

Supplemental Information for
One-Third of Global Population at Cancer Risk due to Elevated Volatile Organic Compounds Levels

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Number of Pages (including this cover page): 30

Number of Figures: 10

Number of Tables: 6

Number of Texts: 2

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Text S1. CAM6-Chem model evaluation

To evaluate model performances in predicting surface BTEX concentrations, we compared model simulated benzene, toluene, xylenes (the sum of *m/p*-xylene, *o*-xylene, and ethylbenzene) concentrations with those measured from ground monitoring networks in the U.S., Canada, and Europe for the year of 2019. Specifically, BTEX observations over the U.S. were downloaded from Ambient Monitoring Technology Information Center (AMTIC) Archive for Hazardous Air Pollutants (<https://www.epa.gov/amtic/amtic-ambient-monitoring-archive-haps>). In Canada, National Air Pollution Surveillance Program (NAPS) data portal (<https://donnees.ec.gc.ca/data/air/monitor/national-air-pollution-surveillance-naps-program/Data-Donnees/?lang=en>) provided VOC measurement data at 39 monitoring stations across 10 provinces and 3 territories of Canada. Over Europe, we accessed BTEX measurements in different European countries from the European Environment Agency Air Quality e-Reporting system (<https://www.eea.europa.eu/data-and-maps/data/aqereporting-9>). Due to sporadic measurements of VOC and lacking nationwide monitoring networks in China and India, we only selected U.S., Canada, and Europe here for model evaluation.

Figure S1 shows the comparison of surface benzene, toluene, xylenes, and BTEX between observed and modeled values over Europe (red square), the U.S. (blue triangle), and Canada (grey dot) in 2019. We found that the normalized mean bias (NMB) between modeled and observed BTEX concentrations were $\pm 25\%$ (Fig. S1d), with Europe and Canada being underestimated while U.S. being overpredicted. The overestimate of BTEX concentrations over the U.S. is largely attributed to the overprediction of xylenes (by 113.6%, Fig. S1c) from 176 U.S. sites. In contrast, the underestimate of BTEX over Canada is resulted from the underproduction of toluene (by 44.3%, Fig. S1b), as the other two species showed a similar overpredicting pattern to the U.S. Over Europe, we found that benzene, toluene, and xylenes were consistently underestimated by 32.1%, 50.1%, and 6.7%, respectively (Fig. S1 a-c). These results implied possible underestimate of anthropogenic emissions of BTEX over Europe while overestimate of benzene and xylenes emissions in the U.S. and Canada. The coarse horizontal resolution,^{1, 2} simplified chemistry schemes³ (TS1 in this study), and misrepresentation of model constraints⁴ are potential reasons causing the discrepancies between model simulated BTEX concentrations and surface observations. We acknowledge that these biases will inevitably lead to uncertainty in estimating global inhalation cancer risk of benzene and BTEX-induced annual total preterm births over the

study period. Further improvements to the BTEX anthropogenic emission inventory and employ better represented chemical mechanism and a finer horizontal resolution might be considered in future endeavors. However, this is not the focus of this study.

Text S2. Calculation of the integrated lifetime inhalation cancer risk (LICR) for each age group

1) The 3rd trimester:

$$LICR_{i,j,k} = Dose_{i,j,k, \text{third trimester}} \times CPF_k \times 10 \times 0.25 / 70 \times 0.85$$

$$Dose_{i,j,k, \text{third trimester}} = PWC_{i,j,k} \times (BR/BW)_{\text{third trimester}} \times 0.96 \times 10^{-6}$$

2) Age 0-2 years old:

$$LICR_{i,j,k} = Dose_{i,j,k, \text{age 0-2}} \times CPF_k \times 10 \times 2 / 70 \times 0.85$$

$$Dose_{i,j,k, \text{age 0-2}} = PWC_{i,j,k} \times (BR/BW)_{0-2} \times 0.96 \times 10^{-6}$$

3) Age 2-9 years old:

$$LICR_{i,j,k} = Dose_{i,j,k, \text{age 2-9}} \times CPF_k \times 3 \times 7 / 70 \times 0.72$$

$$Dose_{i,j,k, \text{age 2-9}} = PWC_{i,j,k} \times (BR/BW)_{2-9} \times 0.96 \times 10^{-6}$$

4) Age 9-16 years old:

$$LICR_{i,j,k} = Dose_{i,j,k, \text{age 9-16}} \times CPF_k \times 3 \times 7 / 70 \times 0.72$$

$$Dose_{i,j,k, \text{age 9-16}} = PWC_{i,j,k} \times (BR/BW)_{9-16} \times 0.96 \times 10^{-6}$$

5) Age 16-30 years old:

$$LICR_{i,j,k} = Dose_{i,j,k, \text{age 16-30}} \times CPF_k \times 1 \times 14 / 70 \times 0.73$$

$$Dose_{i,j,k, \text{age 16-30}} = PWC_{i,j,k} \times (BR/BW)_{16-30} \times 0.96 \times 10^{-6}$$

6) Age 30-70 years old:

$$LICR_{i,j,k} = Dose_{i,j,k, \text{age 30-70}} \times CPF_k \times 1 \times 40 / 70 \times 0.73$$

$$Dose_{i,j,k, \text{age 30-70}} = PWC_{i,j,k} \times (BR/BW)_{30-70} \times 0.96 \times 10^{-6}$$

For a 70-year exposure duration (representing the lifetime residency):

$$\text{Integrated LICR}_{i,j,k} = (\text{Dose}_{i,j,k, \text{third trimester}} \times \text{CPF}_k \times 10 \times 0.25 / 70 \times 0.85) + (\text{Dose}_{i,j,k, \text{age 0-2}} \times \text{CPF}_k \times 10 \times 2 / 70 \times 0.85) + (\text{Dose}_{i,j,k, \text{age 2-9}} \times \text{CPF}_k \times 3 \times 7 / 70 \times 0.72) + (\text{Dose}_{i,j,k, \text{age 9-16}} \times \text{CPF}_k \times 3 \times 7 / 70 \times 0.72) + (\text{Dose}_{i,j,k, \text{age 16-30}} \times \text{CPF}_k \times 1 \times 14 / 70 \times 0.73) + (\text{Dose}_{i,j,k, \text{age 30-70}} \times \text{CPF}_k \times 40 \times 14 / 70 \times 0.73)$$

where exposure parameters of (BR/BW) for each age group and CPF_k for each carcinogen are provided in Tables S1-S2. $\text{PWC}_{i,j,k}$ represents population-weighted concentration of carcinogen k for the grid cell (i, j) . After calculating the lifetime inhalation cancer risk of individual species, we summed them up to estimate the integrated cancer risk of all carcinogenic VOCs.

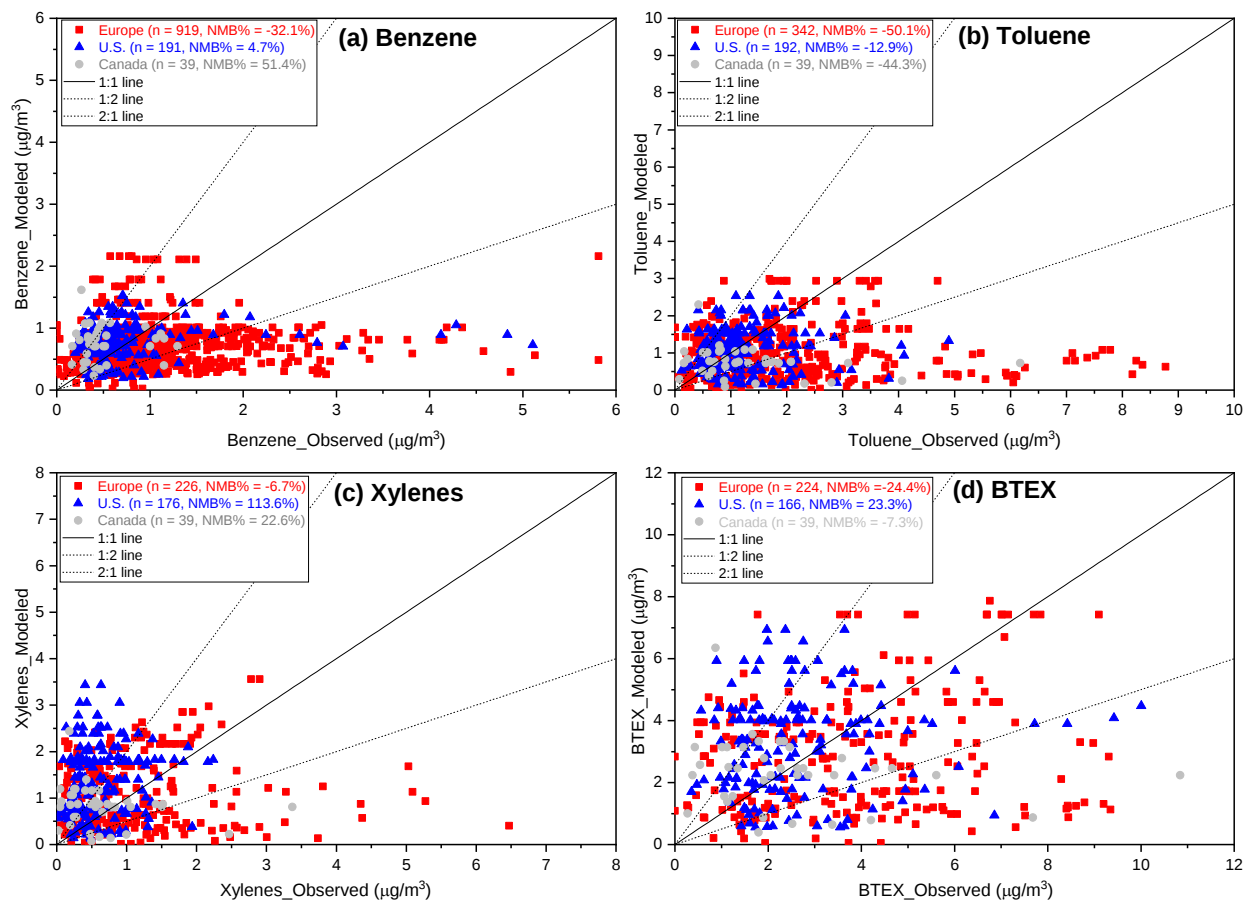


Figure S1. Scatter plots of surface (a) benzene, (b) toluene, (c) xylenes, and (d) BTEX concentrations between model simulations and in-situ observations for Europe (red square), the U.S. (blue triangle), and Canada (grey dot) in 2019. The solid black line is 1:1 reference line and the dashed are 1:2 and 2:1 reference line. The normalized mean bias (NMB) in each region is calculated as $NMB = \frac{\sum_i (M_i - O_i)}{\sum_i O_i} \times 100\%$, where M_i and O_i denote modeled and observed values at each observational site (i), respectively. The number of observation site (n) and calculated NMB are presented in the legend of each panel.

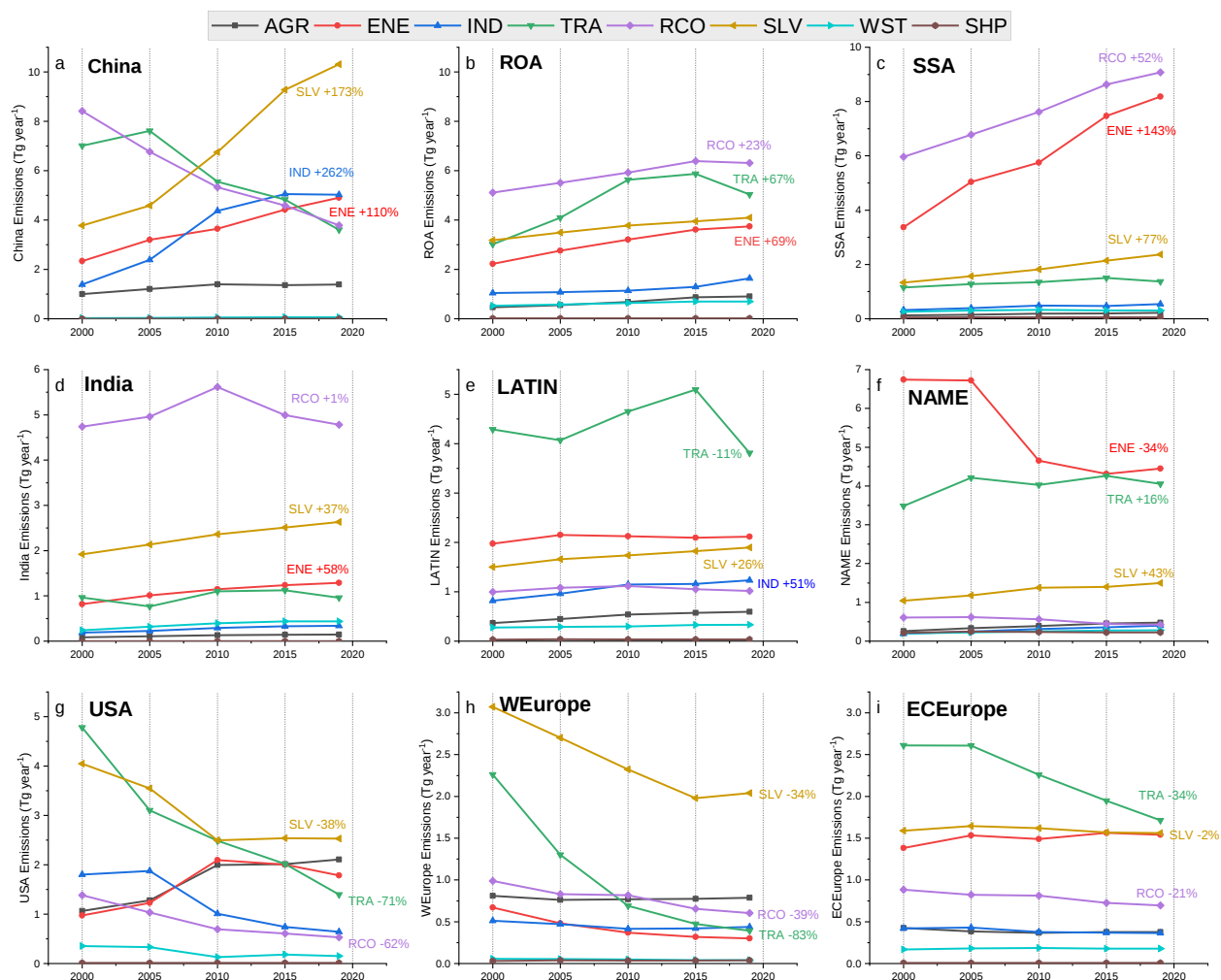


Figure S2. Interannual variation of the total NMVOC emissions from eight sectors in (a) China, (b) ROA, (c) SSA, (d) India, (e) LATIN, (f) NAME, (g) USA, (h) WEurope, and (i) ECEurope for 2000-2019. Eight sectors: AGR, ENE, IND, TRA, RCO, SLV, WST, and SHP in the legend respectively denote agriculture, energy, industry, transportation, residential, commercial, and others, solvent usage, waste, and shipping. Percentages shown in the plots are the relative rate of change in NMVOC emissions from dominant sectors during 2000-2019. It should be noted that Canada and rest of the world (ROW) were not plotted here due to their marginal contributions to global annual NMVOC emissions.

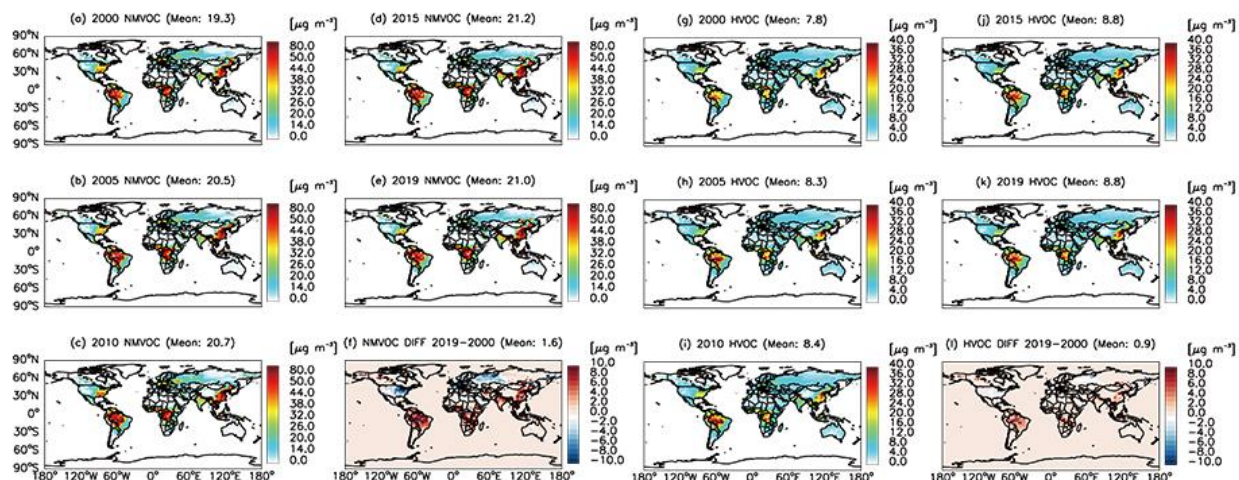


Figure S3. Interannual variation of surface NMVOC and HVOC concentrations between 2000 and 2019. Annual mean value is shown in the panel's title. Panels (f) and (l) respectively show differences of NMVOC and HVOC concentrations between 2019 and 2000.

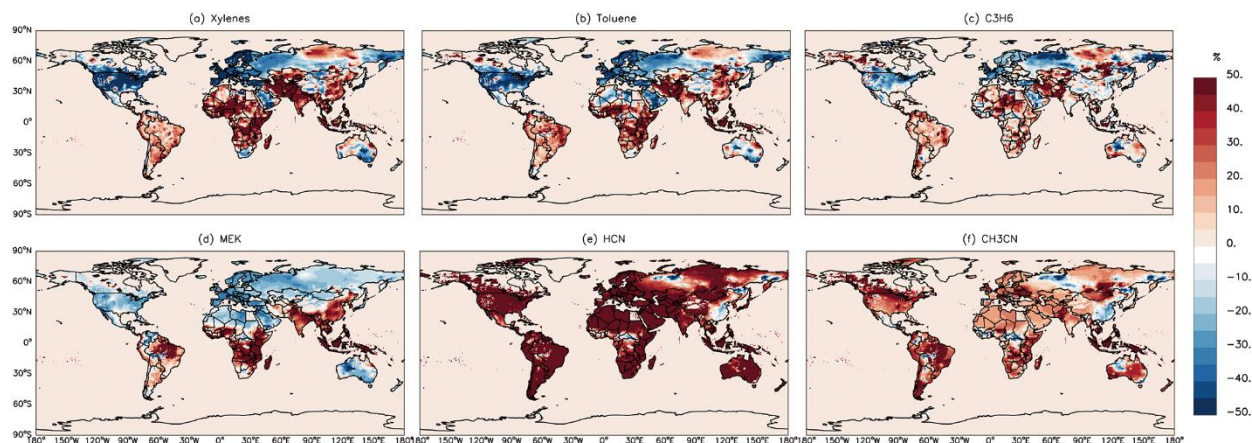


Figure S4. Percentage change in surface concentration of (a) xylenes, (b) toluene, (c) propylene, (d) MEK, (e) hydrogen cyanide, and (f) acetonitrile in 2019 compared to 2000.

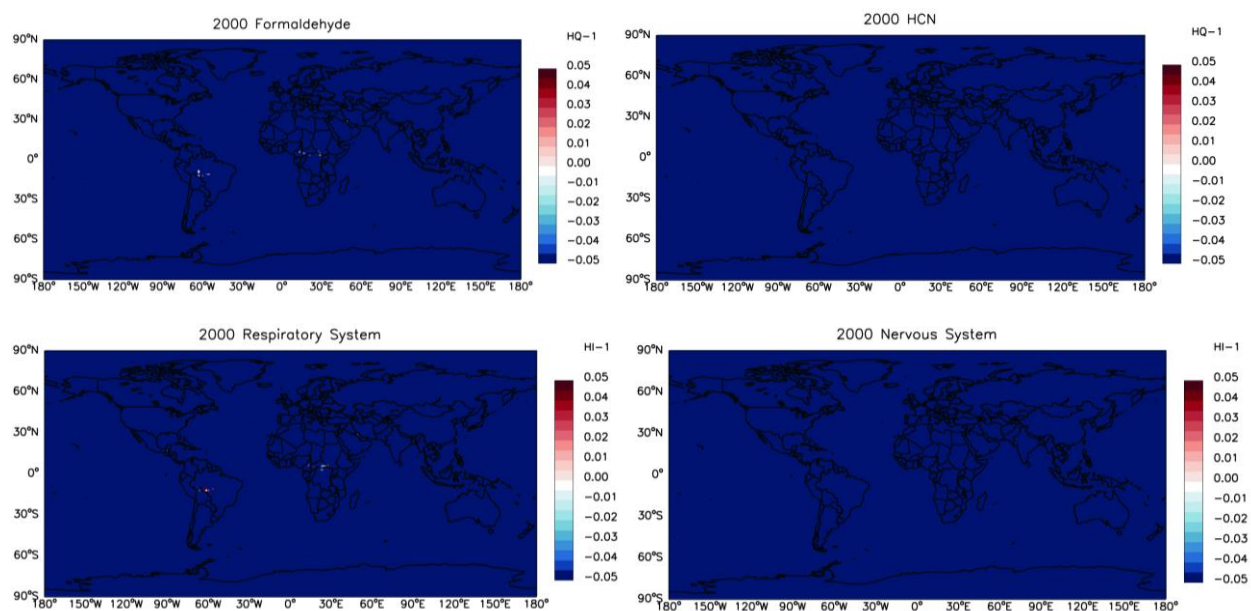


Figure S5. Chronic non-cancer associated risks of CH_2O , HCN, and two most vulnerable organ systems: respiratory and nervous system during 2000-2019. The calculated HQ and HI indexes were subtracted 1 to highlight regions with unacceptable risk level (mainly over Amazon basin and Indonesia). Note that this is a gif plot that can be clicked to play/stop animation.

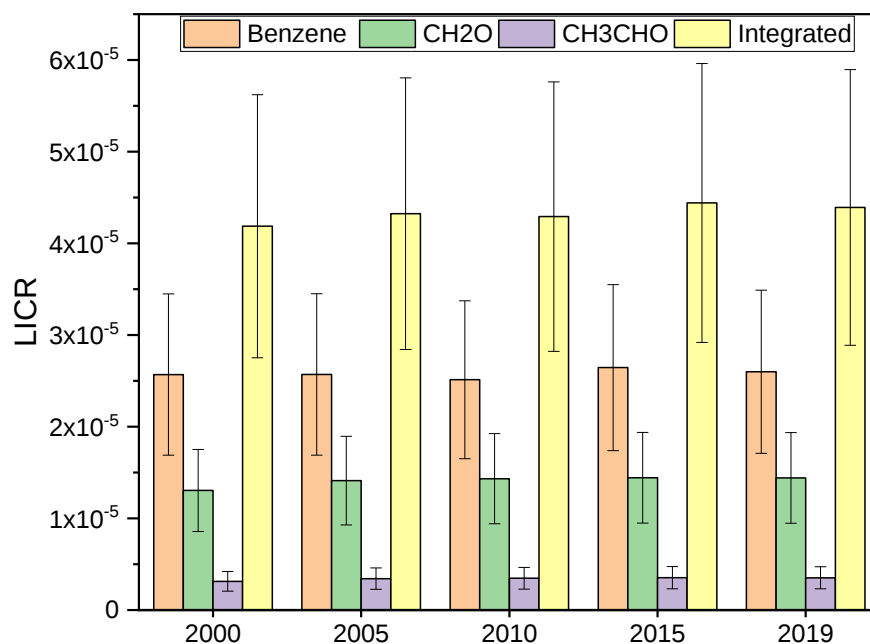


Figure S6. Global averaged lifetime inhalation cancer risks (LICR) of three carcinogenic VOCs and their integrated LICR during 2000-19.

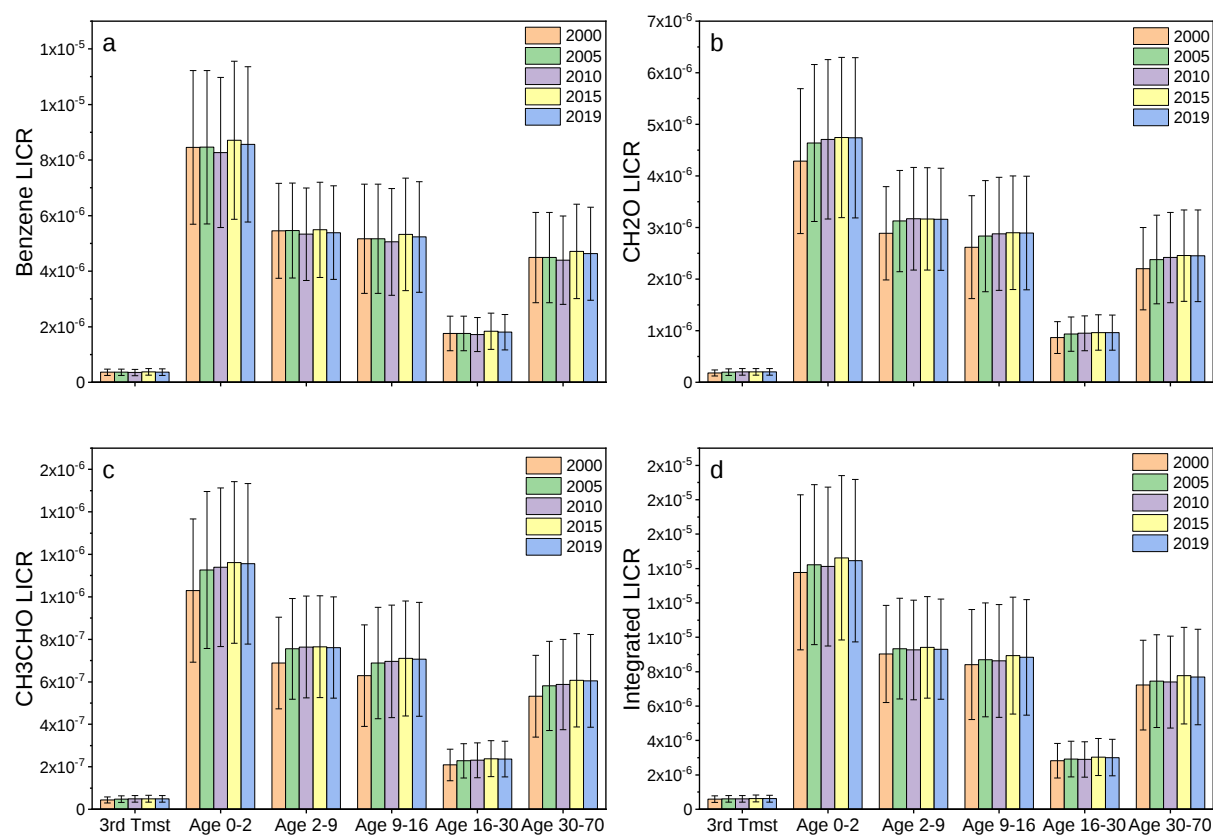


Figure S7. Global averaged lifetime inhalation cancer risks (LICR) of (a) benzene, (b) CH₂O, (c) CH₃CHO and (d) their integrated LICR for different age groups during 2000-19.

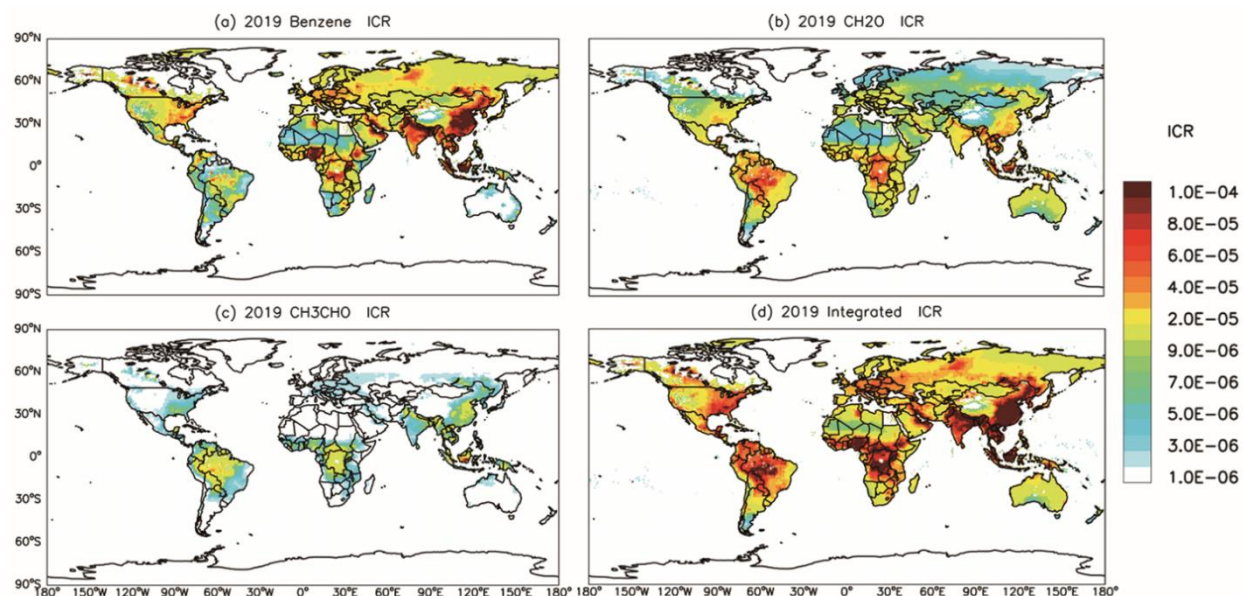


Figure S8. Global distributions of the estimated inhalation cancer risk (ICR) associated with exposure to (a) benzene, (b) CH₂O, (c) CH₃CHO, and (4) the integrated carcinogens in 2019 using a 30-year exposure duration. Note that we used a lifetime (70-yr) exposure duration and LICR in Fig. 4.

Leading countries in 2000 Benzene CB		Leading countries in 2015 Benzene CB		Leading countries in 2019 Benzene CB	
1 China	169,195	1 China	175,873	1 China	176,234
2 India	97,821	2 India	134,944	2 India	146,760
3 Pakistan	17,244	3 Pakistan	34,239	3 Pakistan	40,488
4 United States	16,722	4 Indonesia	27,739	4 Nigeria	29,202
5 Bangladesh	16,287	5 Nigeria	24,205	5 Indonesia	28,599
6 Nigeria	11,201	6 Bangladesh	23,277	6 Bangladesh	25,753
7 Indonesia	8,593	7 United States	12,847	7 United States	12,401
8 Vietnam	6,979	8 Vietnam	9,459	8 Vietnam	10,046
9 Russia	6,449	9 Thailand	5,415	9 Nepal	6,743
10 Germany	4,481	10 Russia	5,383	10 Ethiopia	6,325
15 Thailand	3,108	11 Ethiopia	5,248	12 Thailand	5,824
		12 Nepal	5,035	14 Russia	5,108
		24 Germany	2,847		

Upper-middle income
 Low income
 Low-middle income
 High income

Figure S9. Primary countries with the highest benzene-induced CBs in 2000, 2015, and 2019.

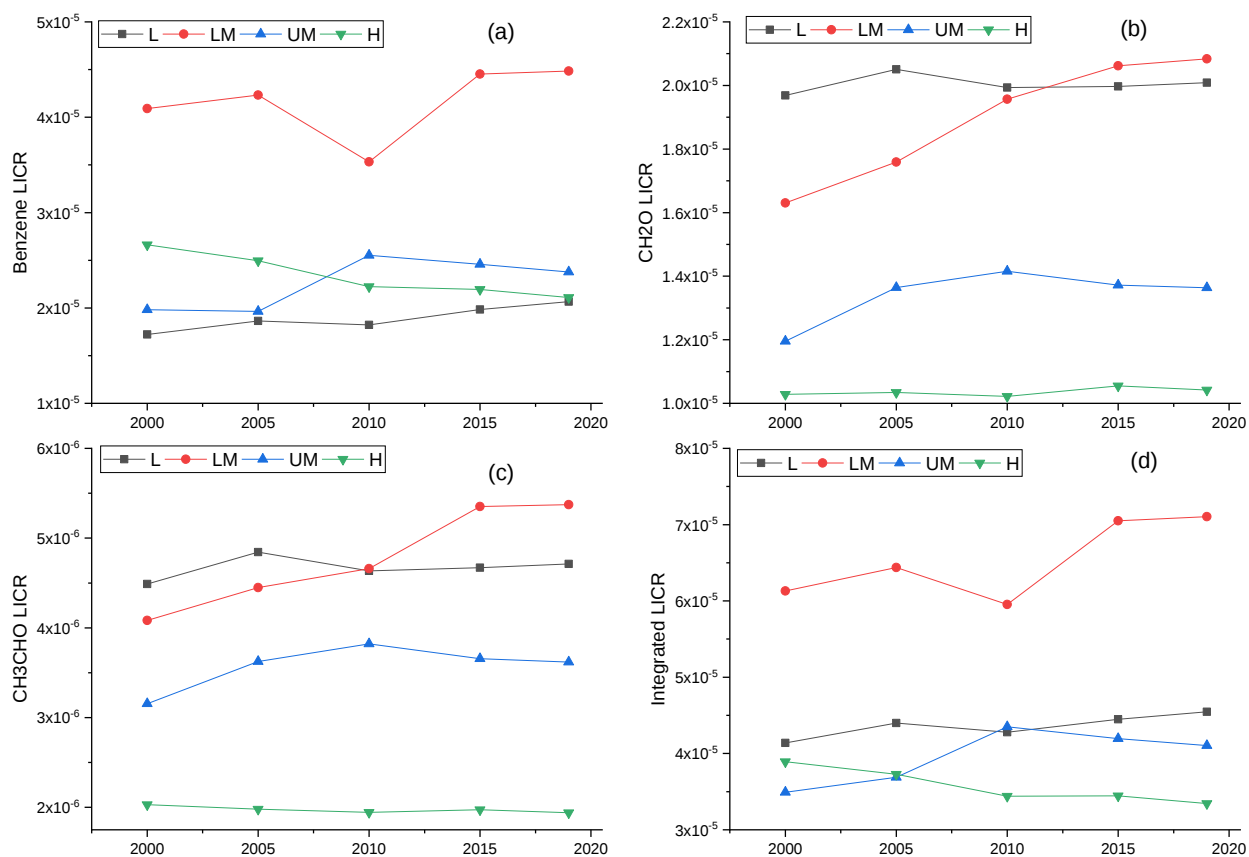


Figure S10. Interannual variation of VOC-induced LIRC of (a) benzene, (b) CH₂O, (c) CH₃CHO, and (d) integrated VOCs for different income economies. L, LM, UM, and H represent low-income, low-middle-income, upper-middle income, and high-income countries, respectively. Country classifications by income levels is obtained from the World Bank.⁵ Note that China has switched from LM to UM since 2010, resulting in a noticeable drop of the integrated LICR in 2010 for the LM economy.

Table S1. Toxicity criteria of ten selected NMVOC in this study.

NMVOC species		Reference exposure level (REL: $\mu\text{g}/\text{m}^3$)	Cancer potency factor (CPF: $(\text{mg}/\text{kg}\cdot\text{day})^{-1}$)
1	Formaldehyde (CH_2O)	9	0.21
2	Acetaldehyde (CH_3CHO)	140	0.1
3	Benzene (C_6H_6)	60	0.1
4	Methanol (CH_3OH)	4000	
5	Acetonitrile (CH_3CN)	60	
6	Hydrogen cyanide (HCN)	9	
7	Methyl ethyl ketone (MEK)	13000	
8	Propylene (C_3H_6)	3000	
9	Toluene (C_7H_8)	300	
10	Xylenes (C_8H_{10})	700	

^a. All REL and CPF values of hazardous NMVOC were obtained from the California EPA Risk Assessment Guidance Manual.⁶

Table S2. Recommended default values of exposure variables used in the health risk assessment.

Variable	Unit	Age (years)					
		3 rd Trimester	0-2	2-9	9-16	16-30	30-70
BR/BW_US ^a	L/kg-day	225	658	535	452	210	185
BR/BW_Canada ^b	L/kg-day	268	503	441	261	235	235
BR/BW_China	L/kg-day	225	658	347 ^c	452	266 ^c	245 ^c
EF	unitless	0.96	0.96	0.96	0.96	0.96	0.96
ASF	unitless	10	10	3	3	1	1
ED	year	0.25	2	7	7	14	40
AT	year	70	70	70	70	70	70
FAR	unitless	0.85	0.85	0.72	0.72	0.73	0.73

^a. The normalized daily breathing rates for each age group. All default values were obtained from Air Toxics Hot Spots Program Guidance Manual developed by the California EPA.⁶ We applied these values to residents in ROW, ECEurope, WEurope, SSA, NAME, and LATIN.

^b. The BR/BW in Canada for each age group was calculated based on the body weight and inhalation rate provided in Appendix E in the Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA).⁷

^c. The BR/BW in China for age groups (> 16 years) were calculated based on the Chinese body weight and inhalation rate provided in the Table 1-1 of the Highlights of the Chinese Exposure Factors Handbook (Adults).⁸ For BR/BW in 2-9 age group, we obtained it from a previous study by Jie et al. (2014).⁹ We applied the same BR/BW to residents living in ROA and India.

Table S3. Global maximum hazard quotients (HQ) of 10 selected hazardous VOCs and the hazard index (HI) by target Organ System in 2019.

HQ	Hematologic	Development	Nervous	Respiratory	Endocrine	Cardiovascular	Eyes
C6H6	0.823						
C7H8		0.079	0.079	0.079			
C8H10			0.039	0.039			0.039
C3H6				0.012			
CH3OH		0.029					
CH2O				3.813			
CH3CHO				0.382			
MEK				0.001			0.001
CH3CN				0.179			
HCN			13.818		13.818	13.818	
HI	0.823	0.107	13.90	4.469	13.818	13.818	0.040

(continued)

Table S4. Benzene-induced cancer burdens for 195 countries worldwide in 2000, 2015, and 2019.

Country	2000	Country	2015	Country	2019
Global	445,434	Global	571,832	Global	613,188
1 China	169,195	China	175,873	China	176,234
2 India	97,821	India	134,944	India	146,760
3 Pakistan	17,244	Pakistan	34,239	Pakistan	40,488
4 USA	16,722	Indonesia	27,739	Nigeria	29,202
5 Bangladesh	16,287	Nigeria	24,205	Indonesia	28,599
6 Nigeria	11,201	Bangladesh	23,277	Bangladesh	25,753
7 Indonesia	8,593	USA	12,847	USA	12,401
8 Vietnam	6,979	Vietnam	9,459	Vietnam	10,046
9 Russia	6,449	Thailand	5,415	Nepal	6,743
10 Germany	4,481	Russia	5,383	Ethiopia	6,325
11 Japan	4,373	Ethiopia	5,248	Congo DRC	6,124
12 Iran	3,771	Nepal	5,035	Thailand	5,824
13 Mexico	3,746	Mexico	4,949	Mexico	5,117
14 Nepal	3,422	Congo DRC	4,424	Russia	5,108
15 Thailand	3,108	Egypt	4,410	Egypt	4,739
16 UK	2,910	Iran	4,368	Iran	4,585
17 Ethiopia	2,809	Japan	4,031	Uganda	4,011
18 France	2,788	Brazil	3,540	Japan	3,900
19 Egypt	2,765	Malaysia	3,293	Malaysia	3,501
20 Myanmar	2,629	Uganda	3,201	Brazil	3,308
21 Italy	2,555	Germany	2,847	South Korea	2,923
22 Turkey	2,311	South Korea	2,825	Iraq	2,882
23 Canada	2,310	Italy	2,639	Germany	2,760
24 South Korea	2,182	Myanmar	2,443	Italy	2,646
25 Ukraine	2,038	Iraq	2,396	Myanmar	2,511
26 Brazil	1,961	Turkey	2,029	Qatar	2,427
27 Poland	1,927	UK	1,803	United Arab Emirates	2,288
28 Iraq	1,663	Saudi Arabia	1,778	Turkey	2,137
29 Saudi Arabia	1,492	South	1,696	Saudi Arabia	2,054
30 Congo DRC	1,401	United Arab Emirates	1,686	Kenya	1,934
31 Uganda	1,283	France	1,669	South	1,868
32 Netherlands	1,155	Canada	1,596	UK	1,844
33 Malaysia	1,063	Poland	1,590	France	1,657
34 North Korea	1,061	Ukraine	1,565	Canada	1,651
35 South Africa	1,009	Kenya	1,559	Poland	1,579

(continued)

36	Romania	791	Colombia	1,302	Colombia	1,472
37	Philippines	755	Qatar	1,229	Ukraine	1,408
38	Belgium	746	Cambodia	1,200	Cambodia	1,406
39	Colombia	745	Philippines	1,190	Philippines	1,311
40	United Arab Emirates	732	North Korea	1,095	Cameroon	1,194
41	Spain	729	Cameroon	996	Romania	1,112
42	Venezuela	713	Tanzania	890	Tanzania	1,070
43	Syrian	682	Venezuela	815	North Korea	1,064
44	Kenya	617	Netherlands	790	Niger	939
45	Uzbekistan	612	Rwanda	745	Rwanda	935
46	Hungary	607	Guatemala	743	Guatemala	867
47	Cameroon	555	Romania	728	Kuwait	848
48	Czech Republic	550	Niger	724	Netherlands	790
49	Kuwait	549	Spain	721	Spain	773
50	Cambodia	534	Kuwait	720	Ghana	772
51	Algeria	475	Uzbekistan	671	Venezuela	729
52	Belarus	453	Ghana	643	Syrian	701
53	Chile	410	Syrian	631	Uzbekistan	698
54	Morocco	392	Algeria	619	Algeria	672
55	Argentina	382	Afghanistan	591	Burkina	667
56	Rwanda	379	Argentina	567	Afghanistan	655
57	Tanzania	377	Chile	559	Chile	640
58	Guatemala	376	Burkina	524	Angola	633
59	Austria	370	Morocco	507	Argentina	584
60	Switzerland	355	Sri Lanka	494	Sri Lanka	578
61	Angola	354	Angola	490	Cote d Ivoire	573
62	Sri Lanka	333	Cote d Ivoire	481	Burundi	560
63	Slovakia	326	Belgium	476	South	541
64	Ghana	318	Hungary	471	Morocco	540
65	Afghanistan	293	Burundi	454	Benin	502
66	Serbia	278	Czech Republic	416	Belgium	476
67	Kazakhstan	271	Benin	396	Mozambique	449
68	Sudan	265	Singapore	393	Sudan	443
69	Burundi	263	Belarus	385	Singapore	441
70	Australia	257	Sudan	384	Hungary	433
71	Niger	251	South	363	Zambia	431
72	Bulgaria	249	Mozambique	355	Czech Republic	409
73	Sweden	241	Zambia	344	Bahrain	401
74	Israel	236	Lao	323	Belarus	360
75	Lao	235	Zimbabwe	317	Chad	350

(continued)

76	Jordan	233	Yemen	304	Yemen	348
77	Yemen	233	Austria	304	Malawi	344
78	Greece	222	Bahrain	289	Lao	342
79	Cote d'Ivoire	215	Chad	284	Zimbabwe	341
80	Portugal	197	Malawi	284	Guinea	323
81	Denmark	185	Switzerland	282	Peru	319
82	Azerbaijan	182	Kazakhstan	272	Mali	299
83	Guinea	180	Guinea	270	Austria	298
84	Zimbabwe	176	Azerbaijan	270	Haiti	297
85	South Sudan	176	Peru	268	Switzerland	287
86	Burkina	172	Serbia	252	Azerbaijan	282
87	Croatia	169	Slovakia	249	Togo	276
88	Moldova	164	Turks and Caicos Islands	246	Kazakhstan	274
89	Tunisia	158	Israel	244	Israel	267
90	Georgia	158	Haiti	243	Turks and Caicos Islands	264
91	Chad	157	Mali	228	Jordan	251
92	El Salvador	156	Jordan	228	Serbia	240
93	Central African Republic	149	Togo	223	Oman	238
94	Turks and Caicos Islands	149	Honduras	222	Slovakia	236
95	Peru	148	El Salvador	206	Honduras	233
96	Zambia	143	Oman	205	Ecuador	226
97	Finland	140	Ecuador	200	El Salvador	219
98	Mozambique	139	Bulgaria	191	Lebanon	212
99	Oman	137	Central African Republic	186	Central African Republic	205
100	Benin	136	Sweden	185	Bulgaria	203
101	Palestine	135	Australia	180	Madagascar	193
102	Lithuania	131	Lebanon	170	Senegal	186
103	Malawi	127	Greece	168	Sweden	181
104	Qatar	127	Portugal	164	Australia	180
105	Cuba	127	Tunisia	161	Turkmenistan	176
106	Ecuador	125	Turkmenistan	158	Tunisia	168
107	Bosnia and Herzegovina	112	Madagascar	155	Palestine	159
108	Bahrain	112	Senegal	153	Greece	158
109	Norway	112	Croatia	150	Bhutan	158
110	Mali	109	Bhutan	148	Portugal	158
111	Singapore	106	Denmark	147	Denmark	146
112	Bhutan	105	Moldova	144	Bolivia	140
113	Kyrgyzstan	103	Palestine	142	Croatia	140
114	Honduras	101	Bolivia	127	Sierra Leone	138
115	Lebanon	100	Sierra Leone	121	Moldova	134

(continued)

116	Turkmenistan	97	Kyrgyzstan	120	Libya	123
117	Slovenia	95	Libya	119	Paraguay	121
118	Togo	94	Bosnia and Herzegovina	109	Kyrgyzstan	114
119	Libya	91	Paraguay	109	Congo	112
120	Armenia	90	Finland	107	Finland	103
121	Senegal	75	Georgia	100	Dominican Republic	101
122	Sierra Leone	75	Lithuania	97	Bosnia and Herzegovina	98
123	Bolivia	74	Congo	97	Georgia	94
124	Ireland	73	Slovenia	93	Slovenia	92
125	Paraguay	72	Dominican Republic	89	Liberia	89
126	Dominican Republic	72	Norway	82	Lithuania	89
127	Albania	68	Cuba	80	Ireland	83
128	Macedonia	64	Liberia	76	Norway	81
129	Haiti	62	Ireland	75	Cuba	79
130	Congo	61	Armenia	68	Somalia	74
131	Madagascar	58	Somalia	63	Papua New Guinea	73
132	Latvia	54	Papua New Guinea	62	Armenia	66
133	Eritrea	37	Latvia	60	Latvia	63
134	Trinidad and Tobago	36	Albania	58	Macedonia	56
135	Nicaragua	35	Macedonia	57	Nicaragua	56
136	Estonia	34	Nicaragua	53	Albania	55
137	Mongolia	32	Eritrea	49	Eritrea	54
138	Lesotho	32	Mongolia	45	Mongolia	48
139	Somalia	30	Lesotho	41	Costa Rica	42
140	Liberia	30	Costa Rica	40	Panama	41
141	Costa Rica	23	Panama	39	Lesotho	41
142	Panama	23	Gabon	32	Gabon	39
143	Luxembourg	22	Trinidad and Tobago	31	Guinea-Bissau	35
144	Papua New Guinea	21	Guinea-Bissau	30	Trinidad and Tobago	30
145	Jamaica	20	Uruguay	29	Uruguay	29
146	Guinea-Bissau	19	Estonia	25	Estonia	25
147	Uruguay	19	Jamaica	22	Gambia	25
148	Swaziland	15	Botswana	21	Mauritania	23
149	Puerto Rico	14	Brunei	21	Botswana	23
150	Botswana	14	Swaziland	20	Jamaica	23
151	Cyprus	14	Mauritania	20	Brunei	22
152	Montenegro	13	Gambia	20	Swaziland	21
153	Gabon	13	Luxembourg	17	Luxembourg	18
154	Mauritania	12	Equatorial Guinea	14	Equatorial Guinea	15
155	Brunei	10	Cyprus	13	Cyprus	14

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156	Gambia	10	Namibia	13	Djibouti	14
157	New Zealand	9	Djibouti	12	Namibia	14
158	Namibia	8	Montenegro	12	Montenegro	11
159	Djibouti	7	Puerto Rico	11	Puerto Rico	11
160	Equatorial Guinea	6	New Zealand	10	New Zealand	10
161	Belize	4	Timor-Leste	7	Timor-Leste	7
162	Timor-Leste	4	Malta	3	Malta	3
163	Malta	4	Belize	3	Belize	3
164	Iceland	3	Iceland	3	Iceland	3
165	Western Sahara	2	Mauritius	3	Mauritius	3
166	Mauritius	2	Guyana	2	Western Sahara	2
167	Guyana	2	Western Sahara	2	Guyana	2
168	Andorra	1	Andorra	2	Andorra	2
169	Bahamas	1	Cape Verde	1	Comoros	1
170	Cape Verde	1	Suriname	1	Suriname	1
171	Suriname	1	Bahamas	1	Cape Verde	1
172	Fiji	1	Comoros	1	Bahamas	1
173	Comoros	0	Fiji	0	French Guiana	1
174	Greenland	0	French Guiana	0	Fiji	0
175	Saint Lucia	0	Sao Tome and Principe	0	Sao Tome and Principe	0
176	Sao Tome and Principe	0	Greenland	0	Greenland	0
177	French Guiana	0	Saint Lucia	0	Saint Lucia	0
178	Bermuda	0	Guam	0	Guam	0
179	Antigua and Barbuda	0	Antigua and Barbuda	0	Antigua and Barbuda	0
180	Virgin Islands	0	Bermuda	0	Bermuda	0
181	Dominica	0	Grenada	0	Maldives	0
182	Guam	0	Saint Vincent and the Grenadines	0	Grenada	0
183	Saint Vincent and the Grenadines	0	Dominica	0	Seychelles	0
184	Grenada	0	Virgin Islands	0	Saint Vincent and the Grenadines	0
185	Seychelles	0	Seychelles	0	Virgin Islands	0
186	Samoa	0	Vanuatu	0	Dominica	0
187	Maldives	0	Samoa	0	Vanuatu	0
188	Vanuatu	0	Maldives	0	Samoa	0
189	Micronesia	0	Micronesia	0	Micronesia	0
190	Tonga	0	Tonga	0	Tonga	0
191	Northern Mariana Islands	0	Northern Mariana Islands	0	Northern Mariana Islands	0
192	American Samoa	0	American Samoa	0	American Samoa	0
193	Kiribati	0	Kiribati	0	Kiribati	0
194	Marshall Islands	0	Marshall Islands	0	Marshall Islands	0
195	The Holy See	0	The Holy See	0	The Holy See	0

(continued)

Table S5. CH₂O-induced cancer burdens for 195 countries worldwide in 2000, 2015, and 2019.

	Country	2000	Country	2015	Country	2019
	Global	123,203	Global	172,936	Global	187,181
1	China	30,192	China	36,912	India	39,757
2	India	24,682	India	36,907	China	37,763
3	USA	5,200	Indonesia	8,711	Indonesia	9,379
4	Indonesia	4,083	USA	5,809	Pakistan	6,273
5	Brazil	3,502	Pakistan	5,470	USA	5,950
6	Bangladesh	3,324	Brazil	5,254	Nigeria	5,732
7	Pakistan	3,045	Bangladesh	4,981	Brazil	5,470
8	Nigeria	2,930	Nigeria	4,868	Bangladesh	5,446
9	Vietnam	2,385	Congo DRC	3,931	Congo DRC	5,057
10	Mexico	2,290	Vietnam	3,862	Vietnam	4,270
11	Thailand	1,885	Mexico	2,944	Mexico	3,245
12	Japan	1,880	Thailand	2,850	Thailand	3,090
13	Congo DRC	1,834	Japan	1,960	Japan	1,987
14	Myanmar	1,724	Philippines	1,591	Philippines	1,795
15	Russia	1,446	Myanmar	1,569	Malaysia	1,719
16	Philippines	1,162	Malaysia	1,560	Ethiopia	1,719
17	Iran	1,118	Russia	1,467	Myanmar	1,585
18	Ethiopia	953	Ethiopia	1,463	Colombia	1,558
19	Malaysia	950	Colombia	1,366	Nepal	1,492
20	Turkey	858	Iran	1,284	Russia	1,435
21	Germany	851	Egypt	1,167	Iran	1,346
22	Italy	821	Nepal	1,142	Egypt	1,273
23	Egypt	779	South Korea	960	Uganda	1,064
24	Nepal	724	Turkey	929	South	998
25	Colombia	717	Venezuela	929	Turkey	973
26	South Korea	712	Italy	922	Tanzania	950
27	Venezuela	581	Uganda	887	Italy	925
28	France	574	Tanzania	841	Iraq	919
29	Uganda	571	Germany	840	Venezuela	913
30	Argentina	555	South	808	South	873
31	South	545	Iraq	750	Kenya	849
32	Iraq	506	Kenya	708	Cambodia	840
33	Angola	489	Cambodia	682	Germany	825
34	Tanzania	480	Argentina	681	Ghana	729
35	Ukraine	458	Ghana	625	Argentina	711
36	UK	457	France	612	France	630

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37	Spain	431	Cameroon	519	Cameroon	602
38	Ghana	429	Ukraine	517	Angola	589
39	Kenya	421	Cote d Ivoire	511	Mozambique	588
40	Poland	357	Angola	510	Cote d Ivoire	583
41	Cote d Ivoire	354	Spain	498	Guatemala	532
42	Cameroon	350	Mozambique	485	Spain	527
43	Canada	349	Guatemala	471	Sudan	515
44	Cambodia	332	Sudan	452	South	507
45	North Korea	318	Saudi Arabia	430	Ukraine	494
46	Guatemala	315	Peru	421	Saudi Arabia	493
47	Saudi Arabia	311	Algeria	421	Zambia	474
48	Algeria	310	UK	420	Peru	471
49	Romania	287	Poland	403	Algeria	469
50	Sudan	282	Canada	395	UK	438
51	Peru	273	Zambia	395	Canada	417
52	Morocco	261	South	363	Romania	411
53	Australia	247	Bolivia	329	Poland	401
54	Mozambique	241	Ecuador	324	Burkina	387
55	Syrian	229	Malawi	324	Mali	376
56	Sri Lanka	228	Morocco	321	Bolivia	375
57	Central African Republic	223	North Korea	319	Malawi	373
58	Uzbekistan	217	Burkina	319	Ecuador	355
59	Bolivia	217	Sri Lanka	319	Sri Lanka	346
60	Guinea	210	Mali	300	Morocco	340
61	Zambia	208	Chile	295	Chile	328
62	Yemen	202	Uzbekistan	293	Yemen	324
63	Burkina	199	Yemen	287	Lao	319
64	Cuba	197	Central African Republic	283	North Korea	318
65	Chile	197	Syrian	282	Qatar	318
66	South	194	Lao	280	Syrian	315
67	Ecuador	188	Romania	268	Uzbekistan	313
68	Malawi	185	Afghanistan	267	Niger	308
69	Mali	180	Guinea	258	Central African Republic	306
70	Lao	173	Madagascar	249	Benin	305
71	Hungary	168	Niger	249	United Arab Emirates	303
72	Rwanda	165	Honduras	249	Madagascar	296
73	Afghanistan	160	Benin	249	Afghanistan	295
74	Netherlands	159	Burundi	243	Guinea	295
75	Burundi	156	Australia	243	Rwanda	284
76	Chad	154	Rwanda	243	Chad	282

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77	Paraguay	153	Chad	241	Burundi	280
78	Zimbabwe	153	Zimbabwe	231	Honduras	273
79	Greece	146	United Arab Emirates	220	Zimbabwe	244
80	Dominican Republic	144	Cuba	204	Haiti	244
81	Honduras	140	Dominican Republic	202	Australia	239
82	El Salvador	132	Paraguay	202	Dominican Republic	230
83	Madagascar	132	Haiti	201	Paraguay	221
84	Bulgaria	130	Togo	185	Togo	221
85	Niger	128	El Salvador	181	Cuba	205
86	Benin	124	Senegal	162	Kuwait	190
87	Serbia	121	Qatar	161	El Salvador	188
88	Kuwait	120	Kuwait	160	Senegal	187
89	Czech Republic	109	Netherlands	155	Papua New Guinea	172
90	Haiti	109	Hungary	148	Netherlands	160
91	Belgium	109	Papua New Guinea	147	Congo	142
92	Senegal	104	Greece	124	Hungary	140
93	Togo	102	Singapore	124	Singapore	135
94	Portugal	100	Kazakhstan	119	Kazakhstan	125
95	Kazakhstan	99	Czech Republic	119	Sierra Leone	125
96	Austria	98	Sierra Leone	113	Czech Republic	119
97	United Arab Emirates	97	Congo	112	Greece	119
98	Congo	93	Serbia	112	Nicaragua	115
99	Sierra Leone	93	Austria	110	Azerbaijan	115
100	Belarus	91	Azerbaijan	109	Belgium	111
101	Tunisia	88	Belgium	107	Turks and Caicos Islands	110
102	Switzerland	86	Belarus	105	Austria	110
103	Singapore	81	Nicaragua	105	Serbia	108
104	Croatia	78	Switzerland	103	Tunisia	108
105	Azerbaijan	76	Tunisia	102	Switzerland	105
106	Slovakia	75	Turks and Caicos Islands	101	Bulgaria	102
107	Israel	73	Portugal	101	Belarus	101
108	Papua New Guinea	72	Bulgaria	100	Portugal	100
109	Jordan	70	Israel	89	Israel	97
110	Bosnia and Herzegovina	69	Jordan	86	Jordan	95
111	Nicaragua	69	Turkmenistan	83	Turkmenistan	94
112	Turks and Caicos Islands	62	Slovakia	78	Somalia	86
113	Sweden	51	Somalia	75	Lebanon	83
114	Georgia	51	Croatia	74	Panama	81
115	Turkmenistan	50	Panama	73	Liberia	80
116	Somalia	48	Liberia	72	Costa Rica	76

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117	Liberia	46	Costa Rica	71	Slovakia	76
118	Costa Rica	46	Lebanon	66	Croatia	71
119	Kyrgyzstan	41	Bosnia and Herzegovina	55	Libya	58
120	Libya	41	Libya	54	Palestine	58
121	Moldova	40	Sweden	52	Oman	55
122	Palestine	40	Palestine	51	Eritrea	53
123	Panama	40	Kyrgyzstan	49	Sweden	53
124	Eritrea	37	Eritrea	49	Bosnia and Herzegovina	52
125	Lebanon	37	Oman	47	Gabon	50
126	Puerto Rico	37	Georgia	45	Kyrgyzstan	50
127	Albania	35	Moldova	42	Bahrain	46
128	Jamaica	33	Gabon	40	Georgia	43
129	Slovenia	33	Slovenia	37	Mauritania	40
130	Macedonia	32	Jamaica	36	Moldova	40
131	Oman	30	Mauritania	34	Guinea-Bissau	38
132	Finland	30	Guinea-Bissau	34	Slovenia	37
133	Armenia	29	Bahrain	34	Jamaica	37
134	Uruguay	28	Bhutan	33	Bhutan	36
135	Denmark	28	Uruguay	33	Botswana	35
136	Lithuania	26	Puerto Rico	33	Uruguay	33
137	Guinea-Bissau	25	Botswana	32	Puerto Rico	30
138	Mauritania	22	Albania	29	Denmark	30
139	Bhutan	22	Denmark	29	Albania	29
140	Namibia	21	Armenia	28	Namibia	28
141	Botswana	21	Finland	27	Armenia	28
142	Norway	20	Macedonia	27	Finland	27
143	Gabon	18	Namibia	26	Macedonia	27
144	Ireland	18	Lithuania	24	Gambia	26
145	Qatar	17	Gambia	21	Ireland	23
146	New Zealand	17	Ireland	20	Lithuania	22
147	Trinidad and Tobago	16	Norway	20	Norway	21
148	Lesotho	16	New Zealand	20	New Zealand	20
149	Bahrain	14	Trinidad and Tobago	20	Swaziland	20
150	Swaziland	14	Swaziland	19	Trinidad and Tobago	20
151	Gambia	14	Lesotho	19	Lesotho	19
152	Mongolia	12	Mongolia	16	Mongolia	18
153	Latvia	11	Latvia	16	Timor-Leste	17
154	Suriname	10	Timor-Leste	15	Latvia	17
155	Guyana	9	Suriname	15	Suriname	16
156	Equatorial Guinea	9	Equatorial Guinea	14	Equatorial Guinea	14

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157	Timor-Leste	8	Guyana	13	Guyana	12
158	Belize	8	Brunei	10	Djibouti	12
159	Cyprus	8	Djibouti	10	Brunei	11
160	Estonia	7	Cyprus	9	Cyprus	10
161	Montenegro	7	Belize	9	Belize	10
162	Brunei	7	Mauritius	7	Mauritius	7
163	Djibouti	6	Montenegro	7	Estonia	7
164	Mauritius	5	Estonia	6	Montenegro	7
165	Luxembourg	4	Luxembourg	5	French Guiana	7
166	Fiji	4	French Guiana	5	Luxembourg	6
167	Malta	2	Fiji	4	Fiji	4
168	Comoros	2	Comoros	3	Comoros	4
169	French Guiana	2	Cape Verde	2	Cape Verde	3
170	Cape Verde	2	Malta	2	Malta	2
171	Western Sahara	2	Bahamas	2	Bahamas	2
172	Bahamas	2	Western Sahara	2	Western Sahara	2
173	Saint Lucia	1	Andorra	1	Andorra	1
174	Andorra	1	Saint Lucia	1	Saint Lucia	1
175	Samoa	1	Sao Tome and Principe	1	Sao Tome and Principe	1
176	Guam	1	Samoa	1	Vanuatu	1
177	Sao Tome and Principe	0	Vanuatu	1	Samoa	1
178	Vanuatu	0	Guam	1	Guam	1
179	Iceland	0	Antigua and Barbuda	1	Antigua and Barbuda	1
180	Grenada	0	Iceland	0	Iceland	0
181	Saint Vincent and the Grenadines	0	Grenada	0	Grenada	0
182	Antigua and Barbuda	0	Saint Vincent and the Grenadines	0	Saint Vincent and the Grenadines	0
183	Virgin Islands	0	Dominica	0	Dominica	0
184	Dominica	0	Virgin Islands	0	Virgin Islands	0
185	Tonga	0	Seychelles	0	Seychelles	0
186	Micronesia	0	Tonga	0	Tonga	0
187	Seychelles	0	Micronesia	0	Micronesia	0
188	Bermuda	0	Bermuda	0	Maldives	0
189	American Samoa	0	American Samoa	0	Bermuda	0
190	Maldives	0	Maldives	0	American Samoa	0
191	Greenland	0	Greenland	0	Greenland	0
192	Northern Mariana Islands	0	Northern Mariana Islands	0	Northern Mariana Islands	0
193	Kiribati	0	Kiribati	0	Kiribati	0
194	Marshall Islands	0	Marshall Islands	0	Marshall Islands	0
195	The Holy See	0	The Holy See	0	The Holy See	0

(continued)

Table S6. The integrated cancer burdens for 195 countries worldwide in 2000, 2015, and 2019.

Country	2000	Country	2015	Country	2019
Global	601,245	Global	790,534	Global	849,640
1 China	210,231	China	225,543	China	226,896
2 India	128,789	India	181,244	India	196,641
3 USA	23,162	Pakistan	41,683	Pakistan	49,080
4 Pakistan	21,273	Indonesia	39,187	Indonesia	40,852
5 Bangladesh	20,560	Nigeria	30,502	Nigeria	36,641
6 Nigeria	14,834	Bangladesh	29,697	Bangladesh	32,780
7 Indonesia	13,587	USA	19,888	USA	19,607
8 Vietnam	10,038	Vietnam	14,344	Vietnam	15,412
9 Russia	8,291	Brazil	9,744	Congo DRC	12,658
10 Japan	6,640	Congo DRC	9,491	Brazil	9,772
11 Mexico	6,445	Thailand	8,917	Thailand	9,605
12 Brazil	6,080	Mexico	8,388	Mexico	8,904
13 Germany	5,581	Russia	7,206	Nepal	8,650
14 Thailand	5,402	Ethiopia	7,150	Ethiopia	8,569
15 Iran	5,083	Nepal	6,491	Russia	6,885
16 Myanmar	4,741	Japan	6,368	Japan	6,269
17 Nepal	4,343	Iran	5,889	Egypt	6,259
18 Ethiopia	4,014	Egypt	5,806	Iran	6,182
19 Congo DRC	3,736	Malaysia	5,232	Malaysia	5,631
20 Egypt	3,679	Uganda	4,386	Uganda	5,440
21 Italy	3,578	Myanmar	4,365	Myanmar	4,445
22 France	3,526	South Korea	4,049	South Korea	4,193
23 UK	3,462	Germany	3,867	Iraq	4,008
24 Turkey	3,335	Italy	3,749	Germany	3,764
25 South Korea	3,085	Iraq	3,313	Italy	3,763
26 Canada	2,766	Turkey	3,115	Philippines	3,383
27 Ukraine	2,614	Philippines	3,034	Colombia	3,320
28 Poland	2,390	Colombia	2,920	Turkey	3,275
29 Iraq	2,285	South	2,659	Kenya	2,988
30 Malaysia	2,226	Kenya	2,434	South	2,911
31 Philippines	2,101	France	2,402	Qatar	2,788
32 Uganda	2,017	UK	2,285	United Arab Emirates	2,669
33 Saudi Arabia	1,847	Saudi Arabia	2,263	Saudi Arabia	2,610
34 South	1,654	Ukraine	2,206	Cambodia	2,471
35 Colombia	1,591	Poland	2,092	France	2,410
36 North Korea	1,476	Canada	2,087	UK	2,347

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37	Venezuela	1,388	Cambodia	2,071	Tanzania	2,219
38	Netherlands	1,356	United Arab Emirates	1,961	Canada	2,168
39	Spain	1,239	Tanzania	1,904	Poland	2,078
40	Romania	1,143	Venezuela	1,892	Ukraine	2,018
41	Kenya	1,118	Cameroon	1,636	Cameroon	1,936
42	Argentina	1,016	North Korea	1,519	Venezuela	1,797
43	Cameroon	984	Qatar	1,413	Ghana	1,664
44	Angola	953	Ghana	1,408	Romania	1,609
45	Syrian	952	Argentina	1,347	Guatemala	1,510
46	Cambodia	947	Guatemala	1,312	North Korea	1,484
47	Tanzania	945	Spain	1,287	Argentina	1,398
48	Belgium	886	Angola	1,108	Spain	1,374
49	Uzbekistan	866	Cote d Ivoire	1,106	Angola	1,341
50	United Arab Emirates	853	Algeria	1,096	Niger	1,312
51	Ghana	843	Rwanda	1,056	Rwanda	1,301
52	Algeria	829	Romania	1,054	Cote d Ivoire	1,287
53	Hungary	817	Niger	1,025	Algeria	1,200
54	Guatemala	753	Uzbekistan	1,010	South	1,182
55	Czech Republic	692	Netherlands	976	Mozambique	1,165
56	Morocco	687	Syrian	960	Burkina	1,135
57	Kuwait	686	Mozambique	947	Syrian	1,069
58	Cote d Ivoire	648	Burkina	908	Kuwait	1,062
59	Chile	642	Chile	903	Uzbekistan	1,059
60	Sri Lanka	591	Kuwait	901	Sudan	1,025
61	Rwanda	587	Afghanistan	897	Chile	1,022
62	Sudan	584	Sudan	896	Zambia	1,018
63	Belarus	568	Morocco	870	Afghanistan	993
64	Australia	539	Sri Lanka	859	Netherlands	982
65	Austria	494	Zambia	832	Sri Lanka	978
66	Peru	490	South	821	Morocco	925
67	Afghanistan	473	Peru	800	Burundi	917
68	Switzerland	464	Burundi	763	Peru	914
69	Burundi	457	Benin	709	Benin	886
70	Yemen	456	Malawi	677	Malawi	798
71	Lao	451	Lao	670	Mali	743
72	Guinea	436	Hungary	650	Lao	734
73	Central African Republic	433	Yemen	618	Yemen	703
74	Mozambique	430	Belgium	604	Chad	689
75	Serbia	426	Zimbabwe	590	Guinea	681
76	South	423	Ecuador	589	Ecuador	652

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77	Slovakia	419	Guinea	583	Zimbabwe	630
78	Burkina	407	Mali	582	Bolivia	627
79	Bulgaria	407	Chad	573	Singapore	611
80	Niger	401	Czech Republic	562	Belgium	608
81	Greece	397	Bolivia	556	Hungary	602
82	Zambia	396	Central African Republic	550	Central African Republic	599
83	Kazakhstan	390	Singapore	548	Haiti	587
84	Bolivia	356	Honduras	518	Honduras	558
85	Zimbabwe	354	Belarus	515	Czech Republic	555
86	Cuba	352	Haiti	482	Togo	554
87	Malawi	351	Togo	454	Madagascar	535
88	Ecuador	349	Australia	454	Belarus	486
89	Chad	344	Madagascar	441	Bahrain	455
90	Israel	325	Austria	439	Australia	449
91	Jordan	321	El Salvador	416	El Salvador	438
92	Mali	320	Kazakhstan	412	Austria	433
93	Portugal	316	Switzerland	406	Kazakhstan	421
94	El Salvador	309	Azerbaijan	399	Azerbaijan	420
95	Sweden	307	Serbia	387	Switzerland	414
96	Benin	287	Turks and Caicos Islands	366	Senegal	400
97	Azerbaijan	271	Paraguay	351	Turks and Caicos Islands	394
98	Honduras	268	Israel	349	Paraguay	387
99	Croatia	265	Slovakia	344	Israel	382
100	Tunisia	260	Senegal	338	Serbia	370
101	Paraguay	257	Jordan	330	Jordan	364
102	Dominican Republic	236	Bahrain	328	Dominican Republic	362
103	Turks and Caicos Islands	222	Dominican Republic	319	Slovakia	328
104	Denmark	221	Cuba	315	Bulgaria	324
105	Togo	219	Greece	312	Cuba	314
106	Georgia	218	Bulgaria	310	Lebanon	311
107	Moldova	214	Portugal	281	Papua New Guinea	302
108	Madagascar	209	Tunisia	278	Oman	301
109	Singapore	203	Oman	259	Greece	297
110	Bosnia and Herzegovina	197	Papua New Guinea	257	Congo	292
111	Senegal	194	Sierra Leone	255	Tunisia	291
112	Haiti	186	Turkmenistan	251	Sierra Leone	287
113	Palestine	185	Sweden	250	Turkmenistan	281
114	Sierra Leone	185	Lebanon	249	Portugal	273
115	Finland	179	Croatia	240	Sweden	247
116	Congo	175	Congo	238	Palestine	229

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117	Oman	171	Palestine	203	Croatia	225
118	Lithuania	164	Moldova	196	Bhutan	203
119	Turkmenistan	152	Bhutan	189	Nicaragua	190
120	Kyrgyzstan	152	Denmark	184	Libya	188
121	Qatar	147	Libya	180	Denmark	184
122	Lebanon	144	Kyrgyzstan	178	Liberia	184
123	Norway	137	Bosnia and Herzegovina	175	Moldova	183
124	Libya	137	Nicaragua	174	Kyrgyzstan	173
125	Slovenia	136	Liberia	162	Somalia	172
126	Bhutan	132	Georgia	154	Bosnia and Herzegovina	160
127	Bahrain	129	Somalia	148	Georgia	145
128	Armenia	124	Finland	142	Finland	138
129	Papua New Guinea	118	Slovenia	138	Slovenia	137
130	Nicaragua	114	Lithuania	127	Panama	134
131	Albania	109	Panama	124	Costa Rica	130
132	Macedonia	103	Costa Rica	122	Lithuania	116
133	Ireland	95	Norway	107	Eritrea	114
134	Liberia	84	Eritrea	104	Ireland	110
135	Somalia	84	Armenia	102	Norway	106
136	Eritrea	79	Ireland	99	Gabon	100
137	Costa Rica	75	Albania	92	Armenia	98
138	Latvia	68	Macedonia	89	Albania	89
139	Panama	68	Gabon	80	Macedonia	88
140	Jamaica	57	Latvia	79	Latvia	84
141	Trinidad and Tobago	55	Guinea-Bissau	71	Guinea-Bissau	81
142	Puerto Rico	54	Uruguay	66	Mongolia	69
143	Lesotho	51	Mongolia	64	Mauritania	68
144	Uruguay	50	Lesotho	63	Uruguay	66
145	Guinea-Bissau	48	Jamaica	62	Jamaica	63
146	Mongolia	47	Botswana	58	Botswana	63
147	Estonia	44	Mauritania	57	Lesotho	63
148	Botswana	37	Trinidad and Tobago	53	Gambia	54
149	Mauritania	36	Puerto Rico	47	Trinidad and Tobago	53
150	Gabon	34	Gambia	44	Namibia	45
151	Namibia	32	Swaziland	42	Swaziland	44
152	Swaziland	32	Namibia	42	Puerto Rico	44
153	Luxembourg	27	Brunei	34	Brunei	35
154	New Zealand	27	Estonia	33	Estonia	33
155	Gambia	26	New Zealand	32	New Zealand	32
156	Cyprus	23	Equatorial Guinea	30	Equatorial Guinea	32

(continued)

157	Montenegro	21	Cyprus	24	Djibouti	28
158	Brunei	19	Luxembourg	23	Timor-Leste	26
159	Equatorial Guinea	16	Djibouti	23	Cyprus	26
160	Belize	15	Timor-Leste	23	Luxembourg	25
161	Guyana	14	Suriname	20	Suriname	22
162	Suriname	14	Montenegro	20	Montenegro	19
163	Timor-Leste	13	Guyana	18	Guyana	18
164	Djibouti	13	Belize	14	Belize	16
165	Mauritius	7	Mauritius	10	Mauritius	10
166	Malta	6	French Guiana	7	French Guiana	9
167	Fiji	5	Malta	6	Malta	6
168	Western Sahara	4	Fiji	5	Fiji	5
169	Iceland	3	Comoros	5	Comoros	5
170	French Guiana	3	Western Sahara	4	Western Sahara	4
171	Cape Verde	3	Cape Verde	4	Cape Verde	4
172	Bahamas	3	Iceland	3	Iceland	3
173	Comoros	3	Bahamas	3	Bahamas	3
174	Andorra	2	Andorra	3	Andorra	3
175	Saint Lucia	1	Saint Lucia	1	Sao Tome and Principe	1
176	Sao Tome and Principe	1	Sao Tome and Principe	1	Saint Lucia	1
177	Samoa	1	Guam	1	Vanuatu	1
178	Guam	1	Samoa	1	Guam	1
179	Grenada	0	Vanuatu	1	Samoa	1
180	Antigua and Barbuda	0	Antigua and Barbuda	1	Antigua and Barbuda	1
181	Virgin Islands	0	Grenada	1	Grenada	1
182	Vanuatu	0	Saint Vincent and the Grenadines	0	Saint Vincent and the Grenadines	0
183	Saint Vincent and the Grenadines	0	Dominica	0	Dominica	0
184	Dominica	0	Virgin Islands	0	Virgin Islands	0
185	Greenland	0	Greenland	0	Seychelles	0
186	Tonga	0	Seychelles	0	Greenland	0
187	Seychelles	0	Micronesia	0	Tonga	0
188	Micronesia	0	Tonga	0	Micronesia	0
189	Bermuda	0	Bermuda	0	Maldives	0
190	Maldives	0	Maldives	0	Bermuda	0
191	American Samoa	0	American Samoa	0	American Samoa	0
192	Northern Mariana Islands	0	Northern Mariana Islands	0	Northern Mariana Islands	0
193	Kiribati	0	Kiribati	0	Kiribati	0
194	Marshall Islands	0	Marshall Islands	0	Marshall Islands	0
195	The Holy See	0	The Holy See	0	The Holy See	0

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