

# Black-White Racial Disparities in Prostate Cancer Rates over Time in Southeastern Pennsylvania (SEPA)

Jenna R. Kantor<sup>1</sup>, Scott W. Keith<sup>1</sup>, Oluwademilade Adefarati<sup>2</sup>, Rickisa Yearwood<sup>2</sup>, Kevin A. Henry<sup>3</sup>, Daniel Wiese<sup>4</sup>, Ann C. Klassen<sup>5</sup>, Amy Hillier<sup>6</sup>, Charnita Zeigler-Johnson<sup>2</sup>

<sup>1</sup> Sidney Kimmel Comprehensive Cancer Center & Division of Biostatistics and Bioinformatics, Thomas Jefferson University; <sup>2</sup> Fox Chase Cancer Center, Temple University; <sup>3</sup> Department of Geography, Temple University; <sup>4</sup> American Cancer Society; <sup>5</sup> Dornsife School of Public Health, Drexel University; <sup>6</sup> School of Social Policy and Practice, University of Pennsylvania

## Introduction

- Prostate cancer (PCa) is the second-leading cause of cancer death in American men, only behind lung cancer (American Cancer Society, 2024).
- PCa accounted for around 15% of all new cancer cases in 2023 (Cancer Stat Facts: Prostate Cancer, 2024).
- Black men are 1.5 times more likely to be diagnosed with PCa and more than twice as likely to die from PCa than White men (Vince Jr. et al., 2022).
- In a study conducted on patients in the Pennsylvania Cancer Registry from 2005-2014, PCa incidence in Philadelphia was highest among Black men (Zeigler-Johnson et al., 2018).
- This study aimed to identify how Black's and White's invasive PCa incidence rates changed from 2007-2009 to 2016-2018 in the southeast region (Philadelphia metropolitan area) of Pennsylvania (SEPA).
  - The study also looked to compare the PCa incidence rates of the two races

## Methods

- Data Source:** Pennsylvania Department of Health's Enterprise Data Dissemination Informatics Exchange (EDDIE)
- Population:** Men in Bucks, Chester, Delaware, Montgomery, and Philadelphia County
- Time Period:** 2007-2018
- Outcome of Interest:** Three-year age-adjusted invasive PCa incidence rates (cases per 100,000 males): 2007-2009, 2010-2012, 2013-2015, 2016-2018
- Statistical Analysis:** A population-weighted generalized linear model (GLM) regressing PCa incidence rates on main effects for race, county, and year, and all two-way and three-way interactions between them was fit to examine the associations between county, race, and time.
  - Population totals were included as frequency weights in the model
  - Linear contrasts between 2007-2009 and 2016-2018 in each race and county were assessed and compared to examine the difference in changes in rates

## Results

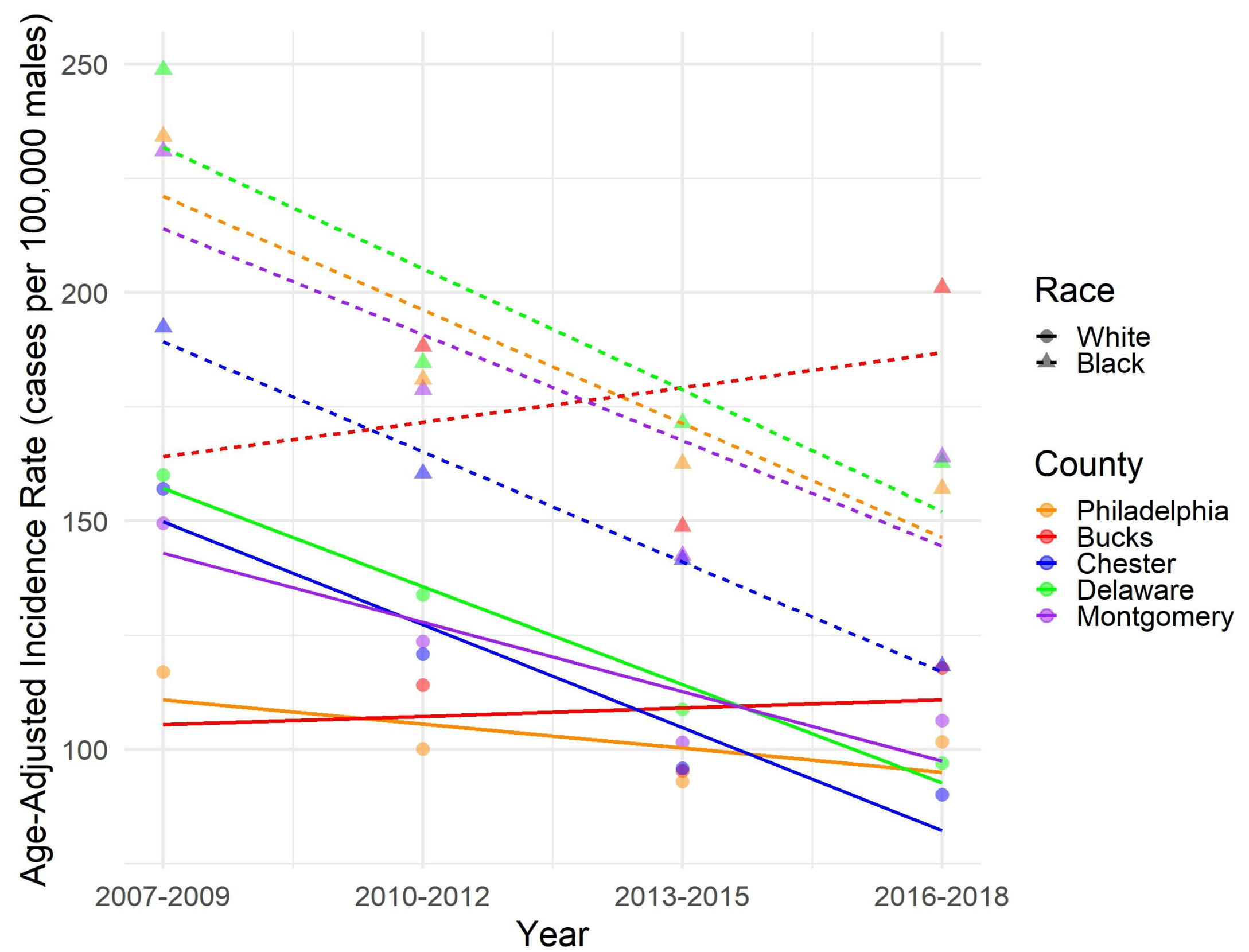
- The age-adjusted PCa incidence rate data are shown in Figure 1 along with the predicted slopes from the GLM model shown in Table 1
- Significant two-way and three-way interactions were found between county, race, and year suggesting the changes in PCa incidence rates over time depended both on county and race**
- Black incidence rates declined at a faster rate than White incidence rates from 2007-2009 to 2016-2018
- Black incidence rates were significantly higher than Whites in Chester county
- Incidence rates declined at a faster rate in Chester, Delaware and Montgomery county than Philadelphia county

**Table 1: Population-weighted GLM predicting age-adjusted PCa incidence rates**

Characteristic	Estimate	95% CI <sup>1</sup>	p-value
(Intercept)	110.81	(100.01, 121.62)	<0.001
County			
Philadelphia	—	—	
Bucks	-5.38	(-31.57, 20.80)	0.700
Chester	39.06	(22.49, 55.62)	<0.001
Delaware	46.34	(34.36, 58.31)	<0.001
Montgomery	32.17	(16.55, 47.78)	<0.001
Race			
White	—	—	
Black	110.30	(84.07, 136.53)	<0.001
Year	-5.27	(-11.35, 0.82)	0.086
County * Race			
Bucks * Black	-51.72	(-118.50, 15.07)	0.120
Chester * Black	-70.90	(-100.64, -41.16)	<0.001
Delaware * Black	-35.61	(-76.61, 5.38)	0.085
Montgomery * Black	-39.31	(-80.16, 1.53)	0.058
County * Year			
Bucks * Year	7.08	(-4.94, 19.10)	0.200
Chester * Year	-17.30	(-26.73, -7.88)	0.001
Delaware * Year	-16.23	(-23.28, -9.18)	<0.001
Montgomery * Year	-9.90	(-19.52, -0.29)	0.044
Race * Year			
Black * Year	-19.63	(-32.55, -6.70)	0.005
County * Race * Year			
Bucks * Black * Year	25.40	(-3.20, 54.00)	0.078
Chester * Black * Year	18.11	(3.13, 33.09)	0.021
Delaware * Black * Year	14.54	(-4.54, 33.63)	0.130
Montgomery * Black * Year	11.63	(-11.40, 34.66)	0.300

<sup>1</sup> CI = Confidence Interval

**Figure 1: Raw and Predicted Age-Adjusted Incidence Rates By County, Race, and Year**



The decline in incidence rates among Blacks in Philadelphia from 2007-2009 to 2016-2018 was significantly greater than the decline in incidence rates in Whites in Philadelphia (Table 2).

**Table 2: Linear Contrasts to Examine Changes in Rates and Differences in Changes between Whites and Blacks in Each County**

	Whites: Difference from 2007-2009 to 2016-2018 (95% CI)	Blacks: Difference from 2007-2009 to 2016-2018 (95% CI)	Difference in Differences	P-value
<b>Bucks</b>	5.45 (-25.66, 36.55)	22.76 (-47.18, 92.7)	-17.31	0.640
<b>Chester</b>	-67.71 (-89.3, -46.12)	-72.27 (-79.39, -65.14)	4.55	0.679
<b>Delaware</b>	-64.49 (-75.19, -53.79)	-79.74 (-120.49, -38.99)	15.25	0.457
<b>Montgomery</b>	-45.51 (-67.85, -23.16)	-69.51 (-122.14, -16.87)	24.00	0.390
<b>Philadelphia</b>	-15.80 (-34.05, 2.45)	-74.68 (-108.89, -40.47)	58.88	0.005

## Conclusion

Overall, PCa incidence decreased from 2007-2009 to 2016-2018 for both races in most counties in SEPA. Black incidence rates tended to decline at a faster rate than White incidence rates in Philadelphia. However, disparities remained, with Blacks experiencing disproportionately higher rates. Future work should focus on further evaluating how PCa screening patterns and differences in access to care might affect outcomes.

## References

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