6TH ANNUAL
VALUE IN CANCER CARE SUMMIT 2019

Mapping Cancer Care Disparities in Washington State

HICOR
at FRED HUTCH

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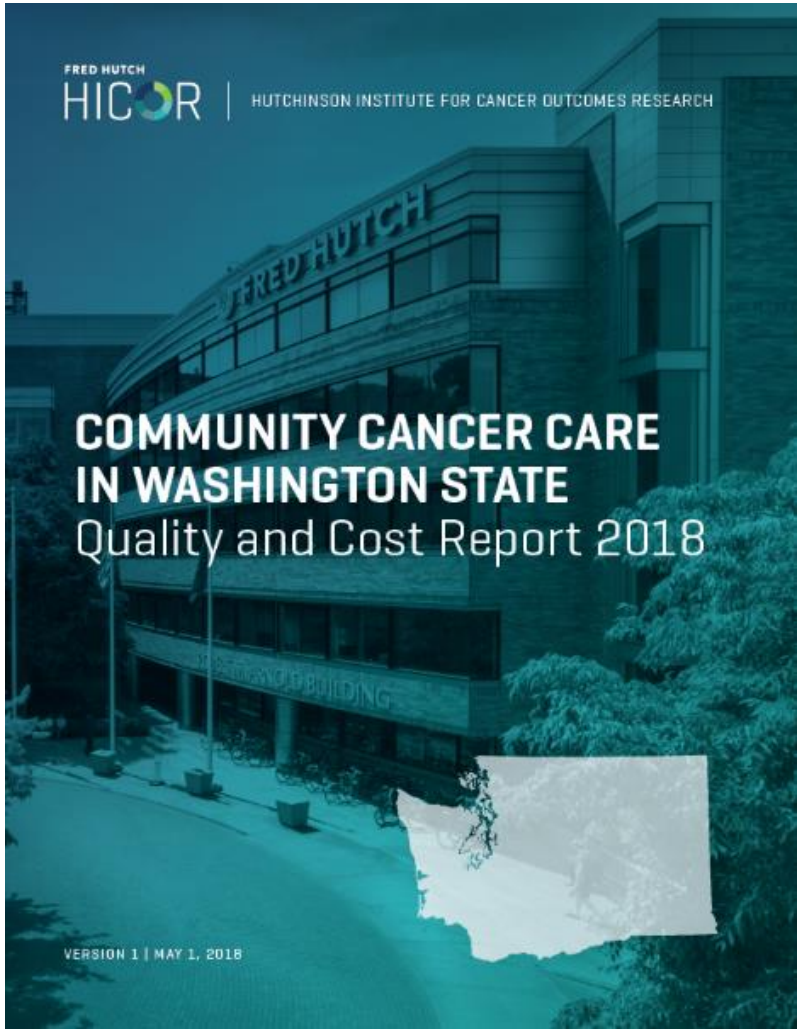
Director and Co-Director, Hutchinson Institute for Cancer Outcomes Research

Follow Up from 2018 Community Cancer Care Report

Our stakeholders asked for more information about:

- Survival
- Disparities in care



Our Questions

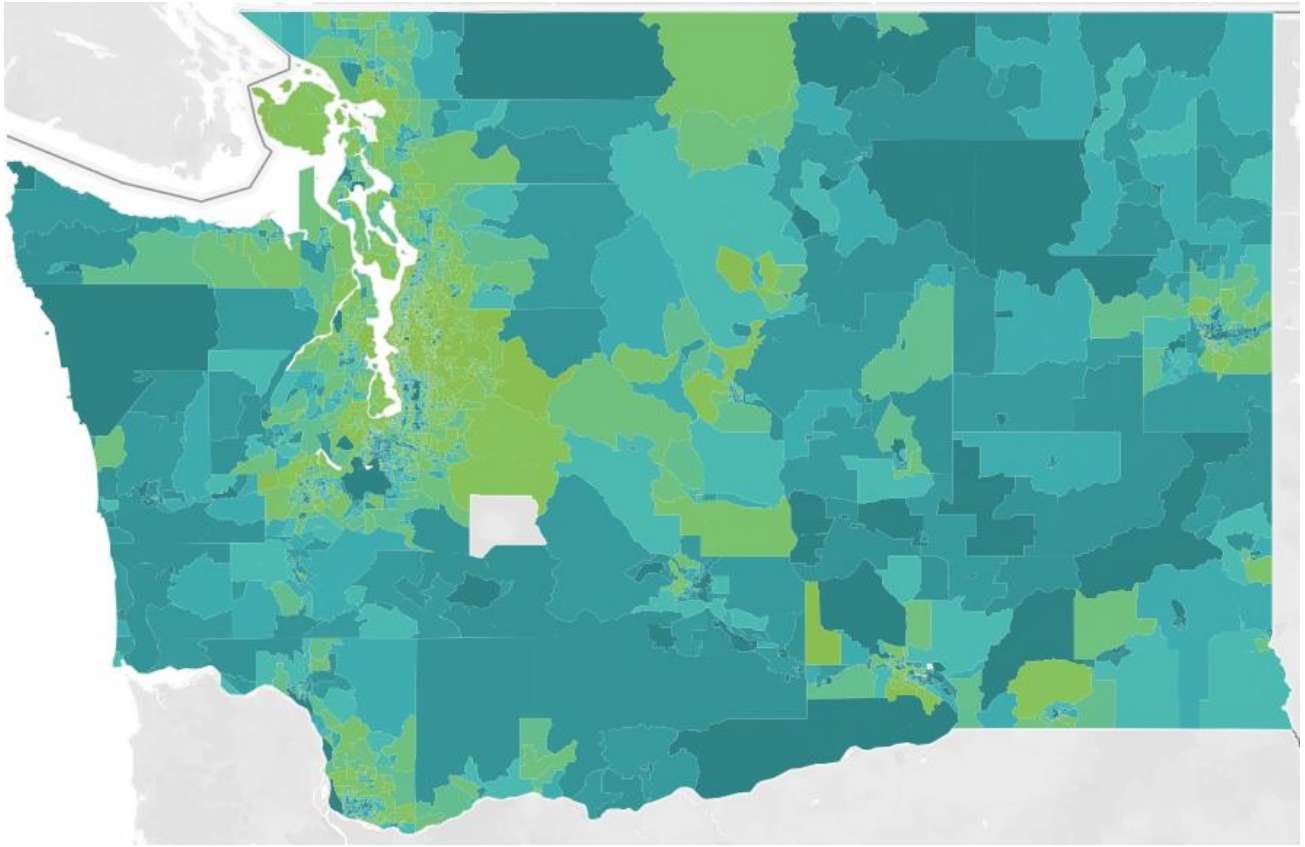
Based on social determinants of health, do we see differences in:

- Stage at diagnosis
- Insurance Type
- Survival
- Quality of cancer care

Social Determinants of Health

Neighborhood Socioeconomic Disadvantage - ADI

Area Deprivation Index (ADI) measures the material deprivation in a person's residence. It includes factors such as income and income disparity, education, employment, and housing costs and quality.



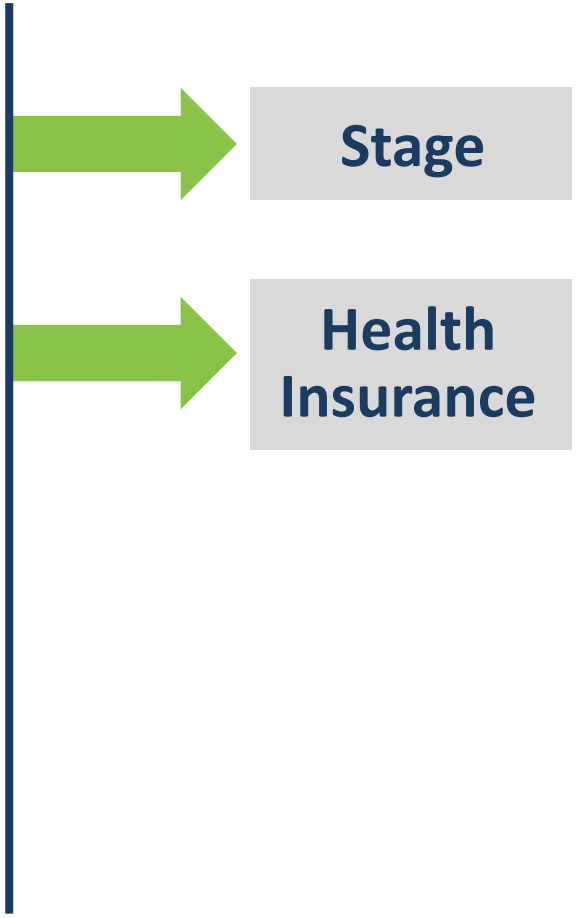
ADI is a more sensitive measure of SES and is calibrated to WA state rather than national disparities.

University of Wisconsin School of Medicine and Public Health. *Area Deprivation Index*. 5/1/2018. Available at: https://www.neighborhoodatlas.medicine.wisc.edu/

Determinants of Care Access, Quality, and Outcome

Determinants of Health

- Age
- Sex
- **Race**
- Education
- Marital Status
- **Distance to care**
- **Rurality**
- Income
- **Neighborhood level socioeconomic status**



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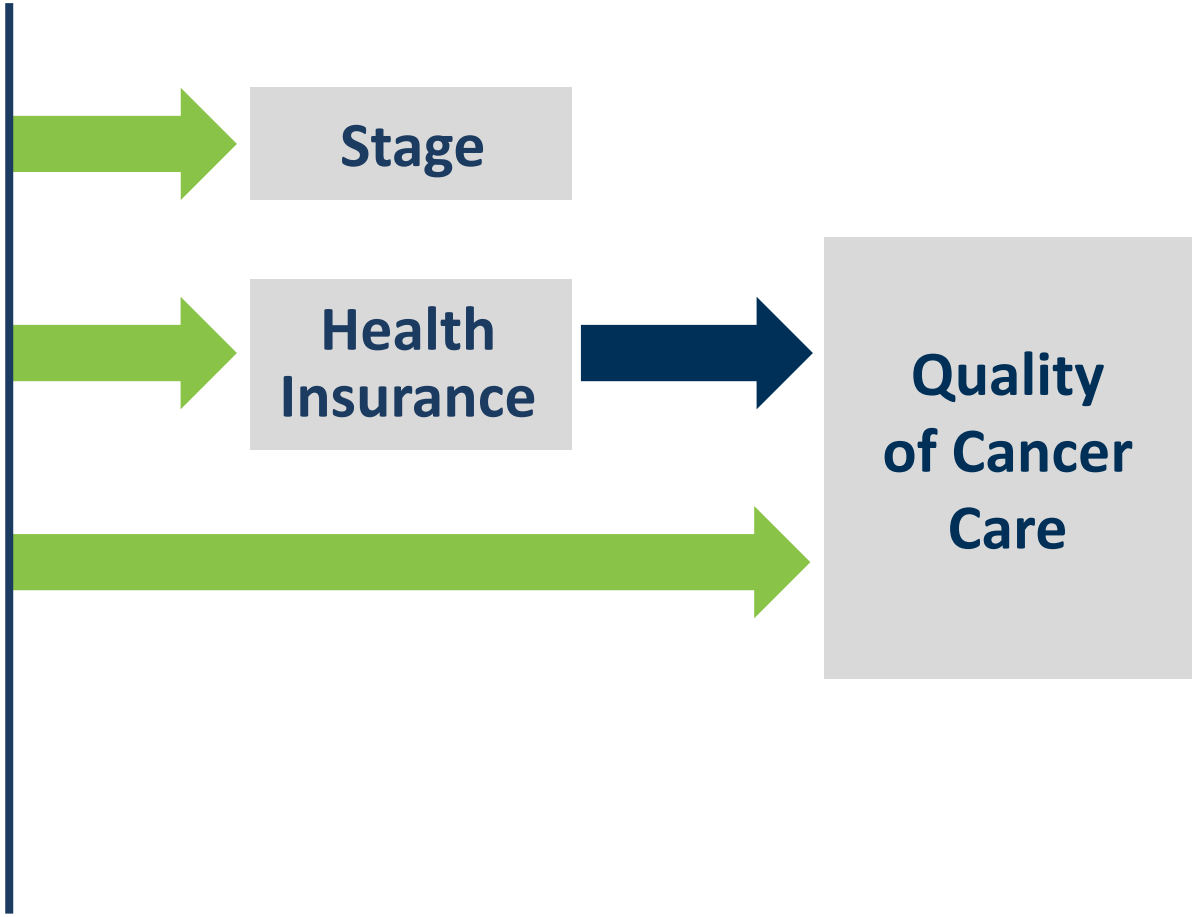

Determinants of Care Access, Quality, and Outcome

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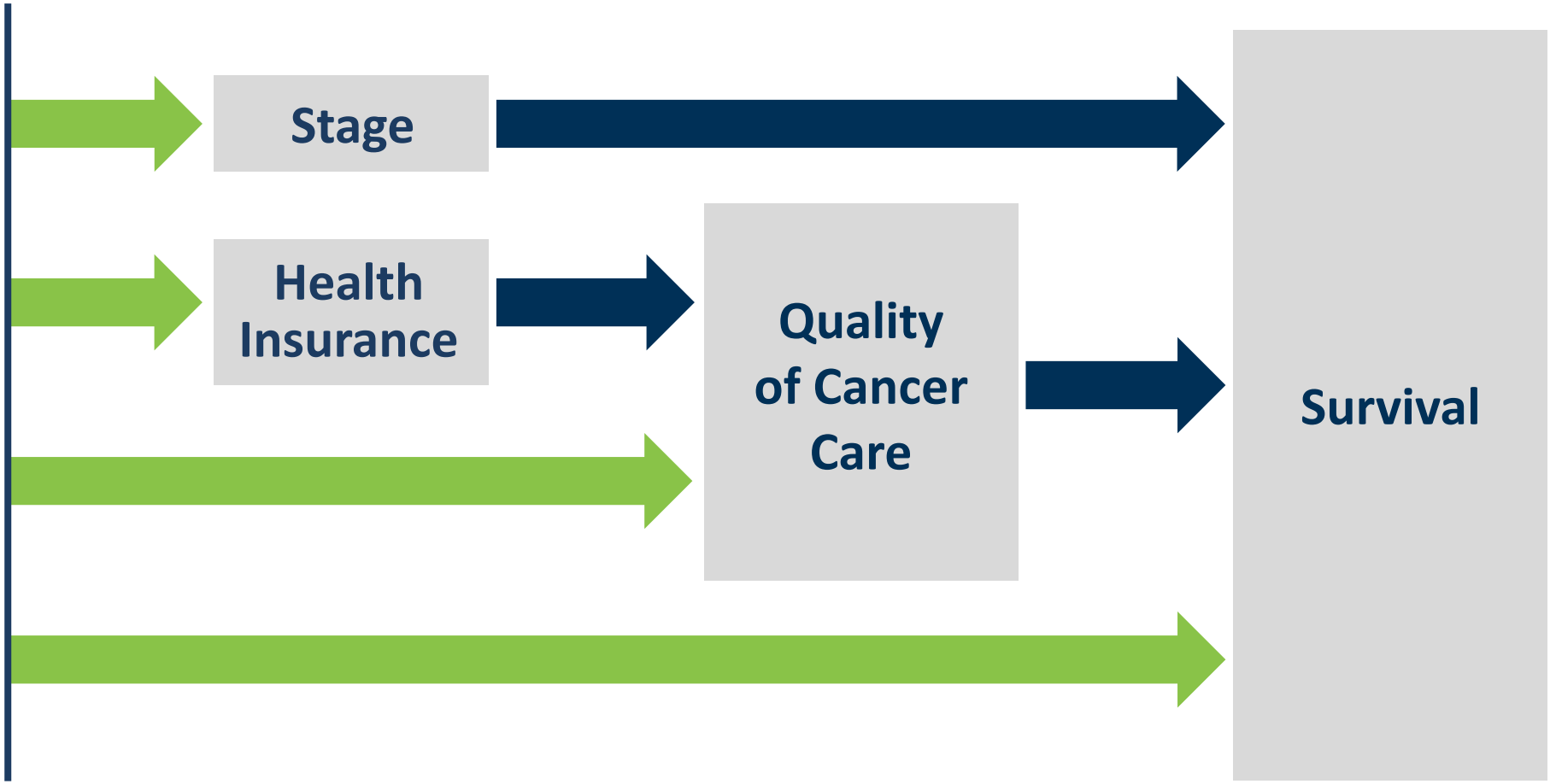


Health Care Claims

Premera Blue Cross

Regence BlueShield

Uniform Medical Plan

Medicare, Medicaid

2007-2018

Cancer Registries

CSS-Puget Sound SEER

Washington State Cancer Registry

2007-2017

Over 157,000 patients at Diagnosis

Over 64,000 at time of Death

Study Populations

3-Year Survival

- Adult solid tumor patients
- Diagnosed 2012-2014
- Insured at time of diagnosis
- Survived at least 30 days after diagnosis

Quality of Cancer Care

- As defined in the Community Cancer Care Report

Stage at Diagnosis

How We Define Cancer Stage

- **Local or Regional**
  - Local – cancer is limited to the organ
  - Regional – cancer has spread outside the organ, may involve lymph nodes
- **Distant**
  - Cancer has spread to a distant part of the body (metastasis)

Social Determinants Impact Stage of Cancer at Diagnosis

Likelihood of more advanced stage at the time of diagnosis, compared to local stage

Social Determinant		Regional	Distant
Race	**Black** v. White	1.2	1.3
	Asian v. White	1.4	1.5
Travel time	**60+** vs. 20 min	1.1	1.1
Neighborhood Disadvantage	**Highest ADI** vs. Lowest ADI	1.4	1.6

Insurance Type

How We Grouped Insurance Coverage

Insurance Type

Commercial	Medicare	Low Income Insurance
N = 10,700	**N = 13,388**	**N = 4,954**
Includes: • Commercial over 65 (including Medicare Advantage) • Commercial under 65	Includes: • Medicare Parts A/B over 65	Includes: • Medicaid • Medicare + Medicaid (Dual Enrollees) • Medicare under 65 (Disabled)

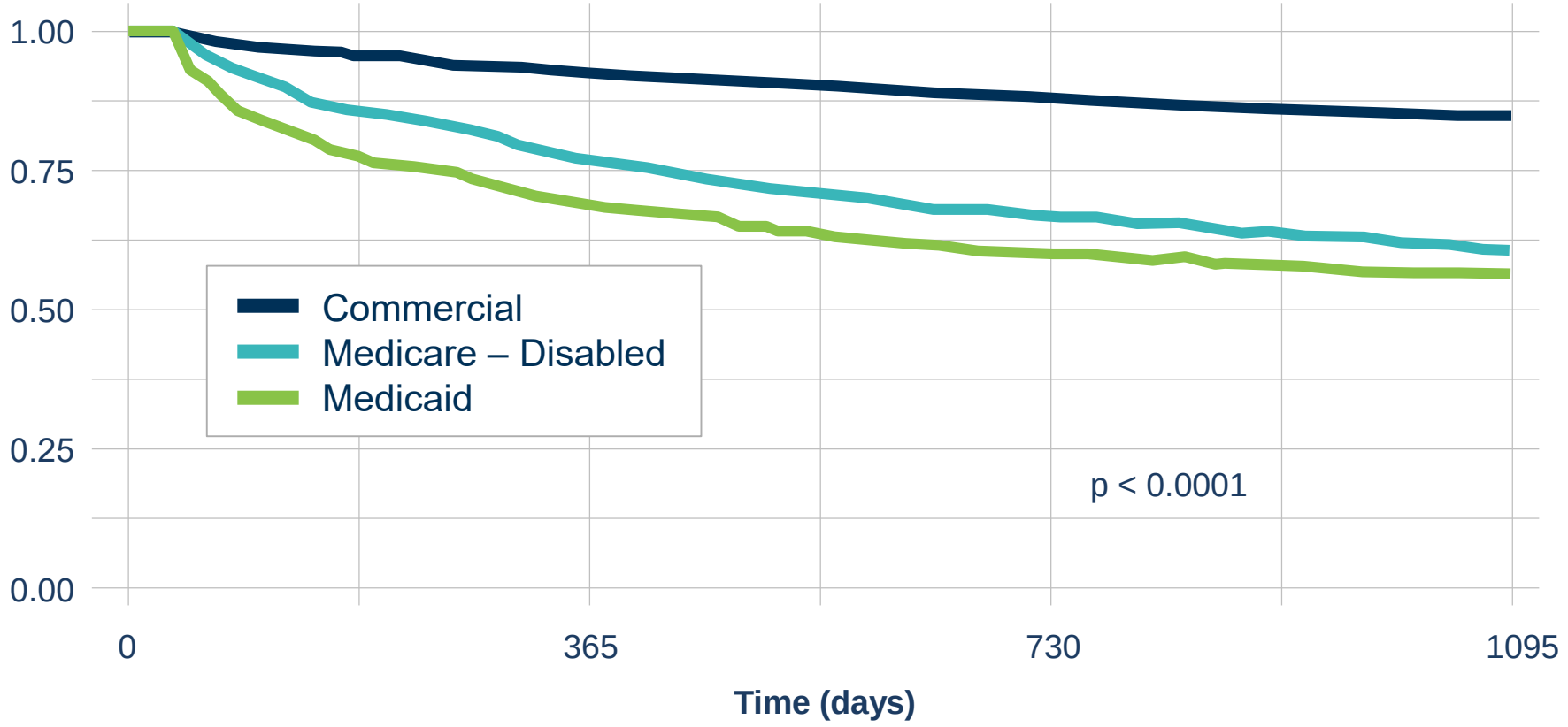
Social Determinants Increase Likelihood of Having Low Income Insurance

Likelihood of having low income insurance (vs. commercial) at the time of cancer diagnosis

Social Determinant		
Race	**Black** v. White	6.2
	Asian vs. White	4.0
	Hispanic vs. White	3.0
	American Indian vs. White	5.5
	Multiple vs. White	3.5
Neighborhood Disadvantage	**Highest ADI** vs. Lowest ADI	3.2

Survival

All Solid Tumors, Survival – Under 65*



* Controlled for age, gender, stage, and cancer site

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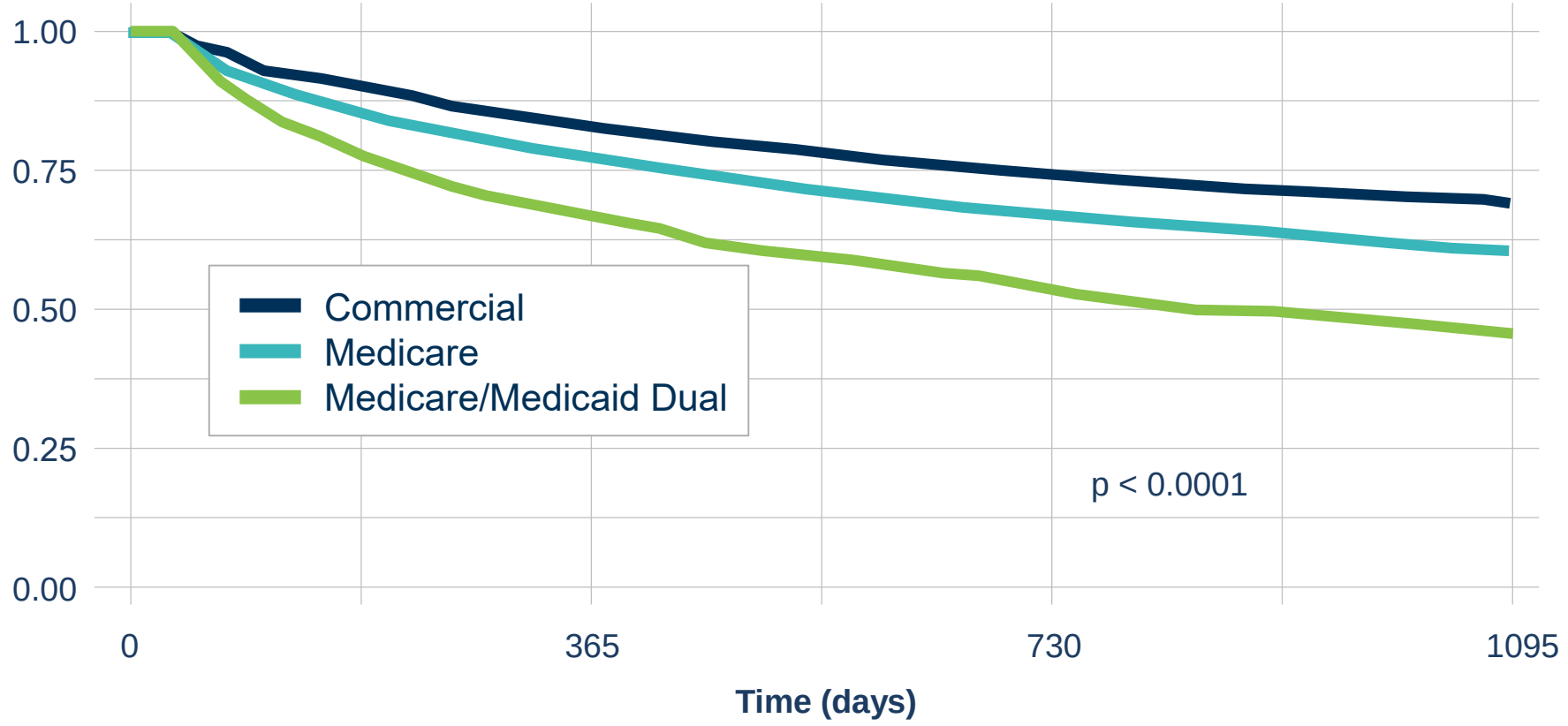
All Solid Tumors, Survival – 65 and over*



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Statistical approach to understand survival differences: Cox Proportional Hazards

Independent variables: Factors that might influence survival independent of the cancer itself

Social determinants of health

- Race
- Rurality (RUCAs)
- Travel time to cancer clinic
- Neighborhood disadvantage

Patient factors

- Gender
- Age
- Marital status

Clinical factors

- Cancer site and grade
- 24 comorbidity categories based on Medicare HCCs

Dependent variable: Survival

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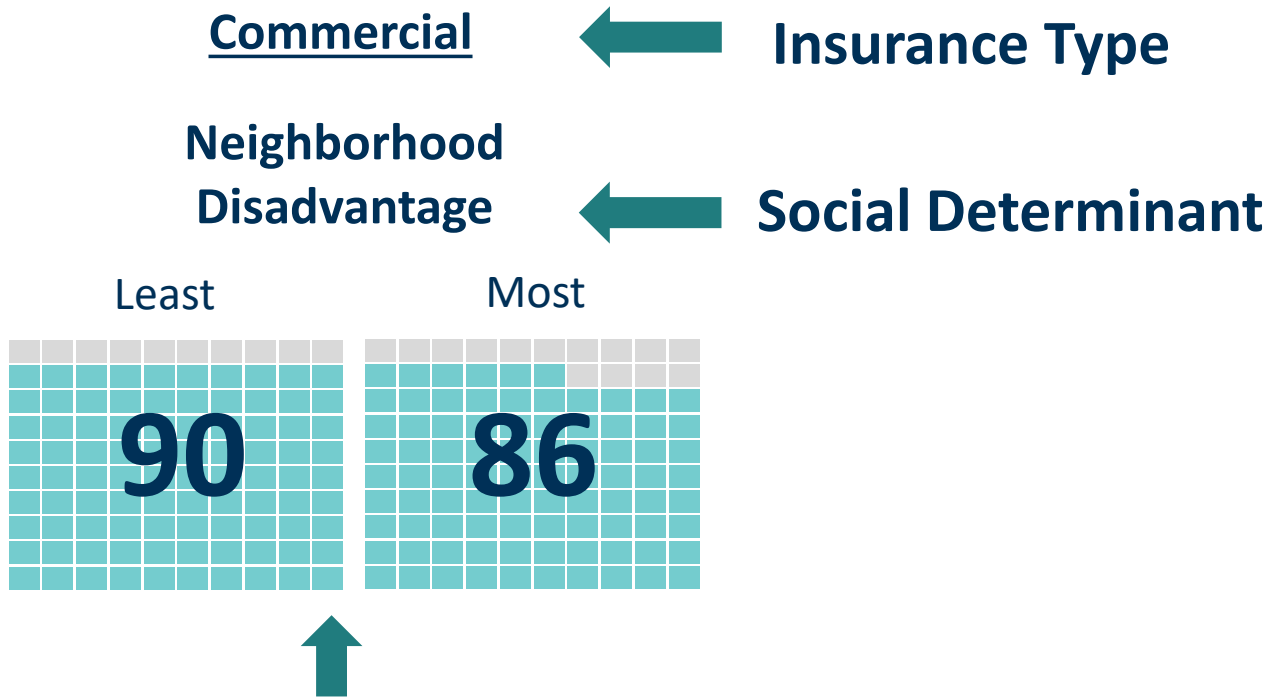
How We Show the Results*



Boxes: Out of 100 patients with that characteristic, the number who survive 3 years from diagnosis

Independent variables: We only show results for factors that are statistically significant (i.e., the difference is unlikely to be solely due to chance)

*Thanks to Tableau Foundation for inspiring this data visualization

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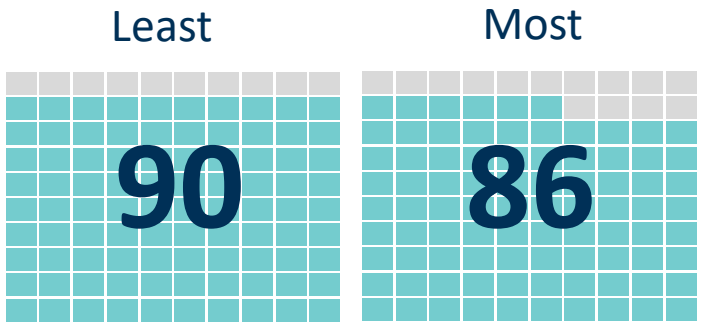
Local/Regional Stage

Neighborhood, Race, and Rurality Influence Survival

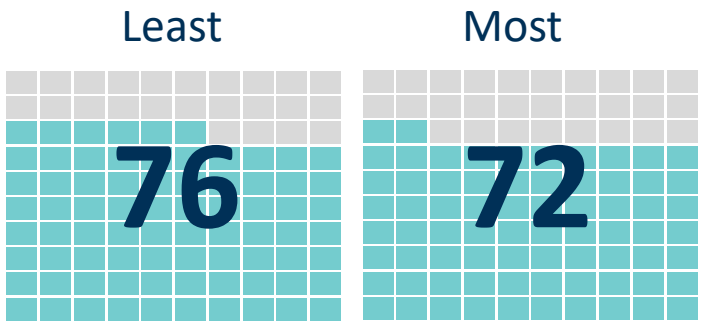
Commercial

Neighborhood Disadvantage



Medicare

Neighborhood Disadvantage



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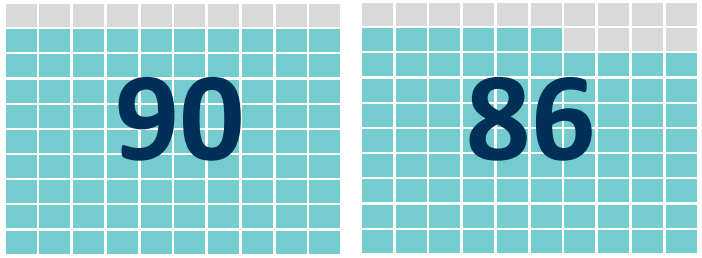

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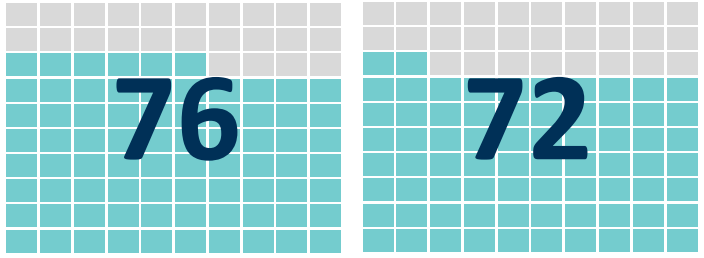
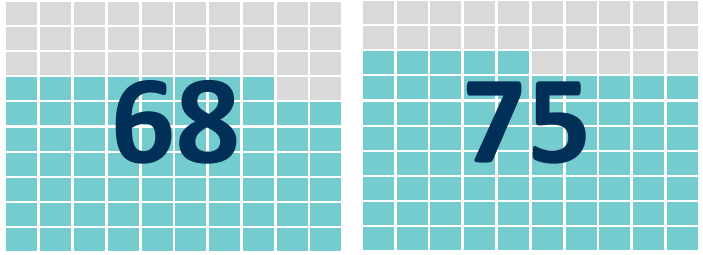
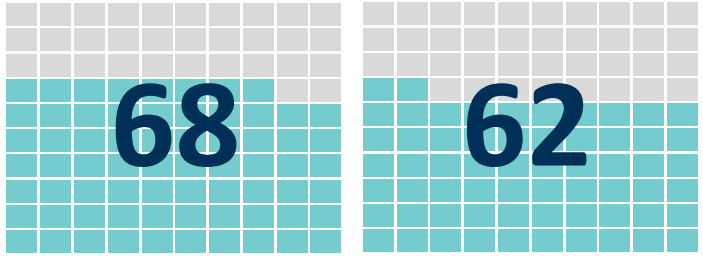


Low Income Insurance

Race



Rurality



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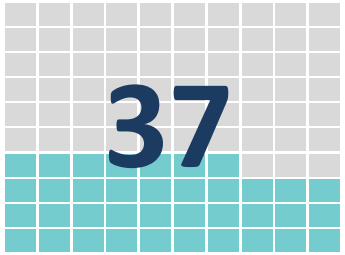
Distant Stage

Neighborhood and Race Influence Survival

Commercial

Neighborhood Disadvantage

Least



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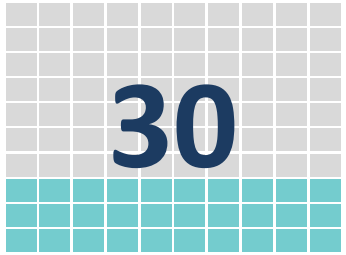

Medicare

Neighborhood Disadvantage

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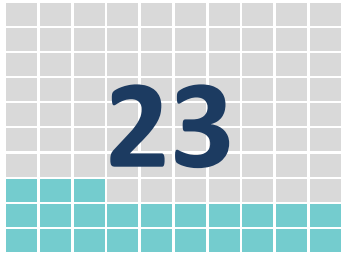

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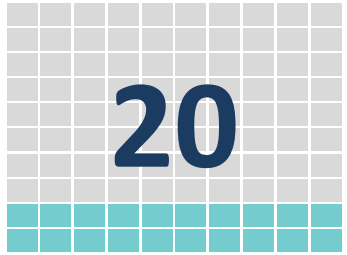

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Distant Stage

Neighborhood and Race Influence Survival

Commercial

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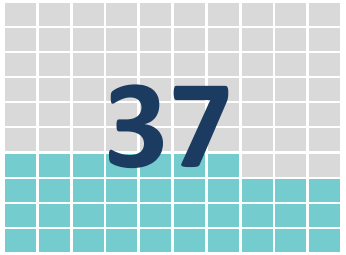

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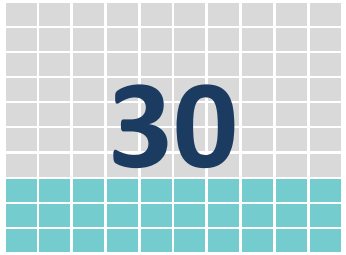

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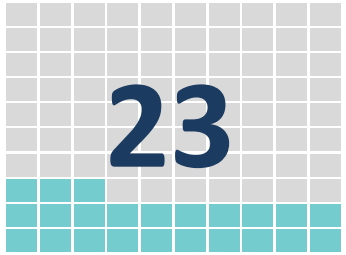

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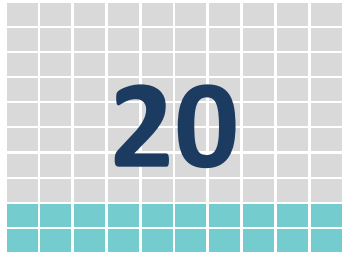
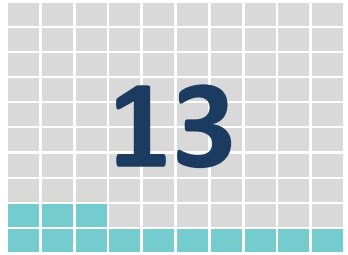


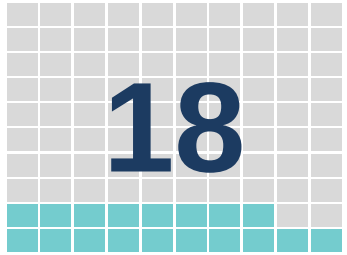
Low Income Insurance

Race

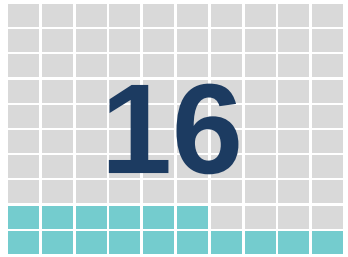
White



Asian



Hispanic



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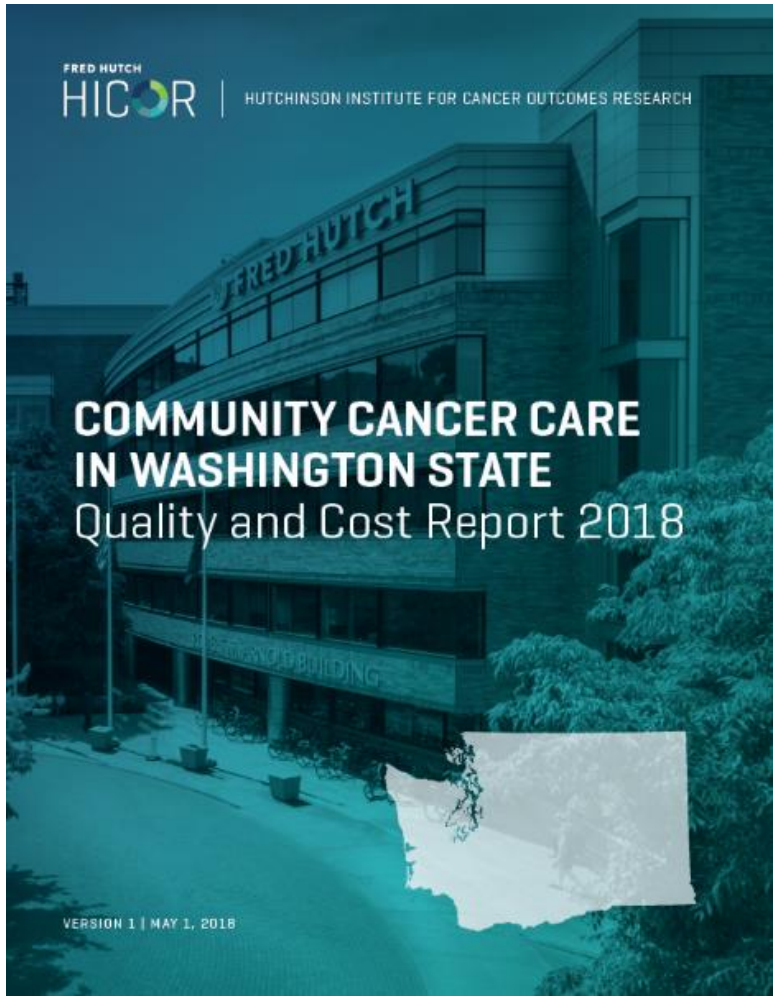
Quality of Care

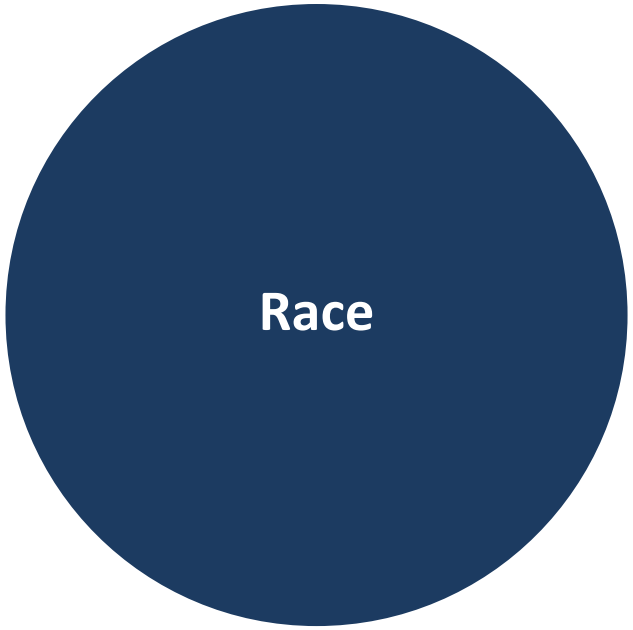
Community Cancer Care Report Metrics

Community Cancer Care Report Metrics

Hospitalization Measures
Emergency Dept (ED) visits during chemotherapy
Inpatient hospital stays during chemotherapy
Multiple ED visits at end of life
ICU stays at end of life
Appropriate Care
Initial treatment: Appropriate therapy
Anti-nausea meds during chemotherapy
Chemotherapy use at end of life
Hospice use at end of life



Did Race Impact Quality of Care?



Hospitalization Measures	C	M	LII
Emergency Department (ED) visits during chemotherapy	✓		✓
Inpatient hospital stays during chemotherapy			
Multiple ED visits at end of life			
ICU stays at end of life			✓
Appropriate Care			
Appropriate therapy			
Anti-nausea meds during chemotherapy			
Chemotherapy use at end of life			
Hospice use at end of life			

Emergency Department Visits During Chemotherapy

- Among Commercial and Low-income insurance plan enrollees, fewer **Asian** patients are seen in the ED during chemotherapy than White patients

ICU Stays at End of Life

- Among Low-income insurance enrollees, **Black** patients are 50% more likely than White patients to be admitted to ICU

Did Neighborhood Impact Quality of Care?

Neighborhood Socioeconomic Disadvantage

Hospitalization Measures	C	M	LII
Emergency Department (ED) visits during chemotherapy	✓	✓	✓
Inpatient hospital stays during chemotherapy	✓	✓	
Multiple ED visits at end of life	✓	✓	
ICU stays at end of life			
Appropriate Care			
Appropriate therapy			
Anti-nausea meds during chemotherapy			
Chemotherapy use at end of life			
Hospice use at end of life	✓		

ED Visits and Hospital Stays During Chemotherapy

- For all insurance types, persons living in the **most disadvantaged neighborhoods** have more ED visits and/or inpatient stays during chemotherapy compared with least disadvantaged neighborhoods

Emergency Department Visits at End of Life

- Commercial and Medicare insured patients living in the **most disadvantaged neighborhoods** have more ED visits at end of life compared with least disadvantage

Did Rurality Impact Quality of Care?

Hospitalization Measures	C	M	LII
Emergency Department (ED) visits during chemotherapy			
Inpatient hospital stays during chemotherapy		✓	✓
Multiple ED visits at end of life			✓
ICU stays at end of life		✓	✓
Appropriate Care			
Appropriate therapy			
Anti-nausea meds during chemotherapy			
Chemotherapy use at end of life			
Hospice use at end of life			✓

Inpatient hospital stays during chemotherapy

- Among Medicare and low-income insurance enrollees, **small town/rural patients** are 37% and 48% less likely than metropolitan patients to be admitted to hospital during chemotherapy

ICU Stays and Hospice Use at End of Life

- Among Medicare and low-income insurance enrollees, **rural** patients have fewer ICU stays at end of life than metropolitan patients; **micropolitan** patients are less likely to enroll in hospice than metropolitan patients

Did Travel Time Impact Quality of Care?

Travel Time to Oncologist

Hospitalization Measures	C	M	LII
Emergency Department (ED) visits during chemotherapy			
Inpatient hospital stays during chemotherapy			
Multiple ED visits at end of life			
ICU stays at end of life			✓
Appropriate Care			
Appropriate therapy			
Anti-nausea meds during chemotherapy			
Chemotherapy use at end of life			
Hospice use at end of life			

ICU Stays at End of Life

- Among low income insurance enrollees, patients with **more travel time to their oncology provider** have a higher likelihood of ICU stay at end of life than patients with shorter travel times

Quality of Care - What did we learn?

- Patients living in the most disadvantaged neighborhoods visit the ED more during treatment and end of life
- Black patients and those with long travel times to their oncology provider have more stays in the ICU at end of life
- Patients living in rural areas are less likely to have inpatient hospital stays during treatment and at end of life
- Appropriate care measures are less likely to be impacted by social determinants of health

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Survival - What did we learn?

Across all cancer stages at diagnosis:

- Persons with low income insurance fare worse than those with commercial and Medicare insurance
- Persons who live in the most disadvantaged neighborhoods fare worse, regardless of their insurance

Factors related to socioeconomic disadvantage are likely responsible for observed lower survival in the low income insurance group:

- Our society sorts people into insurance plans based on their age and socioeconomic status
- Quality of initial cancer treatment is generally high for all insurance types

How can we act on what we learned?

Social determinants must be considered to provide equitable patient-centered care

HICOR

- Conduct a deeper dive where we find that social determinants are associated with worse care and outcomes

Providers and Insurers

- *Insurers*: use ADI as a screening tool
- *Insurers and providers*: Provide support services for persons in more disadvantaged neighborhoods, particularly at end of life

Patients / Patient Advocates / Community Partners

- Identify unmet needs for support, particularly in the most disadvantaged neighborhoods

All: Advocate for policies that support the most vulnerable patients

Thank You