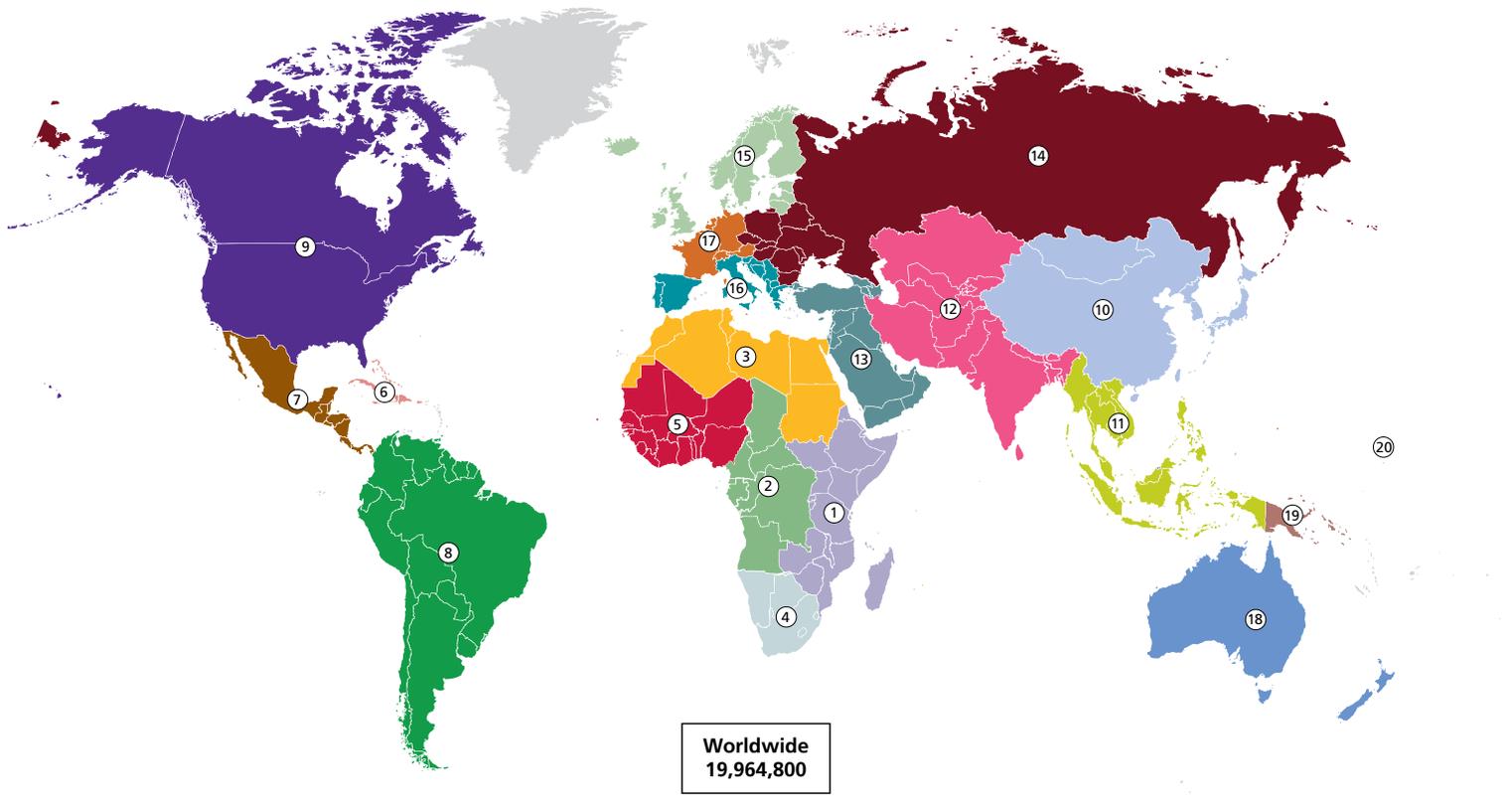


# Global Cancer Facts & Figures 5<sup>th</sup> Edition

Estimated Number of New Cancer Cases by World Region, 2022



1 Eastern Africa (349,500)	6 Caribbean (119,100)	11 South-Eastern Asia (1,146,800)	16 Southern Europe (972,200)
2 Middle Africa (115,300)	7 Central America (276,100)	12 South-Central Asia (2,076,800)	17 Western Europe (1,415,800)
3 Northern Africa (336,900)	8 South America (1,155,900)	13 Western Asia (467,100)	18 Australia and New Zealand (250,500)
4 Southern Africa (120,200)	9 Northern America (2,673,200)	14 Eastern Europe (1,361,300)	19 Melanesia (15,900)
5 Western Africa (263,300)	10 Eastern Asia (6,135,800)	15 Northern Europe (722,100)	20 Micronesia and Polynesia (2,700)

Source: GLOBOCAN 2022 ([gco.iarc.fr/today](http://gco.iarc.fr/today)).

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**Disclaimer:** The designations employed and the presentation of these materials do not imply the expression of any opinion whatsoever on the part of the American Cancer Society concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

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## Fast Facts

- In 2022, approximately 20 million cancer cases were newly diagnosed and 9.7 million people died from the disease worldwide (Table 1). By 2050, the number of cancer cases is predicted to increase to 35 million based solely on projected population growth.
- The overall cancer incidence and mortality rate per 100,000 person-years is 213 cases and 110 deaths in males and 186 cases and 77 deaths in females (Table 2). Approximately 1 in 5 individuals will develop cancer in their lifetime, and 1 in 9 men and 1 in 12 women will die from the disease.
- Lung cancer is the most commonly diagnosed cancer and the leading cause of cancer death worldwide, with almost 2.5 million cases (1 in 8 cancers) and 1.8 million deaths (1 in 5 deaths) (Figure 7).
- In males, lung cancer is followed by prostate, colorectal, and stomach cancers for cases, and liver, colorectal, and stomach cancers for deaths. In females, breast cancer ranks first for both incidence and mortality, followed by lung, colorectal, and cervical cancers (Figure 7).
- Cancer incidence is highest in high-income countries, largely because of higher life expectancy and higher prevalence of risk factors like smoking and obesity, as well as greater access to cancer screening and diagnostic testing. Among males, incidence rates range from over 500 in Australia and New Zealand to below 100 in Western Africa, and among females from over 400 in Australia and New Zealand to close to 100 in South-Central Asia (Figure 2).
- Despite lower incidence rates, mortality rates are disproportionately higher in many low-income nations because of worse survival; for example, the breast cancer mortality rate is over 35 per 100,000 women in Fiji and Jamaica, approximately three times higher than the rate in the United States, despite a 26% to 38% lower incidence rate (Figure 12).
- Many lower-income countries are experiencing a sharp rise in incidence of lung, colorectal, and breast cancers (Figure 11, Figure 13, Figure 14) in the wake of increasing prevalence of risk factors associated with economic development (e.g., smoking, unhealthy diet, alcohol use, obesity and physical inactivity, and lower fertility), although infection-related cancers (e.g., cervical cancer) still prevail.
- Cervical cancer is considered almost completely preventable, yet it continues to be the leading cause of cancer death in women in 37 countries, predominantly in sub-Saharan Africa (Figure 9). Eswatini, Zambia, Malawi, Zimbabwe, and Tanzania exhibit the highest cervical cancer incidence rates globally, ranging from 65 to 96 per 100,000, which are 10 to 16 times higher than the rate in the United States (6 per 100,000) (Figure 21), largely due to inequitable implementation of screening services. The prevalence of lifetime cervical cancer screening is nearly 100% in Sweden and the Netherlands versus 4% in Ethiopia (Figure 24).
- With more than half of cancer deaths worldwide being potentially preventable, prevention offers the most cost-effective and sustainable strategy for cancer control. For example, the elimination of smoking could prevent about 1 in 4 deaths from cancer and approximately 2.6 million cancer deaths annually (Figure 26).

# Introduction

Cancer encompasses a range of hundreds of diseases marked by unchecked cell growth and spread and is a growing global public health problem. It is the second-leading cause of death worldwide and is the leading or second-leading cause of premature death (before age 70 years) in 112 countries. Although cancer is ubiquitous, the scale and variety of the disease vary widely across countries because of differences in the prevalence of risk factors and health care infrastructure, including the availability of preventive services and treatment. Many emerging economies experiencing demographic transitions, urbanization, and lifestyle shifts have a rise in tobacco and alcohol use, unhealthy diets, sedentary lifestyles, increased body weight, and reduced fertility, leading to increases in lung, colorectal, and breast cancers, previously predominant only in affluent countries. The growing burden of these cancers alongside a high prevalence of infection-related cancers, such as cervical and stomach cancers, poses a substantial challenge to the health care infrastructure of numerous transitioning countries.

Accurate assessment of the cancer burden is vital for planning and delivering effective cancer control interventions tailored to the specific local context. This publication is the American Cancer Society's fifth edition of *Global Cancer Facts & Figures*, which presents up-to-date estimates of cancer incidence and mortality for 36 cancer types across 185 countries using data from GLOBOCAN 2022, developed by the International Agency for Research on Cancer (IARC), an affiliate of the World Health Organization (WHO). The report primarily centers on variations in cancer occurrence across different regions and countries, which helps inform cancer control worldwide by highlighting opportunities for cancer prevention and early detection. The estimates presented herein do not account for the impact of the COVID-19 pandemic, as they rely on extrapolations of cancer data collected in years preceding the pandemic.

## Tables/Figures

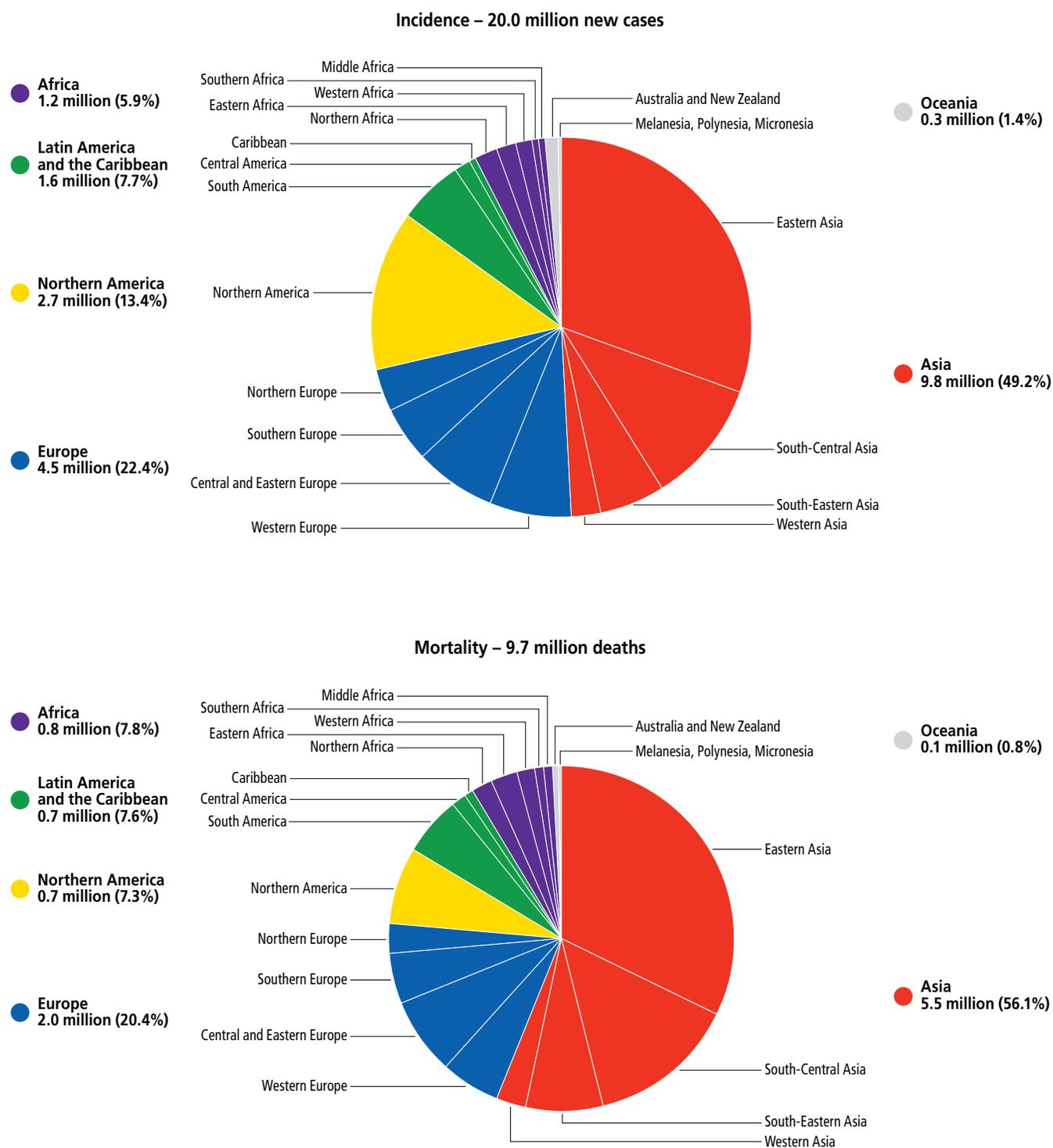
### Figure 1. Estimated Number of New Cancer Cases and Deaths by World Regions, 2022

- In 2022, approximately 20 million cancer cases were newly diagnosed worldwide and 9.7 million people died from the disease.
- About 49% of all new cancer cases were diagnosed in Asia, where 59% of the global population resides. China alone accounted for 24% of all cases (4.8 million).
- Although the Americas represent only 13% of the world's population and Europe represents 10%, each contributes 21% and 22%, respectively, of cancer cases, reflecting higher cancer risk but also greater accessibility to diagnostic services.
- Asia and Africa contribute a larger share of cancer deaths than cases (56% versus 49% and 8% versus 6%, respectively) because of the high prevalence of fatal cancers (e.g., liver and stomach), coupled with limited access to early diagnosis and treatment.

### Figure 2. Incidence and Mortality Rates by Sex for 20 World Regions, 2022

- Globally, cancer incidence rates per 100,000 are 213 in men and 186 in women, with 4- to 5-fold variation across world regions.
- This variation in cancer incidence is largely due to differences in the prevalence of major cancer risk factors and the availability of early detection and diagnostic testing.
- In contrast, there is only a 2-fold variation in cancer mortality, reflecting a difference in the distribution of cancers and much higher survival rates in high-income countries. In males, the highest mortality rate is observed in Eastern Europe (160 per 100,000), where lung and colorectal cancers rank among the highest of all regions. In females, the highest rate is found in Melanesia (116 per 100,000) and Southern Africa (108 per 100,000), reflecting the high burden of both breast and cervical cancers.

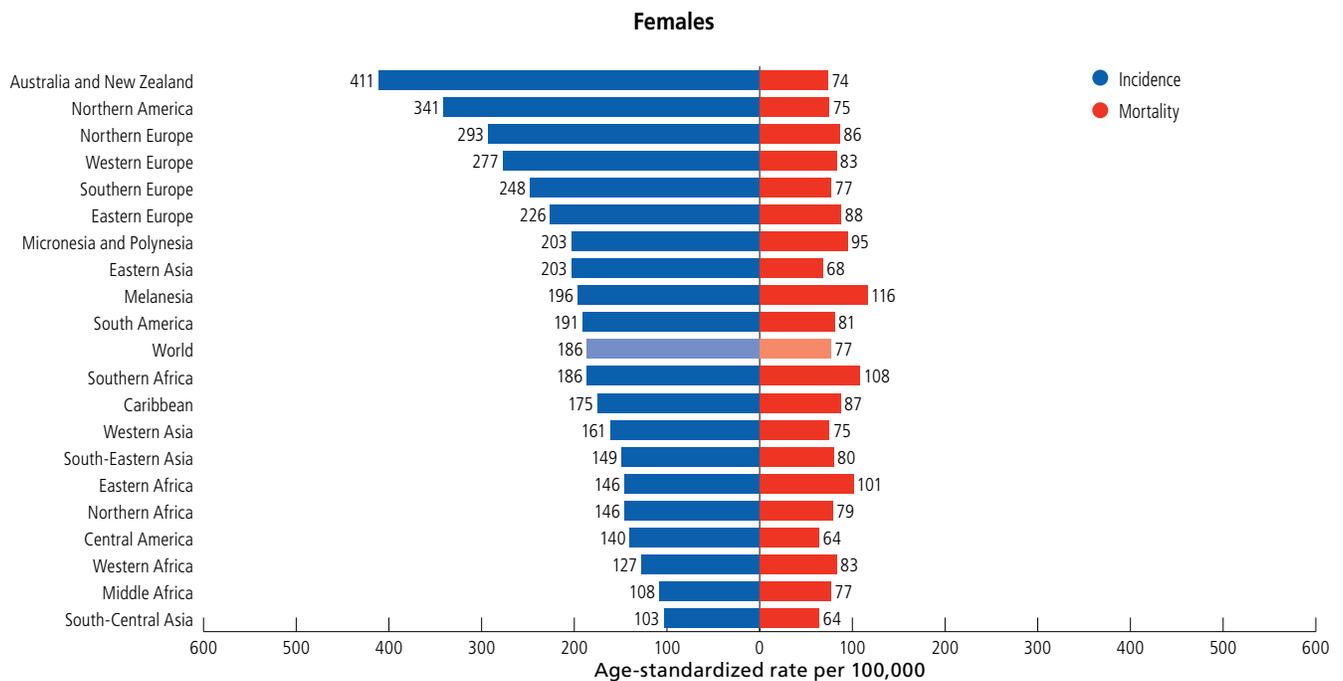
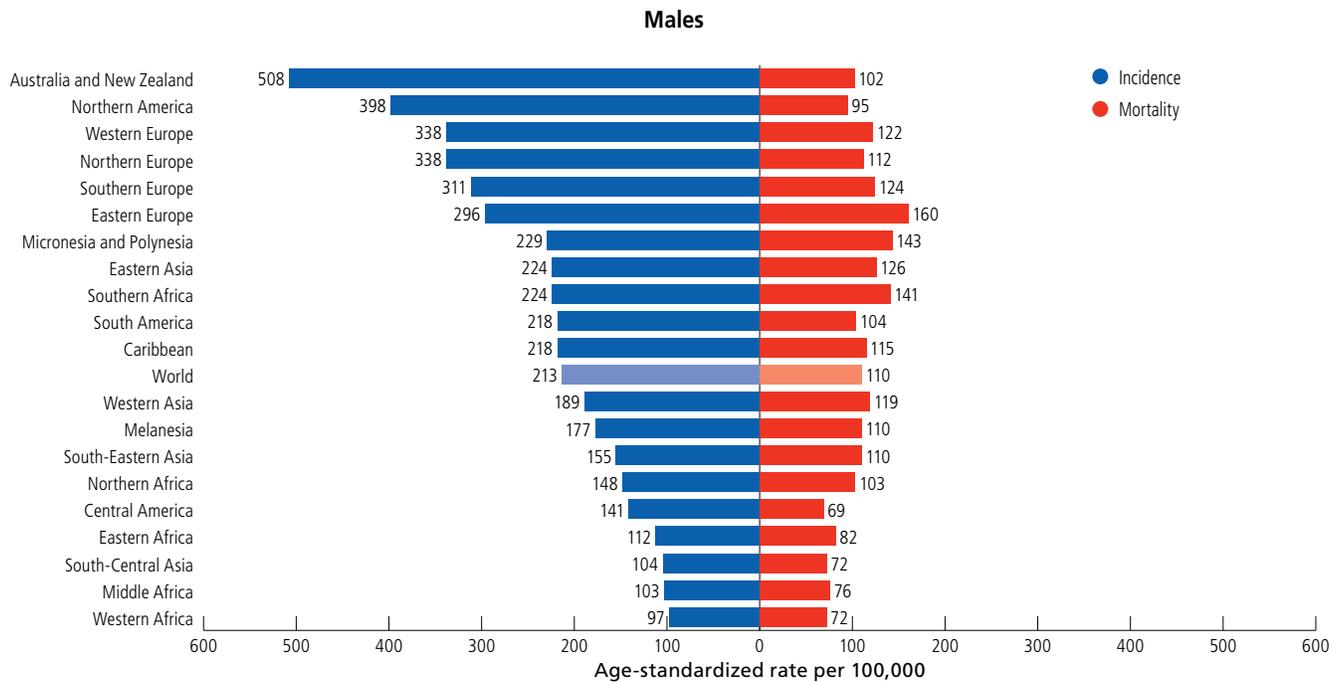
**Figure 1. Estimated Number of New Cancer Cases and Deaths by World Regions, 2022**



Note: Region estimates do not sum to the worldwide estimate due to rounding.

Source: GLOBOCAN 2022 ([gco.iarc.fr/today/](http://gco.iarc.fr/today/)).

**Figure 2. Incidence and Mortality Rates by Sex for 20 World Regions, 2022**

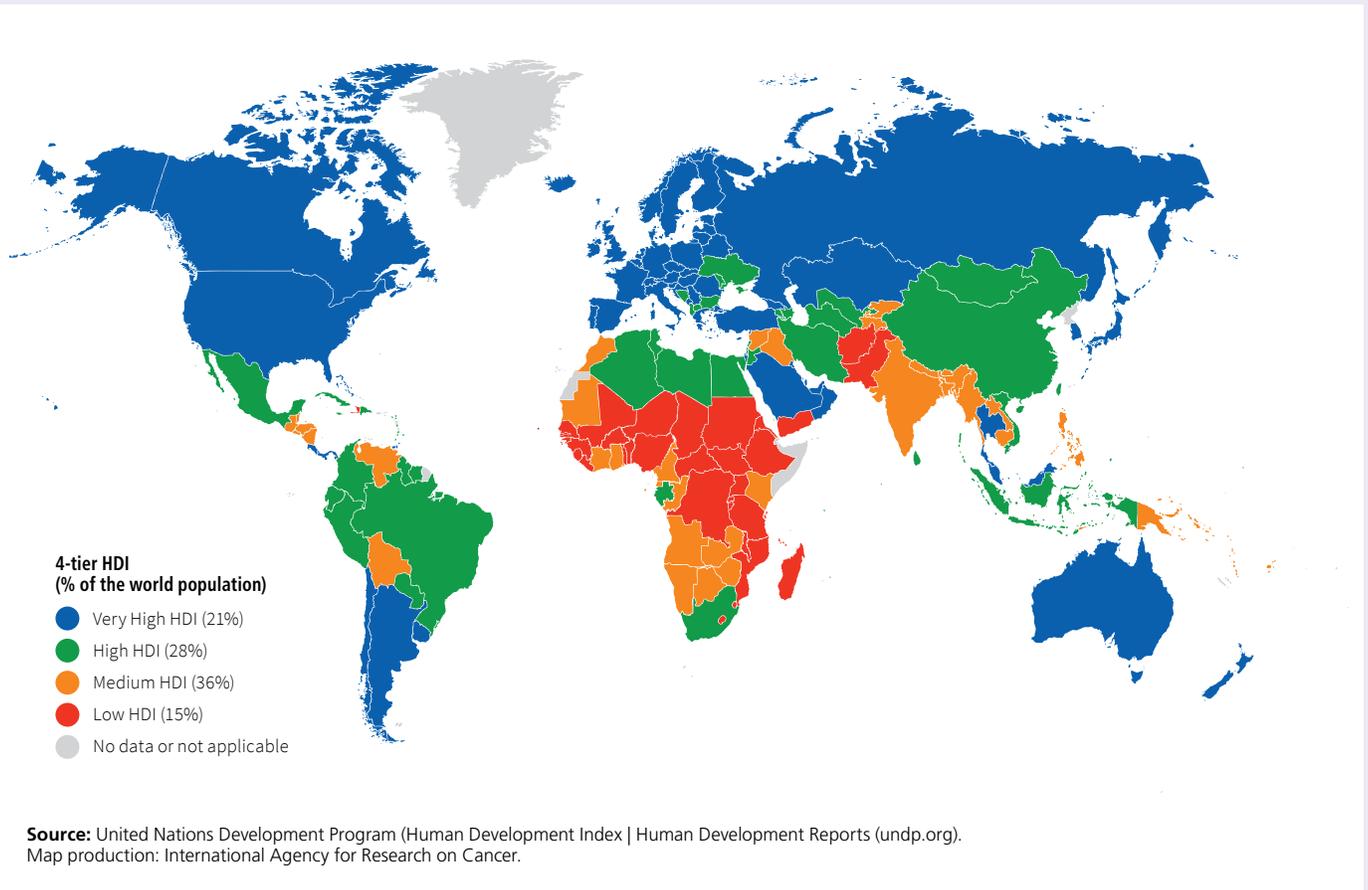


Note: Rates are age-adjusted to the World Standard Population and differ from published rates in the US or Europe, where rates are often standardized to the 2000 US Standard Population and the European Age Standard, respectively.

Source: GLOBOCAN 2022 ([gco.iarc.fr/today/](https://gco.iarc.fr/today/)).

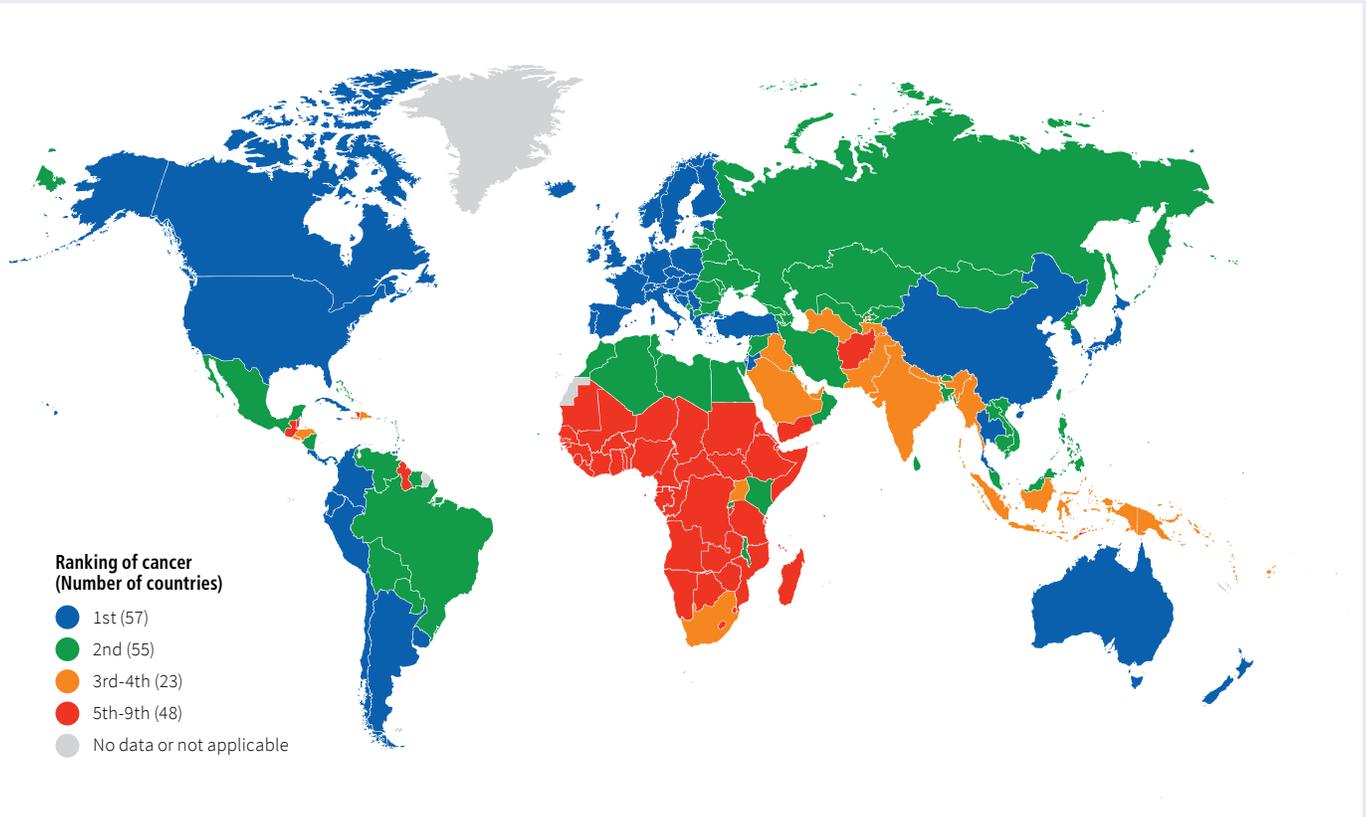
### Figure 3. The 4-tier Human Development Index (HDI), 2021

- The Human Development Index (HDI) is a summary indicator of a country’s achievement in 1) a healthy life (based on life expectancy); 2) knowledge (based on education); and 3) a decent standard of living (based on gross national income per capita) and is commonly presented based on four tiers (low, medium, high, and very high).<sup>1</sup>
- Medium-HDI countries are the largest group (36% of the global population, India included), followed by high-HDI countries (28% of the population, China included).
- Countries with very high HDI encompass affluent Western countries along with a few Asian (e.g., Japan, Singapore, South Korea, and Malaysia), South American (Chile, Argentina, and Uruguay), and Middle Eastern (Saudi Arabia, Oman, and Türkiye) countries.
- Low-HDI countries include mostly sub-Saharan African countries and represent 15% of the global population.



## Figure 4. National Ranking of Cancer as a Cause of Death Before Age 70 Years, 2019

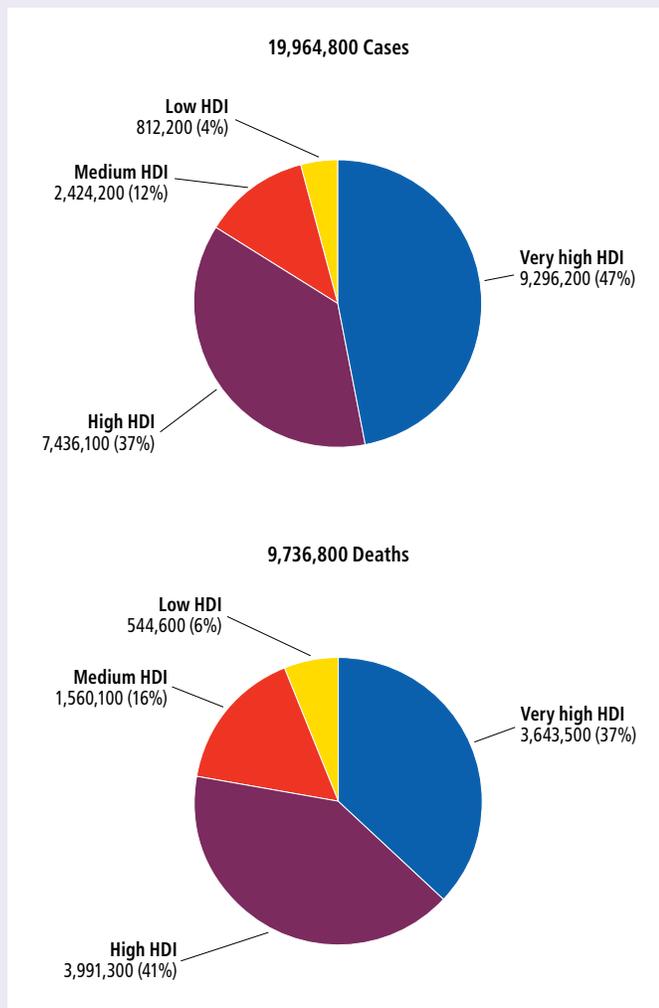
- In 2019, cancer was the leading cause of premature (less than age 70 years) death in 57 of 183 countries (predominantly very high-HDI countries). It was the second-leading cause of premature death after cardiovascular diseases in an additional 55 countries (mainly high-HDI countries).
- In the remaining 71 countries (mostly medium- or low-HDI countries), cancer ranked lower as more people died from infectious diseases, such as malaria, HIV/AIDS, and tuberculosis, although it is a growing health concern because of increases in life expectancy, population growth, and adoption of unhealthy Western behaviors.<sup>2</sup>



**Source:** World Health Organization. Global Health Estimates. ([who.int/data/global-health-estimates](http://who.int/data/global-health-estimates)). Map production: International Agency for Research on Cancer.

**Figure 5. Estimated Number of New Cancer Cases and Deaths by Human Development Index (HDI), 2022**

- About 47% of all new cancer cases in 2022 occurred in countries with very high HDI, where only 21% of the global population resides, compared with 37% in high-HDI, 12% in medium-HDI, and 4% in low-HDI countries.
- The number of cancer deaths is disproportionately lower in countries with very high-HDI countries (37%), reflecting better cancer survival.
- The largest increase in the number of cancer cases – doubling by 2050 – is projected to occur in low-HDI countries, which are least resourced to manage the additional burden.

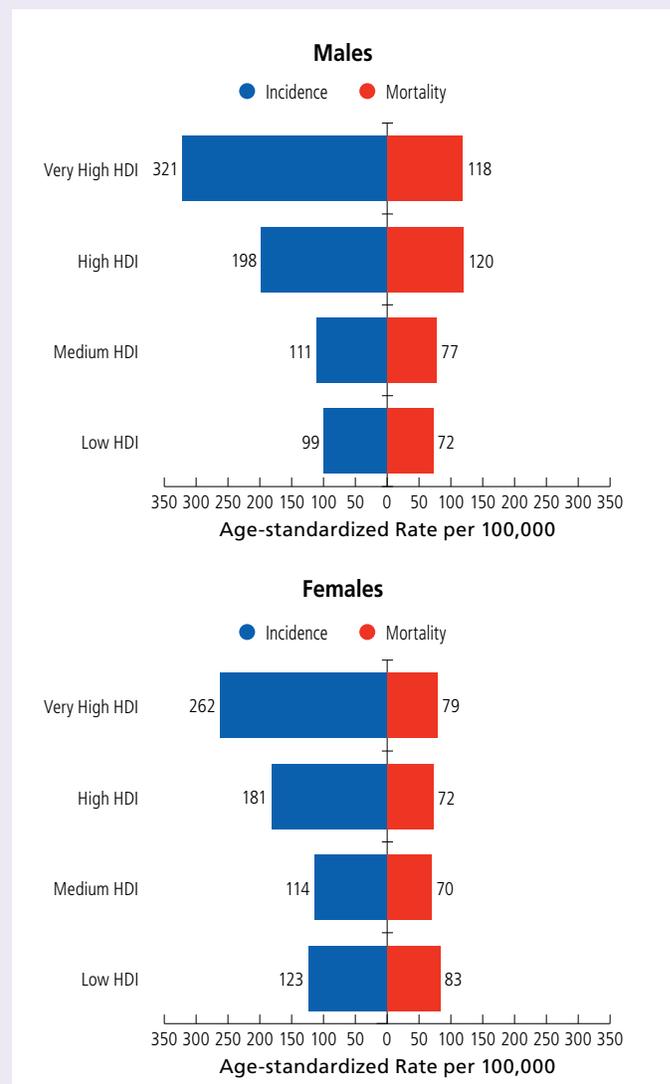


Note: China (high-HDI country) alone accounts for 18.4% of all cancer cases and 19.5% of all cancer deaths. India (medium-HDI country) accounts for 5.4% of all cancer cases and 6.9% of all cancer deaths.

Source: GLOBOCAN 2022 ([gco.iarc.fr/today/](http://gco.iarc.fr/today/)).

**Figure 6. Incidence and Mortality Rates by Sex and Human Development Index (HDI), 2022**

- Cancer rates increase sharply with HDI for incidence but not for mortality, especially among women, because of differences in the distribution of cancer, more cancer detection in higher-HDI countries, and less access to treatment in lower-HDI countries.
- The disparity in cancer mortality is most striking in females living in countries with low HDI, who are at a low risk of developing cancer but have the highest risk of dying from the disease.



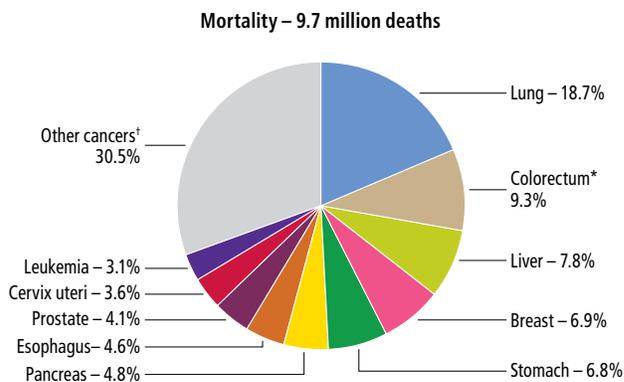
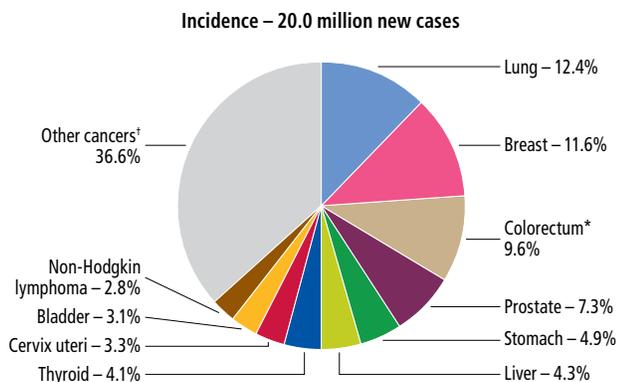
Note: Rates are age-standardized to the World Standard Population and differ from published rates in the US or Europe, where rates are often standardized to the 2000 US Standard Population and the European Age Standard, respectively.

Source: GLOBOCAN 2022 ([gco.iarc.fr/today/](http://gco.iarc.fr/today/)).

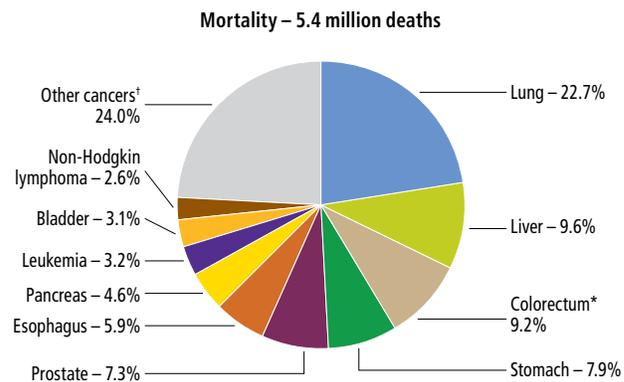
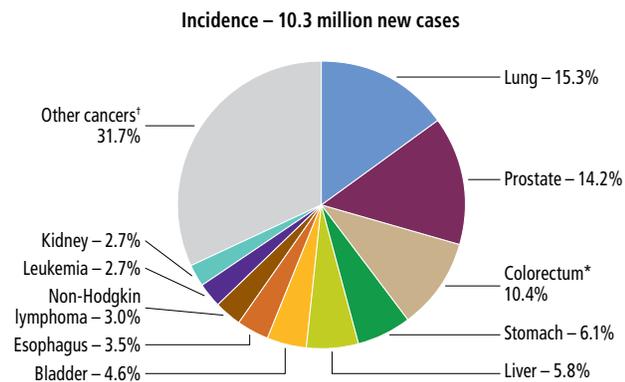
**Figure 7. Distribution of Cases and Deaths for the 10 Most Common Cancers by Sex, 2022**

- Lung cancer is the most commonly diagnosed cancer and the leading cause of cancer death worldwide, with almost 2.5 million cases (1 in 8 cancers) and 1.8 million deaths (1 in 5 deaths).
- In males, lung cancer is followed by prostate, colorectal, and stomach cancers for incidence, and liver, colorectal, and stomach cancers for mortality.
- In females, breast cancer ranks first for both incidence and mortality, followed by lung, colorectal, and cervical cancers.

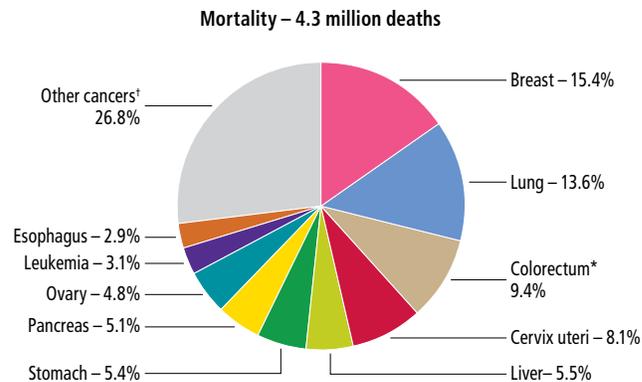
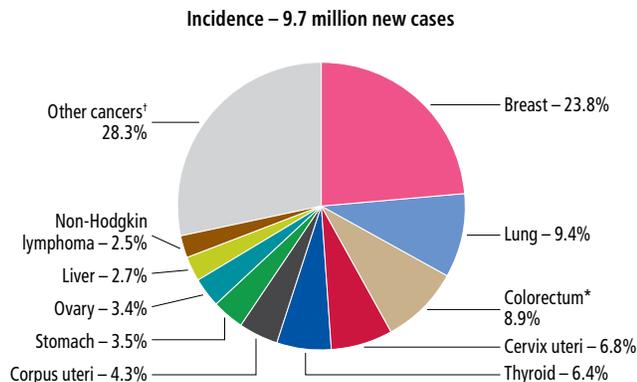
**Both Sexes**



**Males**



**Females**



\*Colorectum includes colon, rectum, and anus. †Other cancers include nonmelanoma skin cancers.

Source: GLOBOCAN 2022 (gco.iarc.fr/today/).

**Table 1. Estimated Number of New Cases and Deaths for 36 Cancers by Sex, 2022**

- In 2022, approximately 20 million cancer cases were newly diagnosed worldwide (18.7 million cases excluding nonmelanoma skin cancers). By 2050, the number of cancer cases is predicted to increase to 35 million based solely on projected population growth.
- Approximately 9.7 million people died from cancer worldwide in 2022, corresponding to about 26,700 deaths per day.

	Estimated Number of New Cases			Estimated Number of Deaths		
	Both Sexes	Male	Female	Both Sexes	Male	Female
<b>All sites</b>	<b>19,964,800</b>	<b>10,306,500</b>	<b>9,658,400</b>	<b>9,736,800</b>	<b>5,427,000</b>	<b>4,309,700</b>
<b>All sites excluding nonmelanoma skin</b>	<b>18,730,200</b>	<b>9,561,700</b>	<b>9,168,600</b>	<b>9,667,300</b>	<b>5,387,300</b>	<b>4,280,000</b>
Lung	2,480,300	1,571,900	908,400	1,817,200	1,233,100	584,100
Female breast	2,295,700	–	2,295,700	665,700	–	665,700
Prostate	1,466,700	1,466,700	–	396,800	396,800	–
Nonmelanoma skin cancer*	1,234,600	744,800	489,800	69,500	39,700	29,800
Colon	1,142,200	609,200	533,000	538,100	283,800	254,300
Stomach	968,400	627,200	341,100	659,900	427,400	232,400
Liver	865,300	600,200	265,000	757,900	521,400	236,500
Thyroid	821,200	206,500	614,700	47,500	17,200	30,200
Rectum	729,700	436,100	293,600	343,800	205,100	138,700
Cervix uteri	661,000	–	661,000	348,200	–	348,200
Bladder	613,800	471,100	142,700	220,300	165,500	54,800
Non-Hodgkin lymphoma	553,000	311,200	241,900	250,500	143,600	106,900
Esophagus	510,700	365,000	145,700	445,100	318,300	126,800
Pancreas	510,600	269,600	241,000	467,000	247,500	219,500
Leukaemia	486,800	277,800	209,000	305,000	173,100	132,000
Kidney	434,400	277,600	156,800	155,700	100,200	55,500
Corpus uteri	420,200	–	420,200	97,700	–	97,700
Lip, oral cavity	389,500	268,800	120,700	188,200	130,700	57,600
Melanoma of skin	331,600	179,900	151,700	58,600	33,100	25,500
Ovary	324,400	–	324,400	206,800	–	206,800
Brain, central nervous system	321,500	173,600	147,900	248,300	139,700	108,600
Larynx	189,000	165,600	23,400	103,200	90,300	13,000
Multiple myeloma	187,800	103,800	84,000	121,300	66,900	54,300
Gallbladder	122,500	43,500	78,900	89,000	31,400	57,600
Nasopharynx	120,400	86,300	34,200	73,500	54,100	19,400
Oropharynx	106,300	86,300	20,000	52,300	42,800	9,500
Hypopharynx	86,300	72,100	14,200	40,900	34,600	6,400
Hodgkin lymphoma	82,400	48,800	33,700	22,700	13,700	9,000
Testis	72,000	72,000	–	9,100	9,100	–
Salivary glands	55,000	30,900	24,100	23,900	14,000	9,900
Anus	54,200	24,000	30,200	22,000	10,900	11,100
Vulva	47,300	–	47,300	18,600	–	18,600
Penis	37,700	37,700	–	13,700	13,700	–
Kaposi sarcoma	35,400	24,300	11,100	15,900	10,500	5,500
Mesothelioma	30,600	21,400	9,200	25,400	18,100	7,300
Vagina	18,800	–	18,800	8,200	–	8,200

\*New cases excludes basal cell carcinoma, while deaths include all types of nonmelanoma skin cancer.

Source: GLOBOCAN 2022 ([gco.iarc.fr/today/](http://gco.iarc.fr/today/)).

**Table 2. Incidence and Mortality Rates for 36 Cancers by Sex, 2022**

- Globally, the incidence rate for all cancers combined is 213 per 100,000 in males and 186 per 100,000 in females. The mortality rate is 110 per 100,000 in males and 77 per 100,000 in females.
- Approximately 1 in 5 individuals will develop cancer in their lifetime, and 1 in 9 men and 1 in 12 women will die from the disease.

- For cancer types that affect both sexes, men typically have higher incidence and mortality rates than women, largely because of the higher prevalence of risk factors, such as tobacco smoking, alcohol consumption, and chronic hepatitis B and C infections (liver cancer).
- Exceptions include breast, thyroid, and gallbladder cancers. Thyroid cancer incidence rate is 3 times higher in females than in males, largely due to differences in health care utilization and overdiagnosis.<sup>3</sup>

	Incidence			Mortality		
	Both Sexes	Male	Female	Both Sexes	Male	Female
<b>All sites</b>	<b>196.8</b>	<b>212.5</b>	<b>186.2</b>	<b>91.6</b>	<b>109.7</b>	<b>76.8</b>
<b>All sites excluding nonmelanoma of skin</b>	<b>186.4</b>	<b>198.5</b>	<b>178.7</b>	<b>91.0</b>	<b>108.9</b>	<b>76.3</b>
Lip, oral cavity	4.0	5.8	2.3	1.9	2.8	1.1
Salivary glands	0.6	0.7	0.5	0.2	0.3	0.2
Oropharynx	1.1	1.9	0.4	0.5	0.9	0.2
Nasopharynx	1.3	1.9	0.7	0.8	1.2	0.4
Hypopharynx	0.9	1.5	0.3	0.4	0.7	0.1
Esophagus	5.0	7.6	2.6	4.3	6.5	2.2
Stomach	9.2	12.8	6.0	6.1	8.6	3.9
Colon	10.7	12.4	9.2	4.7	5.5	4.0
Rectum	7.1	9.1	5.4	3.1	4.1	2.3
Anus	0.5	0.5	0.6	0.2	0.2	0.2
Liver	8.6	12.7	4.8	7.4	10.9	4.1
Gallbladder	1.2	0.9	1.4	0.8	0.6	1.0
Pancreas	4.7	5.5	4.0	4.2	5.0	3.5
Larynx	1.9	3.5	0.4	1.0	1.9	0.2
Lung	23.6	32.1	16.2	16.8	24.8	9.8
Melanoma of skin	3.2	3.7	2.9	0.5	0.7	0.4
Nonmelanoma of skin*	10.4	14.0	7.5	0.6	0.8	0.4
Mesothelioma	0.3	0.4	0.2	0.2	0.3	0.1
Kaposi sarcoma	0.4	0.6	0.3	0.2	0.2	0.1
Breast	24.1	0.3	46.8	6.6	0.1	12.6
Vulva	0.4	–	0.8	0.2	–	0.3
Vagina	0.2	–	0.4	0.1	–	0.2
Cervix uteri	7.1	–	14.1	3.6	–	7.1
Corpus uteri	4.3	–	8.4	0.9	–	1.7
Ovary	3.4	–	6.6	2.1	–	4.0
Penis	0.4	0.8	–	0.1	0.3	–
Prostate	13.7	29.4	–	3.2	7.3	–
Testis	0.9	1.7	–	0.1	0.2	–
Kidney	4.4	5.9	3.0	1.5	2.0	0.9
Bladder	5.6	9.3	2.4	1.8	3.1	0.8
Brain, nervous system	3.5	3.9	3.1	2.6	3.0	2.2
Thyroid	9.1	4.6	13.6	0.4	0.3	0.5
Hodgkin lymphoma	1.0	1.1	0.8	0.2	0.3	0.2
Non-Hodgkin lymphoma	5.6	6.6	4.6	2.4	2.9	1.9
Multiple myeloma	1.8	2.1	1.5	1.1	1.3	0.9
Leukemia	5.3	6.2	4.4	3.1	3.7	2.5

Note: Rates are age-standardized to the World Standard Population and differ from published rates in the US or Europe, where rates are often standardized to the 2000 US Standard Population and The European Age Standard, respectively.

\*Incidence excludes basal cell carcinoma, while mortality includes all types of nonmelanoma skin cancer.

Source: GLOBOCAN 2022 (gco.iarc.fr/today/).

## Figure 8. The Most Commonly Diagnosed Cancer and the Leading Cause of Cancer Death in Males, 2022

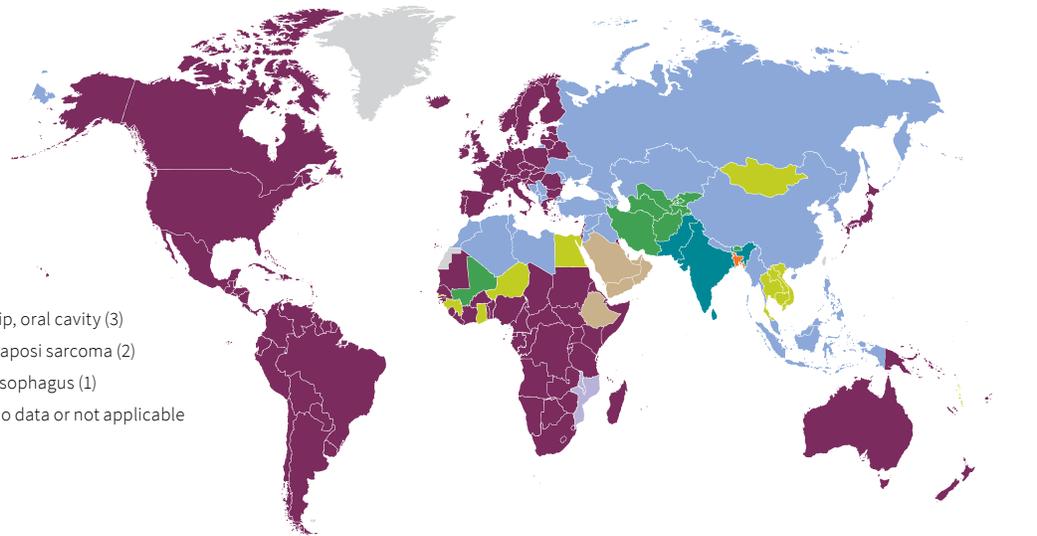
- Prostate cancer is the most commonly diagnosed cancer in males in 118 of 185 countries, but the leading cause of death in only 52 countries, mostly in Central America and sub-Saharan Africa, reflecting large disparities in early detection and survival.
- Lung cancer is the most commonly diagnosed cancer in men in 33 countries, yet it is the leading cause of cancer death in 89 countries, primarily due to its high fatality rate.

- Liver cancer is the most common cancer in men in 11 countries and the leading cause of cancer death in 24 countries, including Mongolia, those in Northern and Western Africa, and a cluster of countries in South-Eastern Asia.
- Kaposi sarcoma is a relatively rare cancer but remains the leading cause of cancer death in men in Mozambique and Zambia due to the high prevalence of human herpesvirus 8 (HHV-8, also known as Kaposi sarcoma-associated herpesvirus) infection and untreated HIV/AIDS.<sup>4</sup>
- The predominance of lip and oral cavity cancer in India and Pakistan likely reflects the popularity of betel nut chewing, often associated with social or traditional rituals.<sup>5,6</sup>

### Incidence

#### Number of countries

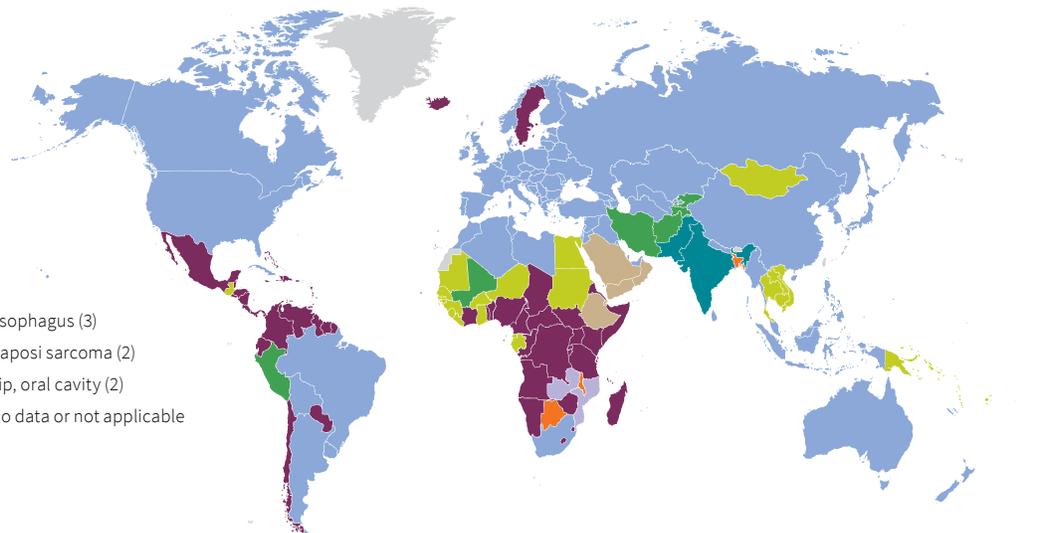
- Prostate (118)
- Lung (33)
- Liver (11)
- Colorectum (9)
- Stomach (8)
- Lip, oral cavity (3)
- Kaposi sarcoma (2)
- Esophagus (1)
- No data or not applicable



### Mortality

#### Number of countries

- Lung (89)
- Prostate (52)
- Liver (24)
- Stomach (8)
- Colorectum (5)
- Esophagus (3)
- Lip, oral cavity (2)
- Kaposi sarcoma (2)
- No data or not applicable



Source: GLOBOCAN 2022 ([gco.iarc.fr/today/](http://gco.iarc.fr/today/)).

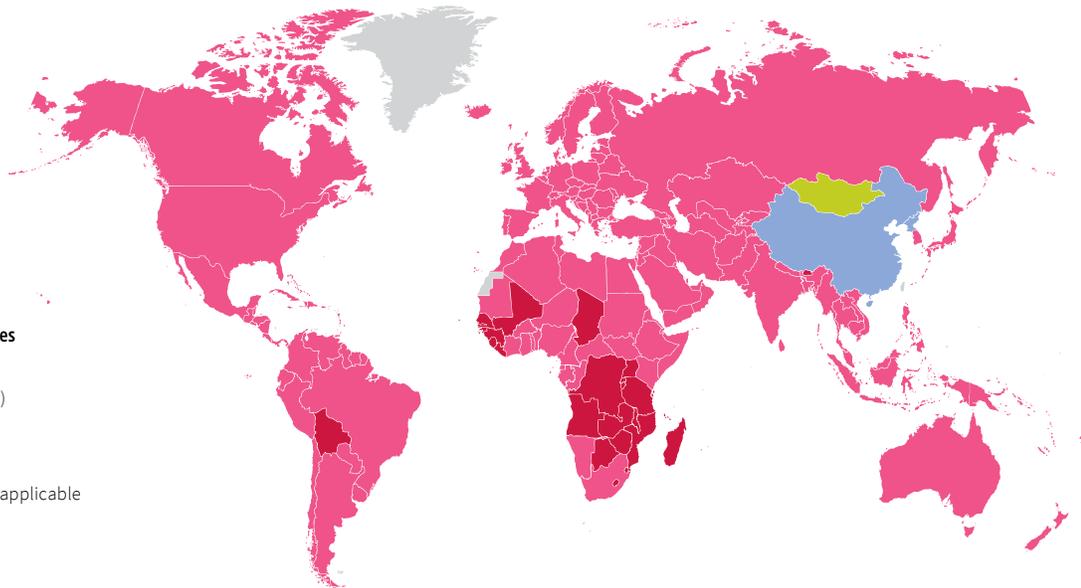
## Figure 9. The Most Commonly Diagnosed Cancer and the Leading Cause of Cancer Death in Females, 2022

- In females, two cancers (breast and cervix) dominate as the most common cancer; breast cancer ranks first in 157 countries, followed by cervical cancer in 25 of 28 remaining countries.
- The mortality profile is slightly more heterogeneous than incidence. Breast cancer is the leading cause of cancer death in 112 countries, followed by cervical cancer in 37 countries and lung cancer in 23 countries.
- Of 37 countries where cervical cancer is the leading cause of cancer death, 29 countries are in sub-Saharan Africa and the remainder are in Central and South America (Belize, El Salvador, Honduras, Bolivia, Peru) and South-Eastern and South-Central Asia (Nepal, Myanmar, and Kyrgyzstan).

### Incidence

#### Number of countries

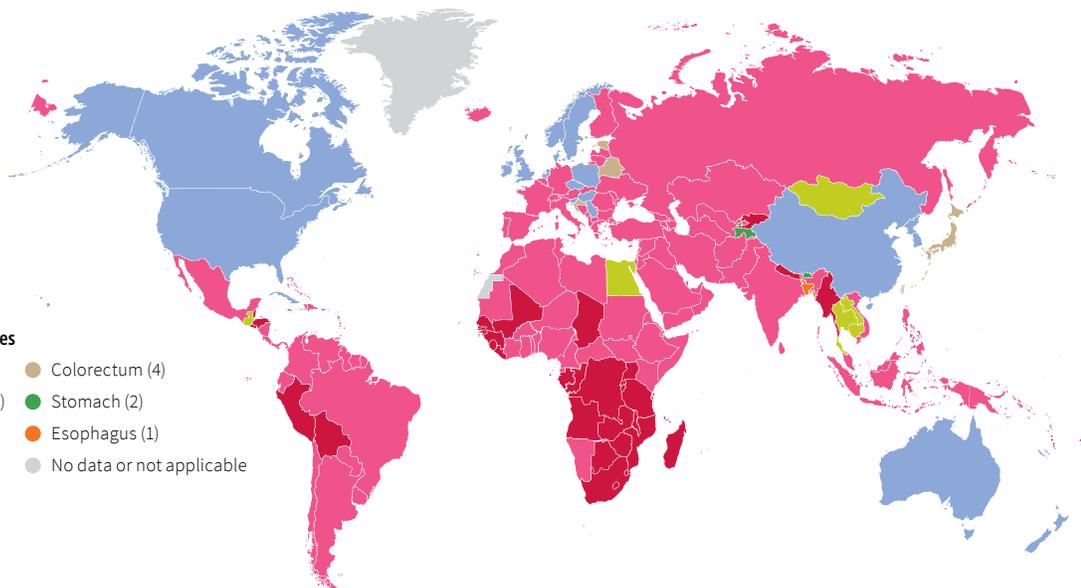
- Breast (157)
- Cervix uteri (25)
- Lung (2)
- Liver (1)
- No data or not applicable



### Mortality

#### Number of countries

- Breast (112)
- Cervix uteri (37)
- Lung (23)
- Liver (6)
- Colorectum (4)
- Stomach (2)
- Esophagus (1)
- No data or not applicable



Source: GLOBOCAN 2022 ([gco.iarc.fr/today/](http://gco.iarc.fr/today/)).

**Table 3. Five-year Net Survival for Select Cancers for Cases Diagnosed from 2000 to 2014**

- Cancer survival differs markedly across countries due to unequal access to effective early detection and treatment.
- The largest variations are for cancers amenable to screening and early detection, such as female breast and colorectal cancers; for example, 5-year survival for breast cancer is 90% in the United States, compared with 66% in India.<sup>7</sup>
- For cancer sites without effective early detection or treatment, survival rates vary little among countries; for example, 5-year survival for pancreatic cancer remains low even in high-income countries (10% to 12%).<sup>7</sup>

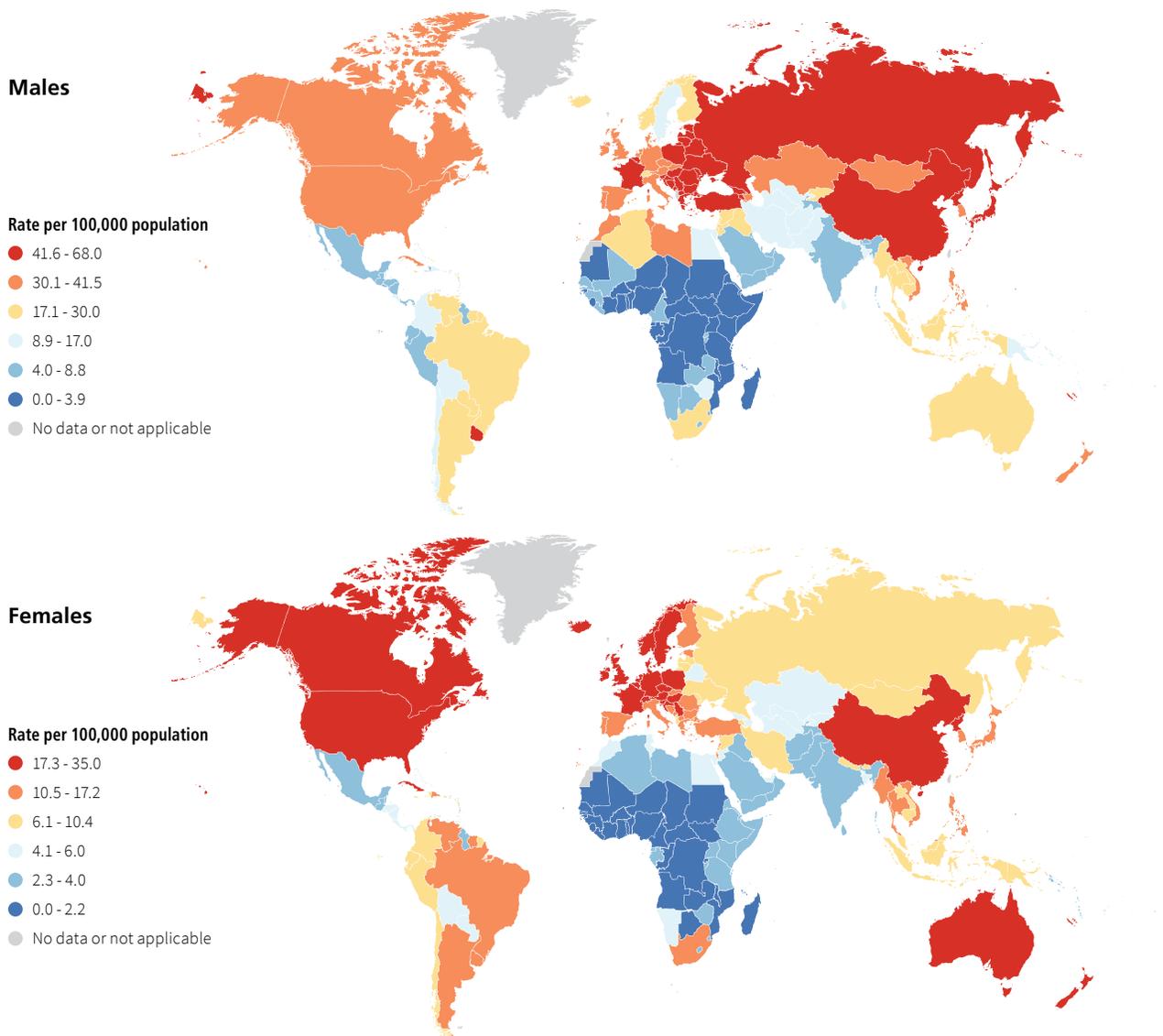
	Acute lymphoblastic leukemia (children)	Breast	Cervix	Colon	Liver	Lung	Pancreas	Prostate	Stomach
<b>Africa</b>									
Mauritius*	–	–	–	58	17	20	25	64	26
<b>America (Central and South)</b>									
Argentina registries	76†	84	53	54†	13†	13†	11†	88	22†
Brazil registries	66	75†	60	48†	8	9	10†	92	21†
Chile registries	64	76†	57†	44†	4†	5†	4	82†	17
Colombia registries	69	72†	49†	35†	5†	9†	5†	80†	17†
Costa Rica*	80	87	78†	60	24†	20†	25†	93	41
Cuba*	–	75	73	64†	–	30†	–	71†	36†
Ecuador registries	50	76	52	48	6b	12†	8†	82	19
Martinique*	–	90	58	54	16	12	12	98	32
Puerto Rico*	93	84	64	63	14†	18	10†	98	35
Uruguay	–	–	57	54	14†	9†	4†	87	19†
<b>America (North)</b>									
Canada registries	93	88	67	67	19	21	11	94	30
United States registries	90	90	63	65	17	21	12	97	33
<b>Asia</b>									
China registries	58	83	68	58	14	20	10	69	36
India registries	–	66	59	39	6	4	6	44	9
Israel*	88	88	67	72	19†	27	12†	96	32
Japan registries	88	89	71	68	30†	33	8†	93	60
Korea*	84	87	77	72	27	25	11	90	69
Kuwait*	88	75	57	59	19	13	24	84	22
Malaysia	82†	65†	57†	56	10	10	19	88	30
Singapore*	89	80	63	62	25	16	9	88	30
Taiwan*	77	84	70	63	28	21	8	83	39
Thailand registries	66	69†	54†	47	7	9	7	68	13
Türkiye registries	87	82	61	55	16	15	10	84	25
<b>Europe</b>									
Austria*	–	85	64	64	15†	10	11†	90	35
Belgium*	91	86	65	68	21	18	12	94	38
Bulgaria*	78	78	55	52	7†	8	–	68	16
Croatia*	85	79	63	51	9†	10	8†	81	20
Czech Republic*	88	81	61	56	7	11	6	85	21
Denmark*	94	86	70	62	8	17	8	86	20
Estonia*	88	77	67	58	4	17	10	86	29
Finland*	95	89	67	65	10†	13	7†	93	26
France registries	89	87	65	64	18	17	9	93	27
Germany registries	91	86	65	65	13	18	11	92	34
Ireland*	88	82	64	61	14	18	10	91	28
Italy registries	88	86	67	64	20	16	9	90	31
Latvia*	84	82	56	57	13	20	14	90	28
Lithuania*	75	74	59	57	8†	10	7†	94	27
Malta*	–	87	57	58	0†	15	6†	88	24
Netherlands*	90	87	68	63	16	17	7	89	25
Norway*	83	88	73	67	19	19	10	93	27
Poland registries*	87	77	55	53	11	14	8	78	21
Portugal*	90	88	66	61	19	16	11	91	32
Russian Federation registries	77	71	58	45	6	14	4	79	21
Slovakia*	87	76	61	52	8†	11	6	75	21
Slovenia*	70	84	66	62	7	15	7	85	29
Spain registries	85	85	65	63	17	14	8	90	28
Sweden*	89	89	68	65	17	20	10	91	25
Switzerland registries	90	86	71	67	15	20	9	89	32
United Kingdom*	92	86	64	60	13	13	7	89	21
<b>Oceania</b>									
Australia registries*	91	90	66	71	19	19	12	95	32
New Zealand*	91	88	67	64	19	15	8	90	26

\*Data with 100% coverage of the national population. †Survival estimate considered less reliable.

**Source:** Allemani C et al. Global surveillance of trends in cancer survival 2000-14 (CONCORD-3): analysis of individual records for 37,513,025 patients diagnosed with one of 18 cancers from 322 population-based registries in 71 countries. *Lancet* 2018;391: 1023-1075.

## Figure 10. International Variation in Lung Cancer Incidence Rates by Sex, 2022

- The incidence rate is roughly twice as high in males compared to females (32 versus 16 per 100,000).
- The highest incidence rates in males (56 to 68 per 100,000) are in Central and Eastern Europe (Hungary), Southern Europe (Serbia and Bosnia Herzegovina), Western Asia (Türkiye and Armenia), and Melanesia (New Caledonia), while the highest incidence rates in females (30 to 35 per 100,000) are in the United States, Canada, China, the Netherlands, and Denmark. Incidence rates remain the lowest in sub-Saharan Africa (except South Africa) in both sexes.
- Although lung cancer patterns mostly reflect the prevalence of smoking, the incidence rate in Chinese women is equal to that in US women (30 per 100,000) despite lower smoking prevalence (1.7% versus 17.5% in 2020), supposedly in part due to exposure to indoor and outdoor air pollution.<sup>8,9</sup>
- Although annual low-dose computed tomography screening is shown to reduce lung cancer mortality in heavy smokers,<sup>10-13</sup> high costs and specialized infrastructure needs limit widespread adoption even in affluent countries.



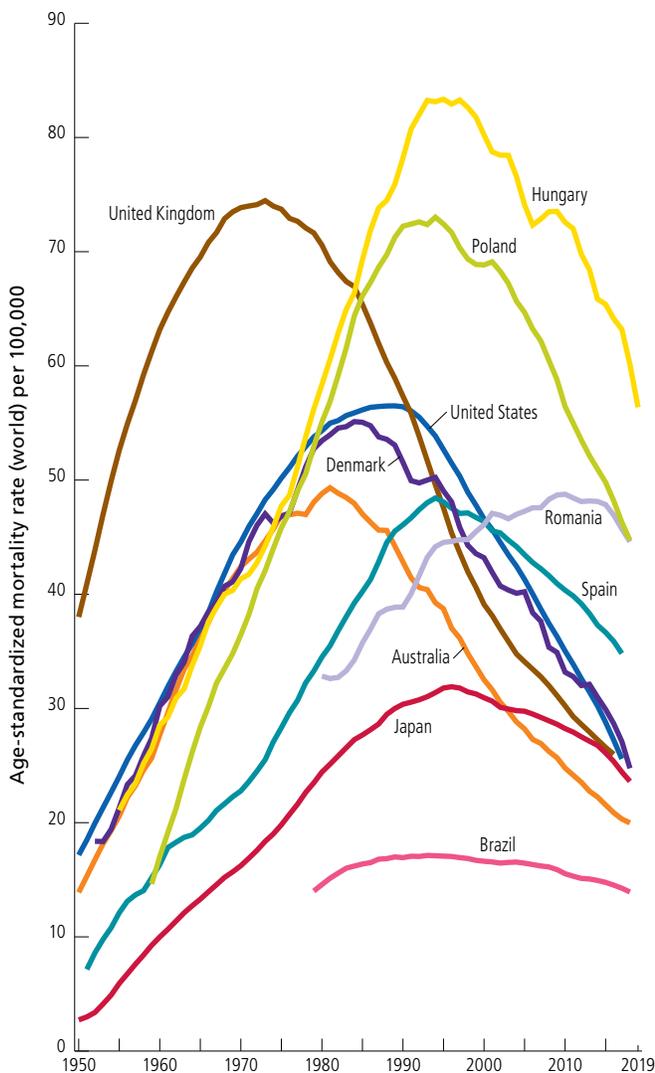
Note: Rates are age-standardized to the World Standard Population and differ from published rates in the US or Europe, where rates are often standardized to the 2000 US Standard Population and the European Age Standard, respectively.

Source: GLOBOCAN 2022 ([gco.iarc.fr/today/](http://gco.iarc.fr/today/)).

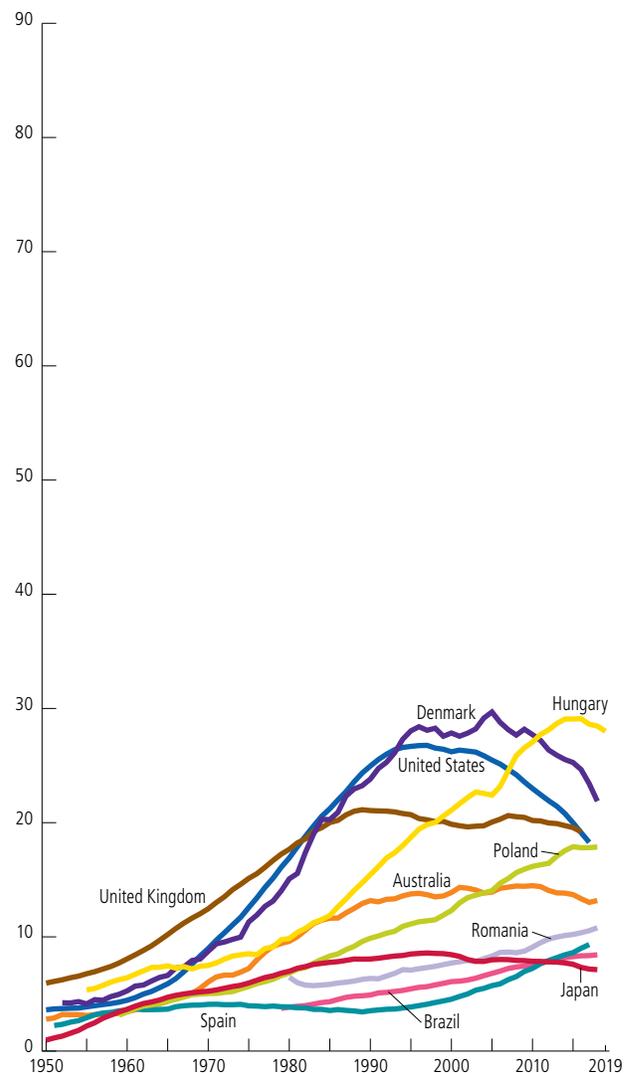
## Figure 11. Trends in Lung Cancer Mortality Rates by Sex, 1950-2019

- Men in high-income countries were the first to take up smoking and then to quit. Reflecting this pattern, lung cancer death rates among males began to fall as early as the late 1980s in countries in North America, Northern and Western Europe, and Australia and New Zealand.
- In countries where the epidemic among males is at an earlier stage (e.g., China, Indonesia, and several African countries), in part because of less stringent tobacco control interventions, the lung cancer death rate either peaked recently or continues to increase.<sup>14, 15</sup>
- In most countries, lung cancer death rates in females are still on the rise or have only recently plateaued because women took up smoking later and have been slower to quit, even in high-income countries. In some high-income countries, lung cancer rates in young women approach or surpass those in men (e.g., Denmark, Iceland, Sweden, and the United States).<sup>16-21</sup>

### Males



### Females

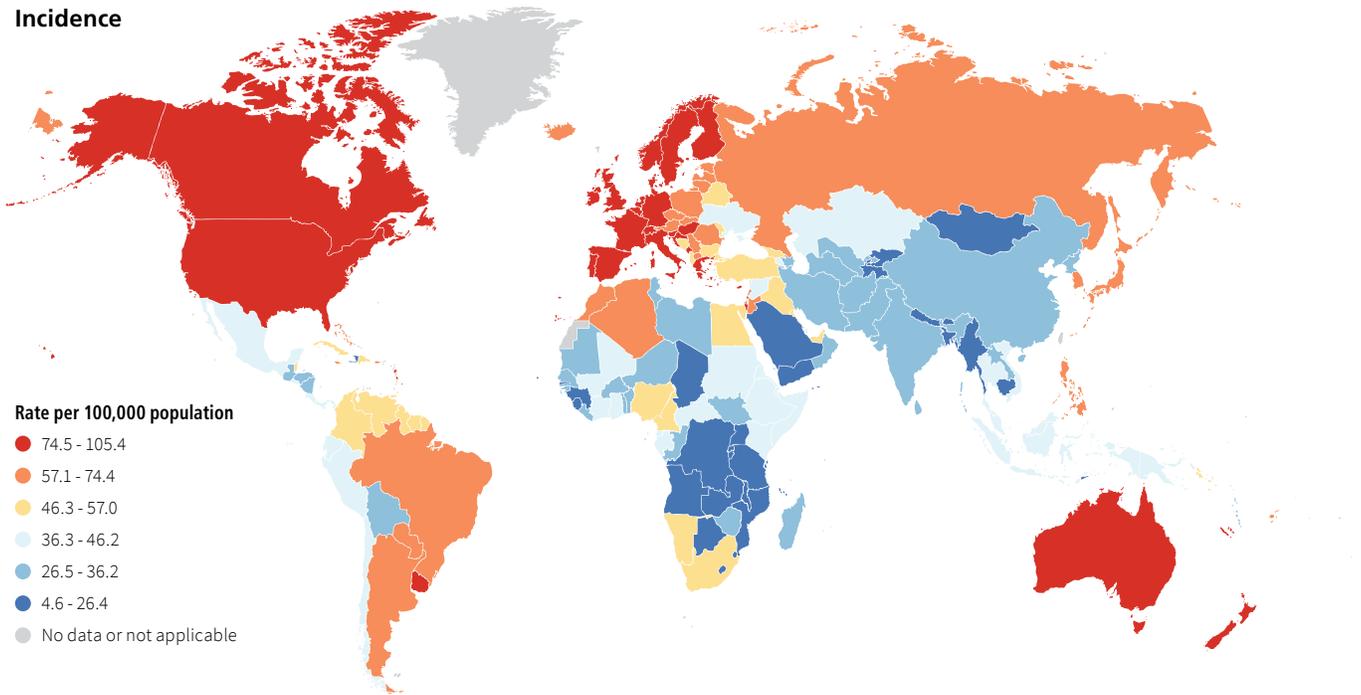


Note: Rates are age-adjusted to the World Standard Population and differ from published rates in the US or Europe, where rates are often standardized to the 2000 US Standard Population and the European Age Standard, respectively.

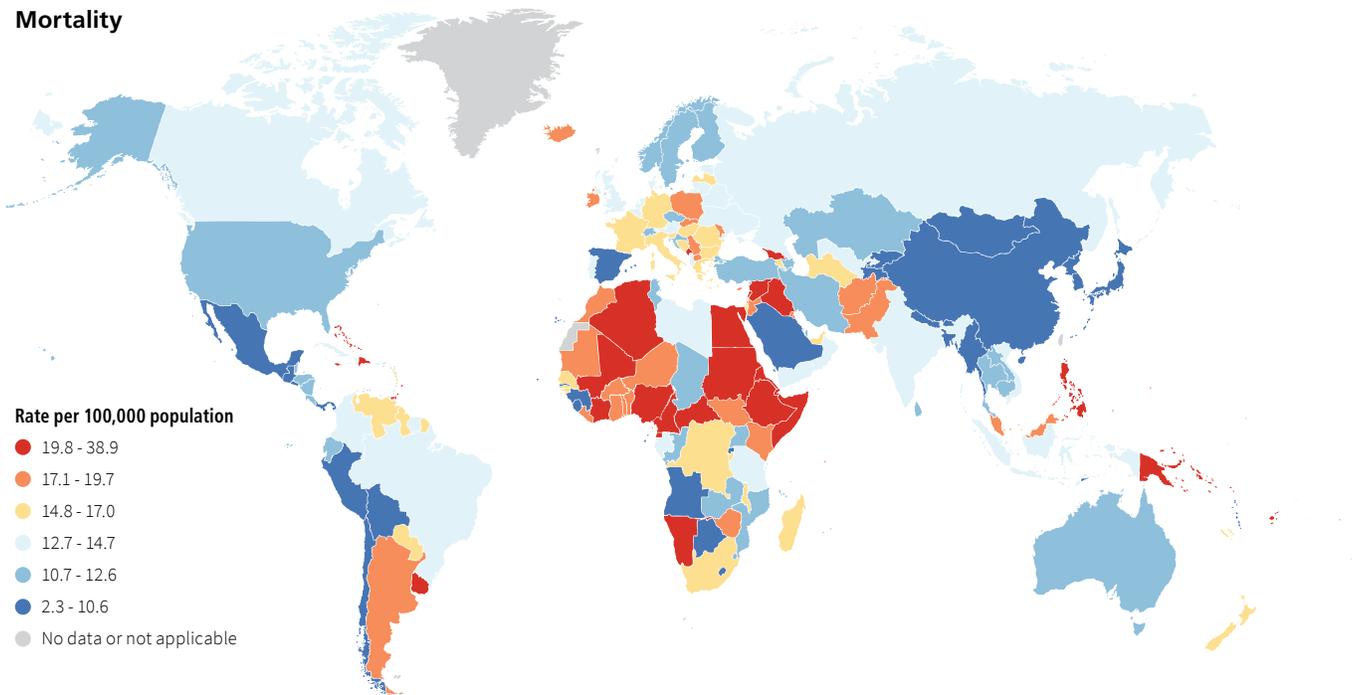
Source: WHO Mortality Database ([who.int/data/data-collection-tools/who-mortality-database](http://who.int/data/data-collection-tools/who-mortality-database)).

**Figure 12. International Variation in Female Breast Cancer Incidence and Mortality Rates, 2022**

**Incidence**



**Mortality**



Note: Rates are age-standardized to the World Standard Population and differ from published rates in the US or Europe, where rates are often standardized to the 2000 US Standard Population and the European Age Standard, respectively.

Source: GLOBOCAN 2022 ([gco.iarc.fr/today/](http://gco.iarc.fr/today/)).

## Figure 12. International Variation in Female Breast Cancer Incidence and Mortality Rates, 2022

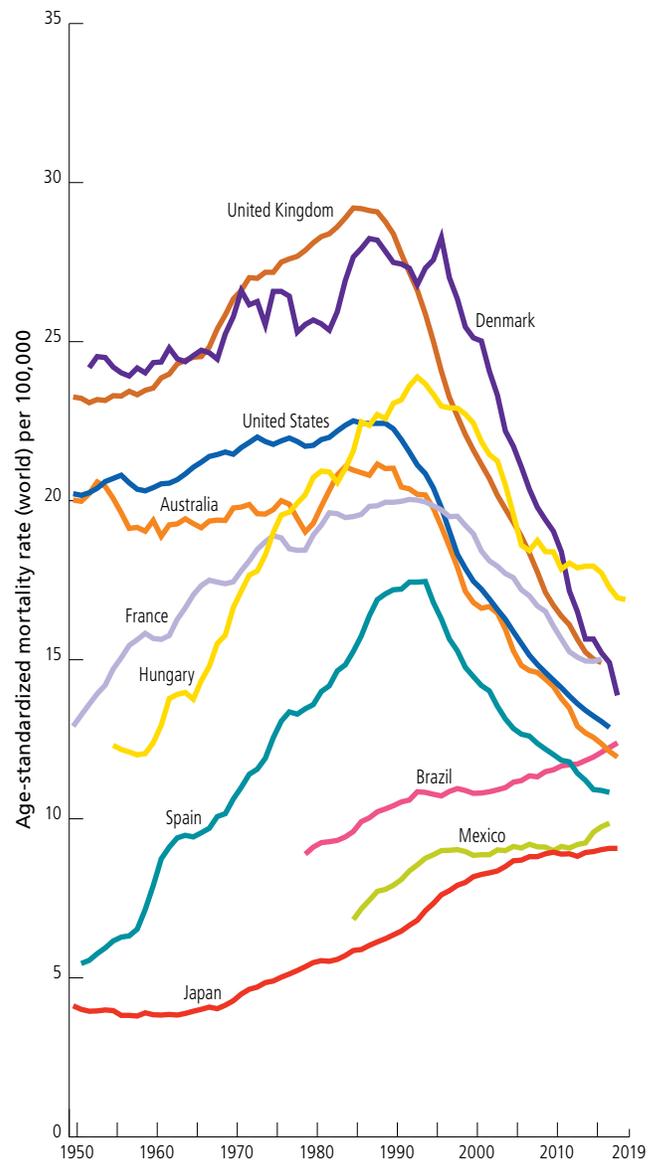
- There is an almost 23-fold variation in breast cancer incidence rates across countries, largely reflecting differences in the prevalence of risk factors (e.g. reproductive patterns, excess body weight, alcohol use, and physical inactivity) and screening.
- Incidence rates are the highest in Northern America, Australia and New Zealand, Northern Europe, Western Europe, and Southern Europe (surpassing 100 per 100,000 in France, Cyprus, Belgium, the Netherlands, and Australia) and lowest in South-Central Asia and sub-Saharan Africa, particularly in Eastern and Middle Africa, with less than 10 per 100,000 women in Bhutan, Sierra Leone, and Angola.
- Death rates show less geographic variation, ranging from under 4 per 100,000 in Mongolia and Bhutan to over 25 per 100,000 in countries across sub-Saharan Africa, the Caribbean, Micronesia and Polynesia, and Melanesia. In Fiji and Jamaica, death rates exceed 35 per 100,000, approximately three times the rate in the United States (12 per 100,000), despite 26% to 38% lower incidence, because of limited access to early detection and high-quality treatment.
- To improve breast cancer survival in low-income settings, implementation of a resource-stratified guideline for early detection and treatment is essential.<sup>22-24</sup> Data from five sub-Saharan African countries suggest that 28% to 37% of breast cancer deaths could be averted through earlier diagnosis of symptomatic cases and appropriate treatment.<sup>25</sup>

## Figure 13. Trends in Female Breast Cancer Mortality Rates, 1950-2019

- Breast cancer death rates have decreased in countries with historically high risk (e.g., the United States, the United Kingdom, Denmark, and Australia) since around the early 1990s, owing to advancements in early detection and treatment.<sup>26, 27</sup>

- Conversely, death rates are rising in countries with historically low breast cancer risk, such as those in Asia, Africa, and South America,<sup>28-30</sup> mirroring increasing incidence that reflects trends in risk factors, such as later childbirth, decreased fertility, and increased body weight in conjunction with increased awareness and screening.

**Figure 13. Trends in Female Breast Cancer Mortality Rates, 1950-2019**



Note: Rates are age-adjusted to the World Standard Population and differ from published rates in the US or Europe, where rates are often standardized to the 2000 US Standard Population and the European Age Standard, respectively.

Source: WHO Mortality Database ([who.int/data/data-collection-tools/who-mortality-database](http://who.int/data/data-collection-tools/who-mortality-database)).

## Figure 14. International Variation in Colorectal Cancer Incidence Rates, 2022

- Colorectal cancer incidence rates reflect a country's socioeconomic development<sup>31,32</sup> and vary over 20-fold across countries, ranging from below 2 per 100,000 in Cape Verde and Sierra Leone and 4.5 per 100,000 in India to over 40 per 100,000 in Denmark, Norway, Hungary, the Netherlands, and Croatia.
- While still high compared to other countries, incidence rates of colorectal cancer have decreased in the United States, Australia, France, and several other affluent European and Asian countries. The reductions have been attributed to population-wide changes in risk factors, such as declines in smoking prevalence and increased use of anti-inflammatory drugs, as well as increased uptake of screening, allowing the removal of precancerous lesions in older adults.<sup>33,34</sup>
- Nevertheless, there is a concerning rise in incidence rates among younger adults in the United States and several other Western countries, pointing to the emergence of risk factors in younger generations.<sup>35-38</sup>
- Colorectal cancer incidence rates continue to rise in many transitioning countries in Eastern Europe, Asia, and South America,<sup>33,39</sup> coupled with parallel increases in mortality rates<sup>30</sup> because of the gradual adoption of a more Westernized lifestyle, characterized by the increased consumption of red meat, heightened levels of smoking and alcohol consumption, a more sedentary lifestyle, and a rise in excess body weight.
- Along with the timely diagnosis of colorectal cancer via screening or symptom awareness, primary prevention remains a fundamental strategy to mitigate the escalating global burden of colorectal cancer, which encompasses abstaining from smoking and alcohol consumption, engaging in regular exercise, and maintaining a healthy diet and weight.<sup>39</sup>

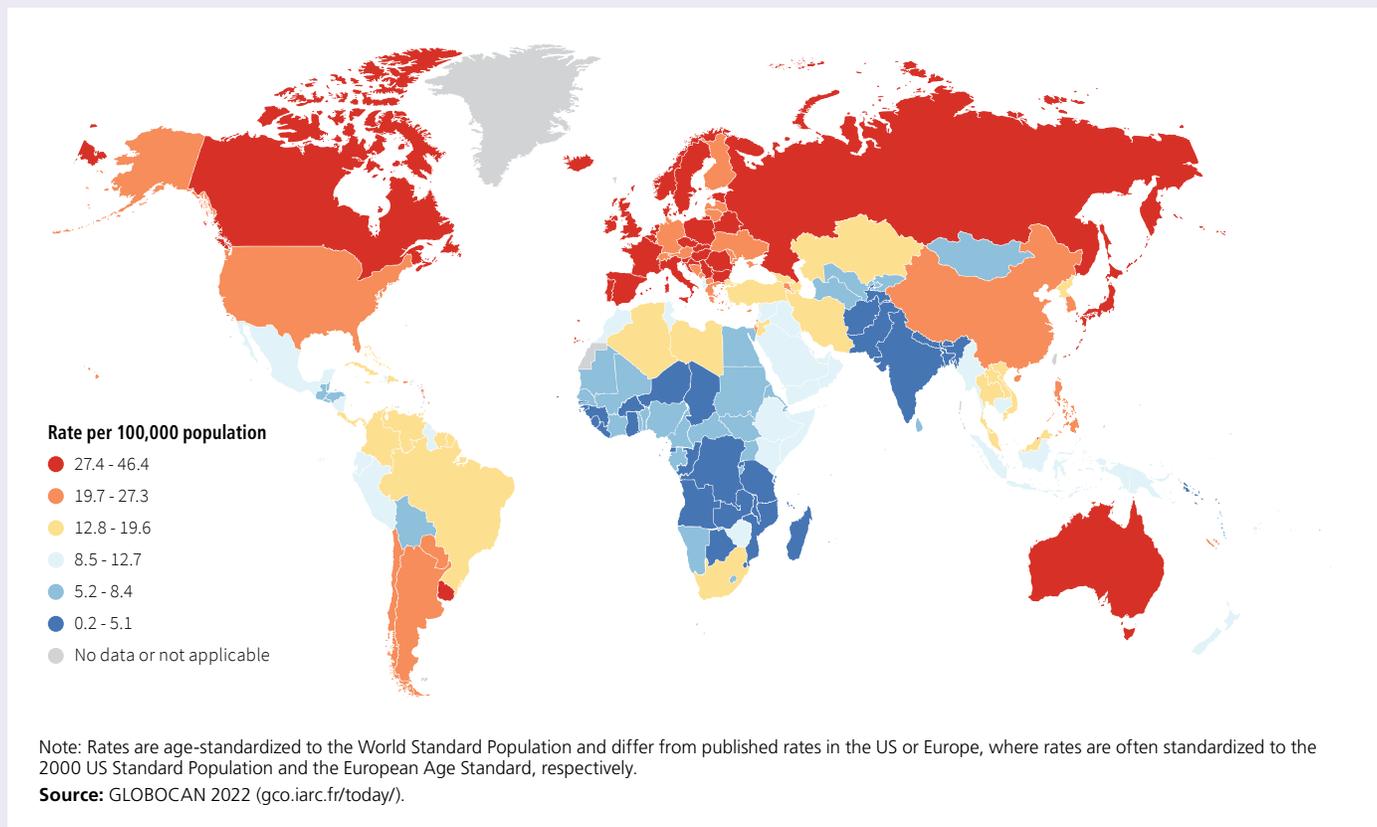
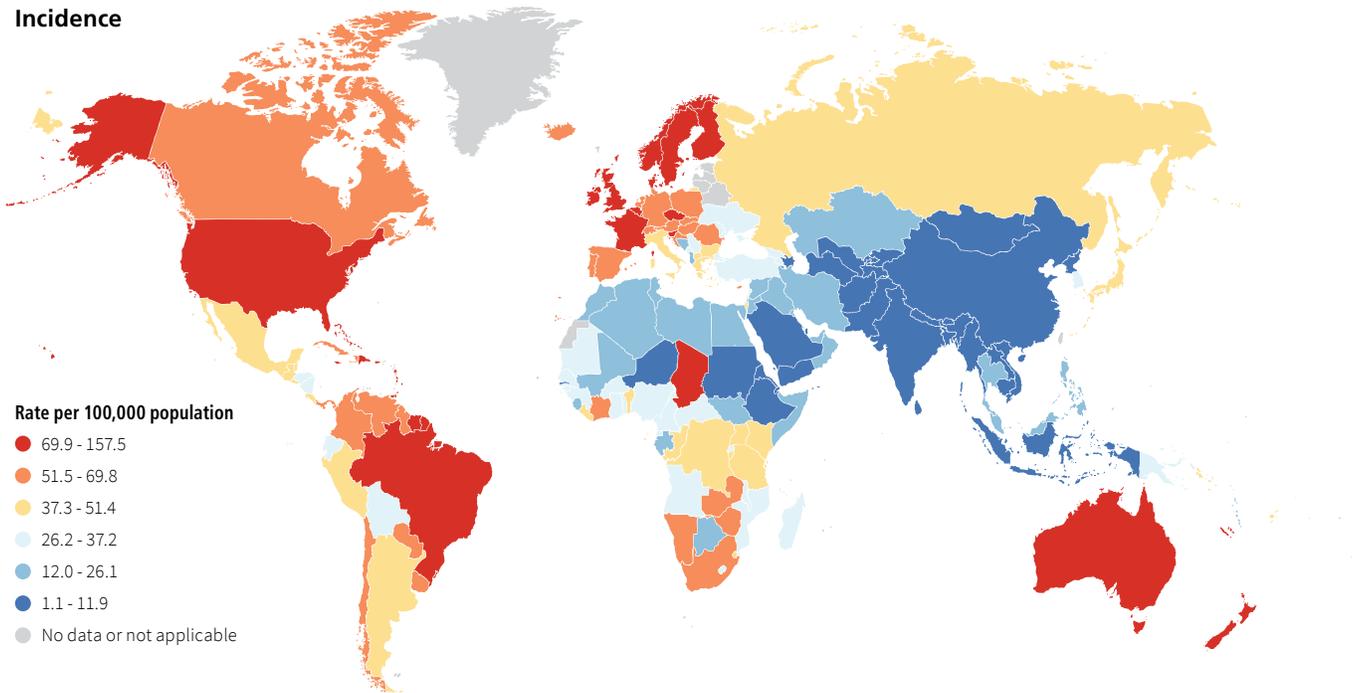
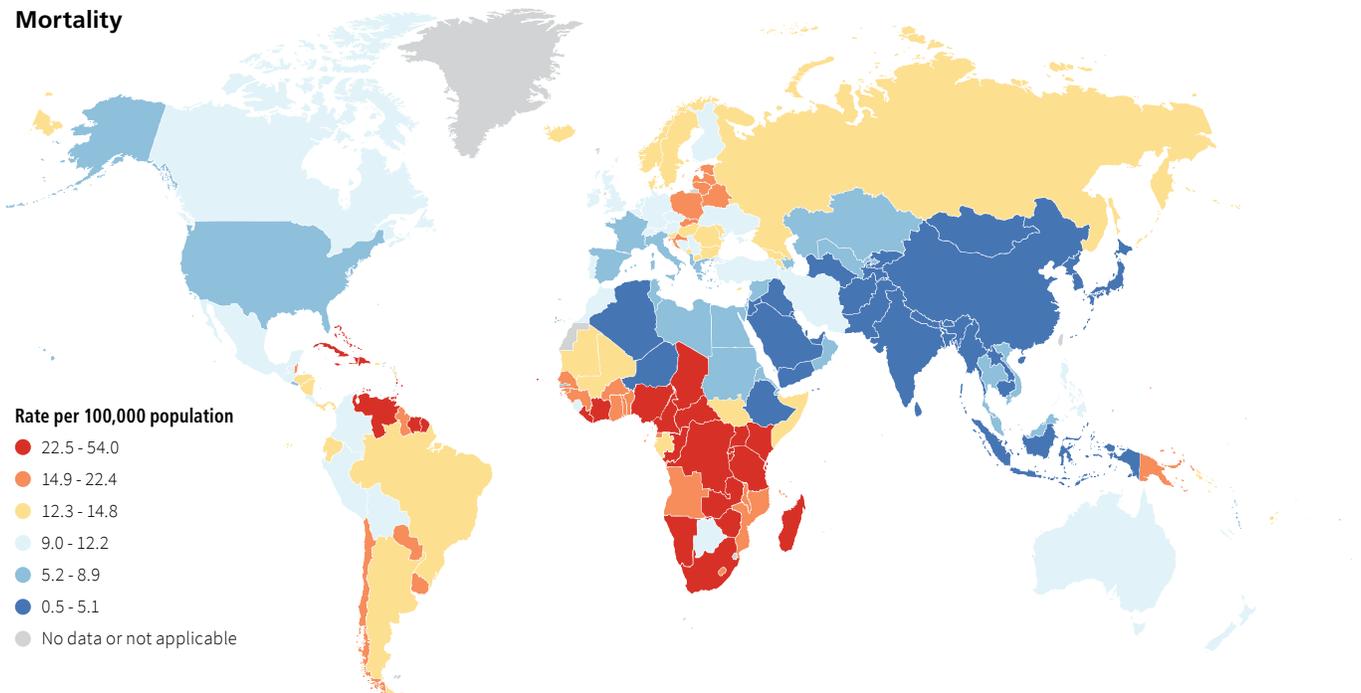


Figure 15. International Variation in Prostate Cancer Incidence and Mortality Rates, 2022

**Incidence**



**Mortality**



Note: Rates are age-standardized to the World Standard Population and differ from published rates in the US or Europe, where rates are often standardized to the 2000 US Standard Population and the European Age Standard, respectively.

Source: GLOBOCAN 2022 ([gco.iarc.fr/today/](http://gco.iarc.fr/today/)).

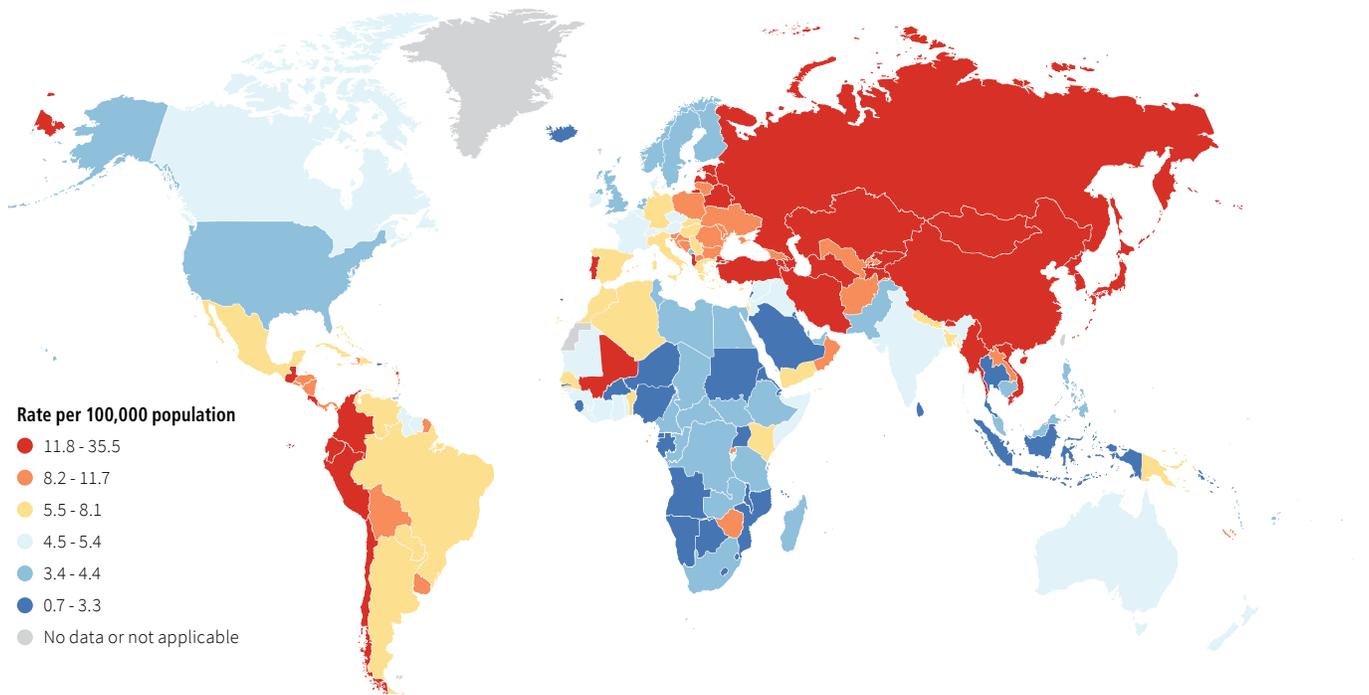
## Figure 15. International Variation in Prostate Cancer Incidence and Mortality Rates, 2022

- Prostate cancer incidence rates vary by more than 50-fold across countries, ranging from less than 3 per 100,000 in Yemen and Bhutan to 101 to 158 per 100,000 in Guadeloupe, Lithuania, Martinique, Norway, Sweden, and Barbados.
- Elevated incidence rates in Europe, Australia and New Zealand, and the Americas are in part due to the widespread use of prostate-specific antigen (PSA) testing, which detects cancer at early stages but also detects cancers that do not progress or cause harms in a lifetime if left undetected (overdiagnosis).<sup>40</sup>
- The higher incidence in the Caribbean and sub-Saharan African countries in part reflects increased genetic susceptibility;<sup>41</sup> multiple genetic variants associated with the disease risk are more common in men with Western African ancestry.<sup>42, 43</sup>
- Prostate cancer mortality patterns by countries differ from incidence because survival rates are high in high-income countries partly due to PSA testing. The highest rates are found in Chad (54 per 100,000), followed by Zambia, Zimbabwe, and Jamaica (>37 per 100,000), while the lowest are in Bangladesh, Nepal, and Bhutan (0.5 to 1.6 per 100,000).
- In many high-income countries, mortality rates have decreased since about the mid-1990s because of improvements in early detection and treatment, although recent trends indicate a leveling off of previous declines (e.g., the United States, Denmark, Spain, Argentina, New Zealand, Israel, and Japan).<sup>44-47</sup>
- In contrast, mortality rates have continued to increase in many countries in Central and Eastern Europe, Asia, and Africa,<sup>44, 48</sup> reflecting increasing incidence along with limited access to early detection and effective treatment.<sup>49</sup>

## Figure 16. International Variation in Stomach Cancer Incidence Rates, 2022

- The highest rates of stomach cancer are found in countries located in East Asia (e.g., Mongolia, Japan, and South Korea, 27-35 per 100,000), Western Asia (e.g., Iran and Tajikistan, 19 per 100,000), Eastern Europe (e.g., Belarus, 15 per 100,000), and South America (e.g., Chile, 14 per 100,000), and the lowest rates are found in sub-Saharan Africa (e.g., below than 1.5 per 100,000 in Eswatini, Botswana, and Mozambique).
- This variation largely reflects differences in the prevalence of chronic *Helicobacter pylori* (*H. pylori*) infection, which is responsible for approximately 90% of all non-cardia stomach cancers that develop in the middle and lower portions of the stomach.
- Stomach cancer incidence rates have decreased steadily over the past decades, because of declines in *H. pylori* infection prevalence and improvements in hygiene and food preservation, as well as decreased smoking prevalence.<sup>50-52</sup>
- With the exceptions of Japan and South Korea, where nationwide screening programs were introduced decades ago, stomach cancer survival is low across countries due to late-stage diagnosis (as shown in [Table 3](#)).
- Lifestyle changes, such as smoking cessation, limiting alcohol consumption and salt intake, and eating a healthy diet with fruits and vegetables, remain as primary prevention strategies.
- Population-based *H. pylori* treatment programs, which are currently the most evidence-based strategies available, may aid in reducing stomach cancer incidence in some settings with high incidence.<sup>53</sup>

**Figure 16. International Variation in Stomach Cancer Incidence Rates, 2022**



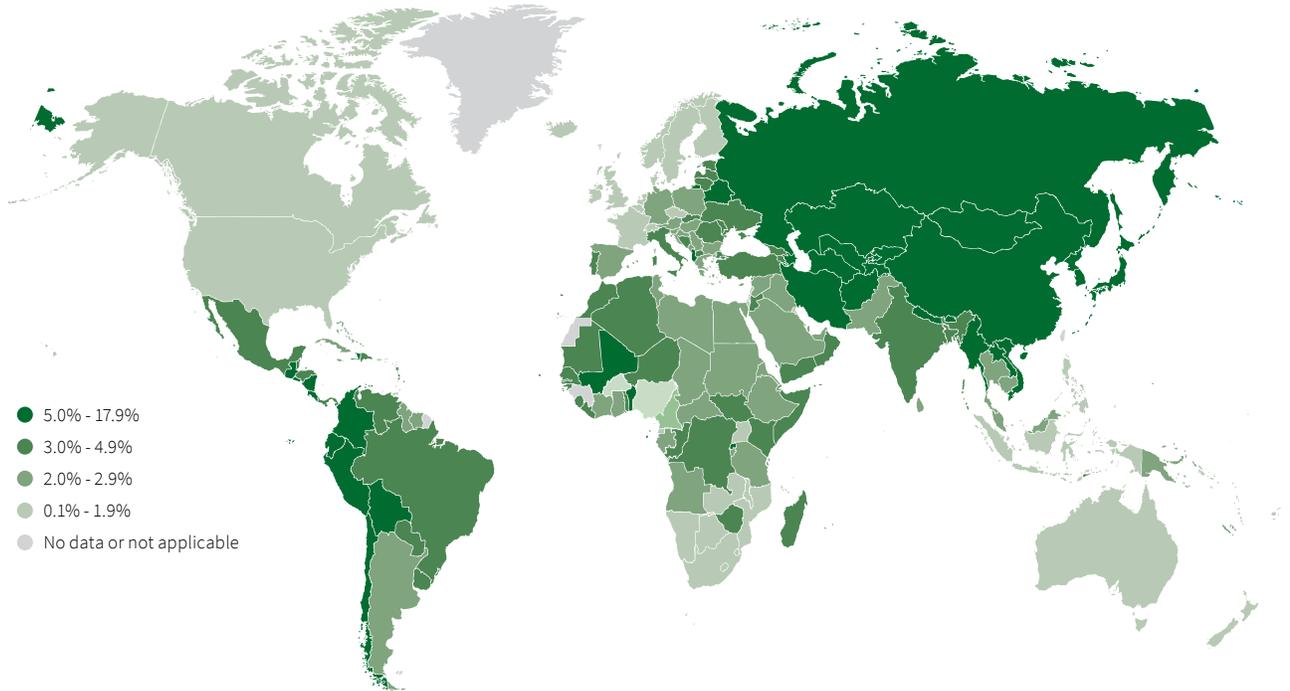
Note: Rates are age-standardized to the World Standard Population and differ from published rates in the US or Europe, where rates are often standardized to the 2000 US Standard Population and the European Age Standard, respectively.

Source: GLOBOCAN 2022 ([gco.iarc.fr/today/](http://gco.iarc.fr/today/)).

## Figure 17. Percentage of All Cancer Cases Attributable to *Helicobacter pylori*, 2020

- An estimated 850,000 cancer cases (mainly non-cardia stomach cancer) each year are attributable to *Helicobacter pylori* (*H. pylori*) infection, representing 4.4% of all cancer cases.<sup>54</sup>
- The percentage of cases attributable to *H. pylori* are among the highest in countries in South-Central Asia (Tajikistan, 17.9%) and Eastern Asia (Mongolia, 12.6%; Japan, 11.7%; South Korea, 11.2%; Vietnam, 8.4%; China, 7.9%) due to the historically high prevalence of the infection.<sup>54, 55</sup>
- Given the large population size and the high prevalence of *H. pylori* infection, China and Japan contributed to 42% and 14% of *H. pylori*-attributable global cancer cases, respectively.<sup>54</sup>
- Countries with the lowest percentages of *H. pylori*-attributable cancers include the United States (1.0%), Sweden (0.9%), and Indonesia (0.9%).<sup>54</sup>

Figure 17. Percentage of All Cancer Cases Attributable to *Helicobacter pylori*, 2020

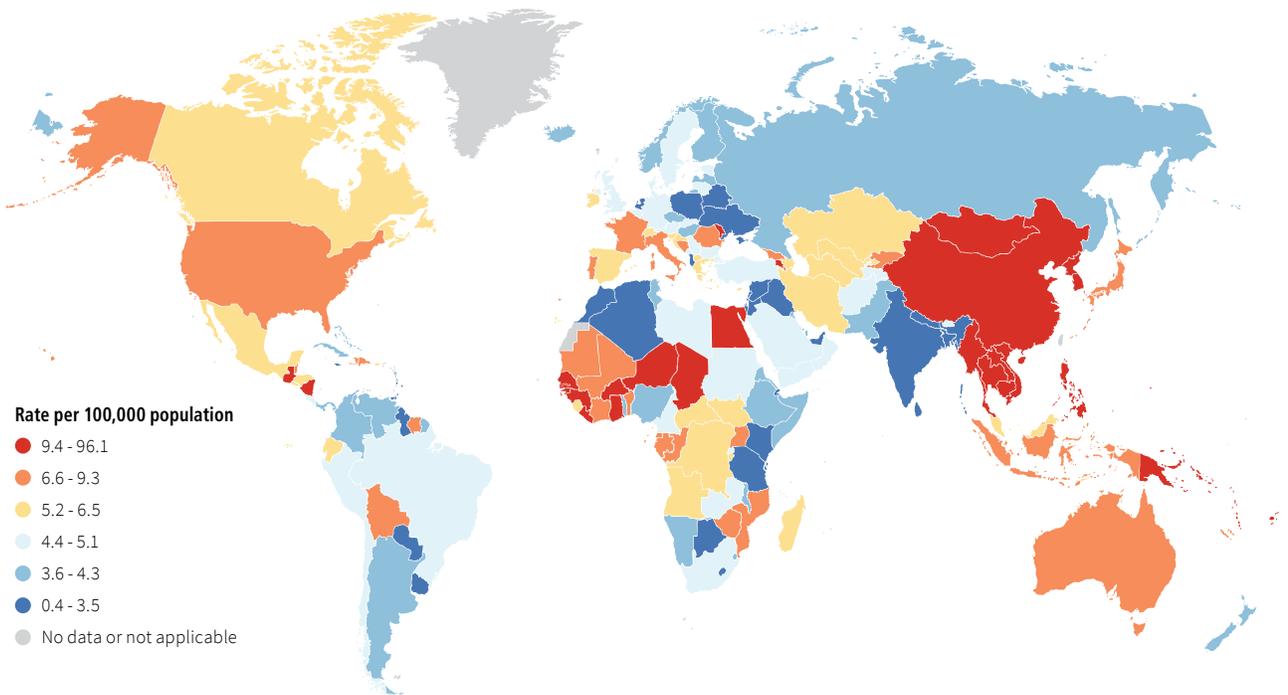


Source: Cancers attributable to infections. Global Cancer Observatory ([gco.iarc.fr/causes/infections/home](http://gco.iarc.fr/causes/infections/home)).

## Figure 18. International Variation in Liver Cancer Incidence Rates, 2022

- The incidence rates of liver cancer are the highest in parts of Eastern Asia, Northern Africa, and South-Eastern Asia (>13 per 100,000), with the world's highest incidence rates found in Mongolia (96 per 100,000), followed by Egypt (32 per 100,000), Cambodia (25 per 100,000), Lao People's Democratic Republic (25 per 100,000), and Thailand (23 per 100,000). The incidence rate is the lowest in South-Central Asia (3 per 100,000).
- Geographic variations in liver cancer rates closely align with the prevalence of hepatitis B virus (HBV) and hepatitis C virus (HCV) infections (Figure 19)<sup>56</sup> as well as distinct local factors, such as aflatoxin (crop contaminating mycotoxin) exposures in areas with (sub)tropical climates<sup>57</sup> and the endemic burden of cholangiocarcinoma caused by liver flukes (e.g., *Opisthorchis viverrini*) in Thailand and neighboring countries.<sup>58</sup>
- Liver cancer rates have decreased in many high-risk countries (e.g., Taiwan, South Korea, and Japan) since the 1980s due to decreases in the prevalence of HBV infection and aflatoxin exposure.<sup>59</sup> Meanwhile, rates are increasing in Europe, North America, Australia and New Zealand, and South America,<sup>30, 60</sup> due to increasing excess body weight, non-alcoholic fatty liver disease, and diabetes, as well as viral hepatitis transmission during injection drug use.
- Liver cancer remains among the most fatal cancers, with 5-year survival of less than 30% even in most developed countries (e.g., 22% in the United States in 2013-2019).

**Figure 18. International Variation in Liver Cancer Incidence Rates, 2022**



Note: Rates are age-standardized to the World Standard Population and differ from published rates in the US or Europe, where rates are often standardized to the 2000 US Standard Population and the European Age Standard, respectively.

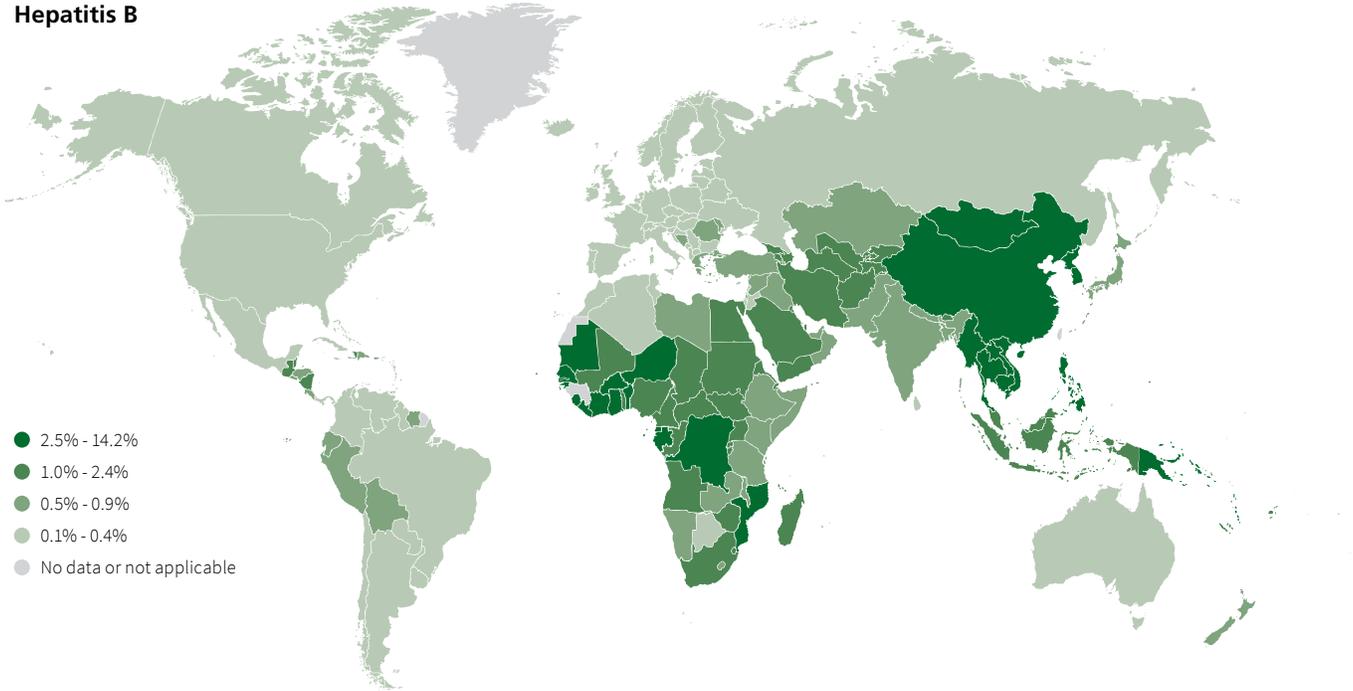
Source: GLOBOCAN 2022 ([gco.iarc.fr/today/](http://gco.iarc.fr/today/)).

## Figure 19. Percentage of All Cancer Cases Attributable to Hepatitis B and C Viruses, 2020

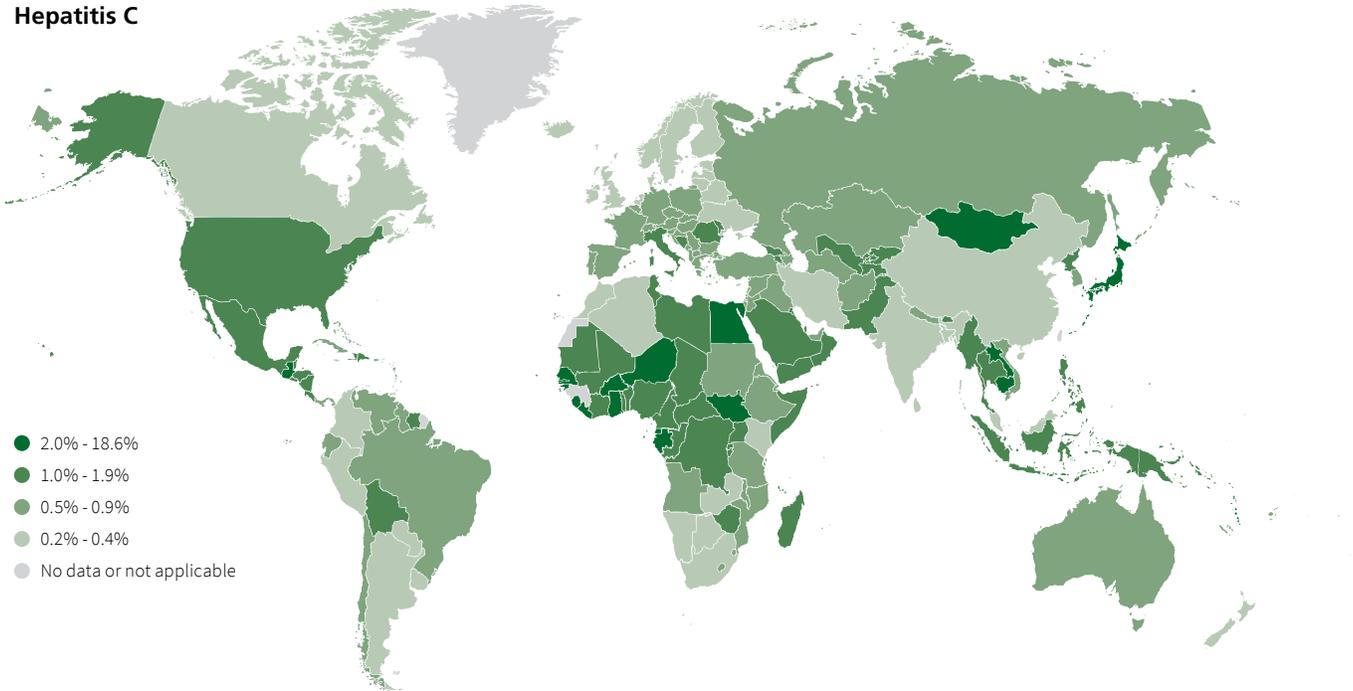
- Hepatitis B virus (HBV) and hepatitis C virus (HCV) infections account for 54% and 24% of all hepatocellular carcinoma cases, respectively.<sup>56</sup>
- The percentage of all cancers attributable to HBV infection is higher in parts of Eastern Asia, South-Eastern Asia, and Western Africa (where the infection is the most prevalent), with the highest estimates found in Mongolia (14.2%), Vietnam (9.1%), Ghana (6.4%), China (5.8%), Thailand (4.8%), and South Korea (3.2%), substantially higher than the United States (0.1%). China alone accounts for 68% of the world's HBV-associated cancers.
- Countries with the highest percentage of HCV-attributable cancers include those in diverse areas (e.g., Egypt, 18.6%; Mongolia, 15.1%; Ghana, 3.9%; Japan, 2.4%; and the United States, 1.2%), reflecting historically widespread viral transmission related to unsafe medical practices (Japan, Egypt, and Mongolia) or a significant presence of intravenous drug users.
- Although nonviral factors are gaining prominence as important risk factors for liver cancer, hepatitis vaccinations (HBV, [Figure 20](#)) and treatment (HCV) are still the primary prevention strategies for liver cancer control.

Figure 19. Percentage of All Cancer Cases Attributable to Hepatitis B and C Viruses, 2020

**Hepatitis B**



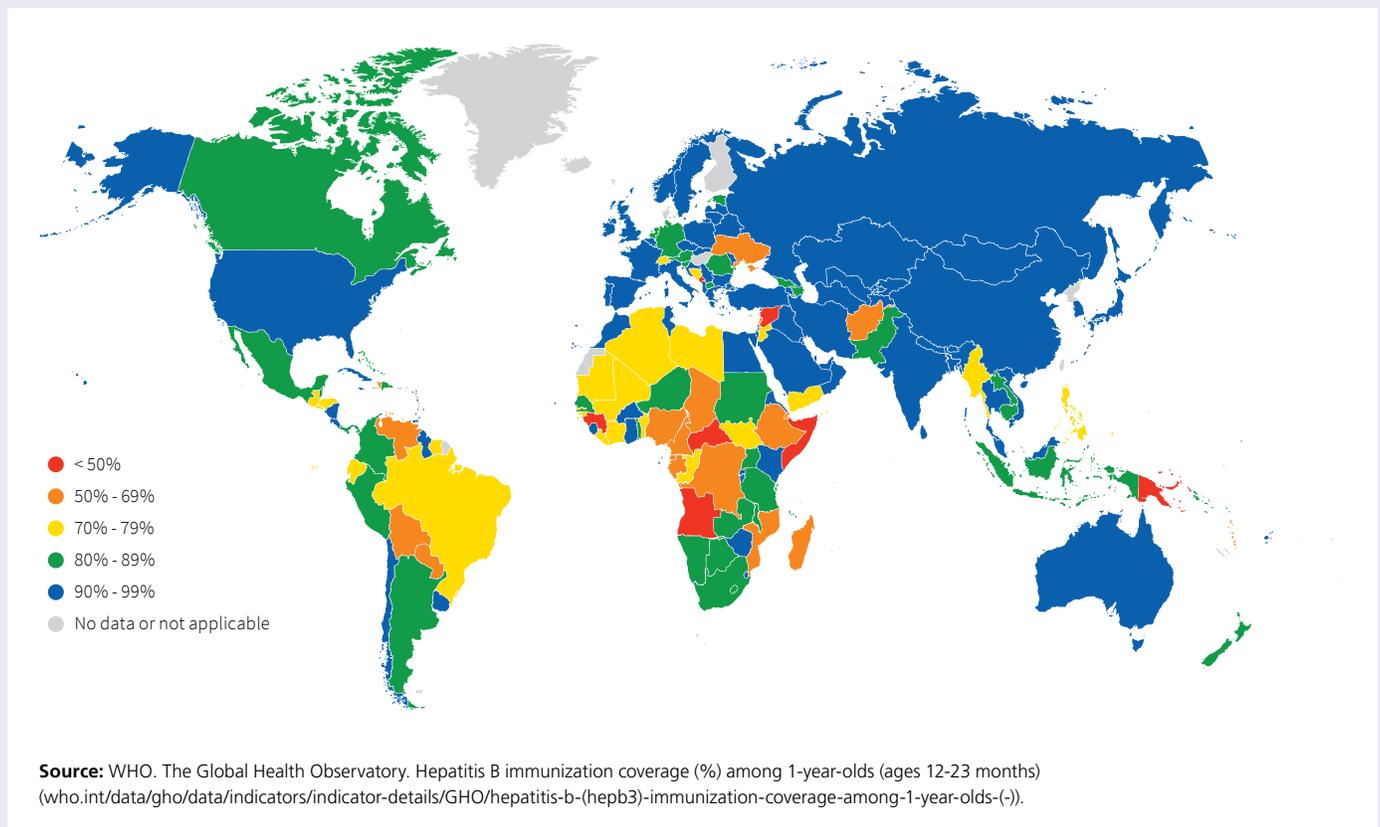
**Hepatitis C**



Source: Cancers attributable to infections. Global Cancer Observatory ([gco.iarc.fr/causes/infections/home](http://gco.iarc.fr/causes/infections/home)).

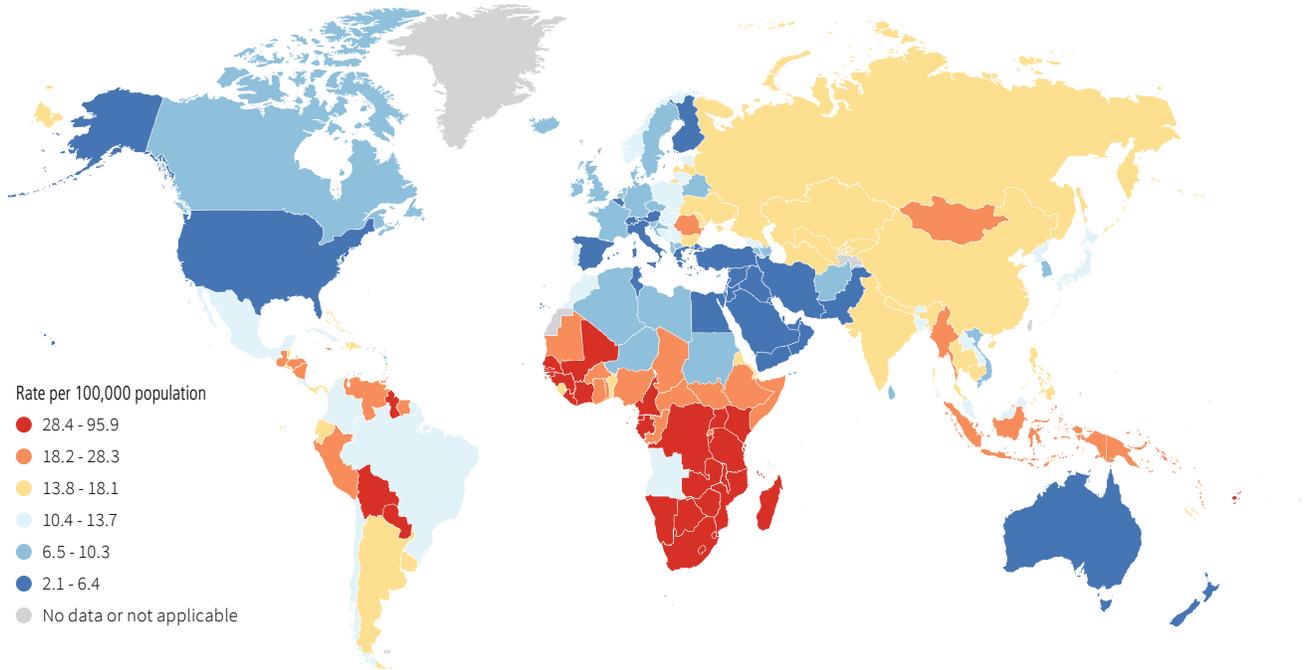
## Figure 20. Hepatitis B Virus (HBV) Immunization Coverage (3rd Dose) Among 1-year-olds, 2022

- The WHO estimated that 296 million people, or 3.8% of the world population, were living with chronic HBV infection in 2019, with 1.5 million new infections each year.<sup>61</sup>
- Administration of HBV vaccine in early life, with a series of three shots within the first 12 months, offers lifelong protection for over 90% of individuals.<sup>61</sup>
- By the end of 2022, 190 of 194 WHO member states had introduced the HBV vaccine for infants nationwide, and an estimated 84% of 1-year-olds had received three doses of the vaccine.<sup>62</sup>
- Nevertheless, only 97 of the 190 countries have achieved the WHO target of 90% coverage of the third dose, and progress has been slow in regions with the most pronounced early-life HBV infection rates, notably in Africa,<sup>63, 64</sup> underscoring the need to prioritize investments in nations at the highest risk of infection.<sup>65</sup>
- Additionally, the **US Centers for Disease Control and Prevention** recommends one-time HBV screening of all adults and vaccination of those 18-59 years of age because 70% of the population is reportedly unvaccinated.



## Figure 21. International Variation in Cervical Cancer Incidence Rates, 2022

- Cervical cancer is considered almost completely preventable, owing to highly effective primary prevention with the HPV vaccine and secondary prevention via screening. Yet, substantial inequality exists across countries due to the uneven adoption of these measures (Figure 24, Figure 25).
- Incidence rates remain the highest in eastern (40 per 100,000) and southern (35 per 100,000) parts of sub-Saharan Africa, notably in Eswatini (96 per 100,000), Zambia (72 per 100,000), Malawi (71 per 100,000), and Zimbabwe (68 per 100,000), and the lowest (less than 2.5 per 100,000) are found in several Western Asian countries, including Yemen, Iraq, and Saudi Arabia.

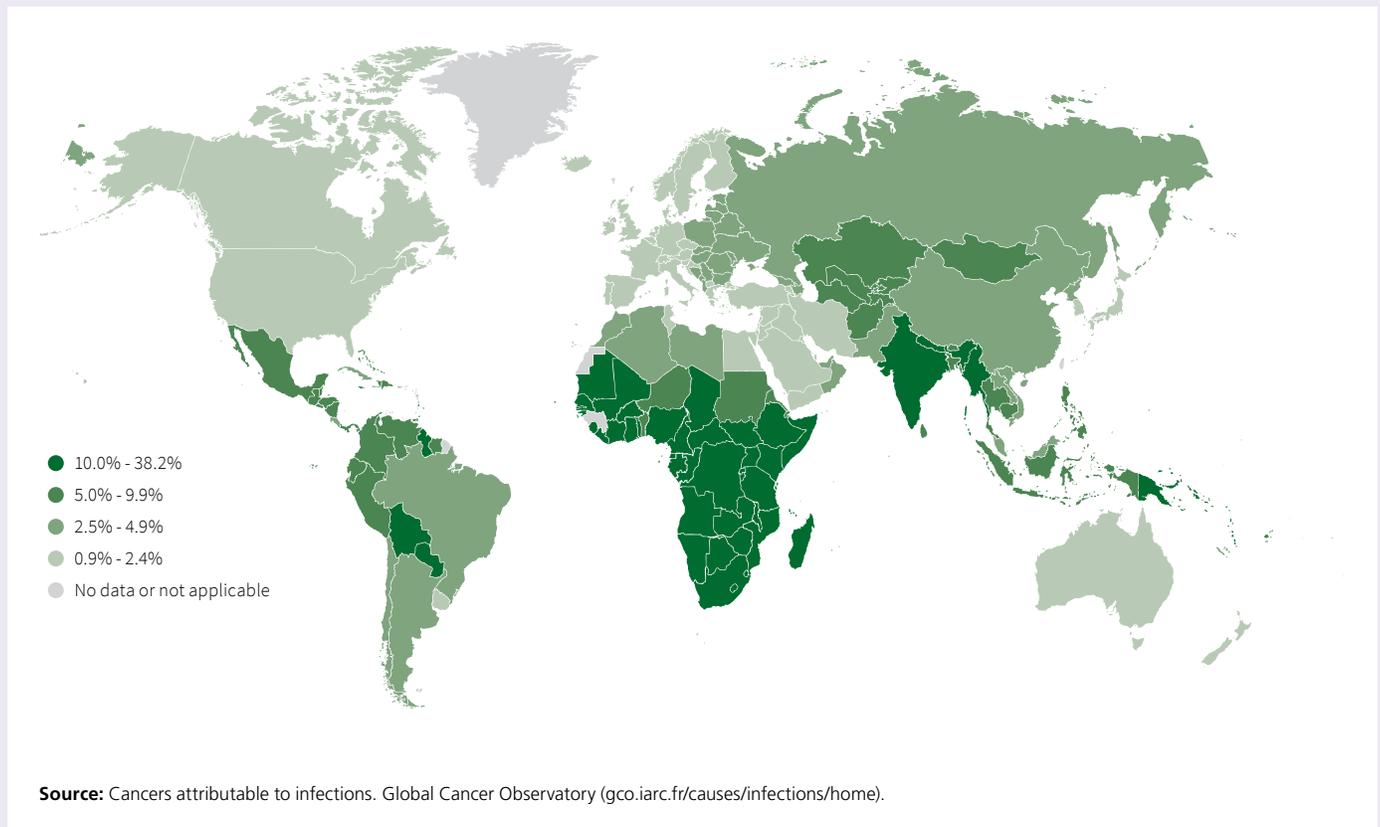


Note: Rates are age-standardized to the World Standard Population and differ from published rates in the US or Europe, where rates are often standardized to the 2000 US Standard Population and the European Age Standard, respectively.

Source: GLOBOCAN 2022 ([gco.iarc.fr/today/](http://gco.iarc.fr/today/)).

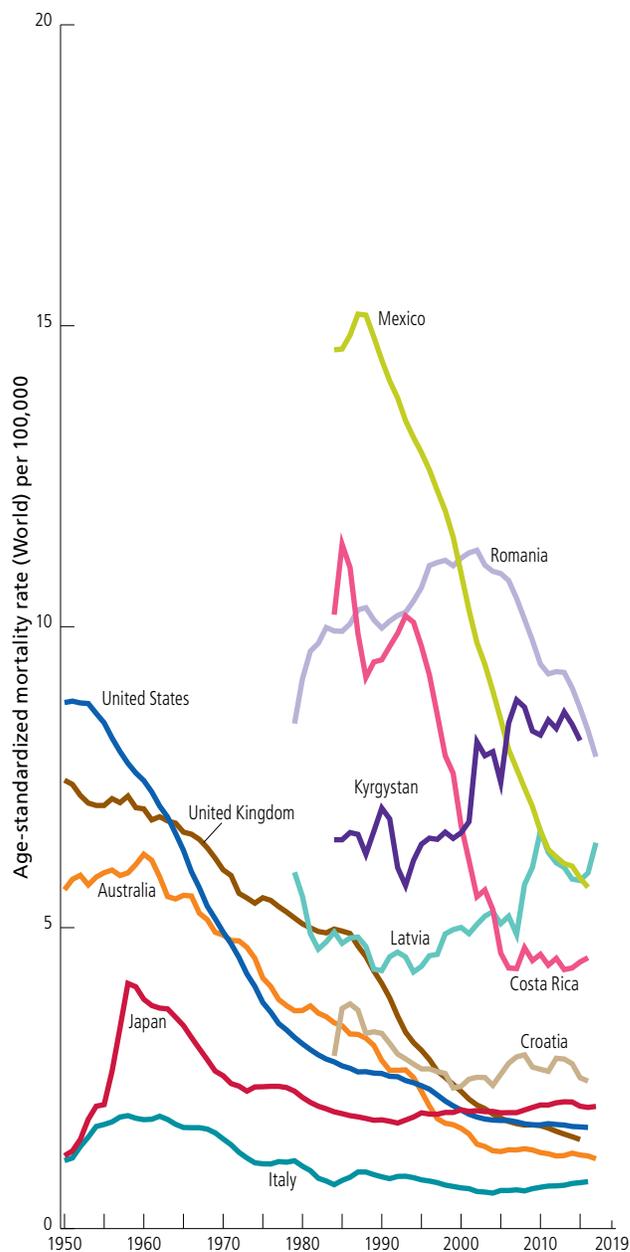
## Figure 22. Percentage of All Cancer Cases Attributable to Human Papillomavirus (HPV), 2020

- Globally, HPV infection causes approximately 730,000 cancer cases annually (3.8% of all cancers), including 100% of cervical cancers, 88% of anal cancers, 78% of vaginal cancers, 53% of penile cancers, and 31% of oropharyngeal cancers.<sup>55</sup>
- The percentages of HPV-attributable cancers surge up to 38% in Eswatini and 27% in Tanzania, substantially higher than the 2% of cases in the United States and 1.2% in Finland.<sup>54</sup>
- India alone accounts for about 20% of the global cancer burden attributable to HPV infection, with 147,000 cases, of which 84% are cervical cancers.<sup>54</sup>



## Figure 23. Trends in Cervical Cancer Mortality Rates, 1950-2017

- Although cervical cancer death rates have decreased by as much as 70% since the mid-20th century in many high-income countries where screening has long been established, some of these countries (e.g., Japan and Italy) are experiencing recent increases,<sup>66-68</sup> possibly reflecting changing sexual behavior and increased transmission of HPV that is not offset by screening activity.<sup>69, 70</sup>
- Incidence rates have also decreased in several countries in the Caribbean and Central and South America,<sup>71</sup> reflecting a diminishing risk of HPV infection, likely resulting from improvements in genital hygiene and a reduction of sexually transmitted diseases,<sup>72</sup> as well as some screening activities. Costa Rica implemented a national screening program in the 1960s (one of the earliest in Latin America) and has experienced the swiftest decline in the region.<sup>73</sup>
- With suboptimal screening coverage in many countries in Eastern Europe (e.g., Belarus and Romania) and Central Asia (e.g., Kyrgyzstan), progress in reducing cervical cancer mortality has been slow, including some increasing trends.<sup>74</sup>
- Most concerning is increasing incidence in Sub-Saharan African countries, including the Gambia, Kenya, Malawi, Seychelles, South Africa, Uganda, and Zimbabwe, suggesting increasing prevalence of HPV infection and limited access to preventive services.<sup>75</sup>

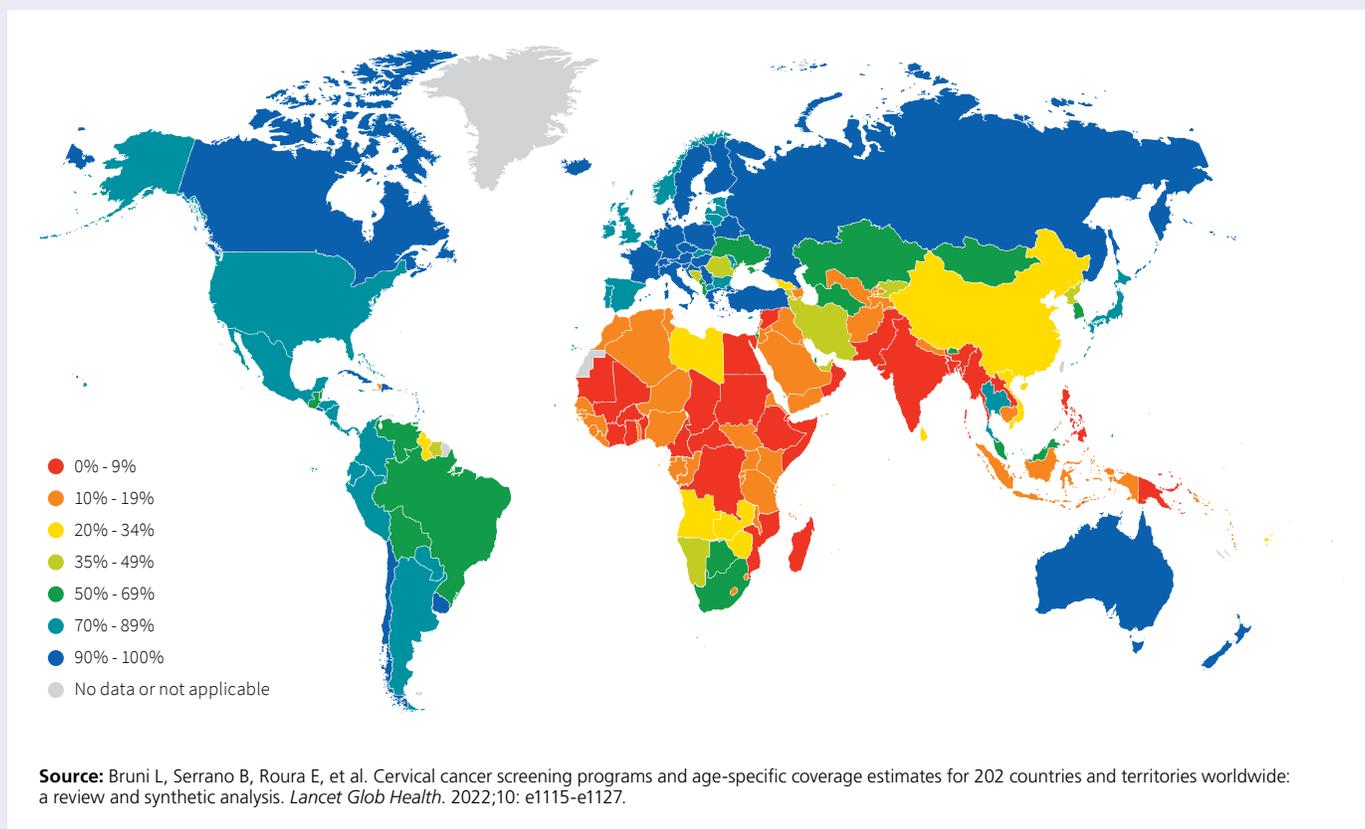


Note: Rates are age-standardized to the World Standard Population and differ from published rates in the US or Europe, where rates are often standardized to the 2000 US Standard Population and the European Age Standard, respectively.

Source: WHO Mortality Database ([who.int/data/data-collection-tools/who-mortality-database](http://who.int/data/data-collection-tools/who-mortality-database)).

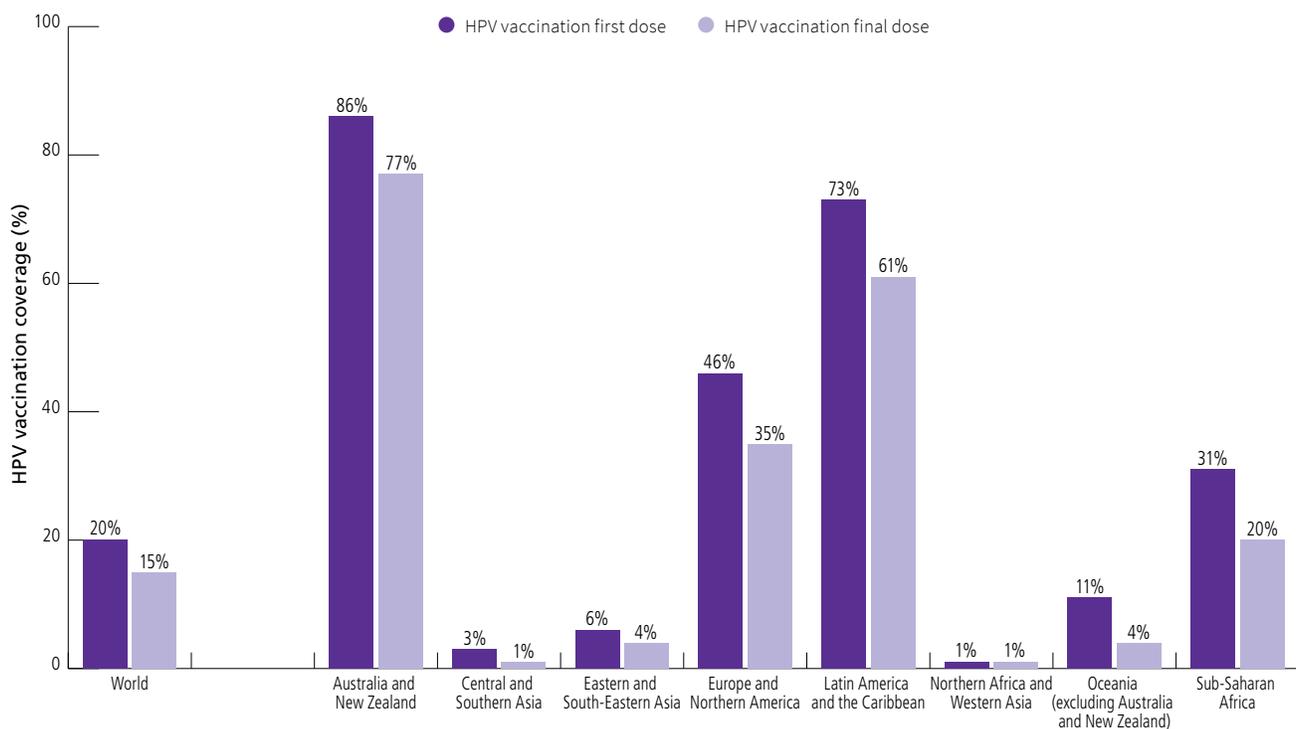
## Figure 24. Lifetime Cervical Cancer Screening Prevalence in Women Ages 30-49 Years, 2019

- Cervical cancer screening and treatment of precancerous lesions can prevent the majority of cervical cancer cases.<sup>76</sup> The WHO recommends that all women start cervical cancer screening at age 30 years, and those living with HIV at age 25.<sup>76</sup>
- However, as of 2021, 63 of 202 countries did not have official screening recommendations. In 2019, only 1 in 3 women (36%) ages 30-49 years globally had ever been screened for cervical cancer, and the WHO target coverage of 70% or more by 2030 as part of the Cervical Cancer Elimination Initiative had been achieved in only 71 countries.<sup>77,78</sup>
- In countries with screening programs, there is a significant variation in screening prevalence, ranging from only 4% in Ethiopia to nearly 100% in Sweden and the Netherlands,<sup>78</sup> underscoring the importance of efforts to improve uptake.
- A self-sampling approach for screening is widely embraced for its privacy, convenience, cost-effectiveness, ease, comfort, safety, and user-friendliness.<sup>79</sup> The choice for women to be able to self-sample may increase screening coverage substantially in countries where HPV tests are available as part of national programs.<sup>79,80</sup>



## Figure 25. Human Papillomavirus (HPV) Vaccination Coverage in Girls (Ages 9-14) by the UN Sustainable Development Goals Geographical Regions, 2019

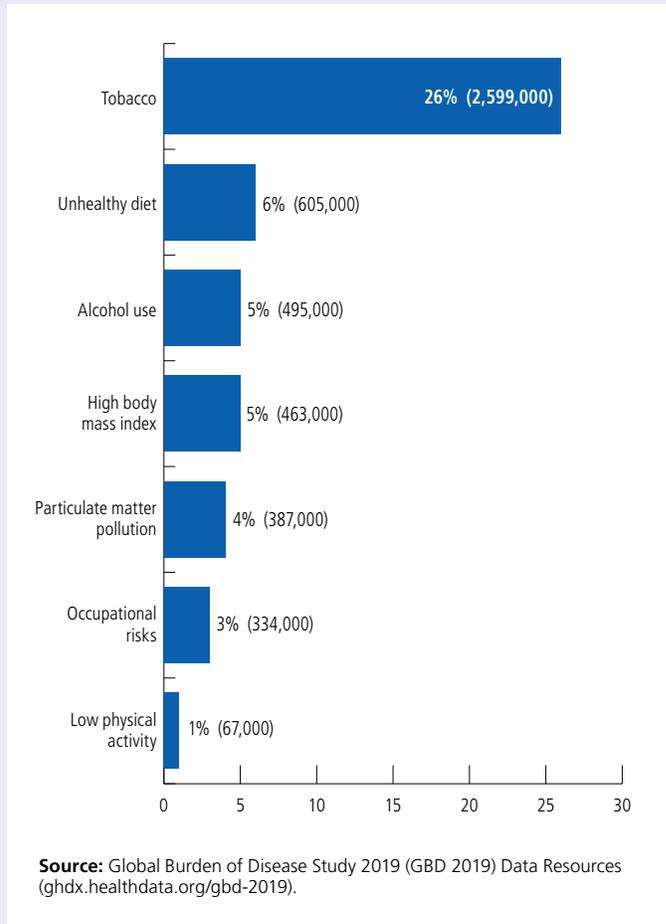
- Although vaccination against particular high-risk types of HPV is a highly effective way to prevent cervical cancer,<sup>81</sup> many girls do not have access.
- Although 107 of the 194 WHO member states have introduced HPV vaccination into their national immunization programs, as of 2020, only 30% of girls live in countries with access to the vaccine. This is primarily because 7 of the 10 most populous countries (China, India, Nigeria, Pakistan, Indonesia, Bangladesh, and Russia) have not introduced the vaccine nationally.<sup>82</sup>
- In countries that have introduced the HPV vaccine, only about half of the girls are protected; the global coverage is 20% for the first dose and 15% for the full dose (the corresponding figure for boys is 5% and 4%, respectively), substantially lower than the 90% by 2030 target set by the WHO Cervical Cancer Elimination Initiative.<sup>82</sup>
- Regional variation in HPV vaccine coverage (first dose) is substantial, with the highest coverage achieved in Australia and New Zealand (86%) and the lowest coverage in Northern Africa and Western Asia (1%) and Central and Southern Asia (3%).<sup>82</sup>
- In April 2022, a review from the WHO Strategic Advisory Group of Experts on Immunization concluded that a single-dose vaccine regimen is as effective as two-dose schedules, reducing cost and simplifying implementation.<sup>83</sup>
- In October 2023, Nigeria and Bangladesh rolled out single-dose HPV vaccination campaigns that will be implemented nationally by 2025, reaching about 26 million girls in both countries.<sup>84</sup>



**Source:** Bruni L, Saura-Lazaro A, Montoliu A, et al. HPV vaccination introduction worldwide and WHO and UNICEF estimates of national HPV immunization coverage, 2010-2019. *Prev Med.* 2021;144: 106399.

### Figure 26. Percentage of All Cancer Deaths Attributable to Major Cancer Risk Factors Other than Infection, 2019

- More than half of all cancer deaths each year worldwide are attributable to known modifiable cancer risk factors. Tobacco use is the leading cause of cancer burden, responsible for 26% of all cancer deaths. Unhealthy diet, excess body weight, and alcohol consumption each contribute approximately 5% to 6% of total cancer deaths.<sup>85</sup>
- While smoking and infections (12%, **Figure 28**) continue to be the leading causes of cancer, metabolic risk factors such as excess body weight and unhealthy diet account for an increasing number of cancers as their prevalences grow.
- Some fractions of cancer burden are attributable to environmental exposures, such as air pollution, for which individuals have less control.

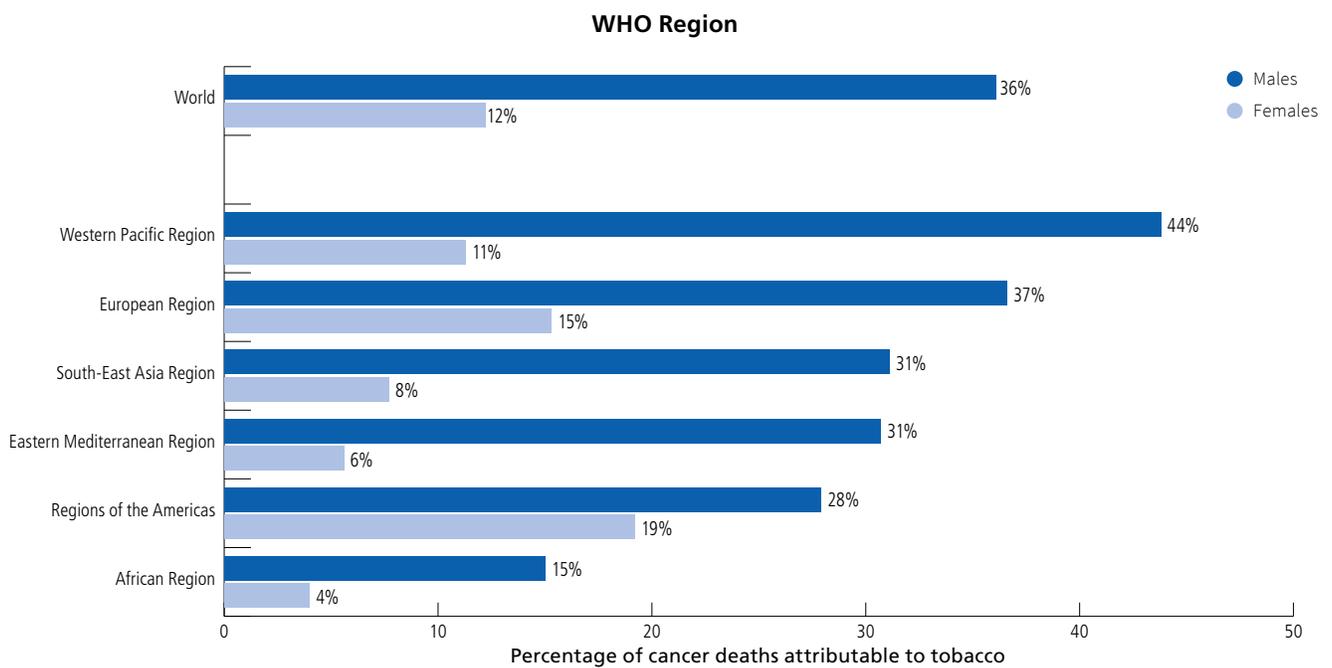
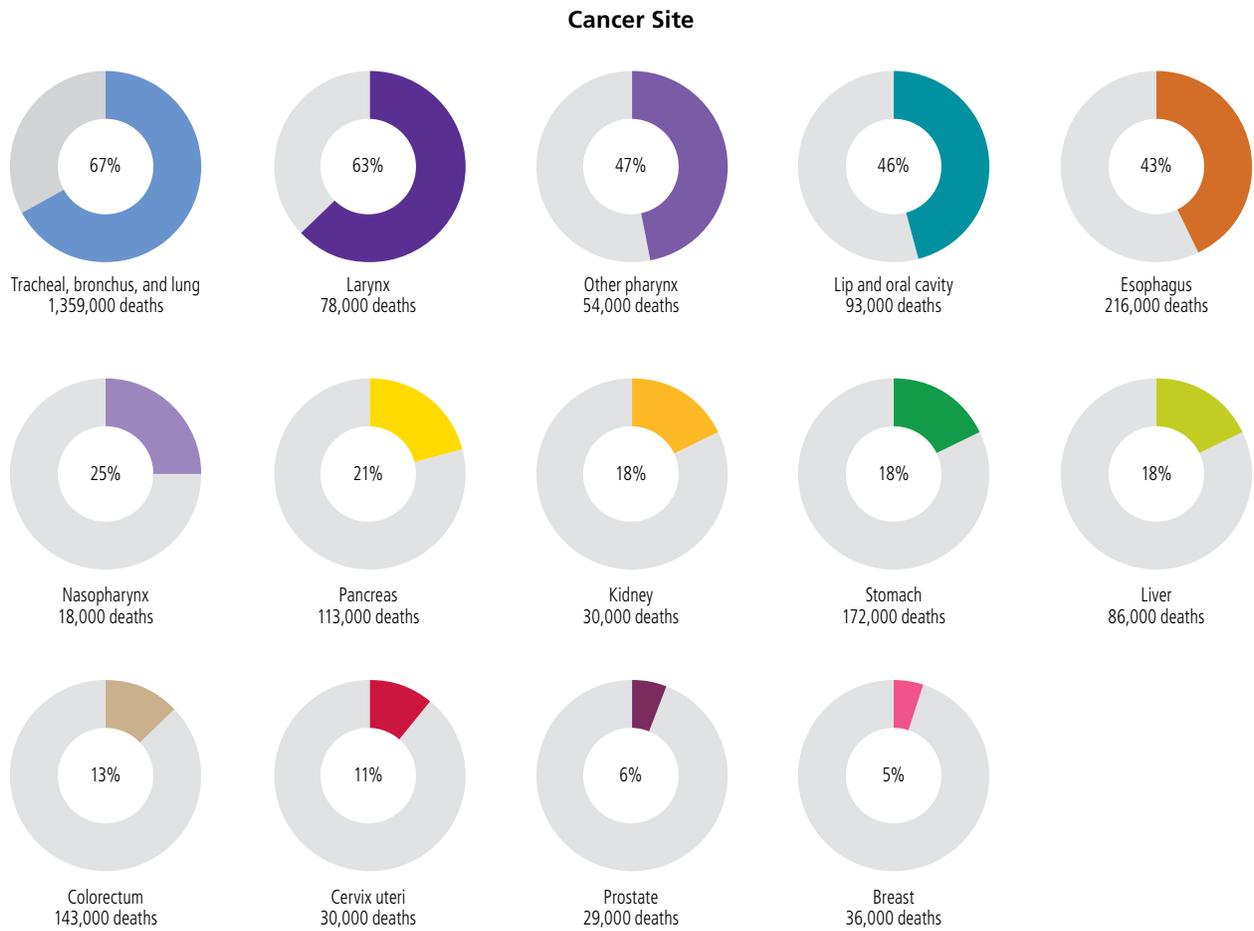


### Figure 27. Percentage of Cancer Deaths Attributable to Tobacco by Cancer Site and WHO Region, 2019

- Tobacco use is the largest avoidable cause of cancer deaths worldwide, responsible for an estimated 2.6 million deaths from 14 different types of cancer each year, including 36% and 12% of all male and female cancer deaths, respectively.<sup>85</sup>
- Cancer sites that contribute most to tobacco-attributable cancer deaths are lung (1.4 million deaths), esophageal (216,000 deaths), stomach (172,000 deaths), and colorectal (143,000 deaths) cancers.<sup>85</sup>

- The percentage of cancer deaths attributable to smoking varies widely by region and sex, based on the extent and stage of the tobacco epidemic. The highest smoking-related cancer burden is in the Western Pacific (44%) and Europe (37%) in men and the Americas (19%) in women.<sup>85</sup>
- While the proportion of smoking-attributable cancer deaths remains lowest in Africa (15% in males; 4% in females), smoking prevalence is on the rise in many parts of Asia and Africa because of a combination of factors that include aggressive tobacco marketing, economic growth allowing more individuals to purchase tobacco products, and the limited tobacco control policies.<sup>86</sup>

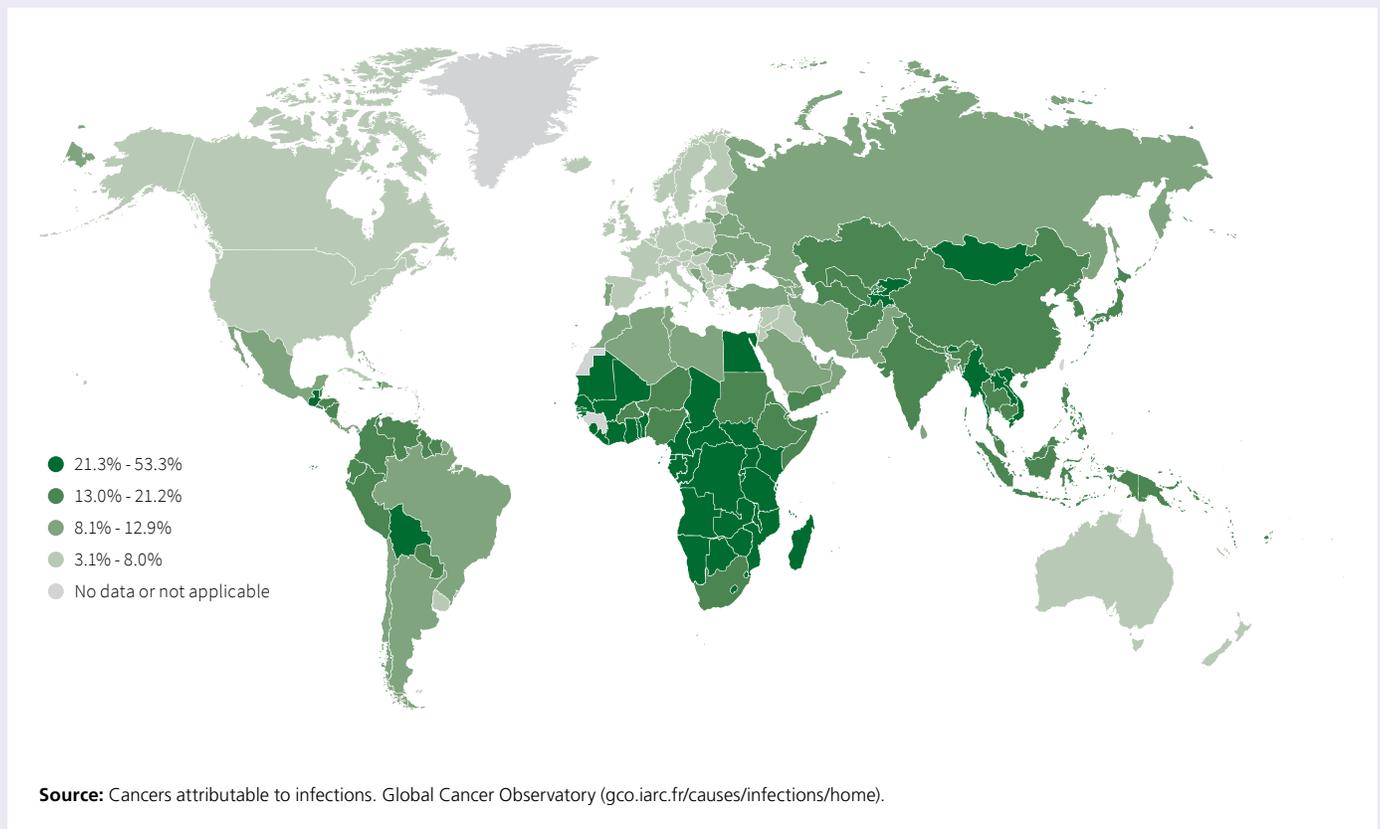
**Figure 27. Percentage of Cancer Deaths Attributable to Tobacco by Cancer Site and WHO Region, 2019**



Source: Global Burden of Disease Study 2019 (GBD 2019) Data Resources ([ghdx.healthdata.org/gbd-2019](https://ghdx.healthdata.org/gbd-2019)).

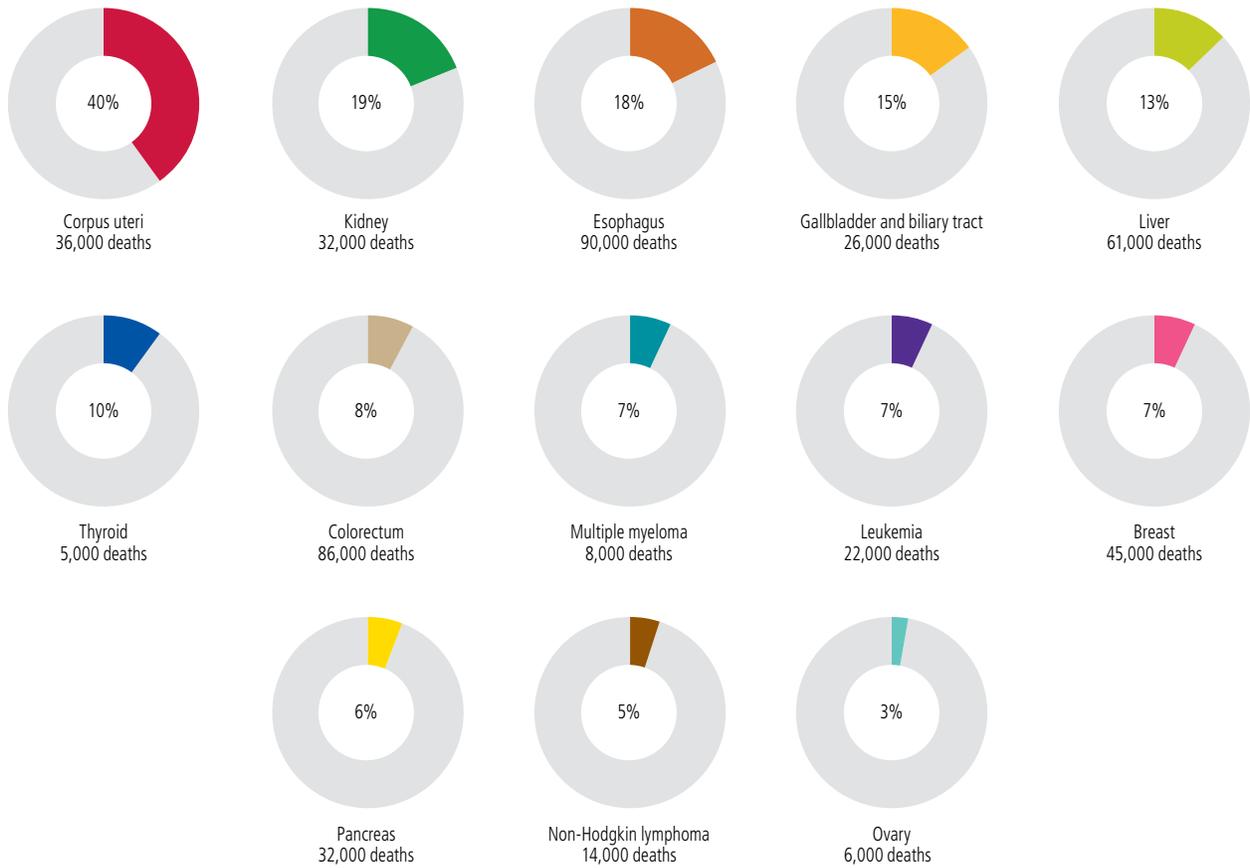
## Figure 28. Percentage of Cancer Cases Attributable to Infection, 2020

- Globally, an estimated 2.3 million cancer cases each year are attributable to infectious agents, representing about 1 in 8 (12%) of all cancer cases.<sup>54</sup>
- However, this percentage ranges from 6% to 31% in high-versus low-income countries; from 4% in Oceania and North America to 26% in sub-Saharan Africa; and from less than 5% in the United States, France, and Canada to 48% in Mongolia and 53% in Eswatini.<sup>54</sup>
- Specific infectious agents and cancer burden differ by country, reflecting a complex interplay of geographical, socioeconomic, and cultural factors, as well as the availability of preventive interventions, such as vaccines, screening services (cervical cancer and stomach cancer), and treatment (hepatitis C virus and *Helicobacter pylori*).<sup>54</sup>
- For example, in Eastern Asia, *Helicobacter pylori* and hepatitis B virus are the primary contributors to infection-related cancers, accounting for 49% and 27% of all infection-related cancers in the region, respectively, whereas in sub-Saharan Africa and South-Central Asia, human papillomavirus is the leading cause, accounting for 57% and 89% of all infection-related cancers, respectively.<sup>54</sup>

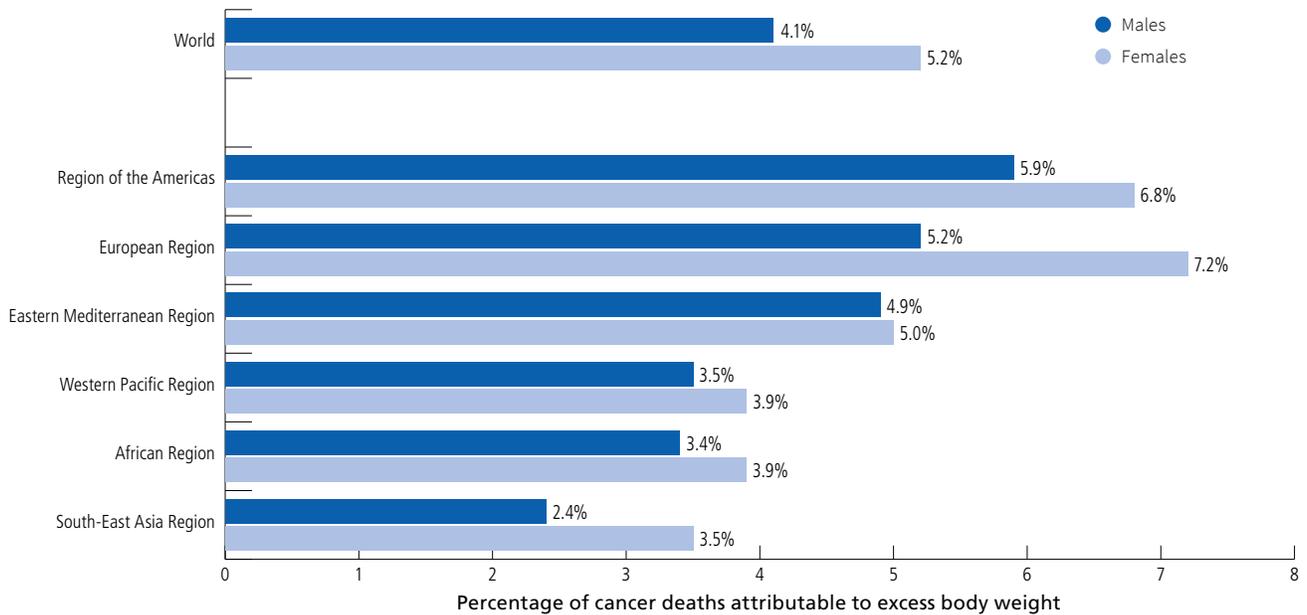


**Figure 29. Percentage of All Cancer Deaths Attributable to Excess Body Weight by Cancer Site and WHO Region, 2019**

**Cancer Site**



**WHO Region**



Source: Global Burden of Disease Study 2019 (GBD 2019) Data Resources ([ghdx.healthdata.org/gbd-2019](https://ghdx.healthdata.org/gbd-2019)).

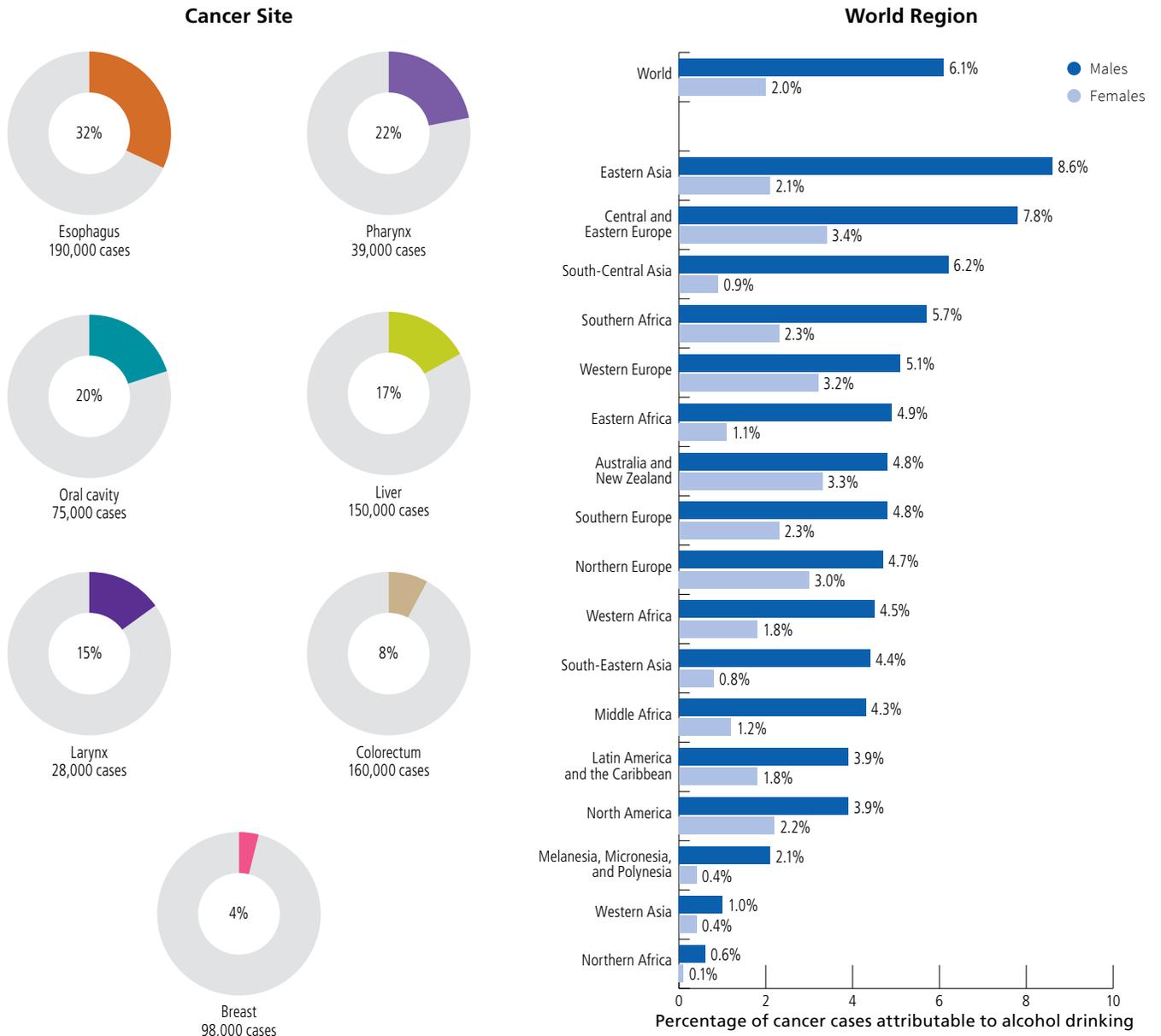
## Figure 29. Percentage of All Cancer Deaths Attributable to Excess Body Weight by Cancer Site and WHO Region, 2019

- Globally, excess body weight is responsible for about 463,000 cancer deaths each year, or 4.5% of all cancer deaths.<sup>85</sup>
- An estimated 40% of all uterine cancer deaths are attributable to excess body weight, followed by 19% of kidney cancer deaths and 18% of esophageal cancer deaths.<sup>85</sup>
- Although the percentage is lower for liver, colorectal, and breast cancers, the absolute number is substantial because of the high incidence of these cancers, ranging from 45,000 breast cancer deaths to 86,000 colorectal cancer deaths.<sup>85</sup>
- Both Europe and the Americas have the highest percentage of cancer deaths attributable to excess body weight in males (5% to 6%) and females (7%), while South-East Asia has the lowest (4% in females and 2% in males), largely reflecting a difference in the prevalence of excess body weight.<sup>85</sup>
- Countries with the lowest prevalence of excess body weight are experiencing the steepest increase in associated cancers because of the rapid changes in the food and built environment.<sup>87</sup> Consequently, the number of obesity-associated cancers will likely increase, posing a challenge to cancer control efforts in low-resource settings alongside the enduring burden of infection-related cancers.

## Figure 30. Percentage of All Cancer Cases Attributable to Alcohol Drinking by Cancer Site and 20 World Regions, 2020

- Worldwide, an estimated 4.1% of all new cancer cases, or 741,000 cases, are attributable to alcohol consumption each year, with the percentage higher in males (6%) than females (2%).<sup>88</sup>
- Overall, an estimated 32% of esophageal cancer cases are attributable to alcohol consumption, followed by 22% of pharyngeal cancers and 20% of oral cavity cancers.<sup>88</sup>
- Although the percentages are less, a substantial burden of colorectal (160,000 cases), liver (150,000 cases), and female breast (98,000 cases) cancers are also attributable to alcohol consumption.<sup>88</sup>
- The highest percentage of cancer cases attributable to alcohol consumption is in Eastern Asia (9%) and Central and Eastern Europe (8%) in males, and in Central and Eastern Europe, Australia and New Zealand, and Western Europe in females (>3%). Northern Africa and Western Asia have the least alcohol-attributable cancers ( $\leq 1\%$ ), reflecting low alcohol consumption.<sup>88</sup>

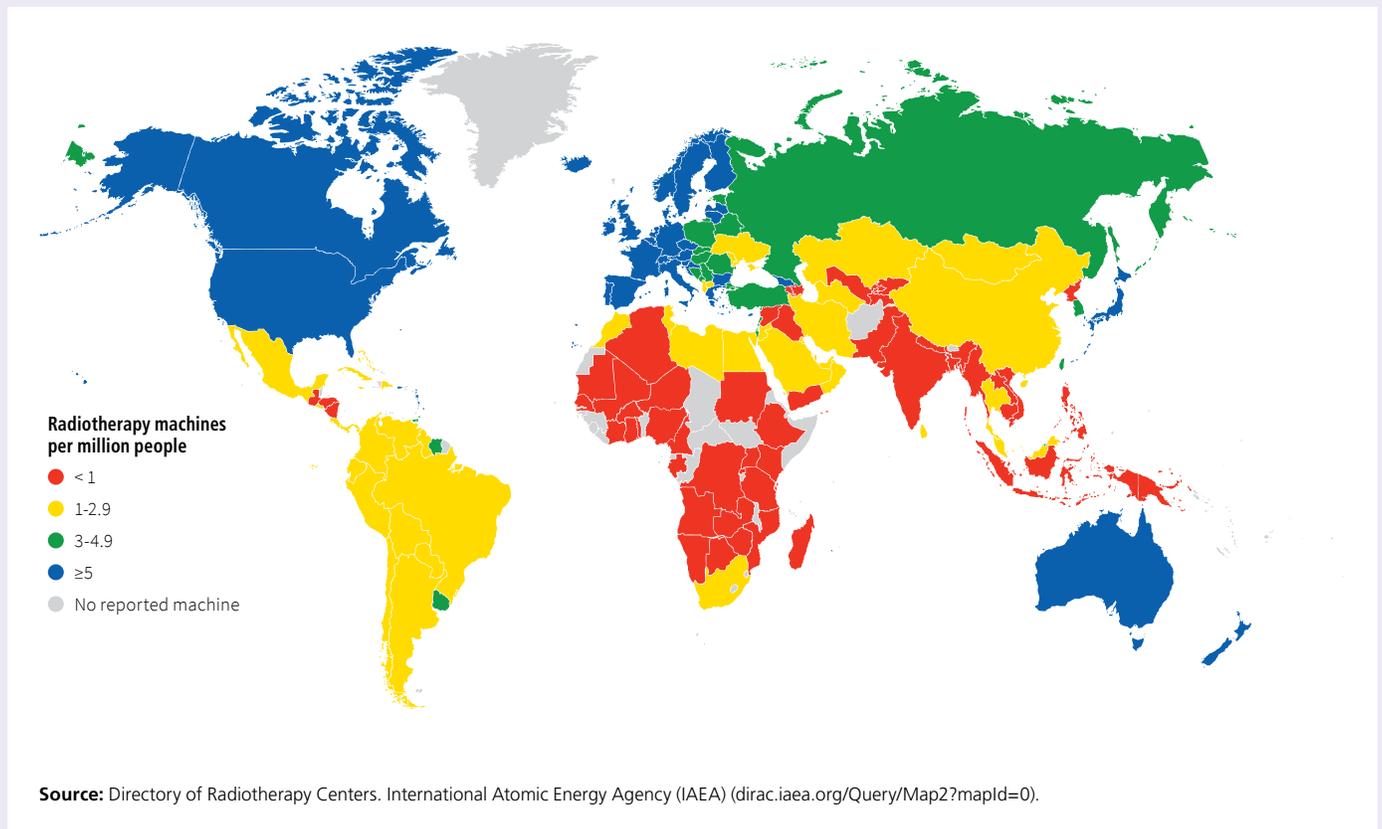
**Figure 30. Percentage of All Cancer Cases Attributable to Alcohol Drinking by Cancer Site and 20 World Regions, 2020**



**Source:** Rumgay H, Lam F, Ervik M, Soerjomataram I (2021). Cancers attributable to alcohol. Lyon, France: International Agency for Research on Cancer. Available from: [gco.iarc.fr/causes/alcohol](https://gco.iarc.fr/causes/alcohol).

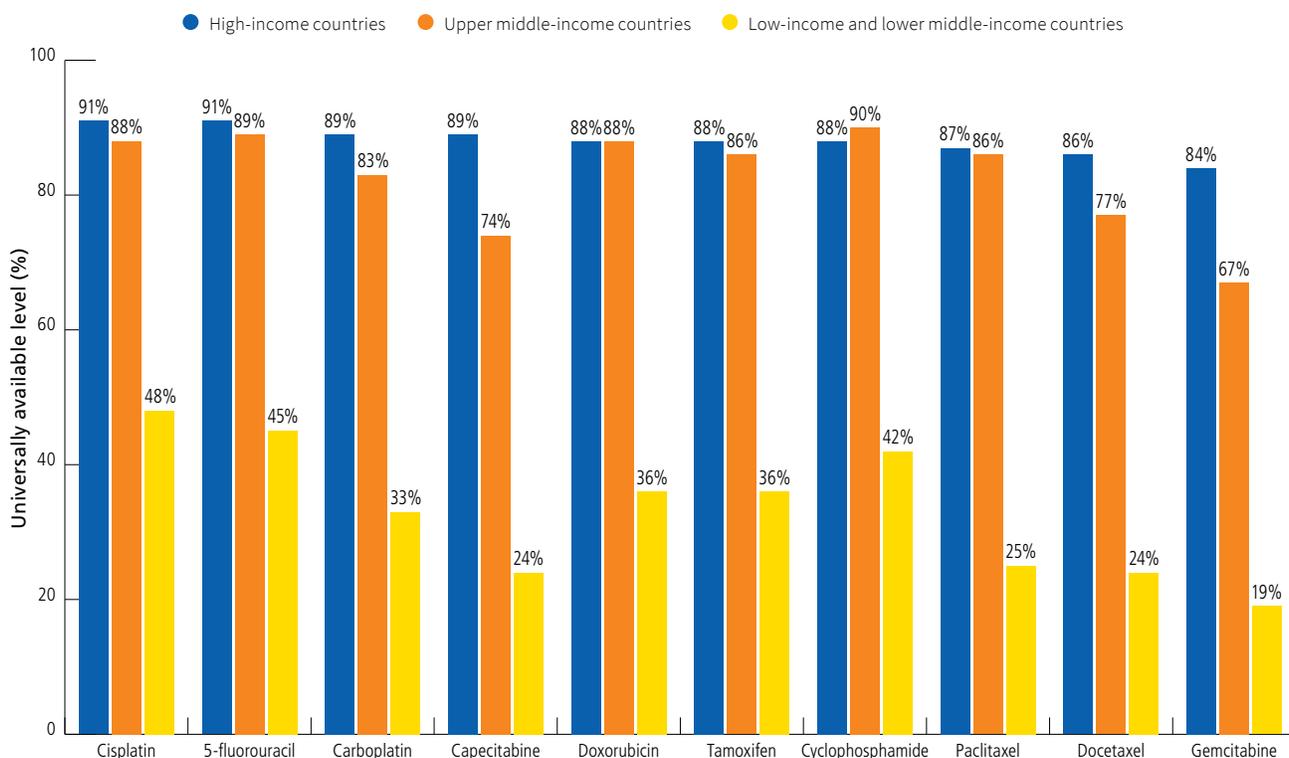
### Figure 31. Global Distribution of Radiotherapy Machines, 2021-2023

- Approximately half of individuals diagnosed with cancer require radiotherapy as a part of treatment, with a higher fraction in countries with limited health care resources for early detection and novel therapies.<sup>89</sup>
- However, stark inequalities persist in the availability of radiotherapy machines; the number of radiotherapy machines per 1 million people ranges from 0.06 (1 in 16.6 million) in low-income countries to 7.7 (1 in 130,000) in high-income countries, with the lowest availability in the Democratic Republic of the Congo, Ethiopia, Yemen, and Mozambique (1 in 23 million people).
- Barriers to radiotherapy access include machine cost, inadequate infrastructure (e.g., electricity and water), and a shortage of trained personnel for operation and maintenance.<sup>90</sup> Alarming, over 40 countries in Asia and Africa lack a single trained radiation oncologist.<sup>91</sup>
- Several initiatives, led by the International Atomic Energy Agency, the WHO, and nongovernmental organizations, are underway to address the inequities, including the implementation and scaling up of machines and the provision of training in low- and middle-income countries.<sup>90</sup>



**Figure 32. Access to Essential Cancer Medicines by World Bank Income Level, 2020**

- Most people in low-income countries do not have access to basic cancer treatment, including WHO-designated essential medicines that improve survival at a relatively low cost.
- In one survey of 948 oncologists, only 19% to 48% of those in low-income and lower middle-income countries reported universal availability of each of the top 10 essential cancer medicines, compared with 67% to 90% in upper middle-income countries and 84% to 91% in high-income countries.<sup>92</sup>
- Less than half of those people in low- and lower middle-income countries had access to the 10 essential cancer medicines, with 4 of those available to only one-quarter of the population.
- For example, the universal availability of 5-fluorouracil (5-FU, a drug that was approved in the United States in 1962 for the treatment of gastrointestinal tract cancers) was reported in 45% of low-income and lower middle-income countries, compared with 89%-91% in upper middle-income and high-income countries.<sup>92</sup>



**Source:** Fundytus A, Sengar M, Lombe D, et al. Access to cancer medicines deemed essential by oncologists in 82 countries: an international, cross-sectional survey. *Lancet Oncol.* 2021;22: 1367-1377.

# The Role of the American Cancer Society

The American Cancer Society is working to end cancer as we know it, for everyone. With more than a century of experience in cancer control, we are uniquely positioned to help save lives from cancer globally by assisting and empowering health professionals, health institutions, and cancer organizations in transitioning countries to implement evidence-based cancer control practices.

**Increase HPV vaccination worldwide.** The [Global HPV Cancer Free \(tinyurl.com/3e84cd68\)](https://www.tinyurl.com/3e84cd68) initiative works to normalize HPV vaccination as cancer prevention in low- and middle-income countries (LMICs), which bear 90% of the global cervical cancer burden. The American Cancer Society envisions all clinicians recommending the vaccine routinely and confidently to age-appropriate adolescents; parents demanding their adolescents to be vaccinated; community members advocating for HPV vaccine access and uptake; and policymakers including and funding the vaccine in national and subnational programs. Currently engaged in Kenya, Colombia, and India, we are seeding multicomponent action led by in-country cancer organizations to increase the uptake of HPV vaccination among clinicians and parents using behavioral interventions that are locally tested for effectiveness and engineered for scale-up through health systems and communities. The tools for health care professionals developed in the three countries are now available at [PreventGlobalHPVCancers.org](https://www.PreventGlobalHPVCancers.org). In addition to work at the country level, the American Cancer Society currently co-chairs [Cervical Cancer Action for Elimination \(CCAIE\) \(cervicalcanceraction.org\)](https://www.cervicalcanceraction.org), a network of organizations working together to accelerate global progress toward a world free from cervical cancer.

**Improve global patient support.** Through the [Building Expertise, Advocacy, and Capacity for Oncology Navigation \(BEACON\)](https://www.beaconcancer.org) initiative, we support health institutions and cancer organizations in LMICs to design, implement, and sustain cancer patient navigation programs to remove barriers to care. We also support the integration of patient navigation into cancer control planning and cancer care delivery in LMICs. The American Cancer

Society has created a dynamic and self-service global oncology navigation toolkit supported by a global virtual community of practice to help stakeholders interested in providing more patient-centered care build and deliver programs suited to their local context utilizing available resources. The BEACON initiative completed an eight-country pilot in May 2023 and now reaches users from 29 countries.

Through our [Enabling Quality Interactions between Providers and Patients through Education Delivery \(EQUIPPED\)](https://www.equip.org) initiative, we enable health institutions and cancer organizations in LMICs to train and equip staff to provide high-quality cancer education to newly diagnosed patients and their caregivers – education that is people-centered, scientifically accurate, culturally and linguistically appropriate, and enhances patients’ understanding and decision-making around treatment. The initiative extends the American Cancer Society’s reach as a provider of accurate cancer information and includes the dissemination of Cancer Education Materials for Patients and Caregivers (CEMPC) in a variety of languages spoken in LMICs and training curricula for health educators. In 2023, the CEMPC was translated into French, Portuguese, and Indonesian, with more language translations in development.

**Make effective treatment available to all in need.** The American Cancer Society Global Patient Support team works to reduce cancer mortality by addressing disparities in access to affordable, high-quality treatment. Along with collaborators in the Allied Against Cancer Alliance, the National Comprehensive Cancer Network, the Clinton Health Access Initiative (CHAI), and the African Cancer Coalition, the American Cancer Society has developed more than 50 cancer treatment guidelines adapted for use in sub-Saharan Africa and covering more than 90% of people with cancer in the region. The American Cancer Society and CHAI have brokered agreements with four pharmaceutical companies to reduce the cost of 44 lifesaving cancer treatments by 50%. Additionally, the

ChemoSafe project supports African Health Ministries and cancer treatment centers to improve the safe handling and administration of chemotherapy through the implementation of safety standards and training.

More than 3.2 billion people worldwide lack access to adequate pain relief. To effectively implement pain management into a health care system in LMICs, the

American Cancer Society introduced the Pain-Free Hospital initiative in 2015, a one-year hospital-wide quality improvement initiative designed to integrate pain treatment into service delivery by providing education, raising motivation and awareness, documenting pain levels, improving medicine supply, and communicating impact.

## Sources of Statistics

Incidence and mortality counts and rates were obtained from the Global Cancer Observatory (GCO) ([gco.iarc.fr](http://gco.iarc.fr)), published by the International Agency for Research on Cancer (IARC). Global Cancer Observatory: Cancer Today ([gco.iarc.fr/today/home](http://gco.iarc.fr/today/home)) provides a comprehensive assessment of the cancer burden worldwide, based on the GLOBOCAN database in 185 countries or territories by sex and age group. The detailed sources and methods used in compiling the GLOBOCAN estimates for 2022 are described online at the GCO.<sup>93</sup> The methods of estimation are country-specific, and the validity of the national estimates depends on the coverage, accuracy, and timeliness of the recorded incidence and mortality data in a given country. Caution must be exercised when interpreting these estimates, given the limited quality and coverage of cancer data worldwide at present, particularly in low- and middle-income countries. In particular, the estimated number of cancer cases and cancer deaths in a given region may not correspond to the sum of the estimated number of cancer cases and deaths in the individual countries of that region; the population of a region may include some small country populations for which no estimates are provided.

The 36 individual cancer types were classified based on codes from the International Statistical Classification of Diseases and Related Health Problems 10<sup>th</sup> Revision (ICD-10) and include malignant neoplasms only, except for bladder cancer, which may include carcinoma in situ, or tumors of uncertain or unknown behavior, in the incidence (but not the mortality), depending on the

definitions of malignancy in each cancer registry. The category “nonmelanoma skin cancer” (NMSC) excludes basal cell carcinomas in incidence, while mortality includes deaths from all types of NMSC.

**Incidence and mortality.** Cancer incidence is defined as the frequency of new cancer diagnoses in a specified population over a given period (typically 1 year). It can be expressed as an absolute number of cases within the entire population per year or as a rate per unit of time (typically per 100,000 persons per year). Similarly, cancer mortality is the number of deaths due to cancer occurring in a specified population over a given period. It can be expressed as an absolute number of deaths within the entire population per year or as a rate per unit of time. Incidence data are routinely collected by national or subnational population-based cancer registries, while mortality data by cause are routinely collected by national vital registration systems. Age standardization of rates is necessary when comparing populations with different age distributions. Age-standardized rate (ASR) can be viewed as a summary measure of the rate that would have been observed if the population had a standard age structure. All incidence and mortality rates estimated in GLOBOCAN were age-standardized using the 1966 Segi-Doll World Standard Population as a standard population.<sup>94, 95</sup> Of note, these rates should not be compared with published rates in the United States or Europe, where rates are standardized to the 2000 US Standard population and the European Age Standard, respectively.

**Net survival.** Net survival is a measure of the probability of surviving cancer, which is comparable between countries, as it corrects for differences between countries in death from other diseases (noncancer mortality). Net survival is often age-standardized for comparability between countries with different age distributions.

## Development Classifications

### Human Development Index (HDI)<sup>1</sup>

The United Nations Development Programme's HDI is a composite measure of educational attainment and life expectancy, as well as level of income. It can be used as a ranking or in categories of very high, high, medium, and low. The 2021 groups were:

**Very high-HDI countries:** Andorra, Argentina, Australia, Austria, Bahamas, Bahrain, Belarus, Belgium, Brunei Darussalam, Canada, Chile, Costa Rica, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hong Kong, China (SAR), Hungary, Iceland, Ireland, Israel, Italy, Japan, Kazakhstan, Korea (Republic of), Kuwait, Latvia, Liechtenstein, Lithuania, Luxembourg, Malaysia, Malta, Mauritius, Montenegro, the Netherlands, New Zealand, Norway, Oman, Panama, Poland, Portugal, Qatar, Romania, Russian Federation, San Marino, Saudi Arabia, Serbia, Singapore, Slovakia, Slovenia, Spain, Sweden, Switzerland, Thailand, Trinidad and Tobago, Türkiye, United Arab Emirates, United Kingdom, United States, and Uruguay; **high-HDI countries:** Albania, Algeria, Antigua and Barbuda, Armenia, Azerbaijan, Barbados, Bosnia and Herzegovina, Brazil, Bulgaria, China, Colombia, Cuba, Dominica, Dominican Republic, Ecuador, Egypt, Fiji, Gabon, Grenada, Guyana, Indonesia, Iran (Islamic Republic of), Jamaica, Jordan, Lebanon, Libya, Maldives, Mexico, Moldova (Republic of), Mongolia, North Macedonia, Palau, Palestine (State of), Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Seychelles, South Africa, Sri Lanka, Suriname, Tonga, Tunisia, Turkmenistan, Ukraine, Uzbekistan, and Vietnam; **medium-HDI countries:** Angola, Bangladesh, Belize, Bhutan, Bolivia (Plurinational State of), Botswana, Cabo Verde, Cambodia, Cameroon, Comoros,

Congo, Côte d'Ivoire, El Salvador, Equatorial Guinea, Eswatini (Kingdom of), Ghana, Guatemala, Honduras, India, Iraq, Kenya, Kiribati, Kyrgyzstan, Lao People's Democratic Republic, Marshall Islands, Mauritania, Micronesia (Federated States of), Morocco, Myanmar, Namibia, Nepal, Nicaragua, Papua New Guinea, Philippines, Sao Tome and Principe, Solomon Islands, Syrian Arab Republic, Tajikistan, Timor-Leste, Tuvalu, Vanuatu, Venezuela (Bolivarian Republic of), Zambia, and Zimbabwe; **low-HDI countries:** Afghanistan, Benin, Burkina Faso, Burundi, Central African Republic, Chad, Congo (Democratic Republic of the), Djibouti, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Haiti, Lesotho, Liberia, Madagascar, Malawi, Mali, Mozambique, Niger, Nigeria, Pakistan, Rwanda, Senegal, Sierra Leone, South Sudan, Sudan, Tanzania (United Republic of), Togo, Uganda, and Yemen.

## Region Classifications

### World Regions: UN Regions<sup>96</sup>

The geographical definition of the regions follows the rules as defined by the United Nations, except for Cyprus, which is located in Southern Europe. China includes Hong Kong and Macao, and Special Administrative Regions (SAR) of China. Cyprus refers to all countries. Serbia includes Kosovo. The Republic of Moldova includes Transnistria.

**Eastern Africa:** Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, La Reunion (France), Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Somalia, Tanzania, Uganda, Zambia, and Zimbabwe. **Middle Africa:** Angola, Cameroon, Central African Republic, Chad, Democratic Republic of Congo, Republic of Congo, Equatorial Guinea, and Gabon. **Northern Africa:** Algeria, Egypt, Libya, Morocco, Sudan, Tunisia, and Western Sahara. **Southern Africa:** Botswana, Eswatini, Lesotho, Namibia, and South African Republic. **Western Africa:** Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea-Bissau, Guinea, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo. **Caribbean:** Bahamas, Barbados, Cuba, Dominican Republic, Guadeloupe (France), Haiti, Jamaica, Martinique (France), Puerto

Rico, and Trinidad and Tobago. **Central America:** Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama. **Southern America:** Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guyana, Guyana, Paraguay, Peru, Suriname, Uruguay, and Venezuela. **Northern America:** Canada and United States of America. **Eastern Asia:** China, Japan, Democratic People's Republic of Korea, Republic of Korea, Mongolia, and Taiwan. **South-Eastern Asia:** Brunei Darussalam, Cambodia, Indonesia, Lao People Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam. **South-Central Asia:** Afghanistan, Bangladesh, Bhutan, India, Islamic Republic of Iran, Kazakhstan, Kyrgyzstan, Nepal, Pakistan, Sri Lanka, Tajikistan, Turkmenistan, and Uzbekistan. **Western Asia:** Armenia, Azerbaijan, Bahrain, Gaza Strip and West Bank (Palestine), Georgia, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar,

Saudi Arabia, Syrian Arab Republic, Türkiye, United Arab Emirates, and Yemen. **Central and Eastern Europe:** Belarus, Bulgaria, Czech Republic, Hungary, Republic of Moldova, Poland, Romania, Russian Federation, Slovakia, and Ukraine. **Northern Europe:** Denmark, Estonia, Finland, Iceland, Ireland, Latvia, Lithuania, Norway, Sweden, and United Kingdom. **Southern Europe:** Albania, Bosnia and Herzegovina, Croatia, Cyprus, Greece, Italy, Former Yugoslav Republic of Macedonia, Montenegro, Malta, Portugal, Serbia, Slovenia, and Spain. **Western Europe:** Austria, Belgium, France, Germany, Luxembourg, the Netherlands, and Switzerland. **Australia and New Zealand:** Australia and New Zealand. **Melanesia:** Fiji, New Caledonia, Papua New Guinea, Solomon Islands, and Vanuatu. **Micronesia:** Guam. **Polynesia:** French Polynesia and Samoa.

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For more information, contact:  
Hyuna Sung, Chenxi Jiang, Rebecca Siegel, or Ahmedin Jemal  
Surveillance and Health Equity Science Department

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