



ORIGINAL ARTICLE

International epidemiology of liver cancer: geographical distribution, secular trends and predicting the future

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Keywords

Incidence • Mortality • Trend • Liver Cancer • The world

Summary

Background. Liver cancer (LC) is ranked seventh common cancer in terms of the incidence; and the fourth in terms of the mortality of cancer in the world. The aim of this study was to investigate the international distribution of the incidence and mortality of LC in 2018 based on various socio-economic and political divisions in the world.

Material and methods. This study was conducted through the use of the incidence and mortality cancer data from GLOBOCAN Project in 2018. The Age-Standardized Incidence Rate (ASIR) and Age Standardized Mortality Rate (ASMR) of LC were expressed per 100,000 people. In the current report, we used Pearson correlation method to assess the correlation between ASIR and ASMR. Statistical significance was considered to be $P < 0.05$.

Results. The highest ASIR and ASMR of LC occurred in Asia (ASIR = 11.4 and ASMR = 10.5), and Western Pacific Region of the World Health Organization (ASIR = 17.4 and ASMR = 15.8), and those regions with income level equal to upper middle income (ASIR = 13.4 and ASMR = 6.6). Furthermore, the lowest ASIR and ASMR of LC occurred in Latin America and Caribbean (ASIR = 5) and Europe (ASMR = 4.4), the South-East Asia region (ASIR = 4.5 and ASMR = 4.3), and regions with Low middle income (ASIR = 5.7) and regions with high income (ASMR = 2.7).

Conclusions. LC is one of the most important cancer forms in the world in terms of incidence and mortality. It is important to prevent exposure to known risk factors for LC by increasing the level of knowledge and attitudes of the community and prevent of morbidity and mortality of the population with early diagnosis and treatment of patients.

Introduction

Despite the advances in preventing and controlling non-infectious diseases in recent decades, the incidence and prevalence of these diseases have increased dramatically [1]. Cancer is the second cause of death in most countries after cardiovascular diseases [2-6]. There were 24.5 million new cancer cases and 9.6 million cancer deaths worldwide in 2017, and led to 233.5 million Disability-Adjusted Life Year (DALYs), of which 3% came from Years lived with disability (YLDs) and 97% came from Years of Life Lost (YLLs). Globally, the odds of developing cancer in lifetime were 33% for men and 25% for women. Between 2007 and 2017, the Age-Standardized Incidence Rate (ASIR) for all cancers has increasing trend, but Age-Standardized Mortality Rate (ASMR) has decreasing trend [7]. Liver is an important body organ that plays an key role in the detoxification, excretion of waste, and the metabolism of glucose and fats [8]. Liver cancer (LC) is ranked seventh among cancers in terms of the incidence; and since most cases of LC are diagnosed at advanced stages of disease, its fatality is high, so that this cancer is ranked fourth among other types of

cancers in terms of the mortality [9]. Globally, there were 953000 new cases and 819 000 deaths of LC in 2017. LC led to 20,800,000 DALYs in 2017, which 1% coming from YLDs and 99% coming from YLLs. Generally, LC was more common in men, so lifetime odds of developing LC for men were 1 in 42 and for women 1 in 118. Population growth and population aging were the main causes of the increase of LC from 705000 cases in 2007 to 953000 cases in 2017 [7]. The most important risk factors associated with the incidence of LC are diagnosed, and most of them can be prevented and altered at the individual and social levels. Therefore, the incidence of LC and ultimately the rate of its mortality can be reduced in societies by taking appropriate measures [10].

LC can be categorized into three main forms with different risk factors associated with each of them. Hepatocellular carcinoma (HCC) is the most important LC form which is caused by the following cases: chronic infection with hepatitis B and C viruses; food contamination with aflatoxins; alcoholic cirrhosis; smoking, diabetes, overweight and obesity. Cholangiocarcinoma is the second most important LC form which is mainly caused by the following factors:

infestation with liver flukes, *Opisthorchis viverrini* and *Clonorchis sinensis*. Angiosarcoma is a very rare type of LC occurring in exposure to Vinyl chloride [11]. In the world, the ASIR of LC is 16 per 100,000 men and 6 per 100,000 women. The ASIR of LC in less developed countries is higher than developed countries (12 versus 5.4 per 100,000) [12]. Since the LC is a very high prevalent cancer and has high mortality due to the late diagnosis, it is considered to be a major health problem which imposes a large burden in term DALYs (YLL and YLD) on countries. Due to the high importance of this cancer, various studies have been conducted on estimating its burden on developed countries [11, 13]. Nevertheless, there are a few studies on distribution of LC at the international level [14]. Since obtaining the appropriate information to properly understand distribution of any disease in terms of person, place, and time is the first and most important necessity for appropriate measures and interventions to reduce the incidence and mortality of any disease, the present study was conducted with the aim to investigate the international distribution of the incidence and mortality of LC in 2018 based on various socio-economic and political divisions in the world. In addition, present study predicts the trends of incidence and mortality of LC during 2018 to 2040 in worldwide.

Materials and methods

In the present study, we extracted data on the incidence and mortality rate of LC in 184 countries from the International Agency for Research on Cancer (IARC) (Project GLOBOCAN, 2018). GLOBOCAN is a database of various types of cancers created by World Health Organization (WHO) [15, 16]. It covers information on the number, raw rates, and age standardization of cancer incidence, and mortality for different regions and countries. Currently, the available data in GLOBOCAN is known as one of the newest international databases on the cancer. Based on the data of GLOBOCAN project, it is possible to investigate and compare the incidence and mortality of cancer based on the type of cancer, age and gender groups for different regions of the world.

The present study categorized and presented the information on the Age-Standardized Incidence Rate (ASIR) and Age Standardized Mortality Rate (ASMR) of LC based on the continents (Africa, Latin America and Caribbean, Northern America, Europe, Oceania, Asia), income levels (high income, upper middle income, low middle income, and low income), human development index (HDI) (very high, high, medium, low, China and India), WHO regions (Africa region (AFRO), Americas region (PAHO), East Mediterranean region (EMRO), Europe region (EURO), South-East Asia region (SEARO) and Western Pacific region (WPRO)), and World regions (Australia and New Zealand, Caribbean, central America, central and eastern Europe, eastern

Africa, eastern Asia, Melanesia, Micronesia, middle Africa, north America, northern Africa, northern Europe, Polynesia, south America, south-central Asia, south-eastern Asia, southern Africa, southern Europe, western Africa, western Asia, and western Europe).

HUMAN DEVELOPMENT INDEX (HDI)

Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: life expectancy, education, and per capita income. The HDI is the geometric mean of normalized indices for each of the three dimensions with rang from 0 to 1 [17].

STATISTICAL ANALYSIS

We provided the information about the incidence and mortality of LC based on the number, raw rates and the Age-Standardized rates in 2018. We also expressed raw and standardized rates of incidence and mortality per 100,000 people. Geographical distribution map was prepared for the incidence and mortality of this disease based on the Age-Standardized rates. In GLOBOCAN project, predicting the number of incidence and mortality of LC in 2020, 2025, 2030, 2035 and 2040 is calculated by multiplying the age-specific incidence rates estimated for 2018, by the corresponding anticipated population for 2020, 2025, 2030, 2035 and 2040 [9]. Detailed descriptions of applied methods are presented in previous reports [11-14]. In the current report; we used Pearson correlation method in order to assess the correlation between ASIR and ASMR of LC. Statistical significance was considered as $P < 0.05$. All P-values reported in this study are two-sided. Also, statistical analyses were performed using SPSS (Version 16.0, SPSS Inc.).

Results

THE ASIR AND ASMR OF LC IN THE WORLD

In 2018, 841,080 new cases of LC were diagnosed worldwide. Of them 596,574 (70.92%) cases occurred in men and 244,506 (29.08%) in women. In general, the ASIR of LC was equal to 9.3 (13.9 in men and 4.9 in women). The sex ratio (men to women ratio) of the newly diagnosed LC was equal to 2.43 (Fig. 1).

There were also 781,631 deaths from LC during this year. Of them, 548,375 (70.15%) cases occurred in men and 233,256 (29.85%) in women. In general, the ASMR of LC was equal to 8.5 (12.7 in men and 4.6 in women). The sex ratio of the mortality of LC was equal to 2.35 (Fig. 2).

THE ASIR AND ASMR OF LC BASED ON THE CONTINENTS

The ASIR of LC was equal to 6.6 (10.1 in men, and 3.4 in women) in North America, 5.1 (8 in men, and 2.7 in women) in Europe, 6.9 (10.1 in men and 3.7 in women) in Oceania, 11.4 (17.1 in men and 5.9 in

Fig. 1. Distribution of new LC cases worldwide in 2018.

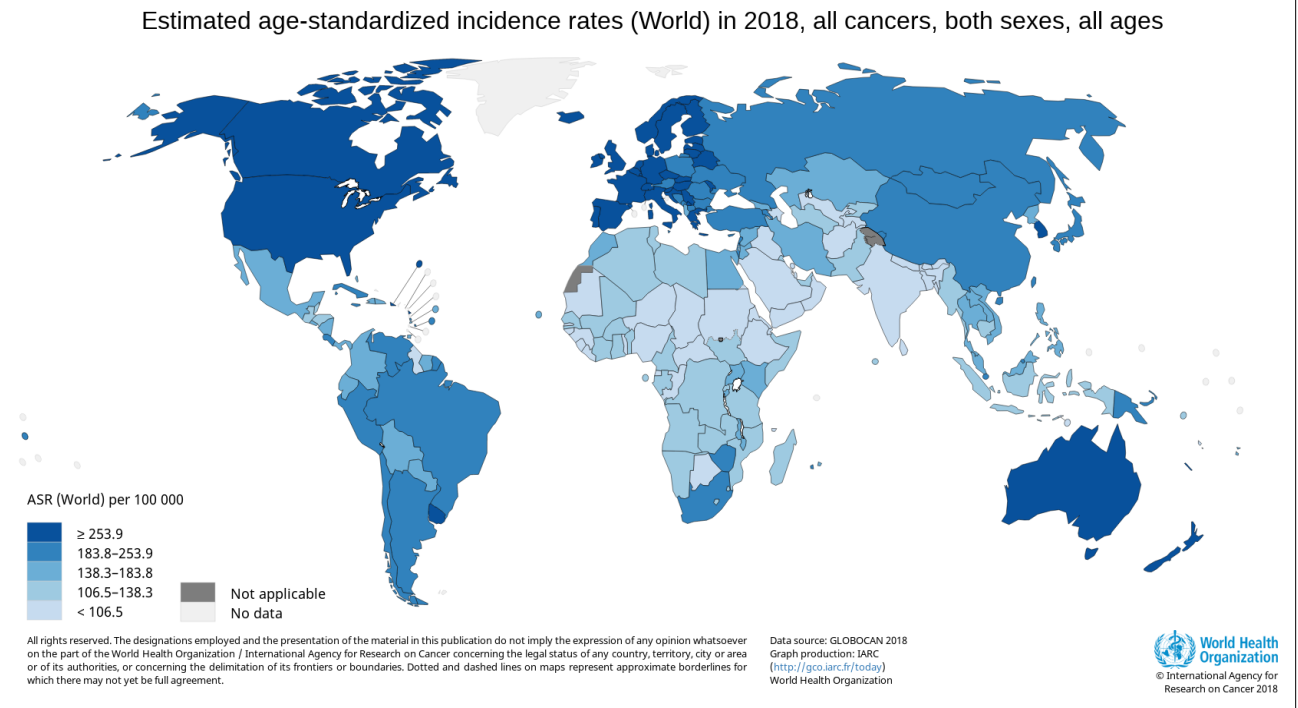
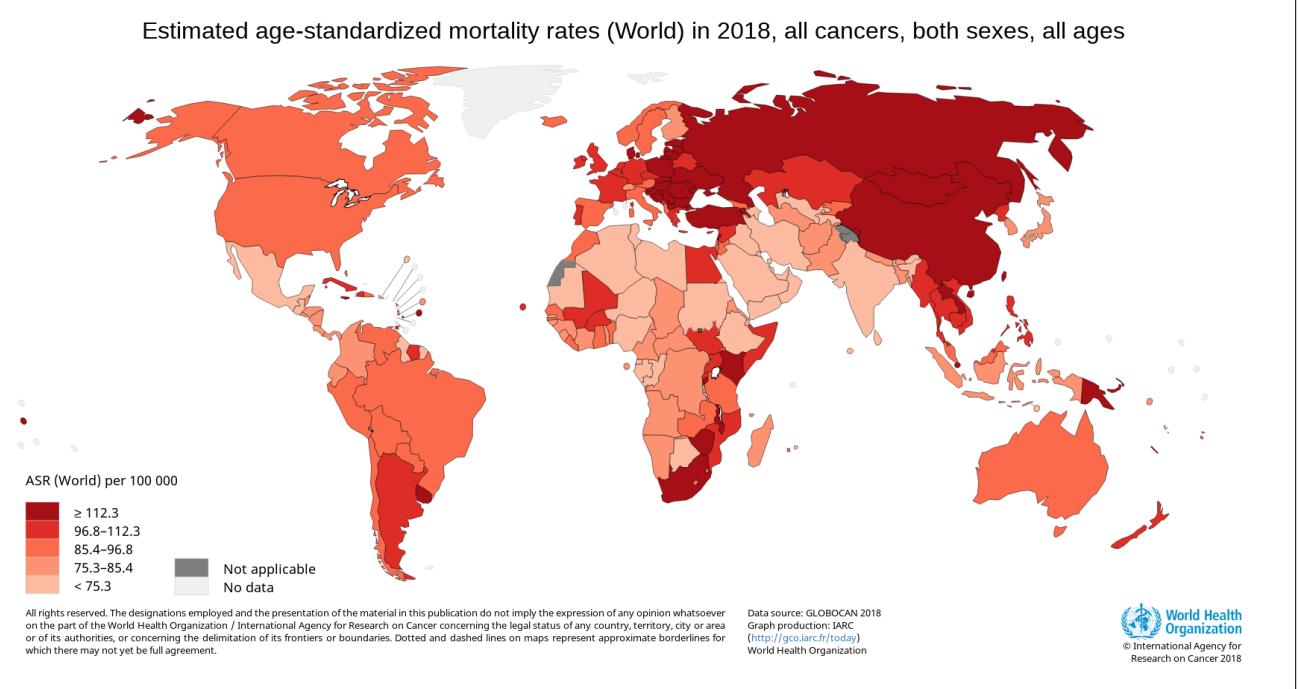


Fig. 2. Distribution of LC mortality worldwide in 2018.



women) in Asia, 5 (6.1 in men and 4.1 in women) in Latin America and Caribbean, and 8.4 (12 in men and 5.3 in women) in Africa. Of the total number of this disease in the world, the highest proportion occurred in Asia and the lowest proportion in Oceania, so that 72.47% of cases occurred in Asia, 9.8% in Europe, 4.97% in North America, 4.56% in Latin America and Caribbean, 7.73% in Africa and 0.47% in Oceania (Tab. I, Figs. 1-4). In addition, numbers, crude rate and

ASIR of LC in worldwide countries are visible in the Supplementary data (Tab. SI).

The ASMR of LC was equal to 4.8 (7.1 in men, and 2.8 in women) in North America, 4.4 (6.8 in men, and 2.4 in women) in Europe, 10.5 (15.8 in men and 5.5 in women) in Asia, 5.8 (8.3 in men and 3.4 in women) in Oceania, 4.8 (7.1 in men and 2.8 in women) in Latin America and Caribbean, and 8.3 (11.9 in men and 5.2 in women) in Africa. Of the total number of deaths

Tab. I. The age-standardized incidence rate of liver cancer in different regions of the world in 2018.

Population		All			Men			Women		
		Numbers	Crude rate	ASR (W)	Numbers	Crude rate	ASR (W)	Numbers	Crude rate	ASR (W)
World		841,080	11	9.3	596,574	15.5	13.9	244,506	6.5	4.9
WHO regions	WHO Africa region (AFRO)	37,036	3.4	6	23,719	4.4	8.1	13,317	2.5	4.1
	WHO Americas region (PAHO)	80,251	7.9	5.6	50,684	10.1	7.8	29,567	5.8	3.7
	WHO East Mediterranean region (EMRO)	39,415	5.7	7.9	26,936	7.5	10.7	12,479	3.7	5
	WHO Europe region (EURO)	91,988	10	5.1	61,546	13.7	7.9	30,442	6.4	2.8
	WHO South-East Asia region (SEARO)	84,733	4.3	4.5	59,783	5.9	6.5	24,950	2.6	2.6
	WHO Western Pacific region (WPRO)	507,501	26.2	17.4	373,794	37.9	26.4	133,707	14.1	8.5
Continents	Africa	64,779	5	8.4	43,530	6.8	12	21,249	3.3	5.3
	Asia	609,596	13.4	11.4	443,744	19.1	17.1	165,852	7.5	5.9
	Europe	82,466	11.1	5.1	55,825	15.5	8	26,641	6.9	2.7
	Latin America and the Caribbean	38,400	5.9	5	20,784	6.5	6.1	17,616	5.3	4.1
	North America	41,851	11.5	6.6	29,900	16.6	10.1	11,951	6.5	3.4
	Oceania	3,988	9.7	6.9	2,791	13.5	10.1	1,197	5.8	3.7
Human Development Index (HDI)	China	392,868	27.6	18.3	292,898	40	27.6	99,970	14.5	9
	High HDI	76,109	19.1	13.8	46,301	27.2	20.8	29,808	10.7	7.2
	India	27,670	2	2.2	18,807	2.7	3.1	8,863	1.4	1.4
	Low HDI	33,447	3.3	6	21,138	4.1	7.9	12,309	2.4	4.3
	Medium HDI	115,604	5.2	5.9	82,796	7.2	8.6	32,808	3.1	3.3
	Very high HDI	195,092	14.1	6.9	134,426	19.6	10.6	60,666	8.6	3.5
Income levels	High income	167,606	13.8	6.6	116,876	19.3	10.2	50,730	8.3	3.3
	Low income	29,774	4	6.9	19,080	5.1	9.4	10,694	2.8	4.6
	Low middle income	148,420	4.9	5.7	104,493	6.8	8.2	43,927	3	3.2
	Upper middle income	480,356	18.3	13.4	345,927	26.1	20.2	134,429	10.3	7
World regions	Australia and New Zealand	2,921	9.9	5.7	2,115	14.4	8.8	806	5.4	2.7
	Caribbean	2,923	6.6	5	1,706	7.8	6.3	1,217	5.5	3.8
	Central America	11,229	6.3	6.3	5,513	6.2	6.7	5,716	6.3	6
	Central and Eastern Europe	22,784	7.8	4	13,737	10	6.2	9,047	5.9	2.5
	Eastern Africa	11,550	2.7	4.8	7,011	3.3	6.2	4,539	2.1	3.6
	Eastern Asia	467,327	28.3	17.7	343,523	40.6	26.8	123,804	15.3	8.7
	Melanesia	915	8.7	11.4	557	10.4	14.2	358	6.9	8.9
	Micronesia	85	16	15.2	69	25.7	25.6	16	6.1	5.4
	Middle Africa	6,010	3.6	6.5	4,137	4.9	9.4	1,873	2.2	3.9
	North America	41,851	11.5	6.6	29,900	16.6	10.1	11,951	6.5	3.4
	Northern Africa	27,935	11.7	14.1	19,912	16.7	20.8	8,023	6.8	7.8
	Northern Europe	10,997	10.5	4.7	7,086	13.7	6.6	3,911	7.4	2.9
	Polynesia	67	9.7	9.2	50	14.2	14.4	17	5	4.1
	South America	24,248	5.7	4.6	13,565	6.4	5.8	10,683	4.9	3.5
	South-Central Asia	44,010	2.2	2.5	29,027	2.9	3.4	14,983	1.6	1.7
	South-Eastern Asia	89,010	13.6	13.3	65,407	20	21	23,603	7.2	6.6
	Southern Africa	2,710	4.1	4.9	1,692	5.2	7.4	1,018	3	3.2
	Southern Europe	25,026	16.4	6.8	17,702	23.7	10.9	7,324	9.4	3.1
	Western Africa	16,574	4.3	8.3	10,778	5.6	11.1	5,796	3.1	5.7
	Western Asia	9,249	3.4	4	5,787	4.1	5.4	3,462	2.7	2.8
Western Europe	23,659	12.2	5.3	17,300	18.1	8.4	6,359	6.5	2.5	

Fig. 3. Age standardized incidence rates of LC by sex in the worldwide in 2018.

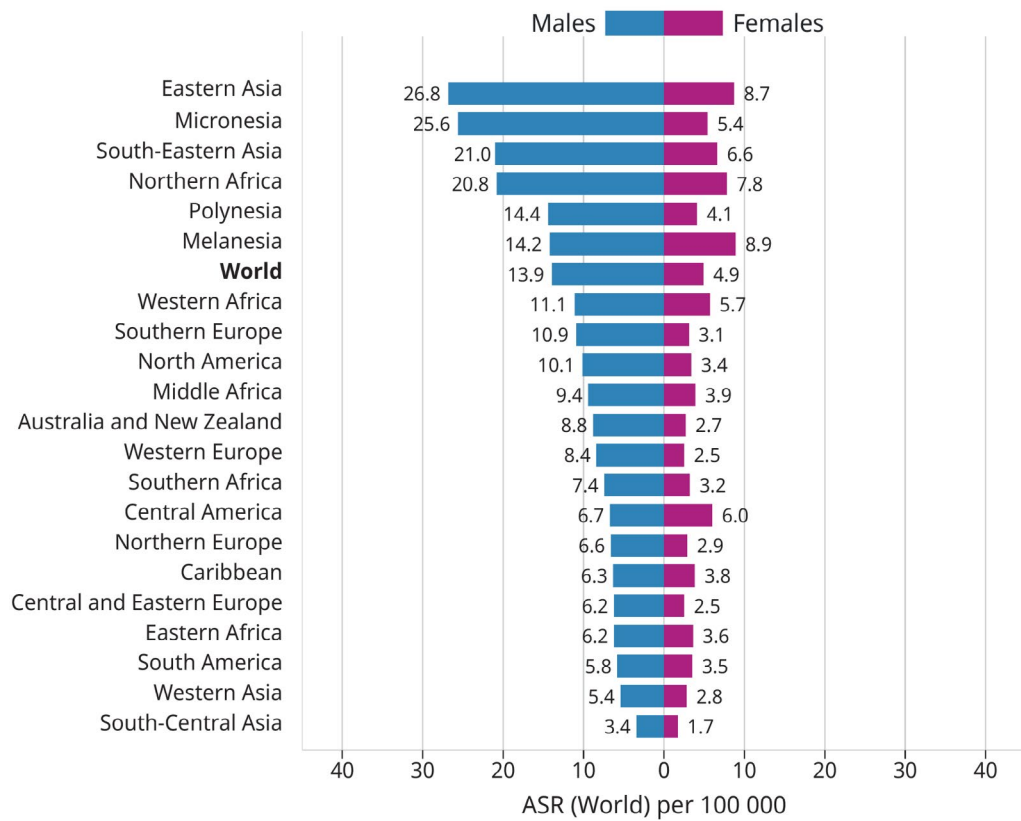
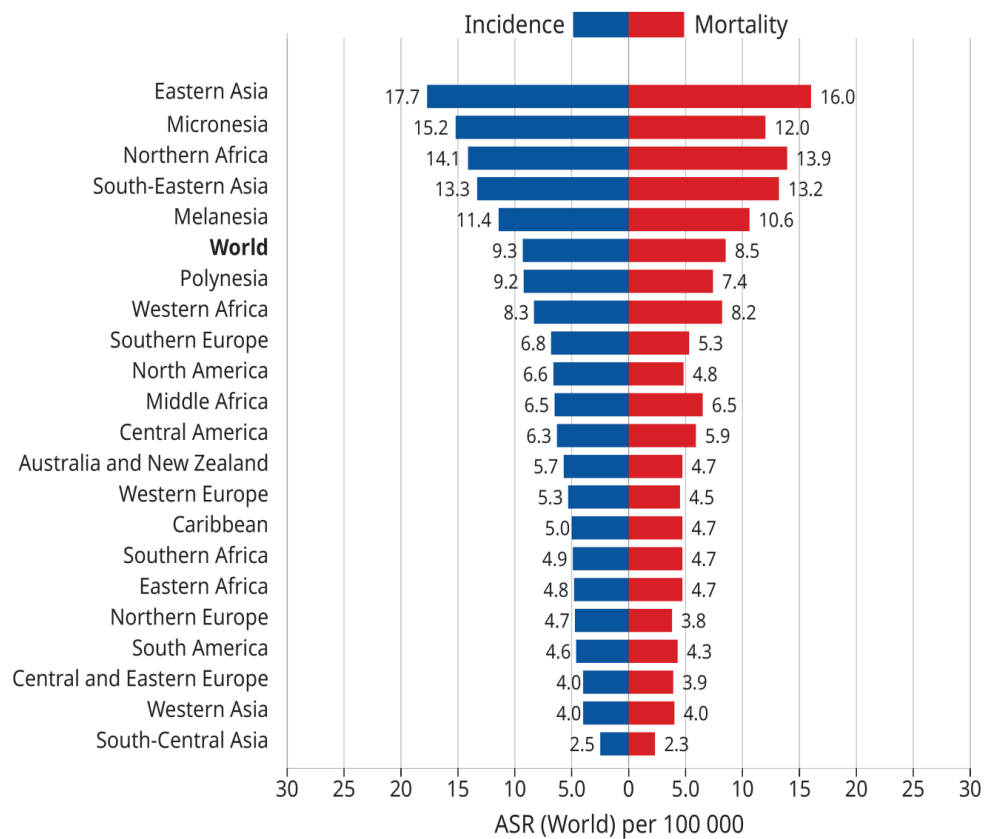


Fig. 4. Age standardized incidence and mortality rates of LC in the worldwide in 2018.



Tab. II. The age-standardized mortality rate of liver cancer in different regions of the world in 2018.

Population		All			Men			Women		
		Numbers	Crude Rate	ASR (W)	Numbers	Crude Rate	ASR (W)	Numbers	Crude Rate	ASR (W)
World		781,631	10.2	8.5	548,375	14.2	12.7	233,256	6.2	4.6
WHO regions	WHO Africa region (AFRO)	36,239	3.4	5.9	23,315	4.3	8	12,924	2.4	4
	WHO Americas region (PAHO)	70,775	7	4.8	42,539	8.5	6.3	28,236	5.5	3.4
	WHO East Mediterranean region (EMRO)	38,637	5.6	7.8	26,358	7.4	10.5	12,279	3.7	5
	WHO Europe region (EURO)	86,407	9.4	4.4	55,850	12.5	6.8	30,557	6.4	2.5
	WHO South-East Asia region (SEARO)	81,347	4.1	4.3	57,697	5.7	6.2	23,650	2.4	2.4
	WHO Western Pacific region (WPRO)	468,065	24.2	15.8	342,501	34.7	24.1	125,564	13.3	7.8
Continents	Africa	63,562	4.9	8.3	42,786	6.7	11.9	20,776	3.2	5.2
	Asia	566,269	12.5	10.5	410,223	17.6	15.8	156,046	7	5.5
	Europe	77,375	10.4	4.4	50,365	14	6.8	27,010	7	2.4
	Latin America and the Caribbean	36,436	5.6	4.7	19,650	6.1	5.7	16,786	5.1	3.9
	North America	34,339	9.4	4.8	22,889	12.7	7.1	11,450	6.2	2.8
	Oceania	3,650	8.8	5.8	2,462	11.9	8.3	1,188	5.8	3.4
Human Development Index (HDI)	China	368,960	25.9	17.1	273,014	37.3	25.6	95,946	13.9	8.6
	High HDI	73,651	18	13	45,107	25.5	19.4	28,544	10.3	6.8
	India	25,627	1.9	2	17,548	2.5	2.8	8,079	1.2	1.3
	Low HDI	32,674	3.2	5.9	20,754	4.1	7.9	11,920	2.3	4.2
	Medium HDI	113,443	5	5.7	81,390	7	8.3	32,053	3	3.2
	Very high HDI	167,010	12	5.3	110,379	16.1	8.1	56,631	8.1	2.9
Income levels	High income	47,477	7.8	2.7	47,477	7.8	2.7	47,477	7.8	2.7
	Low income	10,295	2.7	4.5	10,295	2.7	4.5	10,295	2.7	4.5
	Low middle income	42,245	2.9	3.1	42,245	2.9	3.1	42,245	2.9	3.1
	Upper middle income	129,546	10	6.6	129,546	10	6.6	129,546	10	6.6
World regions	Australia and New Zealand	2,709	9.2	4.7	1,881	12.8	7	828	5.6	2.5
	Caribbean	2,791	6.3	4.7	1,588	7.3	5.8	1,203	5.4	3.7
	Central America	10,672	5.9	5.9	5,324	6	6.4	5,348	5.9	5.5
	Central and Eastern Europe	22,745	7.8	3.9	13,581	9.9	6.1	9,164	5.9	2.4
	Eastern Africa	11,251	2.6	4.7	6,799	3.2	6.2	4,452	2	3.5
	Eastern Asia	427,932	25.9	16	312,228	36.9	24.2	115,704	14.3	8
	Melanesia	819	7.8	10.6	491	9.2	13.1	328	6.3	8.3
	Micronesia	68	12.8	12	54	20.1	19.8	14	5.3	4.9
	Middle Africa	5,853	3.5	6.5	4,056	4.8	9.5	1,797	2.1	3.9
	North America	34,339	9.4	4.8	22,889	12.7	7.1	11,450	6.2	2.8
	Northern Africa	27,505	11.6	13.9	19,570	16.4	20.4	7,935	6.7	7.7
	Northern Europe	9,997	9.5	3.8	6,088	11.8	5.2	3,909	7.4	2.5
	Polynesia	54	7.8	7.4	36	10.2	10.6	18	5.3	4.5
	South America	22,973	5.4	4.3	12,738	6	5.5	10,235	4.7	3.4
	South-Central Asia	40,812	2.1	2.3	27,060	2.7	3.2	13,752	1.4	1.5
	South-Eastern Asia	88,429	13.5	13.2	65,238	19.9	20.9	23,191	7.1	6.5
	Southern Africa	2,597	3.9	4.7	1,614	5	7.1	983	2.9	3.1
	Southern Europe	21,996	14.4	5.3	14,800	19.8	8.3	7,196	9.2	2.6
	Western Africa	16,356	4.3	8.2	10,747	5.6	11.1	5,609	3	5.6
	Western Asia	9,096	3.4	4	5,697	4	5.4	3,399	2.6	2.8
Western Europe	22,637	11.7	4.5	15,896	16.6	7	6,741	6.9	2.2	

of LC in the world, the highest proportion occurred in Asia and the lowest proportion in Oceania, so that 72.44% of cases occurred in Asia, 9.89% in Europe, 4.39% in North America, 4.66% in Latin America and Caribbean, 8.13% in Africa and 0.49% in Oceania (Tab. II, Figs. 1-4). In addition, numbers, crude rate and ASMR of LC in worldwide countries are visible in the Supplementary data (Tab. SII).

THE ASIR AND ASMR OF LC ACCORDING TO THE WHO CLASSIFICATION

The ASIR of LC was equal to 17.4 (26.4 in men, and 8.5 in women) in WPRO, 5.1 (7.9 in men, and 2.8 in women) in EURO, 5.6 (7.8 in men and 3.7 in women) in PAHO, 4.5 (6.5 in men and 2.6 in women) in SEARO, 7.9 (10.7 in men and 5 in women) in EMRO, and 6 (8.1 in men and 4.1 in women) in AFRO. Of the total incidence of this disease, 60.33% occurred in WPRO, 10.93% in EURO, 9.54% in PAHO, 10.07% in SEARO, 4.68% in EMRO, and 4.46% in AFRO (Tab. I).

The ASMR of LC was equal to 15.8 (24.1 in men, and 7.8 in women) in WPRO, 4.4 (6.8 in men, and 2.5 in women) in EURO, 4.8 (6.3 in men and 3.4 in women) in PAHO, 4.3 (6.2 in men and 2.4 in women) in SEARO, 7.8 (10.5 in men and 5 in women) in EMRO, and 5.9 (8 in men and 4 in women) in AFRO. Of the total mortality of this disease, 59.88% occurred in WPRO, 11.05% in EURO, 9.05% in PAHO, 10.4% in SEARO, 4.94% in EMRO, and 4.68% in AFRO (Tab. II).

THE ASIR AND ASMR OF LC ACCORDING TO THE LEVELS OF HUMAN DEVELOPMENT INDEX (HDI)

The ASIR of LC was equal to 6.9 (10.6 in men, and 3.5 in women) in regions with very high HDI, 13.8 (20.8 in men, and 7.2 in women) in regions with high HDI, 5.9 (8.6 in men and 3.3 in women) in regions with medium HDI, 6 (7.9 in men and 4.3 in women) in regions with low HDI, 18.3 (27.6 in men and 9 in women) in China, and 2.2 (3.1 in men and 1.4 in women) in India. Of the total incidence of this disease, 23.19% occurred in regions with very high HDI, 9.04% in regions with high HDI, 13.74% in regions with medium HDI, 3.97% in regions with low HDI, 46.70% in China, and 3.28% in India (Tab. I)

The ASMR of LC was equal to 5.3 (8.1 in men, and 2.9 in women) in regions with very high HDI, 13 (19.4 in men, and 6.8 in women) in regions with high HDI, 5.7 (8.3 in men and 3.2 in women) in regions with medium HDI, and 5.9 (7.9 in men and 4.2 in women) in regions with low HDI. Of the total incidence of this disease, 21.36% occurred in regions with very high HDI, 9.42% in regions with high HDI, 14.51% in regions with medium HDI, and 4.18% in regions with low HDI, 47.20% in China, and 3.33% in India (Tab. II).

PREDICTING THE INCIDENCE AND MORTALITY OF LC FROM 2018 TO 2040

The number of new cases of LC is predicted to increase from 841,080 case in 2018 to 883,925 (+5.1%), 997,895 (+18.6%), 1,118,358 (+33.0%), 1,241,726 (+47.6%)

and 1361836 (+61.9%) case in 2020, 2025, 2030, 2035 and 2040, respectively. In addition, the number of mortality from LC increases from 781631 case in 2018 to 821,727 (+5.1%), 930,121 (+19.0%), 1,046,114 (+33.8%), 1,166,317 (+49.2%) and 1,284,252 (+64.3%) case in 2020, 2025, 2030, 2035 and 2040, respectively (Tab. III).

RELATIONSHIP BETWEEN ASIR AND ASMR OF LC WORLDWIDE

There was a statistically significant correlation between ASIR and ASMR of LC worldwide at the level of 0.987 ($P \geq 0.001$). This correlation was equal to 0.994 ($P \geq 0.001$) in Asia, 0.848 ($P \geq 0.001$) in Europe, 0.996 ($P \geq 0.001$) in Africa, 0.964 ($P \geq 0.001$) in the Latin America and the Caribbean and 0.764 ($P = 0.010$) in Oceania (Fig. 5).

Discussion

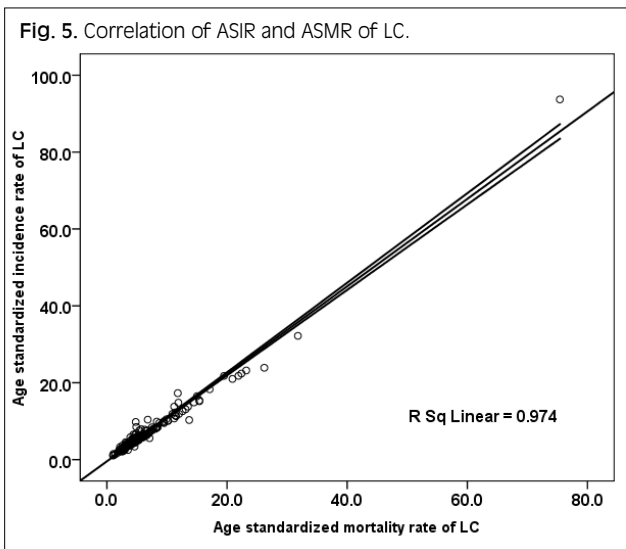
The present study was based on data from GLOBOCAN PROJECT that was internationally conducted by WHO in 2018. The study aimed to examine the geographical distribution of incidence and mortality of LC based on geographical, political and economic divisions at the international level. It also predicts the number of incidence and mortality cases of LC from 2018 to 2040.

Cancer is considered as an important health problem in developing countries, especially Asian countries, so that it is one of the most important causes of death in some Asian countries such as South Korea and Japan. It seems that if current management plans and strategies are not changed, the number of deaths from cancer will increase by more than 7000000 per year in these areas until 2020 [18, 19]. According to this, current study found that most cases of incidence and mortality of LC occurred in less developed regions of the world in 2018. According to a research by Chang et al., hepatocellular carcinoma (HCC) caused by the chronic infection with hepatitis B was more common in areas with a low and moderate HDI mostly in Asia and Africa [20]. On the other hand, the increased incidence of hepatocellular carcinoma in developed countries was due to the higher prevalence of alcohol consumption and hepatitis C infection [21].

Distribution of cancer in different regions of the world varies according to the HDI. Different cancers are considered as the most common cancers in regions with low, medium, high and very high HDI. Lung, colorectal, prostate, and breast cancers are considered as the most common cancers in areas with high and very high HDI; and they account for more than 50% of all new cancer cases in these areas. Meanwhile, in areas with low and moderate HDI, the lung, breast, colorectal, stomach, liver and cervical cancers are also diagnosed as cancers with the highest incidence and severity. However, in areas with low HDI, cancers associated with infectious agents account for a high proportion of cancer incidence and mortality [21-23].

Tab. III. Predicting the incidence and mortality cases of LC from 2018 to 2040.

Year	2018	2020		2025		2030		2035		2040		
Event	Sex	Number	Number	Demographic change (APC 0%)	Number	Demographic change (APC 0%)	Number	Demographic change (APC 0%)	Number	Demographic change (APC 0%)	Number	Demographic change (APC 0%)
Incidence	Males	596,574	626,767	30,193 (+5.1%)	706,015	109,441 (+18.3%)	788,519	191,945 (+32.2%)	872,035	275,461 (+46.2%)	952,887	356,313 (+59.7%)
	Females	244,506	257,158	12,652 (+5.2%)	291,880	47,374 (+19.4%)	329,839	85,333 (+34.9%)	369,691	125,185 (+51.2%)	408,949	164,443 (+67.3%)
	Both sexes	841,080	883,925	42,845 (+5.1%)	997,895	156,815 (+18.6%)	1,118,358	277,278 (+33.0%)	1,241,726	400,646 (+47.6%)	1,361,836	520,756 (+61.9%)
Mortality	Males	548,375	576,354	27,979 (+5.1%)	650,956	102,581 (+18.7%)	729,536	181,161 (+33.0%)	809,877	261,502 (+47.7%)	888,195	339,820 (+62.0%)
	Females	233,256	245,373	12,171 (+5.2%)	279,165	45,909 (+19.7%)	316,578	83,322 (+35.7%)	356,440	123,184 (+52.8%)	396,057	162,801 (+69.8%)
	Both sexes	781,631	821,727	40,096(+5.1%)	930,121	148,490 (+19.0%)	1,046,114	264,483 (+33.8%)	1,166,317	384,686 (+49.2%)	1,284,252	502,621 (+64.3%)



In 2018, the incidence of LC was 5.1 and 6.6 per 100,000 people in Europe and North America, respectively. While the incidence of this disease was 11.4 and 8.4 in Asia and Africa, respectively, indicating the high incidence of disease in less developed regions of the world. Top ten countries with the highest incidence of LC in 2018 were as follows: Mongolia with ASIR = 117, Egypt with ASIR = 49, Viet Nam with ASIR = 39, The Gambia with ASIR = 36.5, Lao People’s Democratic Republic with ASIR = 33.4, Thailand with ASIR = 32.2, Guinea with ASIR = 27.9, Republic of Korea with ASIR = 27.7, China with ASIR = 27.6, and Democratic Republic of Korea with ASIR = 25.4 [21]. Among 10 countries with the highest standardized LC incidence worldwide, 3 countries were located in Africa and 7 countries in Asia. Most of these countries with low or moderate HDI were located in less developed regions [6, 24-29]. In the present study, there was a significant statistical correlation between ASIR and ASMR of LC in the world, Europe, Asia, Africa, the Oceania, and the United States, in other words, an increase in the incidence of LC significantly enhanced its mortality rate. Therefore, appropriate and applied measures and programs should be adopted in areas with the highest incidence of LC, for primary and secondary prevention of disease with the aim to reduce the incidence and

mortality of LC [30, 31]. Accordingly, it is suggested conducting case-control and cohort studies in countries and regions with the highest incidence of LC with the aim to diagnose the most important risk factors of this cancer and the risk attributable to each of these factors in order to perform appropriate regional planning to reduce the incidence of disease. Furthermore, patients need to be diagnosed and treated at early stages of disease by conducting appropriate screening programs in order to reduce the rate of disease mortality in these areas in the long term.

LIMITATIONS OF THE STUDY

The quality of the collected cancer data in the GLOBOCAN project is not similar in all countries, especially those with medium or low HDI, so that the estimates of some countries are based on the recorded cases of cancer in limited areas or based on estimates from neighboring countries [24]. Please, see the Supplementary data (Tabs. SIII, SIV). for more information.

Conclusions

LC is one of the most important cancers in the world in terms of incidence and mortality. It is important to prevent exposure to known risk factors for LC by increasing the level of knowledge and attitudes of the community. In addition, it is necessary that health policy makers have appropriate planning for providing suitable diagnostic and medical service to prevent of morbidity and mortality of the population with early diagnosis and treatment of patients.

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Conflict of interest statement

The authors declare no conflict of interest.

Authors' contributions

AMH conceived the idea of the study and approved the final draft of the manuscript. MM and KAB wrote the first draft of the manuscript and carried out the data analysis. All authors contributed to the revising and editing of the article and the final version of the article was approved by them.

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Supplementary data

Tab. S1. The age-standardized incidence rate of LC in 185 countries of the world in 2018.

Countries	All				Male				Female			
	Numbers	Uncertainty interval	Crude Rate	ASR (W)	Numbers	Uncertainty interval	Crude Rate	ASR (W)	Numbers	Uncertainty interval	Crude Rate	ASR (W)
Afghanistan	642	[491.6-838.4]	1.8	3.9	391	[280.8-544.4]	2.1	4.9	251	[159.9-394.1]	1.4	3
Albania	435	[374.3-505.5]	14.8	7.8	265	[218.1-322.0]	17.9	10	170	[134.3-215.2]	11.7	5.7
Algeria	563	[455.6-695.7]	1.3	1.4	311	[231.8-417.3]	1.5	1.6	252	[185.8-341.8]	1.2	1.3
Angola	581	[368.5-915.9]	1.9	3.6	382	[225.1-648.2]	2.5	5.2	199	[81.3-486.8]	1.3	2.3
Argentina	2 343	[2028.2-2706.6]	5.2	3.6	1 364	[1134.2-1640.3]	6.2	5	979	[776.7-1234.0]	4.3	2.5
Armenia	474	[370.1-607.1]	16.2	9.7	263	[206.2-335.5]	19.1	13.5	211	[57.5-775.0]	13.6	6.9
Australia	2 438	[2235.6-2658.7]	9.8	5.7	1 729	[1572.3-1901.4]	14	8.6	709	[574.1-875.6]	5.7	2.9
Austria	1 121	[970.7-1294.6]	12.8	5.4	750	[629.9-893.0]	17.5	8.2	371	[287.6-478.7]	8.3	3
Azerbaijan	384	[338.4-435.7]	3.9	3.6	192	[161.9-227.8]	3.9	4.1	192	[159.1-231.7]	3.9	3.2
Bahamas	14	[7.2-27.2]	3.5	2.3	10	[4.1-24.4]	5.1	3.9	4	[1.5-10.8]	2	1.1
Bahrain	30	[19.1-47.2]	1.9	3.4	20	[11.1-36.0]	2	3.9	10	[4.9-20.4]	1.7	2.7
Bangladesh	3 128	[2395.3-4084.9]	1.9	2.2	2 352	[1689.1-3275.0]	2.8	3.3	776	[494.2-1218.5]	0.94	1.1
Barbados	14	[7.2-27.1]	4.9	2.4	7	[2.7-18.1]	5.1	3	7	[2.8-17.6]	4.7	1.9
Belarus	555	[471.5-653.3]	5.9	3.3	318	[262.1-385.8]	7.2	4.9	237	[174.9-321.2]	4.7	2.1
Belgium	1 006	[929.9-1088.3]	8.7	4.3	638	[585.3-695.4]	11.2	5.9	368	[292.9-462.3]	6.3	2.9
Belize	19	[11.0-32.7]	5	8.4	14	[6.8-28.7]	7.4	12.2	5	[2.2-11.5]	2.6	4.4
Benin	298	[196.8-451.3]	2.6	5.1	233	[129.9-417.8]	4.1	9.8	65	[36.0-117.3]	1.1	2.1
Bhutan	35	[30.8-39.7]	4.3	5.3	28	[23.9-32.8]	6.5	7.8	7	[5.7-8.6]	1.8	2.3
Bolivia, Plurinational State of	678	[585.7-784.8]	6	6.1	303	[243.2-377.5]	5.4	5.6	375	[308.3-456.2]	6.7	6.7
Bosnia and Herzegovina	552	[454.5-670.4]	15.8	7.4	295	[228.3-381.2]	17.1	9.1	257	[190.8-346.2]	14.4	5.9
Botswana	62	[44.4-86.6]	2.7	3.9	40	[26.3-60.9]	3.5	6.4	22	[12.7-38.1]	1.9	2.3
Brazil	12 463	[11341.2-13695.8]	5.9	4.7	7 317	[6491.1-8248.0]	7.1	6.3	5 146	[4415.6-5997.2]	4.8	3.4
Brunei	38	[23.0-62.8]	8.8	9.9	32	[17.7-57.9]	14.3	17	6	[2.4-15.3]	2.8	3.1
Bulgaria	559	[491.7-635.6]	7.9	3.6	377	[298.3-476.4]	11	5.7	182	[155.7-212.7]	5	1.8
Burkina Faso	1 296	[553.2-3036.0]	6.6	13.8	789	[319.9-1946.2]	8	19.2	507	[39.4-6517.7]	5.1	9.7
Burundi	400	[211.8-755.3]	3.6	6.3	270	[118.6-614.4]	4.9	9	130	[47.7-354.1]	2.3	3.9

Cabo Verde	44	[29.2-66.4]	8	10.7	24	[13.6-42.3]	8.7	11.3	20	[11.0-36.3]	7.2	9.3
Cambodia	2 546	[1376.1-4710.4]	15.7	21.8	1 691	[810.9-3526.2]	21.3	34.6	855	[275.1-2656.9]	10.3	12.7
Cameroon	955	[617.8-1476.4]	3.9	6.1	724	[436.5-1200.9]	5.9	9.3	231	[98.1-543.8]	1.9	3.1
Canada	3 889	[3592.5-4210.0]	10.5	5.3	2 608	[2364.3-2876.9]	14.2	7.6	1 281	[1119.5-1465.8]	6.9	3.2
Central African Republic	149	[94.5-234.9]	3.1	5.1	104	[61.3-176.5]	4.5	7.5	45	[18.4-110.1]	1.9	3.1
Chad	405	[256.9-638.5]	2.6	5.5	280	[165.0-475.1]	3.6	7.8	125	[51.1-305.8]	1.6	3.4
Chile	1 582	[1230.7-2033.6]	8.7	5.4	871	[618.9-1225.8]	9.7	6.9	711	[491.0-1029.7]	7.7	4.2
China	392 868	[386346.0-399500.0]	27.6	18.3	292 898	[287242.0-298665.0]	40	27.6	99 970	[96758.9-103288.0]	14.5	9
Colombia	2 279	[1874.9-2770.3]	4.6	3.9	1 195	[915.2-1560.3]	4.9	4.6	1 084	[814.0-1443.5]	4.3	3.3
Comoros	29	[15.4-54.8]	3.5	5.7	18	[7.9-41.0]	4.3	7.6	11	[4.0-30.0]	2.7	4.1
Congo, Democratic Republic of	3 613	[2291.8-5695.9]	4.3	8	2 431	[1432.6-4125.1]	5.8	11.5	1 182	[483.2-2891.5]	2.8	5
Congo, Republic of	207	[157.7-271.7]	3.8	5.9	146	[105.1-202.7]	5.4	8.6	61	[37.6-99.1]	2.3	3.4
Costa Rica	427	[297.4-613.1]	8.6	6.3	248	[142.8-430.6]	10	7.9	179	[110.9-289.0]	7.2	4.8
Croatia	639	[549.6-742.9]	15.3	6.3	410	[343.8-488.9]	20.4	9.9	229	[171.2-306.3]	10.6	3.4
Cuba	837	[730.9-958.4]	7.3	3.8	498	[419.4-591.3]	8.7	4.7	339	[271.9-422.6]	5.9	2.9
Cyprus	75	[55.3-101.8]	6.3	3.4	51	[35.1-74.1]	8.6	5	24	[14.1-40.9]	4	2
Czechia	1 063	[946.6-1193.7]	10	4.2	679	[592.7-777.8]	13	6.1	384	[307.4-479.7]	7.1	2.6
Côte d'Ivoire	1 121	[932.5-1347.6]	4.5	8.4	703	[562.0-879.4]	5.6	9.7	418	[302.5-577.6]	3.4	6.9
Denmark	611	[537.3-694.8]	10.6	4.9	426	[364.9-497.4]	14.9	7.3	185	[146.9-233.0]	6.4	2.6
Djibouti	19	[10.1-35.9]	2	2.6	11	[4.8-25.0]	2.3	3.1	8	[2.9-21.8]	1.7	2.2
Dominican Republic	718	[587.6-877.3]	6.6	6.5	400	[304.1-526.2]	7.4	7.6	318	[237.0-426.6]	5.8	5.5
Ecuador	979	[846.0-1132.9]	5.8	5.3	483	[389.7-598.6]	5.7	5.7	496	[406.4-605.3]	5.9	4.9
Egypt	25 399	[23831.9-27069.1]	25.6	32.2	18 471	[17185.0-19853.3]	36.8	49	6 928	[6050.8-7932.4]	14.1	16.7
El Salvador	514	[417.9-632.1]	8	6.7	208	[156.0-277.3]	6.9	6.4	306	[227.1-412.3]	9	6.9
Equatorial Guinea	44	[27.9-69.4]	3.3	4.7	34	[20.0-57.7]	4.7	6	10	[4.1-24.5]	1.7	3
Eritrea	92	[48.7-173.7]	1.8	3.3	50	[22.0-113.8]	1.9	3.7	42	[15.4-114.4]	1.6	2.9
Estonia	103	[82.3-128.9]	7.9	3.2	61	[45.4-82.0]	10	5.1	42	[29.8-59.2]	6.1	2
Eswatini	37	[25.3-54.0]	2.7	3.9	20	[12.0-33.4]	3	5	17	[9.7-29.8]	2.4	3.2
Ethiopia	1 608	[1052.3-2457.1]	1.5	2.7	749	[409.9-1368.7]	1.4	2.6	859	[473.1-1559.6]	1.6	2.7
Fiji	76	[65.3-88.4]	8.3	8.3	53	[44.2-63.5]	11.5	12.3	23	[17.4-30.4]	5.1	4.9
Finland	550	[475.8-635.7]	9.9	3.6	347	[283.3-425.0]	12.7	5.2	203	[165.1-249.7]	7.2	2.3
France	10 624	[10156.6-11112.9]	16.3	7.8	8 382	[7967.5-8818.1]	26.1	13.3	2 242	[2033.8-2471.5]	6.8	2.7

France, Guadeloupe	34	[21.8-53.1]	7.6	3.7	22	[12.7-38.1]	10.6	6.2	12	[5.6-25.7]	5	1.7
France, La Réunion	85	[65.0-111.2]	9.6	6	58	[41.8-80.4]	13.6	9.1	27	[16.8-43.3]	5.9	3.3
France, Martinique	39	[26.8-56.8]	10.1	4.1	25	[15.6-40.0]	14.3	5.9	14	[7.5-26.3]	6.7	2.7
France, New Caledonia	38	[24.5-58.9]	13.6	10.4	25	[14.8-42.3]	17.7	14.3	13	[5.9-28.5]	9.4	6.9
French Guiana	21	[11.0-40.1]	7.2	8.5	18	[8.0-40.6]	12.4	15.5	3	[1.0-8.7]	2.1	2.3
French Polynesia	34	[22.3-51.9]	11.9	9.5	23	[11.7-45.3]	15.8	13.4	11	[6.4-19.0]	7.8	5.6
Gabon	55	[36.9-81.9]	2.7	3.3	35	[21.5-56.9]	3.3	3.9	20	[10.0-40.1]	2	2.6
Gaza Strip and West Bank	47	[24.1-91.8]	0.93	1.8	31	[14.5-66.4]	1.2	2.4	16	[3.9-65.3]	0.64	1.3
Georgia	380	[322.7-447.5]	9.7	5.4	235	[198.7-278.0]	12.6	8.3	145	[81.0-259.4]	7.1	3.1
Germany	8 883	[8277.0-9533.3]	10.8	4.2	6 191	[5716.5-6704.9]	15.3	6.4	2 692	[2311.4-3135.2]	6.4	2.3
Ghana	2 753	[2402.2-3155.0]	9.3	15.4	2 016	[1717.8-2365.9]	13.7	24.4	737	[568.3-955.7]	5	7.6
Greece	1 642	[1486.9-1813.2]	14.7	5.7	1 121	[986.4-1274.0]	20.4	8.6	521	[445.3-609.6]	9.2	3.3
Guam	31	[25.3-37.9]	18.7	14.8	25	[20.0-31.2]	29.8	24.5	6	[3.7-9.8]	7.3	5.3
Guatemala	1 787	[1592.4-2005.4]	10.4	14.9	854	[723.0-1008.8]	10.1	15.8	933	[795.3-1094.6]	10.7	14.1
Guinea	1 582	[1242.4-2014.4]	12.1	21.8	969	[717.7-1308.3]	14.8	27.9	613	[408.0-921.0]	9.4	16.3
Guinea-Bissau	126	[53.8-295.2]	6.6	11.9	84	[34.1-207.2]	8.9	17.3	42	[3.3-539.9]	4.3	7.3
Guyana	20	[11.9-33.7]	2.6	2.7	10	[4.9-20.5]	2.5	2.7	10	[4.7-21.5]	2.6	2.7
Haiti	664	[543.7-810.9]	6	8.1	354	[288.2-434.8]	6.4	9.5	310	[132.7-724.1]	5.5	6.8
Honduras	403	[300.0-541.4]	4.3	5.7	302	[206.1-442.5]	6.4	9.2	101	[63.4-160.8]	2.1	2.7
Hungary	1 087	[959.0-1232.1]	11.2	5.4	770	[665.5-890.9]	16.7	9.2	317	[248.3-404.8]	6.2	2.4
Iceland	15	[9.0-25.0]	4.4	2.5	12	[6.2-23.4]	7.1	4.1	3	[1.4-6.6]	1.8	0.95
India	27 670	[26091.1-29344.5]	2	2.2	18 807	[17531.4-20175.5]	2.7	3.1	8 863	[7961.8-9866.2]	1.4	1.4
Indonesia	18 468	[16124.1-21152.6]	6.9	7.6	14 238	[12130.6-16711.6]	10.6	12.4	4 230	[3276.2-5461.5]	3.2	3.4
Iran, Islamic Republic of	3 492	[3303.2-3691.6]	4.3	4.7	1 999	[1860.1-2148.3]	4.8	5.3	1 493	[1368.0-1629.4]	3.7	4.1
Iraq	539	[478.6-607.0]	1.4	2.7	278	[236.4-326.9]	1.4	3.1	261	[219.2-310.8]	1.3	2.4
Ireland	363	[301.4-437.2]	7.6	4.3	275	[207.5-364.5]	11.5	6.8	88	[68.6-112.8]	3.6	2
Israel	336	[281.8-400.6]	4	2.6	200	[159.9-250.2]	4.8	3.5	136	[102.4-180.6]	3.2	1.7
Italy	12 325	[11947.7-12714.2]	20.8	7.9	8 742	[8418.2-9078.3]	30.2	12.8	3 583	[3391.8-3784.9]	11.8	3.5
Jamaica	106	[80.2-140.1]	3.7	2.9	55	[37.8-80.1]	3.8	3	51	[33.6-77.3]	3.5	2.8
Japan	35 535	[34730.5-36358.1]	27.9	7.6	23 448	[22796.6-24118.0]	37.8	12.3	12 087	[11621.1-12571.5]	18.6	3.5
Jordan	188	[148.6-237.8]	1.9	3.1	101	[74.4-137.2]	2	3.4	87	[60.3-125.6]	1.8	2.7
Kazakhstan	1 122	[1045.7-1203.9]	6.1	5.6	655	[597.0-718.6]	7.3	8.2	467	[419.0-520.5]	4.9	3.9

Kenya	1 346	[1050.6-1724.5]	2.6	5.3	761	[556.8-1040.0]	3	6.2	585	[389.4-878.9]	2.3	4.5
Korea, Democratic Republic of	5 718	[5354.5-6106.2]	22.3	16.5	3 831	[3524.8-4163.8]	30.6	25.4	1 887	[1695.9-2099.6]	14.4	9
Korea, Republic of	16 510	[15880.0-17165.0]	32.3	17.3	12 180	[11648.7-12735.6]	47.6	27.7	4 330	[3998.8-4688.6]	16.9	8.2
Kuwait	121	[94.5-155.0]	2.9	5.2	88	[65.4-118.3]	3.7	6.2	33	[21.0-51.8]	1.8	3.7
Kyrgyzstan	456	[371.5-559.7]	7.4	9.5	267	[200.2-356.1]	8.8	13	189	[141.2-252.9]	6.1	6.9
Lao People's Democratic Republic	1 035	[559.4-1914.9]	14.9	22.4	712	[341.4-1484.7]	20.5	33.4	323	[103.9-1003.7]	9.3	13.1
Latvia	152	[112.4-205.5]	7.9	3.1	63	[43.0-92.3]	7.1	3.8	89	[54.4-145.7]	8.5	2.6
Lebanon	227	[185.8-277.3]	3.7	3.2	133	[102.4-172.8]	4.4	3.6	94	[68.9-128.2]	3.1	2.6
Lesotho	68	[39.0-118.4]	3	4.4	41	[20.3-82.7]	3.7	6.6	27	[10.9-66.8]	2.3	3
Liberia	412	[175.9-965.1]	8.5	15.2	247	[100.1-609.3]	10.1	18.9	165	[12.8-2121.1]	6.9	11.7
Libya	191	[125.0-291.8]	3	4.1	98	[55.9-171.9]	3	4.4	93	[48.8-177.3]	2.9	3.8
Lithuania	246	[206.6-292.9]	8.6	3.8	160	[121.7-210.3]	12.1	6.5	86	[68.4-108.1]	5.5	1.9
Luxembourg	70	[48.8-100.5]	11.9	6.5	48	[30.8-74.8]	16.2	9.1	22	[11.8-41.0]	7.5	4.2
Madagascar	898	[475.6-1695.7]	3.4	5.8	584	[256.6-1329.0]	4.5	8.3	314	[115.3-855.3]	2.4	3.6
Malawi	291	[162.5-521.2]	1.5	2.1	167	[78.6-354.9]	1.8	2.4	124	[49.5-310.7]	1.3	1.8
Malaysia	1 944	[1785.5-2116.6]	6.1	6.3	1 460	[1322.7-1611.5]	8.8	9.5	484	[409.4-572.1]	3.1	3.1
Maldives	27	[20.7-35.3]	6.1	8.3	22	[15.8-30.6]	8.7	12.3	5	[3.2-7.9]	2.6	3.7
Mali	598	[473.6-755.0]	3.1	6.3	438	[335.3-572.2]	4.6	10.2	160	[99.3-257.8]	1.7	2.9
Malta	22	[13.9-34.8]	5.1	2.2	15	[8.4-26.9]	6.9	3.5	7	[3.3-14.6]	3.3	0.94
Mauritania	320	[136.6-749.6]	7	11.3	221	[89.6-545.1]	9.7	16.8	99	[7.7-1272.7]	4.4	6.6
Mauritius	63	[46.6-85.1]	5	3.2	36	[24.3-53.3]	5.7	4	27	[16.9-43.2]	4.2	2.6
Mexico	7 265	[6896.2-7653.6]	5.6	5.4	3 450	[3220.8-3695.5]	5.3	5.5	3 815	[3522.2-4132.1]	5.8	5.4
Mongolia	2 241	[2129.2-2358.6]	71.8	93.7	1 299	[1214.3-1389.6]	84.2	117	942	[870.8-1019.0]	59.7	74.1
Montenegro	52	[34.8-77.6]	8.3	3.9	33	[19.8-55.0]	10.6	5.7	19	[10.0-36.2]	6	2.5
Morocco	428	[294.4-622.3]	1.2	1.1	243	[147.9-399.3]	1.4	1.4	185	[104.7-326.9]	1	0.95
Mozambique	1 200	[953.3-1510.5]	3.9	6.6	675	[499.9-911.4]	4.5	8.8	525	[366.9-751.1]	3.4	5
Myanmar	5 304	[2866.9-9812.9]	9.8	10.1	3 532	[1693.8-7365.1]	13.4	14.6	1 772	[570.2-5506.5]	6.4	6.2
Namibia	48	[30.2-76.2]	1.9	2.8	31	[17.3-55.7]	2.5	4.2	17	[8.0-36.2]	1.3	1.8
Nepal	282	[195.5-406.8]	0.95	1.1	175	[110.2-277.8]	1.2	1.5	107	[58.7-195.1]	0.7	0.82
New Zealand	483	[398.0-586.2]	10.2	5.8	386	[267.1-557.8]	16.5	10	97	[76.9-122.4]	4	2
Nicaragua	565	[470.3-678.7]	9	10.5	322	[256.8-403.7]	10.4	13.6	243	[177.6-332.4]	7.6	8
Niger	775	[505.4-1188.4]	3.5	7.3	587	[355.8-968.3]	5.2	11.5	188	[82.7-427.6]	1.7	3.3

Nigeria	5 129	[3969.6-6626.9]	2.6	5.1	3 087	[2271.3-4195.7]	3.1	5.9	2 042	[1281.7-3253.2]	2.1	4.3
Norway	334	[280.6-397.5]	6.2	3.4	248	[191.3-321.4]	9.2	5.3	86	[68.0-108.7]	3.2	1.5
Oman	117	[80.4-170.3]	2.4	4.4	90	[56.8-142.7]	2.8	5.8	27	[14.1-51.6]	1.7	2.7
Pakistan	4 381	[3740.5-5131.2]	2.2	3.1	2 729	[2244.4-3318.3]	2.6	3.8	1 652	[1262.9-2160.9]	1.7	2.3
Panama	249	[195.8-316.7]	6	4.8	115	[82.3-160.7]	5.5	4.9	134	[94.8-189.4]	6.5	4.7
Papua New Guinea	732	[634.1-845.0]	8.7	11.9	425	[360.6-500.9]	9.9	14	307	[228.7-412.1]	7.4	10
Paraguay	181	[129.6-252.8]	2.6	2.8	115	[73.9-179.0]	3.3	3.7	66	[39.6-109.9]	1.9	2
Peru	2 317	[2021.7-2655.4]	7.1	6.6	1 104	[914.3-1333.1]	6.8	6.8	1 213	[995.8-1477.6]	7.4	6.4
Philippines	9 628	[9132.7-10150.2]	9	11.5	6 848	[6430.4-7292.7]	12.8	17.8	2 780	[2522.5-3063.7]	5.3	6.2
Poland	2 569	[2346.3-2812.9]	6.7	3.2	1 541	[1364.3-1740.6]	8.4	4.7	1 028	[897.4-1177.6]	5.2	2.1
Portugal	1 386	[1234.7-1555.8]	13.5	5.4	983	[859.6-1124.1]	20.2	9.2	403	[321.0-506.0]	7.4	2.2
Puerto Rico	351	[310.6-396.7]	9.6	5.2	251	[219.6-286.9]	14.3	8.9	100	[68.7-145.5]	5.3	2.3
Qatar	42	[31.5-56.1]	1.6	4.1	37	[26.5-51.7]	1.8	5.7	5	[2.8-8.9]	0.74	1.8
Republic of Moldova	852	[708.4-1024.7]	21.1	13.8	539	[430.5-674.8]	27.8	20.9	313	[226.4-432.7]	14.9	8.4
Romania	3 451	[3253.3-3660.7]	17.6	8.4	2 229	[2065.1-2405.9]	23.5	12.7	1 222	[1113.6-1340.9]	12.1	4.9
Russian Federation	10 349	[10051.8-10655.0]	7.2	3.9	5 946	[5700.9-6201.6]	8.9	6	4 403	[4228.8-4584.4]	5.7	2.5
Rwanda	737	[498.4-1089.8]	5.9	10.1	483	[296.1-788.0]	7.9	14.7	254	[132.5-486.9]	4	6.6
Saint Lucia	4	[2.4-6.6]	2.2	1.5	3	[1.7-5.4]	3.4	2.2	1	[0.40-2.7]	1.1	0.83
Samoa	16	[10.0-25.7]	8.1	9.8	14	[6.6-29.9]	13.7	17.3	2	[1.1-3.7]	2.1	2.5
Sao Tome and Principe	8	[3.4-18.7]	3.8	8.3	7	[2.8-17.3]	6.7	14.8	1	[0.10-12.9]	0.95	2.6
Saudi Arabia	905	[764.2-1071.7]	2.7	4.5	676	[554.5-824.2]	3.5	6.2	229	[165.6-316.6]	1.6	2.5
Senegal	1 075	[458.9-2518.3]	6.6	12.6	673	[272.8-1660.1]	8.4	18	402	[31.3-5167.9]	4.9	8.4
Serbia	772	[671.3-887.8]	8.8	4.4	460	[383.8-551.3]	10.7	5.9	312	[250.4-388.8]	7	3.2
Sierra Leone	406	[370.8-444.6]	5.3	10	248	[222.7-276.2]	6.5	12.6	158	[133.5-187.0]	4.1	7.5
Singapore	1 378	[1234.4-1538.3]	23.8	12.3	1 000	[882.0-1133.7]	34.9	19.5	378	[277.0-515.8]	12.9	5.9
Slovakia	512	[461.2-568.4]	9.4	5	335	[294.2-381.5]	12.6	7.7	177	[148.5-210.9]	6.3	2.9
Slovenia	292	[243.0-350.8]	14	5.8	216	[166.6-280.1]	20.9	9.7	76	[58.7-98.4]	7.3	2.3
Solomon Islands	41	[34.5-48.7]	6.6	10.3	32	[26.1-39.3]	10.1	15.5	9	[6.6-12.4]	2.9	5.1
Somalia	253	[134.0-477.7]	1.7	3.4	132	[58.0-300.4]	1.7	3.6	121	[44.4-329.6]	1.6	3.2
South Africa	2 495	[2258.3-2756.5]	4.3	5	1 560	[1372.5-1773.2]	5.5	7.6	935	[797.8-1095.8]	3.2	3.3
South Sudan	397	[210.2-749.6]	3.1	5.1	249	[109.4-566.7]	3.8	6.5	148	[54.3-403.1]	2.3	3.8
Spain	6 630	[6218.4-7068.8]	14.3	6.5	4 976	[4616.0-5364.1]	21.9	10.9	1 654	[1462.6-1870.4]	7	2.4

Sri Lanka	767	[644.7-912.5]	3.7	2.7	472	[387.5-574.9]	4.7	3.6	295	[204.3-426.0]	2.7	1.9
Sudan	942	[640.2-1386.1]	2.3	3.8	581	[360.6-936.1]	2.8	4.8	361	[186.9-697.3]	1.7	2.8
Suriname	34	[22.7-51.0]	6	5.6	25	[14.9-42.0]	8.8	9	9	[4.7-17.2]	3.2	2.6
Sweden	974	[880.1-1077.9]	9.8	4.5	641	[567.0-724.7]	12.8	6.5	333	[278.2-398.6]	6.7	2.6
Switzerland	946	[875.7-1021.9]	11.1	4.8	664	[607.6-725.7]	15.7	7.3	282	[241.3-329.6]	6.5	2.7
Syrian Arab Republic	380	[194.6-742.2]	2.1	3	200	[93.4-428.1]	2.2	3.4	180	[44.1-734.9]	2	2.6
Tajikistan	272	[219.9-336.5]	3	4.7	163	[124.4-213.6]	3.6	6	109	[77.2-153.9]	2.4	3.7
Tanzania, United Republic of	1 537	[1081.3-2184.8]	2.6	4.9	1 162	[757.1-1783.4]	4	8.1	375	[202.6-694.2]	1.3	2.2
Thailand	23 296	[22644.5-23966.2]	33.7	21	16 299	[15759.3-16857.2]	48.3	32.2	6 997	[6638.4-7375.0]	19.7	11.4
The former Yugoslav Republic of Macedonia	185	[122.7-278.9]	8.9	5	121	[71.5-204.9]	11.6	7.1	64	[33.2-123.2]	6.1	3.1
The Netherlands	1 001	[891.7-1123.7]	5.9	2.5	620	[527.1-729.2]	7.3	3.4	381	[323.1-449.3]	4.4	1.8
The Republic of the Gambia	319	[273.7-371.9]	14.7	23.9	245	[205.5-292.1]	22.9	36.5	74	[54.1-101.3]	6.8	12
Timor-Leste	38	[20.5-70.3]	2.9	5.3	27	[12.9-56.3]	4	7.3	11	[3.5-34.2]	1.7	3.2
Togo	312	[280.2-347.5]	3.9	6.9	207	[182.0-235.4]	5.2	9.7	105	[86.2-127.9]	2.6	4.4
Trinidad and Tobago	66	[45.7-95.4]	4.8	3.3	36	[21.7-59.7]	5.3	3.9	30	[17.5-51.3]	4.3	2.8
Tunisia	355	[254.1-496.0]	3	2.6	163	[105.7-251.5]	2.8	2.5	192	[113.5-324.7]	3.3	2.7
Turkey	4 362	[3969.3-4793.5]	5.3	4.5	2 779	[2484.7-3108.1]	6.9	6.6	1 583	[1328.5-1886.2]	3.8	2.8
Turkmenistan	281	[237.9-331.8]	4.8	6	175	[141.4-216.5]	6.1	8.4	106	[81.2-138.3]	3.6	4.1
Uganda	1 811	[1416.2-2315.9]	4.1	7.6	1 169	[847.3-1612.8]	5.3	10.1	642	[438.5-939.9]	2.9	5.4
Ukraine	1 787	[1660.4-1923.2]	4.1	2.2	1 003	[910.7-1104.6]	4.9	3.2	784	[700.0-878.1]	3.3	1.6
United Arab Emirates	97	[76.6-122.9]	1	4.2	62	[46.2-83.2]	0.9	4.3	35	[23.5-52.0]	1.3	4.3
United Kingdom	7 618	[7346.6-7899.4]	11.4	5.1	4 832	[4625.2-5048.1]	14.7	7	2 786	[2611.0-2972.7]	8.3	3.3
United States of America	37 948	[37032.2-38886.5]	11.6	6.8	27 282	[26426.9-28164.8]	16.9	10.4	10 666	[10267.4-11080.1]	6.5	3.4
Uruguay	158	[123.5-202.2]	4.6	2.6	114	[78.7-165.1]	6.8	4.4	44	[31.5-61.4]	2.5	1.3
Uzbekistan	1 455	[1332.6-1588.7]	4.5	5.6	792	[705.3-889.4]	4.9	6.8	663	[579.4-758.7]	4.1	4.6
Vanuatu	28	[17.1-45.8]	9.9	13.1	22	[12.8-37.9]	15.4	20.2	6	[1.9-18.8]	4.3	6.2
Venezuela, Bolivarian Republic of	1 193	[1044.6-1362.5]	3.7	3.6	646	[523.7-796.8]	4	4.3	547	[460.8-649.4]	3.4	3
Viet Nam	25 335	[23627.6-27165.8]	26.3	23.2	19 568	[18064.2-21197.0]	41	39	5 767	[4999.5-6652.4]	11.8	9.5
Yemen	620	[511.0-752.3]	2.1	4.4	402	[315.1-512.9]	2.8	6.3	218	[158.6-299.7]	1.5	2.7
Zambia	194	[114.5-328.7]	1.1	2.2	108	[54.7-213.1]	1.2	2.8	86	[37.3-198.4]	0.97	1.8

Zimbabwe	577	[468.9-710.0]	3.4	6.9	321	[246.0-418.9]	3.9	8.7	256	[183.9-356.4]	3	5.6
World	841 080	[817635.0-865198.0]	11	9.3	596 574	[576976.0-616838.0]	15.5	13.9	244 506	[231861.0-257840.0]	6.5	4.9

Tab. SII. The age-standardized mortality rate of LC in 185 countries of the world in 2018.

Countries	All				Male				Female			
	Numbers	Uncertainty interval	Crude Rate	ASR (W)	Numbers	Uncertainty interval	Crude Rate	ASR (W)	Numbers	Uncertainty interval	Crude Rate	ASR (W)
Afghanistan	621	[487.6-790.9]	1.7	3.8	374	[277.1-504.9]	2	4.7	247	[164.1-371.8]	1.4	2.9
Albania	430	[370.0-499.7]	14.7	7.6	259	[213.1-314.8]	17.5	9.6	171	[135.1-216.5]	11.8	5.7
Algeria	544	[424.3-697.5]	1.3	1.4	302	[213.8-426.6]	1.4	1.6	242	[169.2-346.1]	1.2	1.2
Angola	547	[355.7-841.3]	1.8	3.5	350	[212.3-577.1]	2.3	4.8	197	[84.5-459.0]	1.3	2.3
Argentina	2 113	[1963.0-2274.4]	4.7	3.2	1 206	[1095.1-1328.2]	5.5	4.4	907	[809.3-1016.4]	4	2.3
Armenia	455	[370.9-558.2]	15.5	9.4	262	[214.2-320.4]	19	13.5	193	[65.9-565.6]	12.4	6.3
Australia	2 356	[2200.3-2522.8]	9.5	4.8	1 617	[1485.9-1759.6]	13.1	7.2	739	[657.8-830.2]	5.9	2.6
Austria	947	[852.6-1051.8]	10.8	4.3	696	[618.1-783.7]	16.2	7.2	251	[200.5-314.2]	5.6	1.8
Azerbaijan	374	[320.8-436.0]	3.8	3.5	184	[149.5-226.4]	3.7	3.9	190	[151.2-238.7]	3.8	3.2
Bahamas	14	[7.9-24.8]	3.5	2.3	10	[4.6-21.5]	5.1	3.9	4	[1.7-9.4]	2	1.1
Bahrain	28	[16.2-48.3]	1.8	3.3	18	[9.0-36.1]	1.8	3.7	10	[4.2-23.9]	1.7	2.7
Bangladesh	2 841	[2230.6-3618.4]	1.7	2	2 117	[1568.3-2857.7]	2.5	3.1	724	[481.0-1089.7]	0.88	0.99
Barbados	14	[7.8-25.0]	4.9	2.4	7	[3.0-16.1]	5.1	3	7	[3.1-15.7]	4.7	1.9
Belarus	374	[311.0-449.8]	4	2.2	249	[195.9-316.5]	5.7	3.8	125	[93.7-166.8]	2.5	1.1

Belgium	1 004	[926.6-1087.9]	8.7	3.6	630	[576.2-688.9]	11.1	5.1	374	[305.7-457.6]	6.4	2.1
Belize	19	[11.9-30.4]	5	8.4	14	[7.5-26.0]	7.4	12.2	5	[2.4-10.2]	2.6	4.4
Benin	309	[193.6-493.1]	2.7	5.3	237	[122.8-457.4]	4.1	9.9	72	[37.0-139.9]	1.3	2.3
Bhutan	33	[28.8-37.8]	4	5.1	27	[22.8-32.0]	6.2	7.6	6	[4.8-7.5]	1.6	2
Bolivia, Plurinational State of	667	[580.7-766.1]	5.9	6	299	[242.8-368.2]	5.3	5.5	368	[305.7-443.1]	6.6	6.6
Bosnia and Herzegovina	524	[473.3-580.2]	15	6.4	276	[240.0-317.4]	16	7.9	248	[213.8-287.7]	13.9	5.2
Botswana	60	[40.7-88.4]	2.6	3.8	39	[23.9-63.6]	3.4	6.3	21	[11.1-39.7]	1.8	2.2
Brazil	11 797	[11462.0-12141.8]	5.6	4.4	6 906	[6660.3-7160.7]	6.7	5.9	4 891	[4664.0-5129.1]	4.6	3.2
Brunei	31	[20.2-47.6]	7.1	8.3	26	[14.1-48.0]	11.6	14	5	[2.7-9.1]	2.4	2.8
Bulgaria	585	[515.5-663.9]	8.3	3.6	378	[328.0-435.6]	11.1	5.4	207	[156.5-273.8]	5.7	2
Burkina Faso	1 269	[682.7-2358.8]	6.4	13.5	771	[399.5-1488.1]	7.8	18.7	498	[77.5-3198.4]	5	9.5
Burundi	409	[213.6-783.0]	3.6	6.6	288	[124.3-667.2]	5.2	9.7	121	[43.5-336.8]	2.1	3.8
Cabo Verde	47	[32.7-67.5]	8.5	11.2	26	[15.8-42.8]	9.4	11.8	21	[12.4-35.5]	7.6	9.7
Cambodia	2 546	[1408.7-4601.4]	15.7	21.9	1 695	[839.2-3423.4]	21.4	34.7	851	[284.2-2548.5]	10.2	12.7
Cameroon	895	[581.9-1376.5]	3.6	6	683	[414.2-1126.1]	5.5	9.2	212	[91.0-494.0]	1.7	2.9
Canada	3 845	[3578.4-4131.4]	10.4	4.5	2 318	[2129.3-2523.5]	12.6	6	1 527	[1334.5-1747.3]	8.2	3.2
Central African Republic	133	[86.5-204.5]	2.8	4.8	91	[55.2-150.0]	3.9	6.9	42	[18.0-97.9]	1.7	2.9
Chad	372	[241.9-572.1]	2.4	5.3	254	[154.1-418.8]	3.3	7.5	118	[50.6-275.0]	1.5	3.3
Chile	1 448	[1336.6-1568.7]	8	4.9	781	[701.3-869.8]	8.7	6.1	667	[591.7-751.9]	7.3	3.9
China	368 960	[363309.0-374699.0]	25.9	17.1	273 014	[268132.0-277985.0]	37.3	25.6	95 946	[93128.5-98848.7]	13.9	8.6

Colombia	2 216	[2048.6-2397.1]	4.5	3.8	1 156	[995.2-1342.7]	4.8	4.5	1 060	[966.6-1162.5]	4.2	3.2
Comoros	28	[14.6-53.6]	3.4	5.8	18	[7.8-41.7]	4.3	7.8	10	[3.6-27.8]	2.4	3.9
Congo, Democratic Republic of	3 624	[2356.4-5573.6]	4.3	8.1	2 479	[1503.5-4087.3]	5.9	11.9	1 145	[491.4-2668.1]	2.7	4.9
Congo, Republic of	186	[136.9-252.6]	3.4	5.4	131	[90.5-189.6]	4.8	8	55	[31.9-95.0]	2	3.2
Costa Rica	395	[331.3-470.9]	8	5.6	238	[188.7-300.2]	9.6	7.2	157	[120.0-205.4]	6.3	4.1
Croatia	547	[483.6-618.7]	13.1	5.2	364	[314.8-420.8]	18.1	8.4	183	[145.0-231.0]	8.5	2.6
Cuba	773	[691.1-864.6]	6.7	3.3	448	[388.7-516.3]	7.8	4.1	325	[270.9-390.0]	5.7	2.6
Cyprus	101	[77.6-131.5]	8.5	4.6	64	[46.1-88.9]	10.8	6.3	37	[23.8-57.5]	6.2	3
Czechia	874	[784.7-973.4]	8.2	3.2	565	[491.2-649.9]	10.8	4.8	309	[261.0-365.8]	5.7	2
Côte d'Ivoire	1 130	[914.3-1396.5]	4.5	8.4	712	[550.3-921.2]	5.6	9.8	418	[288.2-606.3]	3.4	6.9
Denmark	580	[501.2-671.2]	10.1	4.2	370	[304.9-449.1]	12.9	5.9	210	[168.1-262.3]	7.3	2.6
Djibouti	17	[8.9-32.5]	1.8	2.4	10	[4.3-23.2]	2.1	2.9	7	[2.5-19.5]	1.4	2
Dominican Republic	650	[548.9-769.8]	6	5.8	353	[280.1-444.9]	6.5	6.7	297	[231.8-380.6]	5.4	5
Ecuador	953	[860.4-1055.6]	5.7	5.1	471	[405.2-547.5]	5.6	5.5	482	[419.3-554.1]	5.7	4.7
Egypt	25 084	[23515.3-26757.3]	25.2	31.8	18 209	[16924.1-19591.5]	36.2	48.4	6 875	[5993.1-7886.7]	14	16.6
El Salvador	500	[416.7-599.9]	7.8	6.5	202	[156.8-260.2]	6.7	6.2	298	[229.2-387.4]	8.8	6.8
Equatorial Guinea	42	[27.3-64.6]	3.2	4.9	33	[20.0-54.4]	4.5	6.5	9	[3.9-21.0]	1.5	2.9
Eritrea	90	[47.0-172.3]	1.7	3.2	49	[21.2-113.5]	1.9	3.7	41	[14.7-114.1]	1.6	2.8
Estonia	95	[76.6-117.9]	7.3	2.9	57	[43.0-75.6]	9.3	4.8	38	[27.2-53.1]	5.5	1.6
Eswatini	35	[22.4-54.6]	2.5	3.9	19	[10.4-34.7]	2.8	5	16	[8.3-30.9]	2.2	3.2
Ethiopia	1 656	[1032.5-2655.9]	1.5	2.7	759	[387.7-1485.8]	1.4	2.7	897	[461.5-1743.3]	1.7	2.8

Fiji	75	[56.2-100.2]	8.2	8.2	53	[37.6-74.7]	11.5	12.2	22	[12.8-37.7]	4.9	4.6
Finland	579	[507.0-661.2]	10.4	3.6	377	[312.9-454.2]	13.8	5.5	202	[167.2-244.1]	7.2	2.1
France	10 063	[9742.7-10393.8]	15.4	6.3	7 376	[7117.9-7643.5]	23	10.4	2 687	[2487.4-2902.6]	8.1	2.6
France, Guadeloupe	30	[19.9-45.2]	6.7	2.6	20	[12.0-33.4]	9.6	4.2	10	[5.0-19.9]	4.1	1.3
France, La Réunion	89	[69.1-114.6]	10.1	6.1	60	[44.0-81.9]	14	9.3	29	[18.8-44.7]	6.4	3.3
France, Martinique	38	[26.1-55.4]	9.9	3.8	22	[13.4-36.2]	12.6	5.1	16	[9.0-28.4]	7.6	2.7
France, New Caledonia	26	[16.8-40.3]	9.3	6.8	19	[11.3-32.0]	13.5	10.6	7	[3.1-15.6]	5	3.4
French Guiana	12	[7.5-19.2]	4.1	4.9	11	[5.2-23.3]	7.6	9.5	1	[0.50-1.8]	0.69	0.7
French Polynesia	34	[22.3-51.8]	11.9	9.5	23	[12.2-43.3]	15.8	13.4	11	[6.2-19.4]	7.8	5.6
Gabon	52	[35.4-76.4]	2.5	3.3	33	[20.6-52.8]	3.1	3.9	19	[9.7-37.2]	1.9	2.6
Gaza Strip and West Bank	45	[24.8-81.7]	0.89	1.8	30	[15.3-58.9]	1.2	2.4	15	[4.3-52.9]	0.6	1.2
Georgia	370	[319.4-428.6]	9.5	5.2	227	[195.2-264.0]	12.2	8	143	[84.8-241.3]	7	3
Germany	8 643	[8358.0-8937.7]	10.5	3.8	5 936	[5685.9-6197.1]	14.6	5.7	2 707	[2566.0-2855.7]	6.5	2.1
Ghana	2 737	[2351.4-3185.8]	9.3	15.4	2 000	[1673.3-2390.5]	13.6	24.3	737	[551.7-984.5]	5	7.6
Greece	1 478	[1355.7-1611.4]	13.3	4.5	984	[880.2-1100.0]	17.9	6.7	494	[430.8-566.4]	8.7	2.7
Guam	25	[19.8-31.5]	15.1	11.9	20	[15.4-26.0]	23.8	19.2	5	[3.1-8.1]	6.1	4.9
Guatemala	1 741	[1578.0-1920.8]	10.1	14.5	832	[721.8-959.0]	9.8	15.4	909	[793.3-1041.6]	10.4	13.8
Guinea	1 413	[1098.3-1817.8]	10.8	19.5	866	[633.2-1184.3]	13.2	25	547	[357.8-836.2]	8.4	14.5
Guinea-Bissau	127	[68.3-236.1]	6.7	12	85	[44.0-164.1]	9.1	17.5	42	[6.5-269.7]	4.3	7.4
Guyana	20	[12.2-32.7]	2.6	2.8	10	[5.0-20.0]	2.5	2.8	10	[5.0-20.0]	2.6	2.7
Haiti	653	[539.3-790.6]	5.9	7.8	347	[285.0-422.5]	6.3	9.1	306	[135.9-689.2]	5.4	6.6
Honduras	378	[320.9-445.2]	4	5.4	275	[218.2-346.6]	5.9	8.2	103	[81.7-129.8]	2.2	2.9
Hungary	920	[829.5-1020.4]	9.5	4.4	628	[556.7-708.5]	13.6	7.3	292	[238.6-357.4]	5.8	2.1

Iceland	24	[16.9-34.1]	7.1	3.5	17	[9.9-29.3]	10	5.1	7	[4.4-11.1]	4.2	2
India	25 627	[24053.8-27303.2]	1.9	2	17 548	[16268.1-18928.7]	2.5	2.8	8 079	[7196.8-9069.3]	1.2	1.3
Indonesia	18 148	[15797.0-20848.8]	6.8	7.5	14 047	[11925.3-16546.2]	10.5	12.3	4 101	[3158.3-5325.1]	3.1	3.3
Iran, Islamic Republic of	3 439	[3311.2-3571.7]	4.2	4.7	1 977	[1881.3-2077.6]	4.8	5.2	1 462	[1378.8-1550.2]	3.6	4.1
Iraq	538	[472.1-613.1]	1.4	2.7	279	[233.5-333.4]	1.4	3.1	259	[213.7-313.9]	1.3	2.3
Ireland	380	[326.5-442.3]	7.9	4	245	[190.8-314.6]	10.3	5.7	135	[111.3-163.8]	5.6	2.5
Israel	397	[342.9-459.6]	4.7	3	234	[201.5-271.7]	5.6	4.1	163	[96.1-276.6]	3.8	2
Italy	10 535	[10214.5-10865.6]	17.8	5.7	7 127	[6846.9-7418.6]	24.6	9.2	3 408	[3246.8-3577.2]	11.2	2.7
Jamaica	103	[81.0-130.9]	3.6	2.7	54	[39.1-74.6]	3.7	2.9	49	[34.3-70.1]	3.4	2.6
Japan	28 986	[28306.8-29681.5]	22.8	5.4	18 539	[17987.1-19107.9]	29.9	8.6	10 447	[10055.0-10854.2]	16	2.7
Jordan	178	[135.6-233.6]	1.8	2.9	95	[66.8-135.1]	1.9	3.3	83	[54.2-127.2]	1.7	2.6
Kazakhstan	989	[920.0-1063.2]	5.4	5	605	[551.7-663.4]	6.8	7.6	384	[341.7-431.6]	4	3.3
Kenya	1 331	[1004.0-1764.6]	2.6	5.3	752	[527.0-1073.0]	3	6.2	579	[364.4-920.1]	2.3	4.4
Korea, Democratic Republic of	5 246	[4891.0-5626.7]	20.5	15	3 498	[3194.0-3830.9]	27.9	23.5	1 748	[1566.0-1951.2]	13.4	8
Korea, Republic of	12 122	[11758.6-12496.6]	23.7	11.8	8 819	[8516.9-9131.8]	34.5	19.5	3 303	[3102.9-3516.0]	12.9	5.2
Kuwait	114	[84.2-154.3]	2.7	5	82	[57.5-116.9]	3.4	6	32	[18.2-56.2]	1.8	3.6
Kyrgyzstan	415	[351.0-490.7]	6.8	8.7	252	[199.1-319.0]	8.3	12.2	163	[128.4-206.9]	5.3	6
Lao People's Democratic Republic	1 032	[571.0-1865.1]	14.8	22.4	713	[353.0-1440.0]	20.5	33.4	319	[106.5-955.3]	9.1	13
Latvia	138	[113.6-167.6]	7.2	3.1	87	[69.5-108.9]	9.8	5.3	51	[34.1-76.2]	4.9	1.6
Lebanon	216	[172.5-270.5]	3.5	3	127	[94.6-170.5]	4.2	3.5	89	[62.8-126.1]	2.9	2.5
Lesotho	67	[39.2-114.6]	3	4.4	41	[20.8-80.9]	3.7	6.6	26	[10.8-62.5]	2.2	3

Liberia	422	[227.0-784.4]	8.7	15.4	254	[131.6-490.2]	10.4	19.2	168	[26.2-1079.0]	7	11.9
Libya	147	[93.6-230.8]	2.3	3.3	71	[39.0-129.1]	2.2	3.4	76	[38.2-151.0]	2.4	3.1
Lithuania	222	[181.4-271.7]	7.7	3.3	136	[104.8-176.5]	10.3	5.5	86	[62.5-118.4]	5.5	1.8
Luxembourg	53	[39.1-71.9]	9	4.4	36	[24.8-52.3]	12.1	6.5	17	[10.0-28.8]	5.8	2.5
Madagascar	908	[474.3-1738.4]	3.5	6	586	[252.9-1357.6]	4.5	8.5	322	[115.7-896.4]	2.4	3.8
Malawi	312	[163.0-597.3]	1.6	2.5	185	[79.9-428.6]	1.9	2.9	127	[45.6-353.5]	1.3	2
Malaysia	1 933	[1760.2-2122.7]	6	6.3	1 467	[1315.9-1635.5]	8.9	9.6	466	[387.6-560.3]	3	3
Maldives	26	[25.8-26.2]	5.9	8.2	21	[20.8-21.2]	8.3	12.1	5	[4.9-5.1]	2.6	3.7
Mali	545	[416.8-712.6]	2.9	5.9	402	[295.6-546.7]	4.2	9.7	143	[82.6-247.5]	1.5	2.7
Malta	24	[15.5-37.2]	5.6	2.4	16	[9.2-27.9]	7.4	3.6	8	[3.9-16.4]	3.7	1.1
Mauritania	326	[175.4-606.0]	7.2	11.5	224	[116.1-432.3]	9.8	16.9	102	[15.9-655.1]	4.5	6.7
Mauritius	53	[38.9-72.1]	4.2	2.7	27	[17.6-41.4]	4.3	2.9	26	[16.7-40.6]	4.1	2.4
Mexico	6 868	[6578.5-7170.2]	5.3	5.1	3 361	[3175.3-3557.5]	5.2	5.3	3 507	[3283.0-3746.3]	5.3	4.9
Mongolia	1 773	[1671.3-1880.9]	56.8	75.4	1 067	[988.2-1152.0]	69.1	98.4	706	[643.5-774.6]	44.7	56.8
Montenegro	52	[36.6-74.0]	8.3	3.9	33	[21.1-51.7]	10.6	5.7	19	[10.8-33.5]	6	2.5
Morocco	411	[270.9-623.6]	1.1	1.1	236	[135.7-410.4]	1.3	1.3	175	[92.8-330.0]	0.96	0.9
Mozambique	1 173	[905.2-1520.0]	3.8	6.7	700	[499.2-981.6]	4.7	9.4	473	[316.0-708.1]	3	4.7
Myanmar	5 360	[2965.8-9687.1]	10	10.1	3 571	[1768.1-7212.3]	13.6	14.7	1 789	[597.4-5357.6]	6.5	6.3
Namibia	47	[27.5-80.4]	1.8	2.9	31	[15.7-61.1]	2.5	4.2	16	[6.7-38.4]	1.2	1.8
Nepal	260	[181.6-372.2]	0.88	1	154	[97.9-242.2]	1.1	1.3	106	[58.8-191.0]	0.7	0.8
New Zealand	353	[292.6-425.9]	7.4	3.9	264	[192.7-361.7]	11.3	6.4	89	[70.2-112.9]	3.7	1.7
Nicaragua	533	[457.3-621.2]	8.5	9.9	290	[240.1-350.3]	9.4	12.3	243	[187.1-315.7]	7.6	8

Niger	759	[481.0-1197.7]	3.4	7.2	590	[345.9-1006.5]	5.3	11.5	169	[70.3-406.1]	1.5	3
Nigeria	5 154	[3920.8-6775.0]	2.6	5.1	3 192	[2300.6-4428.9]	3.2	6.1	1 962	[1193.5-3225.3]	2	4.2
Norway	328	[276.8-388.6]	6.1	2.9	220	[179.6-269.5]	8.1	4.2	108	[79.3-147.1]	4.1	1.7
Oman	111	[72.5-170.0]	2.3	4.3	86	[50.9-145.2]	2.7	5.6	25	[12.0-52.2]	1.5	2.6
Pakistan	4 222	[3585.2-4971.9]	2.1	3	2 608	[2130.5-3192.6]	2.5	3.6	1 614	[1222.5-2130.8]	1.7	2.2
Panama	238	[194.3-291.5]	5.7	4.6	112	[84.5-148.5]	5.4	4.7	126	[94.1-168.7]	6.1	4.5
Papua New Guinea	635	[373.9-1078.4]	7.5	10.9	354	[188.2-665.8]	8.3	12.5	281	[106.4-742.2]	6.8	9.4
Paraguay	182	[136.9-242.0]	2.6	2.9	114	[78.2-166.2]	3.3	3.7	68	[44.0-105.0]	2	2.1
Peru	2 239	[2074.3-2416.8]	6.9	6.3	1 057	[948.1-1178.4]	6.5	6.5	1 182	[1061.6-1316.1]	7.3	6.2
Philippines	9 485	[8937.5-10066.0]	8.9	11.4	6 776	[6312.7-7273.3]	12.6	17.7	2 709	[2428.3-3022.2]	5.1	6
Poland	2 230	[2092.9-2376.1]	5.9	2.7	1 305	[1194.3-1426.0]	7.1	3.9	925	[844.7-1013.0]	4.7	1.7
Portugal	1 372	[1217.2-1546.5]	13.3	5.2	980	[840.0-1143.3]	20.1	8.9	392	[324.1-474.1]	7.2	2.1
Puerto Rico	375	[327.9-428.9]	10.2	5.3	249	[207.0-299.5]	14.2	8.5	126	[103.7-153.2]	6.6	2.8
Qatar	40	[29.0-55.2]	1.5	4	35	[24.3-50.4]	1.7	5.6	5	[2.6-9.6]	0.74	1.8
Republic of Moldova	700	[601.9-814.1]	17.3	11.2	448	[372.8-538.4]	23.1	17.3	252	[193.4-328.4]	12	6.7
Romania	3 141	[2976.7-3314.4]	16	7.5	2 003	[1869.4-2146.1]	21.1	11.3	1 138	[1044.6-1239.8]	11.3	4.4
Russian Federation	11 192	[10886.5-11506.1]	7.8	4.1	6 432	[6187.1-6686.6]	9.6	6.4	4 760	[4575.8-4951.6]	6.2	2.6
Rwanda	704	[463.7-1068.9]	5.6	10.2	457	[271.0-770.7]	7.5	14.9	247	[123.3-494.8]	3.9	6.5
Saint Lucia	4	[2.6-6.2]	2.2	1.1	3	[1.8-5.0]	3.4	2	1	[0.40-2.4]	1.1	0.34
Samoa	7	[3.0-16.3]	3.5	4.8	5	[1.8-13.6]	4.9	7.1	2	[0.40-9.7]	2.1	2.6
Sao Tome and Principe	8	[3.8-16.8]	3.8	8.3	7	[3.2-15.4]	6.7	14.8	1	[0.10-9.2]	0.95	2.6

Saudi Arabia	852	[693.0-1047.5]	2.5	4.2	636	[499.2-810.3]	3.3	5.8	216	[145.4-320.9]	1.5	2.4
Senegal	1 083	[582.6-2013.1]	6.6	12.6	679	[351.8-1310.5]	8.5	18	404	[62.9-2594.7]	4.9	8.5
Serbia	892	[806.1-987.0]	10.2	4.7	515	[449.0-590.7]	12	6.3	377	[324.4-438.1]	8.4	3.5
Sierra Leone	374	[337.3-414.7]	4.8	9.5	225	[199.0-254.3]	5.9	11.9	149	[123.0-180.5]	3.8	7.2
Singapore	1 298	[1199.2-1405.0]	22.4	11.4	924	[840.8-1015.5]	32.3	17.7	374	[323.3-432.6]	12.8	5.7
Slovakia	473	[421.0-531.4]	8.7	4.3	302	[265.6-343.4]	11.4	6.7	171	[125.8-232.4]	6.1	2.5
Slovenia	268	[234.6-306.2]	12.9	5	175	[148.3-206.6]	16.9	7.6	93	[74.4-116.3]	8.9	2.6
Solomon Islands	55	[32.3-93.6]	8.8	13.7	43	[22.8-81.1]	13.6	20.7	12	[4.5-31.8]	3.9	6.7
Somalia	241	[125.9-461.4]	1.6	3.3	123	[53.1-285.0]	1.6	3.5	118	[42.4-328.5]	1.5	3.2
South Africa	2 388	[2231.2-2555.8]	4.2	4.8	1 484	[1362.9-1615.9]	5.3	7.2	904	[807.8-1011.6]	3.1	3.1
South Sudan	406	[212.1-777.3]	3.1	5.2	259	[111.8-600.0]	4	6.8	147	[52.8-409.2]	2.3	3.7
Spain	5 569	[5349.6-5797.4]	12	4.7	3 872	[3693.9-4058.7]	17	7.6	1 697	[1571.0-1833.0]	7.2	2
Sri Lanka	614	[497.3-758.2]	2.9	2.2	403	[317.2-512.0]	4	3.1	211	[135.1-329.6]	1.9	1.4
Sudan	906	[610.2-1345.2]	2.2	3.7	560	[343.7-912.4]	2.7	4.7	346	[176.4-678.6]	1.7	2.7
Suriname	43	[30.1-61.4]	7.6	7.1	26	[16.5-41.1]	9.1	9.7	17	[9.6-30.1]	6	4.9
Sweden	785	[709.2-868.9]	7.9	3.1	519	[456.4-590.2]	10.4	4.5	266	[225.5-313.8]	5.3	1.8
Switzerland	875	[764.9-1001.0]	10.2	4.1	567	[486.7-660.6]	13.4	5.8	308	[232.0-408.8]	7.1	2.6
Syrian Arab Republic	380	[208.6-692.2]	2.1	3	198	[100.1-391.5]	2.1	3.4	182	[51.6-641.8]	2	2.6
Tajikistan	253	[210.7-303.8]	2.8	4.4	153	[121.2-193.1]	3.3	5.5	100	[74.3-134.6]	2.2	3.4

Tanzania, United Republic of	1 516	[1028.7-2234.2]	2.6	5	1 146	[714.5-1838.0]	3.9	8.2	370	[187.6-729.7]	1.2	2.2
Thailand	23 154	[22448.8-23881.3]	33.5	20.9	16 284	[15696.9-16893.1]	48.3	32.3	6 870	[6486.9-7275.7]	19.4	11.1
The former Yugoslav Republic of Macedonia	187	[132.3-264.4]	9	5	122	[78.2-190.3]	11.7	7.1	65	[37.4-113.0]	6.2	3.1
The Netherlands	1 044	[966.3-1127.9]	6.1	2.5	648	[593.2-707.8]	7.6	3.3	396	[334.6-468.7]	4.6	1.7
The Republic of the Gambia	343	[288.1-408.4]	15.9	26.2	267	[218.6-326.1]	24.9	41.1	76	[53.2-108.6]	7	12.4
Timor-Leste	38	[21.0-68.7]	2.9	5.3	27	[13.4-54.5]	4	7.4	11	[3.7-32.9]	1.7	3.2
Togo	310	[279.7-343.6]	3.9	6.9	210	[185.7-237.5]	5.3	9.8	100	[82.8-120.7]	2.5	4.2
Trinidad and Tobago	63	[46.0-86.2]	4.6	3.2	34	[22.1-52.3]	5	3.7	29	[18.4-45.8]	4.2	2.7
Tunisia	356	[246.3-514.5]	3.1	2.6	147	[91.2-237.0]	2.6	2.3	209	[117.2-372.7]	3.5	2.8
Turkey	4 307	[4119.8-4502.7]	5.3	4.4	2 747	[2626.6-2872.9]	6.8	6.5	1 560	[1110.5-2191.5]	3.8	2.7
Turkmenistan	262	[226.7-302.8]	4.5	5.6	161	[133.8-193.8]	5.6	7.6	101	[80.1-127.3]	3.4	3.9
Uganda	1 552	[1169.7-2059.3]	3.5	6.7	947	[654.0-1371.2]	4.3	8.8	605	[390.3-937.8]	2.7	5.1
Ukraine	2 256	[2102.7-2420.5]	5.1	2.7	1 271	[1159.5-1393.2]	6.2	3.9	985	[882.8-1099.1]	4.2	1.8
United Arab Emirates	96	[73.6-125.2]	1	4.2	61	[43.8-84.9]	0.89	4.2	35	[22.4-54.6]	1.3	4.2
United Kingdom	6 836	[6586.4-7095.1]	10.3	4	4 042	[3845.3-4248.8]	12.3	5.3	2 794	[2642.3-2954.4]	8.3	2.8
United States of America	30 485	[29839.9-31144.1]	9.3	4.9	20 564	[19973.4-21172.1]	12.7	7.2	9 921	[9613.4-10238.4]	6	2.8
Uruguay	131	[103.7-165.5]	3.8	2.1	80	[55.1-116.1]	4.8	3.1	51	[37.7-69.0]	2.8	1.3
Uzbekistan	1 210	[1066.3-1373.1]	3.7	4.7	660	[554.6-785.5]	4.1	5.5	550	[457.5-661.1]	3.4	4
Vanuatu	28	[16.5-47.5]	9.9	13.1	22	[11.7-41.4]	15.4	20.2	6	[2.3-15.8]	4.3	6.2
Venezuela, Bolivarian Republic of	1 152	[1031.0-1287.1]	3.6	3.5	621	[521.2-739.9]	3.9	4.2	531	[460.1-612.8]	3.3	2.9

Viet Nam	25 404	[23442.7-27529.3]	26.3	23.2	19 708	[17974.3-21608.9]	41.3	39.1	5 696	[4832.2-6714.2]	11.7	9.4
Yemen	595	[486.6-727.6]	2.1	4.3	396	[307.4-510.2]	2.7	6.2	199	[142.9-277.1]	1.4	2.6
Zambia	173	[95.5-313.4]	0.98	2.1	101	[47.0-217.2]	1.2	2.7	72	[28.1-184.6]	0.81	1.5
Zimbabwe	580	[455.7-738.1]	3.4	7	324	[237.8-441.5]	3.9	8.8	256	[174.3-376.1]	3	5.6
World	781 631	[737605.0-828285.0]	10.2	8.5	548 375	[511583.0-587813.0]	14.2	12.7	233 256	[209922.0-259184.0]	6.2	4.6

Tab. SIII. Cancer incidence and mortality data: sources and methods by country.

Incidence	Method
1	National (or local with coverage greater than 50%) rates projected to 2018
2a	Most recent rates from a single registry applied to 2018 population
2b	Weighted/simple average of the most recent local rates applied to 2018 population
3a	Estimated from national mortality estimates by modelling, using mortality:incidence ratios derived from country-specific cancer registry data
3b	Estimated from national mortality estimates by modelling, using mortality:incidence ratios derived from cancer registry data in neighbouring countries
4	"All sites" estimates from neighbouring countries partitioned using frequency data
9	No data: the rates are those of neighbouring countries or registries in the same area
Mortality	
1	National rates projected to 2018
2a	Most recent rates from one source applied to 2018 population
2b	Weighted/simple average of the most recent local rates applied to 2018 population
3	Estimated from national incidence estimates by modelling, using incidence: mortality ratios derived from cancer registry data in neighbouring countries
9	No data: the rates are those of neighbouring countries in the same area

Tab. SIV. The method used in each country to calculate the incidence and attenuation of cancer in Global Cancer Observatory in 2018.

Country	Incidence		Mortality	
	Source	Method	Source	Method
Eastern Africa				
Burundi	No data	9	No data	3
Comoros	No data	9	No data	3
Djibouti	No data	9	No data	3
Eritrea	No data	9	No data	3
Ethiopia	Local	2a	No data	3
France, Reunion	<i>National</i>	2a	<i>National (WHO)</i>	1
Kenya	Local	2b	No data	3
Madagascar	No data	9	No data	3
Malawi	Local	2a	No data	3
Mauritius	National	1	National (WHO)	1
Mozambique	Local	2b	No data	3
Rwanda	Local	4	No data	3
Somalia	No data	9	No data	3
South Sudan	No data	9	No data	3
Tanzania	Local	2b	No data	3
Uganda	Local	2b	No data	3
Zambia	Local	2a	No data	3
Zimbabwe	Local	2b	No data	3
Middle Africa				
Angola	No data	9	No data	3
Cameroon	Local	2a	No data	3
Central African Republic	No data	9	No data	3
Chad	No data	9	No data	3
Congo	Local	2a	No data	3
Congo, Democratic Republic of	No data	9	No data	3
Equatorial Guinea	No data	9	No data	3
Gabon	No data	4	No data	3
Northern Africa				
Algeria	Local	2b	No data	3
Egypt	Local	2b	National (WHO)	3
Libya	Local	2a	No data	3
Morocco	Local	2b	National (WHO)	3
Sudan	Local	2b	No data	3
Tunisia	Local	2b	National (WHO)	3
Southern Africa				
Botswana	National	1	No data	3
Lesotho	No data	9	No data	3
Namibia	National	2a	No data	3
South African Republic	No data	3b	National (WHO)	1
Swaziland	National	2a	No data	3
Western Africa				

Cape Verde	No data	3b	National (WHO)	2a
Benin	Local	2a	No data	3
Burkina Faso	Local	9	No data	3
Cote d'Ivoire	Local	2a	No data	3
Ghana	Local	4	No data	3
Guinea	Local	2a	No data	3
Guinea-Bissau	No data	9	No data	3
Liberia	No data	9	No data	3
Mali	Local	2a	No data	3
Mauritania	No data	9	No data	3
Niger	Local	2a	No data	3
Nigeria	Local	2b	No data	3
Sao Tome and Principe	No data	3b	National (WHO)	2a
Senegal	No data	9	No data	3
Sierra Leone	No data	4	No data	3
The Gambia	National	1	No data	3
Togo	Local	4	No data	3
Caribbean				
Bahamas	No data	3b	National (WHO)	1
Barbados	No data	3b	National (WHO)	1
Cuba	Local	3b	National (WHO)	1
Dominican Republic	No data	3b	National (WHO)	1
France, Guadeloupe	<i>National</i>	1	<i>National</i> (WHO)	1
France, Martinique	<i>National</i>	1	<i>National</i> (WHO)	1
Haiti	No data	3b	National (WHO)	2a
Jamaica	Local	3b	National (WHO)	1
Puerto Rico	National	1	National (WHO)	1
Saint Lucia	No data	3b	National (WHO)	1
Trinidad and Tobago	No data	3b	National (WHO)	1
Central America				
Belize	No data	3b	National (WHO)	2a
Costa Rica	National	1	National (WHO)	1
El Salvador	No data	3b	National (WHO)	1
Guatemala	No data	3b	National (WHO)	1
Honduras	Local	2a	National (WHO)	2a
Mexico	No data	3b	National (WHO)	1
Nicaragua	No data	3b	National (WHO)	1
Panama	No data	3b	National (WHO)	1
South America				
Argentina	Local	3a	National (WHO)	1
Bolivia	Local	3b	National (WHO)	2a
Brazil	Local	3a	National (WHO)	1
Chile	Local	3a	National (WHO)	1
Colombia	Local	3a	National (WHO)	1
Ecuador	Local	3a	National (WHO)	1
French Guiana	<i>National</i>	1	<i>National</i> (WHO)	1
Guyana	No data	3b	National (WHO)	1
Paraguay	No data	3b	National (WHO)	1

Peru	Local	3a	National (WHO)	1
Suriname	No data	3b	National (WHO)	1
Uruguay	National	1	National (WHO)	1
Venezuela	No data	3b	National (WHO)	1
Northern America				
Canada	Local	1	National (WHO)	1
United States of America	National	1	National (WHO)	1
Eastern Asia				
China	Local	2b	Local	2b
Japan	Local	3a	National (WHO)	1
Korea, Democratic Republic of	No data	9	No data	9
Korea, Republic of	National	1	National (WHO)	1
Mongolia	National	2a	National	2a
South-Eastern Asia				
Brunei Darussalam	National	2a	National (WHO)	2a
Cambodia	No data	9	No data	3
Indonesia	National	4	No data	3
Lao People's Democratic Republic	No data	9	No data	3
Malaysia	Local	2b	National (WHO)	3
Myanmar	No data	9	No data	3
Philippines	Local	2b	National (WHO)	3
Singapore	National	1	National (WHO)	2a
Thailand	Local	2b	National (WHO)	3
Timor Leste	No data	9	No data	3
Viet Nam	Local	2b	National (Survey)	3
South Central Asia				
Afghanistan	No data	9	No data	3
Bangladesh	No data	9	No data	3
Bhutan	National (pathology-based register)	2a	No data	3
India	Local	2b	Regional	3
Iran, Islamic Republic of	Local	2b	National (WHO)	2a
Kazakhstan	National	2a	National (WHO)	2a
Kyrgyzstan	Local	3b	National (WHO)	1
Maldives	No data	9	No data	9
Nepal	Local	4	No data	3
Pakistan	Local	2b	No data	3
Sri Lanka	National	1	National (WHO)	3
Tajikistan	No data	3b	National (WHO) (ICD-9 limited sites).	2a
Turkmenistan	No data	3b	National (WHO) (ICD-10 limited sites).	1
Uzbekistan	National	2a	National (WHO)	1

Western Asia				
Azerbaijan	National	2a	National (WHO)	3
Armenia	No data	3b	National (WHO)	1
Bahrain	National	1	National (WHO)	3
Georgia	No data	3b	National (WHO)	1
Iraq	National	2a	No data	3
Israel	National	1	National (WHO)	1
Jordan	National	1	National (WHO)	3
Kuwait	National	1	National (WHO)	3
Lebanon	National	2a	No data	3
Oman	National	1	National (WHO)	3
Palestine	No data	9	National (WHO)	3
Qatar	National	2a	National (WHO)	3
Saudi Arabia	National	1	National (WHO)	3
Syrian Arab Republic	No data	9	No data	3
Turkey	Local	2b	National (WHO)	2a
United Arab Emirates	National	2a	No data	3
Yemen	Local	2b	No data	3
Eastern Europe				
Belarus	National	1	National (WHO)	1
Bulgaria	National	1	National (WHO, ICD-10 limited sites).	2a
Czech Republic	National	1	National (WHO)	1
Hungary	No data	3b	National (WHO)	1
Moldova	No data	3b	National (WHO)	1
Poland	Local	3a	National (WHO)	1
Romania	Local	3b	National (WHO)	1
Russian Federation	National	1	National (WHO, ICD-10 limited sites)	1
Slovakia	National	2a	National (WHO)	1
Ukraine	National	1	National (WHO, ICD-10 limited sites)	1
Northern Europe				
Denmark	National	1	National (WHO)	1
Estonia	National	1	National (WHO)	1
Finland	National	1	National (WHO)	1
Iceland	National	1	National (WHO)	1
Ireland	National	1	National (WHO)	1
Latvia	National	1	National (WHO)	1

Lithuania	National	1	National (WHO)	1
Norway	National	1	National (WHO)	1
Sweden	National	1	National (WHO)	1
United Kingdom	National	1	National (WHO)	1
Southern Europe				
Albania	No data	3b	National (WHO)	1
Bosnia Herzegovina	Local	3a	National (WHO)	2a
Croatia	National	1	National (WHO)	1
Cyprus	National	1	National (WHO)	1
FYR Macedonia	No data	3b	National (WHO)	1
Greece	No data	3b	National (WHO)	1
Italy	Local	3a	National (WHO)	1
Malta	National	1	National (WHO)	1
Montenegro	No data	3b	National (WHO)	1
Portugal	Local	3a	National (WHO)	1
Serbia	Local	3b	National (WHO)	1
Slovenia	National	1	National (WHO)	1
Spain	Local	3a	National (WHO)	1
Western Europe				
Austria	National	1	National (WHO)	1
Belgium	National	1	National (WHO)	1
France	Local	3a	National (WHO)	1
Germany	Local	1	National (WHO)	1
Luxembourg	National (pathology-based register)	3b	National (WHO)	1
The Netherlands	National	1	National (WHO)	1
Switzerland	Local	3a	National (WHO)	1
Australia/New Zealand				
Australia	National	1	National (WHO)	1
New Zealand	National	1	National (WHO)	1
Melanesia				
Fiji	No data	3b	No data	3
France, New Caledonia	<i>National</i>	2a	National (WHO)	2a
Papua New Guinea	Local	9	National	2a
Solomon Islands	No data	9	No data	3
Vanuatu	National	2a	No data	3
Micronesia				
Guam	No data	9	National	2a
Polynesia				
French Polynesia	<i>National</i>	2a	<i>National</i>	2a
Samoa	No data	9	No data	9