

Increase in lifestyle-related cancers over past decade spotlights need for prevention

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Lifestyle-related cancers, such as lung, colorectal, and skin cancers, have increased globally over the past decade, according to the most comprehensive analysis of cancer-related health outcomes and patterns ever conducted.

"While the increase in lung, colorectal, and skin cancers over the past decade is concerning, the prevention potential is substantial," said Dr. Christina Fitzmaurice, Assistant Professor of Global Health at the Institute for Health Metrics and Evaluation (IHME) at the University of Washington, whose organization coordinated the study. "Vital prevention efforts such as tobacco control, dietary interventions, and broader health promotion campaigns need to be scaled up in response to this rise in lifestyle-related cancers."

The study, published today in *JAMA Oncology*, covers 1990 to 2016; it is part of the Global Burden of Disease (GBD) study, a comprehensive effort to quantify health internationally. Researchers reviewed 29 [cancer](#) groups, including lung, breast, prostate, skin, colorectal, pancreatic, stomach, and liver cancers, as well as leukemia and other cancer groups (full list below). The study provides findings by age and sex for 195 countries and territories.

While lifestyle-related cancers saw a universal increase from 2006 to 2016, several cancers from infectious causes—including cervical and stomach cancers—decreased over the same time period.

Study estimates were analyzed using a Socio-demographic Index (SDI) based on rates of education, fertility, and income. SDI is more comprehensive than the historical "developed" versus "developing" nations framework. Countries with high SDI have high levels of income and education and low fertility, whereas low-SDI countries have low levels of income and education and high fertility.

Large disparities in [cancer incidence](#) and death persist between high- and low-SDI countries. Researchers found rates of cancer incidence and death remained higher in high-SDI countries in 2016. For example, the odds of developing [breast cancer](#) over the course of one's lifetime were the highest—at 1 in 10 women—in high-SDI countries, but only 1 in 50 for women in low-SDI countries.

Conversely, the largest and fastest increase in new cancer cases between 2006 and 2016 occurred in middle-SDI countries. And women in low-SDI countries are nearly four times more likely to develop cervical cancer than women in high-SDI countries, and in 2016, [cervical cancer](#) was the most common cause of cancer incidence and death in low-SDI countries.

"Ensuring universal access to health care is a vital prerequisite for early detection and cancer treatment," said Fitzmaurice. "And improving access to advanced diagnostic technologies not commonly available in low-SDI countries is a critical step toward achieving health equity globally."

Additional key findings include:

- In 2016, there were 17.2 million cancer cases worldwide, an increase of 28% over the past decade. There were 8.9 million cancer deaths the same year.
- While cancer death rates decreased in a majority of countries

from 2006 to 2016, incidence rates conversely increased.

- Breast cancer was the leading cause of cancer death in women.
- Lung cancer was the leading cause of cancer death in men; it was also the leading cause of cancer mortality globally, accounting for nearly 20 percent of all cancer deaths in 2016.
- Prostate cancer is one of the most common causes of cancer incidence and death in men, in both high- and low-SDI countries, but especially in sub-Saharan Africa.

NEW CASES PER 100,000 PEOPLE (AGE-ADJUSTED), 2016 "Worst" and "best" countries and global

1. Tracheal, bronchus, and lung cancer: North Korea (56.9), Kenya (4.2), global (30.2)
2. Colon and rectum cancer: Netherlands (57.5), The Gambia (4.3), global (25.9)
3. Breast cancer: Luxembourg (61.8), Niger (5.8), global (24.1)
4. Non-melanoma skin cancer: Australia (300.4), Bangladesh (0.7), global (23.2)
5. Prostate cancer: Dominica (113.1), North Korea (2.4), global (22.1)
6. Stomach cancer: South Korea (44.5), Namibia (2.7), global (17.3)
7. Liver cancer: Mongolia (108.4), Morocco (1.9), global (14.6)
8. Other neoplasms: Malawi (39.6), Syria (2.6), global (10.9)
9. Cervical cancer: Somalia (34.0), Qatar (1.1), global (7.0)
10. Leukemia: New Zealand (20.3), Zambia (2.0), global (6.8)
11. Non-Hodgkin lymphoma: Canada (21.2), Kyrgyzstan (1.5), global (6.7)
12. Bladder cancer: Lebanon (31.1), Nigeria (1.2), global (6.7)
13. Esophageal cancer: Malawi (25.2), Syria (0.7), global (6.6)
14. Pancreatic cancer: Czech Republic (12.5), India (2.6), global (6.4)

15. Uterine cancer: Latvia (23.1), Bangladesh (0.8), global (6.0)
16. Lip and oral cavity cancer: Pakistan (22.1), Sao Tome and Principe (1.0), global (5.5)
17. Kidney cancer: Latvia (20.5), Nepal (1.0), global (5.0)
18. Brain and nervous system cancer: Iceland (20.8), Namibia (1.4), global (4.6)
19. Malignant skin melanoma: Australia (55.6), Nepal (0.2), global (4.1)
20. Ovarian cancer: Estonia (9.3), Niger (1.2), global (3.6)
21. Thyroid cancer: Iceland (18.7), Ghana (0.2), global (3.3)
22. Gallbladder and [biliary tract cancer](#): Chile (11.5), Uzbekistan (0.6), global (2.8)
23. Larynx cancer: Cuba (8.8), The Gambia (0.6), global (2.7)
24. Other pharynx cancer: Hungary (7.3), Palestine (0.2), global (2.4)
25. Multiple myeloma: Barbados (6.3), Tajikistan (0.4), global (2.1)
26. Nasopharynx cancer: Malaysia (5.1), Mali (0.1), global (1.3)
27. Hodgkin lymphoma: Greece (5.3), Syria (0.1), global (1.0)
28. Testicular cancer: Chile (6.4), Mozambique (0.04), global (0.9)
29. Mesothelioma: United Kingdom (2.9), Palestine (0.1), global (0.5)

DEATHS PER 100,000 PEOPLE (AGE-ADJUSTED) IN 2016

"Worst," and "best" countries and global

1. Tracheal, bronchus, and lung cancer: North Korea (61.7), Egypt (4.8), global (25.8)
2. Colon and rectum cancer: Hungary (31.3), Sri Lanka (5.0), global (12.8)
3. Stomach cancer: Mongolia (44.0), Maldives (3.2), global (12.6)
4. Liver cancer: Mongolia (114.7), Morocco (2.0), global (12.1)
5. Breast cancer: Tonga (24.7), Oman (4.0), global (7.9)
6. Other neoplasms: Malawi (37.6), Syria (2.6), global (6.4)
7. Esophageal cancer: Malawi (32.4), Syria (0.8), global (6.2)

8. Pancreatic cancer: Uruguay (12.8), Bangladesh (2.5), global (6.2)
9. Prostate cancer: Dominica (54.9), North Korea (1.9), global (6.1)
10. Leukemia: Syria (15.3), Bangladesh (1.9), global (4.6)
11. Non-Hodgkin lymphoma: Grenada (11.0), Kyrgyzstan (1.4), global (3.6)
12. Cervical cancer: Zimbabwe (28.7), Syria (0.6), global (3.5)
13. Brain and nervous system cancer: Palestine (8.3), Japan (1.2), global (3.2)
14. Bladder cancer: Malawi (11.8), Albania (0.9), global (2.9)
15. Lip oral cavity cancer: Kiribati (14.6), Syria (0.6), global (2.6)
16. Gallbladder and biliary tract cancer: Chile (11.3), Uzbekistan (0.6), global (2.5)
17. Ovarian cancer: Lithuania (5.9), United Arab Emirates (0.9), global (2.4)
18. Kidney cancer: Czech Republic (7.1), Bangladesh (0.5), global (2.0)
19. Other pharynx cancer: India (6.1), Syria (0.2), global (1.7)
20. Larynx cancer: Cuba (5.3), Japan (0.4), global (1.6)
21. Multiple myeloma: Dominica (5.9), Tajikistan (0.4), global (1.5)
22. Uterine cancer: Grenada (5.4), Maldives (0.5), global (1.3)
23. Malignant skin melanoma: New Zealand (6.6), Bangladesh (0.2), global (0.9)
24. Nasopharynx cancer: Malaysia (3.7), Chile (0.1), global (0.9)
25. Non-melanoma skin cancer: Zimbabwe (4.5), Bangladesh (0.2) global (0.8)
26. Thyroid cancer: Zimbabwe (2.3), Syria (0.2), global (0.6)
27. Mesothelioma: United Kingdom (2.6), Palestine (0.1), global (0.5)
28. Hodgkin lymphoma: Afghanistan (2.2), Japan (0.1), global (0.4)
29. Testicular cancer: Kiribati (1.0), Maldives (0.02), global (0.1)

**NEW CANCER CASES PER 100,000 PEOPLE (AGE-ADJUSTED)
IN 2016**

Highest rates

1. Australia (743.8)
2. New Zealand (542.8)
3. United States (532.9)
4. Netherlands (477.3)
5. Luxembourg (455.4)
6. Iceland (455.0)
7. Norway (446.1)
8. United Kingdom (438.6)
9. Ireland (429.7)
10. Denmark (421.7)

Lowest rates

1. Syria (85.0)
2. Bhutan (86.0)
3. Algeria (86.7)
4. Nepal (90.7)
5. Oman (94.9)
6. Maldives (101.3)
7. Sri Lanka (101.6)
8. Niger (102.3)
9. Timor-Leste (105.9)
10. India (106.6)

CANCER DEATHS PER 100,000 PEOPLE (AGE-ADJUSTED) IN 2016

Highest rates

1. Mongolia (272.1)
2. Zimbabwe (245.8)

3. Dominica (203.1)
4. Hungary (202.7)
5. Grenada (201.0)
6. Uruguay (190.6)
7. Tonga (189.7)
8. North Korea (188.7)
9. Saint Vincent and the Grenadines (183.1)
10. Croatia (180.2)

Lowest rates

1. Syria (67.4)
2. Algeria (67.5)
3. Oman (69.2)
4. Maldives (72.0)
5. Sri Lanka (74.7)
6. Bhutan (78.6)
7. Uzbekistan (80.6)
8. Nicaragua (80.9)
9. Morocco (81.0)
10. Qatar (81.6)

More information: Global Burden of Disease Cancer Collaboration, Global, Regional, and National Cancer Incidence, Mortality, Years of Life Lost, Years Lived With Disability, and Disability-Adjusted Life-Years for 29 Cancer Groups, 1990 to 2016, *JAMA Oncology* (2018).

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