



# The Association Between Persistent Poverty and Melanoma Mortality in Texas: A Retrospective Study Using Texas Cancer Registry Data

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## Background

Patients in United States counties with persistent poverty (PP,  $\geq 20\%$  of residents in poverty since 1980) experience significantly higher cancer associated mortality than individuals living in non-PP counties.<sup>1,2</sup> While markers of lower socioeconomic status have been correlated to higher melanoma mortality, the relationship of persistent poverty and melanoma mortality has not been explored.

This project aims to better understand how persistent poverty influences melanoma mortality in the state of Texas. Ultimately, we hope to develop outreach efforts for patients living in regions of persistent poverty and help primary care physicians diagnose melanoma at earlier, more treatable stages.

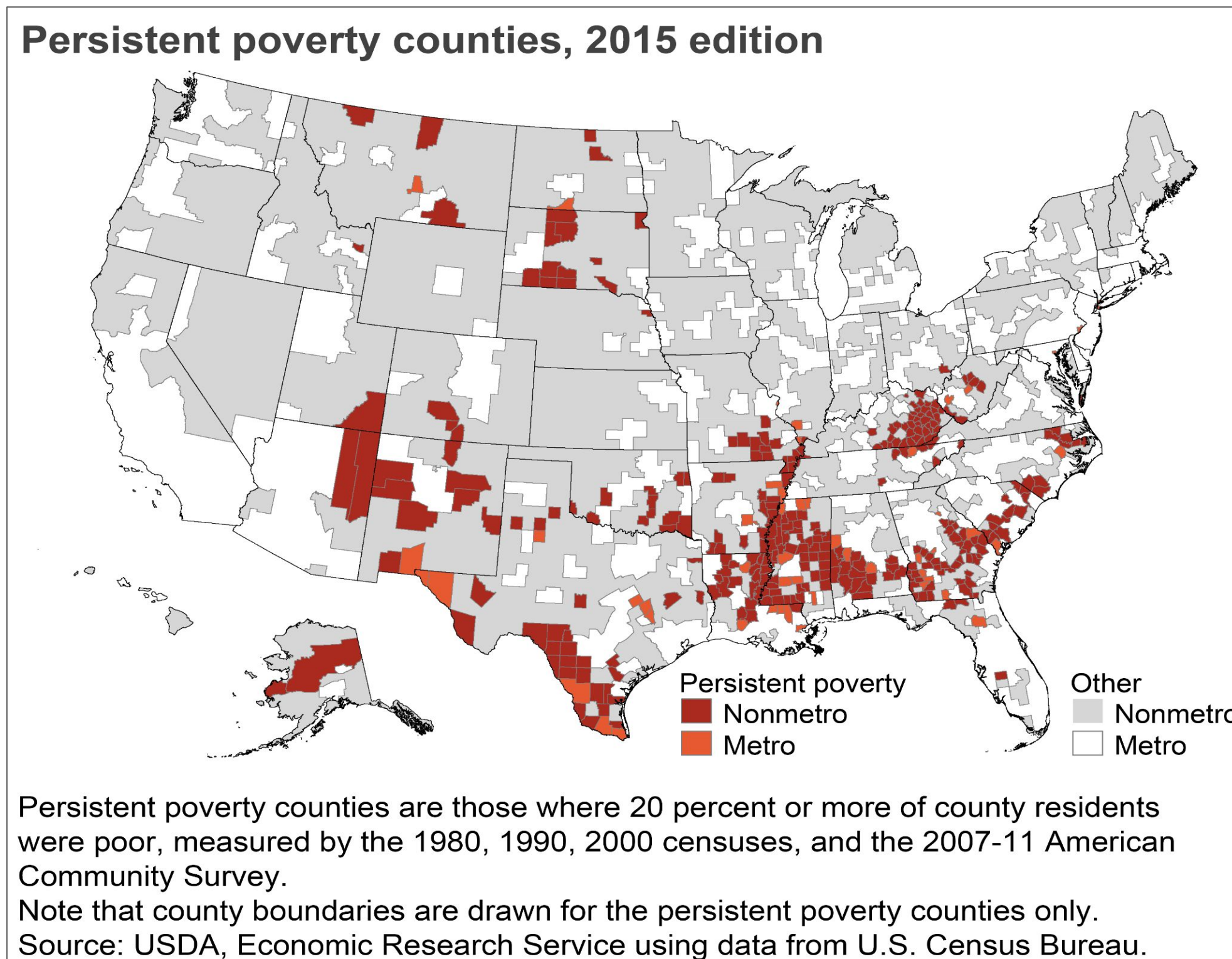


Figure 1: 2015 Map of U.S. Persistent Poverty Counties

## Methods

- Obtained data from 87,713 patients diagnosed with melanoma between 2000-2018 from the Texas Cancer Registry.
- Identified 56 PP counties in Texas with 2021 US Economic Development Administration data.
- Used mixed effect models to assess melanoma-specific mortality rates by persistent poverty, age, sex, and race/ethnicity.

## Results

	Total	Alive	All deaths		Melanoma specific deaths	
	n	n	n	% of all death	n	% of melanoma deaths
<b>Total</b>	87,713	59,368	28,345	32.30%	10264	11.70%
<b>PPC (Persistent Poverty County)</b>						
nPPC	82,282	56,348	25,934	31.50%	9333	11.34%
PPC	5,431	3,020	2,411	44.40%	931	17.14%
<b>Gender</b>						
Female	34,907	26,237	8,670	24.80%	3173	9.09%*
Male	52,806	33,131	19,675	37.30%	7091	13.43%
<b>Race</b>						
NH White	80,810	54,502	26,308	32.60%	9207	11.39%*
NH Black	557	299	258	46.30%	143	25.67%
Hispanic	4,267	2,661	1,606	37.60%	841	19.71%
NH Other	2,079	1,906	173	8.30%	73	3.51%
<b>Age</b>						
18-29	3,207	2,983	224	7.00%	189	5.89%*
30+	6,388	5,782	606	9.50%	477	7.47% <sup>+</sup>
40+	10,835	9,365	1,470	13.60%	1015	9.37%
50+	16,719	13,626	3,093	18.50%	1783	10.66%
60+	20,221	14,649	5,572	27.60%	2359	11.67%
70+	18,354	9,727	8,627	47.00%	2452	13.36%
80+	11,989	3,236	8,753	73.00%	1989	16.59%

Table 1: Incidence-adjusted melanoma mortality compared to all-cause mortality in Texas PP counties. Categories with at least one entry denoted with \* are significantly greater ( $p < 0.01$ ) than those not depicted with \*. Those with + are statistically significant ( $p < 0.05$ ).

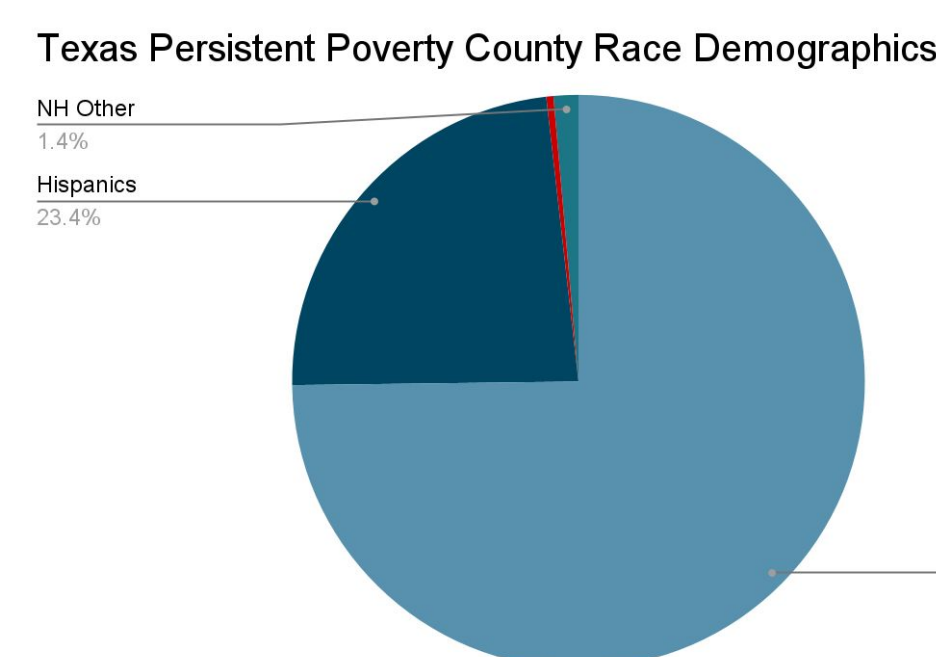


Figure 2: Racial breakdown of Texas PP counties

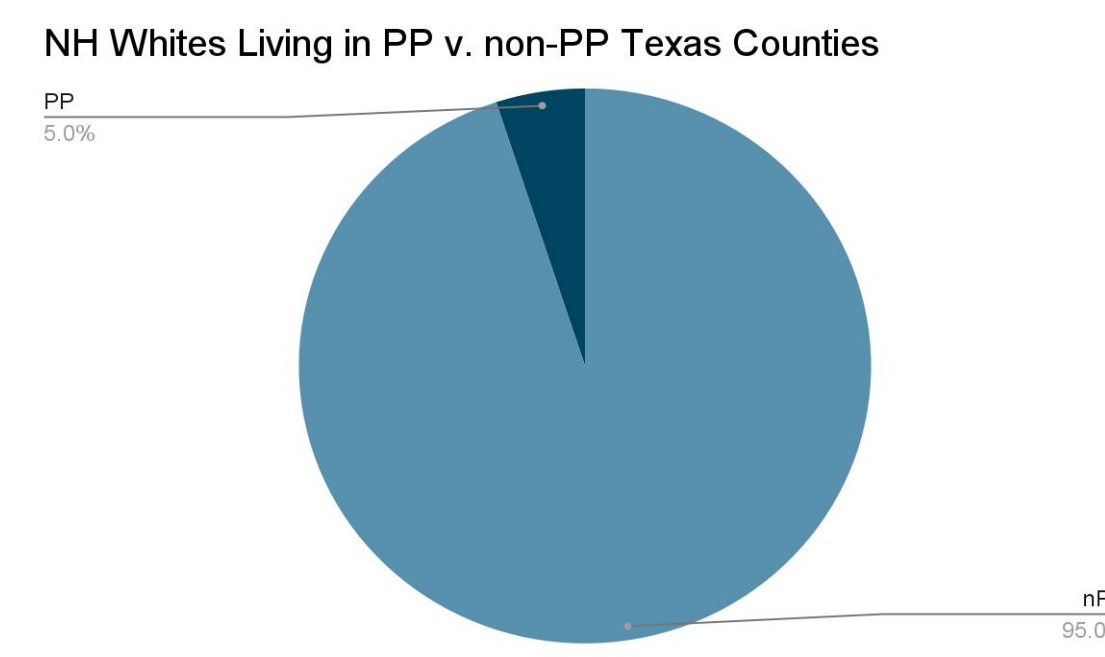


Figure 3: Population of NH Whites living in PP versus non-PP Texas counties

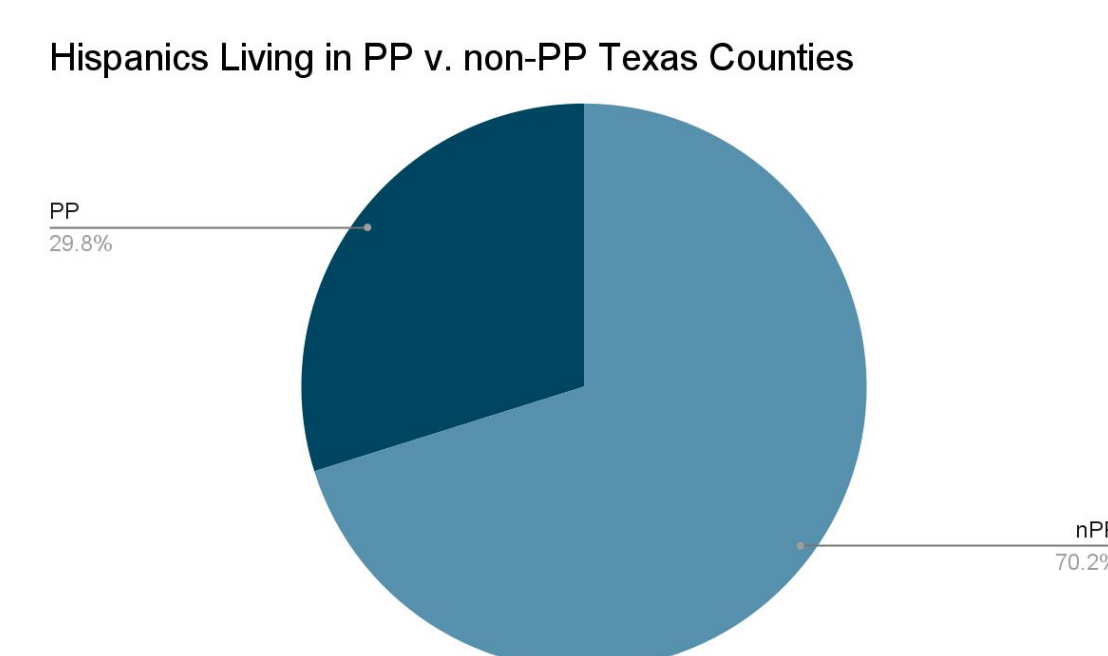


Figure 4: Population of Hispanics living in PP versus non-PP Texas counties

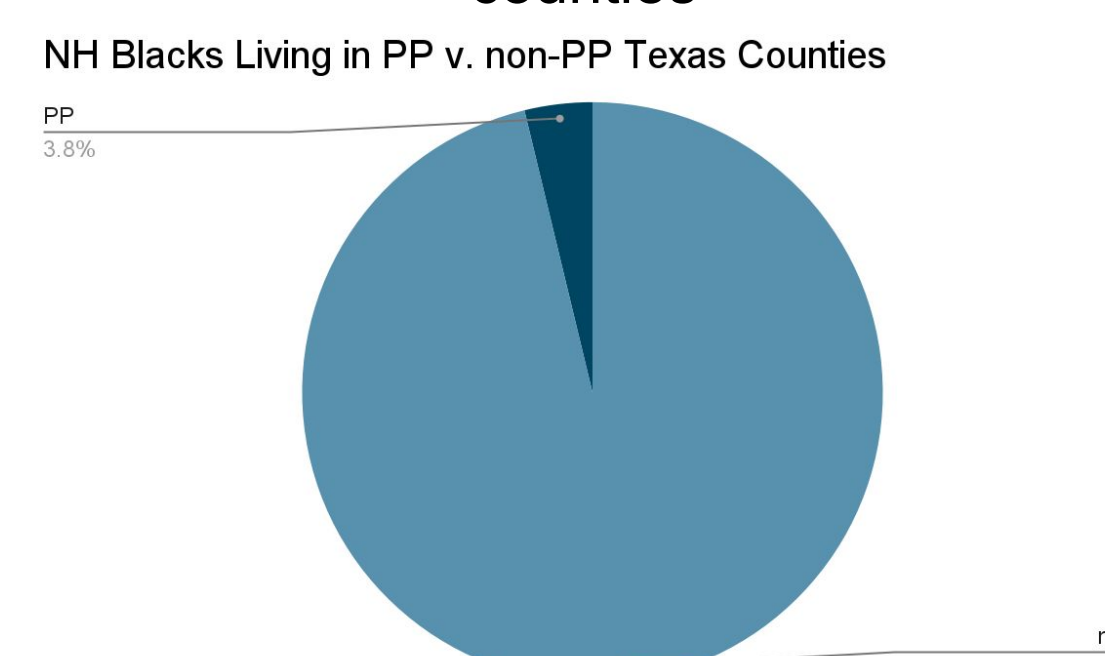


Figure 5: Population of NH Blacks living in PP versus non-PP Texas counties

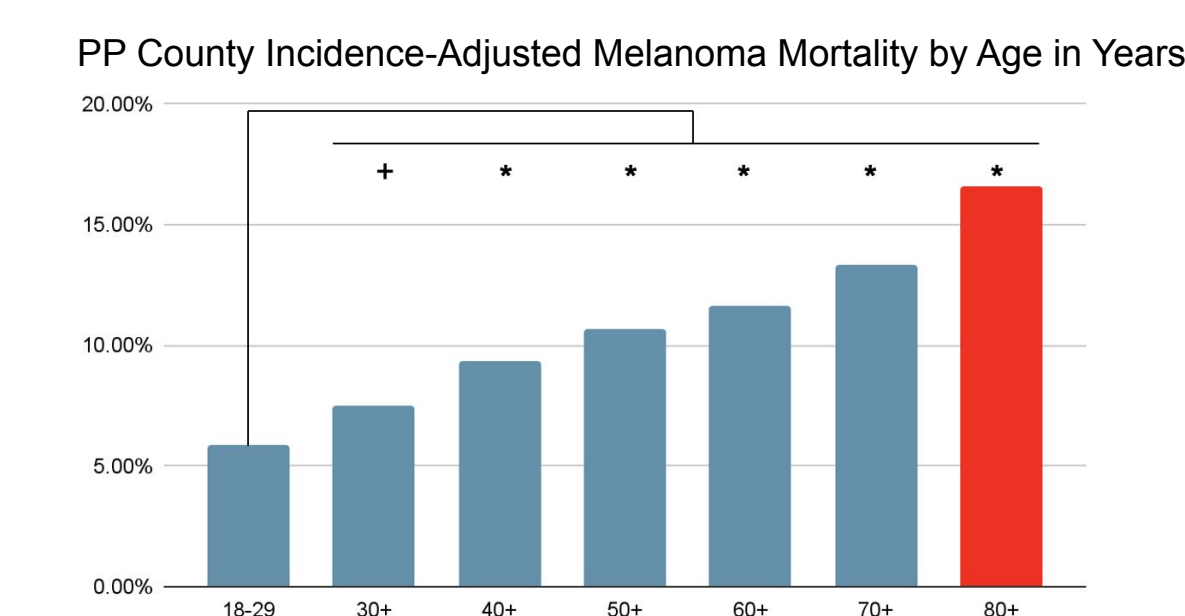


Figure 6

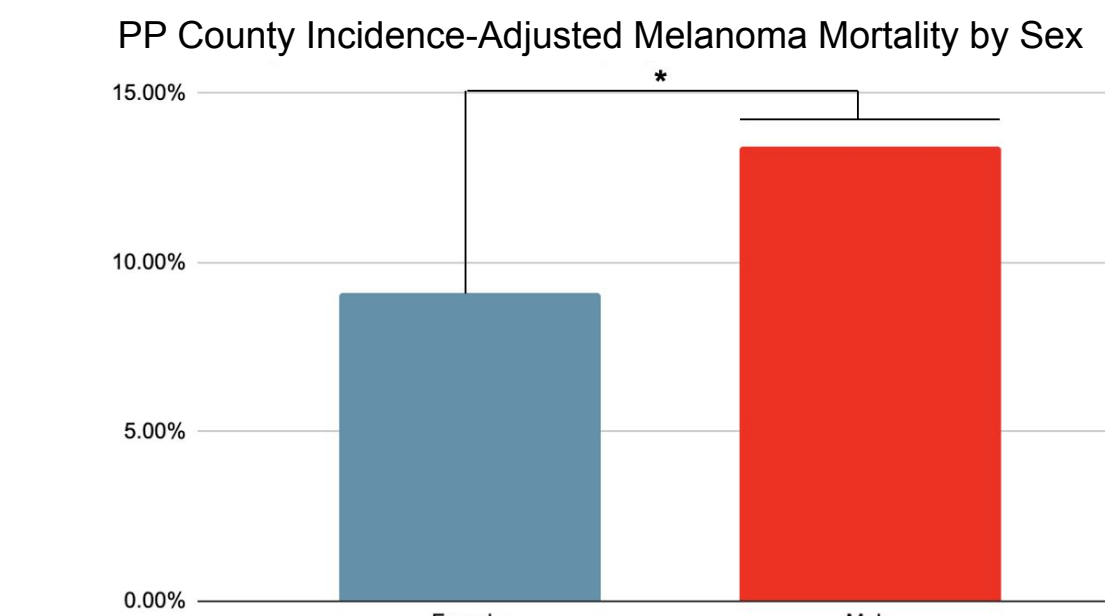


Figure 7

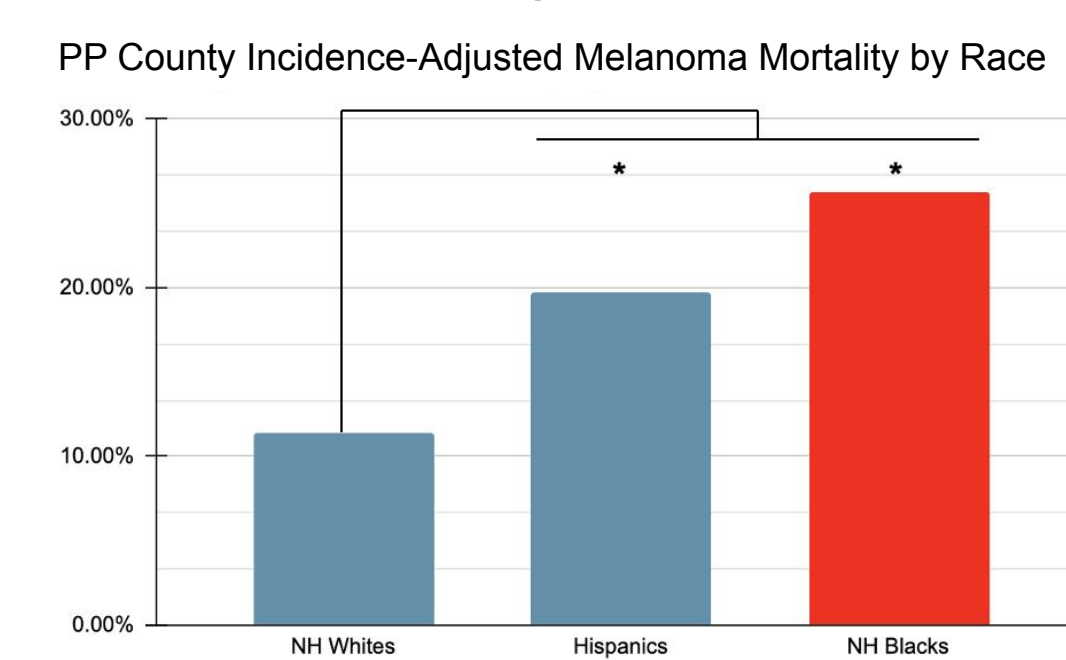


Figure 8

Figures 6, 7, 8: Breakdown of incidence-adjusted Melanoma mortality in Texas PP counties by age, sex, and race, respectively. All entries denoted with \* are significantly greater ( $p < 0.01$ ) than other entries not depicted with \*. Those with + are statistically significant ( $p < 0.05$ ).

## Discussion

Significant health disparities exist in many Texas counties, especially those that meet PP criteria. Many of these PP counties are located along the US-Mexico border and house a significant immigrant population. The high poverty rates in these areas may be exacerbated by legal status, language barriers, higher unemployment rates, environmental factors, educational inequalities, and lack of access to medical care.

More prevention practices and education need to be implemented in these areas to further decrease melanoma incidence-based mortality rates.

## Conclusion

**Age, race/ethnicity, sex, and poverty designation are associated with significant disparities in incidence-adjusted melanoma-specific mortality outcomes.**

## Future Research

- Explore melanoma mortality in PP counties before and after 2011 to better understand the impacts of immune-checkpoint inhibition treatments.
- Create educational platforms that teach primary care physicians in PP counties how to better diagnose skin cancer.
- Identify persistent poverty as a place-based social determinant of health.

## Acknowledgements

This study was supported by the philanthropic contributions of:

- the Lyda Hill Foundation to The University of Texas MD Anderson Cancer Center Moon Shots Program
- UT Austin/MD Anderson Cancer Center Collaborative Pilot Project Grants
- Partnership for Careers in Cancer Science and Medicine
- The Cancer Prevention Research Training Program, NIH/NCI R25CA056452 (Lillian Morris, Shine Chang, Ph.D., Principal Investigator)

## References

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2. Moss JL, Pinto CN, Srinivasan S, Cronin KA, Croyle RT. Persistent Poverty and Cancer Mortality Rates: An Analysis of County-Level Poverty Designations. *Cancer Epidemiol Biomarkers Prev.* Oct 2020;29(10):1949-1954. doi:10.1158/1055-9965.EPI-20-0007