Cancer Care Disparities in Puerto Rico

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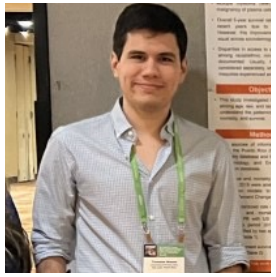

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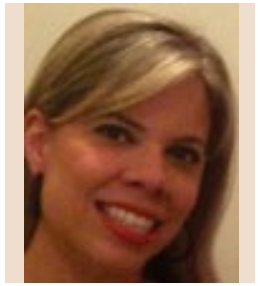

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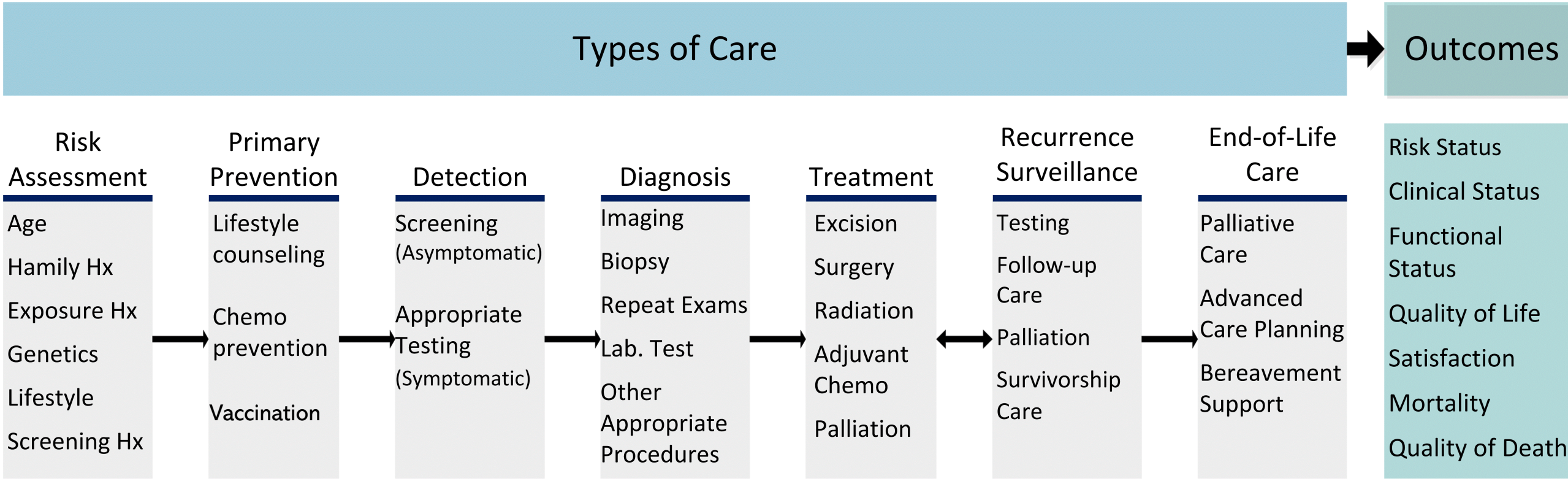
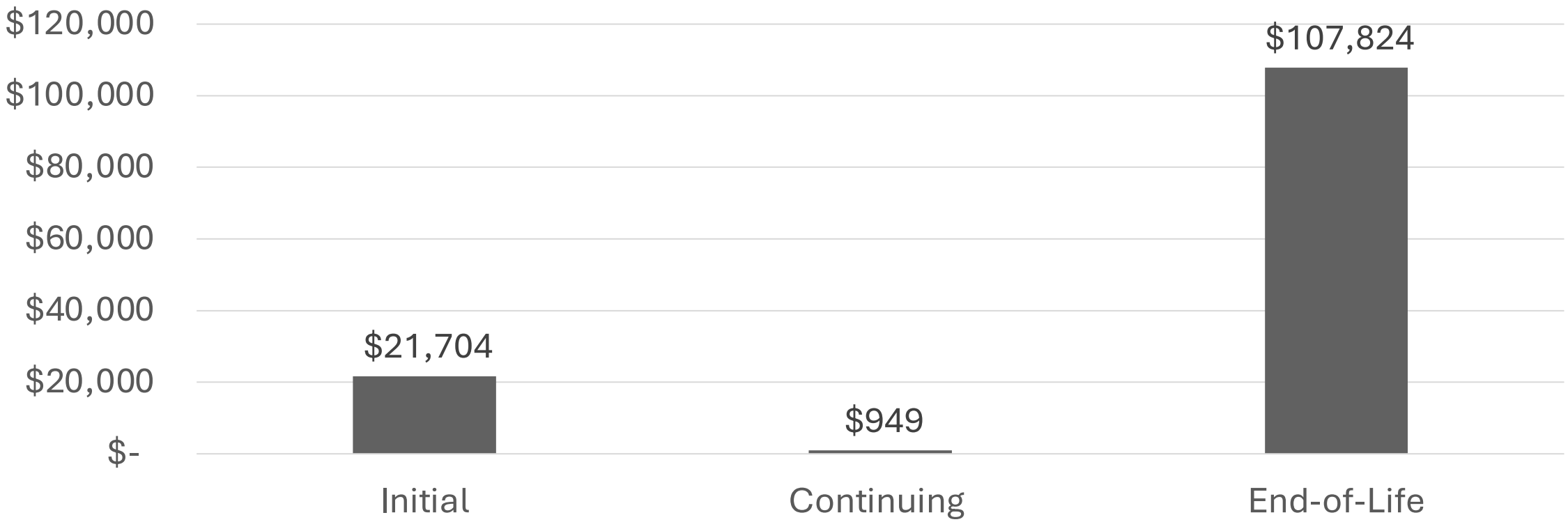
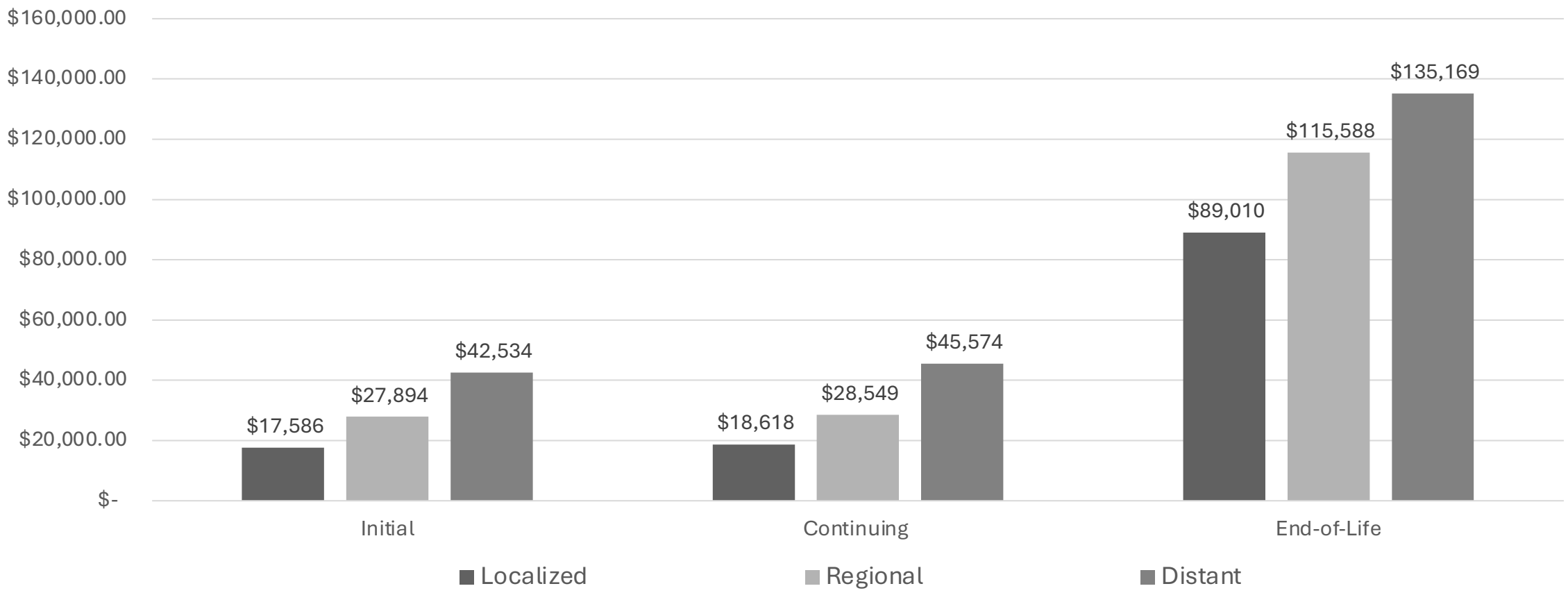
Cancer care continuum



Annualized Average Costs (per patient) for Medical Services Among Cancer Patients in Puerto Rico (2015-2016)

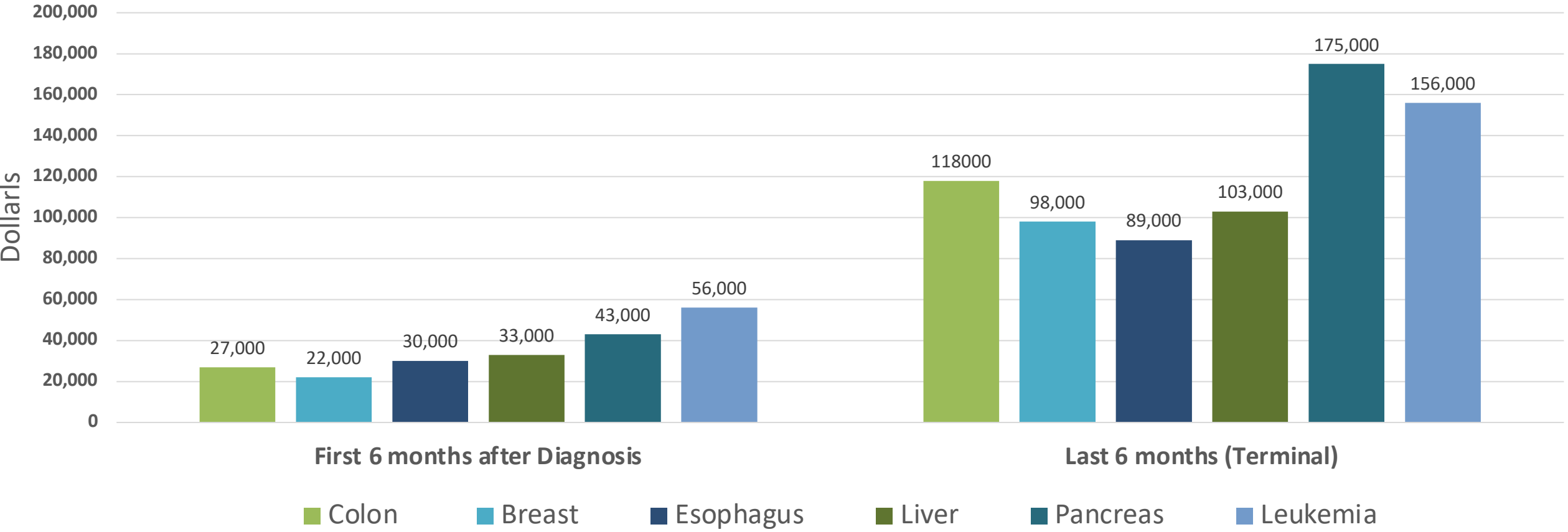


Annualized Average Costs (per patient) for Medical Services Among Cancer Patients in Puerto Rico by Summary Stage (2015-2016)

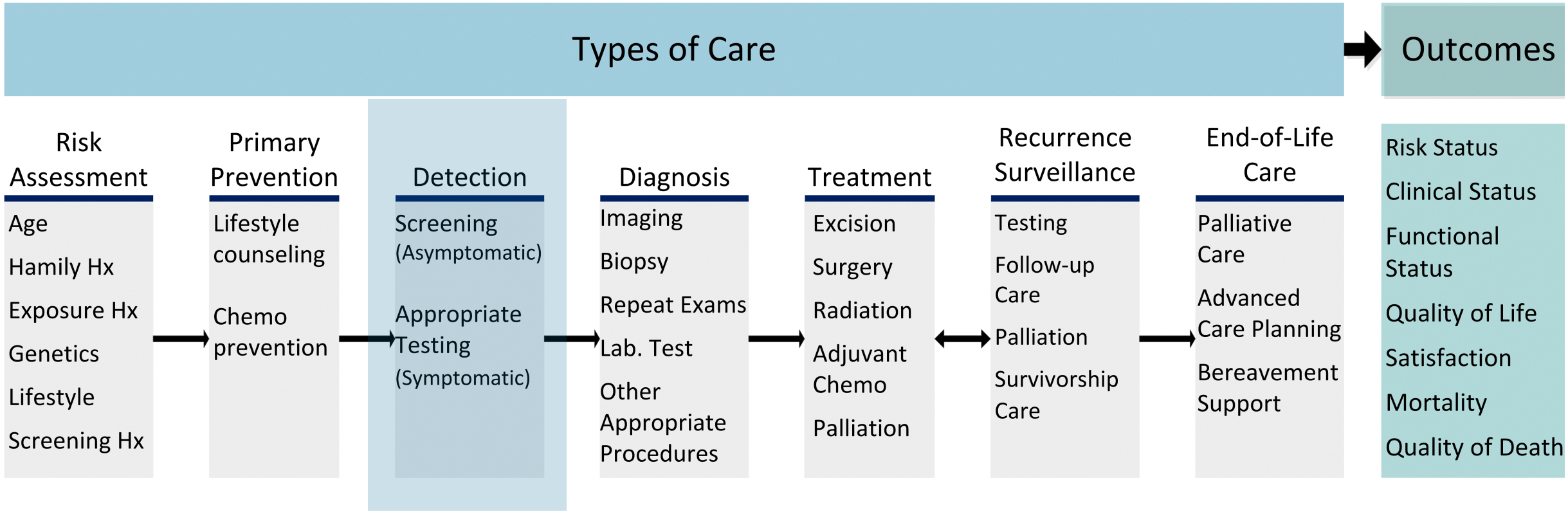


Total Expenditures per Cancer Patient in PR (2018)

Annual Direct Cost for Cancer Care in PR
$1 Billion Dollars
($300M Diagnosis + $700M Last 6 months)



Cancer care continuum



Screening History

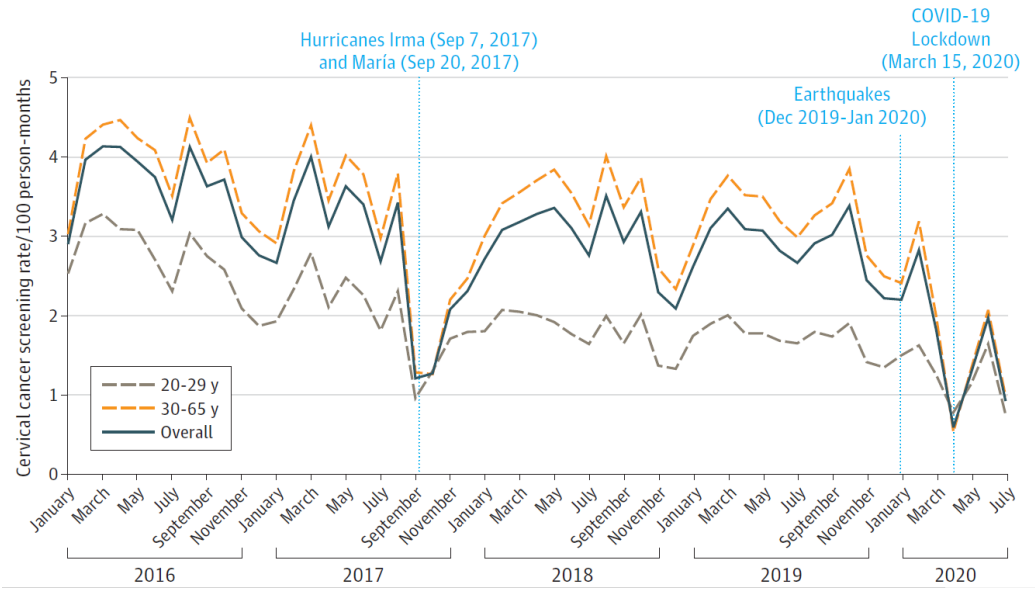
JAMA Network | Open

Research Letter | Public Health

Cervical Cancer Screening Among Medicaid Patients During Natural Disasters and the COVID-19 Pandemic in Puerto Rico, 2016 to 2020

Ana Patricia Ortiz, PhD, MPH; Axel Gierbolini-Bermúdez, MA; Jeslie M. Ramos-Cartagena, MS; Vivian Colón-López, PhD, MPH; Kalyani Sonawane, PhD; Ashish A. Deshmukh, PhD, MPH; Karen J. Ortiz-Ortiz, DrPH

Figure. Cervical Cancer Screening Utilization Among Medicaid-Enrolled Women in Puerto Rico, January 2016 to July 2020



What We Did?

- This cohort study examines rates of cervical cancer screening in Puerto Rico among women with Medicaid health coverage following the 2017 hurricanes, earthquakes in late 2019-2020, and the 2020 COVID-19 lockdown.

Key Findings

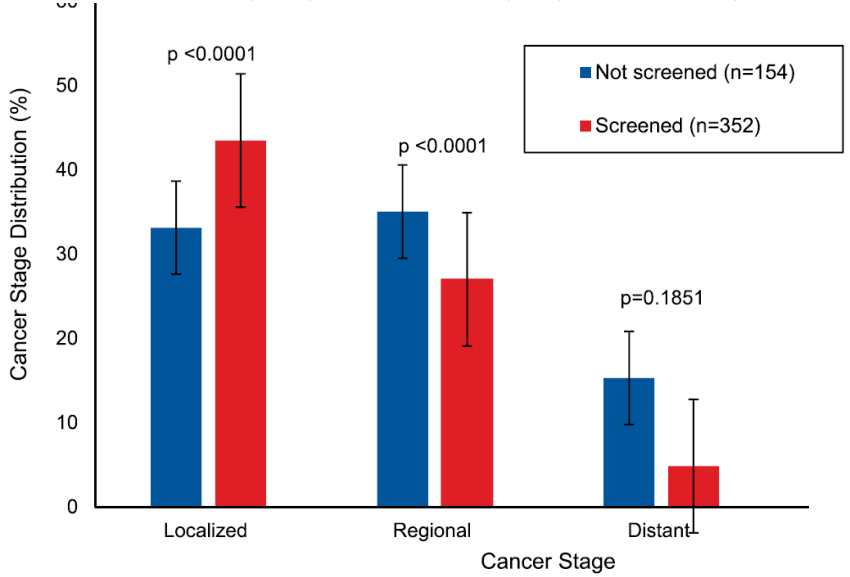
- Cervical cancer screening rates **declined** from 2016 to 2020.
- The greatest reductions coincided with the occurrence of the hurricanes (September 2017) and with the events that affected PR in the 1st quarter of 2020 (earthquakes in January and the COVID-19–related lockdown in March).
- Although some improvements in screening rates were observed after January 2018, these never reached the 2016 levels and plummeted with the COVID-19 pandemic.

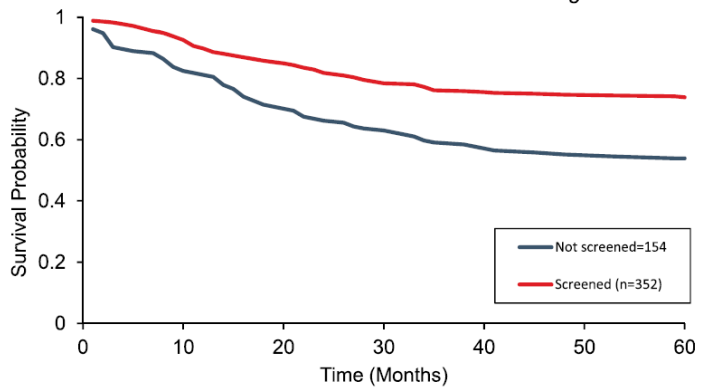
Screening

ORIGINAL RESEARCH ARTICLE: CERVIX AND HPV

Screening History and Survival Among Women With Cervical Cancer in Puerto Rico

Vanessa Gómez-Vargas, MS,[1,2] Karen J. Ortiz-Ortiz, DrPH,[2,3] Israel Almodóvar-Rivera, PhD,[4] Carlos R. Torres-Cintrón, MPH,[3] Ashish A. Deshmukh, PhD,[5,6] and Ana P. Ortiz, PhD[1,2]





Number at risk

Not screened	130 (10)	111 (20)	99 (30)	90 (40)	86 (50)	84 (60)
Screened	329 (10)	303 (20)	284 (30)	266 (40)	260 (50)	256 (60)

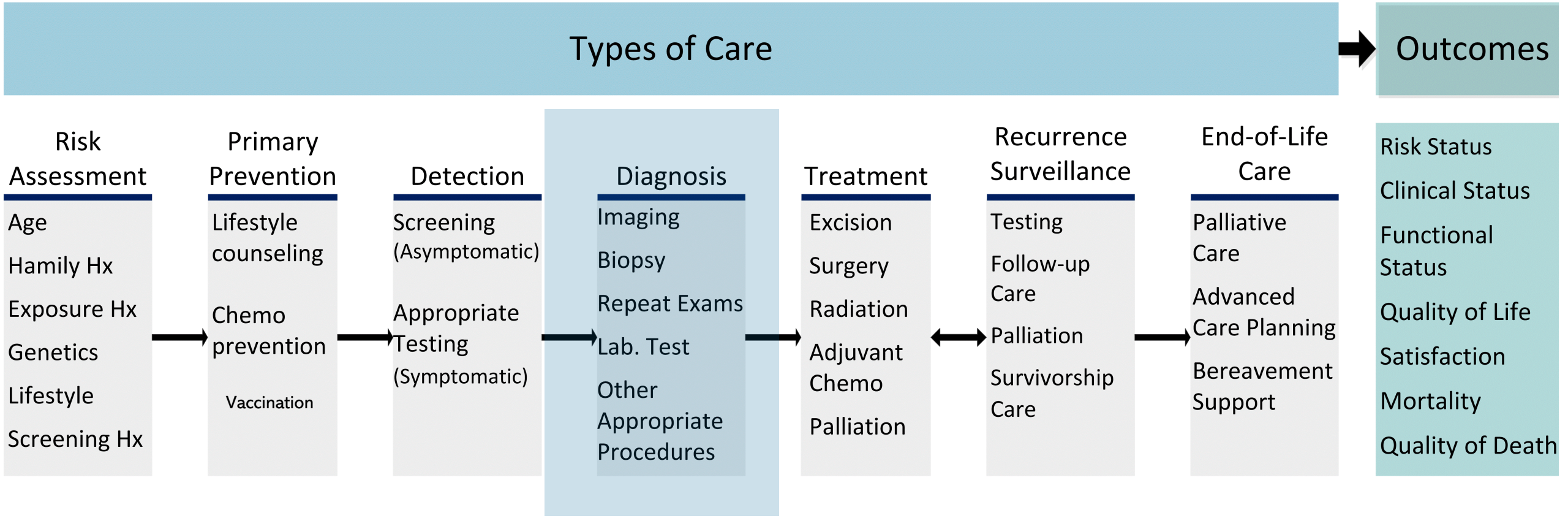
What We Did?

- Screening for cervical cancer could translate into survival benefits attributable to cancer prevention or through cancer detection at early stage.
- Identifying factors associated with lack of screening among cervical cancer cases could inform targeted prevention efforts.
- We evaluated factors associated with cervical cancer screening status among women diagnosed with cervical cancer in PR, and whether screening status was associated with early-stage tumor diagnosis and improved survival.

Key Findings

- Only **69.57%** underwent screening 3 years before dx.
- The likelihood of receiving screening was **71%** lower among women insured by **Medicaid.**
- 5-year survival was significantly greater among screened (72%) than unscreened (54%) women.
- Women who received screening had a **39%** lower risk of death compared with unscreened women.

Cancer care continuum



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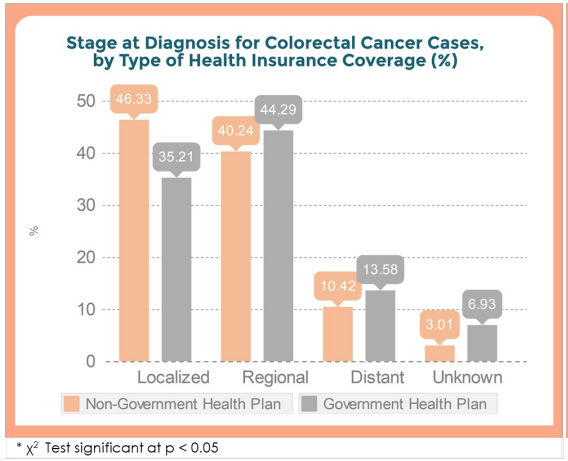
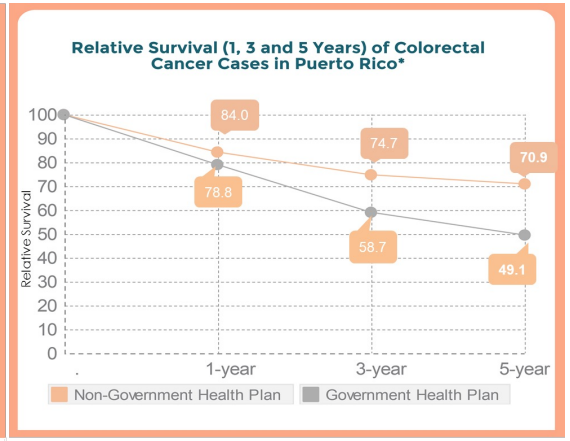
PLOS ONE

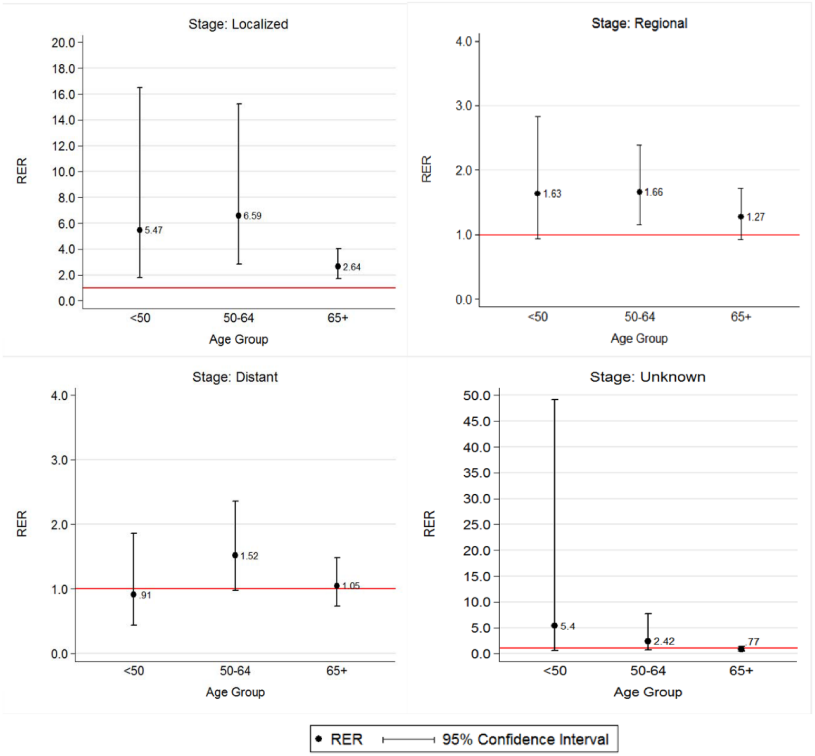
Effects of Type of Health Insurance Coverage on Colorectal Cancer Survival in Puerto Rico: A Population-Based Study

Karen J. Ortiz-Ortiz[1,2]*, Roberto Ramírez-García[2], Marcia Cruz-Correa[3], Moraima Y. Ríos-González[2], Ana Patricia Ortiz[4,5]



* χ^2 Test significant at $p < 0.05$





Reference Group: NGHP

Relative Excess Risk of Death for CRC Cases (GHP vs NGHP) by Stage at Diagnosis and Age Group

What We Did?

- This study estimates the 5-year relative survival rate of colorectal cancer and the relative excess risk of death in Puerto Rico for 2004–2005, by type of health insurance coverage; Government Health Plan (GHP) vs. GHP.

Key Findings

- This study confirms that CRC patients who had GHP were diagnosed at an advanced stage and had lower relative survival compared with NGHP patients (**Non-GHP=71% vs. GHP=49%**).
- In addition, GHP patients from all age-groups diagnosed early (localized stage), had a higher risk of dying within five years, compared to NGHP.
- The observed survival disparities in patients with CRC in Puerto Rico could be indicative that the goals of the reform of the GHP have not been achieved entirely. Further studies evaluating the interplay of access to health services and the barriers affecting the GHP population are warranted.

Diagnosis

RESEARCH ARTICLE Open Access

Factors associated with late stage at diagnosis among Puerto Rico's government health plan colorectal cancer patients: a cross-sectional study

Table 2

Univariate and multivariate analyses for factors associated with late stage at diagnosis, Puerto Rico 2012

Charlson comorbidity index				
0	1.00 [Reference]		1.00 [Reference]	
1	1.13 (0.48, 2.68)	0.777	1.04 (0.39, 2.82)	0.933
≥2	0.55 (0.26, 1.15)	0.111	0.45 (0.19, 1.03)	0.06
Primary site				
Colon	1.00 [Reference]		1.00 [Reference]	
Rectum	0.59 (0.31, 1.11)	0.101	0.48 (0.23, 0.98)	0.045
Type of primary center				
Non FQHC	1.00 [Reference]		1.00 [Reference]	
FQHC	0.89 (0.35, 2.28)	0.815	0.7 (0.24, 2.01)	0.504
Delay in diagnosis (days)				
<14	1.50 (0.71, 3.15)	0.290	0.93 (0.39, 2.2)	0.862
14–59	1.00 [Reference]		1.00 [Reference]	
≥60	2.19 (1.08, 4.45)	0.030	2.94 (1.32, 6.52)	0.008
First visit at ER				
No	1.00 [Reference]		1.00 [Reference]	
Yes	2.38 (1.24, 4.59)	0.008	3.48 (1.6, 7.6)	0.002
Region gastroenterologist rate (per 10,000)				
High rate (≥8.00)	1.00 [Reference]		1.00 [Reference]	
Medium rate (4.00–7.99)	1.47 (0.60, 3.61)	0.41	2.05 (0.73, 5.78)	0.174
Low rate (0–3.99)	1.17 (0.50, 2.70)	0.72	1.7 (0.64, 4.49)	0.284

Adjusted for age, sex, marital status, type of primary center and gastroenterologist rate

What We Did?

- Late stage at diagnosis of cancer is considered a key predictor factor for a lower survival rate.
- We conducted a cross-sectional study to evaluate factors associated with colorectal cancer (CRC) stage at diagnosis among patients 50 to 64 years of age, participants of **Puerto Rico's Government Health Plan**.
- Diagnosis delay was defined as the time in days between the patient's first contact with the health care system to a cancer diagnosis.

Key Findings

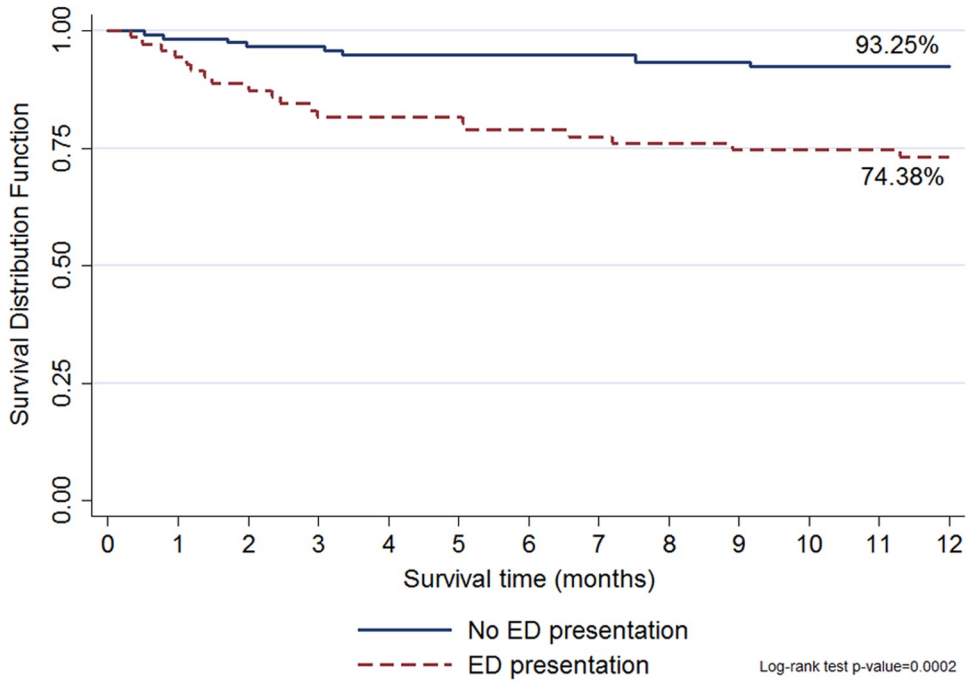
- There were **64%** of CRC patients diagnosed at **late stage**.
- More than one third (**37%**) had a delay in diagnosis of ≥ 60 days.
- In the multivariable analysis having a diagnostic delay of ≥60 days (**AOR 2.94, 95 % CI: 1.32 to 6.52**) was strong predictor of being diagnosed with CRC at a late stage.

Diagnosis

Original Research

Emergency Presentation and Short-Term Survival Among Patients With Colorectal Cancer Enrolled in the Government Health Plan of Puerto Rico

Karen J. Ortiz-Ortiz[1,2], Ruth Ríos-Motta[1], Heriberto Marín-Centeno[1], Marcia R. Cruz-Correa[3], and Ana P. Ortiz[2,4]



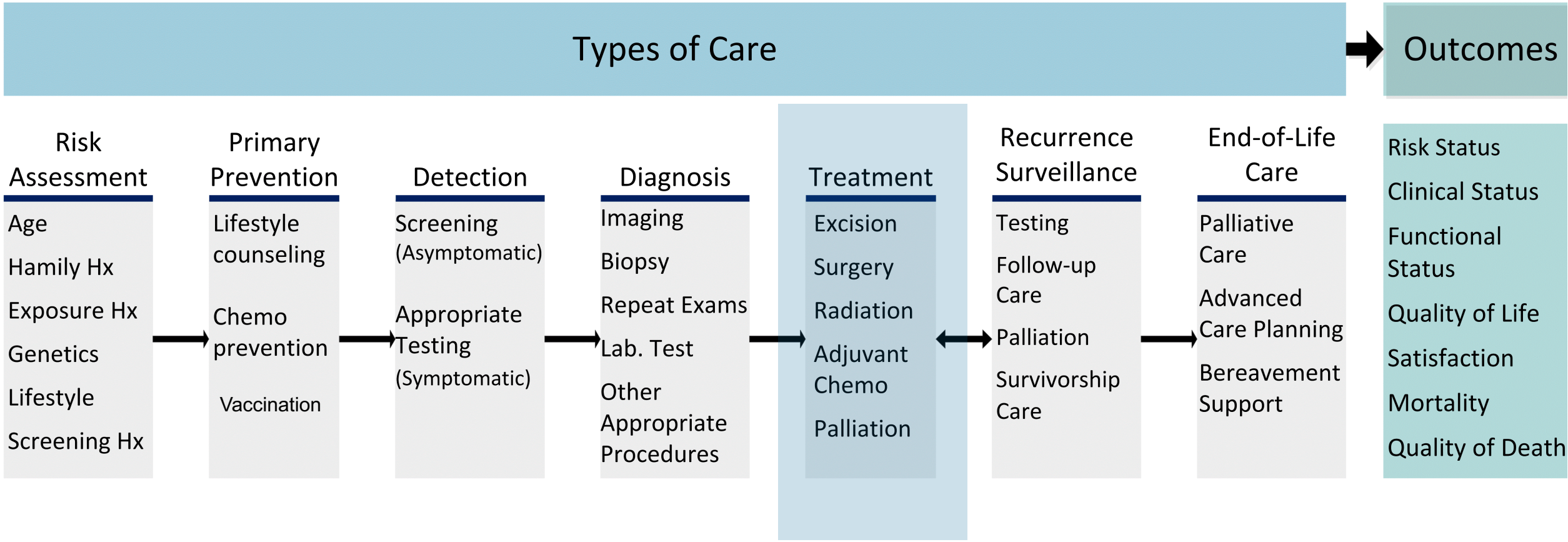
What We Did?

- In this study, we examine factors associated with the use of the emergency room (ER) as an entry point into the healthcare system to initiate a cancer diagnosis among Puerto Rico's Government Health Plan (GHP) patients and compare the 1-year survival of GHP patients that initiated cancer diagnosis in the ER presentation with those that initiated the diagnosis in a physician's office.

Key Findings

- We found that **37.4%** of the study population had an ER presentation.
- Male patients had a higher occurrence of having an ER presentation (**66.2%**).
- While **76.1%** of the patients with an ER presentation were diagnosed in late stage.
- ER presentation was a highly predictive factor for cancer mortality in the year following the diagnosis. These patients had **4 times** higher mortality risk than non-ER presentation patients ($P < .05$).

Cancer care continuum



original report

Underuse of Radiation Therapy After Breast Conservation Surgery in Puerto Rico: A Puerto Rico Central Cancer Registry–Health Insurance Linkage Database Study

William W. Chance, Karen J. Ortiz-Ortiz, Kai-Ping Liao, Diego E. Zavala Zegarra, Michael C. Stauder, Sharon H. Giordano, Guillermo Tortolero-Luna, B. Ashleigh Guadagnolo

Table 3. Predictors of Receipt of Radiation Therapy After Breast Conservation Surgery

Characteristic	OR	95% CI	P
Tumor size, cm			
≤ 0.5	1.00		
> 0.5 and ≤ 1.0	1.25	(0.78 to 1.98)	.357
> 1.0 and ≤ 2.0	0.94	(0.62 to 1.42)	.765
> 2.0 and ≤ 5.0	0.61	(0.40 to 0.93)	.023
> 5.0	0.37	(0.15 to 0.92)	.033
Pathologic N stage			
N−	1.00		
N+	0.81	(0.48 to 1.38)	.441
Payer			
Medicaid	1.00		
Medicare	2.14	(1.46 to 3.13)	< .001
Medicaid–Medicare	1.61	(1.14 to 2.27)	.007
Private insurance	1.35	(0.96 to 1.91)	.085
Region			
East	1.00		
Metro-North	2.20	(1.48 to 3.28)	< .001
North	1.78	(1.20 to 2.64)	.004
Northeast	1.32	(0.89 to 1.96)	.167
San Juan	1.32	(0.84 to 2.07)	.226
Southeast	1.37	(0.86 to 2.20)	.190
Southwest	2.79	(1.70 to 4.59)	< .001
West	4.04	(2.61 to 6.25)	< .001

What We Did?

- Level I evidence indicates that for some women with early-stage invasive breast cancer treated with breast conservation surgery (BCS), radiation therapy (RT) reduces the risk of local recurrence and improves overall survival. Thus, the use of RT in this setting has been used consistently as a quality indicator for appropriate oncologic care.
- The goal of this study was to use the PRCCR–HILD to identify rates of postoperative RT after BCS in women with early-stage invasive breast cancer treated in Puerto Rico and to examine the sociodemographic and health services characteristics that may be associated with variations in receipt of RT.

Key Findings

- Underuse of RT after BCS was identified in Puerto Rico. Among women who received BCS as their primary definitive treatment, **only 64% were recorded as having received adjuvant RT**.
- Patients enrolled in Medicare and those who were dually eligible for Medicaid and Medicare were more likely to receive RT after BCS compared with patients with **Medicaid** alone.
- In addition, it was found that RT was more likely to have been received in certain geographic locations, including the Metro-North, North, West, and Southwest.

Treatment

Predictors of chemotherapy after curative surgery

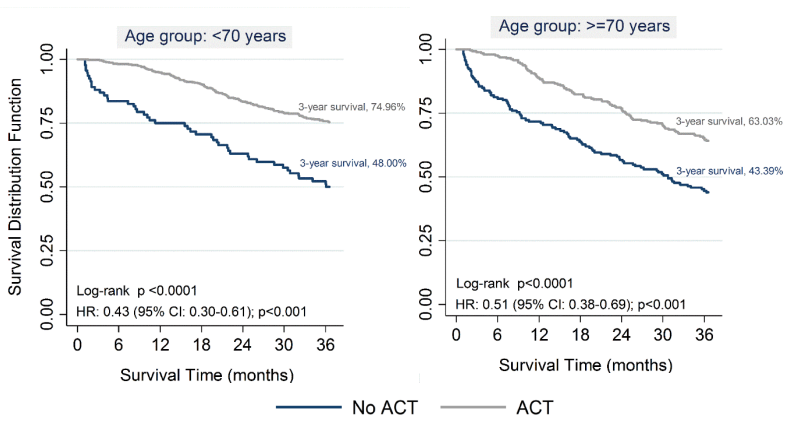
Characteristics	AOR (95%CI)	p-value
Age Group (years)*		
<60	1.00 [Ref.]	
60-69	0.84 (0.52-1.36)	0.489
≥70	**0.22 (0.13-0.35)**	**<0.001**
Sex		
Male	1.00 [Ref.]	
Female	1.05 (0.76-1.45)	0.764
Marital Status		
Unmarried	1.00 [Ref.]	
Married	**1.64 (1.18-2.28)**	**0.003**
Charlson Comorbidy Index		
0	1.00 [Ref.]	
1	0.68 (0.46-1.02)	0.063
≥2	0.81 (0.54-1.20)	0.288
Type of insurance coverage		
Medicaid	1.00 [Ref.]	
Private	1.57 (0.95-2.58)	0.076
Medicare/Medicaid	**1.66 (1.06-2.60)**	**0.028**
Medicare	**1.68 (1.03-2.75)**	**0.039**

RESEARCH ARTICLE

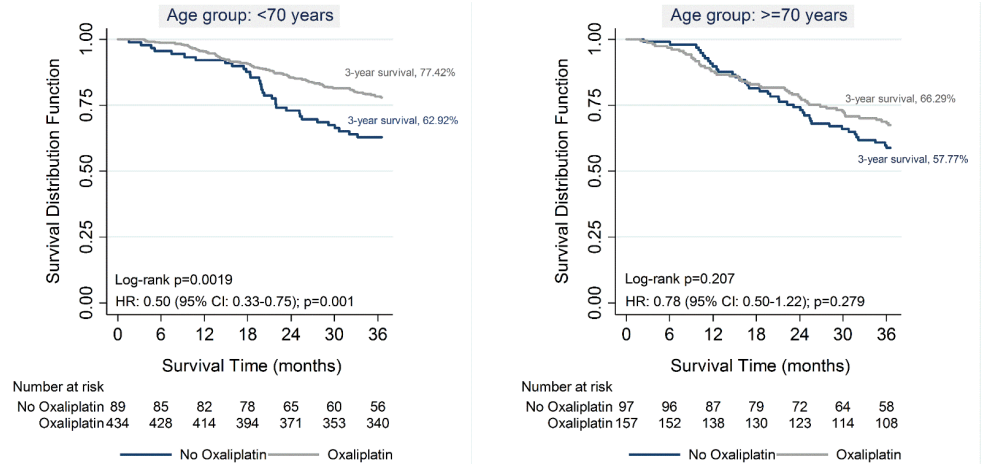
Use of adjuvant chemotherapy in patients with stage III colon cancer in Puerto Rico: A population-based study

Karen J. Ortiz-Ortiz[1,2]*, Guillermo Tortolero-Luna[1,3], Ruth Ríos-Motta[2], Alejandro Veintidós-Feliú[4], Robert Hunter-Mellado[5], Carlos R. Torres-Cintrón[3], Tonatiuh Suárez-Ramos[6], Priscilla Magno[5]

Three-year Overall Survival according to the Receipt of ACT by age group



Three-year Overall Survival according to the Receipt of Oxaliplatin among patients receiving ACT by age group



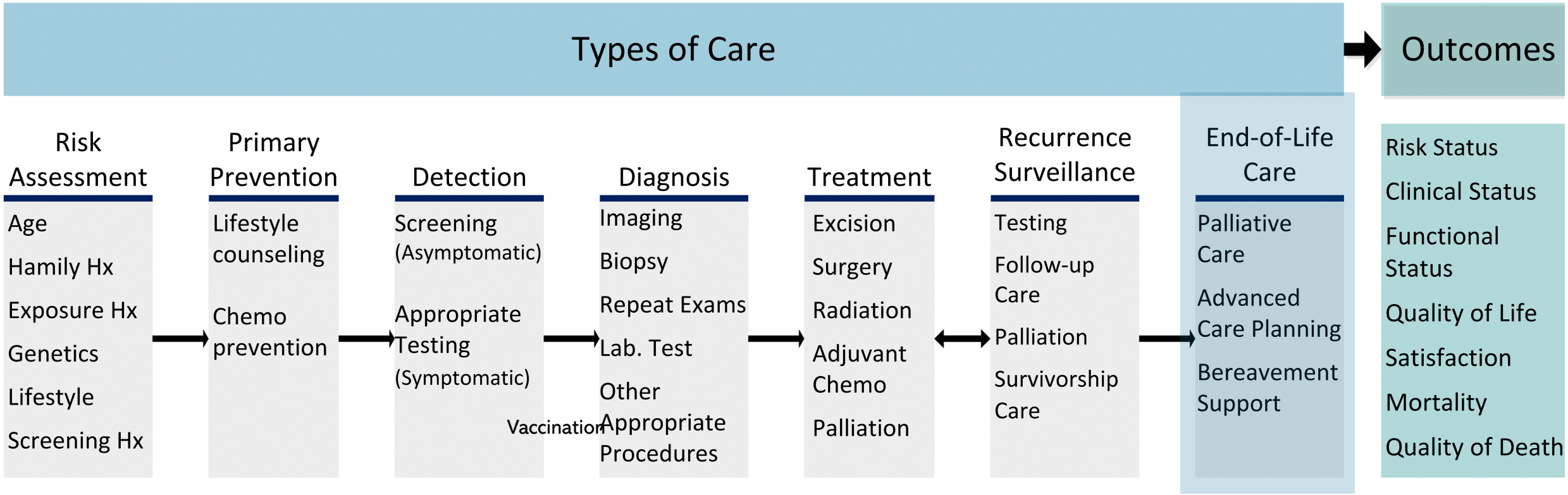
What We Did?

- This study aims to examine factors associated with the use of adjuvant chemotherapy (ACT) and the use of oxaliplatin after curative resection in stage III colon cancer patients and the effect of their use in three-year survival.

Key Findings

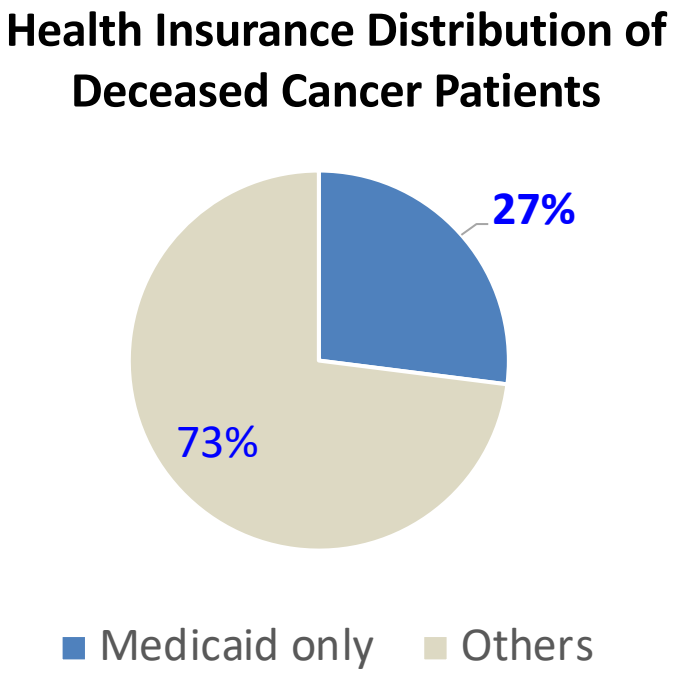
- **75%** of the study population received Adjuvant Chemotherapy
- Factors associated with receiving ACT included being married and being enrolled in Medicare (compared with patients with Medicaid alone)
- Patients aged ≥70 years were less likely to receive ACT
- We observed a significant reduction in mortality among ACT treated patients
- Patients <70 years treated with oxaliplatin had significantly lower risk of death than those who did not

Cancer care continuum



Puerto Rico Medicaid Population

Nearly half (47%) of the population has Medicaid



Among patients diagnosed with cancer from 2010 onward who died of cancer between **27%** had Medicaid only

End-of-Life

original contributions

CARE DELIVERY ReCAP

High-Intensity End-of-Life Care Among Patients With GI Cancer in Puerto Rico: A Population-Based Study

Karen J. Ortiz-Ortiz, DrPH, MPH[1,2]; Guillermo Tortolero-Luna, MD, PhD[1]; Carlos R. Torres-Cintrón, MPH[3]; Diego E. Zavala-Zegarra, PhD[3]; Axel Gierbolini-Bermúdez, MA[4]; and María R. Ramos-Fernández, MD, MSc[5]

TABLE 1. High-Intensity Care Indicators at EoL

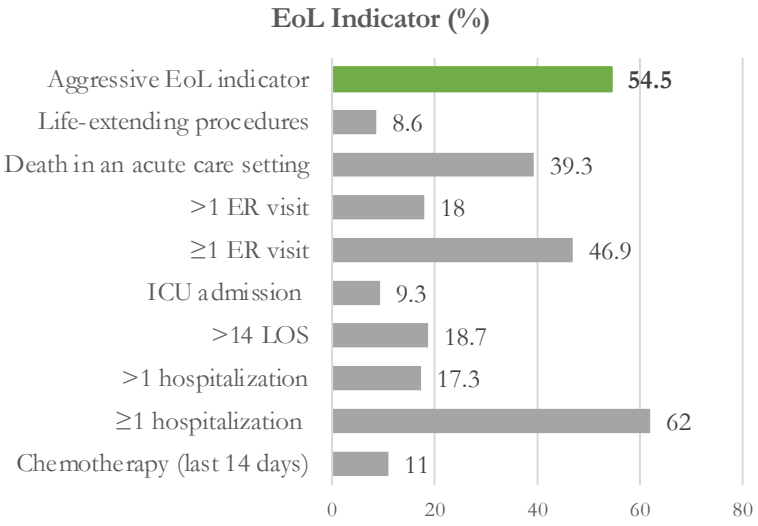


TABLE 3. Predictors of Aggressiveness of EoL Care

	Adjusted Model			
Characteristic	**AOR**	**95% CI**		**p-value**
Sex				
Male	1.00	.	.	.
Female	0.82	0.73	0.92	0.001
Age Group at Death				
<60	1.00	.	.	.
60-69	0.77	0.65	0.92	0.004
70-79	0.54	0.45	0.66	<0.0001
≥80	0.36	0.29	0.44	<0.0001
Year of Death				
2009-2011	1.00	.	.	.
2012-2014	1.09	0.93	1.28	0.270
2015-2017	1.17	0.99	1.38	0.060
Insurance				
Private	1.00	.	.	.
Medicaid	0.72	0.59	0.88	0.001
Medicare/Medicaid	0.72	0.58	0.89	0.002
Medicare	0.87	0.70	1.08	0.219
Survival Time				
≤12 months	1.00	.	.	.
>12 months	0.66	0.58	0.75	<0.0001

What We Did?

- High-intensity care with undue suffering at the EoL is associated with poor quality of life and a higher economic burden
- Using the PRCCRHILD, we identified EoL care intensity indicators and examined factors associated with aggressive EoL care among Puerto Ricans diagnosed with GI cancer between 2009 and 2016

Key Findings

- A high proportion (**54.5%**) of patients with GI cancer receive aggressive EoL care
- Some factors associated with aggressive care were being male, younger, and having private insurance. (P< 0.05)
- These findings suggest that many patients with cancer in Puerto Rico could have inadequate management of symptoms and higher emotional distress at the EoL

RESEARCH Open Access

Use of palliative radiotherapy among patients with metastatic non-small-cell lung cancer in Puerto Rico

Valerie Quiñones-Avila[1], Karen J. Ortiz-Ortiz[1,2,3*], Ruth Ríos-Motta[1], Heriberto Marín-Centeno[1] and Guillermo Tortolero-Luna[2,3]

Table 2 Predictors of Palliative RT among Metastatic NSCLC Patients in Puerto Rico

Characteristic	Adjusted Model	
	Odds Ratio (95% CI)	P Value
Age group (years)		
21–59	1.00	–
60–74	0.80 (0.55, 1.16)	0.231
75+	0.71 (0.44, 1.17)	0.182
Sex		
Male	1.00	–
Female	0.87 (0.64, 1.19)	0.408
Marital Status		
Unmarried	1.00	–
Married	0.91 (0.66, 1.26)	0.571
Unknown	0.87 (0.34, 2.23)	0.779
Health Insurance		
Medicaid	1.00	–
Medicare	1.47 (0.92, 2.37)	0.109
Medicare-Medicaid	1.02 (0.64, 1.63)	0.920
Private	1.50 (0.98, 2.29)	**0.061**
Density of RT Centers		
Low (0–2)	1.00	–
Medium (3–6)	1.13 (0.62, 2.04)	0.685
High (7+)	1.31 (0.70, 2.48)	0.394
Geographic Location		
Metro	1.00	–
Nonmetro	0.70 (0.29, 1.66)	0.416
Surgery		
No	1.00	–
Yes	0.66 (0.39, 1.14)	0.137
Chemotherapy		
No	1.00	–
Yes	3.90 (2.91, 5.45)	**< 0.0001**

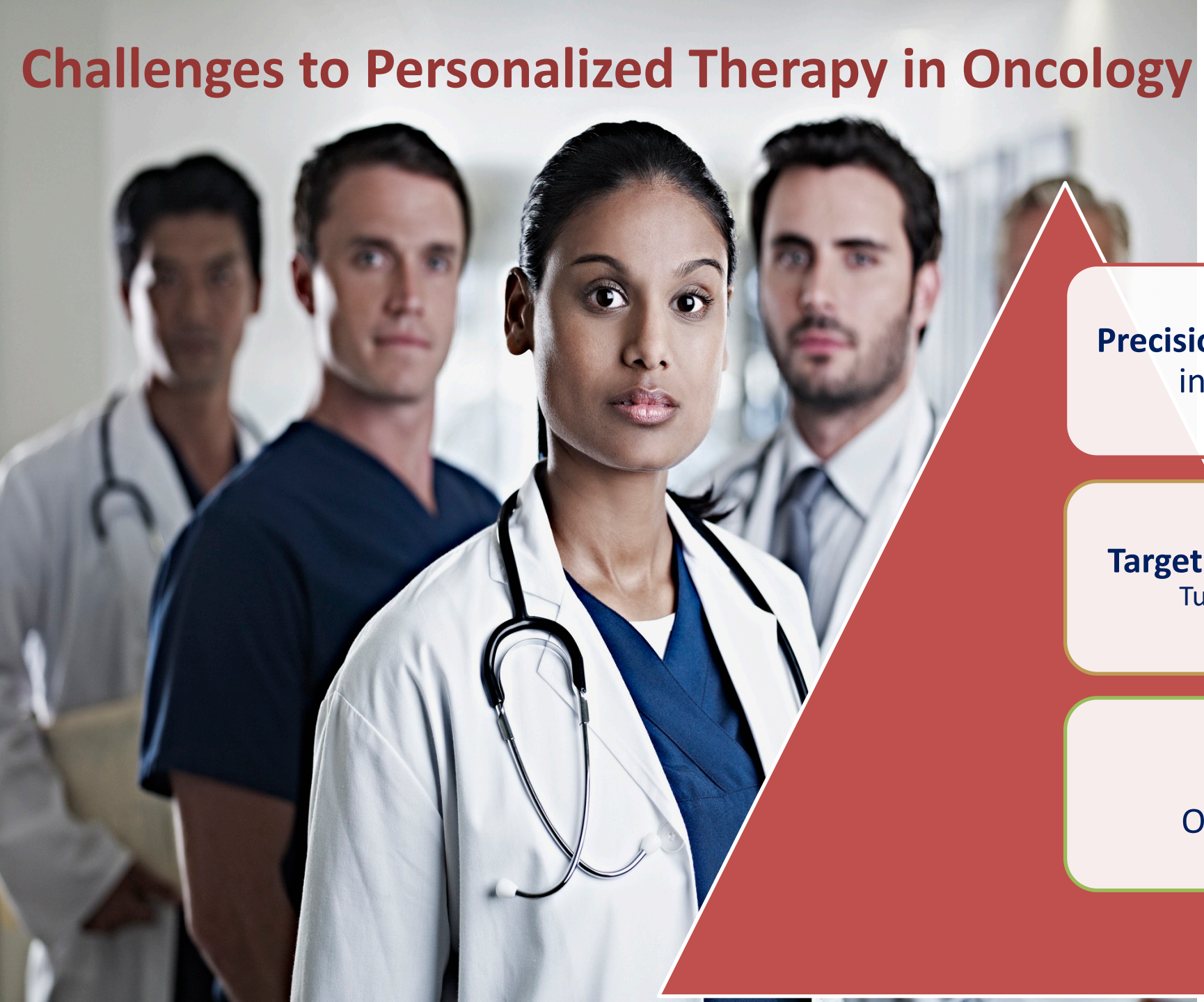
What We Did?

- The relief and management of symptoms in lung cancer patients is frequently achieved through the early integration of palliative radiation therapy (RT), particularly for patients with advanced or metastatic non-small cell lung cancer (NSCLC) .
- The aim of the study is to determine the proportion of patients who had palliative RT within 12 months of diagnosis and evaluate the factors associated with it.

Key Findings

- Among the 929 patients identified with metastatic NSCLC, **33.80%** received palliative RT within the first year after diagnosis.
- After adjusting for other covariates, receipt of chemotherapy and presence of symptoms were associated with increased odds of palliative RT use.
- Patients with private health insurance had increased odds of palliative RT use when compared to beneficiaries of Medicaid.
- The results of this study reveal concerns about the underuse of palliative RT among patients with metastatic NSCLC in Puerto Rico.

Challenges to Personalized Therapy in Oncology



Precision Oncology integration into Clinical Practice

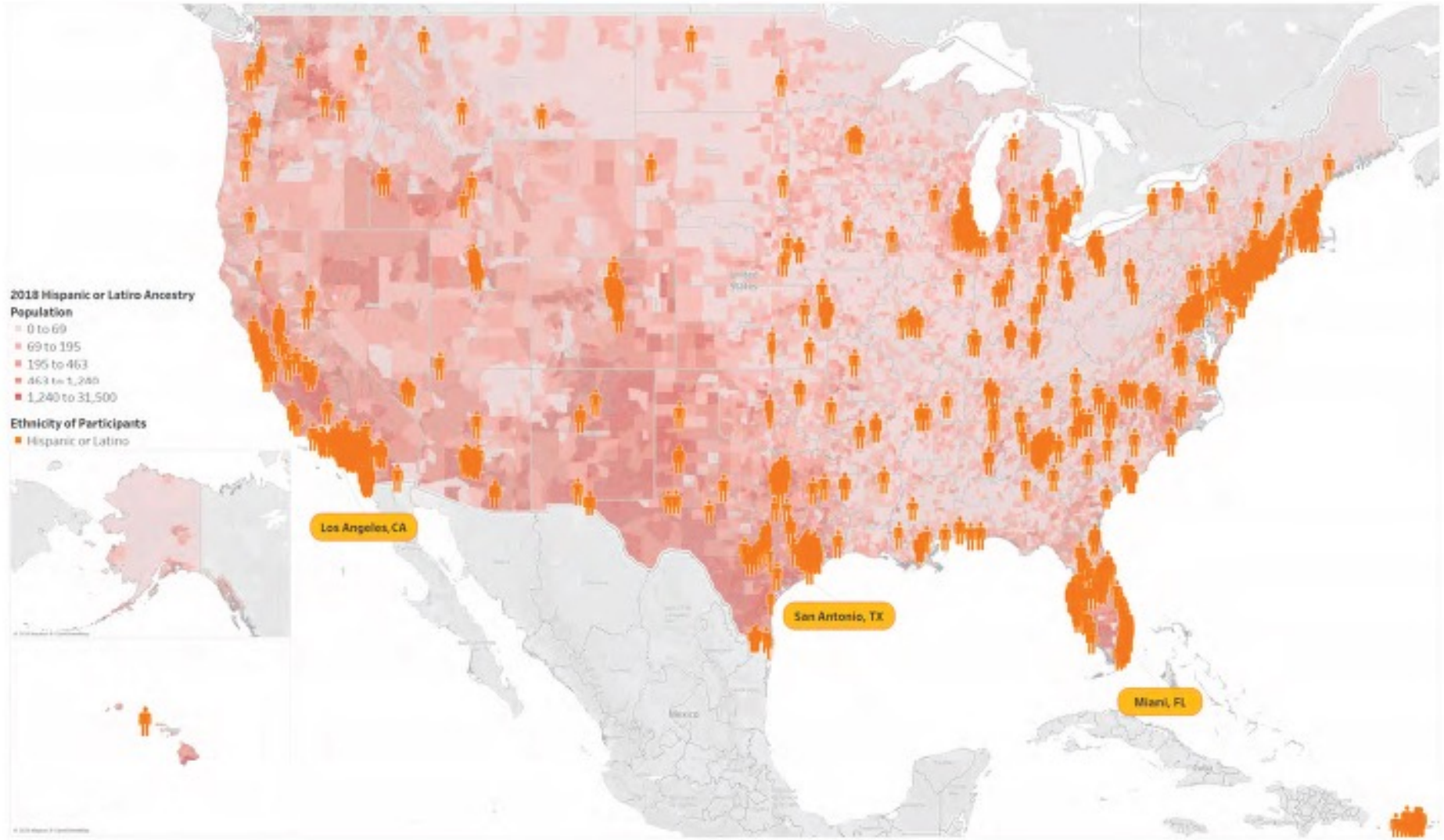
Target Therapies: Requires Tumor & genetic analysis

$Cost

Oncology Therapies

- The **best management** of any patient with cancer is in a **clinical trial**. Participation in clinical trial is especially ***encouraged***
- **Diversity inclusion** is a priority for FDA & NCCN

Distribution of Hispanic Trial Participation



FDA Oncology Approvals (2020)

2020 Drug Trials Snapshots Summary Statistics
(Jan 2020 to Dec 2020)

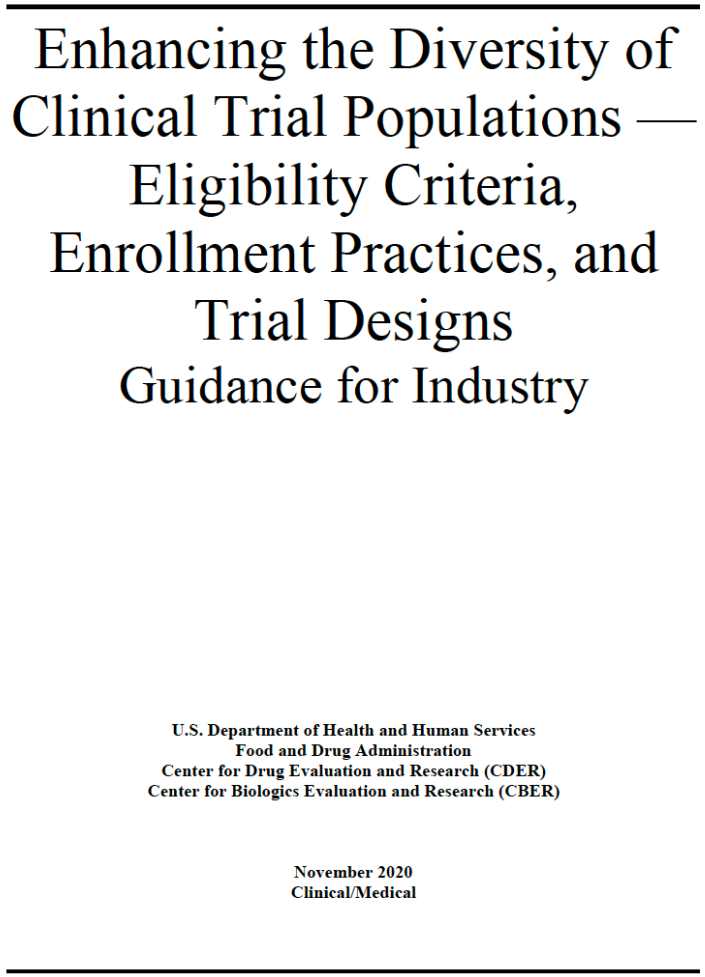
Oncology:

4,922 patients participated in trials that led to approvals of 18 new drugs

Demographic Subgroups	Women	White	Asian	Black or African American	Hispanic	United States
Participant Average	50%	73%	14%	5%	6%	41%

https://www.fda.gov/drugs/informationondrugs/

FDA Guidance for Industry


Enhancing the Diversity of Clinical Trial Populations — Eligibility Criteria, Enrollment Practices, and Trial Designs

Guidance for Industry

U.S. Department of Health and Human Services
Food and Drug Administration
Center for Drug Evaluation and Research (CDER)
Center for Biologics Evaluation and Research (CBER)

November 2020
Clinical/Medical

- **Broadening eligibility criteria to increase diversity in enrollment**
  - inclusion/exclusion criteria
  - Trial design and methods
  - Diverse populations
- **Study Design to improve enrollment**
  - Less burdersome design
  - E-consent
  - Commutity engagement
  - Geographic location trials
- **Clinical Trials to treat rare diseases**

PANONCOLOGY TRIALS

Community Clinical Trials Network

Selected Clinical Trials for GI Cancers in Puerto Rico

Cancer Type	Biomarker	Agent	ClinicalTrials.gov
Biliary	**KRAS (Any mutation)**	*Autophagy inhibitor (GNS561) + Trema*	NCT05874414
Biliary	**HER2 receptor**	*HER2 inhibitor (Zanidatamab)*	NCT02892123
Gastric	**MET**	*Anti-MET (Abb-400)*	NCT05029882
Gastric	**MSI - High**	*Anti-NKG2A + Pembro*	NCT05162755
Pancreas	**KRAS oncogene**	*Anti-KRAS + Cetuximab* *Anti-SOS1*	NCT03785249
Colorectal	**KRAS oncogene** **MSI High** **MET oncogene** **MSS**	*Anti-KRAS (Adagrasib) + Cetuximab* *Anti-STING + Pembro* *Anti-MET (ADC) + FOLFIRI + Beva* *Anti-CD47 + FOLFIRI + Beva*	NCT03785249 NCT04881045 NCT05029882 NCT05330429
Liver	**1st Line** **2nd Line**	*Anti-TIGIT + Atezo + Beva* *AntMET (Abb-400)*	NCT05904886


EXIT

Participation in Clinical Trials

Primary reason people *participate* in clinical trials……**They were asked**

Primary reason people *do not participate* in clinical trials…**They were not asked** ***(not available)***

Conclusions

- While cancer prevention, control, and treatment strategies have shown benefits, patients in Puerto Rico do not always receive high-quality care
- **Several studies have shown that many patients have worse outcomes due to limited access to high-quality cancer care, particularly among certain population groups such as Medicaid patients**
- Access to clinical trials continues to be a barrier in PR and creation of an oncology research network is a model for decentralization and improved access
- **Although there is still a long way to go, this information can guide evidence-based interventions to improve patient outcomes equitably**

Thank you!!

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