

WHITE PAPER

# Cancer in Younger Adults

A Claims-Based Study

A FAIR Health White Paper, December 10, 2024

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## Summary

Although cancer is more common in people 50 and older, concern has been growing in recent years over cancer in adults younger than 50. In this report, FAIR Health delves into its repository of over 49 billion commercial healthcare claim records, the nation's largest such database, to examine cancer trends in adults aged 18 to 49 during the period 2016-2023. This study focuses on cancer treatment rates (defined as the percentage of patients with cancer who received medical services in a given year out of all patients in a given age group who received medical services in that same year) by age over time, cancer treatment rates by state, types of cancer, treatment costs, cancer vaccine utilization rates,<sup>1</sup> cancer screening utilization rates and provider specialties treating cancer patients. The key findings include the following:

- From 2016 to 2023, overall cancer treatment rates decreased in patients aged 18 to 49. Possibly the most striking drop was in human papillomavirus (HPV)-related cancers, where the percentage of patients receiving treatment for HPV-related cancers fell 27.9 percent in the 18-29 age group. There were several notable exceptions to the decline. For patients aged 40 to 49, the cancer treatment rate increased 11.2 percent for cancers of the digestive system, 18.2 percent for colorectal cancer and 8.0 percent for HPV-related cancers.
- From 2020 to 2023, cancer treatment rates increased in patients aged 18 to 49. The greatest increase was 11.7 percent in patients aged 18 to 29, followed by 7.5 percent in patients aged 40 to 49 and 7.2 percent in patients aged 30 to 39. By comparison, the increase in patients aged 50 to 59 was 5.5 percent.
- The five most common types of cancer in adults aged 18 to 49 in 2023 were (in order from most to least common) those of the skin, breast, thyroid and other endocrine glands, digestive organs and female genital organs.
- Among patients aged 18 to 49 diagnosed with cancer in 2022, the median<sup>2</sup> allowed amount<sup>3</sup> for all medical services received during the initial 12 months after their diagnosis was more than \$8,400. That is almost eight times higher than the median allowed amount for similarly aged patients without cancer who received at least one medical service from July 1, 2022, to June 30, 2023. Those patients had a median allowed amount for all medical services received of approximately \$1,100.
- In 2022, the three cancers with the largest total costs of services incurred by patients aged 18 to 49 with a cancer diagnosis (by median allowed amount) were cancers of the breast, respiratory and intrathoracic organs, and digestive organs. All three of these groups of cancers had a median allowed amount over \$25,000 and an average allowed amount over \$80,000.
- There was an especially marked difference in median versus average<sup>4</sup> allowed amounts for two types of cancers in patients aged 18 to 49: leukemias and lymphomas, indicating that some patients incurred substantially higher costs than the median amount. The median allowed amount for all leukemias was less than \$9,000, while the average allowed amount was over \$135,000. The median allowed amount for all lymphomas was almost \$12,000, while the average allowed amount was over \$95,000. Two factors that led to higher cancer treatment costs were the use of chemotherapy or immunotherapy and/or an inpatient facility stay.

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<sup>1</sup> Cancer vaccine utilization measures the number of patients who received a cancer-related vaccination in a given year out of the number of patients who received any medical services in that same year.

<sup>2</sup> The median is the midpoint of the distribution of values below and above which there is an equal number of values.

<sup>3</sup> An allowed amount is the total fee negotiated between an insurance plan and a provider for an in-network service, including both the portion to be paid by the plan member and the portion to be paid by the plan.

<sup>4</sup> The average is the value computed by dividing the sum of all the values by the number of values.

- The hepatitis B vaccine helps prevent liver cancer caused by hepatitis B infection.<sup>5</sup> Among patients aged 18 to 49, the age group 18-29 had the highest hepatitis B vaccine utilization from 2016 to 2022, but the age group 40-49 had the highest in 2023. That year, 0.8 percent of patients in the age group 40-49 received the hepatitis B vaccine, compared to 0.6 percent of the age group 18-29.
- In the age group 40-49, 25.8 percent of patients in 2016 received any kind of cancer screening. This rose to 35.4 percent in 2023, a 36.9 percent increase. This was the largest increase in the percentage receiving any kind of cancer screening among patients aged 18 to 49. Breast cancer screening in the 40-49 age group increased from 36.1 percent of patients in 2016 to 41.1 percent in 2023, a 13.9 percent rise, while colon cancer screening rose from 4.0 percent in 2016 to 12.4 percent in 2023, a rise of 206.8 percent.

## Background

Cancer is a leading cause of death worldwide,<sup>6</sup> and in the United States, one in two men and one in three women will be diagnosed with cancer in their lifetime.<sup>7</sup> A varied group of over 100 diseases, cancer is defined by uncontrolled cell growth and division, which can lead to tumors that may spread into different parts of the body.<sup>8</sup> The accumulation of DNA damage, slowing of cell renewal processes and impairment of immune responses as people age make cancer more likely to develop<sup>9</sup>—88 percent of people diagnosed with cancer in the United States are 50 years or older, while 57 percent are 65 or older.<sup>10</sup>

It is therefore notable that the incidence of early-onset cancer, that is, cancer diagnosed in adults under the age of 50, has reportedly increased in recent years. One study found that rates of all such cancers in the United States increased substantially from 2010 to 2019.<sup>11</sup> The same study found the highest number of early-onset cancer cases were for breast cancer, and that gastrointestinal cancers had the fastest growing incidence rates. Increases in cancer screenings may explain some of the increased incidence of cancer treatments at younger ages.<sup>12</sup>

There are currently two vaccines available that work to prevent cancer: the HPV vaccine, which helps to prevent the types of HPV that can cause cervical and several other cancers, and the hepatitis B vaccine, which helps prevent liver cancer caused by hepatitis B infection.<sup>13</sup> Both vaccines have been administered to the pediatric population in the United States long enough to begin to protect younger adults: In 2006, the Centers for Disease Control and Prevention (CDC) advisory committee began recommending that girls aged 11-12 receive the HPV vaccine and that women aged 13-26 receive the vaccine if they were

<sup>5</sup> “Cancer: Vaccines (Shots),” Centers for Disease Control and Prevention (CDC), September 4, 2024, <https://www.cdc.gov/cancer/prevention/vaccination.html>.

<sup>6</sup> “Cancer,” World Health Organization (WHO), February 3, 2022, <https://www.who.int/news-room/fact-sheets/detail/cancer>.

<sup>7</sup> “All About Cancer,” American Cancer Society, 2024, <https://www.cancer.org/cancer.html>.

<sup>8</sup> “What Is Cancer?,” National Cancer Institute, last updated October 11, 2011, <https://www.cancer.gov/about-cancer/understanding/what-is-cancer>.

<sup>9</sup> Lieze Berben et al., “Cancer and Aging: Two Tightly Interconnected Biological Processes,” *Cancers (Basel)* 13, no. 6 (March 19, 2021), <https://doi.org/10.3390/cancers13061400>.

<sup>10</sup> American Cancer Society, *Cancer Facts & Figures 2024*, 2024, <https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2024/2024-cancer-facts-and-figures-acs.pdf>.

<sup>11</sup> Benjamin Koh et al., “Patterns in Cancer Incidence among People Younger than 50 Years in the US, 2010 to 2019,” *JAMA Network Open* 6, no. 8 (August 16, 2023): e2328171, <https://doi.org/10.1001/jamanetworkopen.2023.28171>.

<sup>12</sup> Tomotaka Ugai et al., “Is Early-Onset Cancer an Emerging Global Epidemic? Current Evidence and Future Implications,” *Nature Reviews Clinical Oncology* 19 (October 2022): 656-73, <https://doi.org/10.1038/s41571-022-00672-8>.

<sup>13</sup> “Cancer: Vaccines (Shots),” CDC.

not vaccinated earlier.<sup>14</sup> In 2011, the HPV vaccine was recommended for boys aged 11-12 as well, and through age 21 if not vaccinated previously.<sup>15</sup> The hepatitis B vaccine has been available for longer<sup>16</sup> and was recommended for all newborns in 1991.<sup>17</sup>

In the event that cancer is diagnosed, it can be an expensive disease. Cancer patients have substantially higher healthcare costs than noncancer patients, a pattern that is even more pronounced for younger adult patients.<sup>18</sup> Among those less than 65 years old, breast cancer requires the greatest number of services and has the highest total spending per year; other costly cancers include lung and colorectum.<sup>19</sup>

In this report, FAIR Health delves into its repository of over 49 billion commercial healthcare claim records, the nation's largest such database, to examine cancer trends in adults aged 18 to 49 during the period 2016-2023. This study focuses on cancer treatment rates by age over time, cancer treatment rates by state, types of cancer, treatment costs, cancer vaccine utilization rates, cancer screening utilization rates and provider specialties associated with the care of cancer patients.

## Methodology

The FAIR Health National Private Insurance Claims (FH NPIC®) database was used to identify a cohort of patients being treated for a primary cancer from January 1, 2016, to December 31, 2023. Patients were determined to have cancer by the presence of a primary cancer ICD-10 diagnosis in the first or second diagnosis position on a professional or facility claim. For the entirety of the study, claims from workers' compensation were excluded. For evaluation of costs—which were based on allowed amounts—claims with missing or zero allowed amounts, claims with an allowed amount greater than the charged amount and claims for Medicare Advantage, Medicaid, Medigap, workers' compensation and auto liability were excluded.

Patient characteristics including age, gender and home state were assigned based on the most frequent value for each of these variables appearing on the patient's medical claims for each calendar year.

Codes for cancer screenings came from the ICD-10 Z12 code series. A claim was included if one of these codes appeared in the first six positions. Codes for colonoscopy, mammography, pap smears and HPV antigen testing were CPT<sup>®20</sup> and HCPCS codes.

Cancer screening was identified by the presence of CPT and/or HCPCS codes specific to the types of cancer in question, including codes for colonoscopy, mammography, pap smears and HPV antigen testing. These procedures were determined to be for cancer screening when they appeared in conjunction with an ICD-10 Z12\* code in one of the first six diagnostic positions on the claim.

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<sup>14</sup> "CDC's Advisory Committee Recommends Human Papillomavirus Virus Vaccination," CDC press release, June 29, 2006, [https://archive.cdc.gov/www\\_cdc.gov/media/pressrel/r060629.htm](https://archive.cdc.gov/www_cdc.gov/media/pressrel/r060629.htm).

<sup>15</sup> American Association for Cancer Research, "CDC Committee Backs HPV Vaccine for Boys," *Cancer Discovery* 1, no. 7 (December 1, 2011): 542, <https://doi.org/10.1158/2159-8290.CD-NB-120111-32>.

<sup>16</sup> "Achievements in Public Health: Hepatitis B Vaccination—United States, 1982–2002," *MMWR Weekly* 51, no. 25 (June 28, 2002): 549-52, <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5125a3.htm>.

<sup>17</sup> "Hepatitis B Virus: A Comprehensive Strategy for Eliminating Transmission in the United States through Universal Childhood Vaccination: Recommendations of the Immunization Practices Advisory Committee (ACIP)," *MMWR Weekly* 40, no. RR-13 (November 22, 1991): 1-19, <https://www.cdc.gov/mmwr/preview/mmwrhtml/00033405.htm>.

<sup>18</sup> Joohyun Park and Kevin A. Look, "Health Care Expenditure Burden of Cancer Care in the United States," *Inquiry* 56 (January-December 2019): 46958019880696, <https://doi.org/10.1177/0046958019880696>.

<sup>19</sup> Nicholas G. Zaorsky et al., "Medical Service Use and Charges for Cancer Care in 2018 for Privately Insured Patients Younger Than 65 Years in the US," *JAMA Network Open* 4, no. 10: e2127784, <https://doi.org/10.1001/jamanetworkopen.2021.27784>.

<sup>20</sup> CPT © 2023 American Medical Association (AMA). All rights reserved.

An index date was established for each patient's cancer as the date of the earliest medical claim on which the cancer diagnosis appeared. An analysis of total cost of care was performed on a subset of cancer patients with index dates from January 1, 2022, to December 31, 2022. The total cost was calculated as the sum of allowed amounts for all medical claims from the index date through 364 days following. Only professional and facility claims were included as pharmacy claims are not available for all patients in the FAIR Health data repository.

In order to evaluate the cost of cancer care, these costs were compared to total cost of care (sum of medical allowed amounts) for a one-year period for patients without a cancer diagnosis who received at least one healthcare service from July 1, 2022, to June 30, 2023.

## Limitations

The data used in this report comprise claims data for commercially insured patients who are covered by insurers and third-party administrators who voluntarily participate in FAIR Health's data contribution program. Medicare Advantage (Medicare Part C) enrollees from contributing insurers are not included, nor are participants in Medicare Parts A, B and D.<sup>21</sup> In addition, data from CHIP and other state and local government insurance programs are not included, nor are data collected regarding uninsured patients.

This is an observational report based on the data FAIR Health receives from private payors regarding care rendered to covered patients.

The report was not subject to peer review.

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<sup>21</sup> FAIR Health also receives the entire collection of claims for traditional Medicare Parts A, B and D under the Centers for Medicare & Medicaid Services Qualified Entity Program, but those data are not a source for this report.

## Results

### Cancer Treatment Rates by Age over Time

From 2016 to 2023, overall cancer treatment rates decreased in all age groups evaluated (figures 1, 2). From 2020 to 2023, however, cancer treatment rates increased. The greatest increase was 11.7 percent in patients aged 18 to 29, followed by a 7.5 percent increase in patients aged 40 to 49 and 7.2 percent in patients aged 30 to 39. By comparison, the increase in patients aged 50 to 59 was 5.5 percent. Cancer treatment rates in 2020 might have been low due to people avoiding healthcare services in the first year of the COVID-19 pandemic, and in 2021 due to many people seeking healthcare services only for COVID-19 testing and vaccination. But even compared to 2019, the cancer treatment rate in patients aged 40 to 49 increased 3.5 percent.

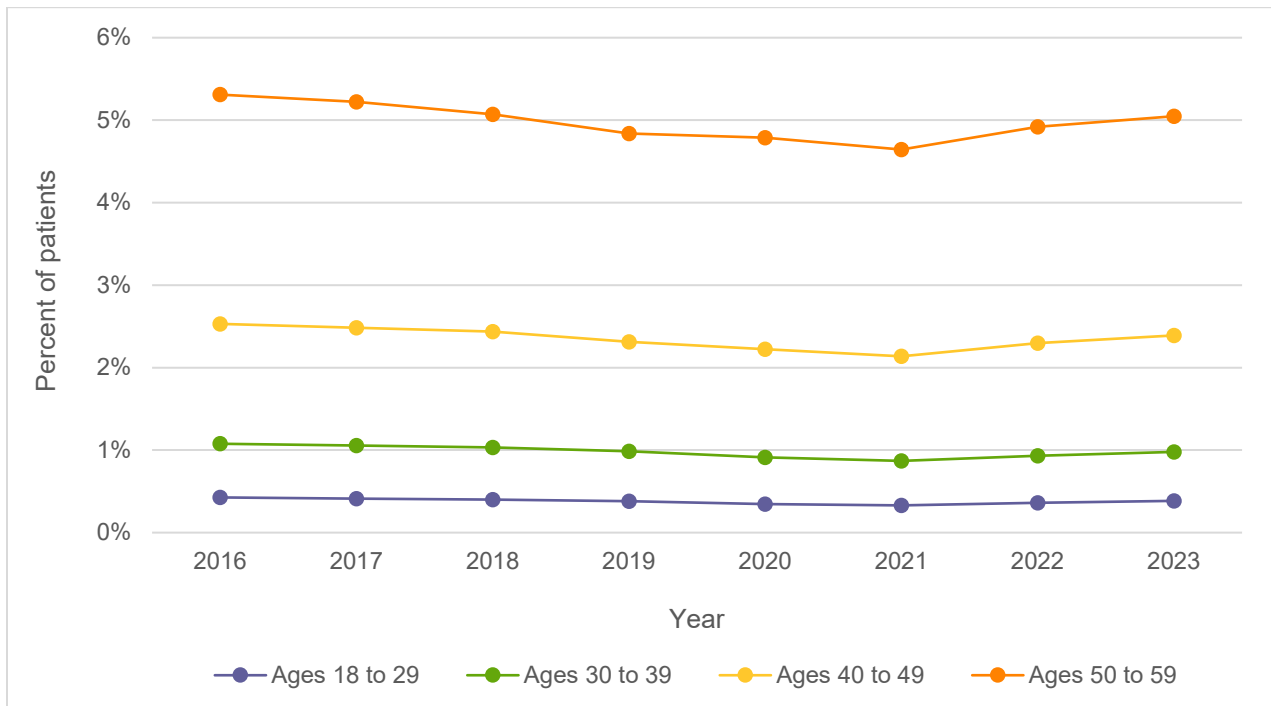
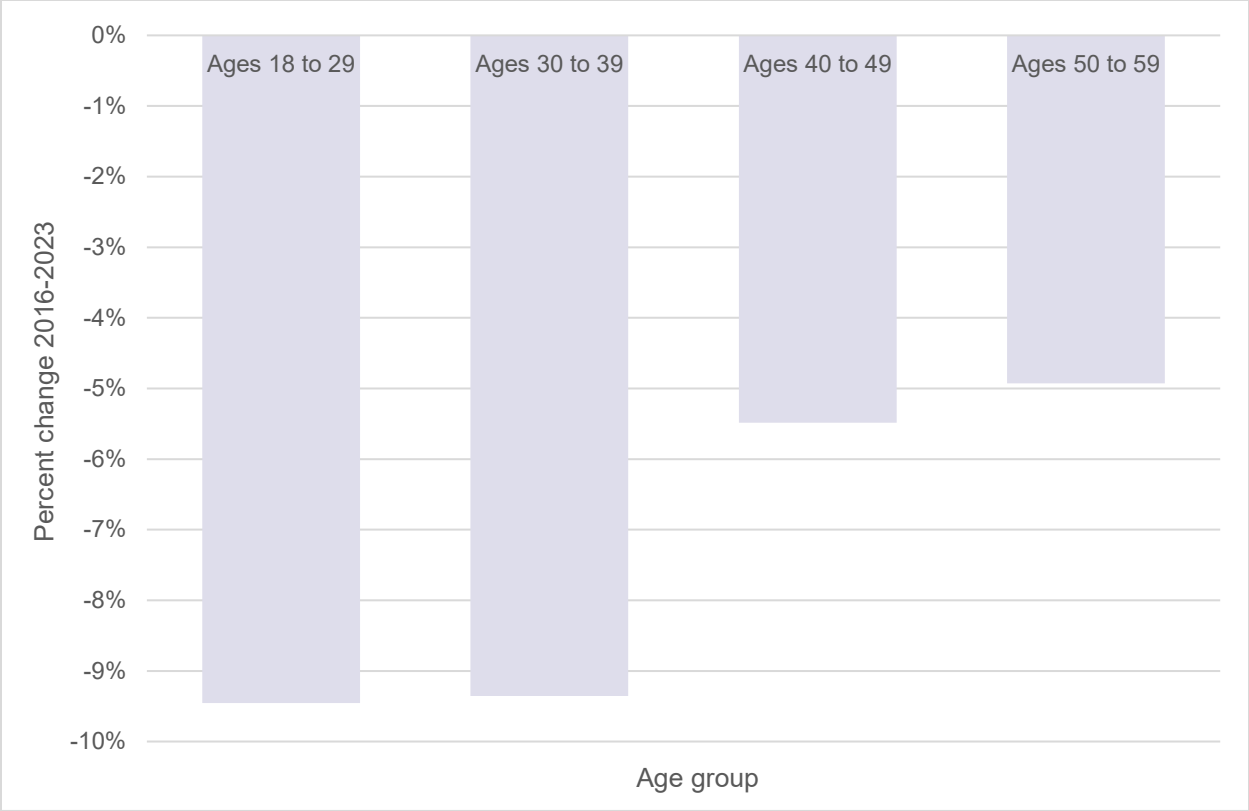
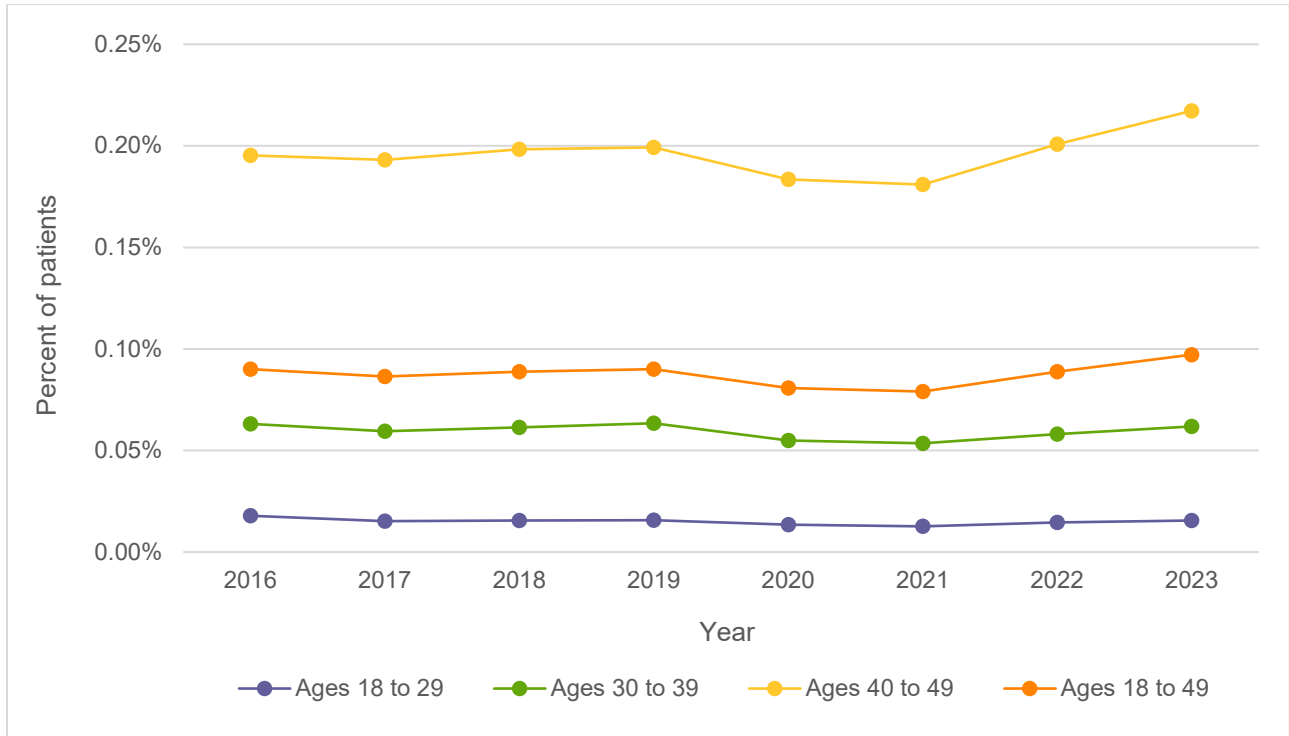


Figure 1. Percent of patients aged 18 to 59 receiving cancer treatment by age and year, 2016-2023



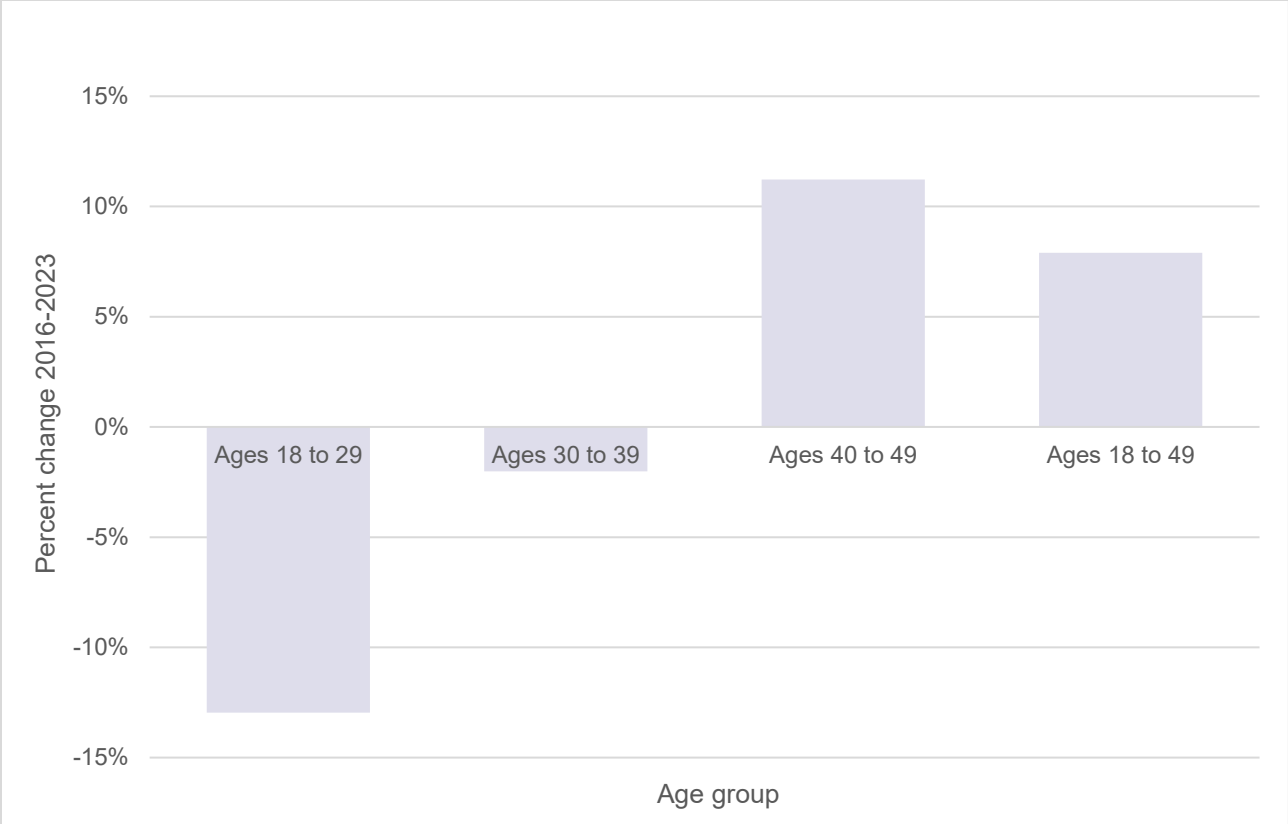
**Figure 2. Percent change in patients aged 18 to 59 receiving cancer treatment by age, 2016-2023**

The decline in cancer treatment rates from 2016 to 2023 was not uniform across cancers. While the overall cancer treatment rate decreased 5.5 percent in patients aged 40 to 49 during that period (figure 2), cancers of the digestive system increased 11.2 percent in that age group (figures 3, 4).



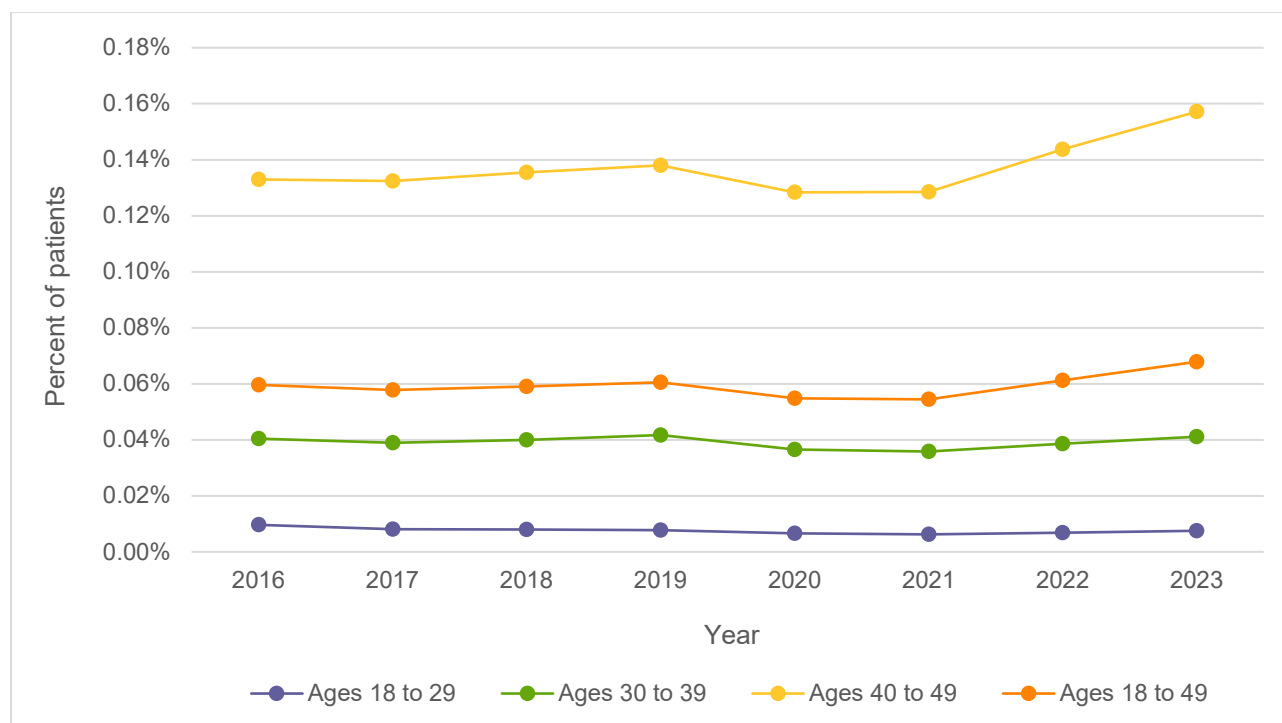
**Figure 3. Percent of patients aged 18 to 49 receiving digestive cancer treatment by age and year, 2016-2023**



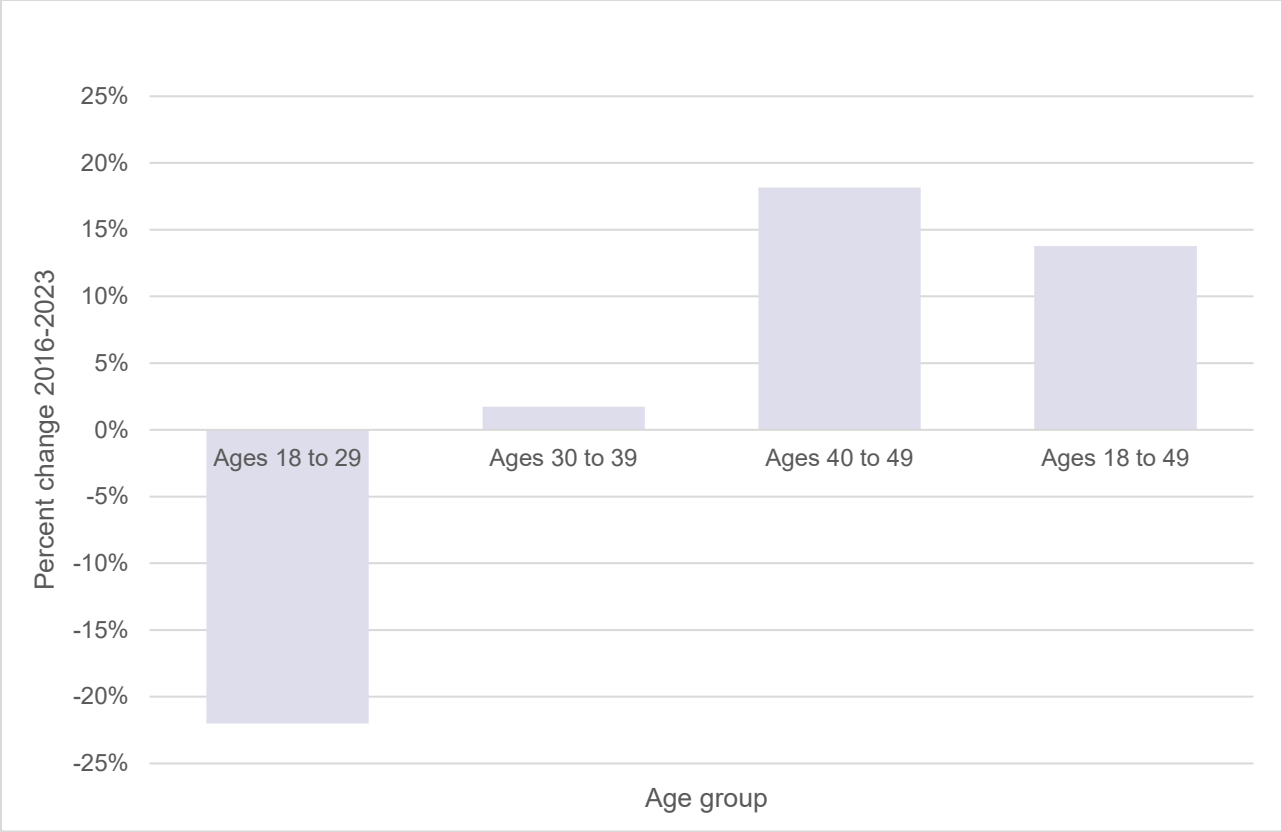


**Figure 4. Percent change in patients aged 18 to 49 receiving digestive cancer treatment by age, 2016-2023**

The colorectal cancer treatment rate increased 18.2 percent in patients aged 40 to 49 from 2016 to 2023 (figures 5, 6), a greater increase than for digestive cancers in general (11.2 percent; figure 4).

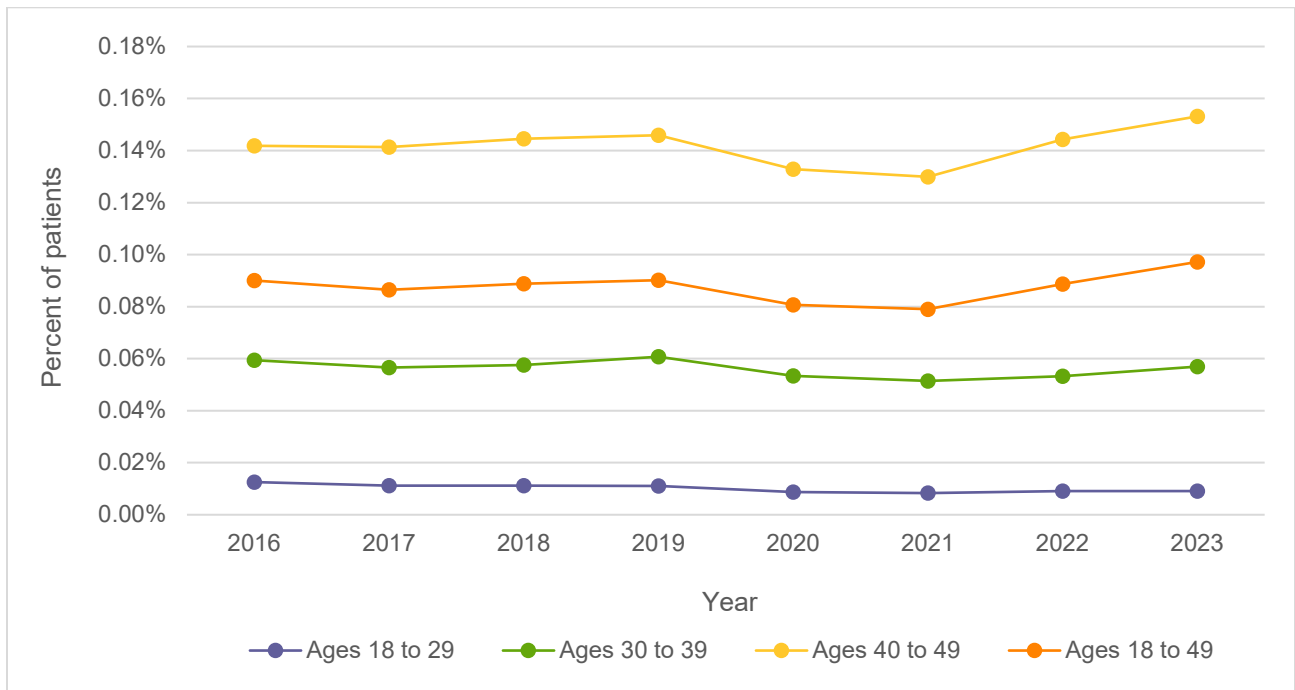


**Figure 5. Percent of patients aged 18 to 49 receiving colorectal cancer treatment by age and year, 2016-2023**



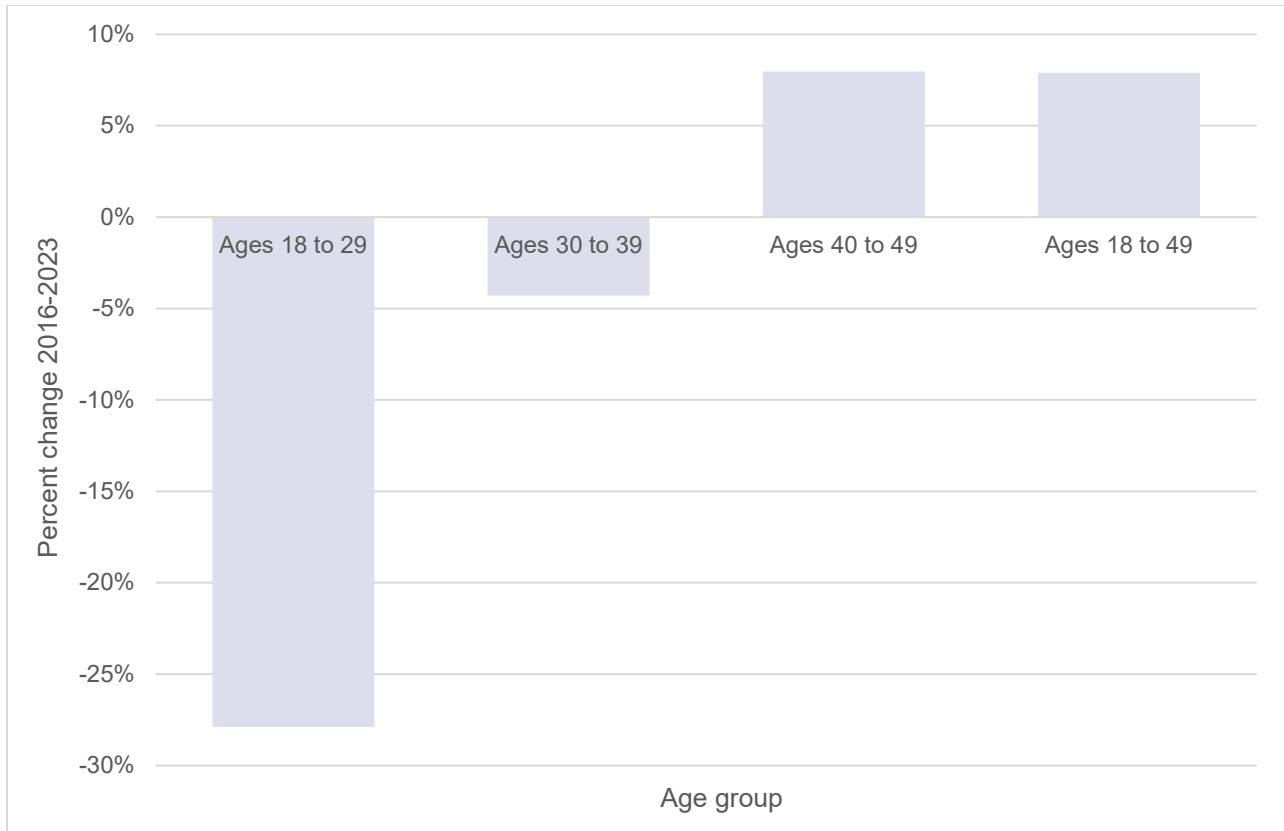
**Figure 6. Percent change in patients aged 18 to 49 receiving colorectal cancer treatment by age, 2016-2023**

From 2016 to 2023, the treatment rate for HPV-related cancers (including anal, cervical, oropharyngeal, penile, vaginal and vulvar cancers) increased 8.0 percent in the age group 40-49 but decreased 4.3 percent in the age group 30-39 (figures 7, 8). The HPV-related cancer treatment rate fell more sharply—27.9 percent—in the age group 18-29. The pronounced drop in the rate of HPV-related cancer treatment among the youngest adults may be due to the access this cohort had to the HPV vaccine during their childhood.<sup>22</sup>



**Figure 7. Percent of patients aged 18 to 49 receiving HPV-related cancer treatment by age and year, 2016-2023**

<sup>22</sup> Lauri E. Markowitz et al., “Ten Years of Human Papillomavirus Vaccination in the United States,” *Academic Pediatrics* 18, supplement no. 2 (March 2018): S3-S10, <https://doi.org/10.1016/j.acap.2017.09.014>.



**Figure 8. Percent change in patients aged 18 to 49 receiving HPV-related cancer treatment by age, 2016-2023**

## Cancer Treatment Rates by State

Among states with at least 100 patients aged 18 to 49 with a cancer diagnosis in 2023, cancer treatment rates in that age group and year ranged from a low of 0.85 percent in Wyoming to a high of 1.37 percent in New York. There was no strong geographic pattern. Of the five jurisdictions with the highest cancer treatment rates in this age group (table 1), two were in the Northeast (New York and Pennsylvania), one in the West (Arizona) and two in the South (District of Columbia and Florida).

**Table 1. Five states with the highest cancer treatment rates in patients aged 18 to 49, 2023**

State	Percent of Patients Aged 18-49 with Cancer
New York	1.37%
Arizona	1.36%
District of Columbia	1.35%
Florida	1.34%
Pennsylvania	1.33%

All three regions were also represented by the five states with the lowest cancer treatment rates in the age group 18-49 (table 2). Two states were in the West (Wyoming and Alaska), two in the South (West Virginia and Alabama) and one in the Northeast (Rhode Island).

**Table 2. Five states with the lowest cancer treatment rates in patients aged 18 to 49, 2023**

State	Percent of Patients Aged 18-49 with Cancer
Wyoming	0.85%
West Virginia	0.89%
Alabama	0.94%
Rhode Island	0.95%
Alaska	0.97%

## Types of Cancer

The five most common types of cancer in patients aged 18 to 49 in 2023 were (in order from most to least common) those of the skin, breast, thyroid and other endocrine glands, digestive organs and female genital organs (table 3). While only the second most common cancer, breast cancer ranked first in total allowed amounts (total costs). Breast cancer varied in the rankings by gender, ranking 2nd among females and 22nd among males. The fourth most common cancer overall was cancer of the digestive system, but it ranked second in total allowed amounts.

**Table 3. Most common types of cancer in patients aged 18 to 49, 2023**

Type of Cancer	Ranking	Total Cost Ranking	Ranking – Males	Ranking – Females
Melanoma and Other Malignant Neoplasms of Skin	1	3	1	1
Malignant Neoplasms of Breast	2	1	22	2
Malignant Neoplasms of Thyroid and Other Endocrine Glands	3	9	4	3
Malignant Neoplasms of Digestive Organs	4	2	3	5
Malignant Neoplasms of Female Genital Organs	5	4	N/A	4
Malignant Neoplasms of Male Genital Organs	6	16	2	N/A
Malignant Neoplasms of Eye, Brain and Other Parts of Central Nervous System	7	6	6	6
Malignant Neoplasms of Urinary Tract	8	15	5	7
Hodgkin Lymphoma	9	8	7	8
Malignant Neoplasms of Mesothelial and Soft Tissue	10	13	9	9

Many cancers are relatively evenly distributed between males and females. However, a few cancers have high gender disparity. Table 4 shows gender disparities greater than 55 percent versus 45 percent in the age group 18-49 in 2023. Excluded are the most extreme disparities, those associated with breast cancer (99.1 percent female) and cancers of male and female genital organs (approximately 99 percent aligned with patient gender).

Of patients with cancers of the urinary tract, 58.4 percent were male; of patients with lymphoid leukemia, 56.5 percent were male. Cancers that were more common in females included cancers of the respiratory and intrathoracic organs (55.2 percent female), skin cancer (60.5 percent female) and cancers of the thyroid and other endocrine glands (80.6 percent female). The large disparity in cancers of the thyroid and other endocrine glands is consistent with reports by other researchers that thyroid cancer is more common in women than men.<sup>23</sup>

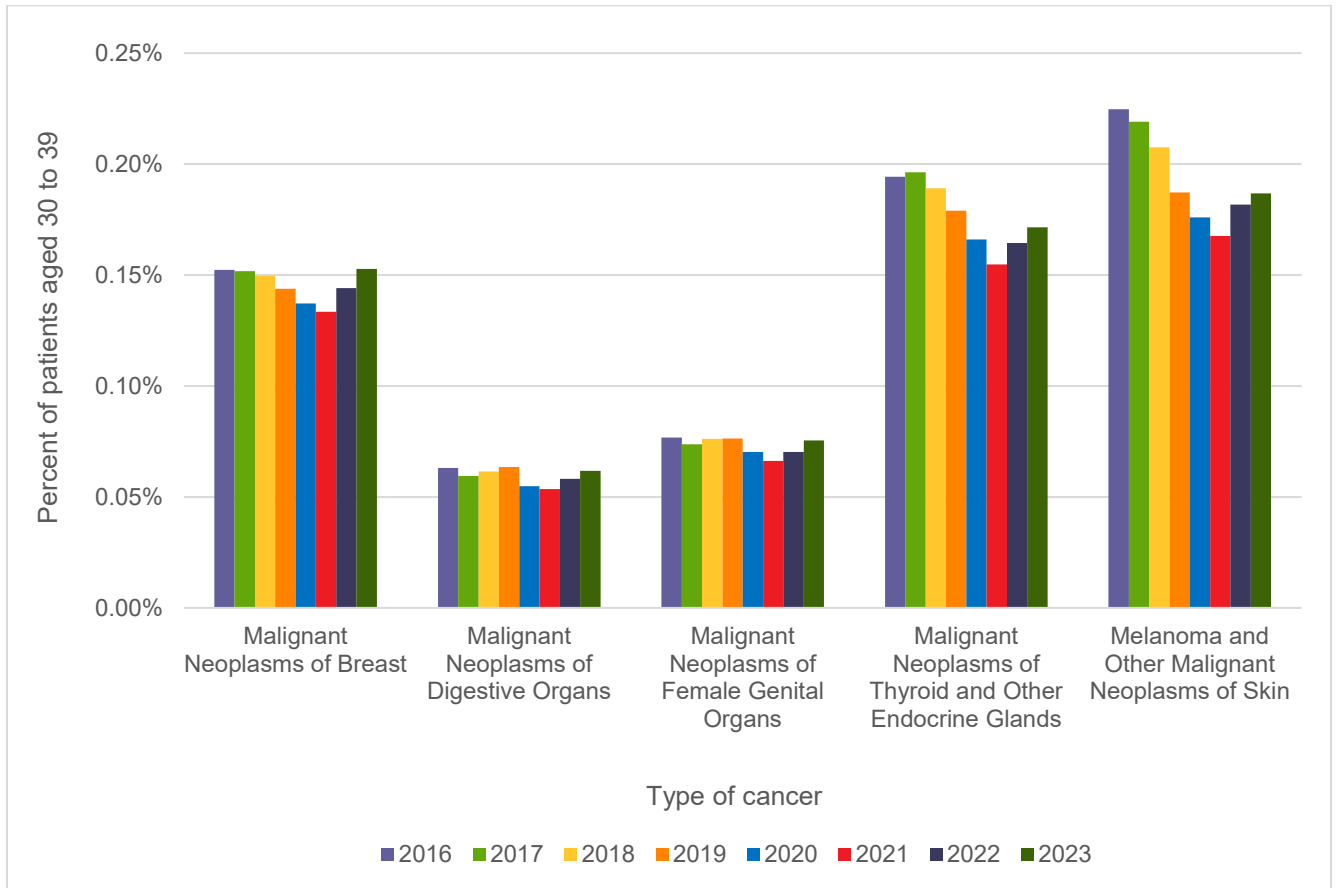
**Table 4. Selected cancers with high gender disparity in the age span 18 to 49, 2023**

Type of Cancer	Percent of Patients – Male	Percent of Patients – Female
Malignant Neoplasms of Urinary Tract	58.4%	41.6%
Lymphoid Leukemia	56.5%	43.5%
Malignant Neoplasm of Respiratory and Intrathoracic Organs	44.8%	55.2%
Malignant Immunoproliferative Diseases and Certain Other B-cell Lymphomas	42.6%	57.4%
Malignant Neoplasm Without Specification of Site	40.9%	59.1%
Melanoma and Other Malignant Neoplasms of Skin	39.5%	60.5%
Malignant Neuroendocrine Tumors	39.2%	60.8%
Monocytic Leukemia	34.5%	65.5%
Malignant Neoplasms of Thyroid and Other Endocrine Glands	19.4%	80.6%

<sup>23</sup> Sarah S. Jackson et al., “Sex Disparities in the Incidence of 21 Cancer Types: Quantification of the Contribution of Risk Factors,” *Cancer* 128, no. 19 (October 1, 2022): 3531-40, <https://doi.org/10.1002/cncr.34390>.

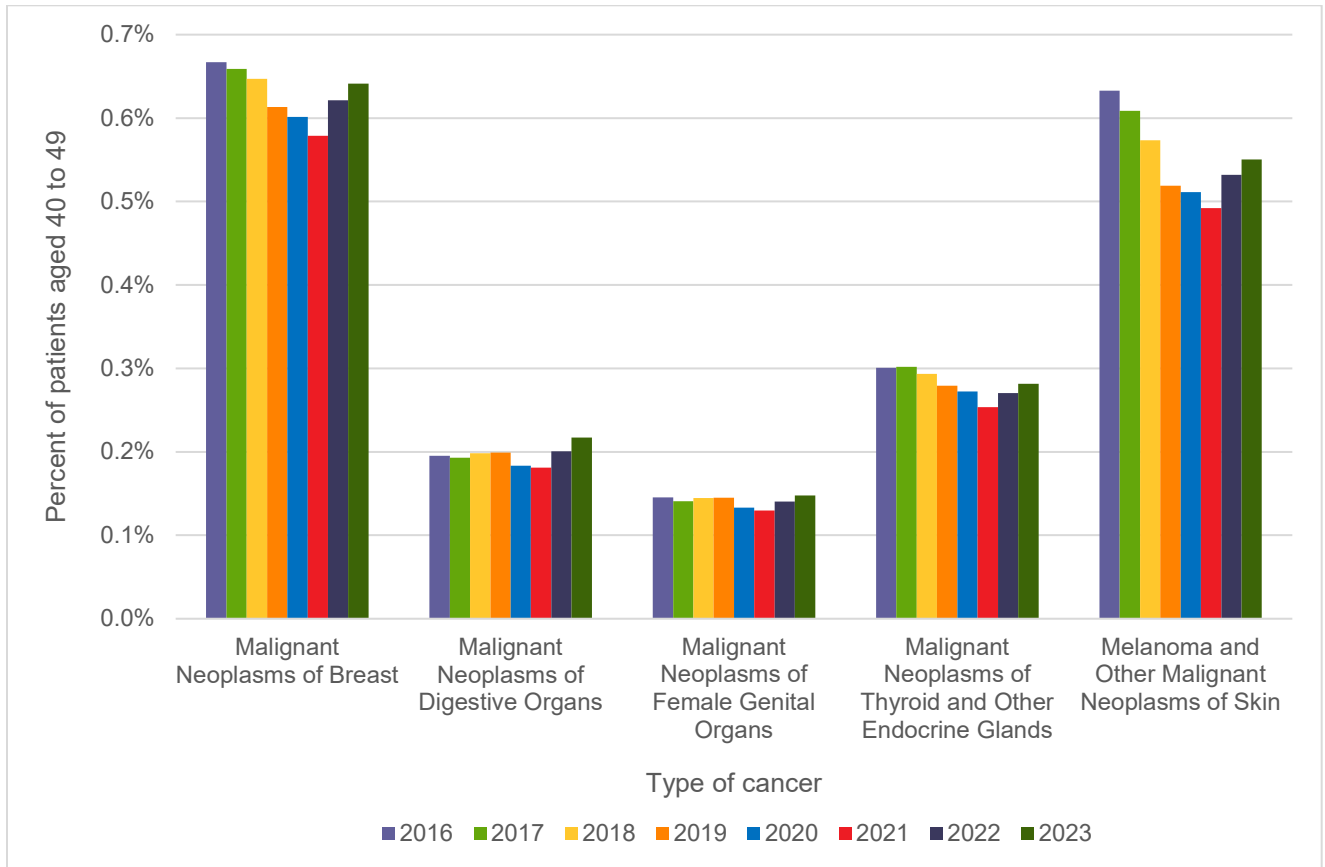


Of the five most common cancers in the age group 30-39, all but one decreased in percent of patients receiving treatment for the indicated cancer from 2016 to 2023 (figure 9). The exception was breast cancer, which increased 0.2 percent. The decreases varied from 1.7 percent for cancers of the female genital organs to 16.9 percent for skin cancer. For the period from 2021 to 2023, all five types of cancer increased: from 10.8 percent for cancers of the thyroid and other endocrine glands to 15.4 percent for digestive cancers.



**Figure 9. Five most common cancers in the age group 30-39, 2016 to 2023**

Of the five most common cancers in the age group 40-49, three decreased in percent of patients receiving treatment for the indicated cancer from 2016 to 2023 (figure 10). Skin cancer decreased by 13.1 percent, cancers of the thyroid and other endocrine glands by 6.4 percent and breast cancer by 3.9 percent. Cancers of the female genital organs increased by 1.4 percent and (as also shown in figure 4) digestive cancers by 11.2 percent. For the period from 2021 to 2023, all five types of cancer increased: from 10.8 percent for breast cancer to 20.1 percent for digestive cancers.



**Figure 10. Five most common cancers in the age group 40-49, 2016 to 2023**

## Costs

To analyze the costs of cancer care in the age group 18-49, patients diagnosed with cancer in 2022 were compared to patients without a cancer diagnosis who received at least one medical service from July 1, 2022, to June 30, 2023. When the costs were compared, patients with a cancer diagnosis had much higher costs (table 5) in the first year after diagnosis than patients without cancer had during a 12-month period. For example, patients without cancer had a median allowed amount of \$1,090, while for patients with cancer, the median allowed amount was almost eight times higher at \$8,446. Similarly, patients without cancer had an average allowed amount of \$4,035, while the average allowed amount for patients with cancer was 12 times higher at \$49,818. Table 5 also illustrates that patients with cancer had a much larger disparity between median and average allowed amounts—for patients without cancer, the average was almost four times higher than the median, a difference of \$2,945; for patients with cancer, the average was almost six times as high as the median, a difference of \$41,472. The main drivers for the differences in median and allowed amounts in patients with cancer were a small percentage of cases with very high costs. Approximately 5 percent of patients with cancer had costs exceeding \$250,000, while only 0.05 percent of patients without cancer had costs exceeding that amount. Two factors that led to the higher costs were the use of chemotherapy or immunotherapy and/or an inpatient facility stay.

**Table 5. Median and average allowed amounts for patients aged 18 to 49 with cancer in 2022 compared to those without cancer from July 1, 2022, to June 30, 2023**

Patient Group	Median Allowed Amount	Average Allowed Amount
All Patients Aged 18 to 49 without Cancer	\$1,090	\$4,035
All Patients Aged 18 to 49 with Cancer	\$8,446	\$49,918

Costs varied by the type of cancer. In 2022, the three cancers with the largest total costs of services incurred by patients aged 18 to 49 with a cancer diagnosis (by median allowed amount) were cancers of the breast, respiratory and intrathoracic organs, and digestive organs (table 6). All three of these groups of cancers had a median allowed amount over \$25,000 and an average allowed amount over \$80,000. Together, they accounted for 44.0 percent of all allowed amounts related to cancer, although they represented only 25.5 percent of cancer patients.

**Table 6. Cancers in patients aged 18 to 49 by highest median allowed amount, with average allowed amount, percent of allowed amounts and percent of patients, 2022**

Type of Cancer	Median Allowed Amount	Average Allowed Amount	Percent of Allowed Amounts	Percent of Patients
Malignant Neoplasms of Breast	\$36,294	\$91,862	30.8%	17.4%
Malignant Neoplasm of Respiratory and Intrathoracic Organs	\$28,167	\$95,309	2.7%	1.5%
Malignant Neoplasms of Digestive Organs	\$27,817	\$82,646	10.5%	6.6%

The three cancers with the smallest total costs of services incurred by patients aged 18 to 49 with a cancer diagnosis in 2022 (by median allowed amount) were cancers of the male genital organs, the thyroid and other endocrine glands, and the skin (table 7). These groups of cancers had median allowed amounts under \$7,000 and average allowed amounts under \$30,000. Together, they accounted for 12.4 percent of allowed amounts related to cancer but represented 43.9 percent of cancer patients.

**Table 7. Cancers in patients aged 18 to 49 by lowest median allowed amount, with average allowed amount, percent of allowed amounts and percent of patients, 2022**

Type of Cancer	Median Allowed Amount	Average Allowed Amount	Percent of Allowed Amounts	Percent of Patients
Malignant Neoplasms of Male Genital Organs	\$6,915	\$25,651	2.1%	4.4%
Malignant Neoplasms of Thyroid and Other Endocrine Glands	\$6,853	\$18,015	3.7%	10.8%
Melanoma and Other Malignant Neoplasms of Skin	\$3,827	\$11,998	6.6%	28.7%

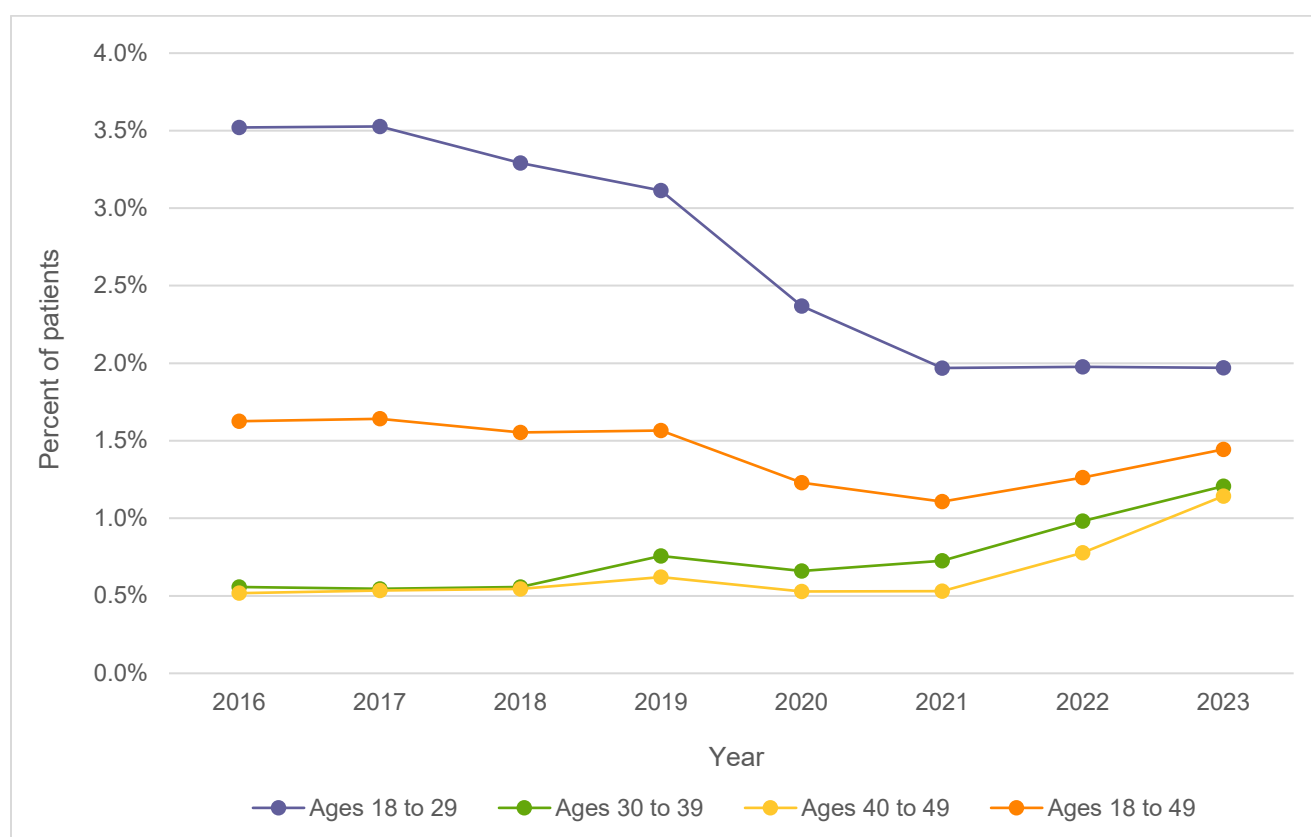
There was an especially marked difference in median versus average allowed amounts for two types of cancers in patients aged 18 to 49: leukemias and lymphomas. Table 8 shows that when pooled, the median allowed amount for all leukemias was \$8,973, while the average allowed amount was \$135,978—a difference of \$127,005, with the average 15 times higher than the median. Similarly, the median allowed amount for all lymphomas was \$11,945, while the average allowed amount was \$95,454—a difference of \$83,509, with the average almost eight times higher than the median. As noted above, a small percentage of cases with very high costs was driving up the averages. Taken together, leukemias and lymphomas accounted for 20.4 percent of allowed amounts related to cancer and 9.8 percent of cancer patients.

**Table 8. Median and average allowed amounts for leukemias and lymphomas in patients aged 18 to 49, with percent of allowed amounts and percent of patients, 2022**

Type of Cancer	Median Allowed Amount	Average Allowed Amount	Percent of Allowed Amounts	Percent of Patients
Leukemias	\$8,973	\$135,978	8.6%	3.3%
Lymphomas	\$11,945	\$95,454	11.8%	6.5%

## Cancer Vaccine Utilization<sup>24</sup>

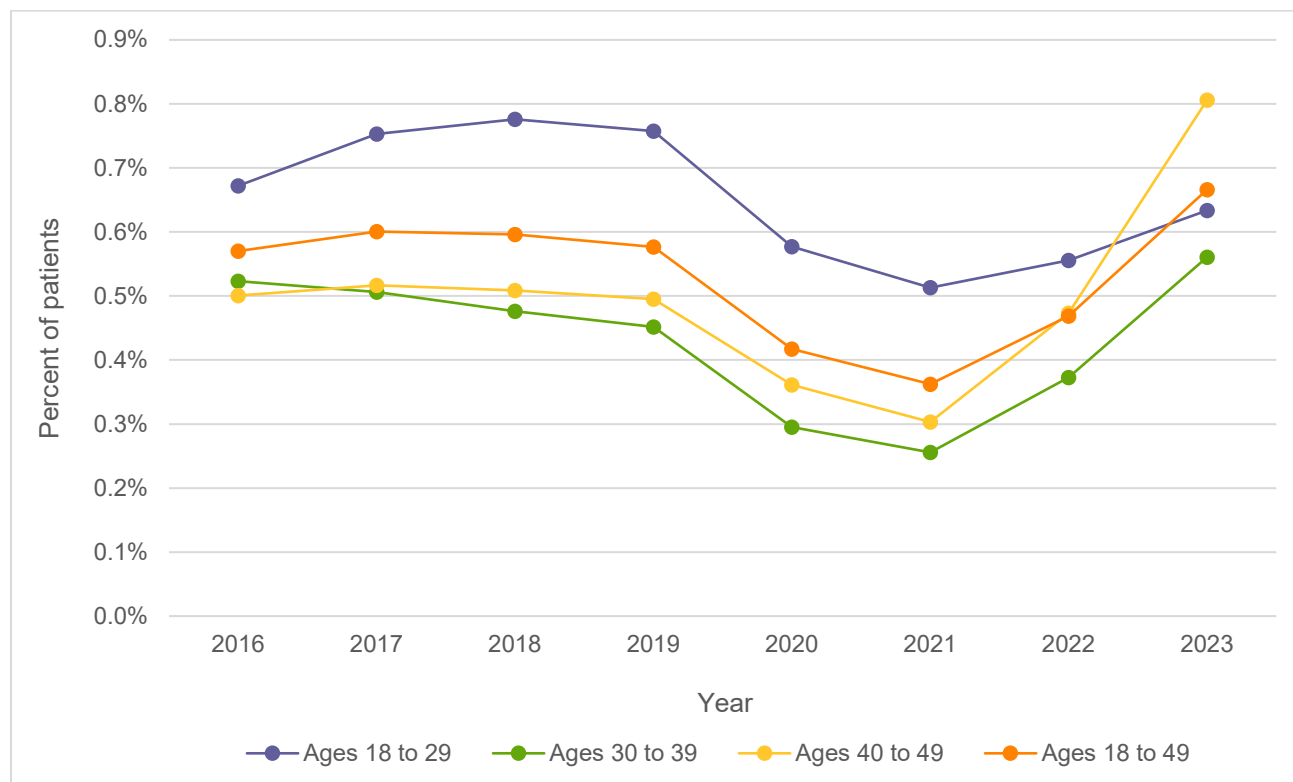
When combined, utilization of the hepatitis B vaccine (to prevent liver cancer) and HPV vaccine showed a decline from 2016 to 2023 in patients in the age group 18-29 (figure 11). In 2016, 3.5 percent of patients in the youngest adult age group received both vaccines, but by 2021, utilization had dropped to 2.0 percent, where it remained through 2023. In contrast, in the age groups 30-39 and 40-49, vaccine utilization remained at around 0.5 percent of patients from 2016 to 2018 and then began to rise. In 2023, the percentage of patients receiving the vaccines in the age group 30-39 had risen to 1.2 percent and in the age group 40-49, it had risen to 1.1 percent. Even though the older two age groups showed net increases in vaccine utilization during the period 2016-2023, all age groups showed a decline in vaccine utilization in 2020 and most either stayed the same or experienced a further decline in 2021. The age group 30-39 increased in percent of patients receiving the two vaccines, rising from 0.66 percent in 2020 to 0.73 percent in 2021.



**Figure 11. Percent of patients aged 18 to 49 receiving both HPV and hepatitis B vaccines by age and year, 2016-2023**

<sup>24</sup> As noted above, cancer vaccine utilization measures the number of patients who received a cancer-related vaccination in a given year out of the number of patients who received any medical services in that same year.

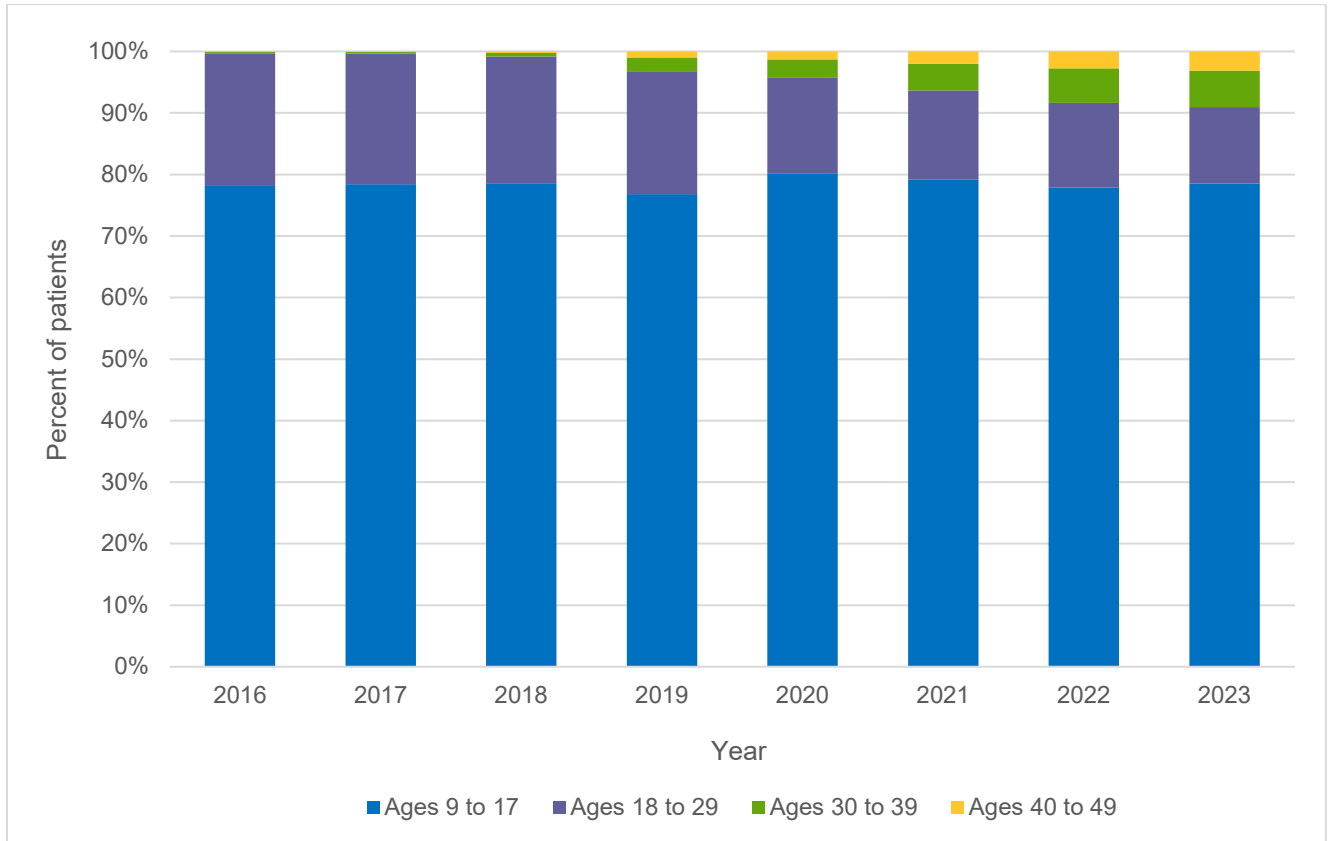
When hepatitis B vaccine utilization was analyzed alone, from 2019 to 2021, there was a decline across all age groups evaluated (figure 12). For the combined younger adult age group 18-49, utilization stayed at around 0.6 percent of patients from 2016 to 2019 and then dropped to 0.4 percent in 2020 and 2021, before rising to 0.5 percent in 2022 and 0.7 percent in 2023. The age group 18-29 had the highest hepatitis B vaccine utilization from 2016 to 2022, but the age group 40-49 had the highest in 2023. That year, 0.8 percent of patients in the age group 40-49 received the hepatitis B vaccine, compared to 0.6 percent of the age group 18-29. In 2022, the CDC advisory committee updated its recommendations on hepatitis B vaccination to include all adults aged 19-59,<sup>25</sup> which could explain the increases in vaccine utilization in 2022 and 2023.



**Figure 12. Percent of patients aged 18 to 49 receiving a hepatitis B vaccine by age and year, 2016-2023**

<sup>25</sup> Mark K. Weng et al., “Universal Hepatitis B Vaccination in Adults Aged 19–59 Years: Updated Recommendations of the Advisory Committee on Immunization Practices—United States, 2022,” *MMWR Weekly* 71, no. 13 (April 1, 2022): 477-83, <https://www.cdc.gov/mmwr/volumes/71/wr/mm7113a1.htm>.

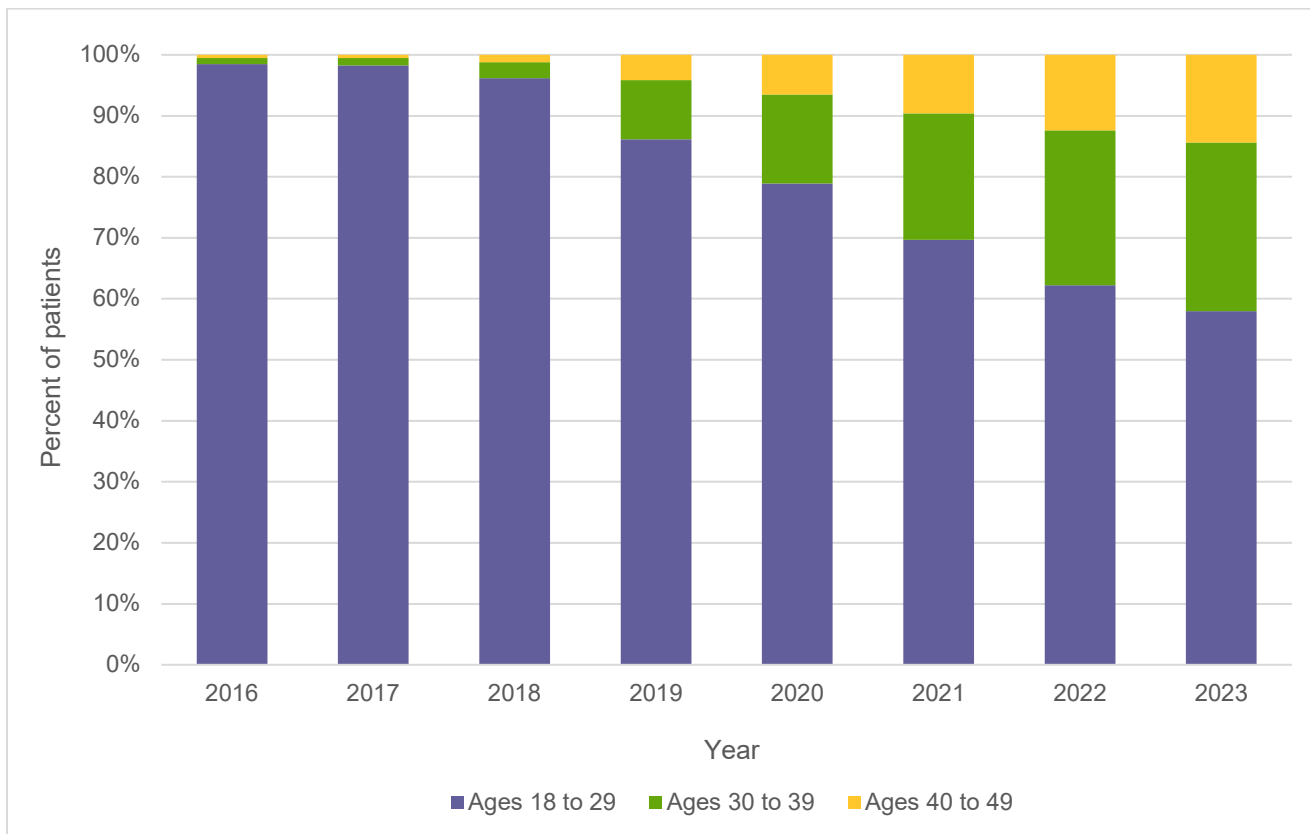
As shown in figure 13, most patients receiving an HPV vaccine from 2016 to 2023 were children and teenagers in the age group 9 to 17. Their share of the total number of vaccine recipients aged 9 to 49 remained fairly stable (from approximately 78 percent to 80 percent) throughout that period.



**Figure 13. Percent of patients aged 9 to 49 receiving an HPV vaccine by age and year, 2016-2023**



Among the older age groups, the trends went in opposite directions. The youngest adult age group (18-29) showed a significant decline in HPV vaccine utilization over the study period, which may be the result of this age group having already received their HPV vaccine as children.<sup>26</sup> The two older age groups, 30-39 and 40-49, by contrast, saw a marked increase in utilization during the period. An HPV vaccine was approved by the Food and Drug Administration for use in adults aged 27 to 45 in 2018,<sup>27</sup> which may explain this upward trend. As a result, the mix of HPV vaccine recipients among the 18-49 age group changed dramatically over this period: 18-29-year-olds fell from 98.5 percent of recipients of the vaccine in this age group to 58.0 percent, while the age group 30-39 rose from 1.0 percent in 2016 to 27.6 percent in 2023; the age group 40-49 increased from 0.5 percent to 14.4 percent (figure 14).



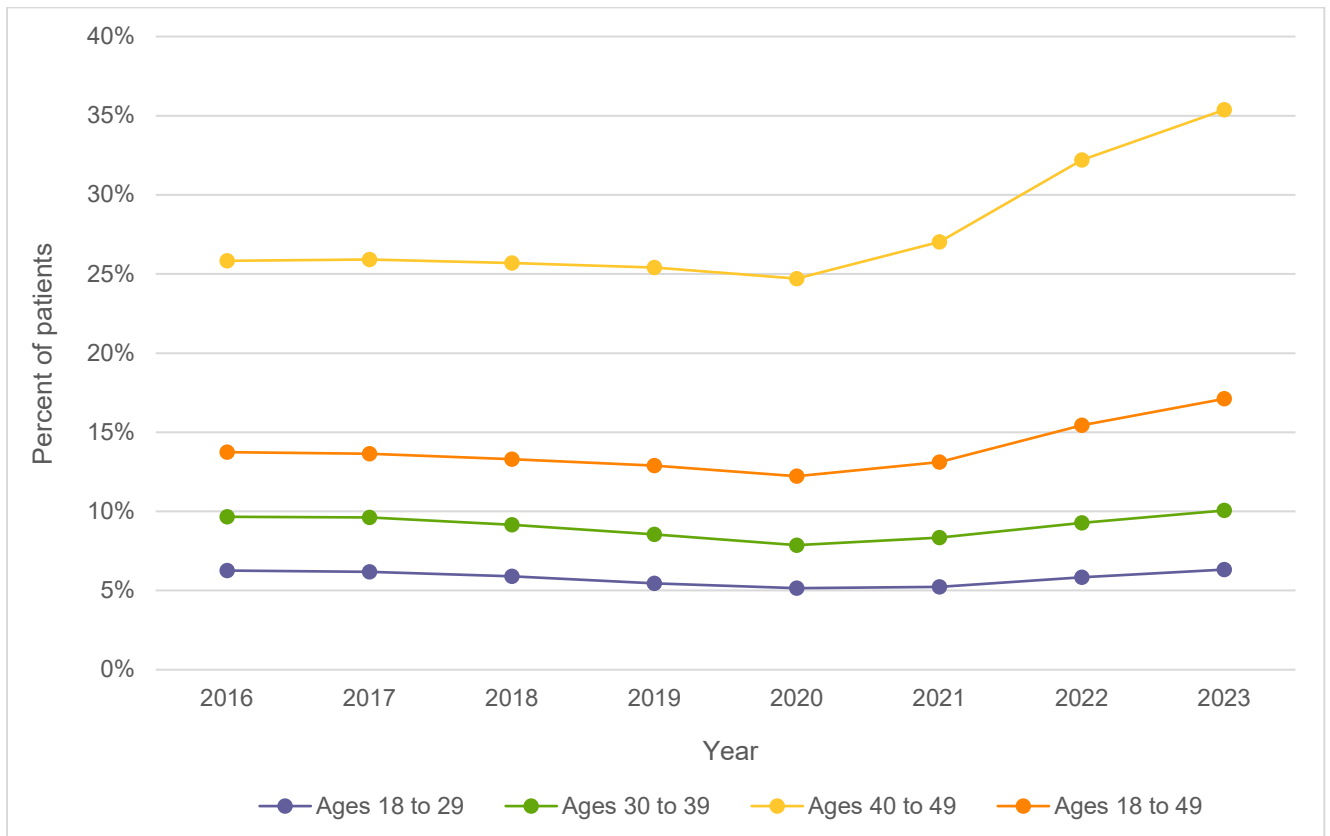
**Figure 14. Percent of patients aged 18 to 49 receiving an HPV vaccine by age and year, 2016-2023**

<sup>26</sup> “HPV Vaccination Recommendations,” CDC, last reviewed November 16, 2021, <https://www.cdc.gov/vaccines/vpd/hpv/hcp/recommendations.html>.

<sup>27</sup> “FDA Approves Expanded Use of Gardasil 9 to Include Individuals 27 through 45 Years Old,” US Food and Drug Administration news release, October 5, 2018, <https://www.fda.gov/news-events/press-announcements/fda-approves-expanded-use-gardasil-9-include-individuals-27-through-45-years-old>.

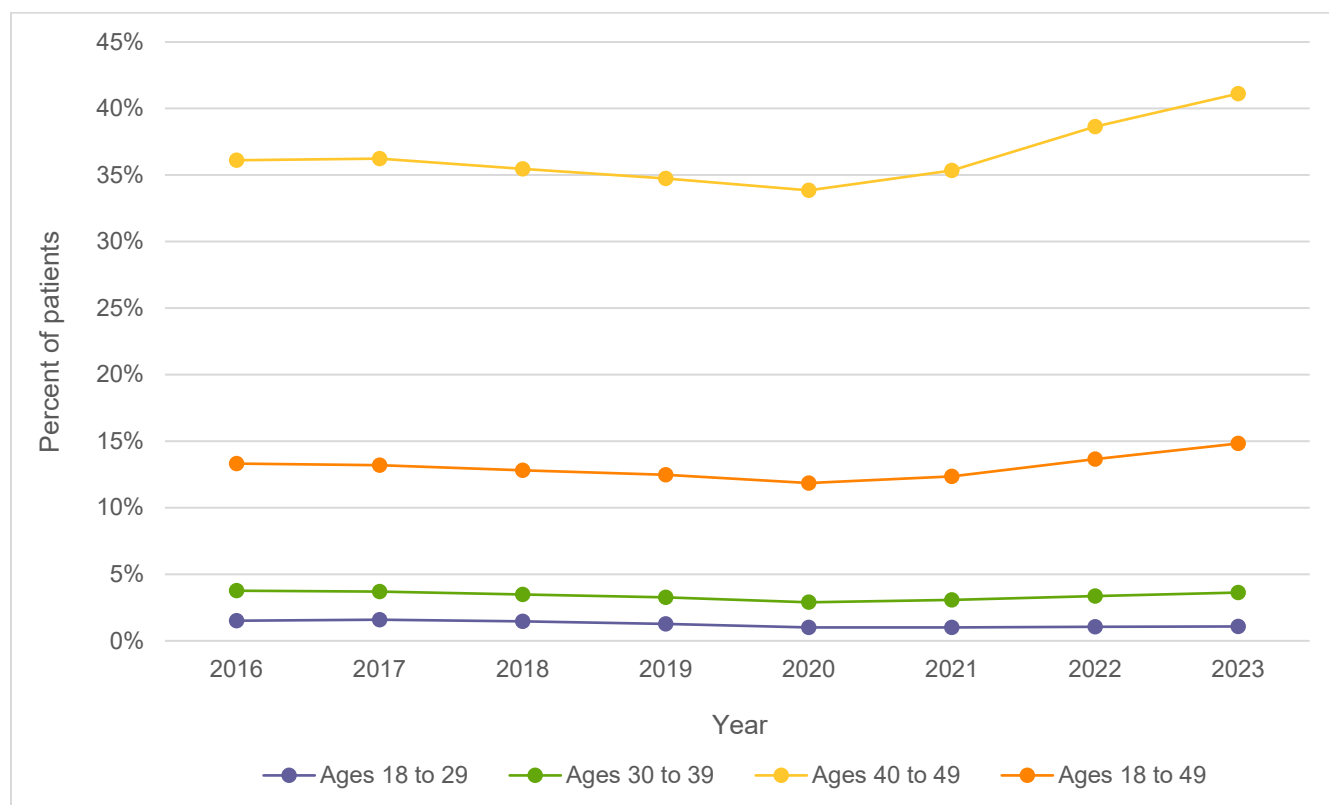
## Cancer Screening Utilization

The percentage of patients in the study aged 18 to 49 who received any kind of cancer screening increased from 2016 to 2023 (figure 15). The largest increase was in the age group 40-49, which rose from 25.8 percent of patients in 2016 to 35.4 percent in 2023, a 36.9 percent increase. Despite the overall increase, the percentage of patients aged 18 to 49 receiving cancer screening declined from 2016 to 2020 and then began to rise in 2021. The sharpest rise was in the age group 40-49; this age group also had the highest percentage of patients receiving screening throughout the study period.



**Figure 15. Percent of patients aged 18 to 49 receiving screening for all cancers by age and year, 2016-2023**

From 2016 to 2023, the share of patients receiving breast cancer screenings, including mammograms, stayed under five percent in the age groups 18-29 and 30-39 (figure 16). In the age group 40-49, however, over 30 percent of patients received breast cancer screening during the same period, and even with declines from 2017 to 2020, the percentage of patients receiving screening in this age group increased from 36.1 percent in 2016 to 41.1 percent in 2023, a 13.9 percent rise. In 2015, the American Cancer Society began recommending women at average risk receive regular mammograms starting at age 45 and that women aged 40-44 should have the opportunity to receive screening mammography.<sup>28</sup> This could help explain the overall increase in the age group 40-49 during the study period. A newer guideline, released by the US Preventive Services Task Force in 2024,<sup>29</sup> recommends women start screening at age 40, suggesting the upward trend observed among 40-49-year-olds may continue.

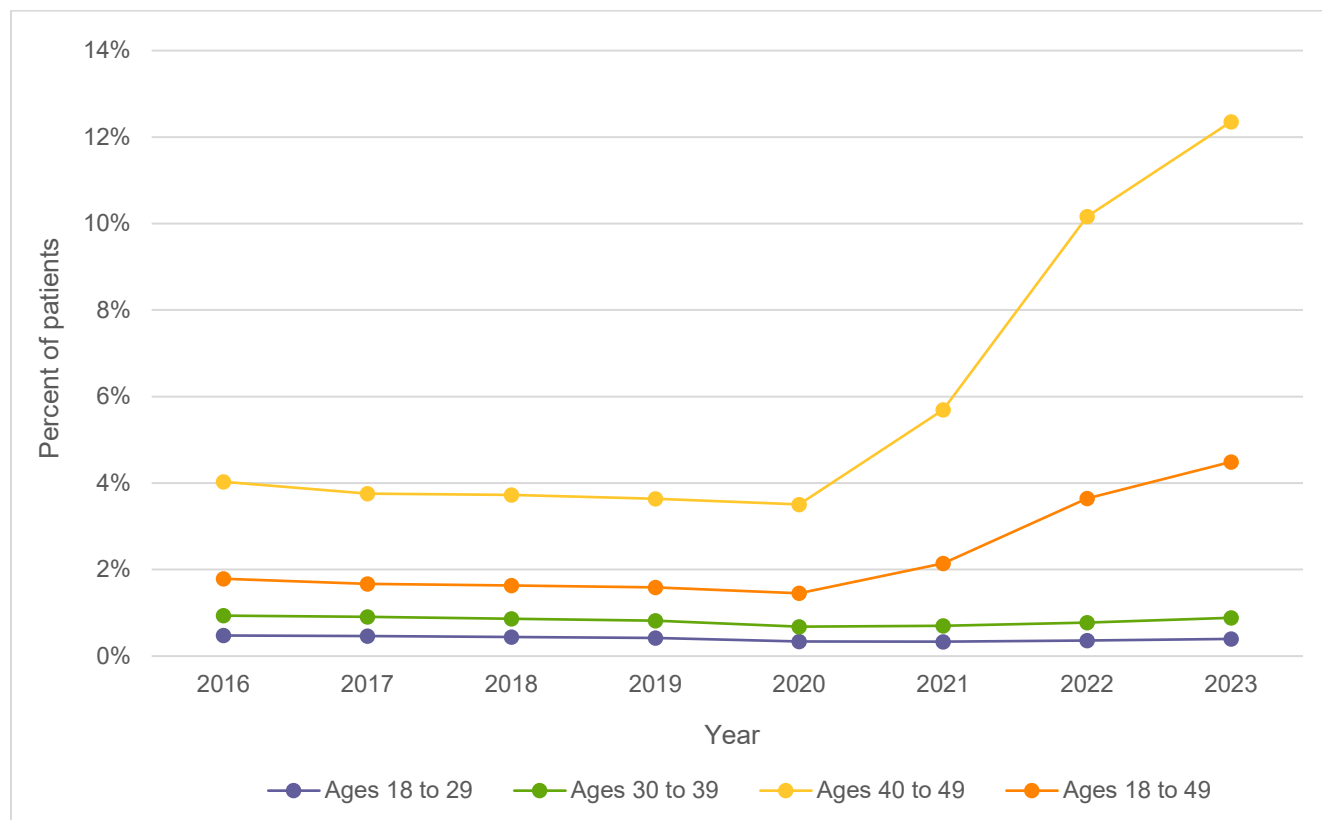


**Figure 16. Percent of patients aged 18 to 49 receiving mammography and other breast cancer screenings by age and year, 2016-2023**

<sup>28</sup> Kevin C. Oeffinger et al., “Breast Cancer Screening for Women at Average Risk: 2015 Guideline Update from the American Cancer Society,” *JAMA* 314, no. 15 (October 20, 2015): 1599-1614, <https://doi.org/10.1001/jama.2015.12783>.

<sup>29</sup> “Final Recommendation Statement: Breast Cancer: Screening,” US Preventive Services Task Force, April 30, 2024, <https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/breast-cancer-screening#fullrecommendationstart>.

More patients in the age group 40-49 received colon cancer screening, including colonoscopy, from 2016 to 2023 than the other age groups studied (figure 17). In addition, after declining from 2016 to 2020, the percentage of patients in that age group increased dramatically. Overall, the percentage of patients aged 40-49 receiving colon cancer screening rose from 4.0 percent in 2016 to 12.4 percent in 2023, a rise of 206.8 percent. The sharp increase, beginning in 2021, corresponds to the 2021 recommendation of the US Preventive Services Task Force that all adults aged 45 to 75 years old receive colorectal cancer screening<sup>30</sup> (previously, the recommendation was for those aged 50 to 75 years). In addition, a shift during the COVID-19 pandemic toward stool-based tests to detect colon cancer,<sup>31</sup> which require more frequent screenings than colonoscopies,<sup>32</sup> could also help explain the rise.



**Figure 17. Percent of patients aged 18 to 49 receiving colonoscopy and other colon cancer screenings by age and year, 2016-2023**

<sup>30</sup> US Preventive Services Task Force, “Screening for Colorectal Cancer US Preventive Services Task Force Recommendation Statement,” *JAMA* 325, no. 19 (May 18, 2021): 1965077, <https://doi.org/10.1001/jama.2021.6238>.

<sup>31</sup> Eric A. Miller and Paul F. Pinsky, “Changes in Uptake of Stool-Based Colorectal Cancer Screening during the COVID-19 Pandemic,” *Cancer Causes & Control* 34, no. 10 (June 13, 2023): 887-95, <https://doi.org/10.1007/s10552-023-01733-8>.

<sup>32</sup> “Screening for Colorectal Cancer,” CDC, October 17, 2024, <https://www.cdc.gov/colorectal-cancer/screening/index.html>.

## Provider Specialties

Consistent with trends in more nonphysicians treating patients for primary care,<sup>33</sup> eating disorders,<sup>34</sup> mental health conditions<sup>35</sup> and giving birth,<sup>36</sup> as reported in previous FAIR Health studies, more nonphysician provider specialties treated younger adults with cancer in 2023 than in 2019. Table 9 shows how three nonphysician specialties—nurse practitioner, physician assistant and student in a healthcare training program<sup>37</sup>—increased in their percentage of claim lines associated with patients aged 18 to 49 with a cancer diagnosis during the five-year period 2019-2023. The percentage of claim lines for the nurse practitioner specialty increased from 2.03 percent in 2019 to 3.31 percent in 2023, a 63.1 percent increase. For the physician assistant specialty, the increase was 69.6 percent, and for the student in a healthcare training program, the increase in percentage of claim lines was 140.8 percent.

**Table 9. Nonphysician specialties by percent of claim lines for patients aged 18 to 49 with a cancer diagnosis, 2019-2023**

Description	Percent of Claim Lines with a Cancer Diagnosis					Percent Change 2019-2023
	2019	2020	2021	2022	2023	
Nurse Practitioner	2.03%	2.12%	2.47%	2.89%	3.31%	63.1%
Physician Assistant	0.99%	1.15%	1.28%	1.47%	1.67%	69.6%
Student in a Healthcare Training Program	0.16%	0.17%	0.20%	0.28%	0.38%	140.8%

<sup>33</sup> FAIR Health, *A Window into Primary Care: An Analysis of Private Healthcare Claims*, A FAIR Health White Paper, March 15, 2023, <https://s3.amazonaws.com/media2.fairhealth.org/whitepaper/asset/A%20Window%20into%20Primary%20Care%20-%20FAIR%20Health%20White%20Paper.pdf>.

<sup>34</sup> FAIR Health, *Spotlight on Eating Disorders: An Analysis of Private Healthcare Claims*, A FAIR Health White Paper, November 15, 2023, <https://s3.amazonaws.com/media2.fairhealth.org/whitepaper/asset/Spotlight%20on%20Eating%20Disorders%20-%20FAIR%20Health%20White%20Paper.pdf>.

<sup>35</sup> FAIR Health, *Trends in Mental Health Conditions: An Analysis of Private Healthcare Claims*, A FAIR Health White Paper, April 29, 2024, <https://s3.amazonaws.com/media2.fairhealth.org/whitepaper/asset/Trends%20in%20Mental%20Health%20Conditions%20-%20FAIR%20Health%20White%20Paper.pdf>.

<sup>36</sup> FAIR Health, *Giving Birth in the United States: A Study of Commercial Claims*, A FAIR Health White Paper, September 9, 2024, [https://s3.amazonaws.com/media2.fairhealth.org/whitepaper/asset/Giving%20Birth%20in%20the%20United%20State%20-%20FAIR%20Health%20White%20Paper.pdf](https://s3.amazonaws.com/media2.fairhealth.org/whitepaper/asset/Giving%20Birth%20in%20the%20United%20States%20-%20FAIR%20Health%20White%20Paper.pdf).

<sup>37</sup> Students in a healthcare training program may include medical students, interns and residents, who are not fully licensed physicians.

## Conclusion

This study of cancer in adults aged 18 to 49 makes several noteworthy findings. From 2016 to 2023, cancer treatment rates overall decreased in this age group, but from 2020 to 2023 they increased. The greatest increase was in patients aged 18 to 29, followed by patients aged 40 to 49 and patients aged 30 to 39. Even in the period 2016-2023, the decline in cancer treatment rates was not uniform across cancers. For example, while the overall cancer treatment rate decreased 5.5 percent in patients aged 40 to 49 from 2016 to 2023, cancers of the digestive system increased 11.2 percent in that age group, and colorectal cancer increased 18.2 percent.

The five most common types of cancer in adults aged 18 to 49 in 2023 were those of the skin, breast, thyroid and other endocrine glands, digestive organs and female genital organs. Patients aged 18 to 49 with cancer had higher median allowed amounts and even higher average allowed amounts than patients in the same age group without cancer. In 2022, the three cancers with the largest total costs of services incurred by patients aged 18 to 49 with a cancer diagnosis (by median allowed amount) were cancers of the breast, respiratory and intrathoracic organs, and digestive organs. There was an especially marked difference in median versus average allowed amounts for two types of cancers in patients aged 18 to 49: leukemias and lymphomas. For leukemias, the average was 15 times higher than the median, and for lymphomas the average was almost eight times higher than the median.

Among patients aged 18 to 49, the age group 18-29 had the highest hepatitis B vaccine utilization from 2016 to 2022, but the age group 40-49 had the highest in 2023. Among patients aged 18 to 49, the largest increase in the percentage who received any kind of cancer screening from 2016 to 2023 was in the age group 40-49. The percentages of patients receiving breast cancer screening and colon cancer screening rose notably in that age group from 2016 to 2023.

The findings in this report have implications for stakeholders across the healthcare spectrum, especially patients aged 18 to 49. The study is also important for the providers who care for these patients, as well as payors and policy makers. In addition, FAIR Health hopes that these findings will be starting points for further research on cancer in younger adults in the United States.

## About FAIR Health

FAIR Health is a national, independent nonprofit organization dedicated to bringing transparency to healthcare costs and health insurance information through data products, consumer resources and health systems research support. FAIR Health qualifies as a public charity under section 501(c)(3) of the federal tax code. FAIR Health possesses the nation's largest collection of commercial healthcare claims data, which includes over 49 billion claim records and is growing at a rate of over 3 billion claim records a year. FAIR Health licenses its commercial data and data products—including benchmark modules, data visualizations, custom analytics and market indices—to commercial insurers and self-insurers, employers, providers, hospitals and healthcare systems, government agencies, researchers and others. Certified by the Centers for Medicare & Medicaid Services (CMS) as a national Qualified Entity, FAIR Health also receives data representing the experience of all individuals enrolled in traditional Medicare Parts A, B and D, which accounts for a separate collection of over 49 billion claim records; FAIR Health includes among the commercial claims data in its database, data on Medicare Advantage enrollees. FAIR Health can produce insightful analytic reports and data products based on combined Medicare and commercial claims data for government, providers, payors and other authorized users. FAIR Health's free, award-winning, national consumer websites are [fairhealthconsumer.org](https://fairhealthconsumer.org) and [fairhealthconsumidor.org](https://fairhealthconsumidor.org). For more information on FAIR Health, visit [fairhealth.org](https://fairhealth.org).

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