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Hutchinson Institute for Cancer Outcomes Research

# Community Cancer Care in Washington State

## Quality and Cost Report 2023

Fred Hutch Cancer Center

The Hutchinson Institute for Cancer Outcomes Research (HICOR®) developed the Community Cancer Care in Washington State: Quality and Cost Report 2023 to improve quality and lower costs in cancer care. HICOR is a scientific research institute based at Fred Hutchinson Cancer Center. HICOR's mission is to improve cancer prevention, detection and treatment in ways that will reduce the economic and human burden of cancer. The report promotes transparency by providing an analysis of quality measures linked to cost on selected indicators of care. HICOR hopes that the information in this report will facilitate the development of interventions aimed at improving care quality, reducing variability in care and lowering the costs of cancer care for patients and the health care system.



This work has been reviewed by the Institutional Review Boards of Fred Hutchinson Cancer Center and Washington state, and is covered by data use agreements with the Centers for Medicare & Medicaid Services, Premera Blue Cross, Cambia Health Solutions Inc., Washington State Healthcare Authority, State of Washington Department of Health, Washington State Cancer Registry and the Cancer Surveillance System.

**Rules of use**

Report data may not be used for clinic or payer advertising or marketing.

**Acknowledgments**

This report is a culmination of many years of collaboration with patients, providers, payers, researchers and guideline experts to define and measure value in cancer care. We would like to thank the individuals involved in HICOR's Value in Cancer Care (VCC) Working Groups, Patient and Caregiver Working Group, Data Methods Committee and Steering Committee for helping us achieve community alignment in our priorities and our methodologies for performance measurement.

We would like to sincerely thank Fred Hutchinson Cancer Center for funding this report.

**How to cite this report**

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Available at FredHutch.org/cancer-care-report

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# From the HICOR Directors

The Hutchinson Institute for Cancer Outcomes Research (HICOR) is pleased to release its fourth Community Cancer Care in Washington State: Quality and Cost Report for 2021. The new report provides updated findings for cost and quality metrics that we have reported since 2018. The metrics cross the spectrum of cancer care, from initial treatment to post-treatment surveillance to end of life care. The report was generated from a database that combines cancer registry and health insurance claims data for Washington state residents who have been diagnosed with cancer between 2015 and 2021.

In this report, we are excited to introduce several new metrics that focus on precision oncology and timeliness of care. The precision oncology metrics include tests that help doctors select treatments based on the genetic composition of the patient and their cancers. In addition to being recommended by our stakeholders, the precision oncology metrics listed in this report are included in national cancer guidelines. The timeliness of care metric measures the period between when the patient first saw their oncologist and when treatment was started. As the first step in metric development, the new measures are reported at the state-level to allow for community feedback before they are reported at a more granular level.

HICOR's goal in generating this report has always been to encourage practice and community level efforts to improve care.

In communicating this information, HICOR aims to reach several audiences:

- **Providers** who can use the information to improve quality and provide high value cancer care
- **Employers** that contribute to health insurance premiums and support their employees as they undergo cancer care
- **Public and private health insurers** that manage benefits and payments to providers on behalf of their members
- **The general public** who support social insurance programs (Medicare and Medicaid) through taxes and insurance premiums

Most of the metrics reported here are from the period immediately prior to the COVID-19 pandemic. As we consider future reports that include most of the care during the pandemic, we may adjust how we report our metrics to account for the profound impact of COVID-19 on cancer care delivery.

This report reflects a tremendous amount of input from many individuals, including patients, in our community. We are profoundly grateful for their support. As always, our hope is that the results shared here provide a foundation for ongoing community collaboration toward our mutual goal of high-quality cancer care at a reasonable cost for all patients in Washington state.

**Scott Ramsey, MD, PhD**
**Director**

**Veena Shankaran, MD**
**Co-Director**

# Contents

# Executive Summary

**The HICOR team is pleased to provide the fourth edition of our publicly accessible statewide report of clinic-level quality and cost measures for cancer care.** The report is designed to facilitate discussion among those who are most impacted by cancer care delivery – clinicians providing cancer care, insurance plan administrators and employer groups who purchase insurance, and patients and their families. We believe that public reporting is the first step towards the goal of high-quality cancer care at reasonable price for all Washingtonians by spurring collaboration, research, and innovation.

The Community Cancer Care Report includes metrics that are identified as meaningful and actionable by community leaders who pay for, provide, and receive cancer care. The information in this report is a selective view of a very complex world. Issues not addressed in this report — such as doctor-patient communication, respect for patient preferences and quality of life — are also critical aspects of cancer care. The metrics themselves are not intended to inform individual medical care decisions.

The results presented in this report draw from a patient-level database that links enrollment and claims records from commercial and public health insurance plans with clinical information from Washington state cancer registries. HICOR's linked database includes approximately 70 percent of all cancer patients who received care in Washington state between 2017 and 2019.

The report displays quality measures and associated costs across the spectrum of cancer care. The quality measures include recommended treatment immediately following diagnosis, emergency department and inpatient hospital admissions during treatment, appropriate use of surveillance testing for patients who have been treated with curative intent, and care for patients in the last 30 days of life. Where possible, we have aligned community input with recommendations and evidence- based guidelines from national organizations such as the National Comprehensive Cancer Network and the American Society of Clinical Oncology, and quality initiatives such as the Quality Oncology Practice Initiative.

The findings in the 2023 report are comparable to those HICOR has previously reported and remain stable over time. **Adherence to Recommended Treatments for Breast, Colorectal, and Lung Cancer** remains high. The **Hospitalization During Chemotherapy** metric continues to show that more than half of cancer patients have an emergency department visit or require hospitalization during their first six months of chemotherapy treatment. Finally, there is substantial variability in the clinic-level quality scores for the **hospitalization during chemotherapy** and **end of life care** metrics.

In this edition of the Community Cancer Care Report, we are introducing two new measures that are reported at the region level: biomarker testing and timeliness of care. Future versions of the report will expand on these new measures, potentially reporting results at a clinic-level, and move into the COVID-19 pandemic reporting period. HICOR invites community feedback on the new measures to ensure that they are well-constructed and meaningful. HICOR will continue to partner with the community to identify new metrics and provide context for how care changed during the pandemic.

The table on the next page provides an overview of our results.

# Executive Summary | Results

**Reporting Years: 2017-2019**

| | Measure Population | Regional Quality Average [Clinic-level Range[1]] | Summary Quality Score Range[2] | Regional Average Episode Cost Per Patient [Clinic-level Range[1]] |
|---|---|---|---|---|
| **Measure 1A: Recommended Treatment for Breast, Colorectal and Lung Cancer** | | | | |
| 1A.1: Recommended therapy based on cancer type | 2149 | 83.0% [78.4% to 89.1%] | -4.5% to 6.1% | $90,464 [$80,914 to $102,347] |
| **Measure 1B: Recommended Treatment for Breast Cancer** | | | | |
| 1B.1: Recommended therapy based on ER/PR and HER2 Status | 1095 | 87.9% [85.9% to 89.1%] | -1.9% to 1.3% | $98,912 [$83,401 to $112,645] |
| **Measure 2: Hospitalization During Chemotherapy** | | | | |
| 2.1: Emergency Department (ED) visits during chemotherapy | 7254 | 31.0% [26.1% to 35.2%] | -4.6% to 6.8% | $68,432 [$58,369 to $86,010] |
| 2.2 Inpatient (IP) stays during chemotherapy | 7254 | 35.4% [33.5% to 37.3%] | | |
| **Measure 3: Breast Cancer Tumor Marker Testing Following Treatment** | | | | |
| 3.1: Breast cancer tumor marker testing following treatment | 861 | 23.9% [2.8% to 46.7%] | -22.8% to 21.2% | $17,564 [$15,021 to $19,157] |
| **Measure 4: End of Life Care** | | | | |
| 4.1: Chemotherapy in the last 14 days of life | 8503 | 5.6% [3.8% to 10.9%] | -16.7% to 19.4% | $19,532 [$15,731 to $24,698] |
| 4.2: Multiple Emergency Department (ED) visits in the last 30 days of life | 8503 | 18.0% [16.1% to 19.6%] | | |
| 4.3: Intensive Care Unit (ICU) stay in the last 30 days of life | 8503 | 25.8% [13.5% to 40.9%] | | |
| 4.4: Hospice care 3 or more days prior to death | 8503 | 62.5% [57.3% to 66.8%] | | |
| **New Measures - State Level Reporting** | | | | |
| **Measure 5: Biomarker Testing for Metastatic Lung Cancer** | | | | |
| 5: Biomarker testing for metastatic lung cancer | 1076 | 88.8% | n/a | n/a |
| **Measure 6: Germline Testing** | | | | |
| 6.1: Germline testing for breast cancer | 1401 | 66.2% | n/a | n/a |
| 6.2: Germline testing for ovarian cancer | 470 | 54.9% | n/a | n/a |
| 6.3: Germline testing for pancreatic cancer | 765 | 15.4% | n/a | n/a |
| 6.4: Germline testing for prostate cancer | 842 | 6.3% | n/a | n/a |
| **Measure 7: Timeliness of Care** | | | | |
| 7: Time to start of treatment | 3237 | 34 days | n/a | n/a |

*[1] All metric quality and cost clinic-level ranges have been risk-standardized for patient factors and clinic size.*

*[2] The range represents clinic performance with zero as the regional average.*

# What's New

New features of the 2023 Community Cancer Care Report:

**Quality Measures for Cancer Patients with Medicaid Insurance**

Quality measures for Medicaid-insured enrollees were first reported in a 2020 supplement. In this report they are included within the sections for each quality measure. HICOR will continue to report Medicaid results at the state level, focusing on quality metrics only and not on episode costs. Because most oncology practices in Washington state care for a small number of Medicaid-insured patients, the number of patients per provider group are generally insufficient for meaningful inter-practice comparisons. More importantly, Medicaid-insured cancer patients face unique challenges, many beyond the control of the oncology clinics and providers who treat them. Our statewide results for Medicaid-insured cancer patients are intended to highlight system-wide issues that may be impacting performance and outcomes. We present a comparison of differences in quality metrics between the commercial-insured and Medicaid-insured patients under the age of 65. As a single insurer for low-income and vulnerable populations, Medicaid's coverage rules differ substantially from commercial insurers, making cost comparisons less relevant.

For demographic information on the population enrolled in Medicaid, please see Appendix A.

**New Measures**

As part of HICOR's ongoing collaboration with community partners, we are introducing three new cancer-care quality measures:

- Biomarker testing for metastatic lung cancer
- Germline testing for breast, ovarian, pancreatic and prostate cancer
- Timeliness of initial treatment

We selected these measures in consultation with our Steering Committee, and after feedback from experts, patients, and caregivers. We consider national guidelines in measure construction when available and follow best practices for measure development.

In line with HICOR's reporting methods, we are first presenting these metrics at the region level. Over time, as the measures are refined, our goal is to report these at the clinic-level alongside the other quality metrics.

**Methodology and Clinic Results by Year**

The methodology section and clinic results by year for each measure have been placed into separate documents. Please find these reports on HICOR's report page.

# How to Read and Interpret the Report

The report provides select indicators of cancer care quality and cost for 27 hospital systems and clinics in Washington state. Results for hospital systems and clinics are shown relative to the regional average.

### Interpreting the Results

- **The regional average for each quality measure is not a benchmark.** The regional average is included to provide a regional reference point when viewing individual clinic results. All graphs highlight clinics with scores that are 5% above or below the regional quality average. The 5% rate was chosen after consultation with the Value in Cancer Care Steering Committee.
- **Cost represents the total amount paid by the insurer to all health care providers over the episode of care relevant to the measure.** Cost includes payments for cancer-directed and non-cancer care. Cost reflects the amount of services provided and the payment per unit of service. Both payment levels and use of services vary from facility to facility.
- **The report does not provide medical advice on how to treat an individual patient.** No medical advice or conclusions about individual care should be drawn from this report. Patients with questions about their health care should contact their providers.
- **The results in this report should be accurately cited.** Users of the report should make precise statements about the results and acknowledge the difference between the regional and the clinic-level outcomes. Example statement: "Over half [52.7%] of cancer patients were either admitted to an emergency department or had a hospital inpatient stay in the six months following the initiation of chemotherapy." Clinic-level results have been risk standardized — that is, adjusted for clinic size and patient characteristics — to facilitate comparison across clinics. Example statement: "29.0% of patients at Clinic X had an emergency department visit during the first six months after the start of chemotherapy, after adjusting for clinic size and patient characteristics."
- **How to cite this document**: Hutchinson Institute for Cancer Outcomes Research. Community Cancer Care in Washington State: Quality and Cost Report 2023. © 2023 Fred Hutchinson Cancer Center, Seattle, WA.
- **The results in this report are intended to improve cancer patient care.** Specifically, report recipients are prohibited from negotiating contracts (without mutual agreement) or engaging in advertising or marketing based on the data shared in the report.

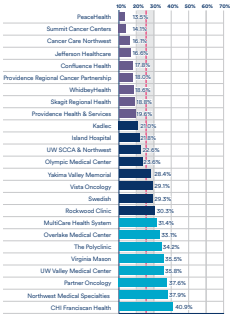
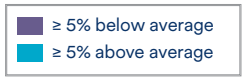
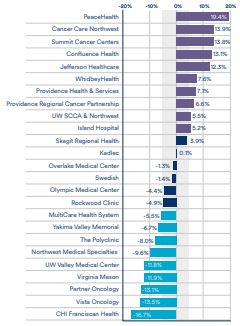
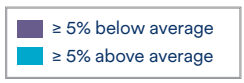
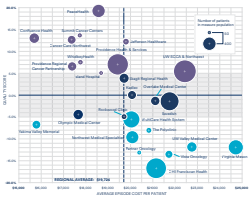
### Understanding the Results Section

Summary results are reported for four measures. Each measure combines the results of up to four individual metrics. For example, the Hospitalization During Chemotherapy measure uses two metrics: 1) Emergency department (ED) visits during chemotherapy and 2) Inpatient (IP) stays during chemotherapy. The table on page 9 describes the key features of the Results section.

### Understanding the Methodology

A table with individual metric definitions can be found in Appendix B. For complete methodology information please refer to the Community in Cancer Care in Washington State: Methodology 2023 report available at FredHutch.org/cancer-care-report. It summarizes the critical steps in metric construction, including the patient population, reporting years, metric specifications, patient attribution to clinics, standardizing individual quality metrics, standardizing costs and constructing a summary quality score.

# How to Read the Report

| ICON | ITEM | ITEM DESCRIPTION | EXAMPLE |
|---|---|---|---|
| | Lists the quality metrics in each measure. | This item is helpful for understanding what is being measured and reported. For more detailed metric definitions, see Appendix B. | **MEASURE 1A: RECOMMENDED TREATMENT FOR BREAST, COLORECTAL AND LUNG CANCER** |
| | **Risk-Standardized Rates of Individual Quality Metrics**<br>Scale: Measured 0 to 100% utilization.<br>Higher quality is always at the top of the figure. Text at the top of each risk-standardized rate indicates one of the following:<br>**Lower rates = higher quality**<br>or<br>**Higher rates = higher quality** | This item is helpful for understanding each clinic's results before combining into a summary quality score.<br>**Citing the results:** "26.1% of patients at Clinic X received recommended therapy based on cancer types, after adjusting for clinic size and patient characteristics."<br>The red line indicates the regional average. The grey shading to the right and left of the red line indicates 5% below and above the regional average. The teal bars indicate clinics that are greater than 5% below the regional average while the purple bars indicate clinics that are greater than 5% above the regional average.<br>Pay close attention to the numbers:<br>1. The difference between clinics can be small.<br>2. The scales may change. |  <br>  |
| | **Summary Quality Score**<br>The summary quality score combines individual clinic results into one quality score. Overall performance is reported relative to the regional average. | This item provides a more comprehensive picture of clinic quality within a care topic area.<br>**Citing the results:** "Clinic X's summary quality score was 2.4% points above the regional average."<br>The 0% line indicates the regional average for this care topic area. The grey shading to the right and left of the red line indicates 5% below and above the regional average. The teal bars indicate clinics that are greater than 5% below the regional average while the green bars indicate clinics that are greater than 5% above the regional average. |  <br>  |
| | **Summary Quality Score and Costs**<br>Displays the summary quality score on the y-axis and cost on the x-axis to facilitate a comparison of each clinic's quality score and costs. | This item is helpful in evaluating the relationship between quality and cost. The grey shading of the y-axis indicates clinics that fall within 5% above and below the summary quality score regional average. The size of the bubble is representative of the clinic size.<br>Pay close attention to the x-axis (cost) scale. The scale varies between graphs.` |  |
| | **Medicaid-Insured Population**<br>Displays the measure results comparing commercially- and Medicaid-insured populations. | Medicaid-insured patients face unique challenges to receiving high quality care. This item is helpful in evaluating that care at a state-wide level. |  |

# Results

MEASURE 1

# Recommended Cancer Treatment

Cancer patient outcomes are better when cancer care providers follow evidence-based recommendations for treatment. By measuring how well clinics follow recommendations for treating breast, colorectal and lung cancer, this measure provides insight into how well clinics follow cancer treatment recommendations overall.

Evidenced-based clinical practice guidelines, or standards of care, are available for the treatment of all major cancers. Guidelines encompass treatment that is intended to cure or control the cancer (depending on the stage of the disease). Treatments can include chemotherapy, surgery, radiation, immunotherapy, targeted therapy and hormone therapy, among others.

The recommended treatments that U.S. cancer care providers follow are typically those issued by professional organizations such as the American Society of Clinical Oncology (ASCO) and the National Comprehensive Cancer Network (NCCN). They reflect the consensus opinion of panels of clinicians and oncology researchers (and sometimes patient advocates), based on the most current data. They are frequently updated to reflect new data and clinical information.

This section of the report describes and displays metrics that summarize provider adherence to a number of recommended cancer treatments. The metrics measure adherence to treatment guidelines for breast cancer, colon and rectal cancer, and non-small cell lung cancer.

Note in prior years we also measured the use of anti-nausea medication for moderate- or high-emetic risk chemotherapy. Because adherence to this metric has been consistently and uniformly high for all clinics in the region over several years, this metric is no longer included in our report.

**Measure 1A** reports results on treatment adherence for breast, colorectal and lung cancers combined.

**Measure 1B** reports on treatment adherence for breast cancer.

Methodology information is available in Appendix B.

## MEASURE 1A: RECOMMENDED TREATMENT FOR BREAST, COLORECTAL AND LUNG CANCER

**Recommended therapy based on cancer type *Breast Cancer***

- Receipt of chemotherapy within 120 days of diagnosis for ER/PR negative patients (stage IC-III)
- Hormone therapy (tamoxifen or aromatase inhibitor) within 365 days of diagnosis for ER/PR positive patients (stage IC-III)
- Receipt of trastuzumab based on HER2 status (stage IC-III)

***Colorectal Cancer***

- Receipt of chemotherapy within 120 days of diagnosis for colon cancer patients (stage III)
- Receipt of chemotherapy within 270 days of diagnosis for rectal cancer patients (stage II-III)

***Non-Small Cell Lung Cancer***

- Receipt of chemotherapy within 60 days of surgery (stage II-IIIA)
- No bevacizumab use for metastatic tumors within three months of diagnosis

**Population:** Breast, colorectal and lung cancer patients undergoing cancer treatment

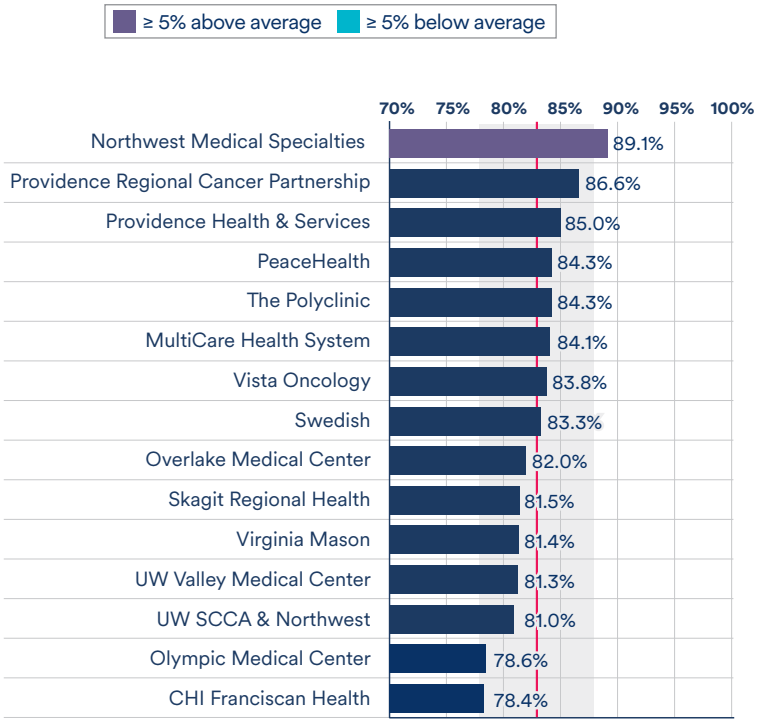
**Reporting Years:** 2017–2019

**Time Period:** The treatment period begins at the start of active treatment (surgery, chemotherapy or radiation therapy) and continues until there is a four-month gap in treatment. The period may end earlier if the patient died or treatment extended beyond 12 months.

# 1A: RECOMMENDED TREATMENT FOR BREAST, COLORECTAL AND LUNG CANCER

### Figure 1A.1: Recommended therapy based on cancer type

Risk-Standardized Rate | **Higher rate = higher quality**




**REGIONAL AVERAGE: 83.0%**

N=1997

RANGE: **78.4% to 89.1%**

## RESULTS (1A.1)

The **Recommended therapy** metric (1A.1) includes 1,997 patients.

On average, 83.0 percent of patients received recommended therapy based on cancer type. There is a 10.6 percentage point difference between the highest and the lowest clinic rate, suggesting a meaningful difference in receipt of recommended treatment among clinics. In general, patients are receiving appropriate therapy based on their cancer type.

## MEDICAID-INSURED POPULATION

| Measure | Tumor Site | Commercial | Medicaid | p-value |
|---|---|---|---|---|
| Recommended cancer treatment | Breast, lung, colorectal | 86% | 78% | <0.01 |

**RESULTS:** Commercially-insured patients with breast, lung, and colorectal cancer have high levels of receipt of recommended treatment than Medicaid-insured patients with these cancers.

**DISCUSSION:** While the receipt of recommended care is generally high across both payer types, the lower levels of adherence to initial recommended care among Medicaid enrollees could be due to several factors including transportation challenges, housing instability or severe financial difficulties. Note that this metric measures processes of care and not outcomes, and thus is not adjusted for factors that may be more prevalent in the Medicaid-insured population such as noncancer illnesses.

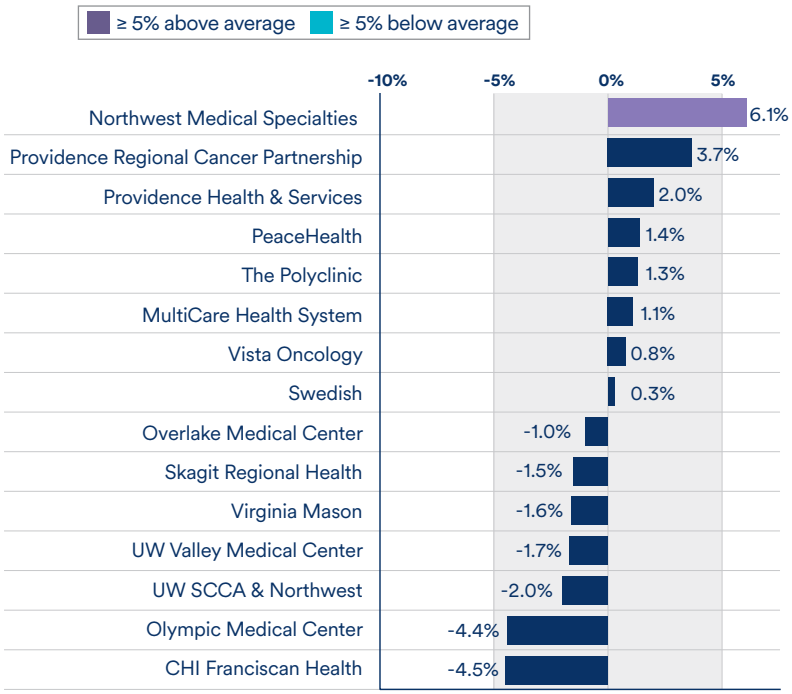
# 1A: RECOMMENDED TREATMENT FOR BREAST, COLORECTAL AND LUNG CANCER

## Figure 1A.2: Recommended treatment for breast, colorectal and lung cancer

**Summary Quality Score**

Positive score = better than the regional average

Negative score = below the regional average




**Zero represents clinic performance at the regional average**

RANGE: **-4.5% to 6.1%**

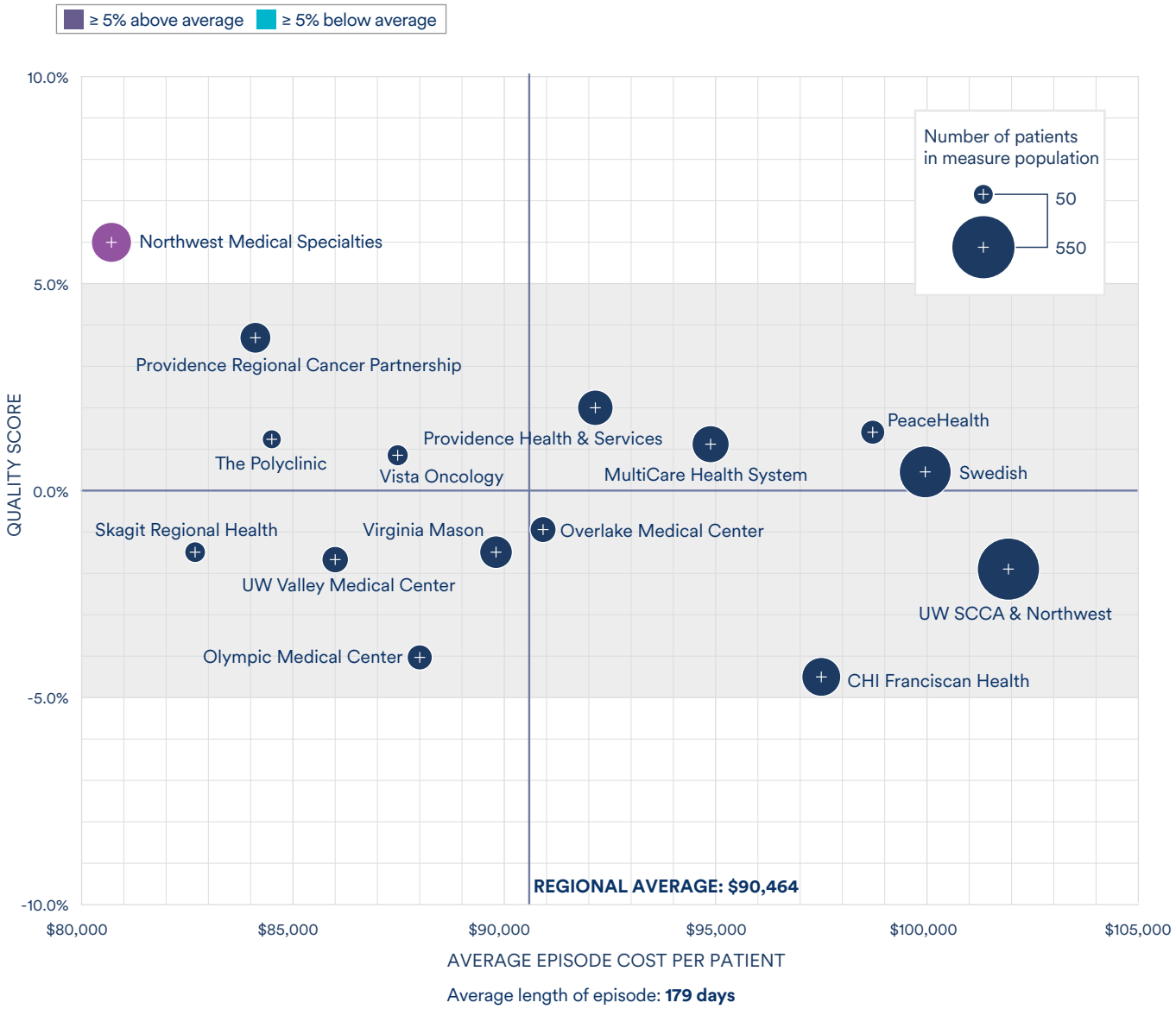
## RESULTS (1A.2)

The summary quality scores, indicating clinic performance relative to the regional average for both metrics, show a difference of 10.6 percentage points between the highest-performing clinic and lowest-performing clinic. The majority of the clinics are clustered around the regional average.

# 1A: RECOMMENDED TREATMENT FOR BREAST, COLORECTAL AND LUNG CANCER

## Figure 1A.3: Recommended treatment for breast, colorectal and lung cancer

Summary quality score and cost




Average length of episode: **179 days**

Summary Quality Score Range: **-4.5% to 6.1%**

Cost Range: **$80,914 to $102,347**

## RESULTS (1A.3)

The regional average for cost of care over the period is $90,464, with an average treatment episode length of 179 days. The cost range is $21,433 ($80,914 to $102,347). The quality score, indicating clinic performance relative to the regional average, show a difference of 10.6 percentage points between the highest-performing clinic and lowest-performing clinic — a meaningful difference. The majority of the clinics are clustered around the regional average for quality.

There is a negative relationship between episode cost and the quality score, suggesting that there may be an opportunity to lower costs without sacrificing quality.

MEASURE 1B

# Recommended Treatment for Breast Cancer

Breast cancer is the most common cancer in Washington state. As such, there were sufficient numbers of patients to analyze quality and cost information separately for breast cancer.

Methodology information is available in Appendix B.

## MEASURE 1B: RECOMMENDED TREATMENT FOR BREAST CANCER

**Recommended therapy based on ER/PR and HER2 status for breast cancer**

- Receipt of chemotherapy within 120 days of diagnosis for ER/PR negative patients
  (stage IC-III)
  - Hormone therapy (tamoxifen or aromatase inhibitor) within 365 days of diagnosis for ER/PR positive patients

    (stage IC-III)
- Receipt of trastuzumab based on HER2 status (stage IC-III)

**Anti-nausea medication during chemotherapy**

- Receipt of serotonin antagonist within seven days of moderate- or high-emetic risk chemotherapy

**Population**: Breast cancer patients undergoing cancer treatment

**Reporting Years**: 2017–2019

**Time Period:** The treatment period begins at the start of active treatment (surgery, chemotherapy or radiation therapy) and continues until there is a four-month gap in treatment. The period may end earlier if the patient died or treatment extended beyond 12 months.

## MEDICAID-INSURED POPULATION

| Measure | Tumor Site | Commercial | Medicaid | p-value |
|---|---|---|---|---|
| Recommended treatment for breast cancer | Breast | 87% | 75% | <0.01 |

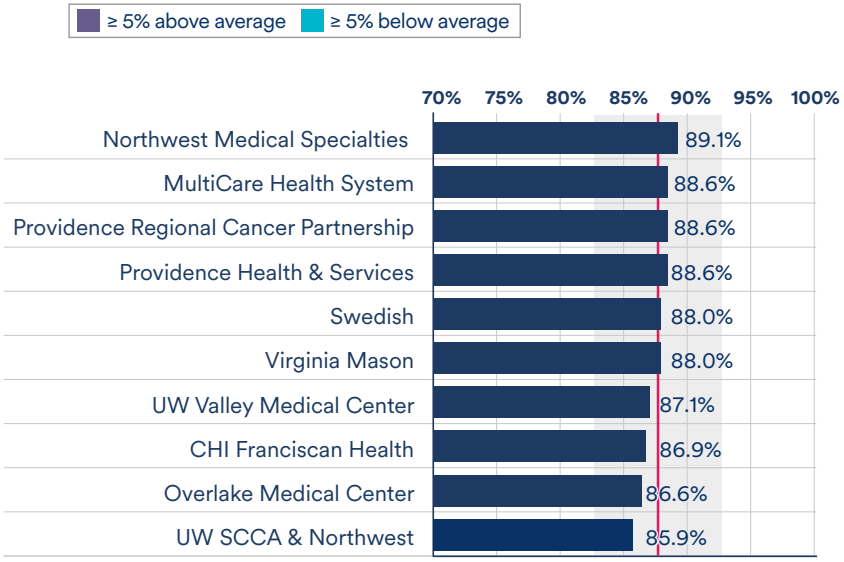
**RESULTS:** Commercially-insured patients with breast cancer have higher levels of receipt of recommended treatment than Medicaid-insured patients with breast cancer.

**DISCUSSION:** While the receipt of recommended care for breast cancer is generally high across both payer types, the lower levels of adherence to initial recommended care among Medicaid enrollees could be due to several factors including transportation challenges, housing instability or severe financial difficulties. Note that this metric measures processes of care and not outcomes, and thus is not adjusted for factors that may be more prevalent in the Medicaid-insured population such as noncancer illnesses.

# 1B: RECOMMENDED TREATMENT FOR BREAST

## Figure 1B.1: Recommended treatment for breast cancer

Risk-Standardized Rate | **Higher rate = higher quality**




**REGIONAL AVERAGE: 87.9%**

N=1170

RANGE: **85.9% to 89.1%**

## RESULTS (1B.1)

The **Recommended therapy** metric (1B.1) includes 1,170 patients.

On average, 87.9 percent of patients received recommended therapy for their breast cancer. There is a 3.2 percentage point difference between the highest and the lowest clinic rate, suggesting minimal difference in receipt of recommended treatment among clinics. In general, patients are receiving appropriate therapy based on their cancer type.

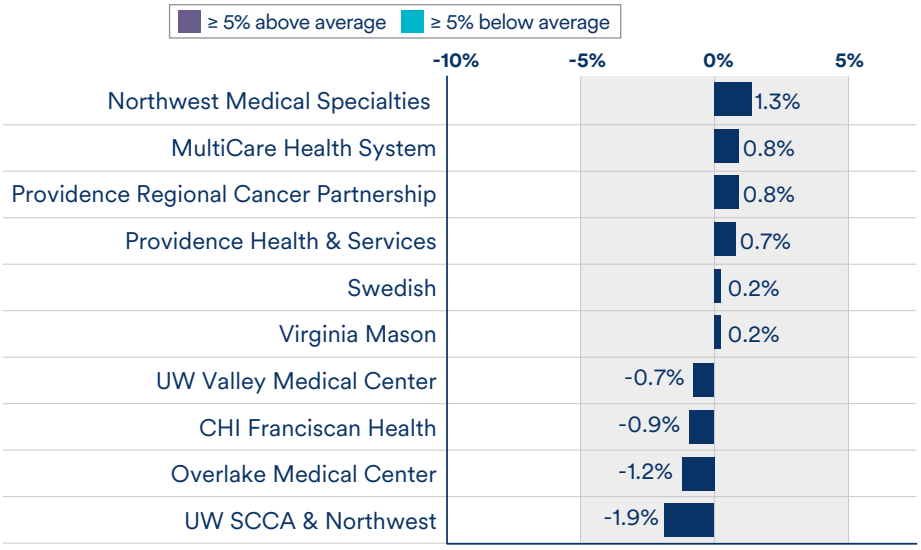
## 1B: RECOMMENDED TREATMENT FOR BREAST

### Figure 1B.2: Recommended treatment for breast cancer

**Summary Quality Score**

**Positive score = better than the regional average**

**Negative score = below the regional average**




**Zero represents clinic performance at the regional average**

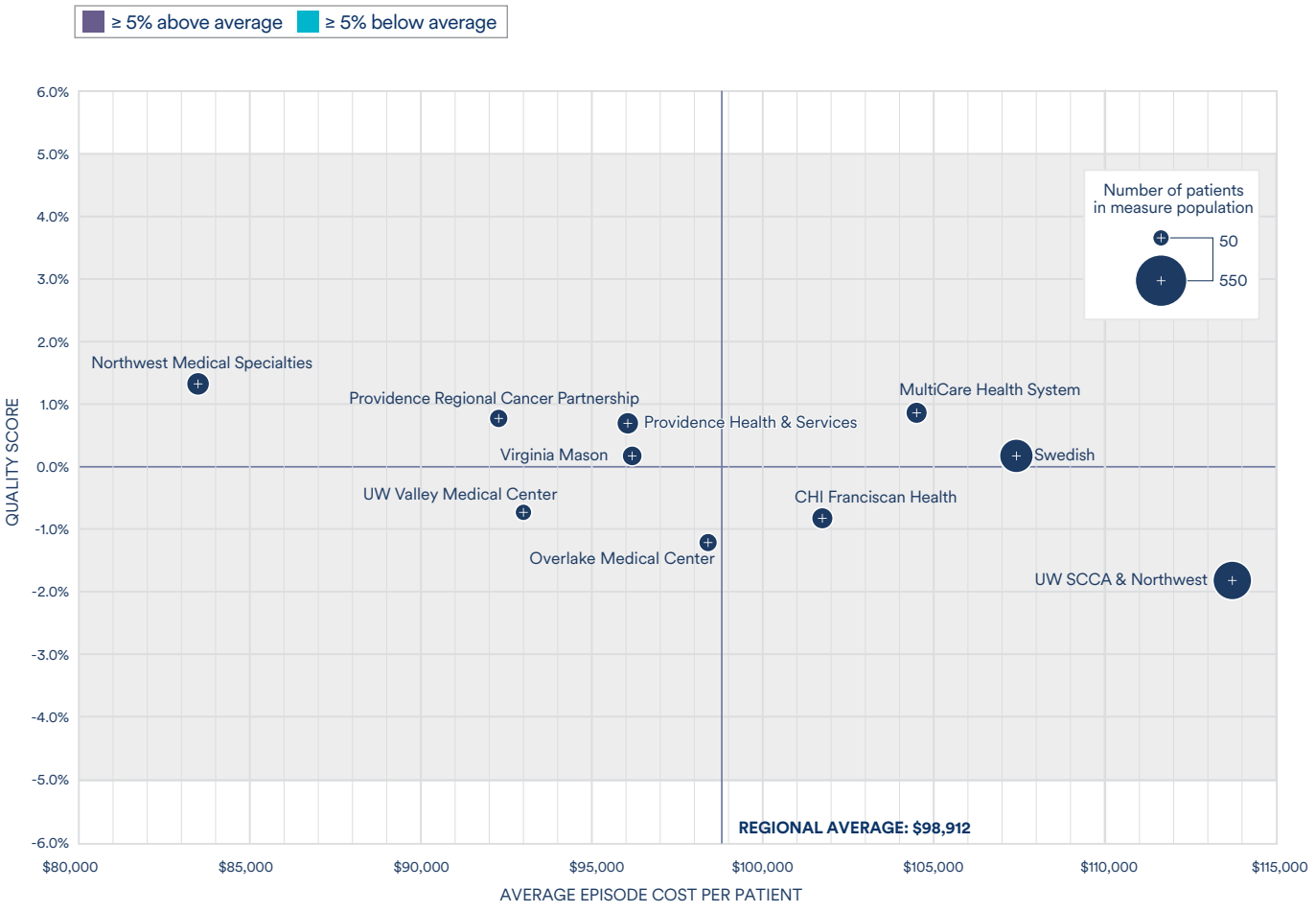
RANGE: **-1.9% to 1.3%**

### RESULTS (1B.2)

The summary quality scores, indicating clinic performance relative to the regional average for both metrics, show a difference of 3.2 percentage points between the highest-performing clinic and lowest-performing clinic. All clinics are clustered around the regional average.

## Figure 1B.3: Recommended treatment for breast

Summary quality score and cost




Average length of episode: **194 days**

Summary Quality Score Range: **-1.9% to 1.3%**

Cost Range: **$83,401 to $112,645**

## RESULTS (1B.3)

The regional average cost of care is $98,912, and the average treatment episode length is 194 days. The cost range is $29,243 ($83,401 to $112,645). There is no difference in quality measures among clinics, suggesting that there may be an opportunity to lower costs without sacrificing quality.

MEASURE 2

# Hospitalization During Chemotherapy

Hospitalization during chemotherapy includes visits to the emergency department or an inpatient hospital stay (excluding stays for cancer-directed surgeries) during the time that a patient receives chemotherapy. Cancer clinics that are the most successful at managing their patients' symptoms during chemotherapy will have the lowest rates of emergency department and hospital stays.

Many cancer patients who receive chemotherapy experience symptoms that require urgent attention, such as pain or nausea. Although cancer clinics often can manage these symptoms through telephone calls and urgent clinic visits, cancer patients often seek care in the emergency department (ED) instead of the cancer clinic. The reasons are many and can include limited clinic hours, lack of understanding of symptom self-management and lack of access to oncology-specific urgent care resources. Untreated symptoms may also lead to inpatient (IP) hospitalization. In a 2017 study, HICOR researchers demonstrated that nearly 50 percent of ED visits by cancer patients are for a potentially preventable cancer-related cause.[1]

The drawbacks of ED care for chemotherapy-related problems are numerous and can include long wait times in crowded and uncomfortable settings, lack of ED staff expertise in managing chemotherapy-related side effects, exposure to infections that can be dangerous to immune-compromised patients, and high costs. ED visits can disrupt the continuum of care received from oncology providers. If a patient's symptoms are severe or if clinicians cannot manage them during an ED visit, the patient may require admission to the hospital.

A lower rate of ED visits and IP admissions for patients undergoing chemotherapy is a marker of higher-quality care, suggesting better symptom management, better support services and better access to cancer clinic-based urgent care services.

Methodology information is available in Appendix B.

### MEASURE 2: HOSPITALIZATION DURING CHEMOTHERAPY

**Emergency department (ED) visits during chemotherapy**

- ED visit without subsequent inpatient admission within six months of first chemotherapy

**Inpatient (IP) stays during chemotherapy**

- Hospital IP admission for any reason within six months of first chemotherapy

**Population**: Cancer patients receiving chemotherapy

**Reporting Years:** 2017–2019

**Time Period**: Six months following the start of chemotherapy

## MEDICAID-INSURED POPULATION

| Measure | Tumor Site | Commercial | Medicaid | p-value |
|---|---|---|---|---|
| Emergency department visits during chemotherapy | All except leukemia | 23% | 39% | <0.01 |
| Inpatient stays during chemotherapy | All except leukmeia | 25% | 39% | <0.01 |

**RESULTS:** Medicaid-insured patients undergoing chemotherapy have a significantly and substantially higher rate of emergency department visits and inpatient stays than similar patients enrolled in commercial health plans.

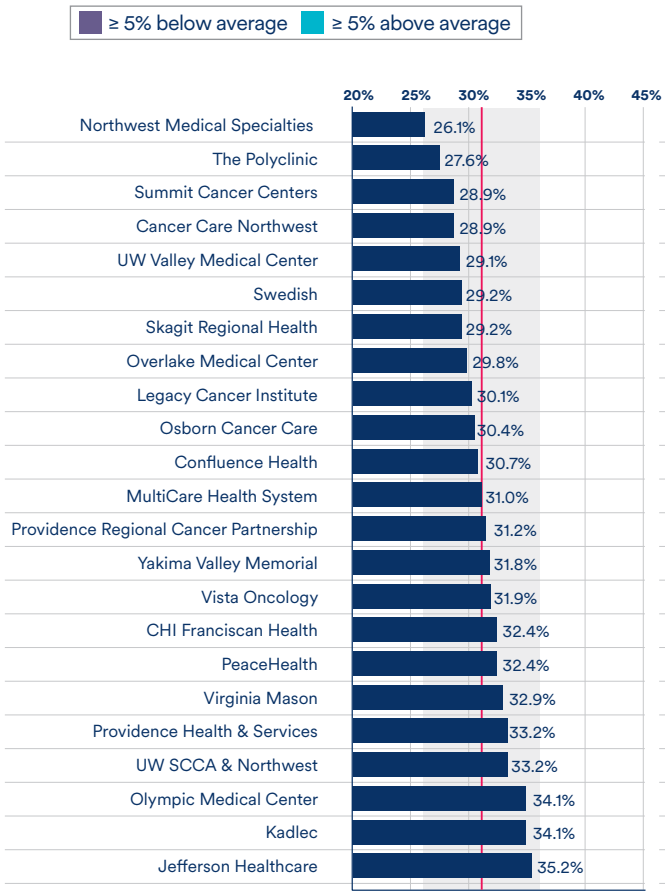
**DISCUSSION:** Some factors that might lead to higher visits for Medicaid patients cannot be controlled for in these analyses such as the patient's financial and housing status, access to care, caregiver availability, available community resources, and non-cancer illnesses. The Medicaid-insured population in this report have a larger percentage of patients with serious non-cancer illnesses that often require more complex or intensive care and increasing the risk of adverse outcomes.

1. Panattoni L, Fedorenko C, Greenwood-Hickman MA, et al. Characterizing Potentially Preventable Cancer- and Chronic Disease–Related Emergency Department Use in the Year After Treatment Initiation: A Regional Study. Journal of Oncology Practice 2018 14:3, e176-e185.

## 2: HOSPITALIZATION DURING CHEMOTHERAPY

### Figure 2.1: ED visits during chemotherapy

Risk-Standardized Rate | **Lower rate = higher quality**



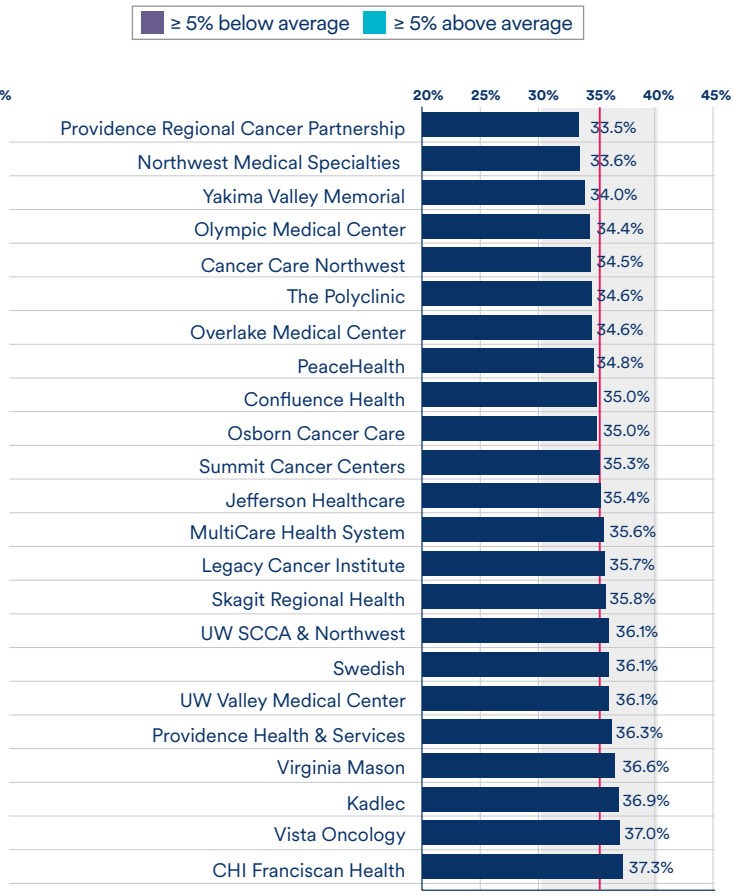

N=7254

REGIONAL AVERAGE: **31.0%**

RANGE: **26.1% to 35.2%**

### Figure 2.2: IP stays during chemotherapy

Risk-Standardized Rate | **Lower rate = higher quality**




N=7254

REGIONAL AVERAGE: **35.4%**

RANGE: **33.5% to 37.3%**

### RESULTS (2.1 & 2.2)

There are 7,254 cancer patients included in this measure.

On average, 31.0 percent of cancer patients had an emergency department (ED) visit during chemotherapy. There is a 9.1 percentage point difference between the highest and the lowest clinic rate, suggesting moderate differences in how cancer clinics manage patients during chemotherapy.

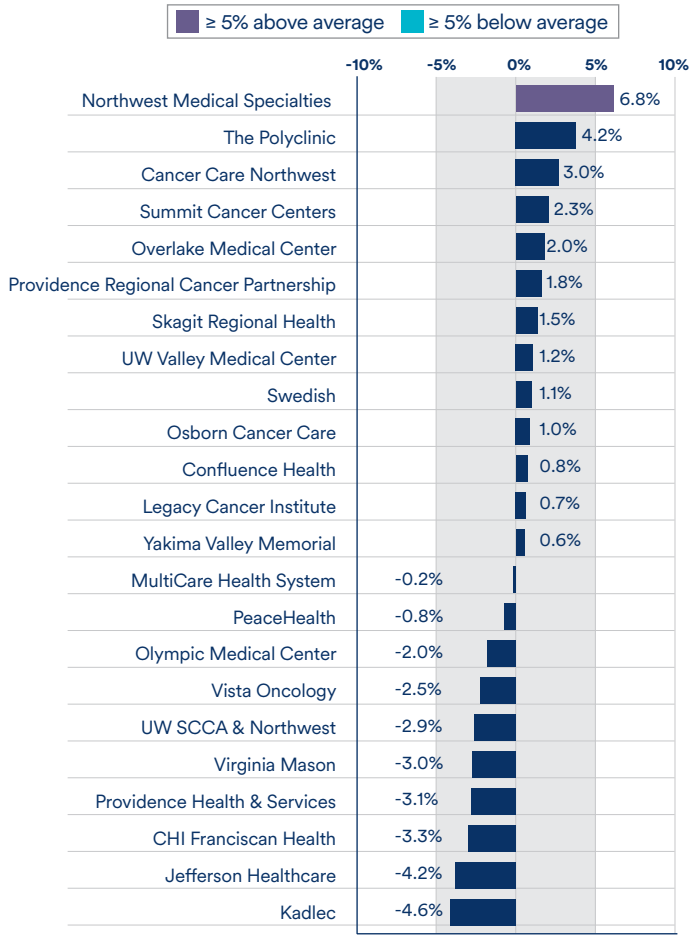
On average, 35.4 percent of cancer patients had an inpatient (IP) stay during chemotherapy. There is a 3.8 percentage point difference between the highest and the lowest clinic rate, suggesting minimal differences in how cancer clinics manage patients during chemotherapy.

## Figure 2.3: Hospitalization during chemotherapy

**Summary Quality Score**

**Positive score = better than the regional average**

**Negative score = below the regional average**




**Zero represents clinic performance at the regional average**

RANGE: **-4.6% to 6.8%**

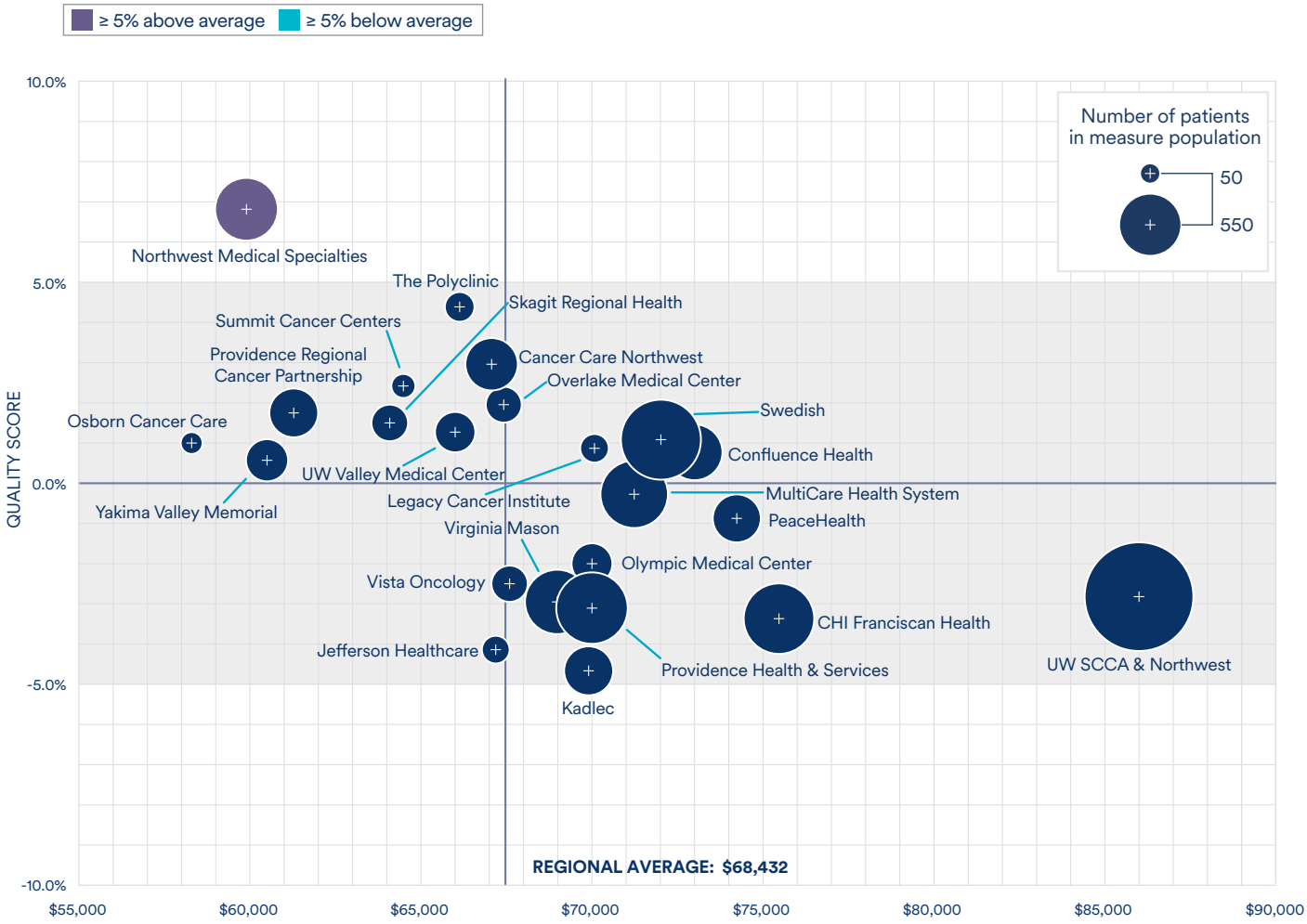
## RESULTS (2.3)

The summary quality scores, indicating clinic performance relative to the regional average for both metrics, show a difference of 11.4 percentage points between the highest-performing clinic and lowest-performing clinic.

In some cases, clinics with above-average results on one quality metric (e.g., ED visits) had below-average results on the other metric (e.g., IP stays) or vice versa. This finding suggests that strategies aimed at reducing one problem may have less of an impact on the other.

## Figure 2.4: Hospitalization during chemotherapy

Summary quality score and cost




**AVERAGE EPISODE COST PER PATIENT**

Average length of episode: **168 days**

Summary Quality Score Range: **-4.6% to 6.8%**

Cost Range: **$58,369 to $86,010**

## RESULTS (2.4)

The regional average cost of care over the period of interest is $68,432, for an average observation period of 168 days. The cost range is $27,641 ($58,369 to $86,010). The quality scores, indicating clinic performance relative to the regional average for both metrics, show a difference of 11.4 percentage points between the highest-performing clinic and lowest- performing clinic, which is a meaningful difference.

There is a strong negative relationship between episode cost and quality score, suggesting that efforts to improve quality may also lower costs during this period of cancer care.

MEASURE 3

# Breast Cancer Tumor Marker Testing Following Treatment

Studies have shown no benefit from the routine use of tumor marker testing for patients with earlier-stage cancers who were treated with curative intent and have no symptoms. Unnecessary testing may lead to misdiagnosis and overtreatment, as well as increased costs.

The American Society of Clinical Oncology (ASCO) recommends against routine use of serum tumor markers for patients who have completed treatment for early-stage breast cancer and do not have symptoms. Use of these tests when not indicated may cause harm. For example, false-positive tests may expose patients to additional, unnecessary invasive tests and procedures, radiation exposure, misdiagnosis, anxiety and increased costs.

Note in prior years we also measured the use of advanced imaging in breast, colorectal, and lung cancer patients. Because adherence to this metric has been consistently and uniformly high for all clinics in the region over many years, these metrics are no longer included in our report.

Methodology information is available in Appendix B.

## MEASURE 3: BREAST CANCER TUMOR MARKER TESTING FOLLOWING TREATMENT

**Breast cancer tumor marker testing following treatment**

- Serum tumor marker test (CEA, CA 15-3, CA 27.29) for breast cancer (stage I-IIIA) during first 13 months of follow-up

**Population**: Breast cancer patients who completed active treatment

**Reporting Years**: 2017–2019

**Time Period**: The follow-up period focuses on the initial (13 month) period after the end of active treatment (surgery, chemotherapy or radiation therapy), but may end earlier if the patient died or restarted active treatment. Patients must have a four-month gap in active treatment to be considered to have completed treatment.

## MEDICAID-INSURED POPULATION

| Measure | Tumor Site | Commercial | Medicaid | p-value |
|---|---|---|---|---|
| Tumor marking testing after treatment | Breast | 27% | 19% | 0.03 |

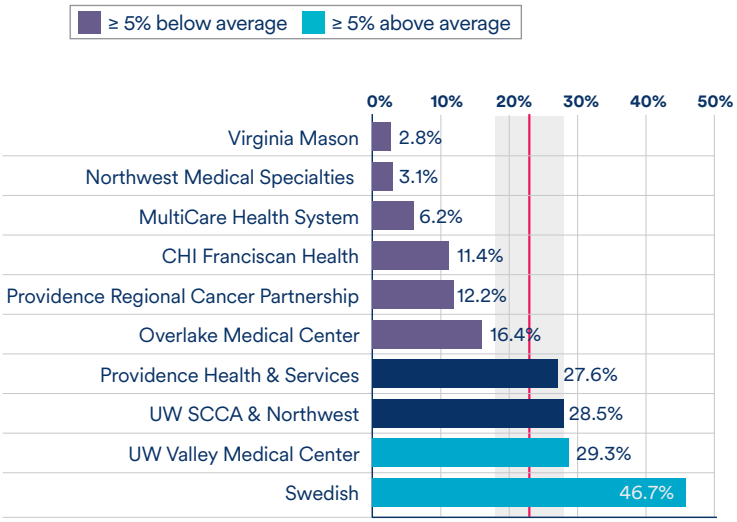
**RESULTS:** Adherence to tumor marker testing following treatment among Medicaid insured patients with early-stage breast cancer were significantly and substantially better than for commercially-insured patients (for this metric, lower rates are better).

**DISCUSSION:** Tumor marker testing is not currently recommended by ASCO or NCCN for surveillance of asymptomatic women with treated breast cancer. Overall we see relatively low testing rates in our population, though commercially insured patients are more likely to receive tumor marker testing than Medicaid patients. While we are not able to capture the reason for increased testing, we hypothesize that the greater testing rate in commercially insured patients may be due to increased testing opportunity due to more follow-up visits, increased patient requests for testing, or provider factors.

# 3: BREAST CANCER TUMOR MARKER TESTING FOLLOWING TREATMENT

## Figure 3.1: Breast cancer tumor marker testing following treatment

Risk-Standardized Rate | **Lower rate = higher quality**




**REGIONAL AVERAGE: 23.9%**

N=861

RANGE: **2.8% to 46.7%**

## RESULTS (3.1)

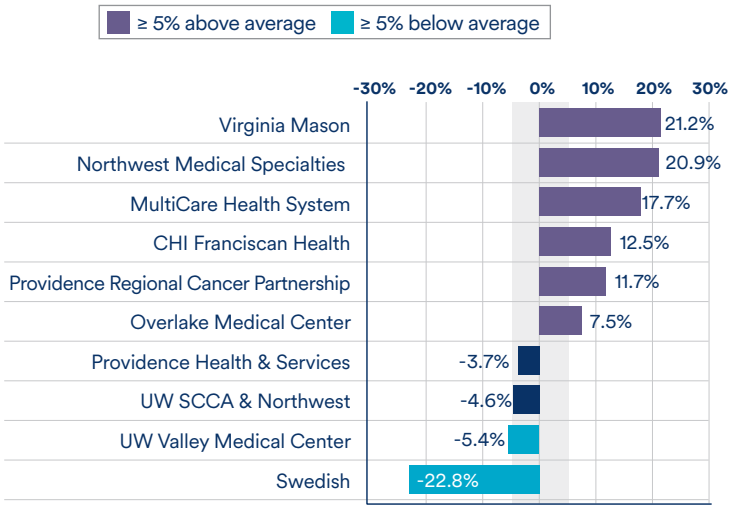
This measure includes 861 breast cancer patients.

On average, 23.9 percent of breast cancer patients received tumor marker tests (CA 15-3, CA 27.29, CEA) in the 13 months following treatment. There is a 44.0 percentage point difference in the rate of tumor marker test ordering between the highest-performing clinic and the lowest-performing clinic, demonstrating wide variability of practice patterns relative to national recommendations.

# 3: BREAST CANCER TUMOR MARKER TESTING FOLLOWING TREATMENT

## Figure 3.2: Breast cancer tumor marker testing following treatment

**Summary Quality Score** | **Positive score = better than the regional average**
**Negative score = below the regional average**




**Zero represents clinic performance at the regional average**

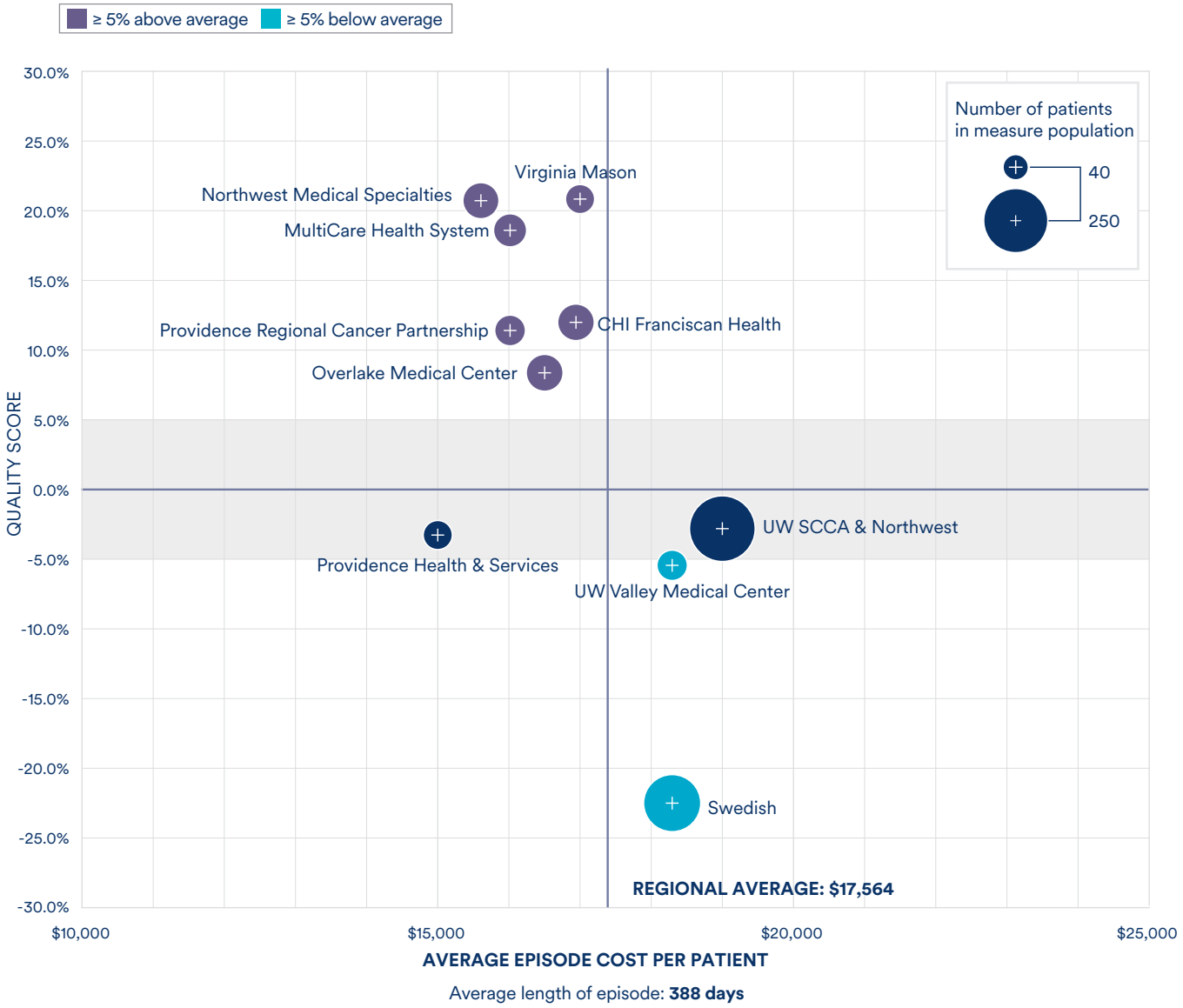
N=861 RANGE: **-22.8% to 21.2%**

## RESULTS (3.2)

The summary quality scores, indicating clinic performance relative to the regional average, show a difference of 44.0 percentage points between the highest-performing clinic and lowest-performing clinic — a wide variation.

## Figure 3.3: Breast cancer tumor marker testing following treatment

Summary quality score and cost




Average length of episode: **388 days**

Summary Quality Score Range: **-22.8% to 21.2%**

Cost Range: **$15,021 to $19,157**

## RESULTS (3.3)

The regional average cost of care over the period is $17,564, and the average length of a follow-up episode is 388 days. The cost range is $4,136 ($15,021 to $19,157). The quality scores, indicating clinic performance relative to the regional average, show a difference of 44.0 percentage points between the highest-performing clinic and lowest-performing clinic — a wide variation.

There is a negative relationship between episode cost and the quality score; that is, among persons who have less tumor marker testing, total episode costs are lower.

MEASURE 4

# End of Life Care

Aggressive cancer-directed treatment for patients with advanced, incurable cancer can be harmful, traumatic and costly without providing benefit. Studies have shown that symptom-focused palliative care is much more beneficial to patients at this stage of their disease.

Appropriate end of life care depends on each patient's needs and should reflect thoughtful consideration of quality of life and the risks and benefits of continued treatment. Aggressive care — including chemotherapy, radiation, invasive procedures, emergency department (ED) visits and intensive care unit (ICU) admissions — can be harmful and traumatic to patients and are unlikely to benefit those who are nearing the end of life.

At the end of life, symptom-focused palliative care, including hospice care, has been shown to improve quality of life and even modestly prolong survival compared to aggressive treatment. It is up to clinicians to clearly communicate to patients the potential benefits, risks, side effects and costs of pursuing aggressive treatment as well as the potential benefits of palliative care.

The End of Life Care measure tracks the use of chemotherapy, multiple ED visits and ICU admissions as indicators of aggressive end of life care and includes hospice admissions as an indicator of recommended, higher-quality care.

Methodology information is available in Appendix B.

## MEASURE 4: END OF LIFE CARE

**Chemotherapy in the last 14 days of life**

- Receipt of any chemotherapy in the last 14 days of life

**Multiple emergency department (ED) visits in the last 30 days of life**

- More than one ED visit in the last 30 days of life

**Intensive care unit (ICU) stay in the last 30 days of life**

- Hospital ICU admission for any reason in the last 30 days of life

**Hospice care three or more days prior to death**

- Two or more inpatient or outpatient hospice encounters, with the first encounter at least three days prior to death

**Population**: Cancer patients at end of life

**Reporting Years**: 2017–2019

**Time Period**: Patient's last 30 days of life.

## MEDICAID-INSURED POPULATION

| Measure | Tumor Site | Commercial | Medicaid | p-value |
|---|---|---|---|---|
| End of Life (EOL): Chemotherapy | Solid | 9% | 6% | <0.01 |
| EoL: 2+ ED visits | Solid | 21% | 21% | |
| EoL: ICU stay | Solid | 28% | 21% | <0.01 |
| EoL: Hospice | Solid | 36% | 45% | <0.01 |

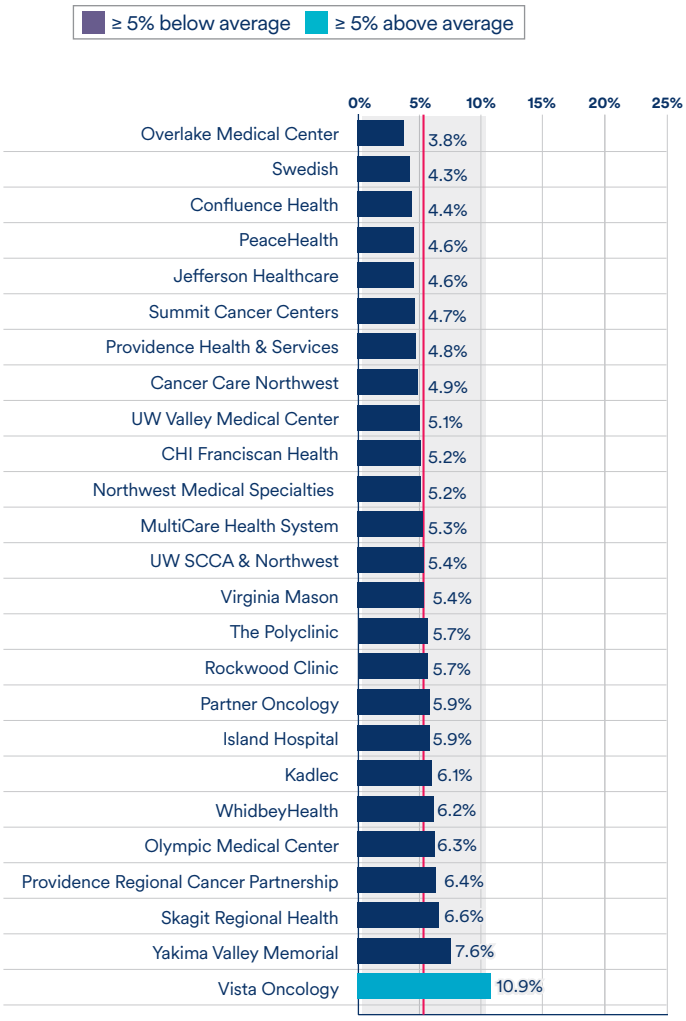
**RESULTS:** Overall adherence to measures of quality in end of life care was higher for Medicaid insured patients compared to their commercial counterparts. ICU stays were significantly lower and enrollment in hospice care was significantly higher for the Medicaid enrollees than commercially insured patients.

**DISCUSSION:** The results suggest that there is room for improving cancer patients' end of life care. While we are not able to understand the reasons for the differences (e.g., patient preferences for care), Medicaid enrollees appear to have a better end of life experience compared to commercially-insured patients.

# 4: END OF LIFE CARE

## Figure 4.1: Chemotherapy in the last 14 days of life

Risk-Standardized Rate | **Lower rate = higher quality**



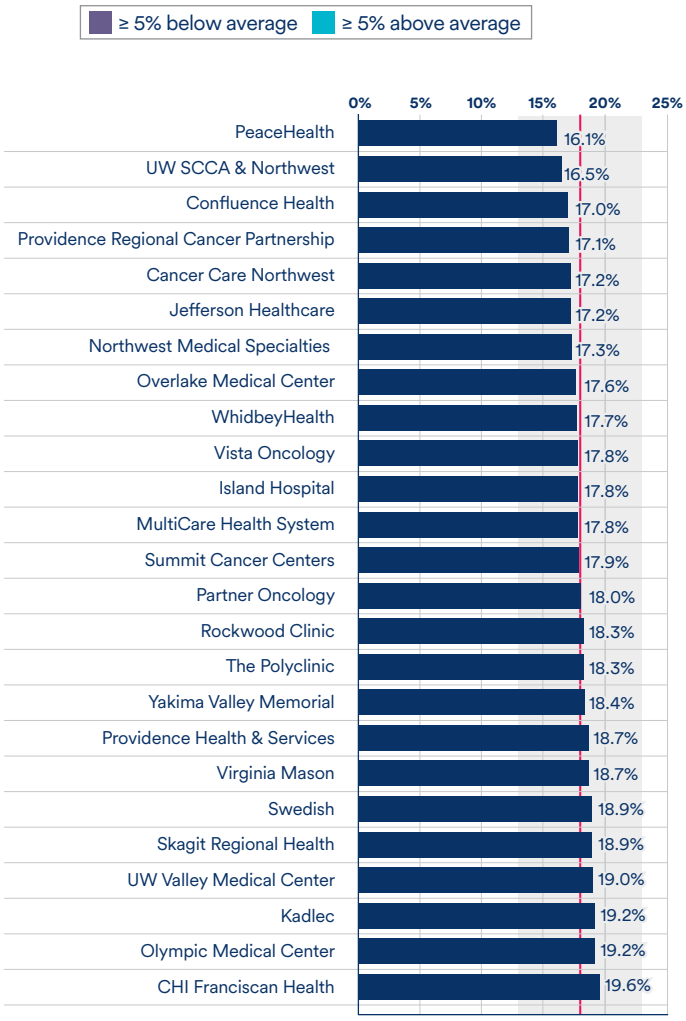

**REGIONAL AVERAGE: 5.6%**

N=8503

RANGE: **3.8% to 10.9%**

## Figure 4.2: Multiple emergency department (ED) visits in the last 30 days of life

Risk-Standardized Rate | **Lower rate = higher quality**




**REGIONAL AVERAGE: 18.0%**

N=8503

RANGE: **16.1% to 19.6%**

## RESULTS (4.1 & 4.2)

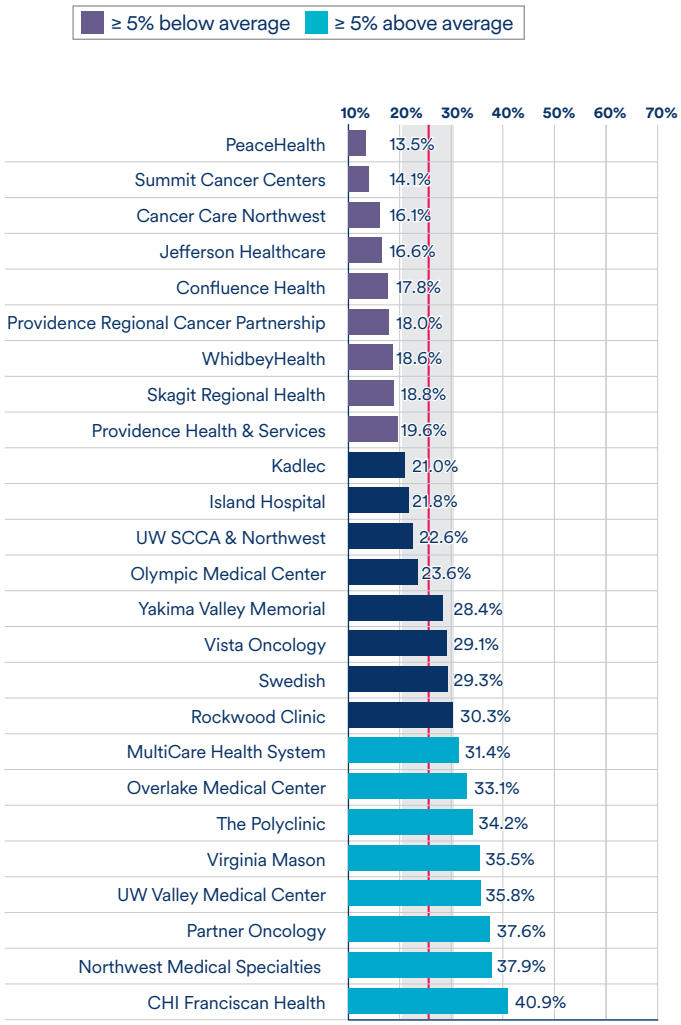
This measure includes 8,503 cancer patients.

On average, 5.6 percent of cancer patients received chemotherapy in the last 14 days of life. There is a 7.1 percentage point difference between the highest-performing clinic and lowest-performing clinic, showing a moderate difference in aggressive end of life care.

On average, 18.0 percent of cancer patients had more than one ED visit in the last 30 days of life. There is a 3.5 percentage point difference between the highest-performing clinic and lowest-performing clinic, suggesting minimal differences in how clinics manage patients at the end of life.

## Figure 4.3: Intensive care unit (ICU) stay in the last 30 days of life

Risk-Standardized Rate | **Lower rate = higher quality**



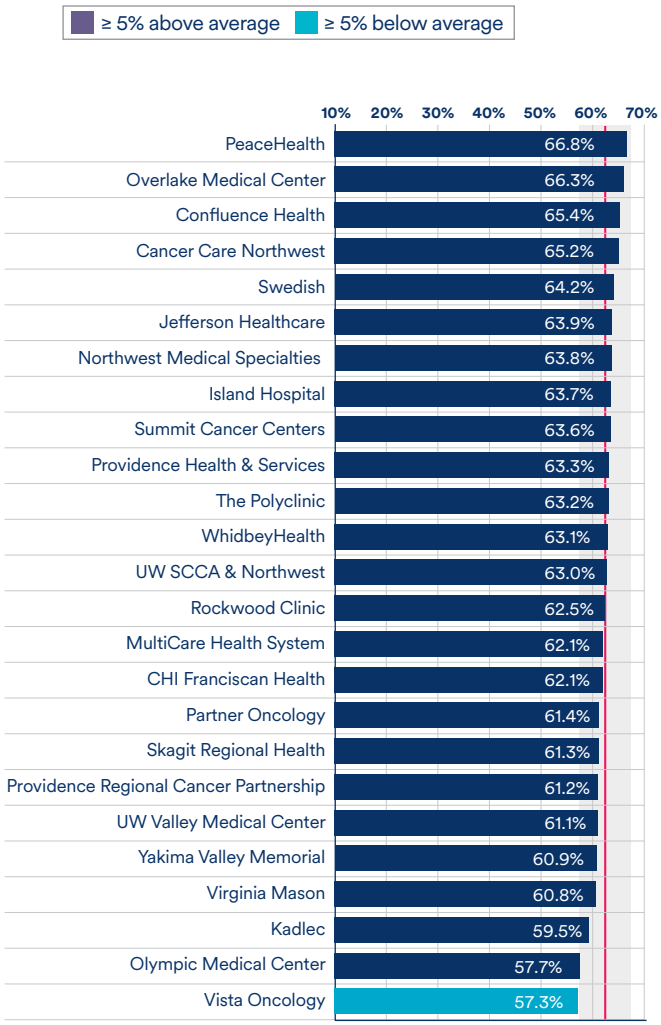

**REGIONAL AVERAGE: 25.8%**

N=8503

RANGE: **13.5% to 40.9%**

## Figure 4.4: Hospice care 3 or more days prior to death

Risk-Standardized Rate | **Higher rate = higher quality**




**REGIONAL AVERAGE: 62.5%**

N=8503

RANGE: **57.3% to 66.8%**

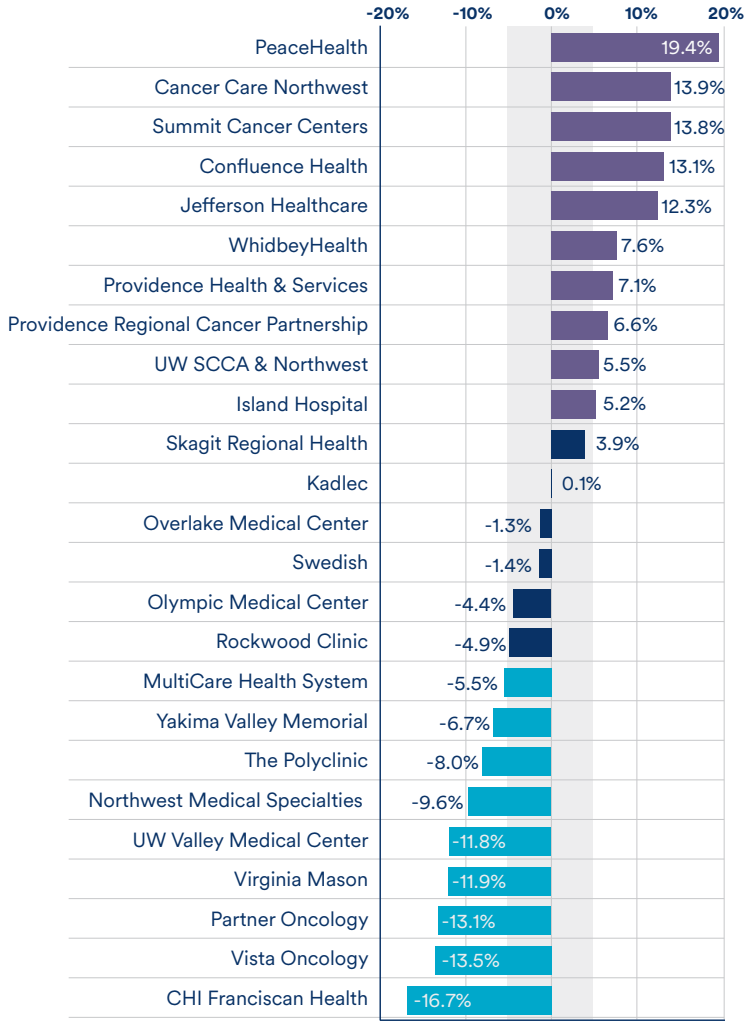
## RESULTS (4.3 & 4.4)

On average, 25.8 percent of cancer patients had an ICU stay in the last 30 days of life. There is a 27.4 percentage point difference between the highest-performing clinic and lowest-performing clinic, suggesting considerable differences in how clinics manage the intensity of care for their patients at the end of life.

On average, 62.5 percent of cancer patients enrolled in hospice care three or more days prior to death. There is a 9.4 percentage point difference between the highest-performing clinic and lowest-performing clinic, suggesting a moderate difference in how clinics manage referrals to hospice care for their patients at end of life. The range in clinic risk-standardized hospice rates has shrunk from prior years' results.

## Figure 4.5: End of Life Care

**Summary Quality Score** | Positive score = better than the regional average
Negative score = below the regional average


**Zero represents clinic performance at the regional average**

RANGE: **-16.7% to 19.4%**

### RESULTS (4.5)

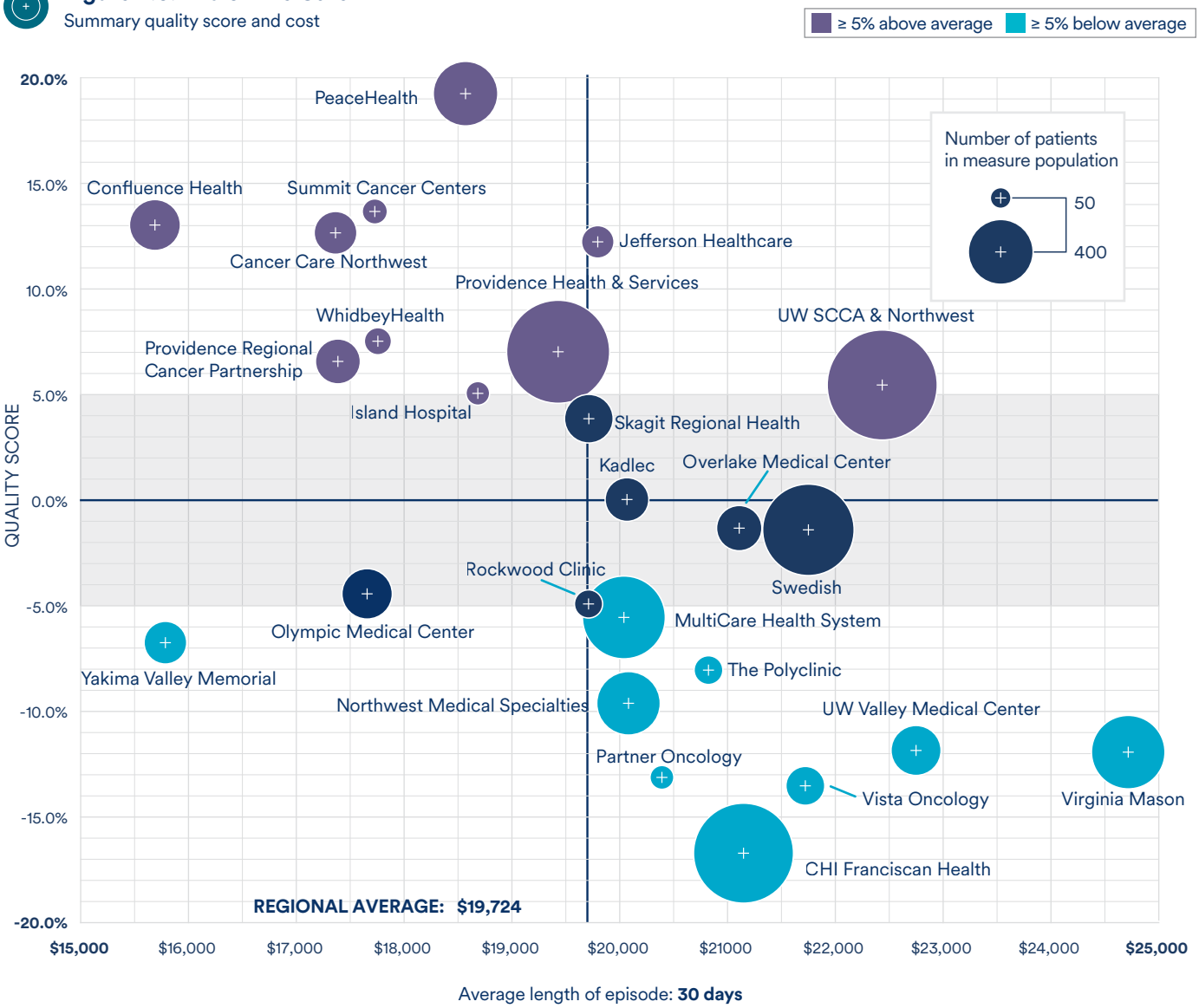
The summary quality scores, indicating clinic performance relative to the regional average for all four end of life metrics, show a difference of 36.2 percentage points between the highest-performing clinic and lowest-performing clinic.

The ICU metric had the greatest impact on the summary quality score.

End of life care shows the greatest variation in quality among all measures in this report.

## Figure 4.6: End of Life Care

Summary quality score and cost




Summary Quality Score Range: **-16.7% to 19.4%**

Cost Range: **$15,731 to $24,698**

## RESULTS (4.6)

The regional average cost of care over the period of interest is $19,724 for the last 30 days of life. The cost range is $8,967 ($15,731 to $24,698). The quality scores, indicating clinic performance relative to the regional average for all four metrics, show a difference of 36.2 percentage points between the highest-performing clinic and lowest-performing clinic.

There is a negative relationship between episode cost and quality score, indicating that higher quality is associated with lower costs for cancer care at end of life.

Most of the measures, including ICU stays which is the main factor influencing the summary quality score, increase the cost of care without clear benefit to patients. In contrast, hospice may improve the patient experience at end of life and also is less expensive for patients and health systems.

MEASURE 5 - STATE LEVEL REPORTING

# Biomarker Testing for Metastatic Lung Cancer

National guidelines recommend biomarker testing to identify mutations in the tumor for patients with metastatic lung cancer. This testing is important because many newer prescribed treatments specifically target certain mutations that can only be identified through testing. This measure provides insight into how well clinics follow biomarker testing recommendations.

Testing patients with cancer for predictive and prognostic biomarkers is prerequisite to the delivery of precision medicine, or personalized medicine. Biomarker or somatic mutation testing looks for mutations or alterations in genes or protein expression within the cancer to determine which specific treatments may be more or less effective. In many instances, biomarker testing is essential at the time of diagnosis to determine initial therapy; in other instances, biomarker testing is needed for future treatment planning and sequencing. Biomarker testing has been recommended by cancer clinical guidelines across a variety of cancers and represents an important component of quality care.

Biomarker testing is important in non-small cell lung cancer. Testing for mutations in a variety of genes, including epidermal growth factor receptor (EGFR), anaplastic lymphoma kinase (ALK), and the ROS1 gene, for example, is critically important in determining initial therapy. Patients with these mutations are better served by the drugs that target them versus more typical chemotherapeutics. Moreover, testing should be done quickly at diagnosis to inform first-line treatment.

## MEASURE 5: BIOMARKER TESTING FOR METASTATIC LUNG CANCER

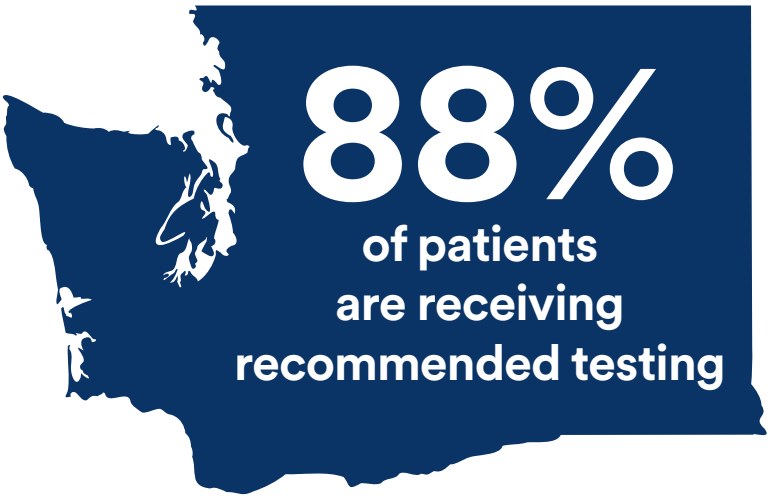
**Biomarker testing for metastatic lung cancer**

- Receipt of NGS, EGFR, ALK or ROS1 test

**Population**: Non-small cell lung cancer patients with metastatic disease

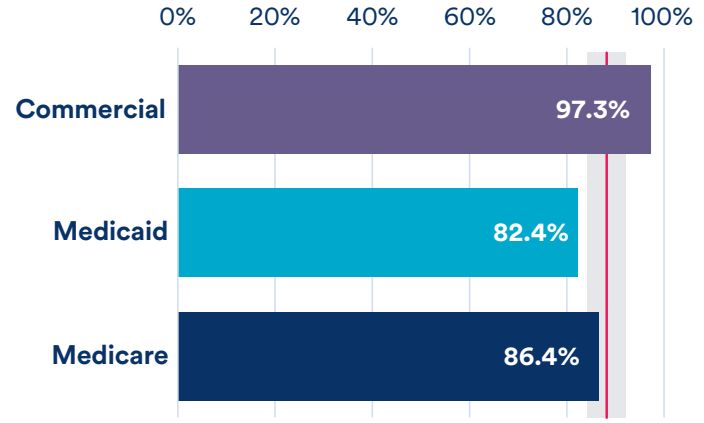
**Reporting Years**: 2017–2019

**Time Period**: The testing period begins 2 months prior to diagnosis and continues through 4 months following diagnosis.



## 5: BIOMARKER TESTING FOR METASTATIC LUNG CANCER - STATE LEVEL REPORTING

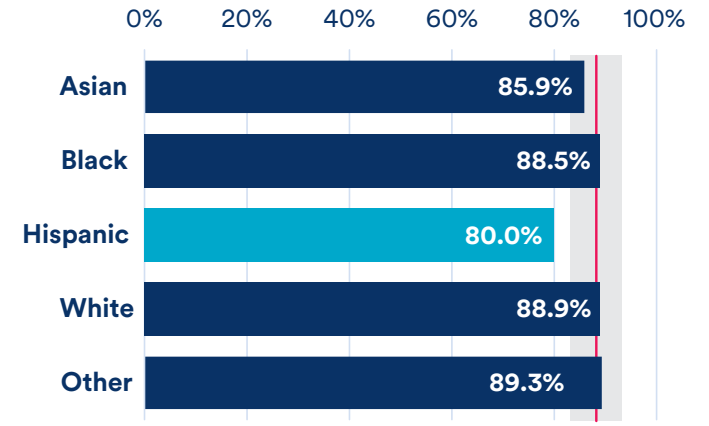
### Figure 5.1: Biomarkers for metastatic lung cancer by insurance type




N=886

REGIONAL AVERAGE: 88.4%

### Figure 5.2: Biomarkers for metastatic lung cancer by race and ethnicity




N=886

REGIONAL AVERAGE: 88.4%

### RESULTS (5.1 & 5.2)

This measure includes 886 cancer patients.

On average, 88.4 percent of cancer patients received biomarker testing. There is a 14.9 percentage point difference in the rate between the highest and lowest insurer. There is a 9.3 percentage point difference in the rate between the highest and lowest racial/ethnicity category.

### DISCUSSION - BIOMARKER TESTING FOR METASTATIC LUNG CANCER

Our findings confirm that the majority of eligible patients in our state with metastatic non-small cell lung cancer received biomarker testing. Given the recent proliferation of highly effective cancer therapies that are targeted to specific cancer subtypes, such testing is critical for treatment decision-making in current practice and is widely supported in clinical practice guidelines. Our results show disparities in use of testing among patients with Medicaid and Medicare insurance. Further work is needed to determine whether the reasons for the disparity stems from differences in insurance coverage and reimbursement, physician-patient decision making, or other factors. An important limitation of our analysis is that we do not have information on test results, and therefore cannot determine whether treatments are in line with biomarker findings.

MEASURE 6 - STATE LEVEL REPORTING

# Germline Testing

Clinical practice guidelines recommend germline testing for patients with breast, ovarian, pancreatic, and prostate cancers. Testing enables doctors and their patients to identify inherited mutations that may help guide treatment and monitoring and help family members understand their risk of cancer. Information about inherited mutations can help patients and their relatives make choices about treatment and the frequency of cancer screenings.

Germline is a form of genetic testing that, unlike cancer biomarker testing described in Measure 5, identifies inherited DNA mutations that were passed from parents to children. The germline DNA changes that a person is born with are in every cell of the body. Germline testing looks at the DNA of healthy cells from your body using samples of blood, skin, or saliva.

Patients with a strong family history of certain types of cancer may receive germline genetic testing to see if they carry a mutation that increases their cancer risk. Germline testing can also be used to determine if a person's cancer is caused by an inherited mutation that might put them at higher risk for developing other cancers. Family members of patients who test positive for germline mutations should also consider germline testing to see if they also carry the same mutation.

For example, patients with breast or ovarian/peritonum cancers are commonly recommended to undergo germline testing for BRCA1 or BRCA2 gene mutations. Positive tests may affect clinical decision-making. People with BRCA mutations may consider preventative surgery to remove both breasts and/or ovaries. Presence of a germline BRCA1/2 mutation may also influence choice of chemotherapies. Similarly, germline mutations are found more commonly than previously thought in pancreatic and prostate adenocarcinoma and may not only influence risk of family members but may also inform treatment choice for the patient and screening for secondary cancers.

## MEASURE 6: GERMLINE TESTING

**Germline testing for breast cancer**

- Receipt of BRCA1/2 test for male, triple negative or patients aged less than 50 with breast cancer

**Germline testing for ovarian cancer**

- Receipt of germline test for patients with ovarian, fallopian tube, or peritoneum cancer

**Germline testing for pancreatic cancer**

- Receipt of germline test for patients with adenocarcinoma of the pancreas

**Germline testing for prostate cancer**

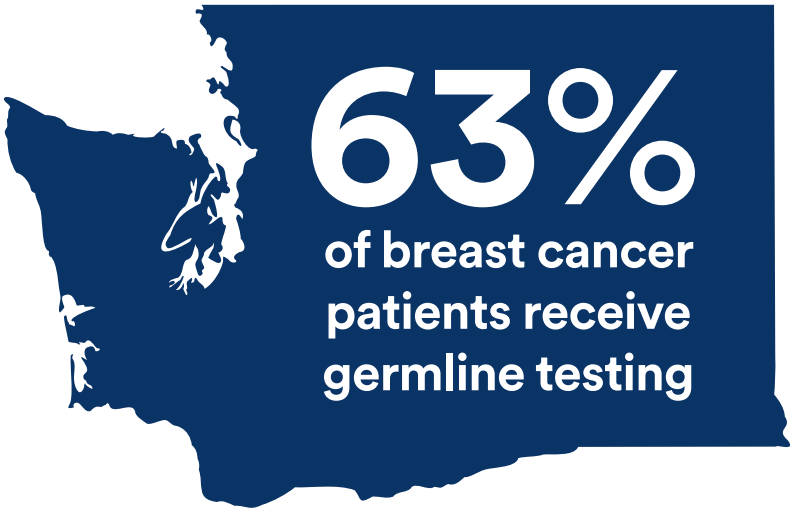
- Receipt of germline test for patients with metastatic, regional (node-positve), or high- or very-high-risk localized prostate cancer

**Population**: Breast, ovarian, panctreatic and prostate cancer patients who meet guidelines for germline testing

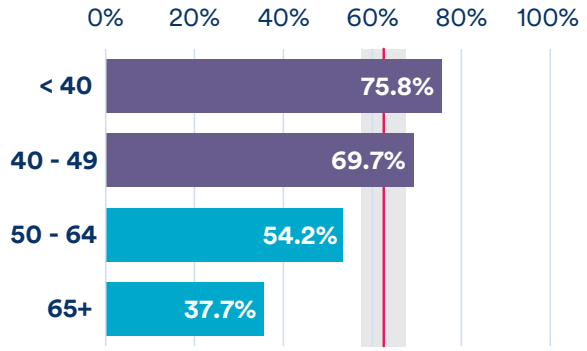
**Reporting Years**: 2017–2019

**Time Period**: The testing period begins 2 months prior to diagnosis and continues through 24 months following diagnosis.

## 6: GERMLINE TESTING - STATE LEVEL REPORTING



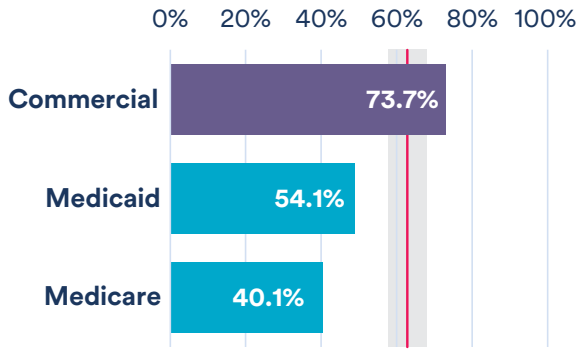

### Figure 6.1.1: Germline testing for breast cancer by age




N=1401

**REGIONAL AVERAGE: 62.6%**

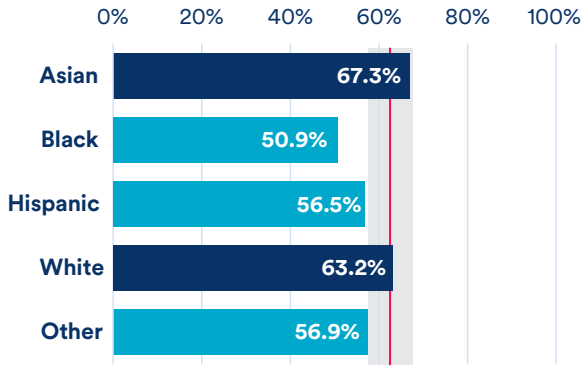
### Figure 6.1.2: Germline testing for breast cancer by insurance type




N=1401

**REGIONAL AVERAGE: 62.6%**

### Figure 6.1.3: Germline testing for breast cancer by race and ethnicity




N=1401

**REGIONAL AVERAGE: 62.6%**

### RESULTS (6.1.1 & 6.1.2 & 6.1.3)

This measure includes 1,076 cancer patients.

On average, 62.6 percent of eligible breast cancer patients received BRCA1/2 testing. There is a 38.1 percentage point difference in testing rates between the highest and lowest age group, a 33.6 percentage point difference in testing rates between the highest and lowest insurer, and a 16.4 percentage point difference in testing rates between the highest and lowest racial/ethnicity category.

## 6: GERMLINE TESTING - STATE LEVEL REPORTING

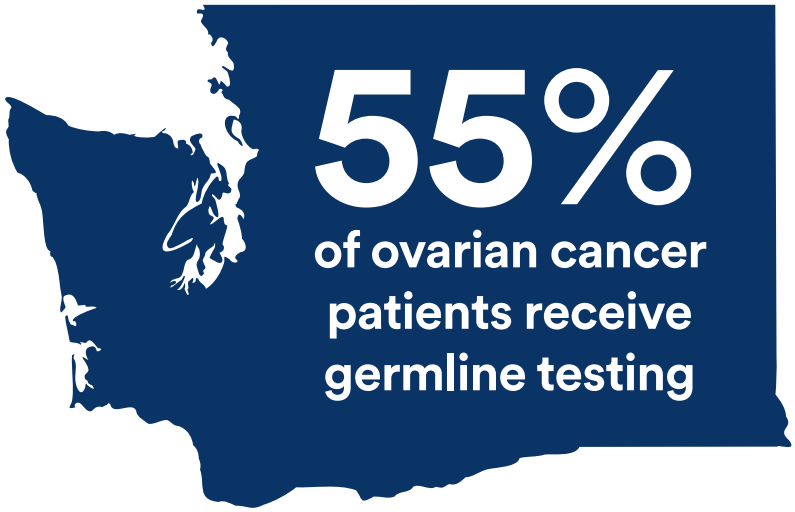
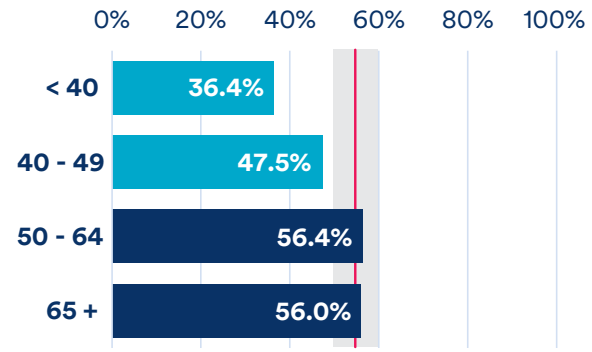


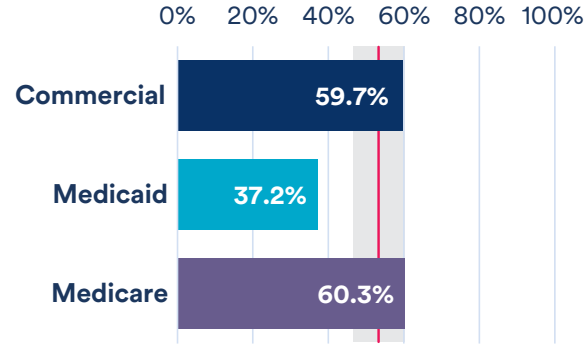

**Figure 6.2.1: Germline testing for ovarian cancer by age**




N=470

**REGIONAL AVERAGE: 54.9%**

**Figure 6.2.2: Germline testing for ovarian cancer by insurance type**




N=470

**REGIONAL AVERAGE: 54.9%**

### RESULTS (6.2.1 & 6.2.2)

This measure includes 470 cancer patients.

On average, 54.9 percent of ovarian, fallopian tube, and peritoneum cancer patients received germline testing. There is a 19.6 percentage point difference in testing rates between the highest and lowest age group and a 23.1 percentage point difference in testing rates between the highest and lowest insurer.

## 6: GERMLINE TESTING - STATE LEVEL REPORTING

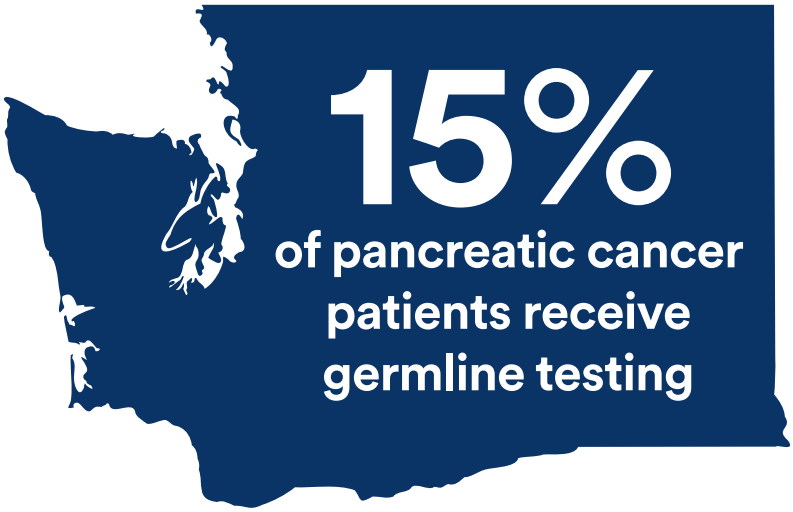
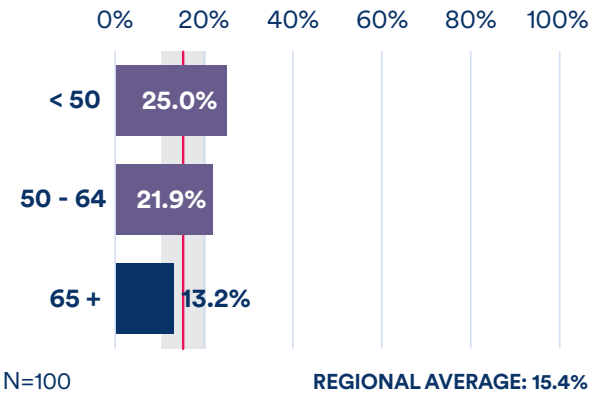
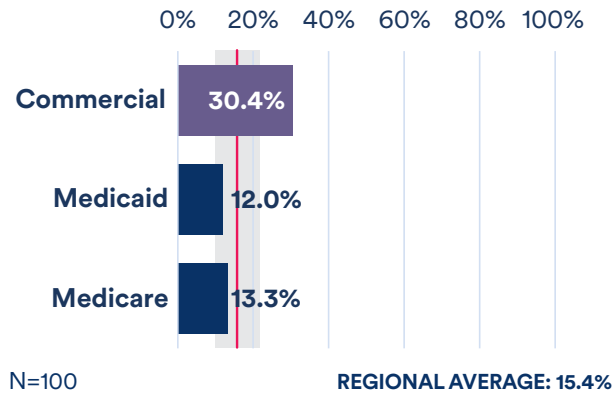



**Figure 6.3.1: Germline testing for pancreatic cancer by age**




N=100 **REGIONAL AVERAGE: 15.4%**

**Figure 6.3.2: Germline testing for pancreatic cancer by insurance type**




N=100 **REGIONAL AVERAGE: 15.4%**

### RESULTS (6.3.1 & 6.3.2)

This measure includes 100 cancer patients.

On average, 15.4 percent of eligible pancreatic cancer patients received germline testing. There is a 19.6 percentage point difference in testing rates between the highest and lowest age group and a 23.1 percentage point difference in testing rates between the highest and lowest insurer.

## 6: GERMLINE TESTING - STATE LEVEL REPORTING

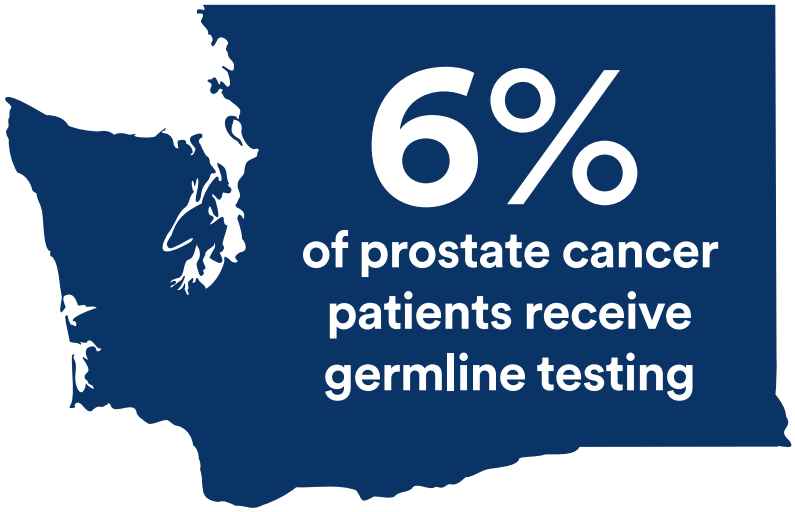
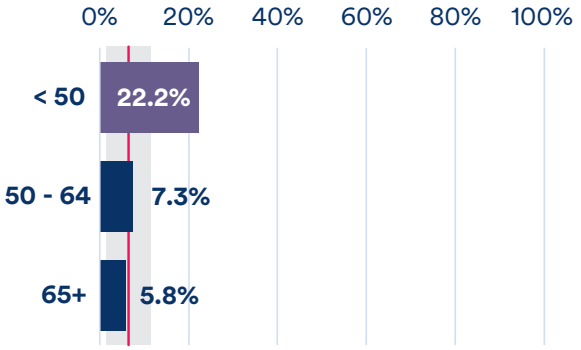


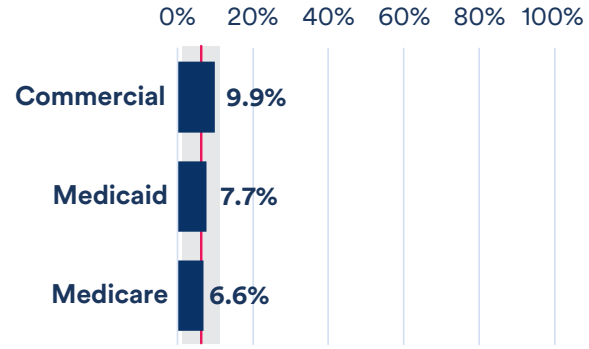

**Figure 6.4.1: Germline testing for prostate cancer by age**




N=842

**REGIONAL AVERAGE: 6.3%**

**Figure 6.4.2: Germline testing for prostate cancer by insurance type**




N=842

**REGIONAL AVERAGE: 6.3%**

### RESULTS (6.4.1 & 6.4.2)

This measure includes 842 cancer patients.

On average, 6.3 percent of eligible prostate cancer patients received germline testing. There is a 16.4 percentage point difference in testing rates between the highest and lowest age group and a 3.3 percentage point difference in testing rates between the highest and lowest insurer.

## DISCUSSION - GERMLINE TESTING

Our findings suggest that there is suboptimal use of germline testing, particularly among patients with pancreatic and prostate adenocarcinoma. Given the relatively high prevalence of germline mutations among patients with pancreatic and prostate adenocarcinomas and the implications of the results for treatment choice (e.g. in patients with BRCA 1/2 or ATM mutations), testing rates of 15% and 6% respectively are surprisingly low. Germline testing in eligible breast cancer patients, is also lower than expected (66%), given that guidelines have recommended testing for over a decade. We also find considerable variability in testing by insurance type suggesting (as in the case of metastatic NSCLC), possible problems with patient access and insurance coverage. We acknowledge that our findings may not represent the full story on germline testing. For example, it is possible that our time frame to identify testing is too narrow for some cancers with long survival time (e.g. prostate adenocarcinoma) and that testing is happening later in the disease course. It is also possible that patients are being appropriately referred to geneticists but not following through on the scheduled appointments or recommended testing. While we suspect these factors are contributors, it is also likely that there are gaps in provider and patient knowledge and awareness about the importance of such testing. The implications of undertesting for both patients and family members can be substantial.

MEASURE 7 - STATE LEVEL REPORTING

# Timeliness of Care

Studies have shown that shorter times from diagnosis to first treatment can lead to better outcomes. Measuring how quickly patients begin cancer treatment can help clinics understand this important benchmark and provides insights into potential disparities in care.

An important component of high quality cancer care is getting patients to treatment as quickly as possible after they are diagnosed with cancer. Several studies have shown that delays in treatment can result in anxiety and poorer outcomes for patients. Accordingly, practice guidelines and measures of cancer quality often measure time to first treatment as a quality metric.

There are some delays associated with factors outside of the clinic. Delays in treatment may be related to patient preferences or schedules (i.e. waiting for after a special occasion, vacation, etc). Situations that may account for a reasonable delay include patients waiting for additional testing or imaging, or for second opinions.

Timeliness of care is important for all cancers. As our first step to understand timeliness of care in Washington state, we started by measuring time from diagnosis to treatment for persons who have been diagnosed with metastatic solid tumor cancers.


### MEASURE 7: TIMELINESS OF CARE

**Time to start of treatment**

- Median number of days between first visit at an oncology clinic and date of first treatment

**Population**: Cancer patients with metastatic disease who start chemotherapy or radiation therapy

**Reporting Years**: 2017–2019

**Time Period**: Intial treatment period, up to 12 months

## Metastatic Cancer Patients

**2,241** patients do not receive treatment

**557** patients' first treatment is surgery

**3,237** patients' first treatment is radiation, chemotherapy, hormone, or other systemic therapy

# 7. TIMELINESS OF CARE - STATE LEVEL REPORTING

**Legend**

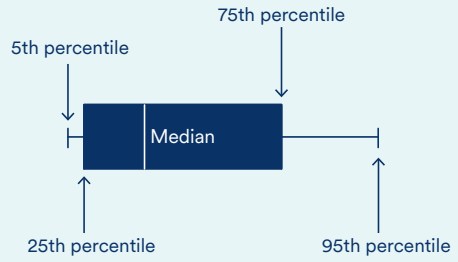
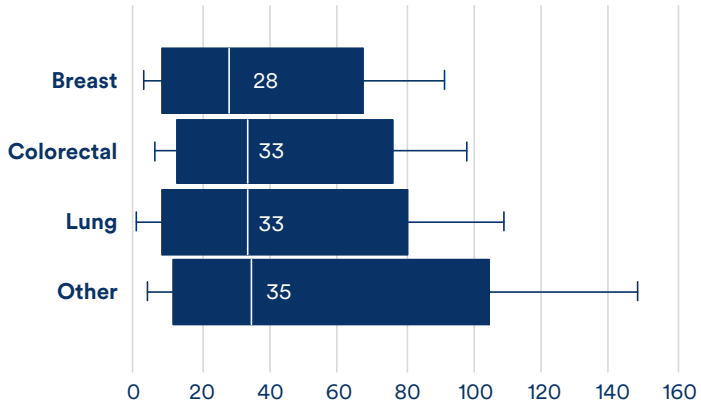


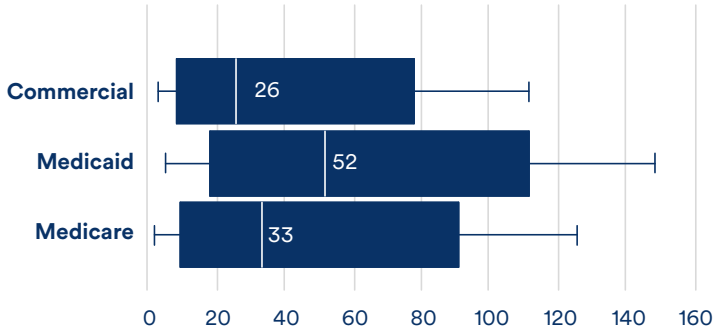

**Figure 7.1.1: Time to start of treatment by cancer site**




N=3794

**REGIONAL AVERAGE: 34 days**

**Figure 7.1.2: Time to start of treatment by insurance type**




N=3794

**REGIONAL AVERAGE: 34 days**

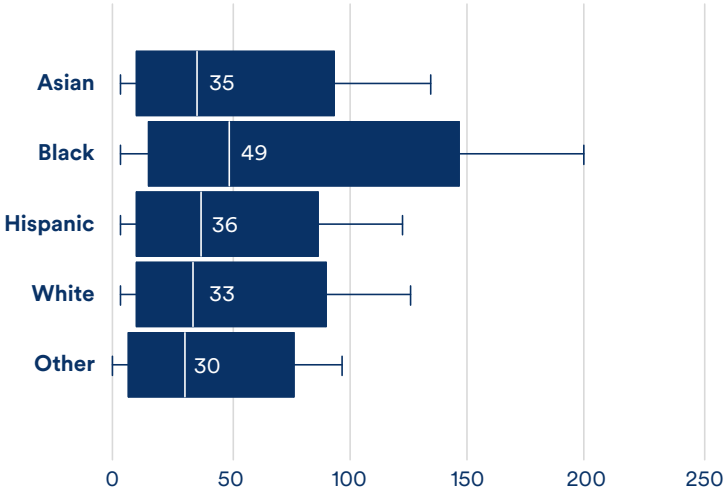
## RESULTS (7.1.1 & 7.1.2)

This measure includes 3,794 cancer patients.

For patients with metastatic cancer, it took a median of 34 days to start chemotherapy or radiation therapy after their first visit at their oncology clinic. Of the largest cancer types, breast cancer patients took the shorted median time of 28 days. The difference between patients on a commercial plan (26 days) and Medicaid-enrolled patients (52 days) was 28 days.

## 7. TIMELINESS OF CARE REPORTING - STATE LEVEL REPORTING

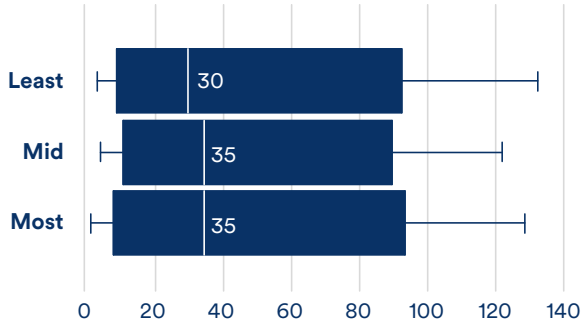
### Figure 7.1.3: Time to start of treatment by race and ethnicity




N=3794

**REGIONAL AVERAGE: 34 days**

### Figure 7.1.4: Time to start of treatment by area deprivation index (ADI)




N=3794

**REGIONAL AVERAGE: 34 days**

### RESULTS (7.1.3 & 7.1.4)

The median time to treatment initiation was longest for Black patients (49 days). Patients who lived in the least deprived neighborhoods, measured by ADI[1], had the lowest time to treatment (30 days). Patients in the mid to most-deprived neighborhoods started treatment a median of 35 days following their first visit at their oncology clinic.

### DISCUSSION - TIMELINESS OF CARE

We found substantial differences in median time to first treatment for stage IV solid tumor patients in our state. Specifically, Black patients and those with Medicaid insurance experienced significantly longer times to first treatment. However, we don't see the same differences by neighborhood deprivation. The reasons are likely multifactorial. An important concern is that cancer patients with significant health-related social needs such as transportation or housing challenges have significant problems accessing treatment, even those with health insurance. Another concern is growing wait times for first appointments, possibly exacerbated by clinic staffing challenges. Understanding the factors underlying the disparities that we see in our region is critical to ensure that all patients are able to access timely and appropriate care.

1. University of Wisconsin School of Medicine and Public Health. Area Deprivation Index. Available at: https://www.neighborhoodatlas.medicine.wisc.edu/

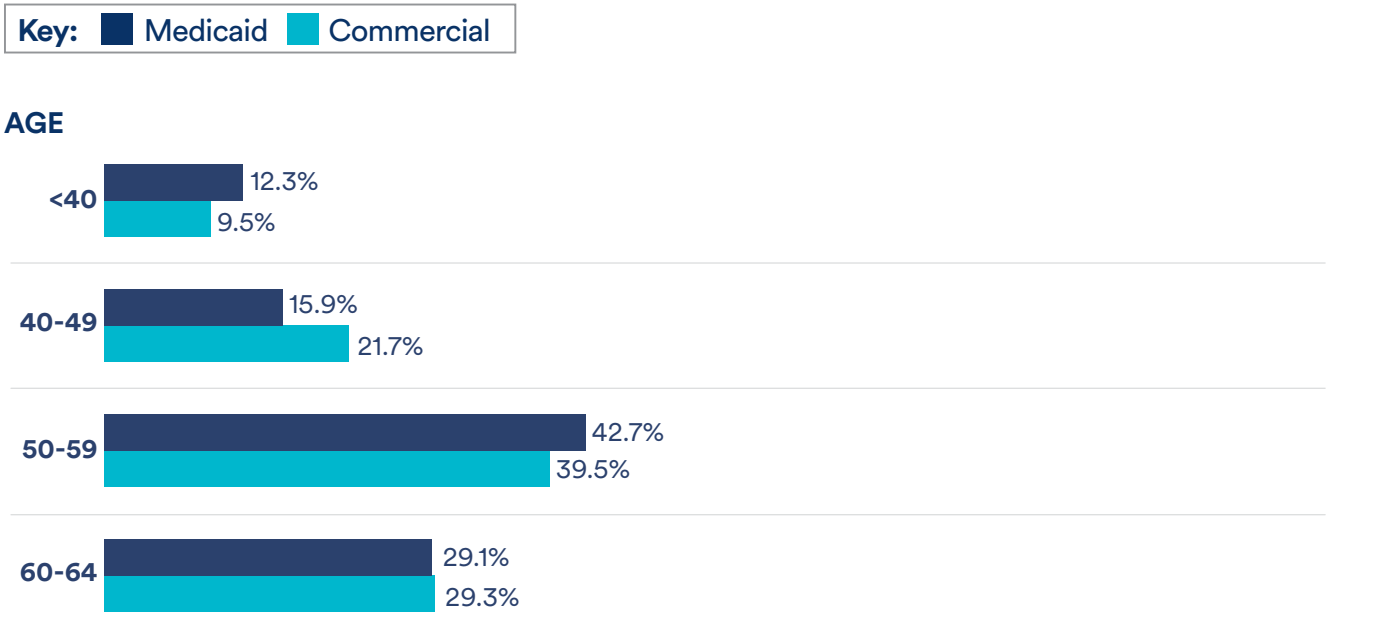
# Appendices

# Appendix A: Demographics for Medicaid Enrollees

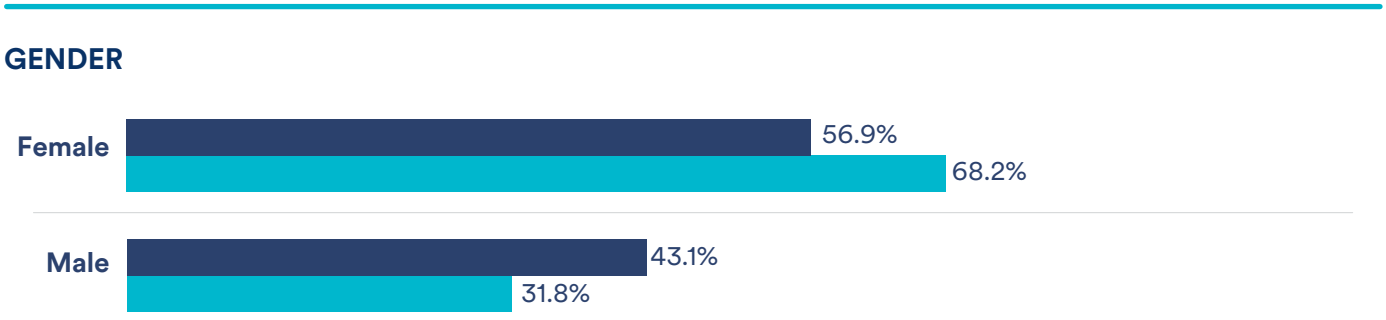
**WHY DO WE COMPARE DEMOGRAPHICS?**

Demographic differences exist between the Medicaid -and commercially- insured populations in Washington state. We know that Medicaid insured patients are more likely to live in neighborhood's that face greater socioeconomic disadvantages. We also know that Black, Hispanic, and Asian/Pacific Islander populations are more likely to be enrolled in Medicaid rather than a commercial insurance plan. Understanding these population differences enables us to recognize areas of disparity in care and outcomes between and among populations. This enables us to highlight system wide issues which impact performance and outcomes.

Below, we compare demographic and clinical factors for Medicaid- and commercially-insured enrollees with a cancer diagnosis.

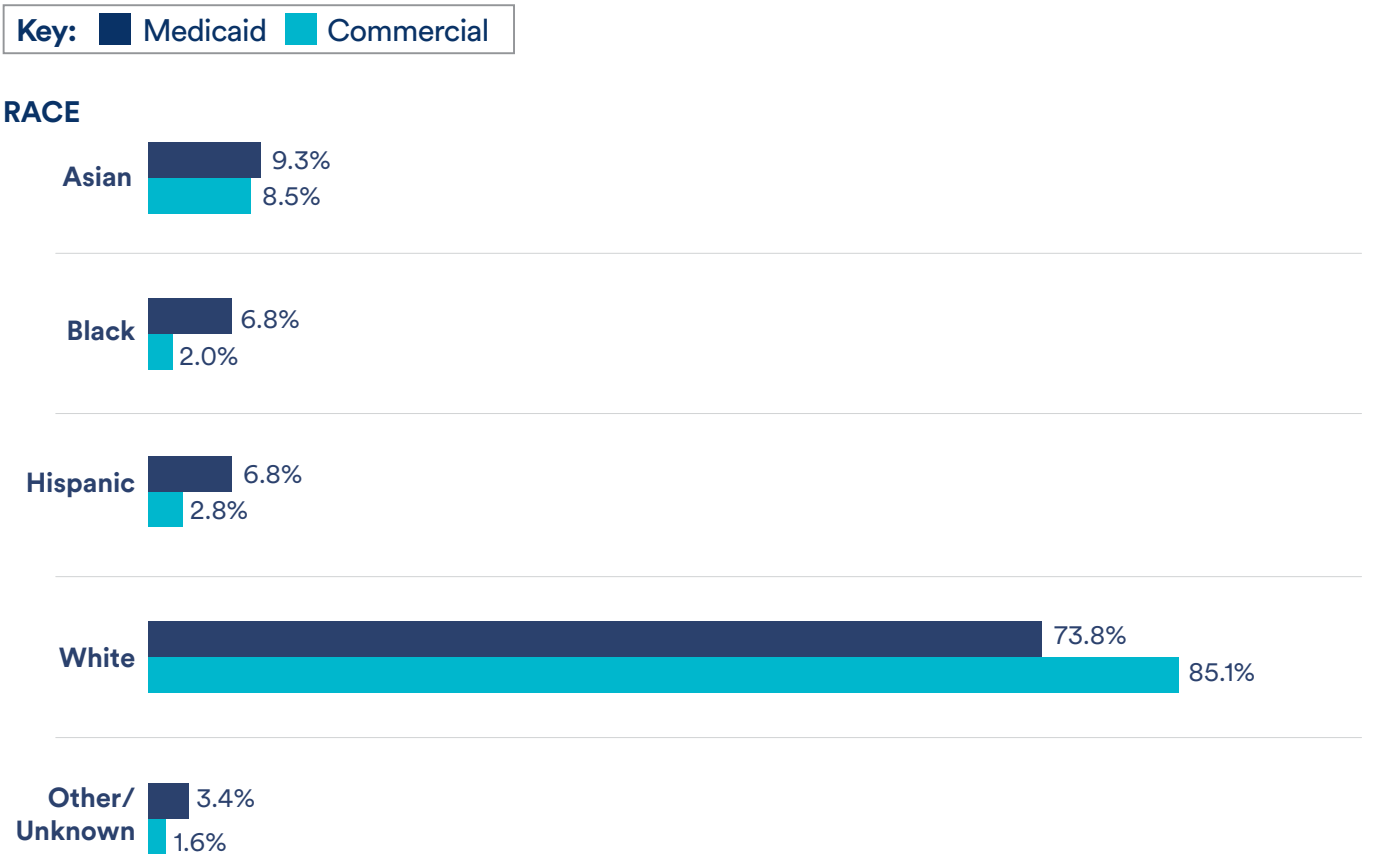



Medicaid-insured patients are more likely to be between 50 to 60 years of age. A higher proportion of young people, (under 40) are enrolled in Medicaid rather than commercial insurance.

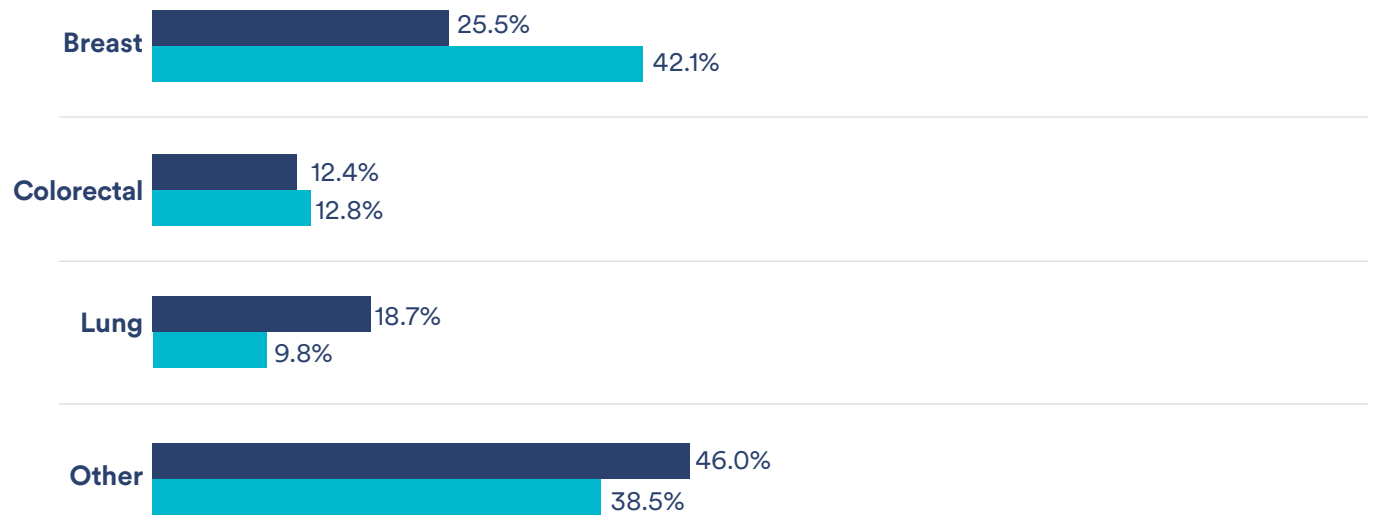



In Washington state, Medicaid-insured patients are more likely to be male than commercially-insured patients.

# Appendix A: Demographics for Medicaid Enrollees



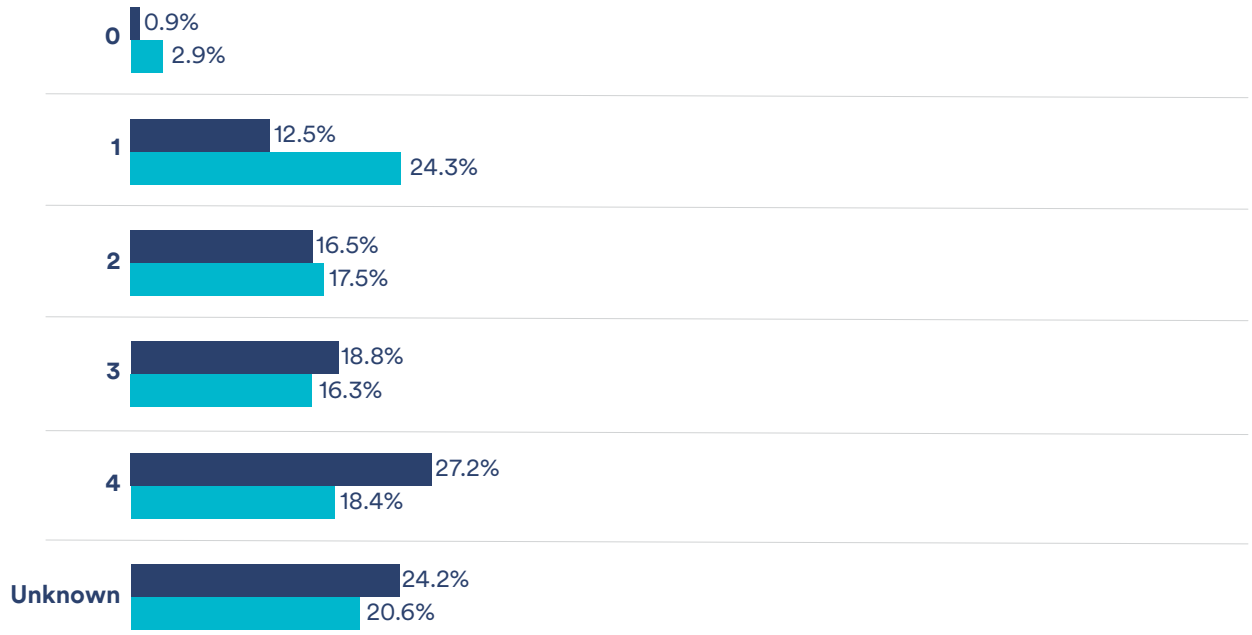

Medicaid enrollees are more likely than commercially-insured patients to be non-white.




The Medicaid-insured population has a greater proportion of lung cancer patients and a smaller proportion of breast cancer patients compared to the commercially-insured population.

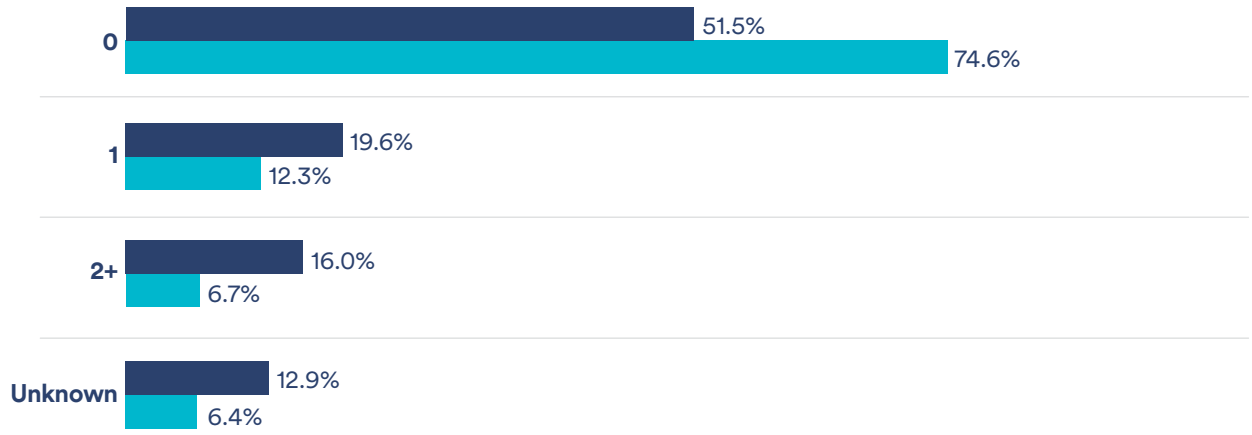
# Appendix A: Demographics for Medicaid Enrollees


## AJCC STAGE




Medicaid-insured patients in Washington state are diagnosed with cancer at later stages than patients with commercial insurance.

## COMORBIDITY (post 6 months/6 months pre death)



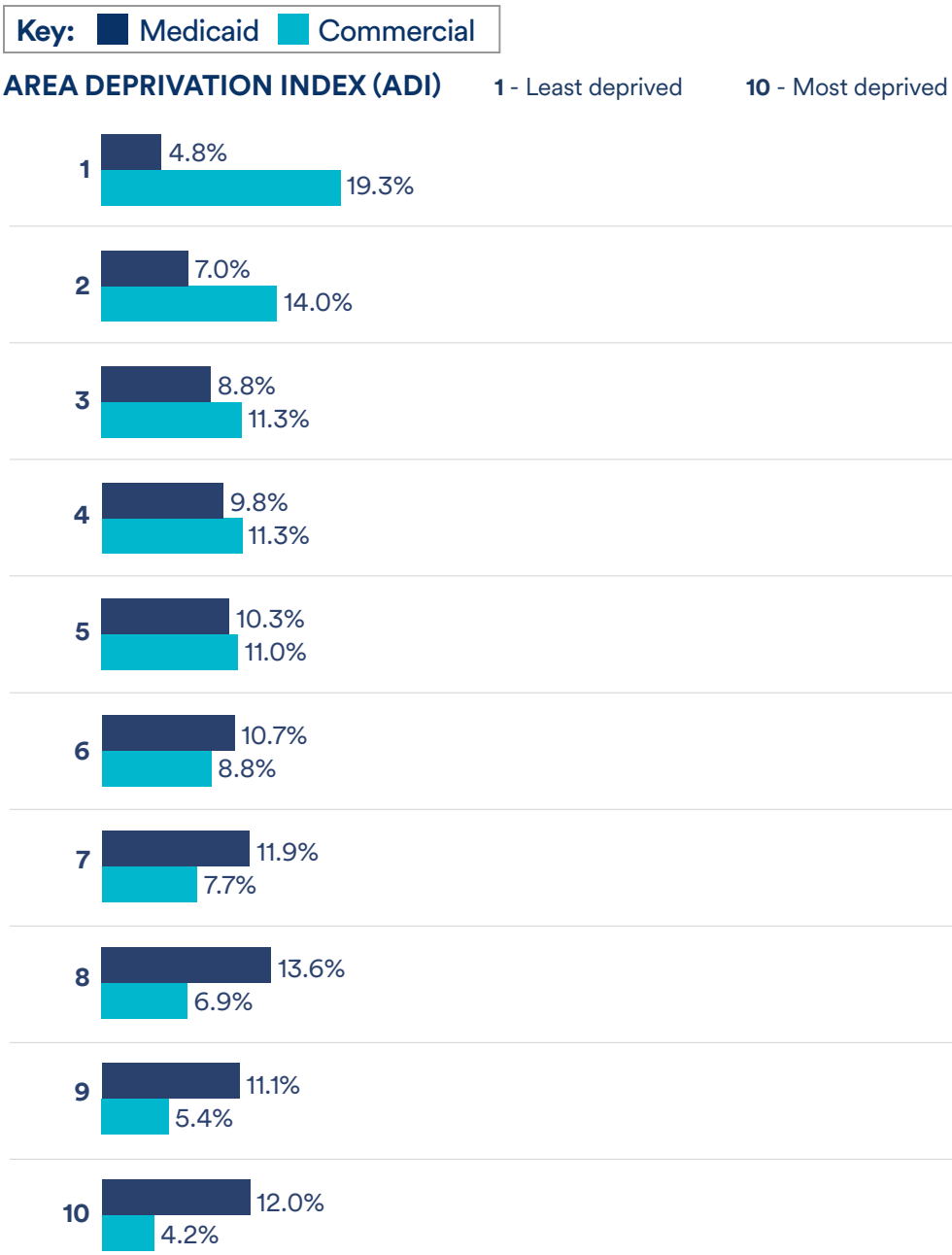

Medicaid-insured patients are more likely to have one or more comorbidities compared to the patients insured by commercial health plans.

The National Cancer Institute Comorbidity Index includes the following[1]:

Acute Myocardial Infarction
History of Myocardial Infarction
Congestive Heart Failure
Peripheral Vascular Disease
Cerebrovascular Disease
Chronic Obstructive Pulmonary Disease
Dementia
Paralysis (Hemiplegia or Paraplegia)
Diabetes
Diabetes with Complications
Renal Disease
Mild Liver Disease
Moderate/Severe Liver Disease
Peptic Ulcer Disease
Rheumatologic
Acquired Immunodeficiency Syndrome (AIDS)

1. NCI Comrbidity Index Overview, NIH National Cancer Institute, 23 May 2019, healthcaredelivery.cancer.gov/seermedicare/considerations/comorbidity.html

# Appendix A: Demographics for Medicaid Enrollees



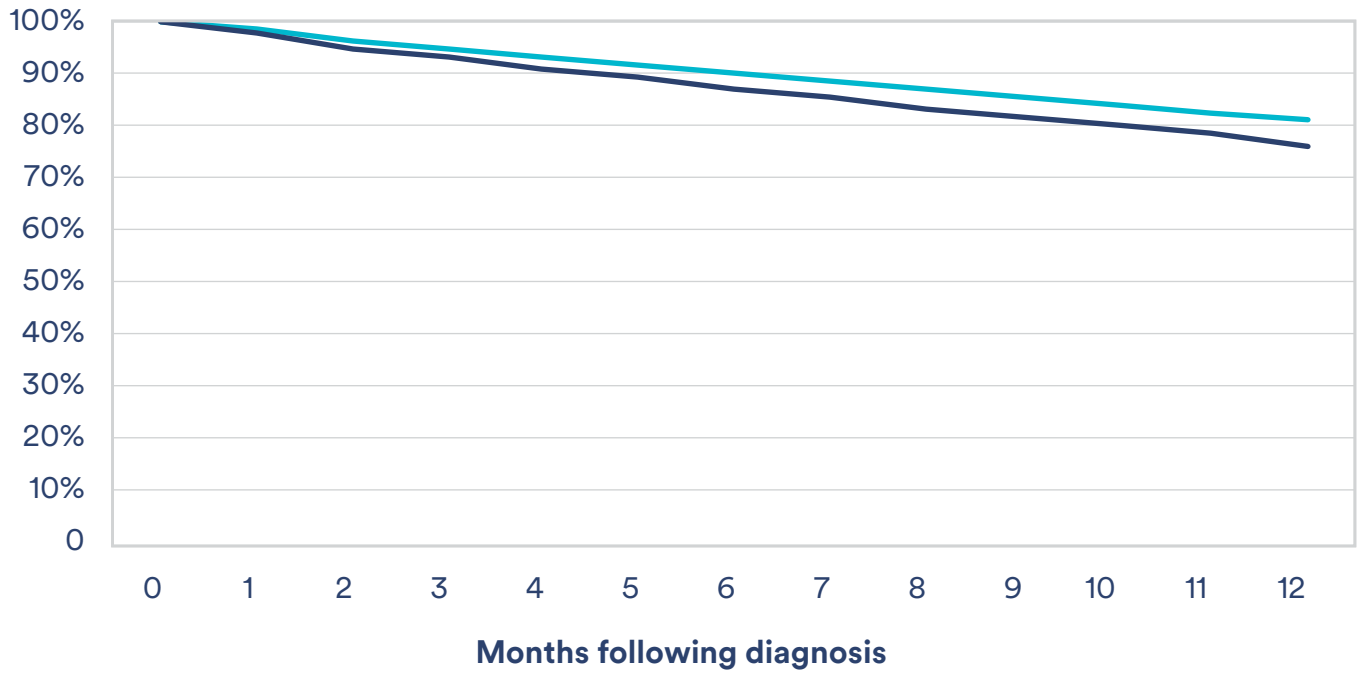

Medicaid-insured patients are more likely to come from high-deprivation neighborhoods based on the Area Deprivation Index (ADI). The ADI measures a patient's neighborhood's socioeconomic disadvantage at the census tract level. It includes 17 factors such as income and income disparity, education, employment, and housing cost and quality. ADI ranks range from 1 (least deprived) to 10 (most deprived.)[1] ADI is used as a risk adjustor in our methodology as it is a more sensitive measure of socioeconomic status and is calibrated to Washington state rather than national disparities.

1. University of Wisconsin School of Medicine and Public Health. Area Deprivation Index. Available at: https://www.neighborhoodatlas.medicine.wisc.edu/

# Appendix A: Demographics for Medicaid Enrollees

**Key:** Medicaid Commercial

### ENROLLMENT IN HEALTH PLAN FOLLOWING DIAGNOSIS (ENROLLMENT PERCENTAGE)




To measure adherence to metrics, patients are required to be continuously enrolled in one of the health plans in the dataset for specific periods of time depending on the measure. In order to understand the impact disenrollment may have on the results, disenrollment rates were compared between commercial and Medicaid health plans.

Patients were all enrolled in their plan at the time of diagnosis and did not die or turn 65 in the year following. Results indicate that patients insured by Medicaid disenrolled at a slightly faster rate; however, patients with both commercial and Medicaid plans either changed (or lost) coverage during that time period.

# Appendix B: Individual Metric Definitions

For complete methodology information please refer to the Community in Cancer Care in Washington State: Methodology 2023 report available at FredHutch.org/cancer-care-report.

General inclusion criteria:

- Diagnosed or treated with cancer in Washington state
- Known date of diagnosis, and not diagnosed at autopsy or by death certificate
- Enrolled in Premera Blue Cross, Regence BlueShield, WA State Uniform Medical Plan or Medicare

| HICOR METRIC | SOURCE | NUMERATOR | DENOMINATOR | CLINIC ATTRIBUTION PERIOD |
|---|---|---|---|---|
| **Measure 1A: Recommended Cancer Treatment for Breast, Colorectal and Lung Cancer (Summary Quality Score)** | | | | |
| Recommended therapy based on cancer type | *See below for appropriate therapy metrics for each cancer type* | | | |
| **Breast Cancer** | | | | |
| Recommended therapy based on ER/PR and HER2 status | **MACRA** #450<br>**OCM**-10<br>**QOPI** BR55<br>**NQF** #1858 | • HER2/neu positive: Claim for trastuzumab, lapatinib, or pertuzumab within 365 days of diagnosis<br>• HER2/neu negative: No claim for trastuzumab, lapatinib, or pertuzumab within 365 days of diagnosis | • Age 18+<br>• Female<br>• Breast cancer<br>• First or only cancer<br>• AJCC stage T1c or AJCC stage II-III breast cancer<br>• Known HER2/neu status<br>• Alive 365 days after diagnosis<br>• Medical coverage in 12 months following diagnosis<br>• Claim for chemotherapy within 365 days of diagnosis<br>• Exclude patients receiving anthracycline-based chemotherapy or radiation therapy in days 335-365 following diagnosis | HICOR Treatment Period* |
| | **OCM**-9<br>**QOPI** BR53<br>**NQF** #0559 | • ER/PR Negative: Claim for two or more chemotherapy agents within 120 days of diagnosis; second agent given within three days of first agent | • Age 18-79<br>• Female<br>• Breast cancer<br>• First or only cancer<br>• Known stage AJCC T1cN0M0 or IB-III breast cancer<br>• Known ER and PR status<br>• Alive 120 days (ER/PR negative) or 365 days (ER/PR positive) after diagnosis<br>• Exclude phyllodes (9020) and rare (8940, 8950, 8980, 8981) histology types<br>• Exclude tumors size ≤1cm2 & AJCC N0<br>• Alive with medical coverage for 120 days (ER/PR negative) or 365 days (ER/PR positive) after diagnosis<br>• ER/PR negative: Lumpectomy or mastectomy in the first 120 days from diagnosis<br>• ER/PR positive: Exclude patients receiving chemotherapy or radiation therapy in days 335-365 after diagnosis; exclude patients who received oophorectomy in year following diagnosis | HICOR Treatment Period* |
| | **OCM**-11<br>**QOPI** BR58<br>**QOPI** BR59<br>**NQF** #0220<br>**NQF** #0387<br>**PQRS** #71 | • ER/PR Positive: Hormone therapy (tamoxifen, aromatase inhibitor or as defined by cancer registry) within 365 days of diagnosis | | |

* See page 53 for definitions of HICOR Treatment Period and HICOR Follow-up Period

# Appendix B: Individual Metric Definitions

| HICOR METRIC | SOURCE | NUMERATOR | DENOMINATOR | CLINIC ATTRIBUTION PERIOD |
|---|---|---|---|---|
| **Colorectal Cancer** | | | | |
| Receipt of chemotherapy within 120 days of diagnosis for stage III colon cancer patients | **OCM**-8<br>**QOPI** CRC68<br>**NQF** #0223<br>**NQF** #0385 | • Claim for chemotherapy within 120 days of diagnosis | • Age 18-79<br>• Colon cancer<br>• First or only cancer<br>• AJCC stage III<br>• Alive 120 days after diagnosis<br>• Medical coverage for 120 days after diagnosis | HICOR Treatment Period* |
| Receipt of chemotherapy within 270 days of diagnosis for stage II-III rectal cancer patients | **QOPI** CRC72 | • Claim for chemotherapy within 270 days of diagnosis | • Age 18-79<br>• Rectal cancer<br>• First or only cancer<br>• AJCC stage II-III<br>• Alive 270 days after diagnosis<br>• Medical coverage for 270 days after diagnosis | HICOR Treatment Period* |
| **Non-Small Cell Lung Cancer** | | | | |
| Receipt of chemotherapy within 60 days of surgery | **QOPI** NSCLC80 & 81 | • Claim for chemotherapy within 60 days of curative surgery | • Age 18+<br>• Non-small cell lung cancer<br>• First or only cancer<br>• AJCC stage II-IIIA<br>• Claim for curative surgery<br>• Medical coverage from diagnosis to two months following surgery | HICOR Treatment Period* |
| No bevacizumab use for metastatic tumors within three months of diagnosis | **QOPI** NSCLC86a | • No claim for bevacizumab within three months of diagnosis | • Age 18+<br>• Non-small cell lung cancer<br>• First or only cancer<br>• AJCC stage IV or registry stage distant<br>• Squamous histology<br>• Medical coverage from diagnosis to three months after diagnosis or death | HICOR Treatment Period* |
| **Measure 1B: Recommended Treatment for Breast Cancer (Summary Quality Score)** | | | | |
| Recommended therapy based on HER2 status | | *See the above measure Recommended Treatment for Breast, Colorectal, and Non-Small Cell Lung Cancer for specifications related to breast cancer quality metrics on page 49.* | | |
| Recommended therapy based on ER/PR status | | | | |
| **Measure 1: Recommended Cancer Treatment (Cost)** | | | | |
| Total cost during treatment | | • All amounts paid by insurers to health care providers during HICOR Treatment Period* | Measure 1A: Patients eligible for any Recommended Treatment for Breast, Colorectal and Non-Small Cell Lung Cancer quality metrics<br><br>Measure 1B: Patients eligible for any Recommended Treatment for Breast Cancer quality metrics | HICOR Treatment Period* |

* See page 53 for definitions of HICOR Treatment Period and HICOR Follow-up Period

# Appendix B: Individual Metric Definitions

| HICOR METRIC | SOURCE | NUMERATOR | DENOMINATOR | CLINIC ATTRIBUTION PERIOD |
|---|---|---|---|---|
| **Measure 2: Hospitalization During Chemotherapy (Summary Quality Score)** | | | | |
| Emergency department (ED) visits during chemotherapy | **OCM**-2 | • ED claim without subsequent inpatient admission (≤1 day) within 180 days of first chemotherapy claim | • Age 18+<br>• All cancers except leukemia<br>• First or only cancer<br>• Medical coverage in month of diagnosis & for six months from first chemotherapy claim (or until death)<br>• Claim for outpatient chemotherapy within 180 days of diagnosis<br>• No bone marrow transplant between diagnosis and 180 days after first outpatient chemotherapy | Start: First outpatient chemotherapy<br><br>End: Start date + 180 days |
| Inpatient (IP) stays during chemotherapy | **OCM**-1 | • Hospital IP admission not related to a cancer-directed surgery within 180 days of first chemotherapy claim | • Age 18+<br>• All cancers except leukemia<br>• First or only cancer<br>• Medical coverage in month of diagnosis & for six months from first chemotherapy claim (or until death)<br>• Claim for outpatient chemotherapy within 180 days of diagnosis<br>• No bone marrow transplant between diagnosis and 180 days after first outpatient chemotherapy | Start: First outpatient chemotherapy<br><br>End: Start date + 180 days |
| **Measure 2: Hospitalization During Chemotherapy (Cost)** | | | | |
| Total cost within six months of initial chemotherapy | | All amounts paid by insurers to health care providers from first outpatient chemotherapy through 180 days | Patients eligible for Hospitalization During Chemotherapy quality measure | Start: First outpatient chemotherapy<br><br>End: Start date + 180 days |

### Definition of Chemotherapy:

Chemotherapy utilization is measured using administrative and drug procedure codes. Chemotherapy includes traditional chemotherapy, immunotherapy, and biologics. The drugs could be delivered either through an IV or orally. Chemotherapy does not include hormone therapy (e.g. tamoxifen) or supportive care (e.g. colony stimulating factors).

# Appendix B: Individual Metric Definitions

| HICOR METRIC | SOURCE | NUMERATOR | DENOMINATOR | CLINIC ATTRIBUTION PERIOD |
|---|---|---|---|---|
| **Measure 3: Breast Cancer Tumor Marker Testing Following Treatment (Summary Quality Score)** | | | | |
| Breast cancer tumor marker testing following treatment | **QOPI** BR62c1 & BR62c2 | • Claim for tumor marker test (CEA, CA 15-3, CA 27.29) during HICOR Follow-up Period* | • Age 18+<br>• Female<br>• Breast cancer<br>• First and only cancer<br>• AJCC stage I, II, IIIA<br>• Received curative treatment (mastectomy, or lumpectomy plus radiation within 90 days)<br>• Medical coverage from diagnosis through end of follow-up period* | HICOR Follow-up Period* |
| **Measure 3: Breast Cancer Tumor Marker Testing Following Treatment (Cost)** | | | | |
| Total cost during follow-up period | | All amounts paid by insurers to health care providers during HICOR Follow-up Period* | Patients eligible for Breast Cancer Tumor Marker Testing Following Treatment quality metric | HICOR Follow-up Period* |

* See page 53 for definitions of HICOR Treatment Period and HICOR Follow-up Period

# Appendix B: Individual Metric Definitions

| HICOR METRIC | SOURCE | NUMERATOR | DENOMINATOR | CLINIC ATTRIBUTION PERIOD |
|---|---|---|---|---|
| **Measure 4: End of Life Care (Summary Quality Score)** | | | | |
| Chemotherapy in the last 14 days of life | **MACRA** #453<br>**QOPI** EOL48<br>**NQF** #0210 | • Claim for any chemotherapy in the last 14 days of life | • Age 18+<br>• Patient died<br>• Solid tumors only (excludes leukemia, lymphoma and myeloma)<br>• Includes AJCC stage II/III/IV or SEER stage regional/distant<br>• Medical coverage six months prior to death through date of death | Last 180 days of life |
| Multiple Emergency Department (ED) visits in the last 30 days of life | **MACRA** #454<br>**QOPI** EOL49<br>**NQF** #0211 | • More than one ED visit in the last 30 days of life | • Age 18+<br>• Patient died<br>• Solid tumors only (excludes leukemia, lymphoma and myeloma)<br>• Includes AJCC stage II/III/IV or SEER stage regional/distant<br>• Medical coverage six months prior to death through date of death | Last 180 days of life |
| Intensive Care Unit (ICU) Stay in the last 30 days of life | **MACRA** #455<br>**QOPI** EOL49a<br>**NQF** #0213 | • Hospital ICU admission for any reason in the last 30 days of life | • Age 18+<br>• Patient died<br>• Solid tumors only (excludes leukemia, lymphoma and myeloma)<br>• Includes AJCC stage II/III/IV or SEER stage regional/distant<br>• Medical coverage six months prior to death through date of death | Last 180 days of life |
| Hospice care three or more days prior to death | **MACRA** #457<br>**OCM**-3<br>**QOPI** EOL44<br>**NQF** #0216 | • Two or more inpatient or outpatient hospice claims, with the first claim at least three days prior to death | • Ages 18+<br>• Patient died<br>• Solid tumors only (excludes leukemia, lymphoma and myeloma)<br>• Includes AJCC stage II/III/IV or SEER stage regional/distant<br>• Medical coverage six months prior to death through date of death | Last 180 days of life |
| **Measure 4: End of Life Care (Cost)** | | | | |
| Total cost in last 30 days of life | | All amounts paid by insurers to health care providers in last 30 days of life | Patients eligible for any End of Life Care quality metrics | Last 180 days of life |

**Definitions of HICOR Care Periods:**

TREATMENT PERIOD:

**Start:** First treatment. Treatment is defined as surgery, chemotherapy or radiation therapy.
**End:** Earliest of:

1. 12 months following first treatment, or
2. Start of follow-up period. The follow-up period begins at the start of a four-month gap in treatment (i.e., surgery, chemotherapy or radiation therapy).

FOLLOW-UP PERIOD:

**Start:** Beginning of a four-month gap in treatment. Treatment is defined as surgery, chemotherapy or radiation therapy.
**End:** Earliest of:

1. 13 months following start of follow-up period, or
2. Start of new treatment (i.e., surgery, chemotherapy or radiation therapy).

# Appendix B: Individual Metric Definitions

| HICOR METRIC | SOURCE | NUMERATOR | DENOMINATOR | CLINIC ATTRIBUTION PERIOD |
|---|---|---|---|---|
| **Measure 5: Biomarker Testing for Metastatic Lung Cancer (State Level Reporting)** | | | | |
| Biomarker testing for metastatic lung cancer | **NCCN** guidelines for non-small cell lung cancer | • Claim for NGS, EGFR, ALK, or ROS1 in the two months prior to diagnosis through four months after diagnosis | • Age 18+<br>• Non-small cell lung cancer<br>• First or only cancer<br>• Includes AJCC stage IV or SEER stage distant<br>• Alive three months after diagnosis<br>• Medical coverage two months prior to diagnosis through four months following diagnosis | N/A |
| **Measure 6: Germline Testing (State Level Reporting)** | | | | |
| Germline testing for breast cancer | **NCCN** guidelines for Genetic/ Familial High-Risk Assessment: Breast, Ovarian, and Pancreatic | • Claim for BRCA1/2 test in the two months prior to diagnosis through 24 months after diagnosis | • Age 18+<br>• Breast cancer<br>• First or only cancer<br>• Group recommended for germline testing: triple negative, male, or age under 50<br>• Alive three months after diagnosis<br>• Medical coverage two months prior to diagnosis through 24 months following diagnosis | N/A |
| Germline testing for ovarian cancer | **NCCN** guidelines for Genetic/ Familial High-Risk Assessment: Breast, Ovarian, and Pancreatic | • Claim for germline test in the two months prior to diagnosis through 24 months after diagnosis | • Age 18+<br>• Ovarian, fallopian tube, or peritoneum cancer<br>• First or only cancer<br>• Alive three months after diagnosis<br>• Medical coverage two months prior to diagnosis through 24 months following diagnosis | N/A |
| Germline testing for pancreatic cancer | **NCCN** guidelines for Genetic/ Familial High-Risk Assessment: Breast, Ovarian, and Pancreatic | • Claim for germline test in the two months prior to diagnosis through 24 months after diagnosis | • Age 18+<br>• Adenocarcinoma of the pancreas<br>• First or only cancer<br>• Alive three months after diagnosis<br>• Medical coverage two months prior to diagnosis through 24 months following diagnosis | N/A |
| Germline testing for prostate cancer | **NCCN** guidelines for Prostate Cancer | • Claim for germline test in the two months prior to diagnosis through 24 months after diagnosis | • Age 18+<br>• Prostate cancer<br>• First or only cancer<br>• Stage: metastatic, regional (node positive), or high- or very-high-risk localized (see NCCN guidelines for Prostate Cancer)<br>• Alive three months after diagnosis<br>• Medical coverage two months prior to diagnosis through 24 months following diagnosis | N/A |
| **Measure 7: Timeliness of Care (State Level Reporting)** | | | | |
| Time to start of treatment | | Median number of days between first visit at an oncology clinic (no more than 30 days prior to diagnosis) and first treatment (radiation or chemotherapy).<br><br>If the patient visited multiple oncology clinics, the clinic with the most number of visits was selected. | • Age 18+<br>• Solid tumors only (excludes leukemia, lymphoma and myeloma)<br>• First or only cancer<br>• Includes AJCC stage IV or SEER stage distant<br>• First treatment was radiation or chemotherapy<br>• Treatment started within 12 months of diagnosis<br>• Medical coverage one month prior to diagnosis through 12 months following diagnosis | N/A |

# Appendix C: Acronyms

| | |
|---|---|
| **ADI** | Area Deprivation Index |
| **AJCC** | American Joint Committee on Cancer |
| **ALK** | Anaplastic Lymphoma Kinase |
| **ASCO** | American Society of Clinical Oncology |
| **ATM** | Ataxia-Telangiesctasia Mutated |
| **BRCA 1/2** | Breast Cancer Gene |
| **CA 15-3** | Cancer Antigen 15-3 |
| **CEA** | Carcinoembryonic Antigen |
| **ED** | Emergency Department |
| **EGFR** | Epidermal Growth Factor Receptor |
| **EOL** | End of Life |
| **ER** | Estrogen Receptor |
| **HER2** | Human Epidermal Growth Factor Receptor 2 |
| **HICOR** | Hutchinson Institute for Cancer Outcomes Research |
| **ICU** | Intensive Care Unit |
| **IP** | Inpatient |
| **MACRA** | Medicare Access and CHIP Reauthorization Act of 2015 |
| **NCCN** | National Comprehensive Cancer Network |
| **NGS** | Next-Generation Sequencing |
| **NQF** | National Quality Forum |
| **NSCLC** | Non-Small Cell Lung Cancer |
| **OCM** | Oncology Care Model |
| **PQRS** | Physician Quality Reporting System |
| **PR** | Progesterone Receptor |
| **QOPI** | Quality Oncology Practice Initiative |
| **ROS1** | ROS Proto-Oncogene1, Receptor Tyrosine Kinase |
| **SCCA** | Seattle Cancer Care Alliance |
| **SEER** | Surveillance, Epidemiology, and End Results |
| **UW** | University of Washington |
| **VCC** | Value in Cancer Care |

# Appendix D: Publications


1. Ramsey SD, Fedorenko C, Chauhan R, et al. Baseline Estimates of Adherence to American Society of Clinical Oncology/American Board of Internal Medicine Choosing Wisely Initiative Among Patients With Cancer Enrolled With a Large Regional Commercial Health Insurer. J Oncol Pract. 2015;11(4):338-343.

2. Kreizenbeck KL, Hoopes T, Steuten L, et al. Value in cancer care: Regional initiative to improve care through data reporting and interventions. Journal of Clinical Oncology. 2016;34(7_suppl):34-34.

3. Fedorenko C KK, Schwartz JS, Cheteri MK, Janes T, Potts M, et al. Linking Cancer Registries with Claims Data to Enable Community Oncology Reporting. NAACCR Annual Conference; June 19-26 2018; Pittsburgh, PA.

4. Fedorenko C WJ, Panattoni L, Kreizenbeck K, Ramsey SD. Comparing Quality of Care for Medicaid and Commercially Insured Patients with Cancer in Washington State. ASCO Quality Care Symposium; September 28-29 2018; Phoenix, AZ.

5. Panattoni L FC, Kreizenbeck K, Sun Q, Li L, Barger S, et al. Washington State Community Cancer Care Report: Implications for Value-based Purchasing. ASCO Quality Care Symposium; September 28-29 2018; Phoenix, AZ.

6. Panattoni L, Fedorenko C, Kreizenbeck K, et al. Lessons From Reporting National Performance Measures in a Regional Setting: Washington State Community Cancer Care Report. Journal of Oncology Practice. 2018;14(12):e801-e814.

7. Panattoni L FC, Kreizenbeck K, Sun Q, Li L, Lyman GH, et al. Lessons from Reporting National Performance Measures in a Regional Setting: Washington State Community Cancer Care Report. ASCO Quality Care Symposium September 28-29 2018; Phoenix, AZ.

8. Ramsey SD FC, Panattoni L, Kreizenbeck K, Sun Q, Li L, et al. . The Washington State Community Cancer Care Report: A Multi-stakeholder Effort to Characterize Quality of Care and Costs for Washington State Oncology Practices. ASCO Quality Care Symposium September 28-29 2018; Phoenix, AZ.

9. Panattoni L, Fedorenko C, Sun Q, Li L, Kreizenbeck K, Ramsey S. Impact of Rurality Versus Neighborhood Deprivation on Stage at Diagnosis and Survival: A Regional Analysis. ASCO Quality Care Symposium; September 6-7, 2019; San Diego, CA.

10. Fedorenko C, Panattoni L, Sun Q, Li L, Kreizenbeck K, Ramsey S. Do Rural Cancer Patients Receive Lower Quality Cancer Care? Assessing the Impact of Rurality on Oncology Practice Performance Measures. ASCO Quality Care Symposium; September 6-7, 2019; San Diego, CA.

11. Panattoni LE, McDermott CL, Li L, et al. Effect of the COVID-19 Pandemic on Place of Death Among Medicaid and Commercially Insured Patients With Cancer in Washington State. J Clin Oncol. 2023;41(8):1610-1617..

12. Ramsey SD, Panattoni LE, Li L, et al. Disparity in telehealth and emergency department use among Medicaid and commercially insured patients receiving systemic therapy for cancer in Washington State following the COVID-19 Pandemic. Journal of Clinical Oncology. 2021;39(15_suppl):6546-6546.

# Appendix D: Publications

13. Panattoni LE, Li L, Sun Q, et al. Medicaid patients more likely to die at home without hospice during the pandemic versus before, exacerbating disparities with commercially insured patients. Journal of Clinical Oncology. 2021;39(15_suppl):6502-6502.

14. Ramsey SD, Panattoni LE, Li L, et al. Disparity in telehealth and emergency department use among Medicaid and commercially insured patients receiving systemic therapy for cancer in Washington State following the COVID-19 Pandemic. Journal of Clinical Oncology. 2021;39(15_suppl):6546-6546.

15. Panattoni LE, McDermott CL, Li L, et al. Effect of the COVID-19 Pandemic on Place of Death Among Medicaid and Commercially Insured Patients With Cancer in Washington State. Journal of Clinical Oncology. 2023;41(8):1610-1617.

16. Sun Q, Fedorenko CR, Bansal A, Kreizenbeck KL, Shankaran V. Impact of the COVID-19 pandemic on insurance transitions among commercially insured cancer patients in Washington state. Journal of Clinical Oncology. 2023;41(16_suppl):6552-6552.

17. Shih L, Sun Q, Fedorenko CR, et al. Molecular testing utilization in patients with advanced non-small cell lung cancer (NSCLC) in Washington (WA) state. Journal of Clinical Oncology. 2023;41(16_suppl):6596-6596.

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