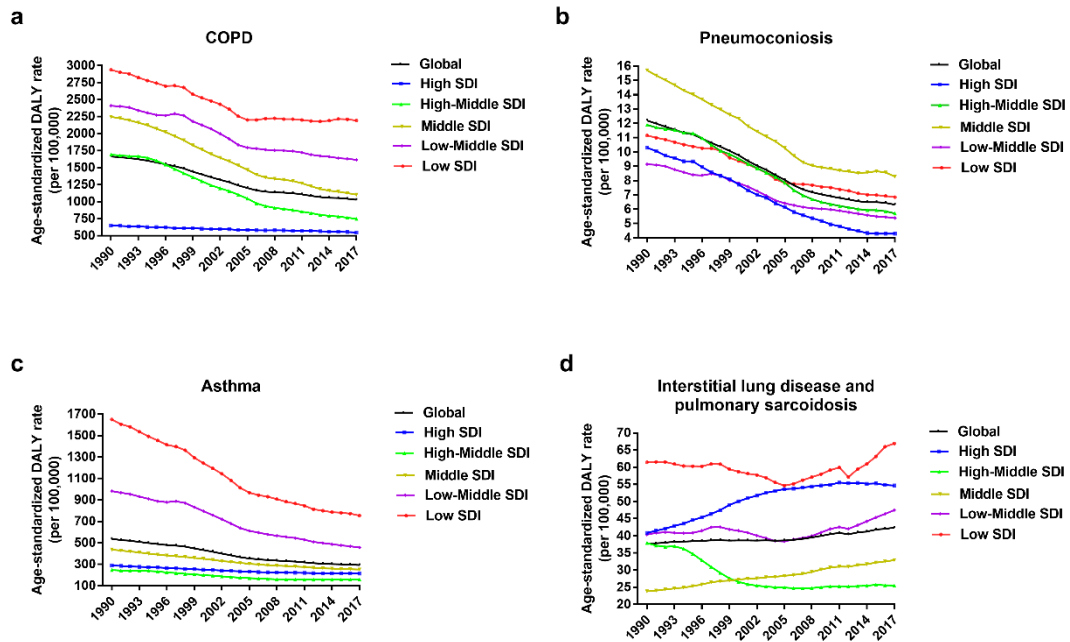
The correlation between the change in the socio-demographic index (SDI) and estimated annual percentage change (EAPC) in the age-standardized mortality rates (ASMRs) of chronic obstructive pulmonary disease (COPD) (a), pneumoconiosis (b), asthma (c), and interstitial lung disease and pulmonary sarcoidosis (d) from 1990 to 2017.



Supplemental Figure 8

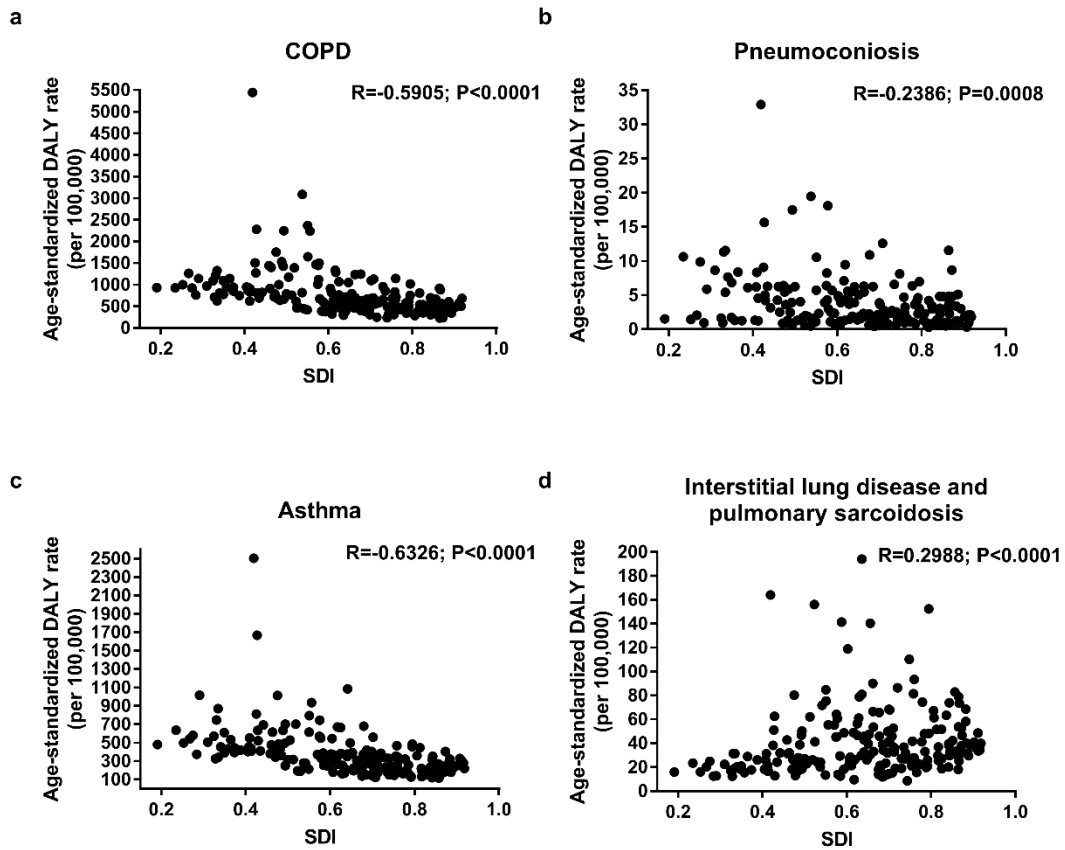


The age-standardized disability-adjusted life years (DALYs) of chronic obstructive pulmonary disease (COPD) (a), pneumoconiosis (b), asthma (c), and interstitial lung disease and pulmonary sarcoidosis (d) grouped by sociodemographic index (SDI) quintiles from 1990 to 2017.



Supplemental Figure 9

The correlation between the sociodemographic index (SDI) and age-standardized disability-adjusted life years (DALYs) of chronic obstructive pulmonary disease (COPD) (a), pneumoconiosis (b), asthma (c), and interstitial lung disease and pulmonary sarcoidosis (d) in 2017.



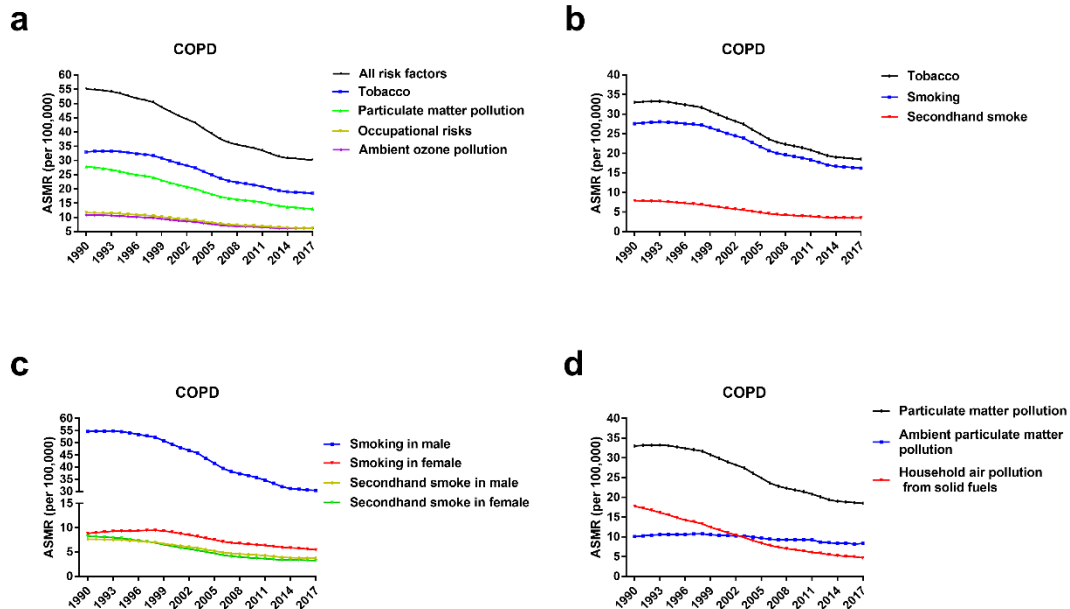
Supplemental Figure 10

a. The age-standardized mortality rates (ASMRs) of chronic obstructive pulmonary disease (COPD) attributed to the four types of risk factors in both sexes from 1990 to 2017.

b. The ASMRs of COPD attributed to tobacco, smoking and secondhand smoke in both sexes from 1990 to 2017.

c. The ASMRs of COPD attributed to smoking and secondhand smoke by sex from 1990 to 2017.

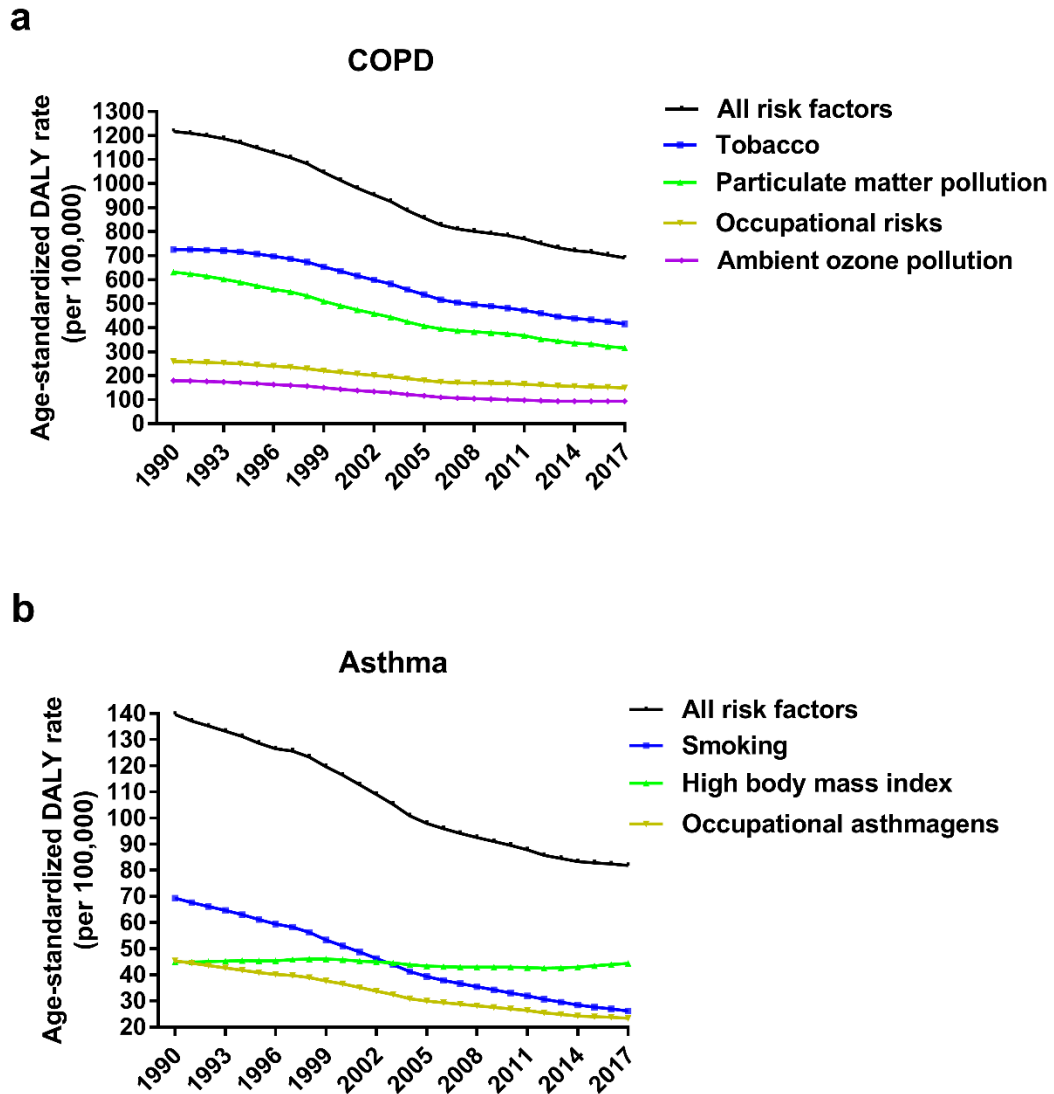
d. The ASMRs of COPD attributed to particulate matter pollution, ambient particulate matter pollution and household air pollution from solid fuels for both sexes from 1990 to 2017.



Supplemental Figure 11

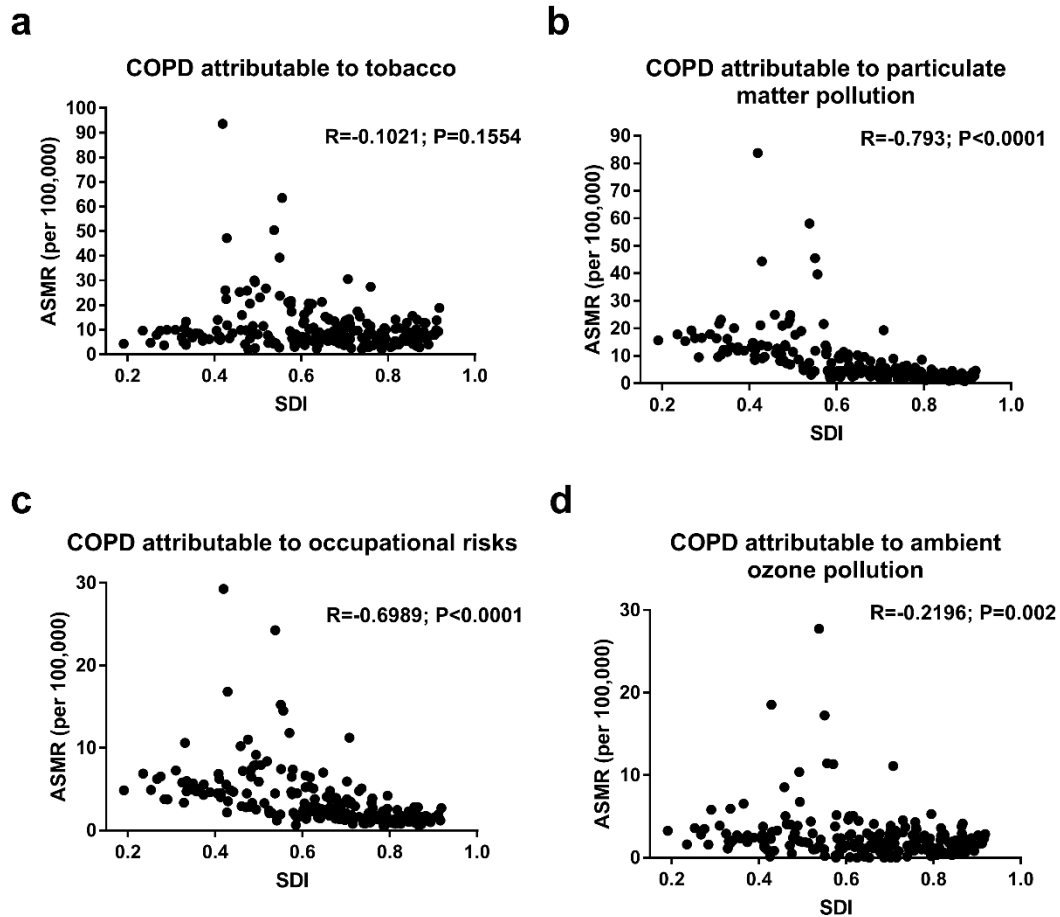
a. The age-standardized disability-adjusted life years (DALYs) of chronic obstructive pulmonary disease (COPD) attributed to the four kinds of risk factors for both sexes from 1990 to 2017.

b. The age-standardized disability-adjusted life years (DALYs) of asthma attributed to the three kinds of risk factors for both sexes from 1990 to 2017.



Supplemental Figure 12

The correlation between the sociodemographic index (SDI) and age-standardized mortality rates (ASMRs) of chronic obstructive pulmonary disease (COPD) attributed to tobacco (a), particulate matter pollution (b), occupational risks (c), and ambient ozone pollution (d) in 2017.



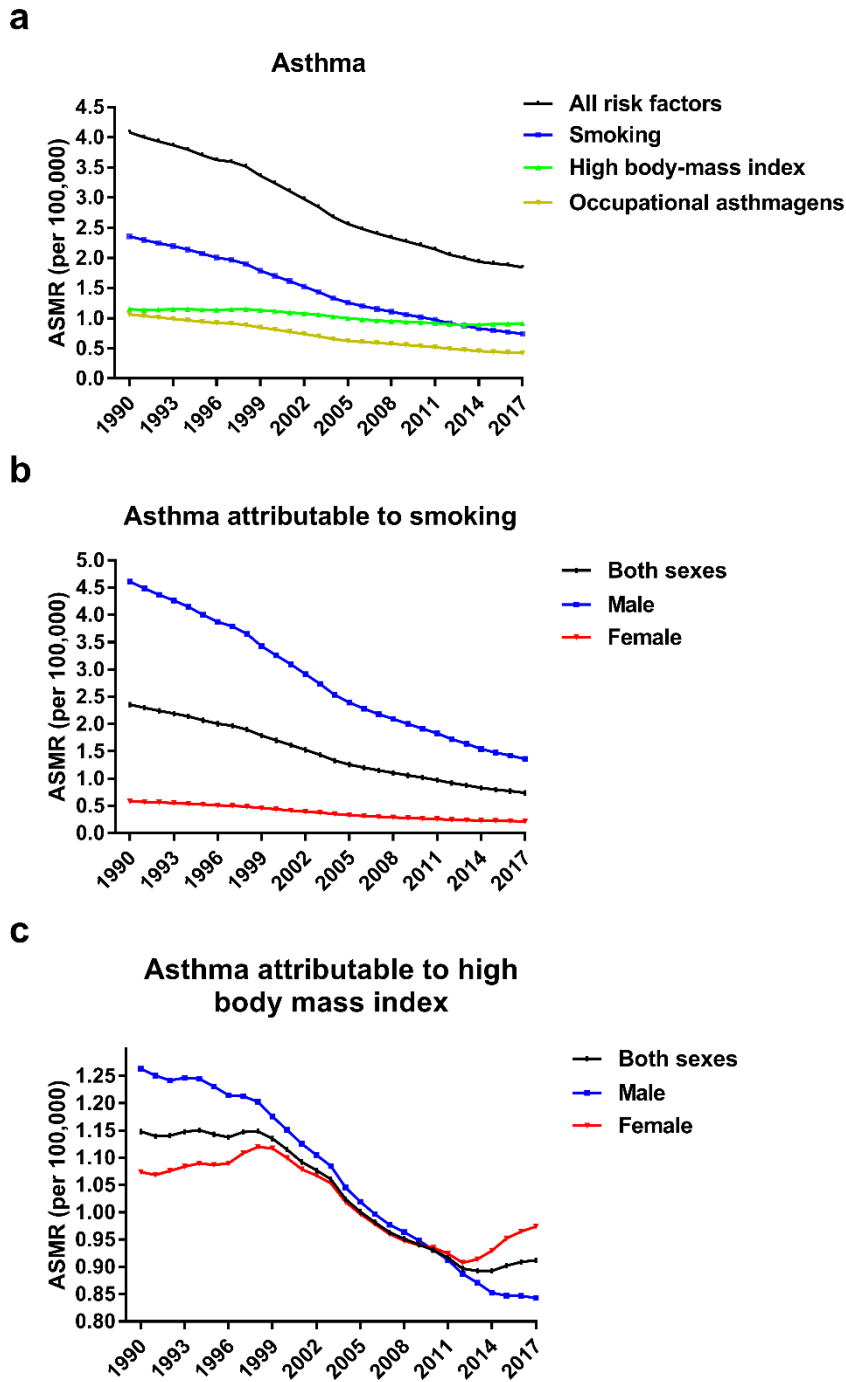
Supplemental Figure 13

a. The age-standardized mortality rates (ASMRs) of asthma attributed to the three types of risk factors for both sexes from 1990 to 2017.

b. The ASMR of asthma attributed to smoking by sex from 1990 to 2017.

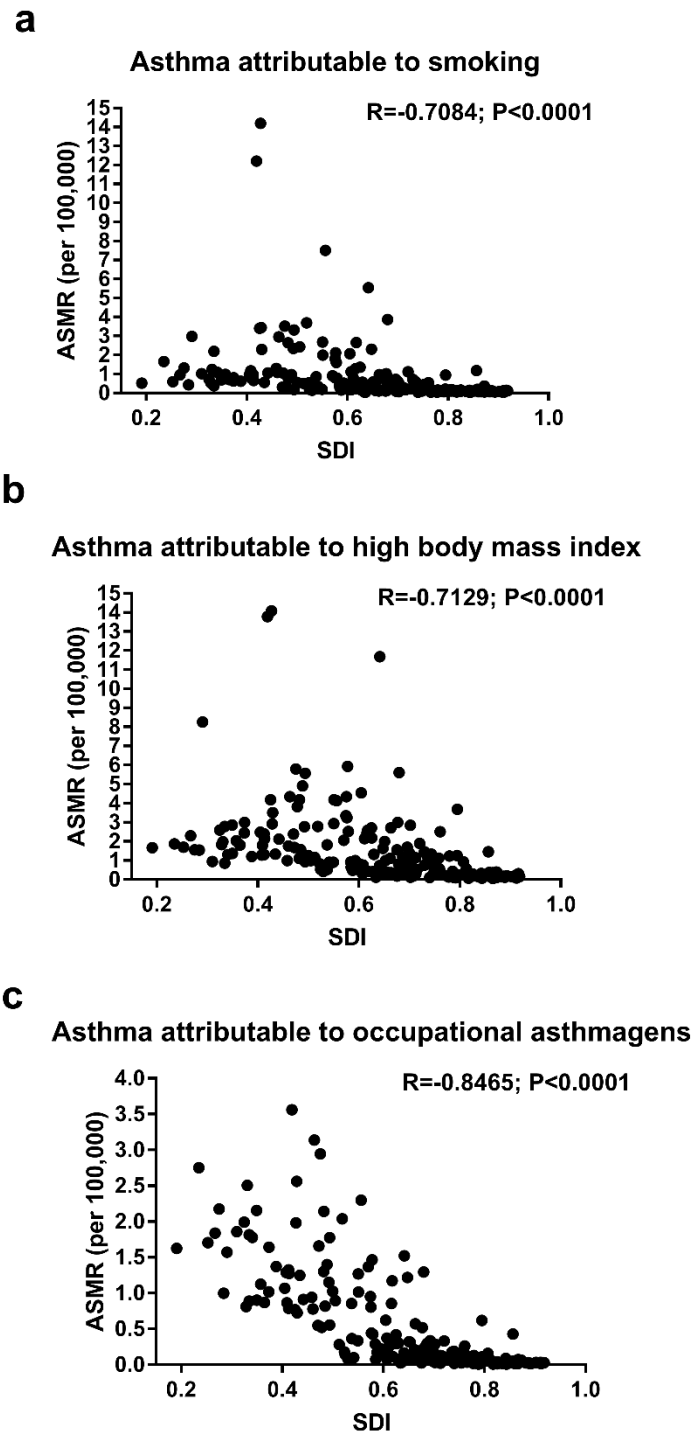
c. The ASMR of asthma attributed to a high body mass index by sex from 1990 to 2017.

ASMR, age-standardized mortality rate.



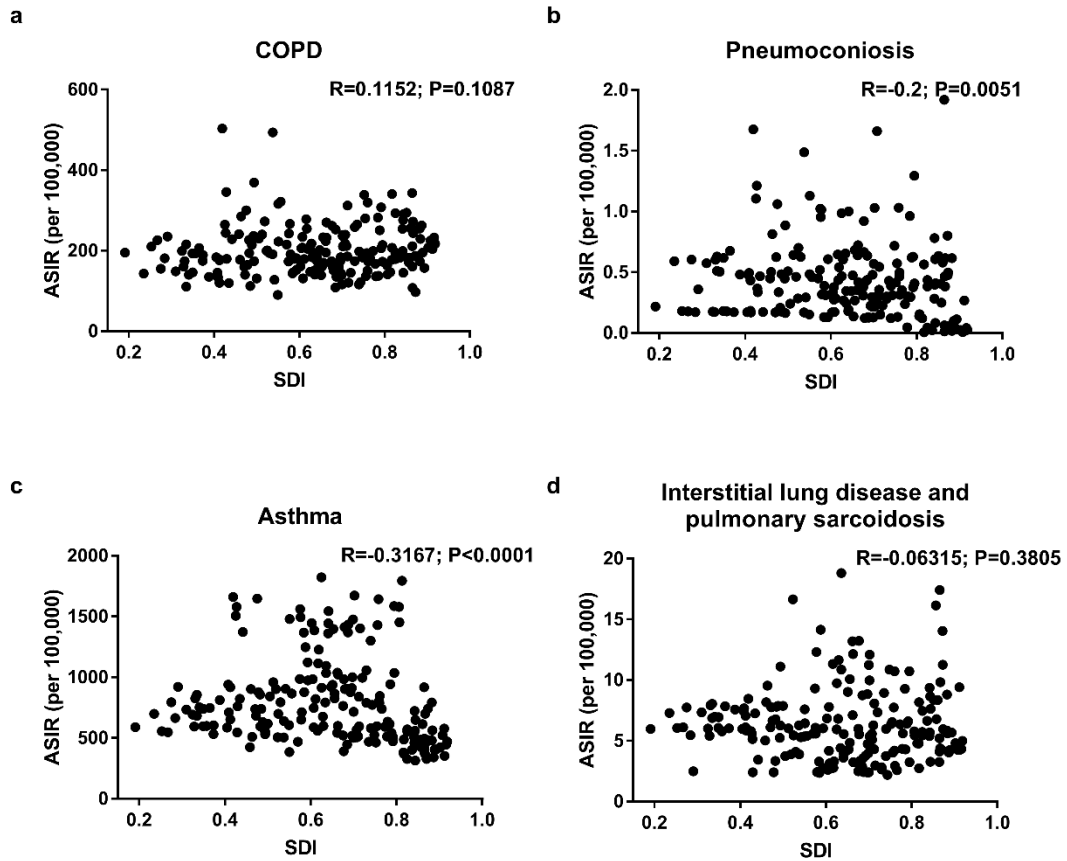
Supplemental Figure 14

The correlation between the sociodemographic index (SDI) and age-standardized mortality rates (ASMRs) of asthma attributable to smoking (a), a high body mass index (b), and occupational asthmagens (c) in 2017.



Supplemental Figure 15

The correlation between the sociodemographic index (SDI) and age-standardized incidence rates (ASIRs) of chronic obstructive pulmonary disease (COPD) (a), pneumoconiosis (b), asthma (c), and interstitial lung disease and pulmonary sarcoidosis (d) in 2017.



Supplemental Table 1. List of International Classification of Diseases (ICD) codes



Cause	ICD-10
Chronic respiratory diseases	D86-D86.2; D86.9; G47.3, J30-J35.9; J37-J39.9; J41-J46.9; J60-J63.8; J65-J68.9; J70; J70.8-J70.9; J82; J84-J84.9; J91-J92.9
Chronic obstructive pulmonary disease	J40-J44.9; J47-J47.9
Pneumoconiosis	J60-63.8; J65-J65.0; J92.0
Silicosis	J62-J62.9
Asbestosis	J61-J61.0; J92.0
Coal workers pneumoconiosis	J60-J60.0
Other pneumoconiosis	J63-63.8; J65-65.0
Asthma	J45-J46.9
Interstitial lung disease and pulmonary sarcoidosis	D86-86.2; D86.89-D86.9; J84-J84.9

Supplemental Table 2. The global mortality, ASMR, and DALY due to chronic respiratory diseases in 1990 and 2017

	Chronic respiratory diseases	Chronic obstructive pulmonary disease	Pneumoconiosis				Asthma	Interstitial lung disease and pulmonary sarcoidosis		
			Overall	Silicosis	Asbestosis	Coal workers pneumoconiosis			Other pneumoconiosis	
<b>1990</b>	<b>DALY*10<sup>6</sup></b>	99.10 (91.72-104.76)*	68.19 (61.54-74.69)	0.52 (0.44-0.60)	0.29 (0.23-0.36)	0.04 (0.03-0.05)	0.11 (0.08-0.16)	0.08 (0.06-0.11)	26.05 (19.95-31.28)	1.59 (1.21-2.13)
	<b>No. death*10<sup>3</sup></b>	3317.21 (3011.59-3425.40)	2600.14 (2288.98-2860.08)	20.38 (17.22-23.95)	11.49 (9.10-14.30)	1.45 (0.97-1.97)	4.77 (3.36-6.74)	2.67 (1.85-3.65)	599.28 (336.25-771.28)	56.43 (42.30-74.97)
	<b>both sexes</b>	89.53 (81.20-92.47)	71.88 (63.56-78.63)	0.52 (0.44-0.61)	0.29 (0.23-0.36)	0.04 (0.03-0.05)	0.13 (0.09-0.18)	0.07 (0.05-0.09)	14.68 (8.26-19.08)	1.50 (1.14-1.96)
	<b>ASMR (per 100,000)</b>	117.29 (112.76-121.35)	94.24 (85.85-103.04)	1.11 (0.92-1.34)	0.64 (0.51-0.80)	0.08 (0.05-0.11)	0.29 (0.20-0.40)	0.11 (0.06-0.17)	18.64 (8.40-27.28)	1.91 (1.39-3.02)
	<b>male</b>	70.32 (55.04-74.97)	56.64 (42.11-64.85)	0.08 (0.05-0.10)	0.02 (0.01-0.03)	0.01 (0.01-0.02)	0.01 (0.00-0.01)	0.03 (0.02-0.05)	11.78 (7.28-15.44)	1.22 (0.80-2.00)
	<b>female</b>									

<b>2017</b>	<b>DALY*10<sup>6</sup></b>	112.32 (104.65- 119.69)	81.60 (75.98- 86.76)	0.51 (0.47- 0.55)	0.26 (0.23- 0.29)	0.07 (0.05- 0.08)	0.08 (0.07-0.10)	0.10 (0.08-0.12)	22.76 (18.08- 28.34)	3.37 (2.77- 4.08)
	<b>No. death*10<sup>3</sup></b>	3914.20 (3790.58- 4044.82)	3197.79 (3028.95- 3358.88)	21.55 (20.47- 22.69)	11.28 (10.39- 12.46)	3.39 (2.31- 3.93)	3.22 (2.90-4.04)	3.65 (3.12-4.50)	495.06 (338.20- 641.20)	147.64 (114.92- 181.32)
	<b>both sexes</b>	51.36 (49.75- 53.07)	42.16 (40.01- 44.20)	0.28 (0.26- 0.29)	0.14 (0.13- 0.16)	0.04 (0.03- 0.05)	0.04 (0.04-0.05)	0.05 (0.04-0.06)	6.33 (4.34- 8.17)	1.93 (1.49- 2.36)
	<b>ASMR (per 100,000)</b>	65.43 (62.95- 67.28)	54.81 (51.46- 57.64)	0.56 (0.53- 0.59)	0.31 (0.28- 0.34)	0.09 (0.06- 0.11)	0.09 (0.08-0.11)	0.08 (0.06-0.10)	6.74 (4.03- 9.44)	2.38 (1.82- 3.09)
	<b>male</b>	40.79 (37.92- 43.81)	32.71 (29.72- 35.26)	0.06 (0.05- 0.06)	0.01 (0.01- 0.02)	0.01 (0.01- 0.01)	0.01 (0.00-0.01)	0.02 (0.02-0.03)	6.01 (4.11- 7.83)	1.58 (1.06- 2.11)
	<b>female</b>									

\*Data in parentheses shown as 95% confidence interval.

DALY, disability-adjusted life year; ASMR, age-standardized mortality rate.

Supplemental Table 3. The age-standardized mortality rates of chronic obstructive pulmonary disease, pneumoconiosis, asthma, interstitial lung disease and pulmonary sarcoidosis for both sexes combined in 2017

Country	Chronic obstructive pulmonary disease			Pneumoconiosis			Asthma			Interstitial lung disease and pulmonary sarcoidosis		
	Estimate value	Lower 95% UI	Upper 95% UI	Estimate value	Lower 95% UI	Upper 95% UI	Estimate value	Lower 95% UI	Upper 95% UI	Estimate value	Lower 95% UI	Upper 95% UI
Afghanistan	37.34	27.58	51.35	0.25	0.15	0.39	35.95	19.66	48.49	0.41	0.15	0.95
Albania	13.00	10.81	15.66	0.24	0.17	0.32	2.93	2.25	3.86	1.27	0.94	1.62
Algeria	13.37	11.52	15.62	0.09	0.06	0.11	5.00	3.96	6.25	0.48	0.31	0.90
American Samoa	40.29	35.44	45.43	0.15	0.12	0.20	8.15	7.06	9.70	1.03	0.86	1.27
Andorra	18.72	14.61	22.93	0.14	0.10	0.19	0.55	0.41	0.75	2.01	1.06	2.78
Angola	31.63	26.12	42.89	0.30	0.23	0.39	11.55	8.67	15.14	1.04	0.43	2.06
Antigua and Barbuda	7.87	7.23	8.55	0.09	0.08	0.11	1.81	1.63	2.01	0.76	0.53	0.89
Argentina	28.60	25.88	31.57	0.14	0.11	0.17	0.98	0.86	1.11	2.52	2.09	3.28
Armenia	29.18	27.38	31.24	0.03	0.03	0.04	0.42	0.37	0.46	3.00	1.69	3.74
Australia	19.30	17.28	21.53	0.34	0.28	0.41	1.07	0.95	1.20	2.59	1.30	3.52
Austria	15.19	14.27	16.15	0.10	0.08	0.11	0.38	0.34	0.42	1.00	0.83	1.25
Azerbaijan	27.12	22.76	33.60	0.01	0.01	0.02	2.08	1.60	2.68	1.46	1.13	1.99
Bahrain	16.80	14.64	21.58	0.10	0.08	0.14	2.82	2.34	3.85	2.03	1.44	2.54
Bangladesh	61.22	54.40	69.20	0.20	0.14	0.30	11.78	7.61	16.57	1.77	1.02	3.05
Barbados	8.05	7.27	8.83	0.03	0.02	0.03	2.52	2.22	2.82	1.31	1.05	1.53
Belarus	11.26	10.50	12.18	0.04	0.03	0.05	0.62	0.47	0.73	0.44	0.36	0.54
Belgium	22.48	20.93	24.11	0.37	0.32	0.44	0.59	0.53	0.65	1.56	1.05	1.88
Belize	19.21	17.64	20.89	0.19	0.17	0.22	2.35	2.11	2.60	4.67	3.98	5.77
Benin	30.54	25.78	36.48	0.04	0.03	0.06	14.17	10.59	19.08	0.46	0.30	0.69

Bermuda	7.66	6.85	8.57	0.06	0.05	0.07	0.80	0.70	0.91	3.03	2.30	3.61
Bhutan	71.14	57.40	87.98	0.20	0.14	0.27	12.00	7.65	18.49	2.66	1.73	3.98
Bolivia	31.14	25.33	36.98	0.29	0.22	0.37	2.09	1.49	2.72	8.38	6.43	10.74
Bosnia and Herzegovina	20.51	18.75	22.49	0.05	0.04	0.06	1.12	0.93	1.29	0.92	0.65	1.11
Botswana	34.96	30.27	40.34	0.31	0.23	0.40	8.33	6.66	10.23	2.23	1.67	2.88
Brazil	30.41	29.69	31.28	0.22	0.19	0.23	1.16	1.10	1.23	1.54	0.95	1.76
Brunei	34.95	30.23	38.69	0.04	0.02	0.05	7.60	6.30	8.72	3.05	2.44	4.01
Bulgaria	20.04	18.61	21.54	0.19	0.15	0.22	0.30	0.26	0.34	0.30	0.23	0.44
Burkina Faso	20.16	17.02	24.09	0.03	0.02	0.04	9.31	6.51	12.53	0.23	0.13	0.39
Burundi	38.76	32.23	46.17	0.42	0.26	0.83	14.23	8.80	18.65	0.65	0.22	1.29
Cambodia	36.32	30.81	42.26	0.03	0.03	0.05	13.14	8.37	17.42	0.64	0.45	0.93
Cameroon	34.02	28.11	40.89	0.05	0.03	0.06	15.15	10.78	21.04	0.73	0.49	1.00
Canada	17.92	16.58	19.51	0.16	0.13	0.19	0.42	0.37	0.46	2.77	1.70	3.48
Cape Verde	14.07	12.32	17.43	0.03	0.02	0.03	4.00	3.33	5.14	0.28	0.23	0.39
Central African Republic	49.49	36.22	67.70	0.53	0.32	0.98	27.28	14.99	37.67	1.07	0.35	2.15
Chad	31.33	25.84	38.65	0.05	0.04	0.07	16.53	11.27	22.18	0.39	0.20	0.71
Chile	17.97	15.81	20.99	0.51	0.43	0.62	1.03	0.88	1.24	6.37	3.90	7.94
China	60.24	57.70	66.76	0.48	0.44	0.51	1.34	1.24	1.48	0.43	0.34	0.52
Colombia	25.10	22.92	27.53	0.13	0.11	0.15	0.43	0.37	0.50	1.09	0.72	1.30
Comoros	26.05	20.88	30.69	0.30	0.20	0.58	9.39	6.51	13.22	0.71	0.29	1.35
Congo	39.16	31.35	51.30	0.32	0.21	0.49	14.97	10.59	21.29	1.75	0.78	2.62
Costa Rica	22.79	20.98	24.55	0.03	0.02	0.03	0.91	0.79	1.02	3.10	2.44	3.70
Cote d'Ivoire	26.05	21.35	31.27	0.04	0.03	0.06	12.86	8.09	17.05	0.41	0.27	0.58

Croatia	18.72	17.58	19.90	0.13	0.11	0.15	0.54	0.48	0.61	0.33	0.28	0.45
Cuba	20.33	18.38	22.34	0.01	0.01	0.02	1.46	1.27	1.65	0.35	0.28	0.51
Cyprus	19.77	16.94	22.45	0.07	0.06	0.09	1.15	0.88	1.36	3.02	1.40	3.96
Czech Republic	15.77	14.55	17.07	0.23	0.20	0.26	0.54	0.49	0.61	1.17	0.56	1.58
Democratic Republic of the Congo	44.27	33.14	62.24	0.41	0.24	0.75	16.26	11.21	22.78	1.03	0.34	2.24
Denmark	32.36	30.29	34.61	0.12	0.10	0.14	0.61	0.55	0.68	1.73	1.47	2.19
Djibouti	23.36	16.14	30.57	0.28	0.19	0.49	8.34	4.94	13.30	0.87	0.36	1.63
Dominica	15.43	14.14	16.92	0.04	0.04	0.05	4.50	4.07	4.98	1.32	1.02	1.56
Dominican Republic	13.37	11.64	15.14	0.03	0.02	0.03	3.50	2.90	4.14	0.65	0.47	0.79
Ecuador	18.86	16.96	21.07	0.09	0.07	0.10	0.62	0.54	0.72	4.59	2.93	5.68
Egypt	28.08	23.34	32.74	0.19	0.13	0.24	13.48	10.32	17.73	0.76	0.39	1.65
El Salvador	17.15	14.76	20.48	0.05	0.04	0.06	2.67	2.17	3.25	2.40	1.53	3.03
Equatorial Guinea	28.83	19.07	43.58	0.24	0.15	0.34	8.19	4.97	15.19	1.84	0.78	3.37
Eritrea	34.96	25.26	44.16	0.36	0.23	0.61	15.16	9.74	20.33	0.98	0.37	1.90
Estonia	8.06	7.14	9.05	0.01	0.00	0.01	1.00	0.85	1.15	0.69	0.53	0.98
Ethiopia	23.67	18.83	27.00	0.27	0.17	0.45	8.45	5.51	12.93	0.50	0.17	1.11
Federated States of Micronesia	52.97	43.34	64.40	0.44	0.30	0.66	18.61	11.62	25.28	1.75	1.24	2.30
Fiji	20.67	17.99	23.73	0.03	0.03	0.04	36.83	32.35	42.24	1.20	0.96	1.49
Finland	10.27	9.30	11.38	0.20	0.17	0.24	0.66	0.58	0.75	1.92	1.15	2.45
France	9.16	8.50	9.88	0.35	0.31	0.41	0.63	0.57	0.70	1.40	1.10	1.65
Gabon	23.84	19.52	30.11	0.23	0.17	0.32	7.54	5.24	10.66	1.42	0.70	2.09
Georgia	24.42	22.55	26.08	0.06	0.04	0.07	1.63	1.48	1.81	2.26	1.76	2.62
Germany	18.73	16.98	20.59	0.25	0.21	0.29	0.62	0.55	0.70	1.56	1.14	1.87

Ghana	21.21	18.38	24.07	0.01	0.01	0.02	7.85	6.43	9.62	0.57	0.45	0.74
Greece	18.20	16.84	19.65	0.02	0.01	0.02	0.26	0.23	0.29	1.26	0.61	1.69
Greenland	43.95	39.13	49.12	0.11	0.09	0.14	1.53	1.33	1.78	4.36	2.37	5.64
Grenada	12.87	11.91	13.86	0.16	0.14	0.18	1.98	1.78	2.18	1.17	0.99	1.48
Guam	23.63	21.41	26.23	0.09	0.08	0.11	3.42	2.82	4.22	4.96	4.13	6.44
Guatemala	15.73	14.30	17.25	0.03	0.03	0.04	2.51	2.22	2.84	1.75	1.24	2.08
Guinea	36.46	30.58	42.39	0.06	0.04	0.08	18.07	11.85	22.65	0.44	0.26	0.68
Guinea-Bissau	36.39	30.52	43.22	0.06	0.04	0.08	20.31	12.39	27.19	0.47	0.31	0.69
Guyana	13.66	12.21	15.31	0.04	0.03	0.05	3.50	3.05	3.99	1.07	0.82	1.29
Haiti	36.59	27.02	45.18	0.16	0.11	0.25	14.19	6.76	20.97	1.31	0.77	2.10
Honduras	28.74	22.83	36.14	0.13	0.09	0.20	4.53	3.13	6.52	2.40	1.56	3.47
Hungary	25.29	23.90	26.77	0.17	0.15	0.20	0.55	0.50	0.61	0.92	0.73	1.10
Iceland	16.67	15.62	17.79	0.02	0.02	0.02	0.43	0.39	0.48	1.67	1.24	1.99
India	113.73	94.03	127.54	0.30	0.24	0.36	26.85	14.49	38.76	4.32	2.64	6.90
Indonesia	41.74	35.72	46.60	0.04	0.03	0.05	13.84	9.52	18.52	1.07	0.84	1.50
Iran	18.85	18.05	20.19	0.17	0.15	0.19	5.03	4.75	5.49	0.55	0.37	0.62
Iraq	6.38	5.78	7.32	0.09	0.07	0.11	1.89	1.69	2.18	0.39	0.33	0.53
Ireland	24.26	22.02	27.02	0.07	0.06	0.09	0.57	0.49	0.65	3.85	2.13	4.97
Israel	12.14	11.28	13.02	0.03	0.03	0.04	0.97	0.87	1.07	1.28	1.05	1.52
Italy	13.14	12.25	14.19	0.25	0.21	0.28	0.26	0.23	0.29	1.44	0.93	1.75
Jamaica	18.86	16.20	21.78	0.03	0.03	0.04	2.94	2.52	3.45	0.74	0.53	0.91
Japan	7.11	6.61	7.99	0.24	0.22	0.27	0.45	0.42	0.51	3.43	2.54	3.86
Jordan	12.20	10.68	13.94	0.02	0.02	0.03	1.80	1.50	2.25	2.48	1.86	3.05
Kazakhstan	32.20	30.03	34.94	0.29	0.24	0.34	3.39	3.00	3.84	0.81	0.67	1.10
Kenya	30.76	26.35	39.44	0.29	0.20	0.46	7.88	6.30	11.28	0.86	0.37	1.71

Kiribati	39.73	34.09	46.09	0.82	0.64	1.06	65.49	54.62	77.67	1.32	0.96	1.67
Kuwait	4.50	4.07	4.97	0.01	0.01	0.01	1.06	0.93	1.19	1.66	1.35	1.98
Kyrgyzstan	35.70	33.93	37.56	0.01	0.00	0.01	1.22	1.10	1.36	0.40	0.30	0.61
Laos	51.13	41.62	62.23	0.05	0.03	0.07	21.96	13.90	31.97	1.03	0.72	1.49
Latvia	8.29	7.51	9.12	0.01	0.01	0.01	0.83	0.72	0.94	0.52	0.40	0.77
Lebanon	17.75	13.72	21.52	0.11	0.06	0.14	3.63	1.88	6.21	0.73	0.42	1.47
Lesotho	73.06	58.09	90.05	0.81	0.57	1.17	24.00	17.41	31.05	1.90	1.28	2.66
Liberia	21.30	17.39	26.24	0.03	0.02	0.05	8.99	6.72	12.26	0.26	0.15	0.39
Libya	23.14	17.39	28.86	0.14	0.09	0.19	6.89	4.86	9.59	1.00	0.48	2.02
Lithuania	11.09	10.36	11.83	0.01	0.01	0.01	0.61	0.55	0.67	0.40	0.33	0.57
Luxembourg	19.37	17.32	21.57	0.13	0.11	0.15	0.97	0.83	1.12	1.59	1.10	2.00
Macedonia	14.44	13.20	16.17	0.01	0.01	0.02	1.32	1.11	1.58	0.28	0.22	0.37
Madagascar	48.39	40.51	56.74	0.54	0.33	0.95	20.33	14.14	27.14	0.99	0.37	1.86
Malawi	26.21	22.79	30.27	0.31	0.19	0.60	9.30	6.56	12.44	0.57	0.21	1.10
Malaysia	23.77	20.62	31.63	0.01	0.01	0.01	2.14	1.66	2.95	1.16	0.89	1.80
Maldives	32.33	29.10	36.52	0.06	0.05	0.07	1.79	1.46	2.31	6.89	5.71	8.76
Mali	40.20	31.82	49.69	0.07	0.05	0.10	17.03	12.94	23.15	0.55	0.22	1.00
Malta	14.25	13.25	15.51	0.09	0.07	0.10	0.55	0.48	0.64	3.20	2.16	3.86
Marshall Islands	64.03	52.72	77.38	0.54	0.39	0.78	20.14	11.36	27.18	2.03	1.49	2.86
Mauritania	22.89	18.24	27.67	0.03	0.02	0.04	8.40	6.52	10.82	0.50	0.34	0.71
Mauritius	20.25	18.37	22.59	0.02	0.02	0.02	8.85	7.91	10.06	4.64	2.36	6.02
Mexico	28.25	27.49	29.18	0.14	0.13	0.15	1.40	1.31	1.50	2.84	1.84	3.24
Moldova	15.23	14.54	15.99	0.00	0.00	0.00	0.55	0.50	0.61	0.24	0.18	0.36
Mongolia	13.25	11.68	16.82	0.10	0.08	0.12	4.64	3.93	5.74	3.12	2.58	3.72
Montenegro	7.91	7.04	8.83	0.17	0.14	0.22	0.31	0.26	0.40	0.27	0.22	0.34



Morocco	18.59	15.12	22.90	0.13	0.10	0.17	8.53	6.26	10.62	0.49	0.32	0.94
Mozambique	27.89	23.75	33.05	0.34	0.22	0.63	11.17	7.51	14.76	0.54	0.24	1.04
Myanmar	108.01	73.98	126.75	0.08	0.06	0.11	37.53	24.26	50.14	2.60	1.81	3.55
Namibia	38.73	33.22	47.69	0.33	0.26	0.41	9.99	8.12	13.13	1.92	1.32	2.51
Nepal	102.90	84.21	129.57	0.26	0.18	0.41	23.66	14.84	36.72	3.06	1.36	5.88
Netherlands	25.11	23.32	27.12	0.07	0.06	0.08	0.33	0.30	0.37	1.65	0.84	2.20
New Zealand	22.35	20.80	24.25	0.18	0.15	0.22	1.07	0.99	1.16	2.00	1.05	2.63
Nicaragua	17.62	15.12	19.65	0.04	0.03	0.05	1.56	1.31	1.82	0.91	0.61	1.10
Niger	29.79	23.49	38.86	0.05	0.03	0.08	15.61	10.30	23.46	0.39	0.14	0.79
Nigeria	17.50	13.06	23.81	0.02	0.02	0.03	6.13	4.29	9.36	0.51	0.32	0.79
North Korea	153.65	123.63	210.14	0.68	0.47	1.04	7.76	5.30	11.96	0.85	0.48	1.41
Northern Mariana Islands	27.57	24.63	31.28	0.27	0.21	0.34	3.54	2.95	4.37	2.71	2.30	3.24
Norway	21.91	21.25	22.73	0.11	0.11	0.12	0.86	0.81	0.91	1.91	1.59	2.30
Oman	8.57	7.10	10.07	0.04	0.03	0.05	3.66	2.83	4.59	0.27	0.20	0.39
Pakistan	62.93	52.58	75.18	0.19	0.13	0.28	15.72	9.05	27.02	2.16	1.36	3.40
Palestine	12.33	10.98	14.64	0.06	0.04	0.09	3.15	2.76	3.86	3.10	2.64	3.77
Panama	15.05	14.02	16.10	0.03	0.02	0.03	1.37	1.22	1.54	1.91	1.30	2.25
Papua New Guinea	229.89	192.79	274.02	1.76	1.23	2.50	95.43	49.09	138.82	4.54	2.75	7.27
Paraguay	18.82	15.90	22.82	0.28	0.21	0.37	1.56	1.25	2.05	1.20	0.86	1.54
Peru	9.73	8.21	11.76	0.27	0.21	0.34	0.58	0.47	0.70	12.10	7.74	14.53
Philippines	38.40	34.12	43.33	0.03	0.03	0.04	16.89	15.01	19.16	0.29	0.21	0.43
Poland	14.57	13.58	15.61	0.08	0.07	0.09	0.66	0.59	0.72	0.67	0.51	0.78
Portugal	19.40	18.09	20.83	0.34	0.30	0.40	0.47	0.41	0.53	1.98	1.35	2.33
Puerto Rico	16.10	14.85	17.63	0.02	0.02	0.03	1.30	1.17	1.46	2.35	1.44	2.89

Qatar	11.95	10.08	14.35	0.06	0.04	0.08	0.55	0.43	0.76	0.58	0.44	0.84
Romania	17.04	15.76	18.29	0.08	0.07	0.09	0.57	0.51	0.64	1.41	0.98	2.31
Russian Federation	14.57	14.07	15.14	0.09	0.07	0.10	0.79	0.73	0.85	0.57	0.34	1.12
Rwanda	33.84	28.17	40.21	0.30	0.20	0.54	9.66	7.03	14.00	0.79	0.32	1.61
Saint Lucia	18.74	17.35	20.17	0.08	0.07	0.10	3.55	3.20	3.95	1.89	1.49	2.25
Saint Vincent and the Grenadines	10.67	9.81	11.56	0.16	0.14	0.18	2.74	2.49	3.03	1.01	0.73	1.18
Samoa	38.56	32.44	45.54	0.22	0.16	0.31	11.64	8.63	15.39	1.21	0.89	1.59
Sao Tome and Principe	63.95	51.94	75.86	0.10	0.07	0.12	22.86	16.31	28.23	1.39	0.98	1.78
Saudi Arabia	16.68	13.93	19.60	0.02	0.02	0.03	3.02	2.09	4.46	4.31	2.81	5.60
Senegal	28.27	23.80	33.51	0.04	0.03	0.06	12.77	9.64	16.39	0.47	0.29	0.68
Serbia	23.02	21.32	25.28	0.05	0.05	0.06	2.02	1.77	2.35	0.56	0.47	0.69
Seychelles	22.26	20.41	24.42	0.02	0.01	0.02	4.54	3.66	5.30	0.92	0.66	1.39
Sierra Leone	30.18	25.23	35.71	0.04	0.03	0.06	13.07	9.55	16.58	0.37	0.24	0.55
Singapore	7.68	7.00	8.41	0.01	0.01	0.01	0.57	0.51	0.63	1.05	0.72	1.67
Slovakia	10.89	9.88	12.55	0.07	0.06	0.09	0.52	0.45	0.62	0.78	0.63	0.91
Slovenia	11.48	10.50	12.61	0.14	0.12	0.16	0.40	0.35	0.46	0.91	0.45	1.23
Solomon Islands	57.31	46.70	68.53	0.51	0.33	0.81	24.02	11.43	34.23	1.12	0.70	1.73
Somalia	36.42	26.06	48.34	0.52	0.27	1.05	19.97	11.43	30.02	0.68	0.18	1.57
South Africa	34.01	32.32	36.23	0.50	0.46	0.57	9.30	8.50	10.13	2.71	2.27	3.66
South Korea	12.58	11.57	13.71	0.49	0.42	0.58	3.01	2.65	3.35	1.96	1.49	2.29
South Sudan	34.50	25.48	46.19	0.48	0.28	0.74	16.19	9.21	23.22	0.73	0.22	1.59
Spain	22.03	20.51	23.66	0.24	0.21	0.28	0.78	0.69	0.88	2.84	1.85	3.41
Sri Lanka	23.07	19.09	27.61	0.01	0.01	0.02	35.85	27.14	42.93	0.75	0.55	1.01
Sudan	22.63	17.88	28.67	0.16	0.11	0.23	13.98	7.65	20.12	0.45	0.26	0.91

Suriname	16.21	14.76	17.79	0.26	0.22	0.31	2.38	2.07	2.72	1.62	1.27	1.94
Swaziland	47.78	40.03	56.00	0.85	0.60	1.17	16.60	12.96	20.68	2.36	1.63	3.08
Sweden	15.33	14.19	16.51	0.08	0.07	0.10	0.61	0.56	0.68	2.03	1.33	2.46
Switzerland	11.79	10.91	12.67	0.07	0.05	0.08	0.49	0.44	0.55	1.44	1.07	1.67
Syria	16.51	13.90	19.59	0.03	0.02	0.04	6.95	5.86	8.58	0.84	0.63	1.29
Taiwan	20.55	19.25	21.92	0.58	0.51	0.65	1.77	1.61	1.94	0.76	0.39	1.01
Tajikistan	19.50	16.93	22.95	0.00	0.00	0.01	4.83	4.01	6.04	6.09	4.93	8.36
Tanzania	20.42	17.35	23.88	0.21	0.14	0.34	7.43	5.15	10.33	0.56	0.25	1.01
Thailand	17.31	15.29	21.17	0.01	0.01	0.01	3.71	3.18	4.54	0.33	0.25	0.54
The Bahamas	9.84	8.93	10.82	0.07	0.06	0.09	1.88	1.64	2.12	1.63	1.26	1.91
The Gambia	31.21	26.03	37.41	0.05	0.03	0.07	12.72	9.50	17.17	0.50	0.33	0.71
Timor-Leste	49.03	40.29	57.75	0.05	0.03	0.07	16.94	11.10	25.08	0.95	0.62	1.53
Togo	29.10	23.88	35.03	0.04	0.03	0.06	12.89	9.37	17.02	0.45	0.30	0.64
Tonga	41.87	36.64	48.08	0.33	0.23	0.46	11.23	8.61	14.58	1.55	1.22	1.95
Trinidad and Tobago	9.55	7.92	11.26	0.02	0.01	0.02	3.17	2.60	3.78	1.57	0.99	2.06
Tunisia	17.24	13.95	21.31	0.11	0.07	0.15	5.20	3.79	6.91	0.54	0.34	1.06
Turkey	31.90	27.75	35.06	0.09	0.08	0.11	2.11	1.73	2.43	0.98	0.79	1.32
Turkmenistan	12.10	11.16	13.09	0.01	0.01	0.02	0.80	0.65	0.98	0.67	0.50	0.95
Uganda	27.02	22.54	32.68	0.30	0.19	0.50	10.04	7.24	15.05	0.80	0.28	1.72
Ukraine	13.14	12.32	13.96	0.09	0.08	0.10	0.35	0.32	0.39	0.57	0.44	0.87
United Arab Emirates	31.85	26.10	39.08	0.29	0.19	0.40	9.62	6.75	12.44	1.72	0.68	4.42
United Kingdom	27.50	26.37	29.38	0.31	0.29	0.34	1.06	1.00	1.14	3.93	2.16	4.80
United States	28.96	28.10	30.03	0.19	0.17	0.20	0.86	0.82	0.91	3.50	2.48	3.87
Uruguay	29.22	26.44	32.06	0.06	0.05	0.07	1.93	1.68	2.23	2.17	1.59	2.59
Uzbekistan	15.87	14.29	17.73	0.05	0.04	0.06	4.86	4.30	5.47	2.92	2.41	3.58

Vanuatu	64.34	47.90	82.63	0.28	0.17	0.50	29.08	16.96	55.41	2.14	1.24	4.24
Venezuela	20.04	17.67	22.69	0.03	0.03	0.04	1.23	1.05	1.43	1.29	1.01	1.61
Vietnam	36.00	30.28	41.29	0.03	0.02	0.04	7.25	5.70	8.78	1.39	0.88	1.88
Virgin Islands, U.S.	11.87	10.13	13.41	0.11	0.09	0.13	2.31	1.96	2.68	2.71	2.18	3.31
Yemen	28.58	21.30	37.36	0.19	0.12	0.27	17.28	9.49	23.25	0.44	0.23	0.94
Zambia	28.15	24.09	32.36	0.29	0.21	0.46	10.85	7.20	14.80	0.79	0.37	1.32
Zimbabwe	36.19	29.71	43.52	0.10	0.07	0.13	21.42	15.34	26.62	1.11	0.68	1.50

UI, uncertainty interval.

## Supplemental material

### Socio-Demographic Index (SDI) Definitions and Method <sup>11</sup>

The Socio-demographic Index (SDI) is a composite indicator of development status strongly correlated with health outcomes. In short, it is the geometric mean of 0 to 1 indices of total fertility under 25 (TFU25), mean education for those aged 15 and older (EDU15+), and lag distributed income (LDI) per capita.

An index score of 0 represents the minimum level of each covariate input past which selected health outcomes can get no worse, while an index score of 1 represents the maximum level of each covariate input past which selected health outcomes cease to improve. As a composite, a location with an SDI of 0 would have a theoretical minimum level of development relevant to these health outcomes, while a location with an SDI of 1 would have a theoretical maximum level of development relevant to these health outcomes.

The final scales for GBD 2017 are summarized in table below.

Input	Lower Bound	Upper Bound
TFU25	0	3
LDI per capita	250 USD (5.52 log USD) <sup>a</sup>	60,000 USD (11.00 log USD)
EDU15+	0 years	17 years

<sup>a</sup>The minimum for the LDI scale was originally set at the theoretical limit of 0 USD, as we did not observe an asymptotic relationship between log(LDI) and E<sub>0</sub> or 5q<sub>0</sub> at lower values of log(LDI). Empirically, however, we also did not observe an LDI below 350 USD (5.86 log USD) for the estimation period 1970-2016. In log-space, this meant that approximately half of our scale was not being utilized, compressing the observed variation in LDI and diminishing its meaningful contribution to SDI. Accordingly, we set the lower limit on LDI to 250 USD (5.52 log USD) to ensure we were fully utilizing the range of the scale to capture its variation across space and time, as is the case with the other two inputs.

Using scales described above, we computed the index scores underlying SDI as follows:

$$I_{Cty} = (C_{ty} - C_{low}) / (C_{high} - C_{low})$$

Where  $I_{cly}$  – the index for covariate  $C$ , location  $l$ , and year  $y$  – is equal to the difference between the value of that covariate in that location-year and the lower bound of the covariate divided by the difference between the upper and lower bounds for that covariate. If the values of input covariates fell outside the upper or lower bounds (e.g. LDI per capita greater than 60,000 USD), they were mapped to the respective upper or lower bounds. The index value for TFU25 was computed as  $1 - I_{TFU25ly}$ , as lower TFU25s correspond to higher levels of development, and thus higher index scores. For GBD 2017 we expanded the computation of SDI to 890 national and subnational locations spanning the time period 1950-2017.

The composite SCI was the geometric mean of these three indices for a given location-year. The cutoff values used to determine quintiles for analysis were computed using country-level estimates of SDI for the year 2017, excluding countries with populations less than 1 million.

### **Example Calculation**

Below we present the calculation of SDI for Mexico in the year 2010

$$TFU25 = 1.09; \text{ Mean educ yrs pc} = 8.23; \ln LDI = 9.60$$

$$I_{TFU25} = 1 - \frac{1.09 - 0}{3 - 0} = .637$$

$$I_{Educ} = \frac{8.23 - 0}{17 - 0} = .484$$

$$I_{\ln LDI} = \frac{9.60 - 5.52}{11.00 - 5.52} = .744$$

$$SDI = \sqrt[3]{I_{TFU25} * I_{Educ} * I_{\ln LDI}} = \sqrt[3]{.637 * .484 * .744} = .611$$

**The SDI values by location in 2017 are provided in table below**

Location ID	Location Name	SDI Index Value	SDI Quintile
1	Global	0.652	
31	Central Europe, Eastern Europe, and Central Asia	0.766	
32	Central Asia	0.673	
33	Armenia	0.702	High-middle SDI
34	Azerbaijan	0.701	High-middle SDI
35	Georgia	0.700	High-middle SDI
36	Kazakhstan	0.735	High-middle SDI
37	Kyrgyzstan	0.607	Low-middle SDI
38	Mongolia	0.662	Middle SDI
39	Tajikistan	0.523	Low-middle SDI
40	Turkmenistan	0.696	Middle SDI
41	Uzbekistan	0.630	Middle SDI
42	Central Europe	0.814	
43	Albania	0.685	Middle SDI
44	Bosnia and Herzegovina	0.713	High-middle SDI
45	Bulgaria	0.792	High-middle SDI
46	Croatia	0.825	High SDI
47	Czech Republic	0.851	High SDI
48	Hungary	0.817	High-middle SDI
49	Macedonia	0.754	High-middle SDI
50	Montenegro	0.788	High-middle SDI
51	Poland	0.844	High SDI
52	Romania	0.784	High-middle SDI
53	Serbia	0.752	High-middle SDI

54	Slovakia	0.842	High SDI
55	Slovenia	0.860	High SDI
56	Eastern Europe	0.785	
57	Belarus	0.773	High-middle SDI
58	Estonia	0.858	High SDI
59	Latvia	0.825	High SDI
60	Lithuania	0.841	High SDI
61	Moldova	0.676	Middle SDI
62	Russian Federation	0.792	High-middle SDI
63	Ukraine	0.740	High-middle SDI
64	High-income	0.854	
70	Australasia	0.869	
71	Australia	0.873	High SDI
72	New Zealand	0.842	High SDI
65	High-income Asia Pacific	0.869	
66	Brunei	0.856	High SDI
67	Japan	0.865	High SDI
35446	Aichi	0.875	High SDI
35428	Akita	0.829	High SDI
35425	Aomori	0.825	High SDI
35435	Chiba	0.859	High SDI
35461	Ehime	0.838	High SDI
35441	Fukui	0.852	High SDI
35463	Fukuoka	0.855	High SDI
35430	Fukushima	0.831	High SDI



35444	Gifu	0.849	High SDI
35433	Gunma	0.851	High SDI
35457	Hiroshima	0.863	High SDI
35424	Hokkaido	0.842	High SDI
35451	Hyogo	0.860	High SDI
35431	Ibaraki	0.851	High SDI
35440	Ishikawa	0.856	High SDI
35426	Iwate	0.825	High SDI
35460	Kagawa	0.850	High SDI
35469	Kagoshima	0.830	High SDI
35437	Kanagawa	0.875	High SDI
35462	Kochi	0.825	High SDI
35466	Kumamoto	0.832	High SDI
35449	Kyoto	0.873	High SDI
35447	Mie	0.854	High SDI
35427	Miyagi	0.850	High SDI
35468	Miyazaki	0.823	High SDI
35443	Nagano	0.851	High SDI
35465	Nagasaki	0.826	High SDI
35452	Nara	0.848	High SDI
35438	Niigata	0.843	High SDI
35467	Oita	0.846	High SDI
35456	Okayama	0.856	High SDI
35470	Okinawa	0.818	High SDI
35450	Osaka	0.872	High SDI

35464	Saga	0.834	High SDI
35434	Saitama	0.852	High SDI
35448	Shiga	0.871	High SDI
35455	Shimane	0.831	High SDI
35445	Shizuoka	0.859	High SDI
35432	Tochigi	0.853	High SDI
35459	Tokushima	0.845	High SDI
35436	Tokyo	0.924	High SDI
35454	Tottori	0.834	High SDI
35439	Toyama	0.860	High SDI
35453	Wakayama	0.840	High SDI
35429	Yamagata	0.832	High SDI
35458	Yamaguchi	0.849	High SDI
35442	Yamanashi	0.854	High SDI
68	South Korea	0.872	High SDI
69	Singapore	0.872	High SDI
100	High-income North America	0.868	
101	Canada	0.882	High SDI
349	Greenland	0.760	High-middle SDI
102	United States	0.867	High SDI
523	Alabama	0.837	High SDI
524	Alaska	0.861	High SDI
525	Arizona	0.845	High SDI
526	Arkansas	0.826	High SDI
527	California	0.872	High SDI

528	Colorado	0.882	High SDI
529	Connecticut	0.906	High SDI
530	Delaware	0.874	High SDI
531	District of Columbia	0.890	High SDI
532	Florida	0.864	High SDI
533	Georgia	0.848	High SDI
534	Hawaii	0.872	High SDI
535	Idaho	0.841	High SDI
536	Illinois	0.879	High SDI
537	Indiana	0.848	High SDI
538	Iowa	0.870	High SDI
539	Kansas	0.864	High SDI
540	Kentucky	0.831	High SDI
541	Louisiana	0.835	High SDI
542	Maine	0.872	High SDI
543	Maryland	0.896	High SDI
544	Massachusetts	0.913	High SDI
545	Michigan	0.868	High SDI
546	Minnesota	0.893	High SDI
547	Mississippi	0.819	High SDI
548	Missouri	0.853	High SDI
549	Montana	0.863	High SDI
550	Nebraska	0.873	High SDI
551	Nevada	0.847	High SDI
552	New Hampshire	0.904	High SDI

553	New Jersey	0.899	High SDI
554	New Mexico	0.835	High SDI
555	New York	0.893	High SDI
556	North Carolina	0.850	High SDI
557	North Dakota	0.880	High SDI
558	Ohio	0.858	High SDI
559	Oklahoma	0.838	High SDI
560	Oregon	0.871	High SDI
561	Pennsylvania	0.879	High SDI
562	Rhode Island	0.890	High SDI
563	South Carolina	0.846	High SDI
564	South Dakota	0.860	High SDI
565	Tennessee	0.837	High SDI
566	Texas	0.838	High SDI
567	Utah	0.856	High SDI
568	Vermont	0.896	High SDI
569	Virginia	0.885	High SDI
570	Washington	0.884	High SDI
571	West Virginia	0.825	High SDI
572	Wisconsin	0.878	High SDI
573	Wyoming	0.869	High SDI
96	Southern Latin America	0.720	
97	Argentina	0.710	High-middle SDI
98	Chile	0.748	High-middle SDI
99	Uruguay	0.707	High-middle SDI

73	Western Europe	0.857	
74	Andorra	0.902	High SDI
75	Austria	0.866	High SDI
76	Belgium	0.886	High SDI
77	Cyprus	0.865	High SDI
78	Denmark	0.918	High SDI
79	Finland	0.893	High SDI
80	France	0.865	High SDI
81	Germany	0.870	High SDI
82	Greece	0.817	High SDI
83	Iceland	0.907	High SDI
84	Ireland	0.882	High SDI
85	Israel	0.816	High-middle SDI
86	Italy	0.843	High SDI
87	Luxembourg	0.916	High SDI
88	Malta	0.836	High SDI
89	Netherlands	0.912	High SDI
90	Norway	0.911	High SDI
91	Portugal	0.778	High-middle SDI
92	Spain	0.825	High SDI
93	Sweden	0.883	High SDI
4944	Stockholm	0.914	High SDI
4940	Sweden except Stockholm	0.873	High SDI
94	Switzerland	0.889	High SDI
95	United Kingdom	0.843	High SDI

4749	England	0.849	High SDI
4621	East Midlands	0.830	High SDI
4623	East of England	0.840	High SDI
4624	Greater London	0.894	High SDI
4618	North East England	0.821	High SDI
4619	North West England	0.834	High SDI
4625	South East England	0.856	High SDI
4626	South West England	0.841	High SDI
4622	West Midlands	0.829	High SDI
4620	Yorkshire and the Humber	0.830	High SDI
433	Northern Ireland	0.835	High SDI
434	Scotland	0.805	High SDI
4636	Wales	0.806	High SDI
103	Latin America and Caribbean	0.640	
120	Andean Latin America	0.628	
121	Bolivia	0.587	Low-middle SDI
122	Ecuador	0.636	Middle SDI
123	Peru	0.636	Middle SDI
104	Caribbean	0.638	
105	Antigua and Barbuda	0.715	High-middle SDI
106	The Bahamas	0.756	High-middle SDI
107	Barbados	0.739	High-middle SDI
108	Belize	0.602	Low-middle SDI
305	Bermuda	0.805	High-middle SDI
109	Cuba	0.688	Middle SDI

110	Dominica	0.687	Middle SDI
111	Dominican Republic	0.593	Low-middle SDI
112	Grenada	0.640	Middle SDI
113	Guyana	0.584	Low-middle SDI
114	Haiti	0.442	Low SDI
115	Jamaica	0.679	Middle SDI
385	Puerto Rico	0.813	High-middle SDI
116	Saint Lucia	0.653	Middle SDI
117	Saint Vincent and the Grenadines	0.608	Middle SDI
118	Suriname	0.641	Middle SDI
119	Trinidad and Tobago	0.698	Middle SDI
422	Virgin Islands, U.S.	0.807	High-middle SDI
124	Central Latin America	0.623	
125	Colombia	0.634	Middle SDI
126	Costa Rica	0.662	Middle SDI
127	El Salvador	0.593	Low-middle SDI
128	Guatemala	0.524	Low-middle SDI
129	Honduras	0.512	Low-middle SDI
130	Mexico	0.628	Middle SDI
4643	Aguascalientes	0.659	Middle SDI
4644	Baja California	0.657	Middle SDI
4645	Baja California Sur	0.659	Middle SDI
4646	Campeche	0.616	Middle SDI
4649	Chiapas	0.533	Middle SDI
4650	Chihuahua	0.639	Middle SDI

4647	Coahuila	0.645	Middle SDI
4648	Colima	0.654	Middle SDI
4652	Durango	0.624	Middle SDI
4653	Guanajuato	0.621	Middle SDI
4654	Guerrero	0.562	Middle SDI
4655	Hidalgo	0.587	Middle SDI
4656	Jalisco	0.649	Middle SDI
4657	Mexico	0.635	Middle SDI
4651	Mexico City	0.716	Middle SDI
4658	Michoacan de Ocampo	0.586	Middle SDI
4659	Morelos	0.635	Middle SDI
4660	Nayarit	0.620	Middle SDI
4661	Nuevo Leon	0.677	Middle SDI
4662	Oaxaca	0.561	Middle SDI
4663	Puebla	0.584	Middle SDI
4664	Queretaro	0.639	Middle SDI
4665	Quintana Roo	0.626	Middle SDI
4666	San Luis Potosi	0.621	Middle SDI
4667	Sinaloa	0.649	Middle SDI
4668	Sonora	0.650	Middle SDI
4669	Tabasco	0.611	Middle SDI
4670	Tamaulipas	0.647	Middle SDI
4671	Tlaxcala	0.604	Middle SDI
4672	Veracruz de Ignacio de la Llave	0.592	Middle SDI
4673	Yucatan	0.630	Middle SDI



4674	Zacatecas	0.608	Middle SDI
131	Nicaragua	0.530	Low-middle SDI
132	Panama	0.677	Middle SDI
133	Venezuela	0.655	Middle SDI
134	Tropical Latin America	0.662	
135	Brazil	0.663	Middle SDI
4750	Acre	0.602	Low-middle SDI
4751	Alagoas	0.556	Low-middle SDI
4753	Amapa	0.659	Middle SDI
4752	Amazonas	0.629	Middle SDI
4754	Bahia	0.591	Low-middle SDI
4755	Ceara	0.600	Low-middle SDI
4756	Distrito Federal	0.792	High-middle SDI
4757	Espirito Santo	0.677	Middle SDI
4758	Goiias	0.650	Middle SDI
4759	Maranhao	0.507	Low-middle SDI
4762	Mato Grosso	0.662	Middle SDI
4761	Mato Grosso do Sul	0.650	Middle SDI
4760	Minas Gerais	0.661	Middle SDI
4763	Para	0.579	Low-middle SDI
4764	Paraiba	0.574	Low-middle SDI
4765	Parana	0.682	Middle SDI
4766	Pernambuco	0.594	Low-middle SDI
4767	Piaui	0.552	Low-middle SDI
4768	Rio de Janeiro	0.709	High-middle SDI

4769	Rio Grande do Norte	0.605	Low-middle SDI
4772	Rio Grande do Sul	0.693	Middle SDI
4770	Rondonia	0.622	Middle SDI
4771	Roraima	0.646	Middle SDI
4773	Santa Catarina	0.702	High-middle SDI
4775	Sao Paulo	0.720	High-middle SDI
4774	Sergipe	0.616	Middle SDI
4776	Tocantins	0.611	Middle SDI
136	Paraguay	0.619	Middle SDI
137	North Africa and Middle East	0.639	
138	North Africa and Middle East	0.639	
160	Afghanistan	0.290	Low SDI
139	Algeria	0.696	Middle SDI
140	Bahrain	0.712	High-middle SDI
141	Egypt	0.604	Low-middle SDI
142	Iran	0.700	High-middle SDI
143	Iraq	0.585	Low-middle SDI
144	Jordan	0.697	Middle SDI
145	Kuwait	0.786	High-middle SDI
146	Lebanon	0.730	High-middle SDI
147	Libya	0.761	High-middle SDI
148	Morocco	0.579	Low-middle SDI
149	Palestine	0.541	Low-middle SDI
150	Oman	0.744	High-middle SDI
151	Qatar	0.766	High-middle SDI

152	Saudi Arabia	0.779	High-middle SDI
522	Sudan	0.478	Low-middle SDI
153	Syria	0.611	Middle SDI
154	Tunisia	0.675	Middle SDI
155	Turkey	0.729	High-middle SDI
156	United Arab Emirates	0.795	High-middle SDI
157	Yemen	0.430	Low SDI
158	South Asia	0.534	
159	South Asia	0.534	
161	Bangladesh	0.458	Low SDI
162	Bhutan	0.570	Low-middle SDI
163	India	0.550	Low-middle SDI
164	Nepal	0.429	Low SDI
165	Pakistan	0.492	Low-middle SDI
4	Southeast Asia, East Asia, and Oceania	0.685	
5	East Asia	0.709	
6	China	0.707	High-middle SDI
7	North Korea	0.538	Low-middle SDI
8	Taiwan	0.864	High SDI
21	Oceania	0.471	
298	American Samoa	0.702	High-middle SDI
25	Federated States of Micronesia	0.575	Low-middle SDI
22	Fiji	0.641	Middle SDI
351	Guam	0.794	High-middle SDI
23	Kiribati	0.427	Low SDI

24	Marshall Islands	0.550	Low-middle SDI
376	Northern Mariana Islands	0.758	High-middle SDI
26	Papua New Guinea	0.419	Low SDI
27	Samoa	0.576	Low-middle SDI
28	Solomon Islands	0.425	Low SDI
29	Tonga	0.625	Middle SDI
30	Vanuatu	0.475	Low-middle SDI
9	Southeast Asia	0.641	
10	Cambodia	0.482	Low-middle SDI
11	Indonesia	0.648	Middle SDI
4709	Aceh	0.640	Middle SDI
4726	Bali	0.647	Middle SDI
4717	Bangka-Belitung Islands	0.637	Middle SDI
4725	Banten	0.636	Middle SDI
4715	Bengkulu	0.606	Low-middle SDI
4737	Gorontalo	0.557	Low-middle SDI
4720	Jakarta	0.795	High-middle SDI
4713	Jambi	0.641	Middle SDI
4721	West Java	0.636	Middle SDI
4722	Central Java	0.607	Middle SDI
4724	East Java	0.642	Middle SDI
4729	West Kalimantan	0.589	Low-middle SDI
4731	South Kalimantan	0.624	Middle SDI
4730	Central Kalimantan	0.642	Middle SDI
4732	East Kalimantan	0.747	High-middle SDI

4719	North Kalimantan	0.756	High-middle SDI
4718	Riau Islands	0.728	High-middle SDI
4716	Lampung	0.616	Middle SDI
4739	Maluku	0.556	Low-middle SDI
4740	North Maluku	0.546	Low-middle SDI
4727	West Nusa Tenggara	0.557	Low-middle SDI
4728	East Nusa Tenggara	0.519	Low-middle SDI
4742	Papua	0.588	Low-middle SDI
4741	West Papua	0.683	Middle SDI
4712	Riau	0.714	High-middle SDI
4738	West Sulawesi	0.559	Low-middle SDI
4735	South Sulawesi	0.611	Middle SDI
4734	Central Sulawesi	0.612	Middle SDI
4736	Southeast Sulawesi	0.596	Low-middle SDI
4733	North Sulawesi	0.652	Middle SDI
4711	West Sumatra	0.641	Middle SDI
4714	South Sumatra	0.642	Middle SDI
4710	North Sumatra	0.653	Middle SDI
4723	Yogyakarta	0.650	Middle SDI
12	Laos	0.519	Low-middle SDI
13	Malaysia	0.759	High-middle SDI
14	Maldives	0.655	Middle SDI
183	Mauritius	0.720	High-middle SDI
15	Myanmar	0.556	Low-middle SDI
16	Philippines	0.617	Middle SDI

17	Sri Lanka	0.680	Middle SDI
186	Seychelles	0.692	Middle SDI
18	Thailand	0.684	Middle SDI
19	Timor-Leste	0.505	Low-middle SDI
20	Vietnam	0.607	Middle SDI
166	Sub-Saharan Africa	0.446	
167	Central Sub-Saharan Africa	0.457	
168	Angola	0.461	Low-middle SDI
169	Central African Republic	0.334	Low SDI
170	Congo	0.574	Low-middle SDI
171	Democratic Republic of the Congo	0.364	Low SDI
172	Equatorial Guinea	0.625	Middle SDI
173	Gabon	0.651	Middle SDI
174	Eastern Sub-Saharan Africa	0.387	
175	Burundi	0.310	Low SDI
176	Comoros	0.434	Low SDI
177	Djibouti	0.485	Low-middle SDI
178	Eritrea	0.409	Low SDI
179	Ethiopia	0.334	Low SDI
180	Kenya	0.499	Low-middle SDI
181	Madagascar	0.331	Low SDI
182	Malawi	0.349	Low SDI
184	Mozambique	0.340	Low SDI
185	Rwanda	0.407	Low SDI
187	Somalia	0.235	Low SDI

435	South Sudan	0.275	Low SDI
189	Tanzania	0.412	Low SDI
190	Uganda	0.388	Low SDI
191	Zambia	0.472	Low-middle SDI
192	Southern Sub-Saharan Africa	0.640	
193	Botswana	0.663	Middle SDI
194	Lesotho	0.493	Low-middle SDI
195	Namibia	0.616	Middle SDI
196	South Africa	0.677	Middle SDI
197	Swaziland	0.578	Low-middle SDI
198	Zimbabwe	0.463	Low-middle SDI
199	Western Sub-Saharan Africa	0.441	
200	Benin	0.373	Low SDI
201	Burkina Faso	0.284	Low SDI
202	Cameroon	0.482	Low-middle SDI
203	Cape Verde	0.549	Low-middle SDI
204	Chad	0.253	Low SDI
205	Cote d'Ivoire	0.412	Low SDI
206	The Gambia	0.405	Low SDI
207	Ghana	0.537	Low-middle SDI
208	Guinea	0.325	Low SDI
209	Guinea-Bissau	0.349	Low SDI
210	Liberia	0.328	Low SDI
211	Mali	0.267	Low SDI
212	Mauritania	0.471	Low-middle SDI

213	Niger	0.191	Low SDI
214	Nigeria	0.493	Low-middle SDI
215	Sao Tome and Principe	0.488	Low-middle SDI
216	Senegal	0.373	Low SDI
217	Sierra Leone	0.357	Low SDI
218	Togo	0.413	Low SDI

### Reference

1. Global, regional, and national disability-adjusted life-years (DALYs) for 333 diseases and injuries and healthy life expectancy (HALE) for 195 countries and territories, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet* 2017;390(10100):1260-344.