



# Western Lifestyle, Global Problem: Rising Rates of Cancer in the Young

Hilary Henly  
Head of Underwriting Ireland  
Director, Divisional Underwriting Research

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## Rising rates of early onset cancer in those aged under 50

The cause of rising incidence rates of cancer in adolescents and young adults is unknown, but research suggests that it relates to the increasing prevalence of obesity, the consumption of a Westernized diet and leading a sedentary lifestyle

In 2018, there were an estimated 1.2 million cancer cases and 400,000 cancer-related deaths globally in the 15 to 39 years old age group.<sup>1</sup> The increasing incidence of early-onset cancer in those aged under 50 is of real concern and affects all aspects of insurance, from product development and pricing, to underwriting and claims. If today's adolescents and young adults do not change their lifestyles, the impact on rising cancer rates will be greater than ever before.

### Why the rising rates?

While tobacco use is a widely known risk factor for cancer, environmental changes, eating habits, sedentary lifestyles, and subsequent rising obesity rates are all impacting rates of cancer in adolescents and young adults.<sup>2</sup> Diets rich in animal fat and processed meats and lack of physical activity – and the obesity that results – are shifting the burden of cancer to younger age groups. (Learn more about the prevalence of obesity in the article, "[Obesity: A Silent Pandemic](#).") The International Agency for Research on Cancer (IARC) has identified that overweight and obesity are associated with 13 types of cancer: breast, colon and rectal, esophageal, gallbladder, kidney, liver, meningioma, multiple myeloma, ovarian, pancreatic, stomach, and uterine cancer.<sup>3</sup> Rising rates of female breast cancer are also being driven by changes in reproductive behavior such as having fewer children and having children later in life. Higher rates of thyroid cancer are being driven by the wider use of ultrasound and subsequent diagnosis of indolent cancers, while rates of kidney cancer may also be reflective of advances in diagnostic imaging. Increases in leukemia rates are likely related to past childhood treatment with radiotherapy and chemotherapy.<sup>1,4</sup>

### Are rising rates confined to specific regions?

Cancer incidence varies widely around the world due to differences in screening practices, genetic predisposition, and exposure to different risk factors. For example, rates of lip and oral cavity cancers are up to three times higher in some Asian countries than the global average due to the use of smokeless tobacco products and betel quid.<sup>5</sup> (Learn more about this phenomenon in the RGA report, "[Group 1 Carcinogens: The Unknowns](#).") Asia accounts for half of all global cancer cases, where incidence is highest in Japan, South Korea, and Thailand. Specifically, esophageal, liver, and stomach cancers have disproportionately high rates in the region. This is likely related to sharp increases in rates of obesity and alcohol consumption. It is estimated that as a result of rising alcohol consumption and rates of obesity in China, there will be a 2.4% and 6% increase, respectively, in total cancer incidence.<sup>6</sup>

*Cancer is expected to be the leading cause of death in every country during the 21<sup>st</sup> century<sup>2</sup>*

In South Korea, the number of adults in their 20s being treated for breast, cervical, colorectal, liver, and stomach cancer in the last five years has increased by 45%, with cases of breast cancer up 40% from 2014 to 2018.<sup>7</sup> Increased incidence of thyroid cancer has been reported in Chile, China, Ireland, Lithuania, and South Korea, while Belarus, China, Ireland, Japan, Norway, Turkey, and the U.K. all report increases in cervical cancer incidence.<sup>1</sup> Fortunately, the introduction of vaccines for hepatitis B virus (HBV) and human papillomavirus (HPV) is helping to curb increases in cases of liver and cervical cancer in many countries.<sup>8</sup>

Figure 1: Annual average percentage change (AAPC) for selected cancers occurring among 15- to 39-year-olds

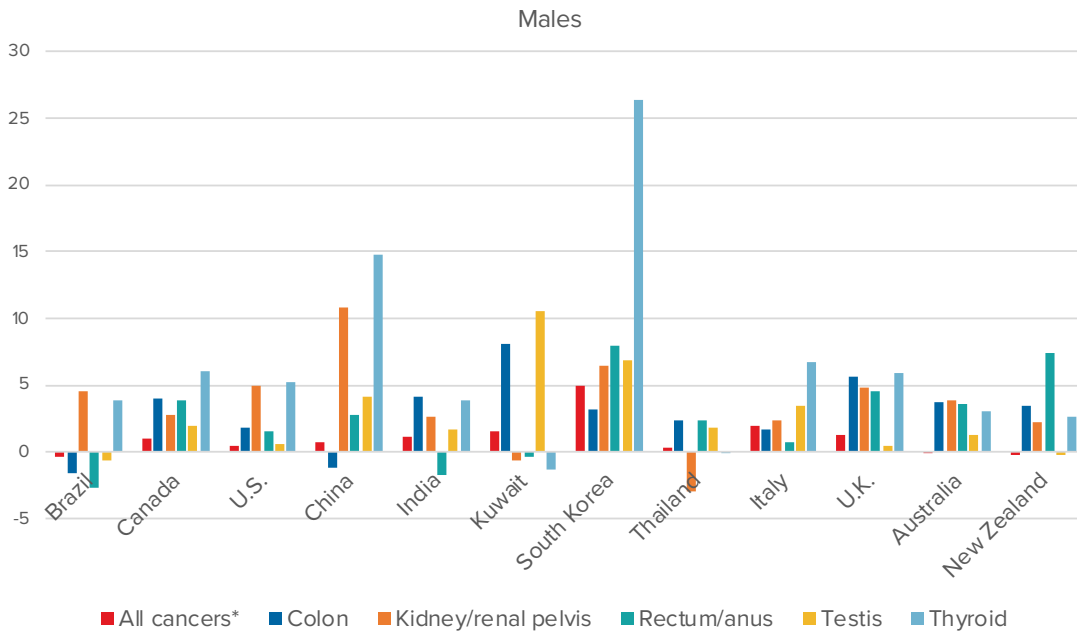
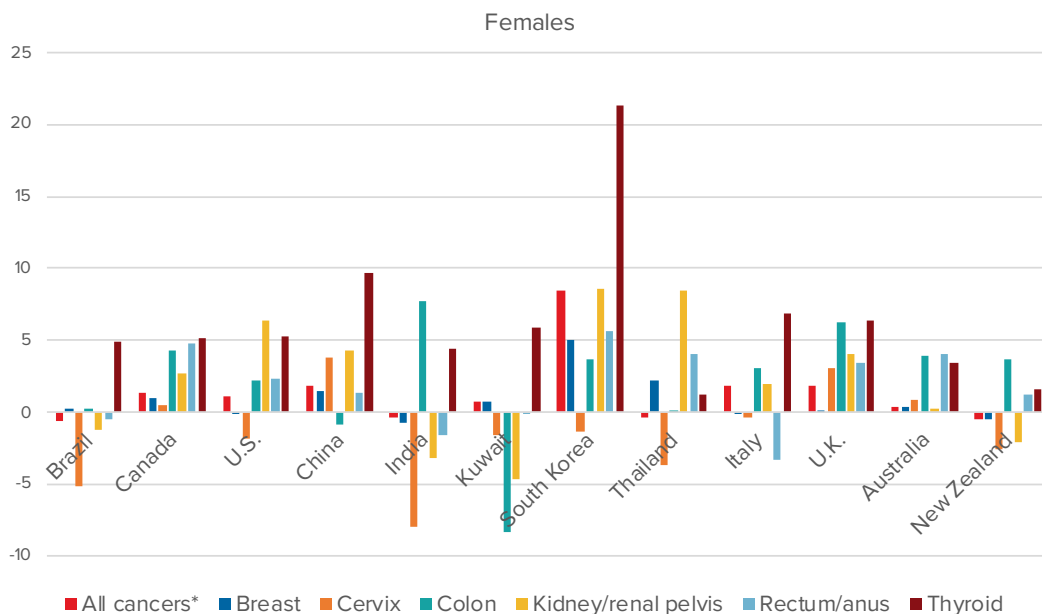
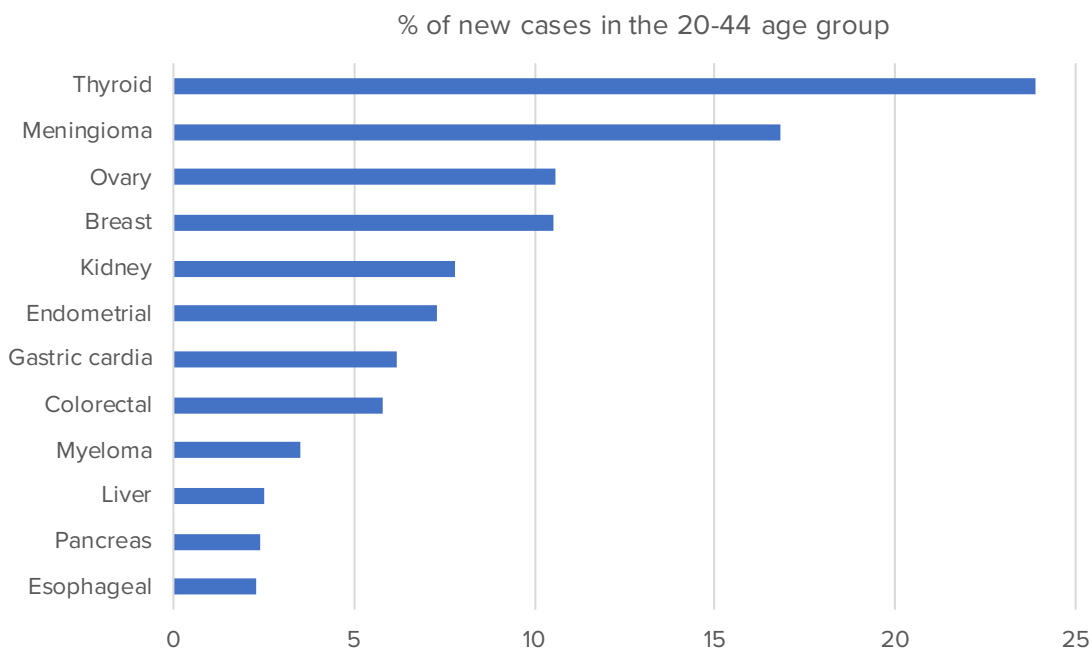


Figure 2: Annual average percentage change (AAPC) for selected cancers occurring among 15- to 39-year-olds during 1998-2012 by sex<sup>1</sup>



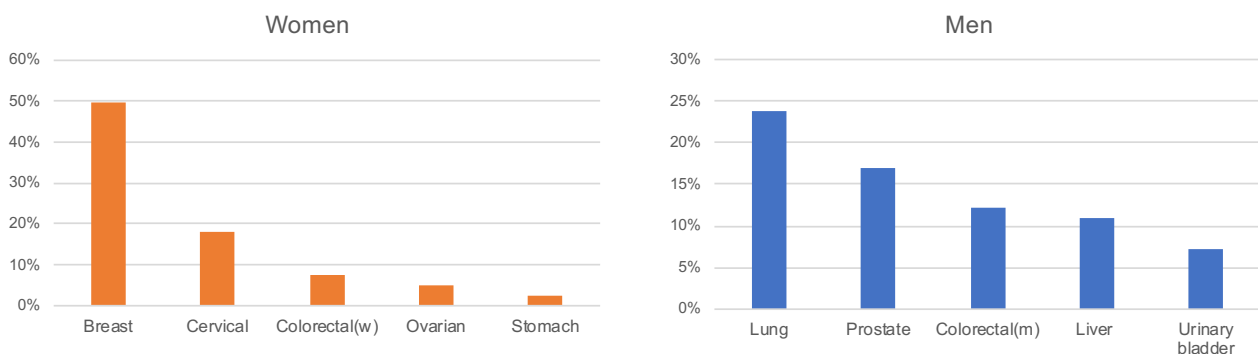
An analysis of cancer rates in young adults in the U.S. showed that the risk of cancer increased for six of 12 obesity-related cancers between 1995 and 2014. The most diagnosed cancers in the 20- to 29-year-old age group are thyroid, testicular germ cell, and skin melanoma, with breast, thyroid, and melanoma being most common in females.<sup>4</sup> These figures largely reflect data from a recently published paper on trends in cancer incidence in U.S. adolescents and young adults from 1973 to 2015, which reported that among male patients aged 15 to 39 years, cancer sites with the greatest annual percentage change (APC) increase in incidence were carcinoma of the kidney (APC 3.6%), unspecified soft tissue sarcoma (APC 2.5%), and thyroid carcinoma (APC 2.3%). In women the sites were carcinoma of the kidney (APC 3.6%), thyroid cancer (APC 3.5%), and myeloma, mast cell and miscellaneous lymphoreticular neoplasms (APC 2.8%). Overall, the increase in cancer incidence in this age group increased by 29.6% from 1973 to 2015.<sup>9</sup>

Figure 3: Relation of obesity-associated cancers to young adult malignancies in the U.S., 2016 <sup>10</sup>



Cancer rates in the Gulf States and the Eastern Mediterranean Region (EMR), which comprises 22 countries from Morocco to Pakistan, are also rising rapidly. Long-term projections from 2002 to 2030 show a 1.8-fold increase in cancer incidence.<sup>11</sup> A significant shift to more Western lifestyle and dietary habits has led to increased obesity rates over the past four decades and is rapidly driving up rates of cancer in young adults.<sup>12</sup>

Figure 4: Most common site of cancer in men and women in the Gulf States and the Eastern Mediterranean Region (EMR), 2012 <sup>11</sup>



## What cancers are being increasingly diagnosed in young adults?

### Breast cancer

Breast cancer is the leading malignancy in women globally, with incidence rates four times higher in high-income countries than low-income countries. The age-standardized incidence rate (ASIR) grew by 20% from 1990 to 2017. The largest increase in incidence was observed in Saudi Arabia, where rates increased by 226% from 1990 to 2017, followed by China and Taiwan with an increase of 189%.<sup>2</sup> Most breast cancer cases reported were in women younger than age 50.<sup>13</sup>

Factors such as younger age at menarche, later age at first full-term pregnancy, lower number of births, and a lack of physical exercise are driving up rates of breast cancer in young adults. One Chinese study indicated that a drop of 1.1 years in the mean age at menarche over a 30-year period would lead to a 5% increase in the incidence of breast cancer. Even if there is a one year increase in age at menarche, two fewer births and a two-year increase in age at first birth compared to the previous generation would lead to a 25% increase in breast cancer incidence.<sup>6</sup>

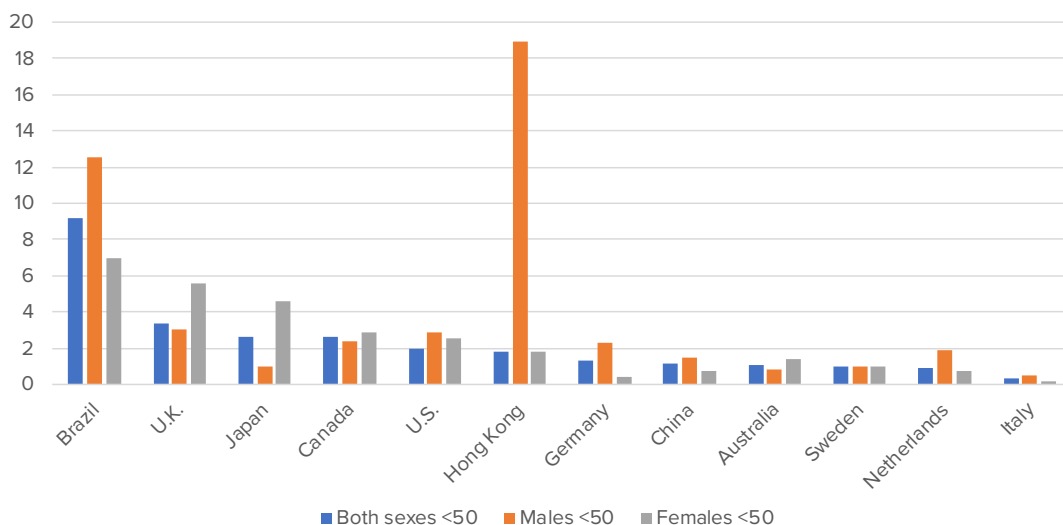
### Colorectal cancer

Colorectal cancer (CRC) is the third most common cancer (after lung and breast cancer) worldwide. An increase in the incidence of CRC has been observed in young adults in North America, Australia, Asia, and Europe.<sup>14</sup> Of 195 countries, only 26 showed reduced incidence of CRC in 2017 compared to 1990, and another 36 countries showed an increased rate of more than 50%.<sup>15</sup> Consuming a Western diet that includes more processed and red meat is understood to increase the risk of CRC, with excess body weight doubling the risk of colorectal adenocarcinoma.

Data from European cancer registries shows that CRC incidence increased by 7.9% per year from 2004 to 2016 in the 20- to 29-year-old age group, and by 4.9% per year from 2005 to 2016 in the 30- to 39-year-old age group.<sup>16</sup> Italy is the only country in Europe that showed a consistently lower CRC incidence in adults aged 20 to 39 years, which may be indicative of the positive health effects from consuming a Mediterranean diet.<sup>14</sup>

In Western Australia, incidence of CRC in adolescents and young adults aged 15 to 39 increased significantly between 1982 and 2007, with an APC of 3%. The greatest increase was observed in female adults aged 20 to 24, with an APC of 10.1%, and in female adults aged 25 to 29, with an APC of 4.9%. Young et al. reported that between 1990 and 2010, incidence of CRC increased by 85-100% in Australians aged 20 to 29 and by 35% in those aged 30 to 39.<sup>17</sup> APC of colon cancer incidence in Hong Kong males was significantly higher (21.58) than rectal cancer incidence (3.69).<sup>14</sup>

Figure 5: Comparison of annual percentage change (APC) for colorectal cancer across 12 countries/regions (1988 – 2007)<sup>14</sup>



In the U.S., CRC incidence in adults aged 20 to 49 years rose by 2.67% per annum from 2012 to 2016.<sup>18</sup> U.S. Surveillance, Epidemiology, and End Results (SEER) data indicates that there will be a 90% increase in colon cancer incidence and a 124.2% increase in rectal cancer incidence in the 20- to 34-year-old age group by 2030, a grim prediction for the future.<sup>15, 19</sup> The data also showed that younger patients presented with more advanced disease than older patients.<sup>10</sup>

These findings are possibly attributable to young adults ignoring symptoms of disease or being misdiagnosed, often meaning that CRC patients under the age of 50 face worse outcomes.<sup>17</sup> Kasi et al.'s study showed that over half of young patients (57.8%) had either stage 3 or 4 disease at the time of diagnosis.<sup>20</sup> Younger patients in the U.S. are also more likely to be uninsured, and this lack of health insurance may further contribute to delayed diagnosis.<sup>21</sup> The American Cancer Society recently provided a recommendation to reduce the screening age from 50 to 45 years and over.<sup>15</sup>

A 2020 survey conducted by the Colorectal Cancer Alliance in the U.S. found that 81% of colorectal cancer patients under the age of 50 reported having at least three symptoms of the disease prior to diagnosis, but that 62% had waited more than three months before seeking medical advice. More than 75% of patients saw at least two different doctors before a correct diagnosis was made, and 11% of patients had consulted with at least 10 doctors. Many required multiple visits to their primary doctor before they were referred for colonoscopy, and 19% of patients were not diagnosed for more than 12 months. Just over three-quarters of patients (77%) were diagnosed with stage III or stage IV disease.<sup>19</sup>

### Thyroid cancer

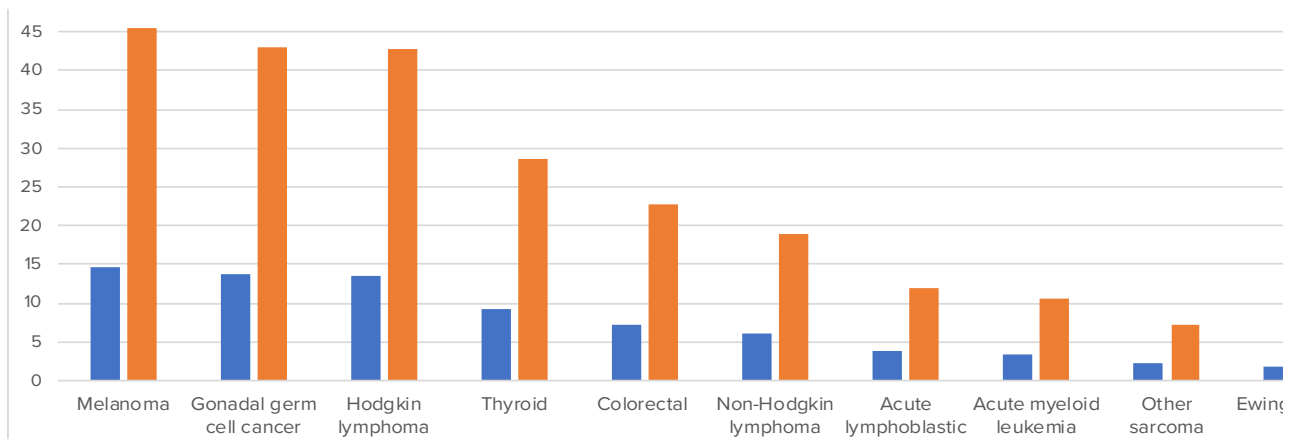
Thyroid cancer is often diagnosed in young adults and is four times more common in women than men. Incidence of thyroid cancer tends to be significantly higher in developed countries, likely as a result of national screening programs and overdiagnosis, and the subsequent diagnosis of indolent cancers. Incidence rates vary significantly by region, with the greatest burden of thyroid cancer being found in North America (ASR 13.4), a rate 45 times that of middle Africa.<sup>22</sup> Increasing incidence rates have been noted in young Australians, but the greatest increase was observed in South Korea. Thyroid cancer is common in young South Korean adults; 28% of new cases are diagnosed in those aged 20 to 40 years old.<sup>10</sup> National screening for thyroid cancer was introduced in 1999, and evidence to date shows a close correlation between the increased numbers of thyroid cancers and rates of screening by ultrasonography.<sup>23</sup> Interestingly, when thyroid cancers were removed from the overall cancer burden, the cancer incidence rate in South Korea dropped from 22.1% to 1.9%.

### Malignant melanoma

Incidence of malignant melanoma in young Australians is notably high, where rates are more than 12 times the world average due to higher exposure to levels of ambient ultraviolet radiation (UVR).<sup>2</sup> From 2010 to 2014, melanoma was the most common cancer in young Australians aged 14 to 24 and accounted for 15% of all cancers diagnosed. However, due to public health campaigns promoting the use of sun protection, incidence rates have declined in Australia in the last decade. Cases for all cancers combined decreased from 330 new cases per million in 1995-1999 to 308 new cases per million in 2010-2014, largely attributable to a decline in melanoma incidence.<sup>24</sup> Conversely, northern hemisphere countries have seen an increase in melanoma incidence rates of 2-4% per year, attributable to the increased use of sunbeds and subsequent excess UVR exposure.<sup>25</sup>



Figure 6: The top 10 commonly diagnosed cancers in Australia, age 15-24 years, 2010-2014<sup>24</sup>



### Liver cancer

The highest incidence of liver cancer worldwide is in East Asia, where 55% of all cases are reported in China. Liver cancer incidence reaches a peak at age 55 in South Korea and age 53 in Taiwan, approximately a decade earlier than in the United States. Rates are five times that of Eastern Europe or South Africa.<sup>26</sup> Rising rates of liver cancer are in part attributable to high infection rates of hepatitis B (HBV) and hepatitis C (HCV) virus, which is highly prevalent in parts of China, Hong Kong, India, Japan, South Korea, Singapore, and Taiwan. However, following the introduction in 1984 of the HBV vaccine for infants, prevalence of chronic HBV infection has fallen from 9.7% in university students born before 1974 to <1% in those born after July 1992.<sup>27</sup> Higher obesity rates are now impacting the incidence of nonalcoholic fatty liver disease (NAFLD), a predisposing risk factor for cirrhosis and hepatocellular cancer. Incidence rates have increased 2.5-fold in young adults aged 18 to 30 over the past three decades. Hepatocellular cancer is one of the most common cancers worldwide, and the high incidence of NAFLD in young adults who are overweight or obese is another indicator of the likely increase in cancer rates in this population.<sup>10</sup>

### Other obesity-related cancers

As well as breast, colorectal, and liver cancer, other obesity-related cancers such as kidney, pancreatic, and endometrial cancers are increasingly being diagnosed in young adults. In the U.S., pancreatic cancer cases rose by 4.3% per year on average for those aged 25 to 49 between 1995 and 2014. Its onset is two to six years earlier in those 20 to 39 years old who are overweight or obese compared to those of normal weight. There has also been a disturbing rise in uterine cancers diagnosed in young adults. Compared to those born around 1950, incidence rate ratios (IRR) for uterine cancer double for those born around 1985. Gallbladder cancer has risen by 3.7%, and kidney cancers have risen by 6.2% every year between 1995 and 2014 in the 25- to 29-year-old age group. Excess body weight is likely to account for 60% of endometrial, 36% of gallbladder, 33% of kidney, and 17% of pancreatic cancers, and approximately 11% of multiple myelomas in the U.S. since 2014.<sup>10, 28</sup>

### Conclusions

Growing evidence supports an association between adolescent and young adult obesity and an increased risk of 13 cancers. Rising cancer rates in young adults reflect changes in lifestyle and diets rich in red meat and processed foods. While screening programs for cervical and breast cancer have helped reduce malignancy in young adults, alcohol and tobacco use, in addition to over-screening of the thyroid gland, are contributing to increased cancer incidence in the younger population. If this rising trend in cancer incidence is to be reversed, obesity rates need to be reduced in adolescents and young adults and significant lifestyle modifications must be made. A focus on lifestyle and dietary habits of young insurance applicants would provide useful insights into the top modifiable risk factors for cancer and help stem the inevitable rising rates of claims for cancer. ■

## Appendix

Table 1: Estimated number (ASR) of new cancer cases in 2018, by country, both sexes, age 15-49 <sup>29</sup>

Country	Thyroid	Breast	Stomach	Colorectal	Liver	Lung	Lip/oral	Prostate	Cervix	All
South Korea	72.7	62.4	13.1	131.3	4.9	3.1	0.75	0.76	9.5	173.3
France	14.2	69.1	1.4	7.6	1.6	7.5	2.8	3.4	8.6	136.2
Australia	13.5	59.3	1.1	11.2	1.7	3.4	3.6	7.1	8.4	131.4
Italy	15.6	66.1	1.3	5.5	1.9	2.6	1.1	0.52	9.4	123.1
U.S.	17.0	49.4	1.3	9.2	1.6	4.5	1.6	5.9	8.2	118.1
Canada	23.3	47.5	1.0	8.8	1.1	2.2	1.5	3.1	7.7	117.1
New Zealand	7.2	63.1	1.7	7.3	1.8	3.2	1.5	4.5	7.7	117.0
U.K.	6.6	62.2	1.1	8.7	0.88	2.8	1.8	2.4	13.1	112.6
South Africa	4.1	32.0	1.1	3.9	1.9	3.2	1.0	2.8	47.2	98.3
Japan	8.5	67.7	4.3	10.6	0.89	2.0	1.3	0.77	24.3	88.7
Brazil	9.8	42.6	2.4	6.3	0.89	1.9	1.7	2.9	11.7	86.2
China	12.3	30.8	4.5	5.5	8.0	6.1	0.55	0.18	11.7	83.5
Singapore	4.6	65.1	1.4	7.0	1.5	3.6	0.62	0.75	4.2	81.9
Thailand	4.9	32.8	1.4	5.1	9.4	4.9	1.5	0.22	18.1	69.0
Mexico	9.7	28.9	1.8	4.1	0.71	0.75	0.54	0.8	10.4	68.2
India	1.2	17.9	1.7	1.9	0.58	1.5	5.8	0.14	11.5	46.1
Saudi Arabia	7.6	24.3	0.54	5.3	0.35	0.55	0.47	0.08	1.9	44.0
U.A.E.	2.6	30.9	0.17	2.3	0.16	0.25	0.04	-	2.9	19.6



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