MILLIMAN WHITE PAPER

Cancer screening utilization and costs by insurance segment

Commissioned by Delfi Diagnostics, Inc.

Kristin Niakan, MPH
Ketaki Nagarkar, DPT
Ellyn Russo, MS

Milliman

Delfi Diagnostics, Inc. engaged Milliman, Inc. to estimate the utilization of screening per 1,000 members, as well as the average allowed cost per member per month (PMPM) for screening for lung, breast, colorectal, and cervical cancer by insurance market segment. We analyzed Milliman's Consolidated Health Cost Guidelines™ Sources Database (CHSD) to summarize calendar years 2021 and 2022 data for the commercial, managed Medicaid, and Medicare Advantage insurance market segments. For traditional Medicare, also known as Medicare fee-for-service (FFS), we used calendar year 2021 data from the Centers for Medicare and Medicaid Services (CMS) Standard Analytical Files 5% sample. The screening utilization and allowed cost PMPMs are summarized in Figure 1 by cancer screening type. Allowed cost PMPMs reflect the entire population and are not limited to the population who received screening.

FIGURE 1: SCREENING UTILIZATION AND ALLOWED COST PER MEMBER PER MONTH (PMPM), 2021 AND 2022

	2021		2022	
LUNG CANCER SCREENING (SMOKING DIAGNOSIS REQUIRED*)				
INSURANCE SEGMENT	UTILIZATION PER 1,000 MEMBERS	ALLOWED PMPM	UTILIZATION PER 1,000 MEMBERS	ALLOWED PMPM
Commercial	2.61 (2.29)	$0.07 ($0.06)	3.44 (3.06)	$0.10 ($0.08)
Managed Medicaid	2.52 (2.24)	$0.03 ($0.02)	3.06 (2.82)	$0.04 ($0.03)
Medicare Advantage	17.79 (16.21)	$0.23 ($0.20)	21.63 (20.39)	$0.31 ($0.27)
Medicare FFS	6.13 (5.90)	$0.07 ($0.07)	N/A	N/A
BREAST CANCER SCREENING				
INSURANCE SEGMENT	UTILIZATION PER 1,000 MEMBERS	ALLOWED PMPM	UTILIZATION PER 1,000 MEMBERS	ALLOWED PMPM
Commercial	105.03	$3.06	107.74	$3.24
Managed Medicaid	31.90	$0.43	30.01	$0.41
Medicare Advantage	216.08	$3.29	216.59	$3.38
Medicare FFS	95.40	$1.41	N/A	N/A
COLORECTAL CANCER SCREENING				
INSURANCE SEGMENT	UTILIZATION PER 1,000 MEMBERS	ALLOWED PMPM	UTILIZATION PER 1,000 MEMBERS	ALLOWED PMPM
Commercial	52.22	$4.55	58.93	$5.58
Managed Medicaid	16.50	$0.62	17.31	$0.71
Medicare Advantage	58.51	$1.77	59.81	$1.99
Medicare FFS	29.46	$0.80	N/A	N/A
CERVICAL CANCER SCREENING				
INSURANCE SEGMENT	UTILIZATION PER 1,000 MEMBERS	ALLOWED PMPM	UTILIZATION PER 1,000 MEMBERS	ALLOWED PMPM
Commercial	108.18	$0.53	103.40	$0.51
Managed Medicaid	45.53	$0.17	42.74	$0.16
Medicare Advantage	25.85	$0.12	22.99	$0.10
Medicare FFS	21.52	$0.09	N/A	N/A

* Lung cancer screening per 1,000 members and average allowed PMPM for lung cancer screening when limited to individuals with a diagnosis code indicating smoking dependence or history of dependence, as defined by CMS. See the Methodology and Assumptions section below for additional details.

Results

ESTIMATED UTILIZATION AND COST OF CANCER SCREENING

Lung cancer screening

- Medicare Advantage has the highest screening per 1,000 members, at approximately 18 and 22 per 1,000 in 2021 and 2022, respectively. This was approximately seven times the utilization rate of commercial and managed Medicaid in both 2021 and 2022, which is expected given the U.S. Preventive Services Task Force (USPSTF) minimum age recommendation of 50 years for this screening.[1]
- Lung cancer screening had the lowest utilization rate compared to all other cancer screenings included in the analysis in 2021 and 2022; yet it experienced the largest year-over-year percentage increase for utilization and average allowed PMPM across all the cancer screenings included in the analysis.
- Lung cancer screening had the lowest average allowed PMPM compared to all other cancer screenings. This is expected as PMPM is a function of the utilization of the service, and lung cancer likely has the fewest number of individuals who meet the USPSTF screening recommendation based on age (and smoking history for Medicare FFS) and cost of service.[2] The only exception was for the Medicare Advantage population, which had a lower average allowed PMPM for cervical cancer screening in both years.

Breast cancer screening

- Medicare Advantage has the highest breast cancer screening utilization rate at approximately 216 per 1,000 members in both 2021 and 2022. The Medicare Advantage population had a screening utilization rate that was more than two times higher than the Medicare FFS population in 2021.
- Breast cancer screening contributed to the highest average allowed PMPM for the Medicare Advantage population compared to the other cancer screenings included in the analysis in both years.
- The managed Medicaid population has the lowest screening utilization rate, which is expected due to the low proportion of individuals covered by Medicaid and of the USPSTF recommended age of 50 years to start for this screening.[3]

Colorectal cancer screening

- The Medicare Advantage and commercial populations had fairly similar screening utilization rates, at approximately 60 per 1,000 and 59 per 1,000, respectively, in 2022. Despite the similar screening utilization rates, colorectal cancer screening had a much higher average allowed PMPM in the commercial insurance segment.
- Colorectal cancer screening in the commercial insurance segment was the highest average allowed PMPM across all insurance segments and all cancer screenings included in the analysis at $4.55 PMPM and $5.58 PMPM in 2021 and 2022, respectively. The increase in colorectal cancer screening utilization rate and average allowed PMPM is examined further in the Discussion section below.

Cervical cancer screening

- The commercial population had the highest utilization rate of cervical cancer screening in 2021 and 2022.
- Cervical cancer screening was the only cancer screening analyzed that decreased in utilization and average annual PMPM across all insurance segments included in the analysis.

Observations by insurance segment

- Medicare Advantage had higher screening per 1,000 members rates than Medicare FFS for all four types of cancer. Explanations for these differences were beyond the scope of this analysis, but may include the difference in population characteristics, reimbursement arrangements leveraged by the programs, and initiatives implemented by Medicare Advantage plans to promote screenings.
- Managed Medicaid has the lowest screening per 1,000 members of all other insurance segments for lung, breast, and colorectal cancer. The average age of the managed Medicaid population included in our analysis was 26 years old. Cervical cancer screening was the only screening included in the analysis for which managed Medicaid did not have the lowest utilization rate. This is expected, as the recommended age for cervical cancer screening is much lower than the other cancer screenings studied.

[1] U.S. Preventive Services Task Force. A & B Recommendations. Retrieved November 29, 2023, from https://uspreventiveservicestaskforce.org/uspstf/recommendation-topics/uspstf-a-and-b-recommendations.
[2] Ibid.
[3] Ibid.

AGE- AND GENDER-ADJUSTED SCREENING UTILIZATION

We also calculated the screening utilization rates for each insurance segment age-adjusted and gender-adjusted to the U.S. general population, which is summarized in Figure 2. These age- and gender-adjusted results reflect the screening per 1,000 members if each population had the same age and gender distribution as the U.S. general population.

FIGURE 2: AGE- AND GENDER-ADJUSTED SCREENING UTILIZATION PER 1,000 MEMBERS, 2021

		2021		
INSURANCE SEGMENT	LUNG CANCER*	BREAST CANCER	COLORECTAL	CERVICAL
Commercial	2.50	91.80	48.79	91.28
Managed Medicaid	4.38	48.90	29.33	48.21
Medicare Advantage	9.80	142.26	31.49	41.24
Medicare FFS	2.62	36.37	11.60	25.73
		2022		
INSURANCE SEGMENT	LUNG CANCER*	BREAST CANCER	COLORECTAL	CERVICAL
Commercial	3.12	94.27	53.94	86.61
Managed Medicaid	5.56	47.68	31.83	44.85
Medicare Advantage	12.62	119.04	38.11	35.15

* Lung cancer screenings per 1,000 is limited to individuals with a diagnosis code indicating smoking dependence or history of dependence, as defined by CMS. See the Methodology and Assumptions section below for additional details.

Age- and gender-adjusted results address the differences in the distribution of members in the data source analyzed (CHSD) to the U.S. general population. For example, the managed Medicaid age- and gender-adjusted screening utilization rates for colorectal cancer are higher than the unadjusted screening utilization rates because the Milliman managed Medicaid population is younger than the U.S. general population (see Appendix B for the age and gender distributions).

While Medicaid had the lowest screening utilization rate for lung, breast, and colorectal cancer in the non-adjusted results, once adjusted for age and gender, Medicaid no longer has the lowest rates for these cancer types in 2021. On the other hand, Medicare FFS has the lowest cancer screening utilization rates once adjusted for age and gender. Once adjusted for age and gender, colorectal and cervical cancer had the highest screening utilization rates in the commercial market, while lung and breast cancer screening had the highest utilization in the Medicare Advantage insurance segment in 2021.

Background

CANCER SCREENING COVERAGE

Under the Social Security Act, CMS may cover preventive services through the Medicare national coverage determination (NCD) process. Preventive services must meet the following criteria:

- Reasonable and necessary for the prevention or early detection of illness or disability
- Recommended with a grade of A or B by the USPSTF[4]
- Appropriate for individuals entitled to benefits under Part A or enrolled under Part B

As such, CMS has highly specific coverage criteria that applies to cancer screening. For Medicare claims, we summarized data for Current Procedural Terminology (CPT) and Healthcare Common Procedure Coding System (HCPCS) codes that align with the CMS billing and coding guides for each cancer screening type. Figure 3 outlines the current USPSTF grade A and B cancer screening recommendations. Additional details on CPT and HCPCS codes included in the analysis can be found in the Methodology and Assumptions section below.

FIGURE 3: CURRENT USPSTF GRADE A AND B CANCER SCREENING RECOMMENDATIONS[5]

1. **Lung:** The USPSTF recommends annual screening for lung cancer with low-dose computed tomography (LDCT) in adults aged 50 to 80 years who have a 20-pack per year smoking history and currently smoke or have quit within the past 15 years. Screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery (Grade B, March 2021).
2. **Breast:** The USPSTF recommends biennial screening mammography for women aged 50 to 74 years (Grade B, January 2016).
3. **Colorectal:** The USPSTF recommends screening for colorectal cancer in all adults aged 50 to 75 years (Grade A). The USPSTF recommends screening for colorectal cancer in adults aged 45 to 49 years (Grade B, May 2021).
4. **Cervical:** The USPSTF recommends screening for cervical cancer every three years with cervical cytology alone in women aged 21 to 29 years. For women aged 30 to 65 years, the USPSTF recommends screening every three years with cervical cytology alone, every five years with high-risk human papillomavirus (hrHPV) testing alone, or every five years with hrHPV testing in combination with cytology (Grade A, August 2018).

Other insurance segments (i.e., commercial and managed Medicaid) may have less strict coverage criteria. While commercial payer rules vary, we included a broad list of cancer screening codes for the non-Medicare insurance segments. For a full list of the codes included in the analysis, please see Appendix A.

Please note that the annual screening utilization rates shown should not be used to estimate the portion of each population in compliance with screening recommendations, as these recommendations involve multiyear considerations, which were not accounted for in this analysis.

[4] Ibid.
[5] Ibid.

Methodology and Assumptions

DATA SOURCE

We analyzed Milliman's CHSD, which includes 60 million to 100 million lives annually, to summarize data for the commercial, managed Medicaid, and Medicare Advantage populations from 2021 to 2022. For the Medicare FFS summaries, we used data from the CMS Standard Analytical Files 5% sample, which includes claims and membership for a 5% sample of the Medicare FFS population. Data from the Medicare FFS 5% sample were only available through 2021. We limited our analysis to members who were continuously enrolled in each year.

CANCER SCREENING CODE IDENTIFICATION

As Medicare has highly specific coverage criteria that apply to cancer screening, we limited Medicare screening CPT and HCPCS codes to those outlined by CMS's billing and coding medical policies, which can be found in Figure 4.

FIGURE 4: MEDICARE CANCER SCREENING BILLING AND CODING SOURCES

CANCER SCREENING TYPE	BILLING AND CODING MEDICAL POLICY
Lung Cancer Screening ***ICD-10 codes indicating smoking dependence or history of dependence***	https://www.cms.gov/medicare-coverage-database/view/ncd.aspx?NCDId=364 *https://www.cms.gov/files/document/r11388cp.pdf*
Cervical Cancer Screening	https://www.cms.gov/medicare-coverage-database/view/ncd.aspx?NCDId=185 https://www.cms.gov/medicare-coverage-database/view/ncd.aspx?NCDId=365
Colorectal Cancer Screening	https://www.cms.gov/medicare-coverage-database/view/ncd.aspx?ncdid=281
Breast Cancer Screening	https://www.cms.gov/medicare-coverage-database/view/ncd.aspx?NCDId=186

Other insurance segments (i.e., commercial and managed Medicaid) may have less strict coverage criteria. While commercial payer rules vary, we used coverage guidelines from major payers to determine general coding practices for cancer screening. We included CPT and HCPCS codes that are covered by Medicare for the other insurance segments. We added an additional requirement for the CPT and HCPCS codes that are not covered by Medicare, as typically commercial payers will cover these other codes as screening when they have a relevant screening diagnosis coded listed on the claim, and compiled a list of relevant diagnosis codes based on the requirements of major payers. We referenced the Healthcare Effectiveness Data and Information Set (HEDIS) codes included in measures related to colorectal cancer, cervical cancer, and breast cancer screening in order to develop the universe of non-Medicare CPT and HCPCS cancer screening codes. A full list of CPT, HCPCS, and ICD-10 codes included in the analysis can be found in Appendix A.

AGE- AND GENDER-ADJUSTED RESULTS

In order to age-adjust and gender-adjust the screening utilization for each insurance segment, we used male and female distribution by age for 2021 and 2022 from the U.S. Census Bureau. We applied the age and gender distributions for each year from the U.S. Census Bureau to the prevalence of members with evidence of cancer screening for each insurance segment. The distribution by age range and gender for each population is outlined in Appendix B.

Discussion

IMPACT OF COVID-19

The COVID-19 pandemic impacted utilization of healthcare services, and some services were impacted for years after the start of the pandemic.[6,7] One study notes that, in 2021, about one in five adults missed or delayed medical care due to the COVID-19 pandemic.[7] In fact, the National Cancer Institute estimates that 9.4 million cancer screenings were forgone in 2020, likely due to the temporary closure of cancer screening facilities, staffing shortages, and patient hesitation to utilize nonemergency procedures during the pandemic.[8] While not a focus of this study, it is possible that the COVID-19 pandemic impacted cancer screening rates, therefore the average allowed PMPM is due in part to deferred care in 2020 creating increased demand in 2021 and beyond. Additionally, managed Medicaid experienced significant enrollment changes as a result of the COVID-19 public health emergency (PHE), which may have impacted trends in cancer screening.

CHANGES IN USPSTF RECOMMENDATIONS

In May 2021 the USPSTF updated its recommendation and lowered the recommended age of screening for colorectal cancer in adults aged 45 to 49 years, giving this recommendation a grade B.[9] By expanding the recommended population for colorectal cancer, we would expect to see an increase in the screening per 1,000 members and the average allowed PMPM for colorectal cancer screening, particularly in the non-Medicare insurance segments. In the commercial insurance segment, we observed a 13% increase in the screening per 1,000 members for colorectal cancer between 2021 and 2022, accompanied by a $1.03 (23%) increase in average allowed PMPM. The managed Medicaid population observed a 5% increase in screening per 1,000 members for colorectal cancer and a $0.09 (15%) increase in the average allowed PMPM.

Additionally, in 2021 the USPSTF expanded the recommended eligible population for lung cancer screening. The USPSTF expanded the eligible age to 50 to 80 years (previously 55 to 80 years), as well as decreased the pack-per-year history to 20 years of smoking history (previously 30 years). From 2021 to 2022 we observed an increase in screening per 1,000 members and average allowed PMPM for lung cancer screening across all insurance segments.

Although still in draft form as of October 2023, the USPSTF is considering expanding the age of biennial screening mammography for women to ages 40 to 74 years.

ADDITIONAL SOURCES OF CANCER SCREENING RECOMMENDATIONS

We mention above that managed Medicaid and commercial insurance segments may have less strict coverage criteria than Medicare. While Medicare coverage typically requires a USPSTF grade A or B recommendation, other insurance segments may follow different guidelines. For example, the American Cancer Society's breast cancer screening guidelines recommend women ages 40 to 44 should have the choice to start annual mammography, women ages 45 to 54 years should receive annual mammograms, and women ages 55 years and older should receive biennial screening mammography or continue with annual screening.[10]

ELIGIBLE POPULATION

The screening utilization rates by insurance segment should be considered along with the population eligible for each cancer screening, as well as the population mix in each market segment. For example, in 2020, 79% of the Medicaid population was under the age of 45 and therefore would not meet the USPSTF recommended screening criteria for lung, breast, or colorectal cancer based on age.[11] Medicaid also has a higher percentage of female enrollees, at 53%, so it is not surprising that cervical cancer screening utilization is

[6] Zhou, X., Andes, L.J., Rolka, D.B., & Imperatore, G. (2023). Changes in health care utilization among Medicare beneficiaries with diabetes two years into the COVID-19 pandemic. AJPM Focus;2(3):100117. Retrieved November 29, 2023, from https://www.ajpmfocus.org/article/S2773-0654(23)00054-8/fulltext.

[7] McGough, M., Amin, K., & Cox, C. (January 24, 2023). How has healthcare utilization changed since the pandemic? Peterson-KFF. Retrieved November 29, 2023, from https://www.healthsystemtracker.org/chart-collection/how-has-healthcare-utilization-changed-since-the-pandemic/#Physician%20encounters%20per%20member%20per%20month,%201st%20Quarter%202019%20-%203rd%20Quarter%202022.

[8] Wang L. (May 17, 2022). Working to close the cancer screening gap caused by COVID. NIH National Cancer Institute. Retrieved November 29, 2023, from https://www.cancer.gov/news-events/cancer-currents-blog/2022/covid-increasing-cancer-screening#:~:text=Cancer%20screening%20rates%20drastically%20dropped,back%20to%20pre%2Dpandemic%20levels.&text=As%20the%20coronavirus%20pandemic%20raged,the%20United%20States%20dropped%20dramatically.

[9] U.S. Preventive Services Task Force, A & B Recommendations, op cit.

[10] American Cancer Society. American Cancer Society guidelines for the early detection of cancer. Retrieved November 29, 2023, from https://www.cancer.org/cancer/screening/american-cancer-society-guidelines-for-the-early-detection-of-cancer.html#:~:text=Women%20ages%2040%20to%2044,or%20can%20continue%20yearly%20screening.

[11] Medicaid.gov. Who enrolls in Medicaid and CHIP? Retrieved November 29, 2023, from https://www.medicaid.gov/state-overviews/scorecard/who-enrolls-medicaid-chip/index.html.

higher in the managed Medicaid insurance segment. It is also useful to consider the frequency of recommended cancer screening when comparing utilization of cancer screenings among the difference cancer types—while breast cancer screening is recommended every other year for eligible women, colorectal cancer screening is recommended once every five to 10 years for the eligible population who do not have an increased risk of colorectal cancer, depending on the type of colorectal cancer screening.[12]

CAVEATS AND LIMITATIONS

The information in this white paper is intended to summarize results of an analysis to estimate cancer screening utilization and payer cost by insurance market segment. It is not intended, and should not be used, for any other purpose. This analysis was not designed to compare the effectiveness of cancer screening for the cancers studied.

Any reader must possess a certain level of expertise in areas relevant to this analysis to appreciate the significance of the assumptions and their impact on the illustrated results. The reader should be advised by professionals competent in these areas so as to properly interpret the results.

This analysis is subject to the limitations inherent in analysis of claims data (e.g., the potential for mis- or under-coding of diagnosis). In preparing this report, we relied on internal claims datasets. We accepted this information without audit but reviewed the information for general reasonableness. Our results and conclusions may not be appropriate if this information is not accurate.

[12] Centers for Disease Control and Prevention. Colorectal cancer screening tests. Retrieved November 29, 2023, from https://www.cdc.gov/cancer/colorectal/basic_info/screening/tests.htm#:~:text=How%20often%3A%20Every%2010%20years,increased%20risk%20of%20colorectal%20cancer.

APPENDIX A-1: LIST OF HCPCS AND CPT CODES USED TO IDENTIFY CANCER SCREENING

HCPCS / CPT CODE	CANCER SCREENING TYPE	COVERED BY MEDICARE	DIAGNOSIS CODE RESTRICTIONS*
71271	LUNG	YES	ANY DIAGNOSIS**
G0296	LUNG	YES	ANY DIAGNOSIS**
G0297	LUNG	YES	ANY DIAGNOSIS**
76376	BREAST	NO	LIMIT TO SPECIFIED DIAGNOSIS AND ONLY WHEN THERE IS AN MRI CODE BEING BILLED IN ADDITION TO 76376 AND 76377 ON THE SAME CLAIM
76377	BREAST	NO	LIMIT TO SPECIFIED DIAGNOSIS AND ONLY WHEN THERE IS AN MRI CODE BEING BILLED IN ADDITION TO 76376 AND 76377 ON THE SAME CLAIM
77046	BREAST	NO	LIMIT TO SPECIFIC DIAGNOSIS ON PROCEDURE CLAIM
77047	BREAST	NO	LIMIT TO SPECIFIC DIAGNOSIS ON PROCEDURE CLAIM
77048	BREAST	NO	LIMIT TO SPECIFIC DIAGNOSIS ON PROCEDURE CLAIM
77049	BREAST	NO	LIMIT TO SPECIFIC DIAGNOSIS ON PROCEDURE CLAIM
77051	BREAST	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
77052	BREAST	YES	ANY DIAGNOSIS
77061	BREAST	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
77062	BREAST	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
77063	BREAST	YES	ANY DIAGNOSIS
77065	BREAST	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
77066	BREAST	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
77067	BREAST	YES	ANY DIAGNOSIS
0633T	BREAST	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
0634T	BREAST	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
0635T	BREAST	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
0636T	BREAST	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
0637T	BREAST	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
0638T	BREAST	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
C8903	BREAST	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
C8905	BREAST	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
C8906	BREAST	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
C8908	BREAST	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
87624	CERVICAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
88141	CERVICAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
88142	CERVICAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
88143	CERVICAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
88147	CERVICAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
88148	CERVICAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
88150	CERVICAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
88152	CERVICAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
88153	CERVICAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
88164	CERVICAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM

HCPCS / CPT CODE	CANCER SCREENING TYPE	COVERED BY MEDICARE	DIAGNOSIS CODE RESTRICTIONS*
88165	CERVICAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
88166	CERVICAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
88167	CERVICAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
88174	CERVICAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
88175	CERVICAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
98625	CERVICAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
0500T	CERVICAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
G0101	CERVICAL	YES	ANY DIAGNOSIS
G0123	CERVICAL	YES	ANY DIAGNOSIS
G0124	CERVICAL	YES	ANY DIAGNOSIS
G0141	CERVICAL	YES	ANY DIAGNOSIS
G0143	CERVICAL	YES	ANY DIAGNOSIS
G0144	CERVICAL	YES	ANY DIAGNOSIS
G0145	CERVICAL	YES	ANY DIAGNOSIS
G0147	CERVICAL	YES	ANY DIAGNOSIS
G0148	CERVICAL	YES	ANY DIAGNOSIS
G0476	CERVICAL	YES	ANY DIAGNOSIS
P3000	CERVICAL	YES	ANY DIAGNOSIS
P3001	CERVICAL	YES	ANY DIAGNOSIS
Q0091	CERVICAL	YES	ANY DIAGNOSIS
00812	COLORECTAL	NO	ANY DIAGNOSIS
44388	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
44389	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
44392	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
44394	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
45330	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
45331	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
45333	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
45338	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
45340	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
45341	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
45346	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
45378	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
45380	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
45381	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
45384	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
45385	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
45388	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
45390	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
45391	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
45392	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
45393	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM

HCPCS / CPT CODE	CANCER SCREENING TYPE	COVERED BY MEDICARE	DIAGNOSIS CODE RESTRICTIONS*
74263	COLORECTAL	NO	ANY DIAGNOSIS
74270	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
74280	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
81528	COLORECTAL	YES	ANY DIAGNOSIS
82270	COLORECTAL	YES	ANY DIAGNOSIS
82274	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
88305	COLORECTAL	NO	LIMIT TO SPECIFIED DIAGNOSIS ON PROCEDURE CLAIM
G0104	COLORECTAL	YES	ANY DIAGNOSIS
G0105	COLORECTAL	YES	ANY DIAGNOSIS
G0106	COLORECTAL	YES	ANY DIAGNOSIS
G0120	COLORECTAL	YES	ANY DIAGNOSIS
G0121	COLORECTAL	YES	ANY DIAGNOSIS
G0122	COLORECTAL	NO	ANY DIAGNOSIS
G0327	COLORECTAL	YES	ANY DIAGNOSIS
G0328	COLORECTAL	YES	ANY DIAGNOSIS
S0285	COLORECTAL	NO	ANY DIAGNOSIS

* Refer to ICD-10 diagnosis codes in Appendix A-2.
** Lung cancer screening results in Figure 1 above that include a smoking diagnosis require an ICD-10 diagnosis code in Appendix A-3.

APPENDIX A-2: DIAGNOSIS CODES THAT INDICATE CANCER SCREENING

ICD-10-CM CODE	DESCRIPTION	CANCER SCREENING TYPE
Z0000	Encounter for general adult medical examination without abnormal findings	Breast, cervical, colorectal
Z0001	Encounter for general adult medical examination with abnormal findings	Breast, cervical, colorectal
Z01411	Encounter for gynecological examination (general) (routine) with abnormal findings	Cervical
Z01419	Encounter for gynecological examination (general) (routine) without abnormal findings	Cervical
Z0142	Encounter for cervical smear to confirm findings of recent normal smear following initial abnormal smear	Cervical
Z1151	Encounter for screening for human papillomavirus (HPV)	Cervical
Z1210	Encounter for screening for malignant neoplasm of intestinal tract, unspecified	Colorectal
Z1211	Encounter for screening for malignant neoplasm of colon	Colorectal
Z1212	Encounter for screening for malignant neoplasm of rectum	Colorectal
Z1213	Encounter for screening for malignant neoplasm of small intestine	Colorectal
Z1231	Encounter for screening mammogram for malignant neoplasm of breast	Breast
Z1239	Encounter for other screening for malignant neoplasm of breast	Breast
Z124	Encounter for screening for malignant neoplasm of cervix	Cervical
Z129	Encounter for screening for malignant neoplasm, site unspecified	Breast, cervical, colorectal
Z139	Encounter for screening, unspecified	Breast, cervical, colorectal
Z1501	Genetic susceptibility to malignant neoplasm of breast	Breast
Z803	Family history of malignant neoplasm of breast	Breast
Z8481	Family history of carrier of genetic disease	Breast
Z923	Personal history of irradiation	Breast

APPENDIX A-3: DIAGNOSIS CODES THAT INDICATE SMOKING DEPENDENCE OR SMOKING HISTORY

ICD-10-CM CODE	DESCRIPTION
Z87.891	Personal history of tobacco use/personal history of nicotine dependence
F17.210	Nicotine dependence, cigarettes, uncomplicated
F17.211	Nicotine dependence, cigarettes, in remission
F17.213	Nicotine dependence, cigarettes, with withdrawal
F17.218	Nicotine dependence, cigarettes, with other nicotine-induced disorders
F17.219	Nicotine dependence, cigarettes, with unspecified nicotine-induced disorders

APPENDIX B-1: DISTRIBUTION OF THE U.S. GENERAL POPULATION AND MILLIMAN CHSD INSURANCE SEGMENTS BY AGE RANGE AND GENDER, 2021

AGE RANGE (YEARS)	U.S. POPULATION		COMMERCIAL		MANAGED MEDICAID		MEDICARE ADVANTAGE		MEDICARE FEE-FOR-SERVICE	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
0 - 25	16.7%	15.9%	17.0%	16.4%	27.9%	28.8%	0.1%	0.1%	0.1%	0.1%
26 - 35	7.0%	6.7%	6.4%	6.7%	5.3%	8.2%	0.1%	0.1%	0.5%	0.4%
36 - 45	6.5%	6.3%	7.8%	8.2%	4.2%	6.1%	0.3%	0.3%	0.9%	0.8%
46 - 55	6.2%	6.1%	8.3%	8.8%	3.6%	4.4%	0.7%	0.9%	1.6%	1.6%
56 - 65	6.2%	6.5%	8.2%	8.7%	3.5%	4.0%	2.9%	3.4%	3.5%	3.6%
66 - 75	4.5%	5.1%	1.4%	1.3%	0.9%	1.4%	23.3%	27.7%	24.6%	28.0%
76 - 85	2.0%	2.6%	0.2%	0.2%	0.4%	0.8%	13.5%	16.7%	11.2%	14.3%
86+	0.6%	1.1%	0.1%	0.1%	0.1%	0.4%	3.6%	6.2%	3.1%	5.7%
Total	**49.7%**	**50.3%**	**49.5%**	**50.5%**	**45.9%**	**54.1%**	**44.6%**	**55.4%**	**45.5%**	**54.5%**

APPENDIX B-2: DISTRIBUTION OF THE U.S. GENERAL POPULATION AND MILLIMAN CHSD INSURANCE SEGMENTS BY AGE RANGE AND GENDER, 2022

AGE RANGE (YEARS)	U.S. POPULATION		COMMERCIAL		MANAGED MEDICAID		MEDICARE ADVANTAGE	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
0 - 25	16.7%	15.9%	16.2%	15.6%	31.2%	32.2%	0.1%	0.1%
26 - 35	7.0%	6.7%	6.2%	6.4%	6.0%	9.3%	0.1%	0.1%
36 - 45	6.5%	6.3%	7.6%	8.0%	4.8%	7.0%	0.3%	0.3%
46 - 55	6.2%	6.1%	7.9%	8.4%	3.9%	4.8%	0.7%	0.8%
56 - 65	6.2%	6.5%	7.9%	8.3%	3.8%	4.3%	2.7%	3.2%
66 - 75	4.5%	5.1%	1.4%	1.3%	1.1%	1.6%	23.6%	28.3%
76 - 85	2.0%	2.6%	0.2%	0.2%	0.4%	0.9%	13.8%	17.1%
86+	0.6%	1.1%	0.0%	0.1%	0.1%	0.4%	3.6%	6.0%
Total	**49.7%**	**50.3%**	**47.6%**	**48.3%**	**51.4%**	**60.4%**	**44.7%**	**55.9%**

Milliman

Milliman is among the world's largest providers of actuarial, risk management, and technology solutions. Our consulting and advanced analytics capabilities encompass healthcare, property & casualty insurance, life insurance and financial services, and employee benefits. Founded in 1947, Milliman is an independent firm with offices in major cities around the globe.

milliman.com

CONTACT

Ellyn Russo
ellyn.russo@milliman.com

Kristin Niakan
kristin.niakan@milliman.com