



**THE BURDEN OF CANCER IN PERSISTENT
POVERTY AREAS OF
CALIFORNIA**

**UC DAVIS
HEALTH**

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ACKNOWLEDGEMENTS AND DISCLAIMER

The collection of cancer incidence data used in this study was supported by the California Department of Public Health pursuant to California Health and Safety Code Section 103885; Centers for Disease Control and Prevention's (CDC) National Program of Cancer Registries, under cooperative agreement 5NU58DP006344; the National Cancer Institute's Surveillance, Epidemiology and End Results Program under contract HHSN261201800032I awarded to the University of California, San Francisco, contract HHSN261201800015I awarded to the University of Southern California, and contract HHSN261201800009I awarded to the Public Health Institute. The ideas and opinions expressed herein are those of the author(s) and do not necessarily reflect the opinions of the State of California, Department of Public Health, the National Cancer Institute, and the Centers for Disease Control and Prevention or their Contractors and Subcontractors.

This publication was prepared by the California Cancer Reporting and Epidemiologic Surveillance (CalCARES) Program, UC Davis Comprehensive Cancer Center, University of California Davis Health.

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SUGGESTED CITATION:

Movsisyan AS, Maguire FB, Ullah AT, Hofer BM, Parikh-Patel A, Keegan THM, Wun T. The Burden of Cancer in Persistent Poverty Areas of California. Sacramento, CA: California Cancer Reporting and Epidemiologic Surveillance (CalCARES) Program, UC Davis Comprehensive Cancer Center, UC Davis Health. July 2023.

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EXECUTIVE SUMMARY

This report compares cancer incidence in areas of persistent poverty, (defined as 20 percent or more of the population living below the established poverty level for the past 30 years) to areas of non-persistent poverty to understand the differential impact of poverty on the cancer burden in California.

Compared to areas without persistent poverty, persistent poverty areas had:

- ❖ Higher incidence rates for lung and bronchus, colorectal, kidney, liver, stomach, and cervical cancers.
- ❖ Lower incidence rates of breast, prostate, non-Hodgkin lymphoma, melanoma, uterine, leukemia, pancreatic, thyroid, oropharyngeal, and bladder cancers.
- ❖ Higher incidence rates of lung, colorectal, liver and stomach cancers among males and higher rates of liver, kidney, cervical, and stomach cancers among females.
- ❖ Higher cancer incidence among non-Hispanic/Latino Whites and Black/African Americans.
- ❖ Lower cancer incidence among Hispanic/Latinos, Asian/Pacific Islanders, and American Indians.
- ❖ Higher incidence rates of stomach, colorectal, and lung cancers among non-Hispanic Whites, Black/African Americans, and Asian/Pacific Islanders.
- ❖ Higher incidence rates of stomach cancer among Hispanics and higher incidence rates of kidney cancer among American Indians.
- ❖ Higher incidence rates of liver and cervical cancers for all racial/ethnic groups.
- ❖ Higher incidence of regional/remote stage lung, colorectal, and cervical cancers.
- ❖ Significant increases in incidence rates from 2006 to 2019 for regional/remote stage non-Hodgkin lymphoma, thyroid cancer among Black/African Americans and non-Hodgkin lymphoma and colorectal cancer among Hispanic/Latinos.

INTRODUCTION

Over the last several decades, considerable progress has been made in reducing the burden of cancer in California, with overall cancer incidence and mortality steadily declining since 1988.¹ However, progress has not been equal for all populations, and disparities in the burden of cancer, cancer care, and outcomes continue to persist based on socioeconomic status and race/ethnicity.^{2,3} Race/ethnicity is a significant factor in cancer health disparities, with worse cancer outcomes observed in minority groups in California.⁴ Previous research has shown that persistent poverty counties in the United States are more likely rural and have large populations of racial/ethnic minorities.⁵ Further, individuals in areas of persistent poverty are more likely to have greater exposure to environmental and occupational carcinogens and infectious agents, lack adequate housing, experience food insecurity and increased stress, and have poor access to transportation and reliable healthcare.⁶ Areas of persistent poverty have become a central focus of National Cancer Institute research and healthcare policy, as evidenced by an executive order from President Joe Biden, which advocates for improved efforts to address the inequities faced by residents of persistent poverty areas.^{6,7}

The United States Department of Agriculture (USDA) Economic Research Service provides persistent poverty area measures for counties and census tracts across the United States, with persistent poverty defined as areas with a poverty rate of 20% or more for four consecutive time periods, totaling approximately

More than a quarter of all Californians live in or near poverty.



Larger proportions of **racial/ethnic minority** groups live in persistent poverty.

30 years.⁸ Prior research has shown that counties in the United States meeting this definition of persistent poverty have larger proportions of racial/ethnic minority groups.⁹

In California, more than a quarter of all residents continue to live in or near poverty.¹⁰ In Fall 2021, 29 percent of Californians were *poor or near poor* and 3 percent were living in *deep poverty* with less than half the resources to meet basic needs.¹⁰ Higher poverty rates in California are observed among seniors, Hispanic/Latino groups and adults with lower educational attainment.¹⁰ While many California residents continue to live in poverty, overall poverty rates have improved, due in large part to California's social safety net programs including CalFresh, CalWORKs, and the Federal Child Tax Credit.¹⁰ It is estimated that without safety net programs, nearly 4 million more Californians would be living in poverty.¹⁰

In terms of the associations between persistent poverty areas and cancer outcomes, studies have shown that when compared to non-persistent poverty counties, persistent poverty counties have an increased overall cancer mortality rate.¹¹ This may be in part due to the structural, social, and behavioral challenges residents face that make them more vulnerable to cancer and poorer access to care. Interestingly, the disparities observed in cancer outcomes in persistent poverty counties resolve once an area is no longer in poverty.¹²

Although several studies have examined the relationship between persistent poverty and cancer care and outcomes, this report is, to the best of our knowledge, the first to determine the relationship between persistent poverty in California and cancer incidence. We hope that this information can guide clinicians, researchers, public health professionals, and policy-makers to develop strategies to support the most vulnerable Californians residing in impoverished areas of the state.

Data for this report were obtained from the California Cancer Registry (CCR). The CCR is California's statewide cancer surveillance system and has been collecting information on all reportable cancers diagnosed among California residents since January 1, 1988. The California Department of Public Health partners with the California Cancer Reporting and Epidemiologic Surveillance (CalCARES) Program, within the University of California Davis Comprehensive Cancer Center, to manage the operations of the CCR.

METHODS AND TECHNICAL NOTES

CASES

Data presented in this report came from the California Cancer Registry (CCR). The CCR is California's statewide, population-based, cancer surveillance system. This report includes incident cancer cases diagnosed in California between January 1, 2006 and December 31, 2020, and reported to the CCR as of January 3, 2020.

PERSISTENT POVERTY MEASURE

The United States Department of Agriculture (USDA) Economic Research Service defines persistent poverty as areas with a poverty rate of at least 20 percent for four consecutive time periods, 10 years apart, and persisting for approximately 30 years (baseline time period plus three evaluation periods).⁸ The University of California San Francisco (UCSF) Health Atlas project is an additional resource developed and maintained by the UCSF Office of Population Health and Health Equity and provides information on the persistent poverty status of each census tract in California based on 2010 Census boundaries.¹³ Data from the UCSF Health Atlas project was used to assign persistent poverty status to each cancer case based on the patient's census tract of residence at time of diagnosis and to append persistent poverty status to census tract-level population estimates.

CALIFORNIA COUNTIES AND CENSUS TRACTS

Presently, there are 58 counties in California. As of the 2010 Census, there were 8,057 census tracts in the state. Census tracts are county subdivisions with an average population size of 5,000 residents.^{2,14} Annual, census tract population estimates by age group, race/ethnicity, and sex (female and male) for the years 2006 through 2020 were obtained from the National Cancer Institute.¹⁴ Census tracts were the geographic unit of analysis used in this report to calculate cancer incidence rates and to report on cancer patterns in persistent poverty areas of California in comparison to non-persistent poverty areas.

CANCER TYPE

Cancers were classified based on the primary site and histology of the tumor, using the National Cancer Institute's Surveillance, Epidemiology and End Results (SEER) site recode, available at https://seer.cancer.gov/siterecode/icdo3_dwhoheme/index.html. Unless otherwise stated, malignant cancers among males and females were reported for 16 common cancers.

INCIDENCE RATES

Incidence rates were calculated as the number of new cases in specific age groups per 100,000 persons each year and were age-adjusted to the 2000 United States standard population. Age-adjusted rates are weighted averages of age-specific rates, where the weights represent the age distribution of a standard population. Such adjustment eliminates differences in rates due to differences in the age distribution between population groups. Age-adjusted incidence rate ratios and respective p-values were also calculated to facilitate comparisons between rates among patients living in Persistent Poverty Areas and non-Persistent Poverty Areas in California. Age-adjusted incidence rates for female breast, cervical, and uterine cancers were calculated using the female population at risk, and incidence rates for prostate cancer were calculated using the male population at risk. Age-adjusted cancer incidence rates were calculated in non-Hispanic/Latino White, Black/African American, Hispanic/Latino, Asian/Pacific Islander, and American Indian groups. Within each race/ethnicity group, we determined cancer incidence rates among persistent poverty and non-persistent poverty areas.

TRENDS IN CANCER INCIDENCE

The estimated average annual percent change (AAPC) represents the average percent increase or decrease in cancer rates per year over a specified period. The trend in cancer rates was considered statistically significant if there was less than a five percent chance that the difference was the result of random variation. As a result of the overall decreased cancers diagnosed in 2020 due to restricted healthcare access related to the COVID-19 pandemic, observed cancer incidence across all sites in California was 9.2% lower than expected during 2020. Therefore, incidence trends were calculated for the period between 2006 and 2019, to avoid bias due to lower-than-expected diagnoses for 2020.

STAGE AT DIAGNOSIS

Stage at diagnosis was defined according to the Surveillance, Epidemiology, and End Results (SEER) Program's Summary Stage classification scheme. In this scheme, tumors are classified as in situ, localized, regional, or remote. In situ tumors are non-invasive and do not penetrate the basement membrane. Localized tumors are confined entirely to the organ of origin. Regional tumors extend into surrounding organs, tissues, or regional lymph nodes. Remote tumors have metastasized to other parts of the body. This report focused on invasive tumors, categorized as localized, regional, or remote. In situ tumors were excluded for all sites except for bladder cancer where in situ cases were included because they are considered invasive. Leukemia was not included in any stage analyses because it is a blood cancer and is not staged the same as other cancers.

RESULTS

PERSISTENT POVERTY IN CALIFORNIA

Observation of the number and percentage of census tracts in each California county that met the definition of persistent poverty showed that Tulare County had the largest percentage of census tracts in persistent poverty, with 33 out of 78 (42 percent) meeting the definition (Figure 1, Figure 2). Imperial County had the second highest percentage of census tracts in persistent poverty, with 12 of 31 (39 percent) meeting the definition.

Trinity, Lake, Yuba, San Joaquin, Madera, Kings, Humboldt, Butte, Kern, and Yolo counties had 20-26.8% of census tracts in persistent poverty, and Sacramento, Stanislaus, Mendocino, Los Angeles, and Merced counties had 10-18% of census tracts in persistent poverty. Census tracts in persistent poverty for Sonoma, Santa Clara, Contra Costa, Ventura, Santa Cruz, Orange, and Shasta counties ranged from 1-5%, and 6-10% for San Francisco, Riverside, Monterey, Siskiyou, San Luis Obispo, San Diego, Santa Barbara, San Bernardino, Alameda, and Sutter counties.

Interestingly, 23 of 58 (40 percent) California counties had no persistent poverty census tracts, including Alpine, Amador, Calaveras, Colusa, Del Norte, El Dorado, Glenn, Inyo, Lassen, Marin, Mariposa, Modoc, Mono, Napa, Nevada, Placer, Plumas, San Benito, San Mateo, Sierra, Solano, Tehama, and Tuolumne counties.

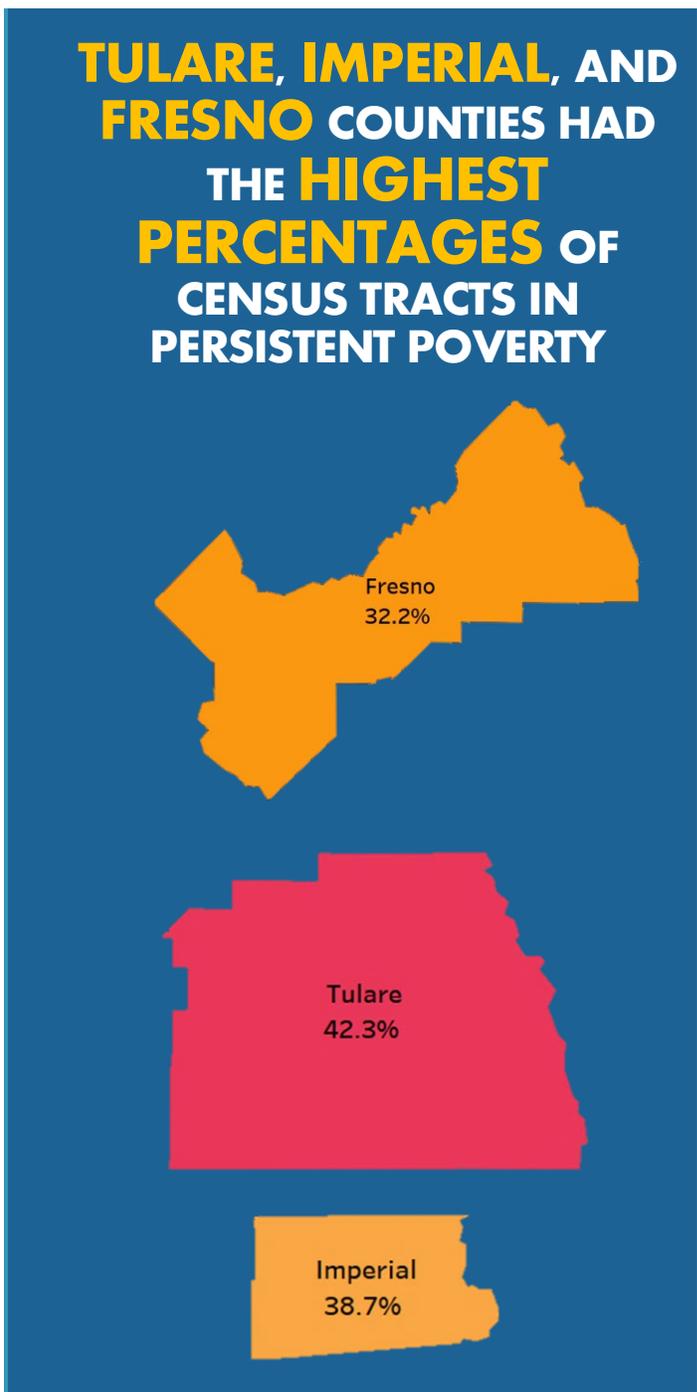
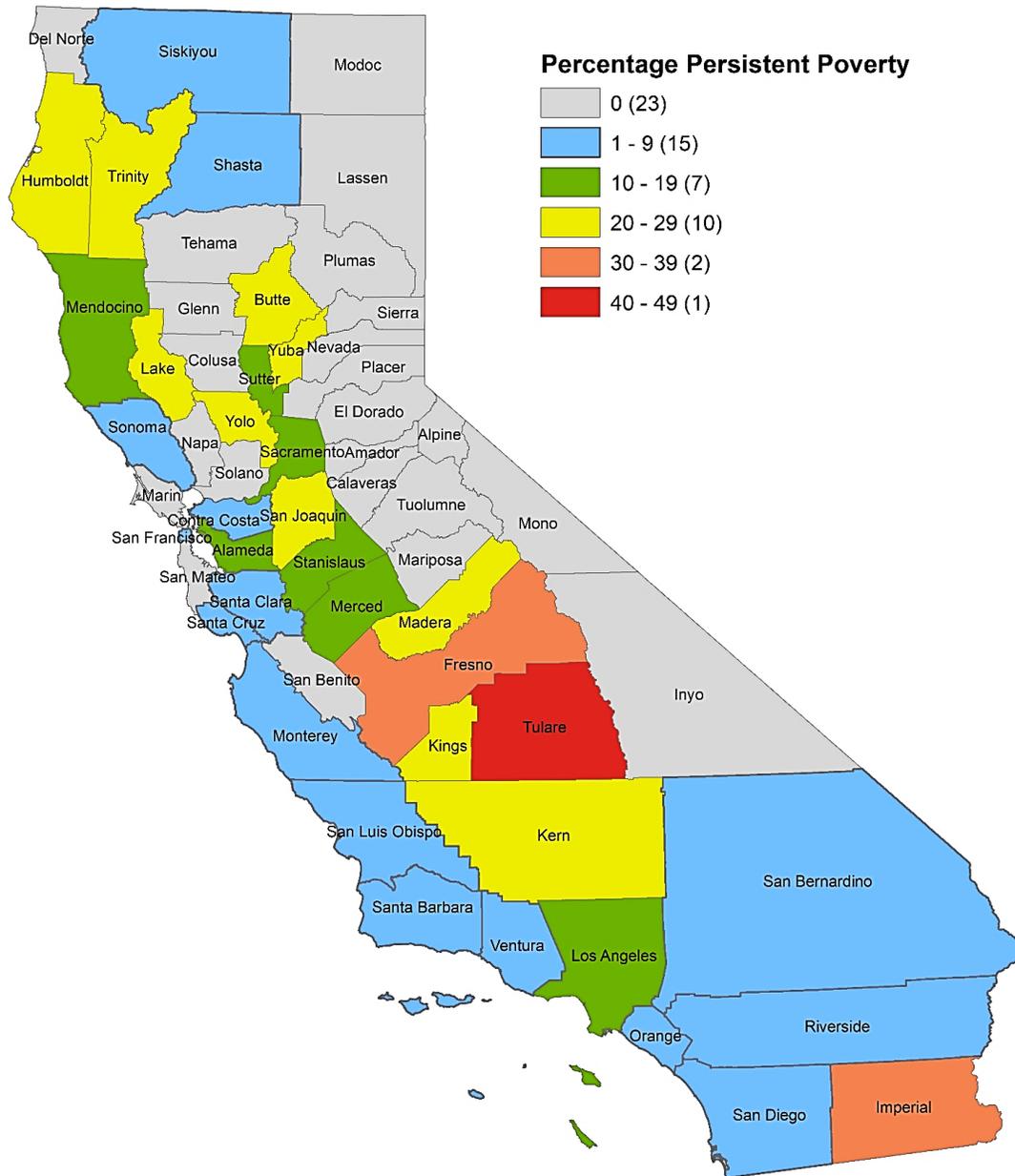
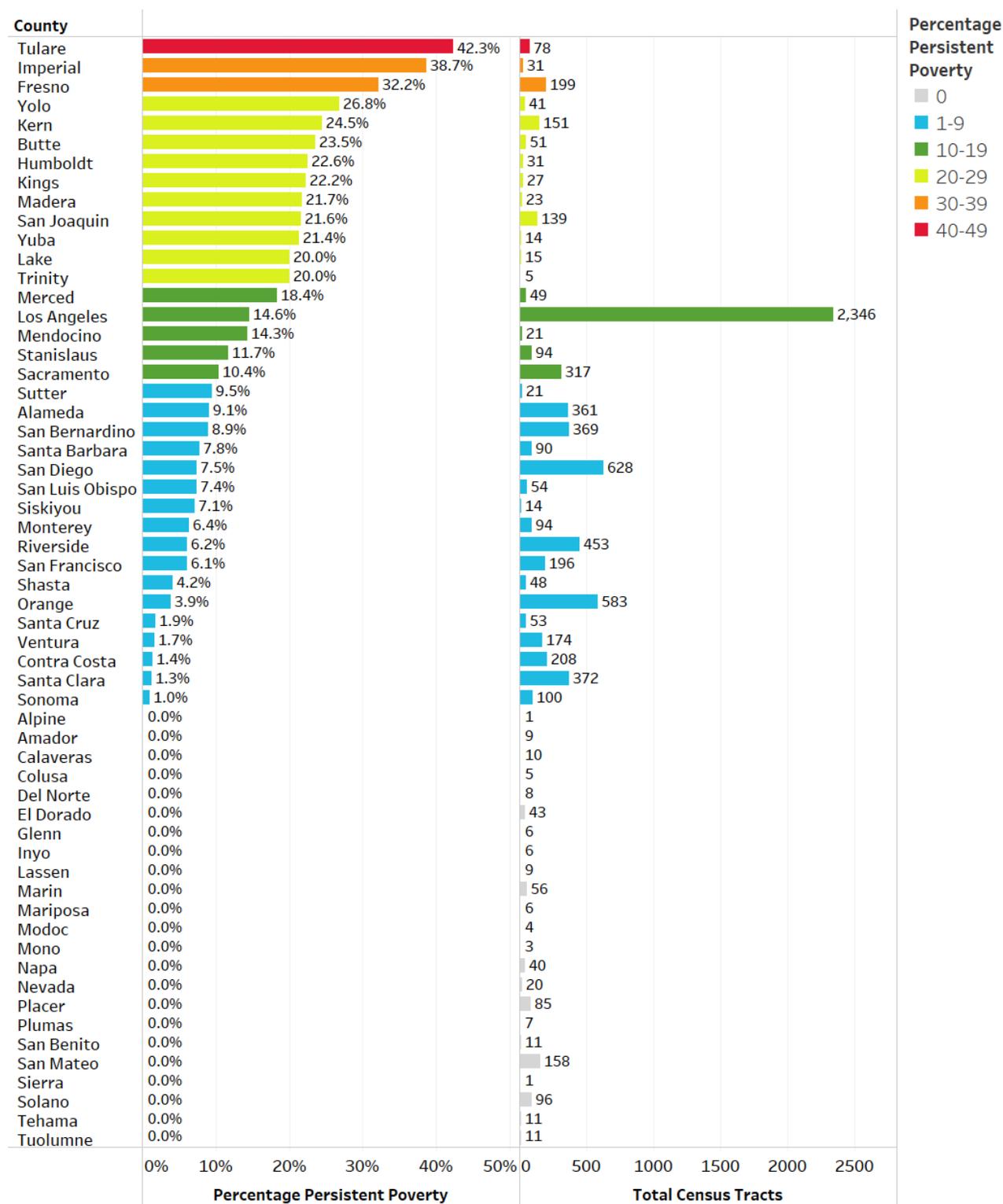


FIGURE 1. PERCENTAGE OF CENSUS TRACTS IN PERSISTENT POVERTY PER CALIFORNIA COUNTY



Data Source: UCSF Health Atlas. University of California, San Francisco School of Medicine Dean's Office of Population Health and Health Equity, 2022. Accessed from: www.healthatlas.ucsf.edu

FIGURE 2. TOTAL COUNT OF CENSUS TRACTS AND PERCENTAGE OF PERSISTENT POVERTY CENSUS TRACTS BY COUNTY IN CALIFORNIA



Data Source: UCSF Health Atlas. University of California, San Francisco School of Medicine Dean's Office of Population Health and Health Equity, 2022. Accessed from: www.healthatlas.ucsf.edu

PATIENT POPULATION CHARACTERISTICS

From January 1, 2006 to December 31, 2020, a total of 2,493,936 individuals were diagnosed with invasive cancer in California. Of those, 162,538 (6.5 percent) lived in persistent poverty areas at the time of diagnosis and 2,331,398 (93.5 percent) lived in non-persistent poverty areas. Table 1 presents characteristics of cancer patients who lived in persistent poverty areas versus those who did not, and highlights differences between these two groups. A larger percentage of patients in persistent poverty areas were children, adolescents, and

most cancer patients in persistent poverty had public health insurance or no health insurance

young adults aged 39 years and younger compared to those who lived in non-persistent poverty areas (8.9 versus 5.9 percent). The percentage of patients ages 40-64 years was also higher among those who lived in persistent poverty areas versus those who did not (42.6 versus 38.9 percent), whereas the percentage of patients ages 65-79 years and 80+ years was higher among those in non-persistent poverty areas (37.9 versus 34.3 percent and 17.3 versus 14.1 percent, respectively). More patients living in persistent poverty areas were diagnosed with remote or regional stage cancer compared to patients in non-persistent poverty areas (50 versus 45 percent, respectively). Fewer patients in persistent poverty areas were diagnosed when the tumor was localized (39.7 versus 47.1 percent).

In terms of race and ethnicity, higher percentages of Hispanic/Latino (41.3 versus 17.6 percent) and Black/African American (15.7 versus 5.7 percent) patients lived in persistent poverty areas compared to non-Hispanic/Latino White and Asian/Pacific Islander patients (31.0 versus 63.1 percent and 10 versus 11.2 percent, respectively). Geographically, more patients residing in persistent poverty areas lived in rural than in urban areas (18.3 versus 13.8 percent). Roughly one third of patients

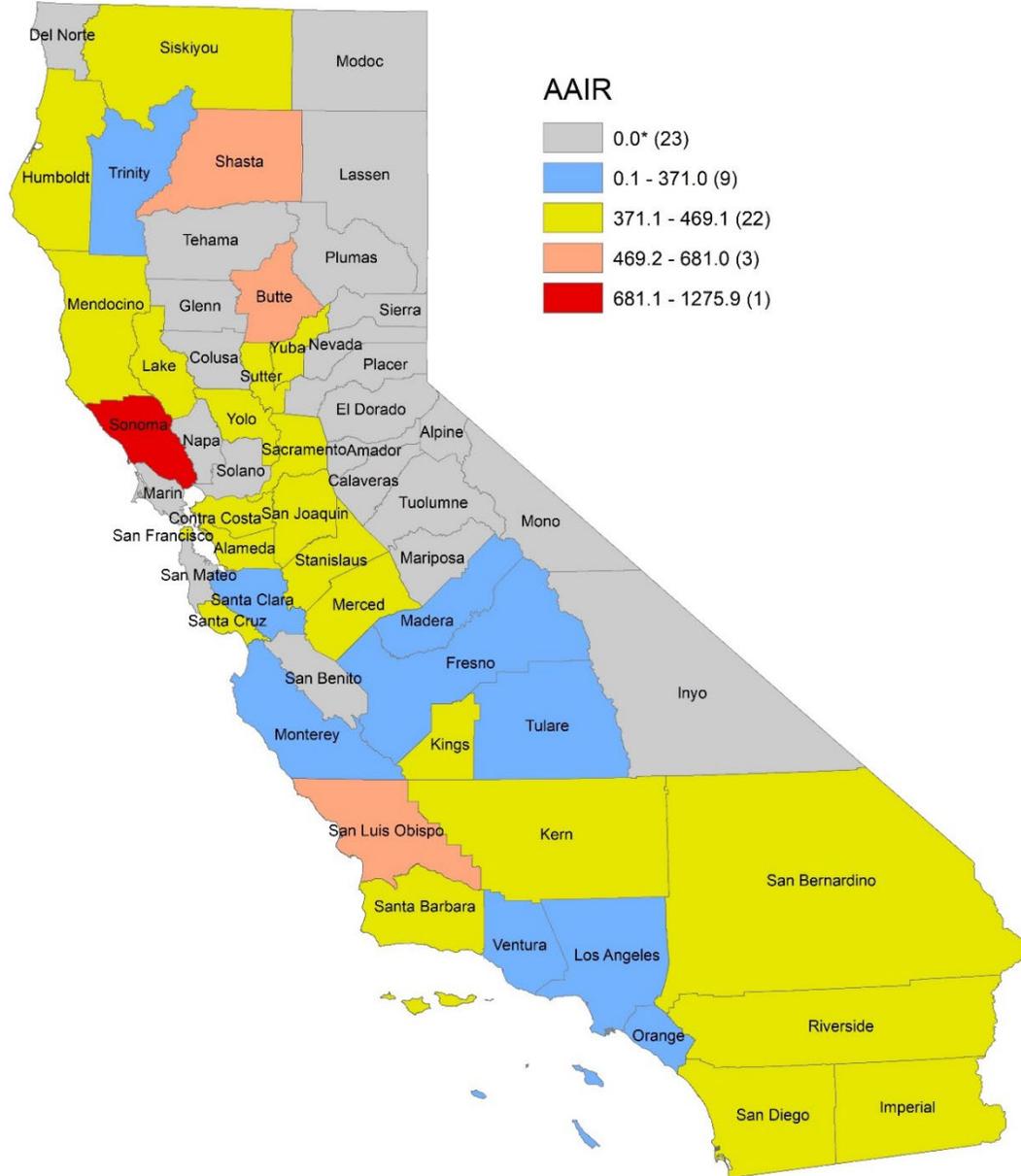
who lived in persistent poverty areas lived in Central California (32.1 percent) or Los Angeles (32.6 percent) compared to 22.4 percent (Central California) and 23.2 percent (Los Angeles) of patients in non-persistent poverty areas. Additionally, fewer patients in persistent poverty areas were married (40 versus 53.7 percent) or had private insurance (38.5 versus 60.4 percent) and more had public insurance or no insurance (54.9 percent vs 33.4 percent) compared to those in non-persistent poverty areas.

TABLE 1. CHARACTERISTICS OF CANCER PATIENTS BY PERSISTENT POVERTY, 2006 TO 2020, CALIFORNIA

	Persistent Poverty		
	Total (2,493,936)	Yes (162,538)	No (2,331,398)
	% (n)	% (n)	% (n)
Age (years)			
00-14	0.8% (19201)	1.4% (2355)	0.7% (16846)
15-39	5.3% (132632)	7.5% (12175)	5.2% (120457)
40-64	39.2% (976466)	42.6% (69256)	38.9% (907210)
65-79	37.6% (938733)	34.3% (55830)	37.9% (882903)
80 plus	17.1% (426904)	14.1% (22922)	17.3% (403982)
Sex			
Female	49.8% (1242142)	49.2% (79957)	49.8% (1162185)
Male	50.2% (1251794)	50.8% (82581)	50.2% (1169213)
Health Insurance Status			
Private	58.9% (1469681)	38.5% (62569)	60.4% (1407112)
Public/uninsured	34.8% (867748)	54.9% (89165)	33.4% (778583)
Unknown	6.3% (156507)	6.6% (10804)	6.2% (145703)
Race/Ethnicity			
Non-Hispanic/Latino White	61.0% (1521974)	31.0% (50347)	63.1% (1471627)
Black/African American	6.4% (159296)	15.7% (25504)	5.7% (133792)
Hispanic/Latino	19.1% (477242)	41.3% (67107)	17.6% (410135)
Asian/Pacific Islander	11.2% (278188)	10.0% (16212)	11.2% (261976)
Other	2.3% (57236)	2.1% (3368)	2.3% (53868)
Residence			
Rural	14.1% (351425)	18.3% (29699)	13.8% (321726)
Urban	85.9% (2142508)	81.7% (132838)	86.2% (2009670)
Unknown	0.0% (3)	0.0% (1)	0.0% (2)
Stage at Diagnosis			
Localized	46.6% (1163410)	39.7% (64556)	47.1% (1098854)
Regional	20.8% (519542)	21.8% (35400)	20.8% (484142)
Remote	24.5% (609962)	28.2% (45761)	24.2% (564201)
Unknown	8.1% (201022)	10.3% (16821)	7.9% (184201)
Cancer Treatment at an NCI facility			
Yes	16.1% (401394)	16.8% (27332)	16.0% (374062)
No	83.9% (2092542)	83.2% (135206)	84.0% (1957336)
Marital Status			
Married	52.8% (1317276)	40.0% (64996)	53.7% (1252280)
Not married	39.8% (992214)	52.9% (85994)	38.9% (906220)
Unknown	7.4% (184446)	7.1% (11548)	7.4% (172898)
Area of California			
Bay Area	19.4% (484609)	8.1% (13150)	20.2% (471459)
Central California	23.0% (574232)	32.1% (52191)	22.4% (522041)
Northern California	16.4% (408085)	16.0% (26060)	16.4% (382025)
San Diego, Imperial	17.3% (432165)	11.2% (18213)	17.8% (413952)
Los Angeles	23.9% (594845)	32.6% (52924)	23.2% (541921)
Cancer Type			
Breast	15.6% (388005)	13.2% (21472)	15.7% (366533)
Prostate	12.7% (316062)	11.1% (18093)	12.8% (297969)
Lung	10.3% (256261)	11.2% (18280)	10.2% (237981)
Colorectal	8.9% (221005)	9.9% (16109)	8.8% (204896)
Melanoma	5.2% (130363)	2.1% (3392)	5.4% (126971)
Oral	2.5% (62882)	2.5% (4060)	2.5% (58822)
Liver	2.4% (59520)	3.9% (6334)	2.3% (53186)
Kidney	3.5% (86993)	4.0% (6506)	3.5% (80487)
Pancreas	2.8% (70415)	2.9% (4669)	2.8% (65746)
Bladder	4.1% (101414)	3.1% (5091)	4.1% (96323)
Stomach	1.8% (44474)	2.7% (4420)	1.7% (40054)
Thyroid	2.9% (71509)	2.8% (4528)	2.9% (66981)
Uterine	3.3% (82241)	3.5% (5626)	3.3% (76615)
non-Hodgkin Lymphoma	4.4% (109611)	4.3% (7017)	4.4% (102594)
Leukemia	3.0% (74817)	3.3% (5305)	3.0% (69512)
Cervical	0.9% (22112)	1.7% (2767)	0.8% (19345)
Other	15.9% (396252)	17.8% (28869)	15.8% (367383)

Source: California Cancer Registry, California Department of Public Health.

FIGURE 3. AGE-ADJUSTED INCIDENCE RATES (AAIR) IN PERSISTENT POVERTY AREAS OF CALIFORNIA BY COUNTY, 2006-2020



Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
 *Counties with rates of 0 had no persistent poverty tracts in the county.
 Source: California Cancer Registry, California Department of Public Health

CANCER INCIDENCE

Overall, we observed a significantly lower overall cancer incidence rate among patients in persistent poverty areas compared to patients in non-persistent poverty areas (Table 2, Figure 4). However, higher cancer incidence rates were observed for certain cancers in persistent poverty areas (Table 2, Figure 5).

Significant differences were observed in age-adjusted incidence rates of 16 common cancers among patients in persistent poverty areas compared to patients in non-persistent poverty areas of California. There were significantly higher incidence rates of lung and bronchus, colorectal, kidney, liver, stomach, and cervical cancers and significantly lower rates of breast, prostate, non-Hodgkin lymphoma, melanoma, uterine, leukemia, pancreatic, thyroid, oropharyngeal, and bladder cancers among patients in persistent poverty areas compared to patients in non-persistent poverty areas (Table 2, Figure 5).

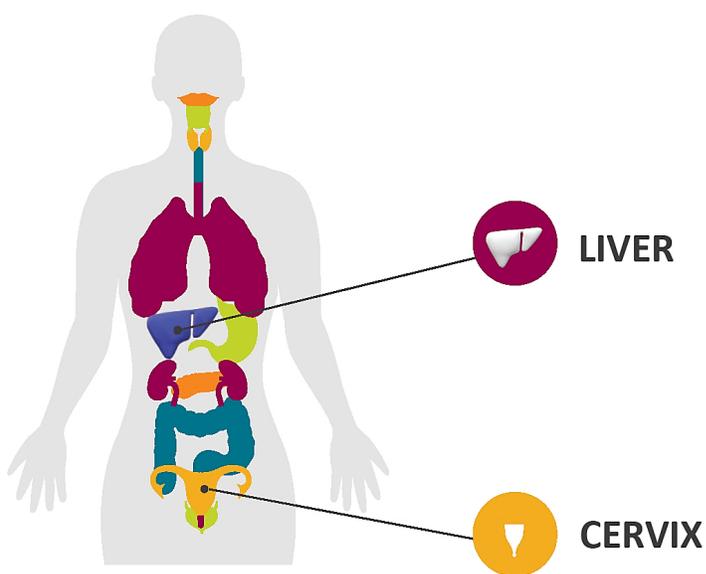
Overall cancer incidence rates in persistent and non-persistent poverty areas by sex were significantly lower among males living in persistent poverty areas compared to non-persistent poverty areas. The same pattern was observed among females (Figure 6, Table 3).

Incidence rates for lung, colorectal, liver, and stomach cancers among males living in persistent poverty areas were significantly higher compared to their counterparts in non-persistent poverty areas. Among females, incidence rates of liver, kidney, cervical, and stomach cancers were significantly higher among those in persistent poverty compared to non-persistent poverty areas (Table 3, Figure 7). Males (vs. females) in both persistent and non-persistent poverty areas had higher incidence rates for all cancer sites, except for thyroid and breast cancer (Figure 7).

**significantly
higher
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liver cancer
rates were
observed
across all
racial/ethnic
groups in
California
persistent
poverty
areas**

Our overall results show that non-Hispanic/Latino White patients in persistent poverty areas had significantly higher cancer incidence relative to non-Hispanic/Latino White patients in non-persistent poverty areas (Table 4, Figure 8). Similarly, Black/African American patients in persistent poverty areas had significantly higher cancer incidence rates compared to Black/African American patients in non-persistent poverty areas of California (Table 5, Figure 8). Hispanic/Latino and Asian/Pacific Islander patients living in non-persistent poverty areas had significantly higher overall cancer incidence rates than those same groups in persistent poverty areas, as did American Indians but this difference was not significant (Tables 6-8 and Figure 8).

Among non-Hispanic/Latino Whites, patients in persistent poverty areas had significantly higher incidence rates of most of the common 16 cancer types, including oropharyngeal, stomach, colorectal, liver, pancreatic, lung, kidney, uterine, and cervical cancers, and had significantly lower incidence of melanoma, breast, prostate, and thyroid cancers (Table 4, Figure 9). Among Black/African Americans in persistent poverty areas, we observed significantly higher incidence rates of oropharyngeal, stomach, colorectal, liver, lung, and

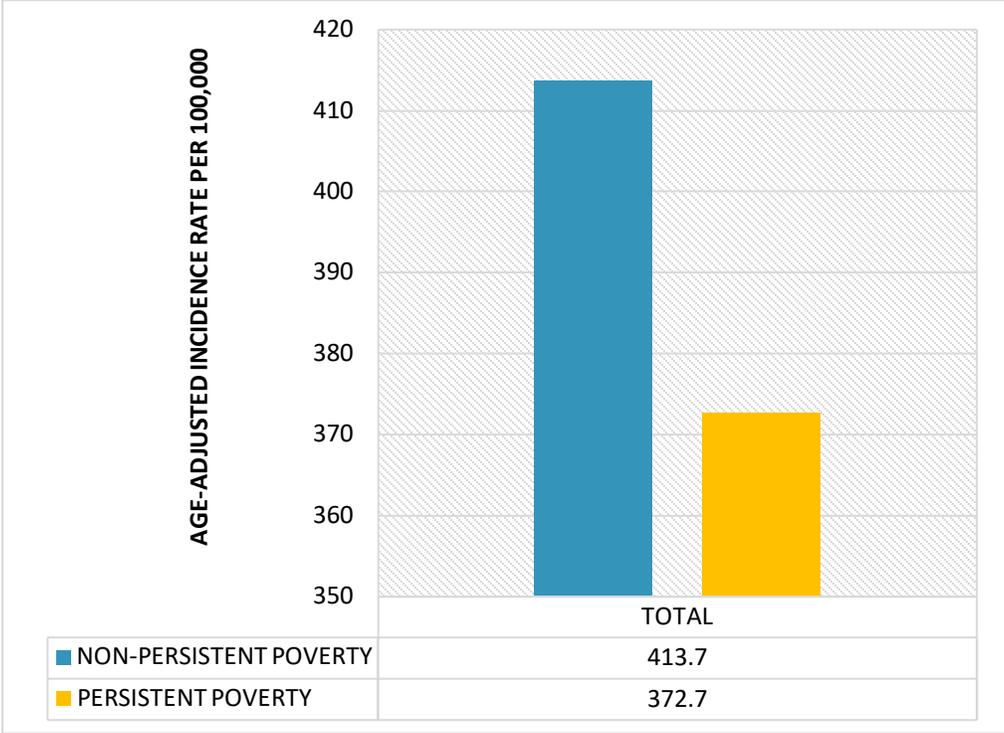


cervical cancers and significantly lower breast, prostate, and thyroid cancers compared to Black/African Americans in non-persistent poverty areas (Table 5, Figure 9). Interestingly, among the Hispanic/Latino group, significantly lower incidence rates were observed for most of the 16 cancers among patients in persistent poverty areas versus non-persistent poverty areas, including oropharyngeal, colorectal, pancreatic, lung, melanoma, breast, uterine, prostate, bladder, kidney, thyroid, non-Hodgkin lymphoma, and leukemia. Significantly higher incidence rates among

Hispanic/Latino patients in persistent poverty areas were observed for stomach, liver, and cervical cancers compared to non-persistent areas (Table 6, Figure 9). Among the Asian/Pacific Islander persistent poverty group, we observed significantly higher incidence rates of stomach, colorectal, liver, lung, and cervical cancers, and significantly lower melanoma, breast, uterine, prostate, bladder, kidney, thyroid, non-Hodgkin lymphoma, and leukemia relative to the non-persistent poverty Asian/Pacific Islander group (Table 7, Figure 9). Lastly, among the American Indian group in persistent poverty areas, we observed significantly higher rates of liver, kidney, and cervical cancers and significantly lower rates of melanoma and breast cancers relative to those in non-persistent poverty areas (Table 8, Figure 9).

Across all racial/ethnic groups, significantly higher incidence rates of cervical and liver cancers were observed in persistent poverty areas versus non-persistent poverty areas. Conversely, across all racial/ethnic groups, significantly lower incidence rates of female breast cancer were observed in persistent poverty areas versus non-persistent poverty areas in California (Tables 4-8, Figure 9).

FIGURE 4. AGE-ADJUSTED INCIDENCE RATES FOR ALL CANCERS COMBINED BY PERSISTENT POVERTY, 2006-2020



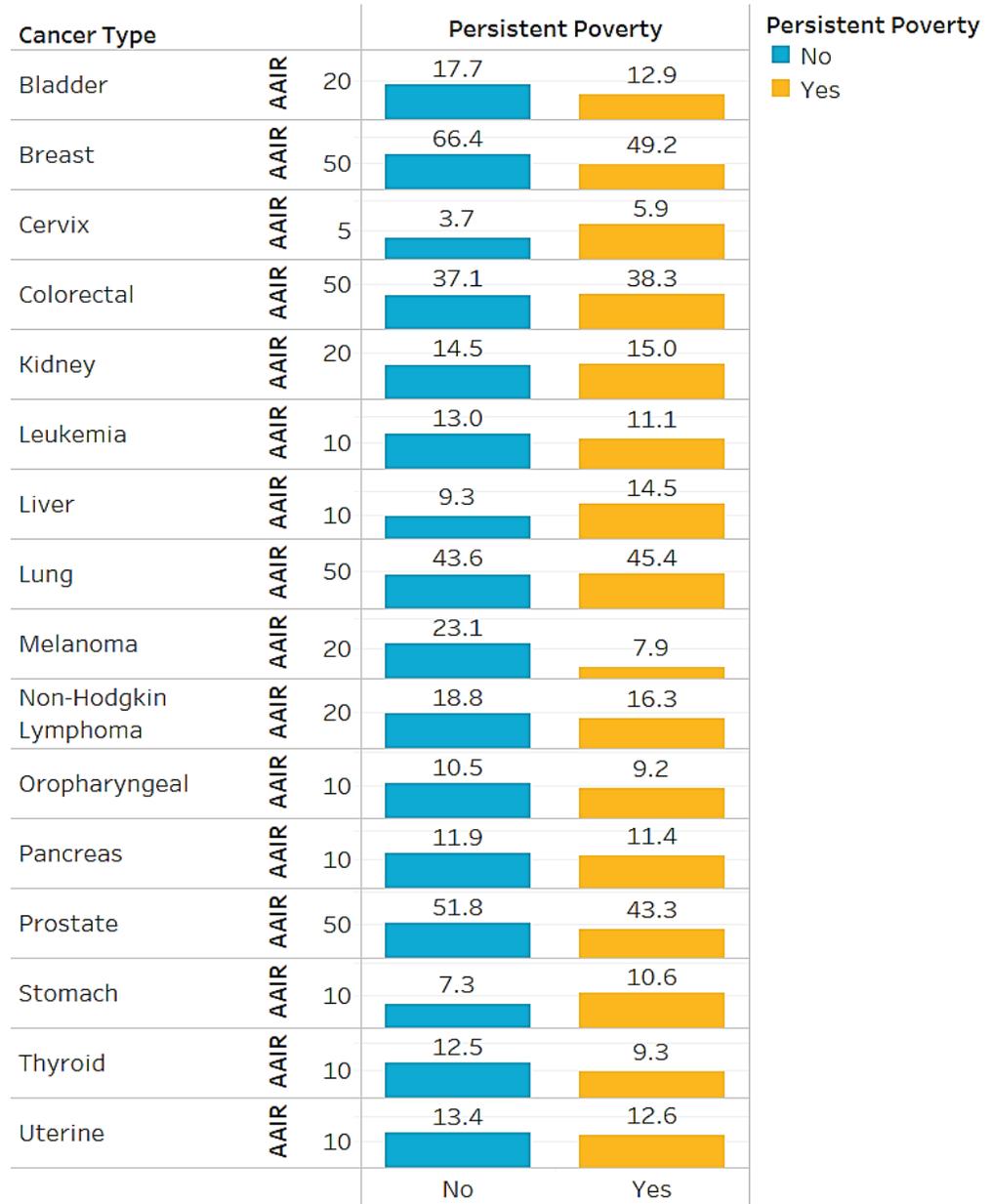
Source: California Cancer Registry, California Department of Public Health.

TABLE 2. AGE-ADJUSTED INCIDENCE RATES AND RATE RATIOS OF COMMON CANCERS BY PERSISTENT POVERTY, 2006-2020

<i>Cancer Type</i>	Persistent Poverty					
	Yes		No		Rate Ratio	
	Rate	N	Rate	N	Yes/No	p-value
<i>All Cancers</i>	372.7	160,467	413.7	2,285,774	0.90	<0.001
<i>Breast</i>	49.2	21,472	66.4	366,533	0.74	<0.001
<i>Prostate</i>	95	18,092	113.1	297,969	0.84	<0.001
<i>Lung</i>	45.4	18,280	43.6	237,981	1.04	<0.001
<i>Colorectal</i>	38.3	16,109	37.1	204,896	1.03	<0.001
<i>Liver</i>	14.5	6,334	9.3	53,186	1.56	<0.001
<i>Kidney</i>	15	6,506	14.5	80,487	1.04	0.007
<i>Pancreas</i>	11.4	4,669	11.9	65,746	0.96	0.008
<i>Melanoma</i>	7.9	3,392	23.1	126,971	0.34	<0.001
<i>Uterine</i>	24.2	5,626	25.4	76,614	0.95	<0.001
<i>Non-Hodgkin Lymphoma</i>	16.3	7,017	18.8	102,594	0.87	<0.001
<i>Bladder</i>	12.9	5,091	17.7	96,323	0.73	<0.001
<i>Leukemia</i>	11.1	5,305	13	69,512	0.86	<0.001
<i>Cervix</i>	11.7	2,767	7.2	19,345	1.63	<0.001
<i>Oropharyngeal</i>	9.2	4,060	10.5	58,822	0.88	<0.001
<i>Stomach</i>	10.6	4,420	7.3	40,054	1.45	<0.001
<i>Thyroid</i>	9.3	4,528	12.5	66,981	0.74	<0.001

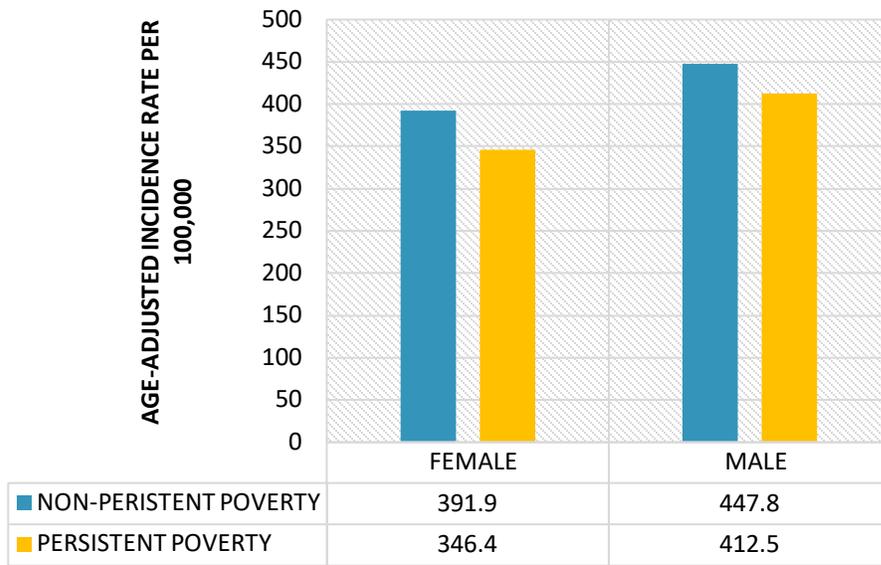
Source: California Cancer Registry, California Department of Public Health.

FIGURE 5. AGE-ADJUSTED INCIDENCE RATES OF 16 COMMON CANCERS BY PERSISTENT POVERTY, 2006-2020



Source: California Cancer Registry, California Department of Public Health.
AAIR: Age-Adjusted Incidence Rate per 100,000

FIGURE 6. AGE-ADJUSTED INCIDENCE RATES BY PERSISTENT POVERTY AND SEX, 2006-2020



Source: California Cancer Registry, California Department of Public Health.

TABLE 3. AGE-ADJUSTED INCIDENCE RATES AND RATE RATIOS OF COMMON CANCERS BY PERSISTENT POVERTY AND SEX, 2006-2020

	Persistent Poverty					
	Yes		No		Rate Ratio	
	Rate	N	Rate	N	Yes/No	p-value
Male						
<i>All Cancers</i>	412.5	80,950	447.8	1,133,804	0.92	<0.001
<i>Breast</i>	0.9	167	1.0	2,586	0.84	0.03
<i>Prostate</i>	95	18,092	113.1	297,969	0.84	<0.001
<i>Lung</i>	56.3	10,175	49.4	119,821	1.14	<0.001
<i>Colorectal</i>	45.1	8,769	42.3	106,607	1.07	<0.001
<i>Liver</i>	21.6	4,505	14	37,486	1.54	<0.001
<i>Kidney</i>	19.5	3,945	20	51,617	0.98	0.15
<i>Pancreas</i>	12.7	2,379	13.5	33,432	0.94	0.007
<i>Melanoma of the Skin</i>	10.3	1,985	30.6	76,410	0.34	<0.001
<i>Non-Hodgkin Lymphoma</i>	19.2	3,857	22.8	56,921	0.84	<0.001
<i>Bladder</i>	22.2	3,838	31.1	74,076	0.71	<0.001
<i>Leukemia</i>	13.8	3,074	16.5	40,490	0.84	<0.001
<i>Oropharyngeal</i>	14	2,902	15.7	41,291	0.89	<0.001
<i>Stomach</i>	13.7	2,579	9.6	23,820	1.43	<0.001
<i>Thyroid</i>	4.4	1,007	6.4	16,705	0.69	<0.001
Female						
<i>All Cancers</i>	346.4	79,517	391.9	1,151,970	0.88	<0.001
<i>Breast</i>	93.4	21,305	124.7	363,947	0.75	<0.001
<i>Lung</i>	36.9	8,105	39.3	118,160	0.94	<0.001
<i>Colorectal</i>	32.5	7,340	32.8	98,289	0.99	0.54
<i>Liver</i>	8.1	1,829	5.2	15,700	1.57	<0.001
<i>Kidney</i>	11.2	2,561	9.8	28,870	1.14	<0.001
<i>Pancreas</i>	10.3	2,290	10.6	32,314	0.97	0.22
<i>Melanoma of the Skin</i>	6.0	1,407	17.5	50,561	0.34	<0.001
<i>Uterine</i>	24.2	5,626	25.4	76,614	0.95	<0.001
<i>Non-Hodgkin Lymphoma</i>	13.8	3,160	15.5	45,673	0.89	<0.001
<i>Bladder</i>	5.7	1,253	7.3	22,247	0.78	<0.001
<i>Leukemia</i>	8.9	2,231	10.1	29,022	0.88	<0.001
<i>Cervix</i>	11.7	2,767	7.2	19,345	1.63	<0.001
<i>Oropharyngeal</i>	5.0	1,158	5.9	17,531	0.85	<0.001
<i>Stomach</i>	8.2	1,841	5.5	16,234	1.49	<0.001
<i>Thyroid</i>	14.2	3,521	18.6	50,276	0.76	<0.001

Source: California Cancer Registry, California Department of Public Health.

FIGURE 7. AGE-ADJUSTED INCIDENCE RATES FOR 16 COMMON CANCERS BY PERSISTENT POVERTY AND SEX, 2006-2020



Source: California Cancer Registry, California Department of Public Health.
AAIR: Age-Adjusted Incidence Rate per 100,000

TABLE 4. AGE-ADJUSTED INCIDENCE RATES AND RATE RATIOS OF COMMON CANCERS BY PERSISTENT POVERTY AND RACE/ETHNICITY, 2006-2020: NON-HISPANIC/LATINO WHITE

Cancer Type	Persistent Poverty				Rate Ratio	
	Yes		No		Yes/No	p-value
	Rate	N	Rate	N		
<i>All Cancers</i>	478.6	49,287	456.5	1,436,402	1.05	<0.001
<i>Female Breast</i>	121.5	6,115	140.2	222,390	0.87	<0.001
<i>Lung</i>	73.5	7,787	50.3	166,177	1.46	<0.001
<i>Prostate</i>	103.0	5,295	116.9	186,288	0.88	<0.001
<i>Colorectal</i>	44.3	4,595	38	120,982	1.17	<0.001
<i>Liver</i>	12	1,293	6.7	22,484	1.77	<0.001
<i>Kidney</i>	16.7	1,679	14.7	46,167	1.13	<0.001
<i>Pancreas</i>	13.1	1,381	12.3	40,846	1.06	0.04
<i>Melanoma</i>	24.6	2,458	36.3	109,604	0.68	<0.001
<i>Non-Hodgkin Lymphoma</i>	19.7	1,994	20.4	63,526	0.97	0.16
<i>Bladder</i>	22.8	2,424	22.2	73,582	1.03	0.17
<i>Leukemia</i>	14.2	1,408	14.6	43,953	0.98	0.38
<i>Oropharyngeal</i>	16.4	1,686	12.8	40,909	1.28	<0.001
<i>Stomach</i>	6.7	698	5.3	17,281	1.26	<0.001
<i>Thyroid</i>	9.9	918	13.2	33,896	0.75	<0.001
<i>Uterine</i>	28.4	1,468	26.2	44,342	1.09	0.003
<i>Cervix</i>	11.9	476	6.6	8,097	1.81	<0.001

Source: California Cancer Registry, California Department of Public Health.

TABLE 5. AGE-ADJUSTED INCIDENCE RATES AND RATE RATIOS OF COMMON CANCERS BY PERSISTENT POVERTY AND RACE/ETHNICITY, 2006-2020: BLACK/AFRICAN AMERICAN

Cancer Type	Persistent Poverty				Rate Ratio	
	Yes		No		Yes/No	p-value
	Rate	N	Rate	N		
<i>All Cancers</i>	481.9	25,275	442.8	132,413	1.09	<0.001
<i>Female Breast</i>	122	3,426	129.5	21,031	0.94	0.001
<i>Lung</i>	74.4	3,866	54	15,447	1.38	<0.001
<i>Prostate</i>	165.8	4,021	178.7	25,504	0.93	<0.001
<i>Colorectal</i>	51.6	2,669	45.2	13,173	1.14	<0.001
<i>Liver</i>	15.8	890	10.4	3,310	1.53	<0.001
<i>Kidney</i>	17.9	938	17.9	5,432	1	0.99
<i>Pancreas</i>	16.6	861	15.5	4,431	1.07	0.07
<i>Melanoma</i>	0.8	44	1.1	312	0.75	0.08
<i>Non-Hodgkin Lymphoma</i>	14.5	756	14.9	4,421	0.98	0.59
<i>Bladder</i>	13.7	692	12.9	3,556	1.06	0.14
<i>Leukemia</i>	11.3	584	11	3,168	1.03	0.58
<i>Oropharyngeal</i>	11.5	623	8.4	2,591	1.38	<0.001
<i>Stomach</i>	11.7	596	9.2	2,581	1.27	<0.001
<i>Thyroid</i>	6.4	331	7.5	2,304	0.85	0.007
<i>Uterine</i>	26.7	785	26.4	4,486	1.01	0.76
<i>Cervix</i>	10.9	292	6.8	1,073	1.60	<0.001

Source: California Cancer Registry, California Department of Public Health.

TABLE 6. AGE-ADJUSTED INCIDENCE RATES AND RATE RATIOS OF COMMON CANCERS BY PERSISTENT POVERTY AND RACE/ETHNICITY, 2006-2020: HISPANIC/LATINO

Cancer Type	Persistent Poverty					
	Yes		No		Rate Ratio	
	Rate	N	Rate	N	Yes/No	p-value
<i>All Cancers</i>	308.4	66,559	336.6	405,506	0.92	<0.001
<i>Female Breast</i>	75.7	9,152	94.3	64,920	0.80	<0.001
<i>Lung</i>	24.0	4,154	25.2	25,261	0.95	0.006
<i>Prostate</i>	82.7	6,983	97.3	47,635	0.85	<0.001
<i>Colorectal</i>	31.3	6,450	33.4	38,966	0.94	<0.001
<i>Liver</i>	15.0	3,066	13.1	15,176	1.14	<0.001
<i>Kidney</i>	15.5	3,359	16.8	20,583	0.92	<0.001
<i>Pancreas</i>	9.9	1,839	11.2	11,817	0.89	<0.001
<i>Melanoma</i>	2.8	615	5.0	6,201	0.57	<0.001
<i>Non-Hodgkin Lymphoma</i>	16.4	3,470	17.5	20,720	0.94	<0.001
<i>Bladder</i>	8.2	1,408	10.2	10,255	0.80	<0.001
<i>Leukemia</i>	9.8	2,832	10.4	14,520	0.94	0.005
<i>Oropharyngeal</i>	5.7	1,232	6.2	7,547	0.91	0.005
<i>Stomach</i>	11.5	2,331	10.1	11,424	1.14	<0.001
<i>Thyroid</i>	9.3	2,636	11.8	17,945	0.79	<0.001
<i>Uterine</i>	22.0	2,724	22.8	15,957	0.96	0.09
<i>Cervix</i>	12.2	1,652	9.0	6,768	1.36	<0.001

Source: California Cancer Registry, California Department of Public Health.

TABLE 7. AGE-ADJUSTED INCIDENCE RATES AND RATE RATIOS OF COMMON CANCERS BY PERSISTENT POVERTY AND RACE/ETHNICITY, 2006-2020: ASIAN/PACIFIC ISLANDER

Cancer Type	Persistent Poverty					
	Yes		No		Rate Ratio	
	Rate	N	Rate	N	Yes/No	p-value
<i>All Cancers</i>	289.2	16,031	306.1	258,785	0.94	<0.001
<i>Female Breast</i>	82.1	2,239	104.9	50,130	0.78	<0.001
<i>Lung</i>	38.3	2,235	35.3	29,072	1.09	<0.001
<i>Prostate</i>	41.1	1,051	64.3	24,256	0.64	<0.001
<i>Colorectal</i>	37.6	2,130	33.4	28,315	1.12	<0.001
<i>Liver</i>	17.4	962	13.4	11,403	1.29	<0.001
<i>Kidney</i>	7.4	400	8.3	7,131	0.88	0.02
<i>Pancreas</i>	9.3	540	9.9	8,104	0.94	0.16
<i>Melanoma</i>	0.9	51	1.2	1,025	0.75	0.04
<i>Non-Hodgkin Lymphoma</i>	11.4	642	14.2	11,781	0.8	<0.001
<i>Bladder</i>	7.8	470	8.6	6,999	0.90	0.03
<i>Leukemia</i>	7.0	388	8	6,408	0.88	0.01
<i>Oropharyngeal</i>	8.3	436	7.7	6,610	1.08	0.12
<i>Stomach</i>	13.2	766	10.1	8,317	1.31	<0.001
<i>Thyroid</i>	10.6	545	13.6	11,626	0.78	<0.001
<i>Uterine</i>	19.3	535	21.6	10,602	0.90	0.02
<i>Cervix</i>	11.2	295	6.5	3,028	1.72	<0.001

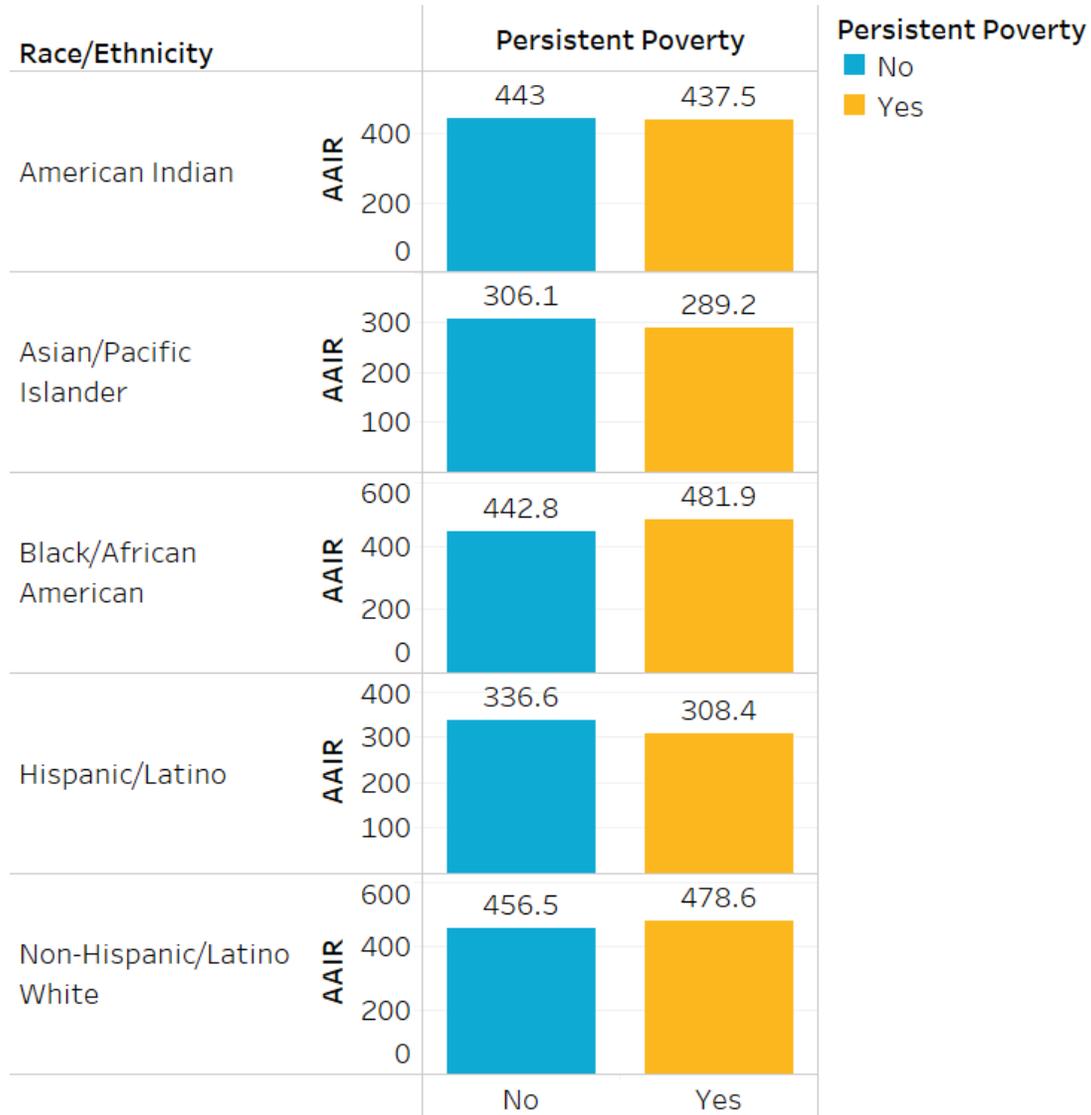
Source: California Cancer Registry, California Department of Public Health.

TABLE 8. AGE-ADJUSTED INCIDENCE RATES AND RATE RATIOS OF COMMON CANCERS BY PERSISTENT POVERTY AND RACE/ETHNICITY, 2006-2020: AMERICAN INDIAN

<i>Cancer Type</i>	Persistent Poverty					
	Yes		No		Rate Ratio	
	Rate	N	Rate	N	Yes/No	p-value
<i>All Cancers</i>	437.5	1,522	443.0	13,006	0.99	0.67
<i>Female Breast</i>	102.3	201	129.4	2,048	0.79	0.002
<i>Lung</i>	51.7	176	49	1,373	1.06	0.54
<i>Prostate</i>	78.9	118	90.6	1,317	0.87	0.18
<i>Colorectal</i>	45.0	158	41.7	1,192	1.08	0.41
<i>Liver</i>	28.5	107	19.6	634	1.46	0.001
<i>Kidney</i>	28.9	101	21.3	649	1.36	0.009
<i>Pancreas</i>	9.6	34	13.4	380	0.72	0.07
<i>Melanoma</i>	5.0	18	12.5	365	0.40	<0.001
<i>Non-Hodgkin Lymphoma</i>	19.3	63	18.4	523	1.05	0.77
<i>Bladder</i>	13.4	46	15.5	422	0.87	0.41
<i>Leukemia</i>	13.9	46	14.8	417	0.94	0.77
<i>Oropharyngeal</i>	10.8	37	11.8	369	0.92	0.69
<i>Stomach</i>	4.8	17	7.4	219	0.65	0.10
<i>Thyroid</i>	10.1	35	12.9	368	0.79	0.21
<i>Uterine</i>	32.4	65	33.3	537	0.97	0.91
<i>Cervix</i>	18.9	33	11.7	164	1.62	0.02

Source: California Cancer Registry, California Department of Public Health.

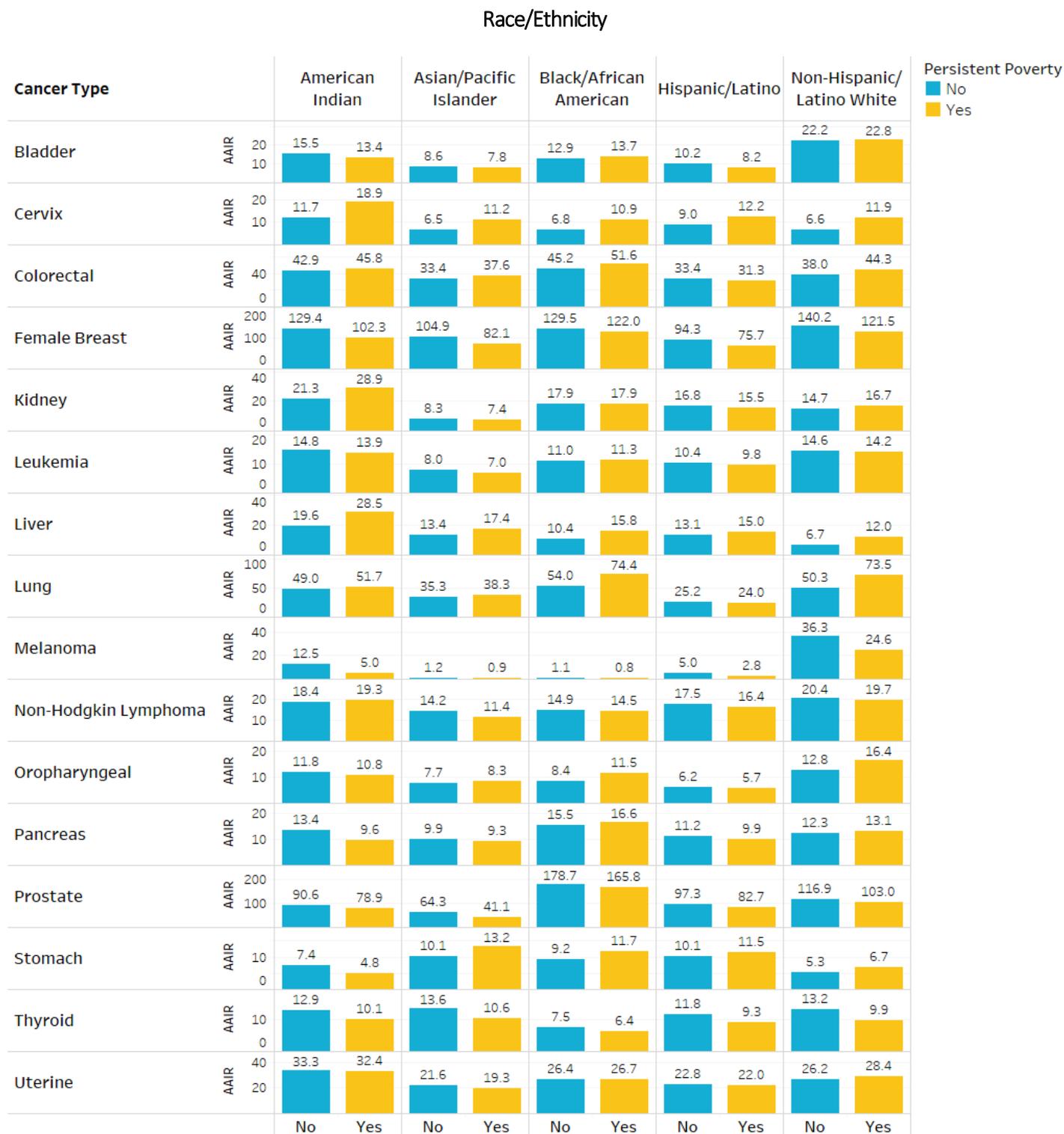
FIGURE 8. AGE-ADJUSTED INCIDENCE RATES OF ALL CANCERS COMBINED AMONG PATIENTS BY PERSISTENT POVERTY AND RACE/ETHNICITY, 2006-2020



Source: California Cancer Registry, California Department of Public Health.

AAIR: Age-Adjusted Incidence rate per 100,000

FIGURE 9. AGE-ADJUSTED INCIDENCE RATES FOR 16 COMMON CANCERS AMONG PATIENTS BY PERSISTENT POVERTY AREA AND RACE/ETHNICITY, 2006-2020



Source: California Cancer Registry, California Department of Public Health.
AAIR: Age-Adjusted Incidence Rate per 100,000

CANCER STAGE AT DIAGNOSIS

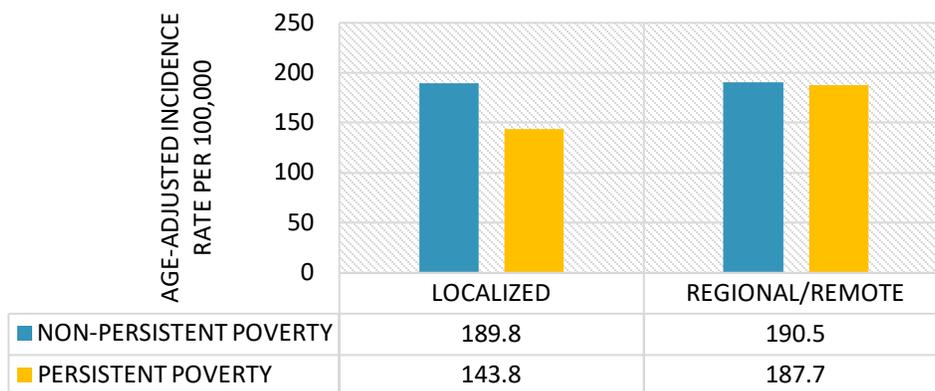
Stage at diagnosis describes the extent the disease has spread and is one of the strongest predictors of survival. Cancers detected at localized stage have a greater potential to be cured. For some cancers including oral, colorectal, lung, melanoma, female breast, cervical, and prostate, screening tests are available which

most cancers in **persistent poverty areas** were diagnosed at **regional or remote stage**

allow for the possibility of early detection. For all cancers combined, people living in persistent poverty areas (vs. non-persistent poverty areas) had lower rates of localized stage disease at diagnosis (Figure 10). Incidence rate ratios comparing rates by stage at diagnosis in persistent poverty areas to non-persistent poverty areas are presented in Tables 9 and 10. Results show that rates of localized stage were significantly lower in persistent poverty areas (vs. non-persistent poverty areas) for most cancer types presented in this report. Exceptions included liver and cervical cancers where rates of localized stage were significantly higher in persistent poverty areas, and kidney cancer where rates were not significantly different from each other in

the two areas (Table 9). Significantly higher incidence rates of regional/remote stage at diagnosis were observed for lung, colorectal, liver, kidney, stomach, and cervical cancers in persistent poverty areas (vs. non-persistent poverty areas) (Table 10). Figure 11 shows comparisons of stage at diagnosis by persistent poverty grouping and cancer site. Variability existed by site but notable findings included higher rates of regional/remote stage at diagnosis (vs. localized) for colorectal, lung, non-Hodgkin lymphoma, oropharyngeal, pancreas, and stomach cancers for both persistent poverty groupings. For liver cancer, incidence rates were roughly equivalent for localized and regional/remote stages by persistent poverty area. Cervical cancer was the only site that had higher incidence rates for regional/remote stage at diagnosis (vs. localized stage) among people living in persistent poverty areas but not for those living in non-persistent poverty areas.

FIGURE 10. AGE-ADJUSTED INCIDENCE RATES FOR ALL CANCERS COMBINED BY PERSISTENT POVERTY AREA AND STAGE AT DIAGNOSIS, 2006-2020



Source: California Cancer Registry, California Department of Public Health.

TABLE 9. AGE-ADJUSTED INCIDENCE RATES FOR COMMON CANCERS BY PERSISTENT POVERTY AREA AND STAGE, 2006-2020: LOCALIZED

Cancer Type	Persistent Poverty				Rate Ratio	
	Yes		No		Yes/No	p-value
	Rate	N	Rate	N		
All Cancers	143.8	62,491	189.8	1,053,313	0.76	<0.001
Female Breast	52.2	11,847	79.0	232,237	0.66	<0.001
Lung	7.5	2,982	9.1	49,291	0.82	<0.001
Prostate	61.9	11,978	79.6	211,418	0.78	<0.001
Colorectal	13.1	5,511	14.3	79,157	0.91	<0.001
Liver	5.9	2,562	4.0	22,881	1.47	<0.001
Kidney	9.4	4,081	9.5	52,542	0.99	0.51
Pancreas	1.3	532	1.5	8,209	0.88	0.006
Melanoma	5.4	2,339	18.2	99,895	0.30	<0.001
Non-Hodgkin Lymphoma	3.9	1,710	4.9	26,770	0.80	<0.001
Bladder	10.1	3,971	14.8	80,493	0.68	<0.001
Oropharyngeal	2.4	1,061	3.3	18,412	0.73	<0.001
Stomach	2.8	1,128	2.0	11,069	1.38	<0.001
Thyroid	5.3	2,577	7.7	41,508	0.68	<0.001
Uterine	14.8	3,466	16.8	50,624	0.89	<0.001
Cervix	4.2	1,034	3.4	8,680	1.29	<0.001

Source: California Cancer Registry, California Department of Public Health.

TABLE 10. AGE-ADJUSTED INCIDENCE RATES FOR COMMON CANCERS BY PERSISTENT POVERTY AREA AND STAGE AT DIAGNOSIS, 2006-2020: REGIONAL/REMOTE

Cancer Type	Persistent Poverty				Rate Ratio	
	Yes		No		Yes/No	p-value
	Rate	N	Rate	N		
All Cancers	187.7	81,160	190.5	1,048,342	0.99	<0.001
Female Breast	37.7	8,647	42.7	122,807	0.88	<0.001
Lung	33.8	13,716	31.3	171,431	1.08	<0.001
Prostate	20.3	3,936	23.4	61,955	0.87	<0.001
Colorectal	21.9	9,277	20.5	112,791	1.07	<0.001
Liver	6.3	2,761	4.0	22,795	1.57	<0.001
Kidney	4.8	2,079	4.4	24,673	1.08	<0.001
Pancreas	8.6	3,547	9.2	50,634	0.94	<0.001
Melanoma	1.6	678	2.9	15,888	0.54	<0.001
Non-Hodgkin Lymphoma	10.6	4,597	12.1	66,392	0.88	<0.001
Bladder	2.0	818	2.2	11,910	0.92	0.03
Oropharyngeal	6.1	2,698	6.5	36,761	0.94	0.002
Stomach	6.4	2,707	4.4	24,352	1.44	<0.001
Thyroid	3.6	1,777	4.5	23,974	0.80	<0.001
Uterine	7.9	1,825	7.6	23,092	1.03	0.17
Cervix	6.5	1,516	3.5	9,634	1.86	<0.001

Source: California Cancer Registry, California Department of Public Health.

FIGURE 11. AGE-ADJUSTED INCIDENCE RATES FOR 16 COMMON CANCERS BY PERSISTENT POVERTY AND STAGE, 2006-2020



Source: California Cancer Registry, California Department of Public Health.
AAIR: Age-Adjusted Incidence Rate per 100,000

TRENDS IN CANCER INCIDENCE

During the study period, trends in the age-adjusted incidence rate for all cancers combined were similar in persistent and non-persistent poverty areas (Figure 12). However, trends varied by cancer type (Figure 13). In both non-persistent and persistent poverty areas, significant decreases were observed for bladder, lung, and prostate cancers. Significant decreases in cervical, colorectal, non-Hodgkin lymphoma, and stomach cancers were observed among those in non-persistent areas only. In both areas, significant increases in incidence were observed for kidney, melanoma, thyroid, and uterine cancers. Significant increases were observed for liver and pancreatic cancers in non-persistent poverty areas only (Figure 14).

For most cancer sites males had higher incidence rates than females regardless of persistent poverty area status (Figure 15). Exceptions were observed for thyroid and breast cancer, where females had higher incidence rates, and for pancreatic cancer, where incidence rates were roughly equivalent between males and females. Among both males and females, non-Hodgkin lymphoma incidence significantly decreased in the non-persistent poverty group only. Melanoma significantly increased among both males and females in the non-persistent poverty group but did not significantly change among males and females in the persistent poverty group. Among females, cervical and oropharyngeal cancers also significantly decreased in the non-persistent poverty group, but not in the persistent poverty group (Figure 16). Figure 17 shows trends in age-adjusted incidence rates by cancer type, stage at diagnosis, and persistent poverty area status. Trends in cancer incidence by stage showed that localized stage diagnoses were trending in the same direction in persistent and non-persistent poverty areas for most cancers. Differences were observed among localized melanoma, which decreased significantly in persistent

poverty areas only, and localized female breast cancer, which significantly increased in non-persistent poverty areas only (Figure 18). For cancers diagnosed at a regional/remote stage, significant decreases were observed in both persistent and non-persistent poverty areas for colorectal and lung cancers and significant increases were observed for thyroid cancer. Remote/regional bladder, female breast, leukemia, non-Hodgkin lymphoma and stomach cancers decreased significantly in non-persistent poverty areas only. Interestingly, regional/remote cervical cancer incidence decreased significantly in persistent poverty areas only and regional/remote liver, melanoma, and uterine cancers increased significantly in non-persistent poverty areas only. Regional/remote stage non-Hodgkin lymphoma decreased significantly in non-persistent poverty areas but increased significantly in persistent poverty areas (Figure 18).

**regional/remote
non-Hodgkin
lymphoma
significantly
increased
in
persistent
poverty areas
from
2006-2019**

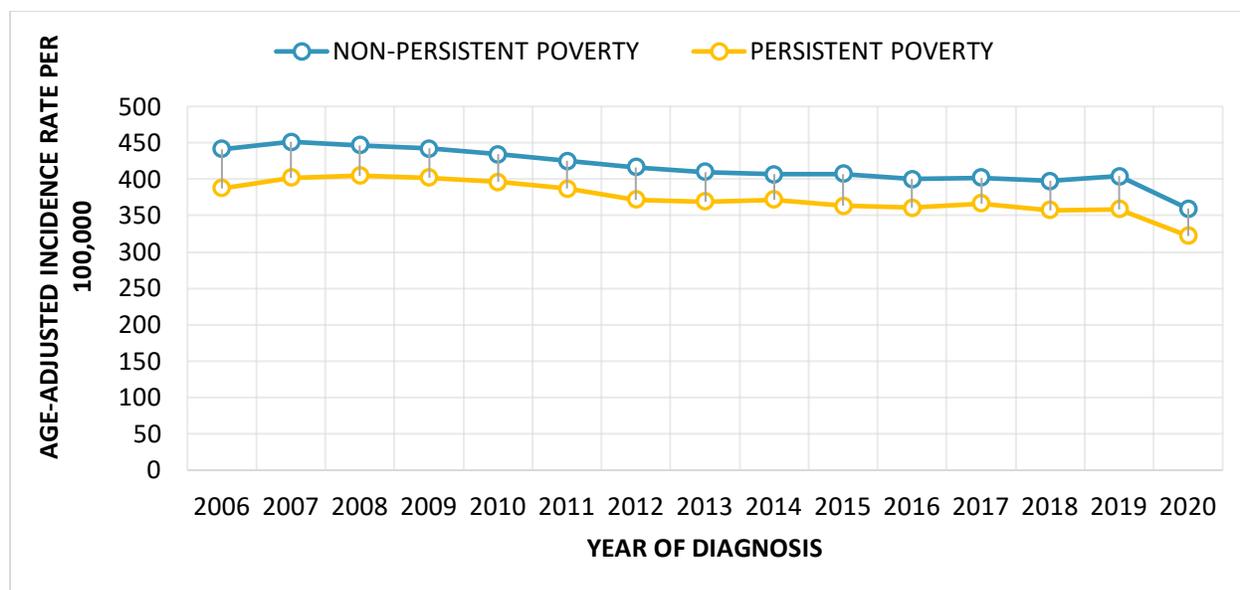
Figure 19 shows trends in age-adjusted incidence rates by cancer type, race/ethnicity, and persistent poverty area status. Higher incidence rates of lung cancer were observed among non-Hispanic/Latino Whites and Black/African Americans compared to other racial/ethnic groups, with higher incidence rates occurring among those living in persistent poverty areas (Figure 19). Incidence rates were higher among non-

colorectal cancer and non-Hodgkin lymphoma significantly increased among Hispanic/Latinos in persistent poverty areas from 2006-2019

Hispanic/Latino Whites with bladder cancer and melanoma for the 2006 to 2019 time period. Black/African Americans experienced the highest incidence rates for prostate and colorectal cancers at the start of the time period. Cancer incidence trends were evaluated by race/ethnicity in persistent and non-persistent poverty areas. Notable differences include, among non-Hispanic/Latina Whites, cervical cancer significantly decreased in non-persistent poverty areas only. Among Hispanic/Latinos, colorectal cancer and non-Hodgkin lymphoma increased significantly in persistent poverty areas and decreased in non-persistent poverty areas. Among Black/African Americans, thyroid cancer significantly increased in persistent poverty areas only. Among Asian/Pacific Islanders, cervical cancer decreased in both groups, with a much more pronounced decrease in persistent poverty areas (AAPC=-10.5) versus non-persistent poverty areas (AAPC=-2.8). Among American Indians, significant increases were observed for most cancers in non-

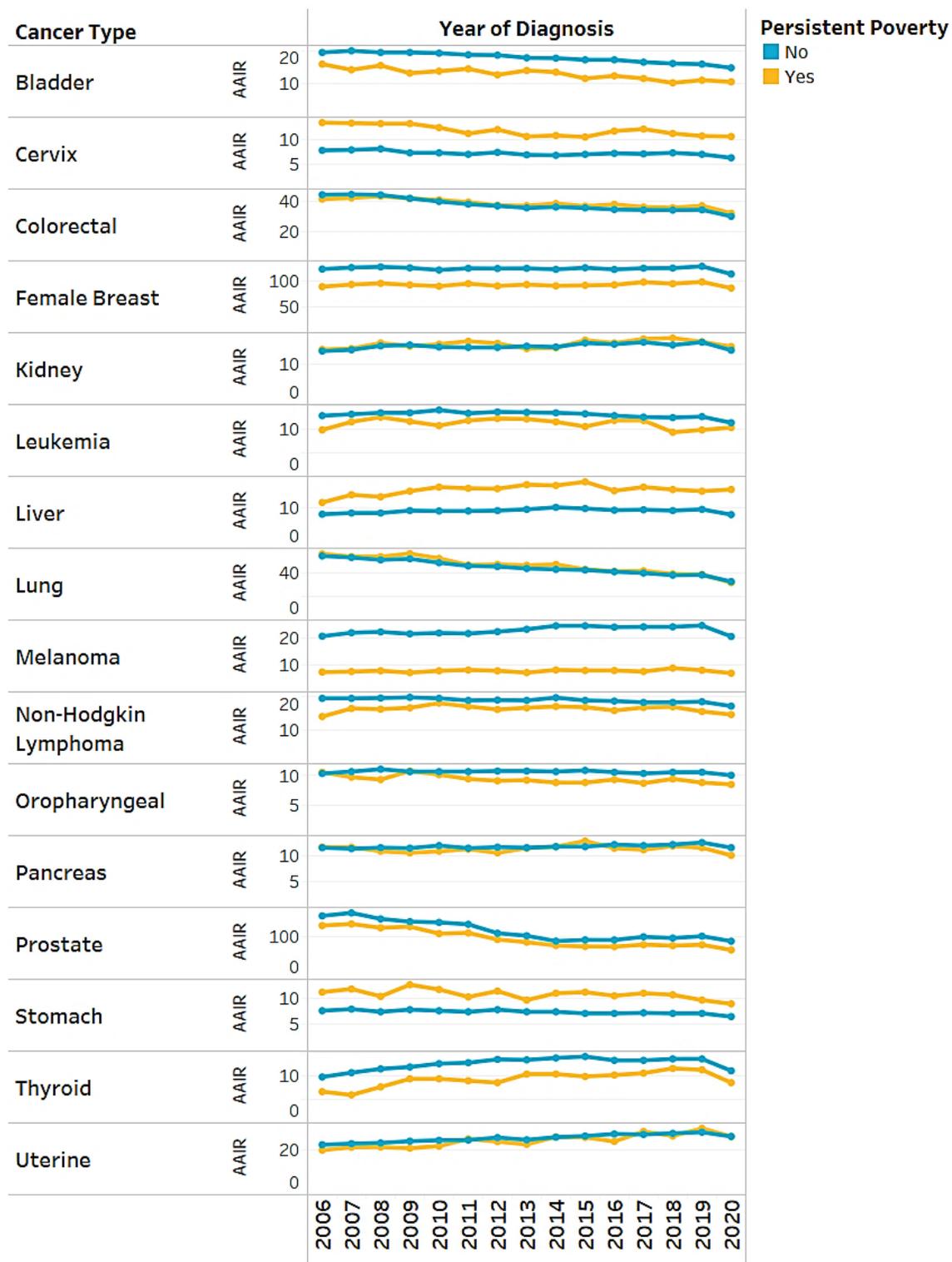
persistent poverty areas (Figure 20). However, trends for many cancers could not be calculated in persistent poverty areas due to a small population and unstable underlying incidence rates.

FIGURE 12. AGE-ADJUSTED INCIDENCE RATES OF ALL CANCERS COMBINED BY PERSISTENT POVERTY AND YEAR OF DIAGNOSIS, 2006-2020



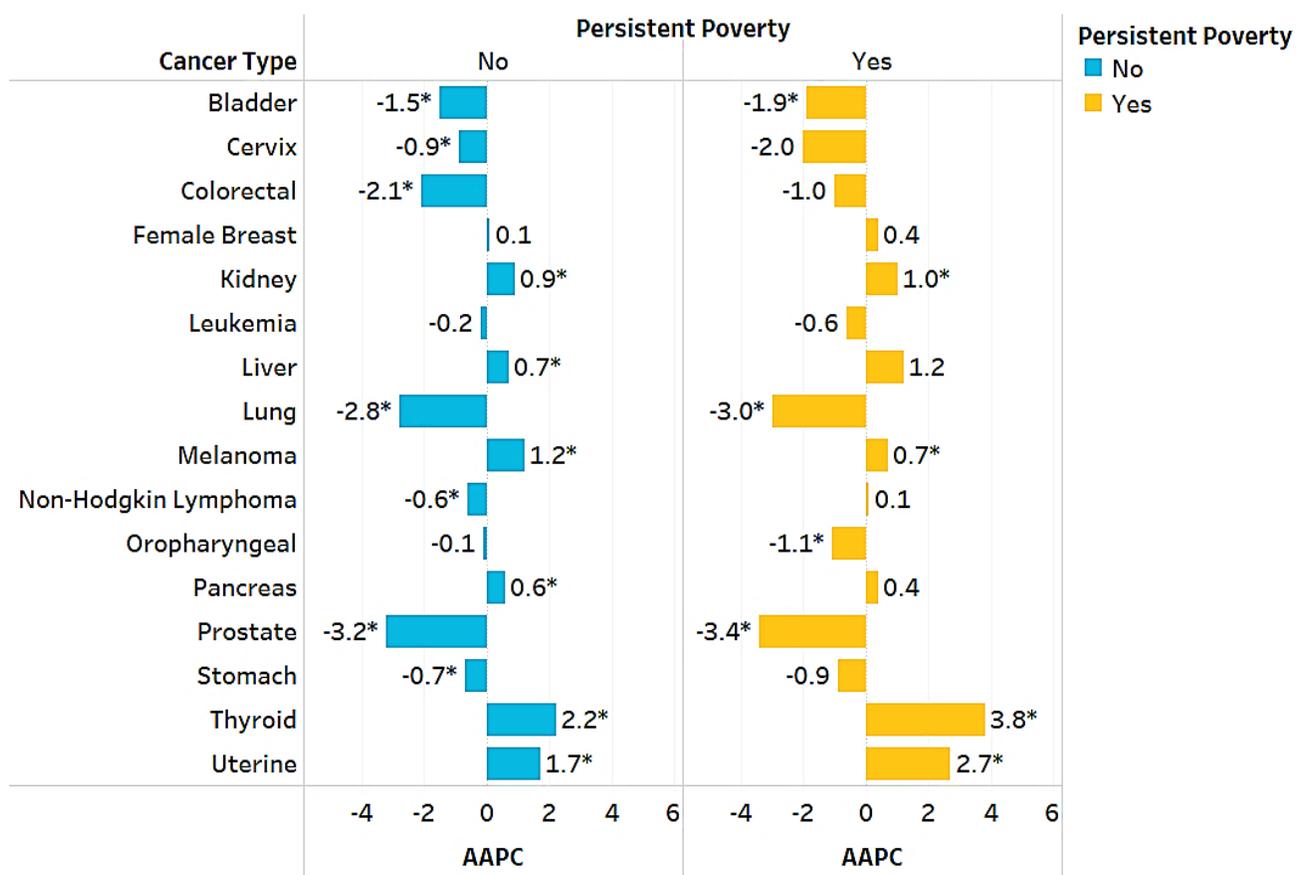
Source: California Cancer Registry, California Department of Public Health.

FIGURE 13. AGE-ADJUSTED INCIDENCE RATES FOR 16 COMMON CANCERS BY PERSISTENT POVERTY AND YEAR OF DIAGNOSIS, 2006-2020



Source: California Cancer Registry, California Department of Public Health.
AAIR: Age-Adjusted Incidence Rate per 100,000

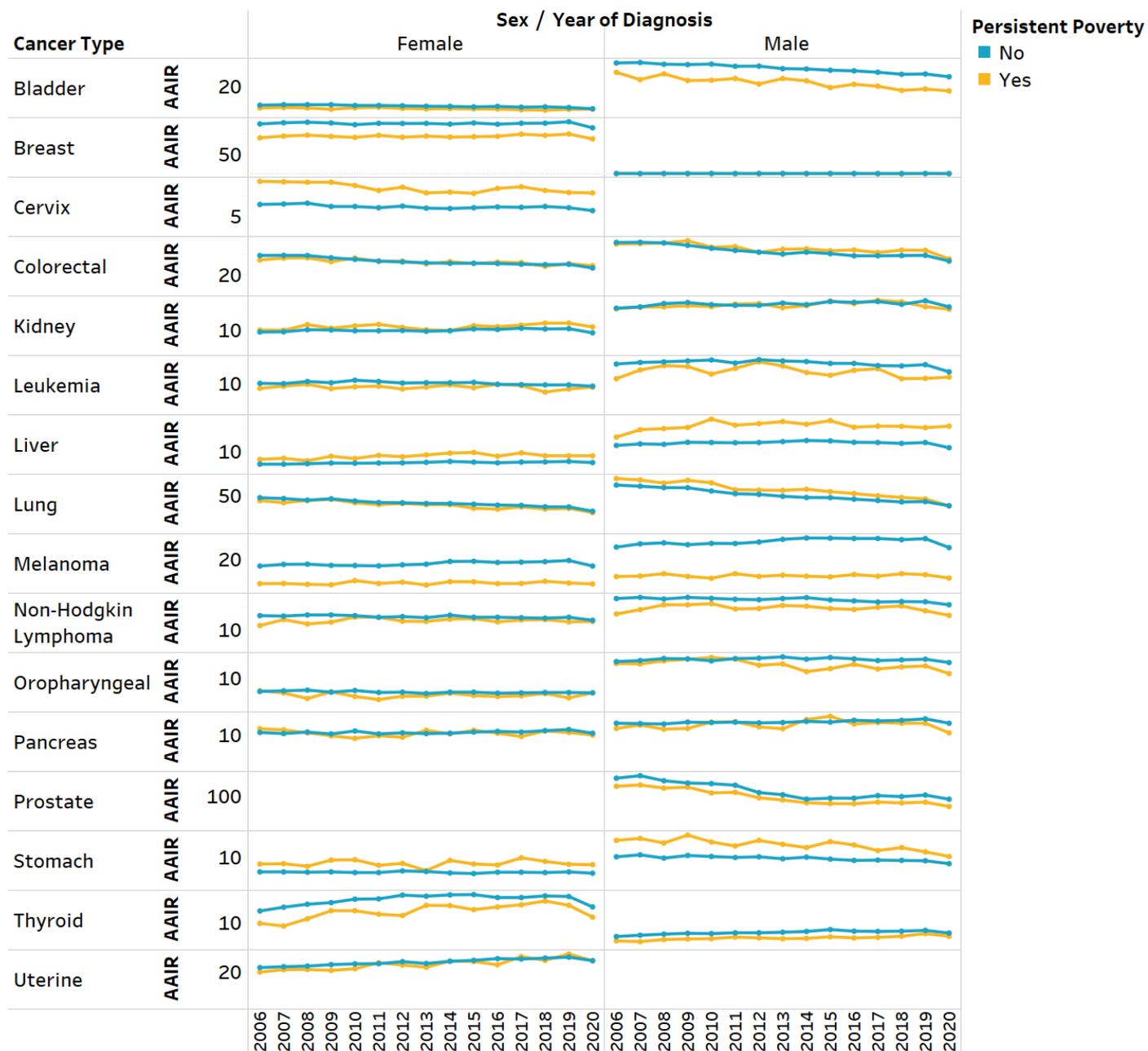
FIGURE 14. AVERAGE ANNUAL PERCENT CHANGE IN AGE-ADJUSTED INCIDENCE RATES FOR 16 COMMON CANCERS BY PERSISTENT POVERTY, 2006-2019



AAPC: Average Annual Percent Change

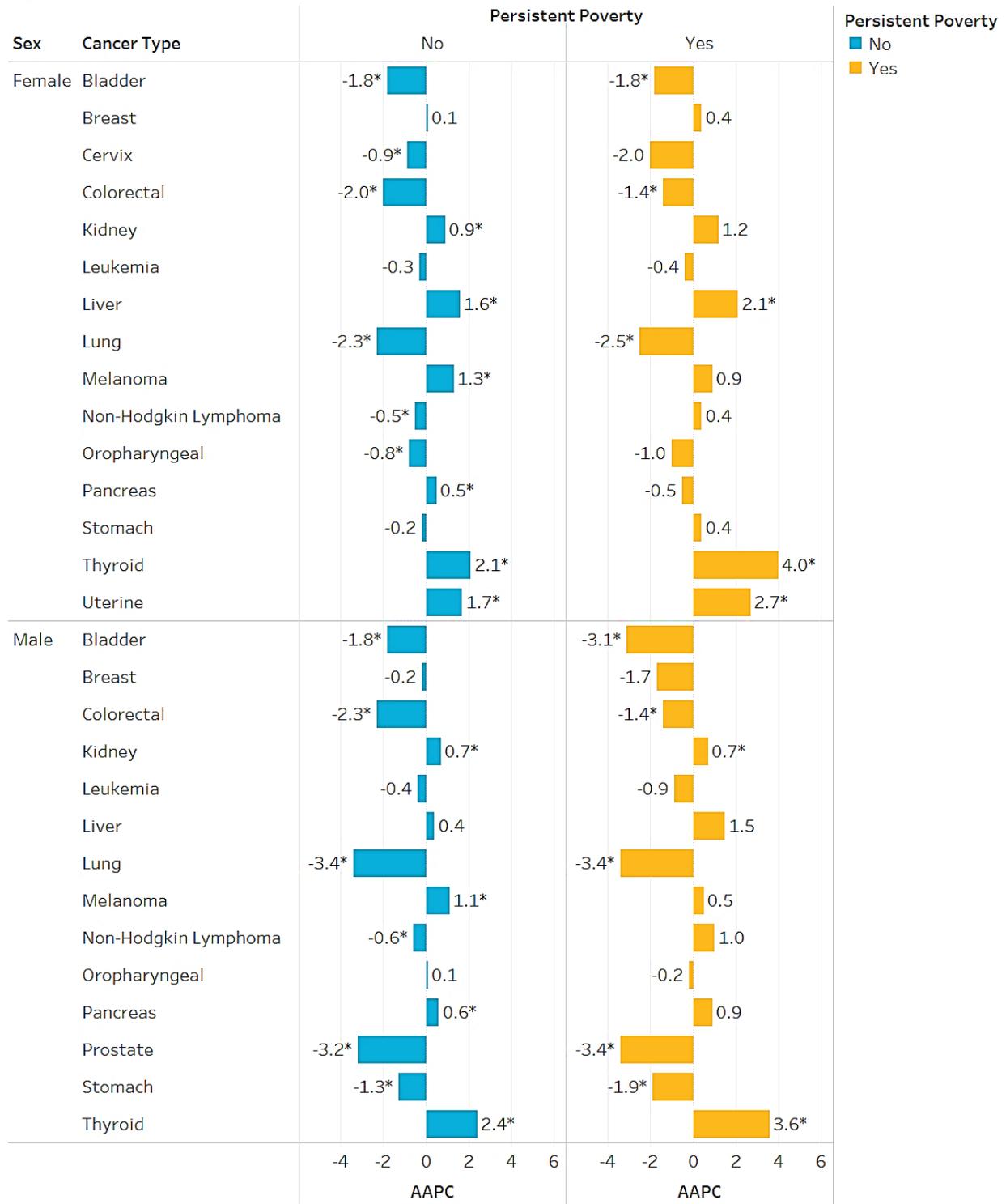
*The AAPC is significantly different from zero at $p < 0.05$.

FIGURE 15. AGE-ADJUSTED INCIDENCE RATES FOR 16 COMMON CANCERS BY PERSISTENT POVERTY, SEX, AND YEAR OF DIAGNOSIS, 2006-2020



Source: California Cancer Registry, California Department of Public Health.
 AAIR: Age-Adjusted Incidence Rate per 100,000
 Note: Prostate cancer AAIR for males only, uterine and cervix cancer AAIR for females only.

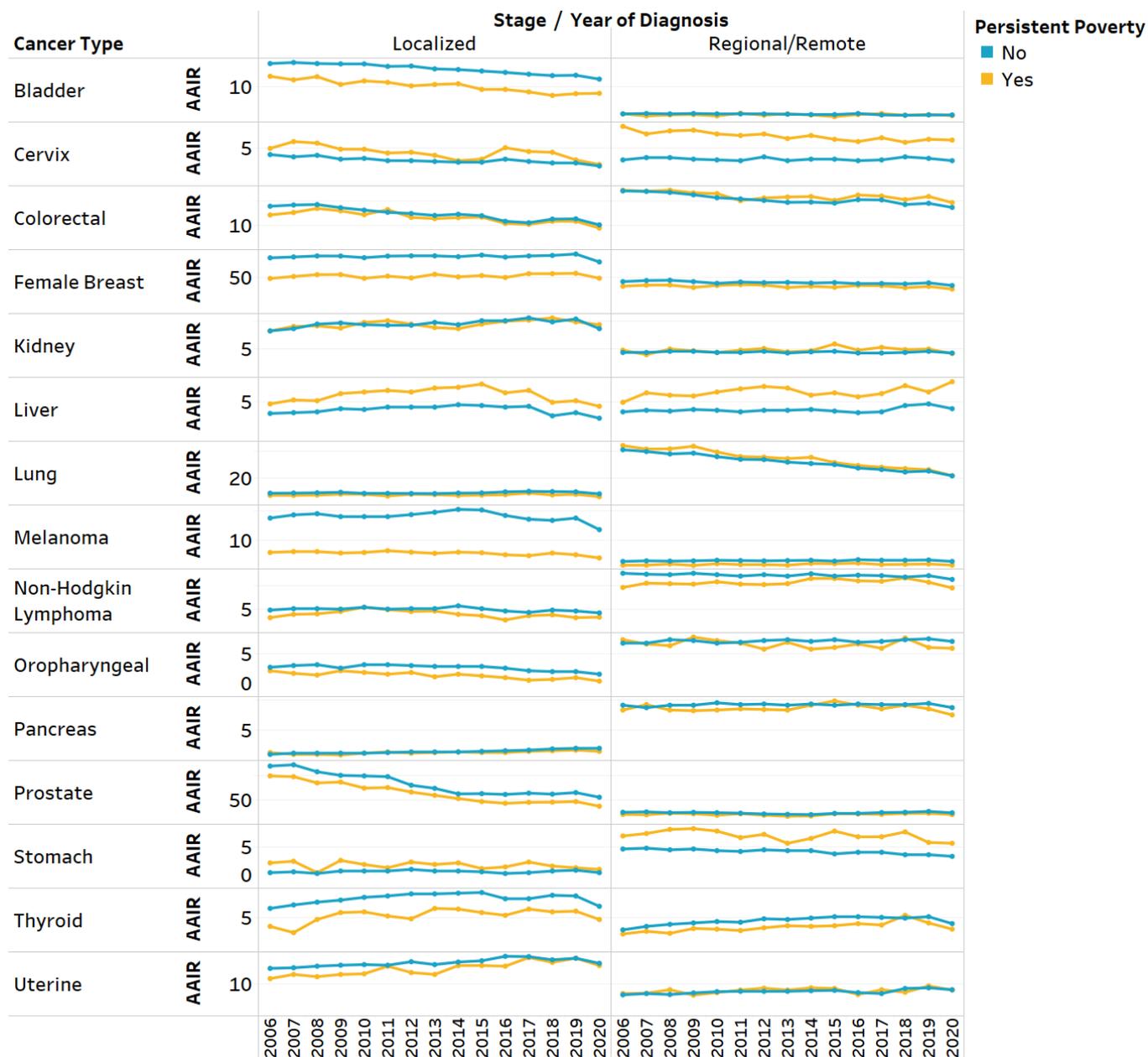
FIGURE 16. AVERAGE ANNUAL PERCENT CHANGE IN AGE-ADJUSTED INCIDENCE RATES FOR 16 COMMON CANCERS BY PERSISTENT POVERTY AND SEX, 2006-2019



AAPC: Average Annual Percent Change

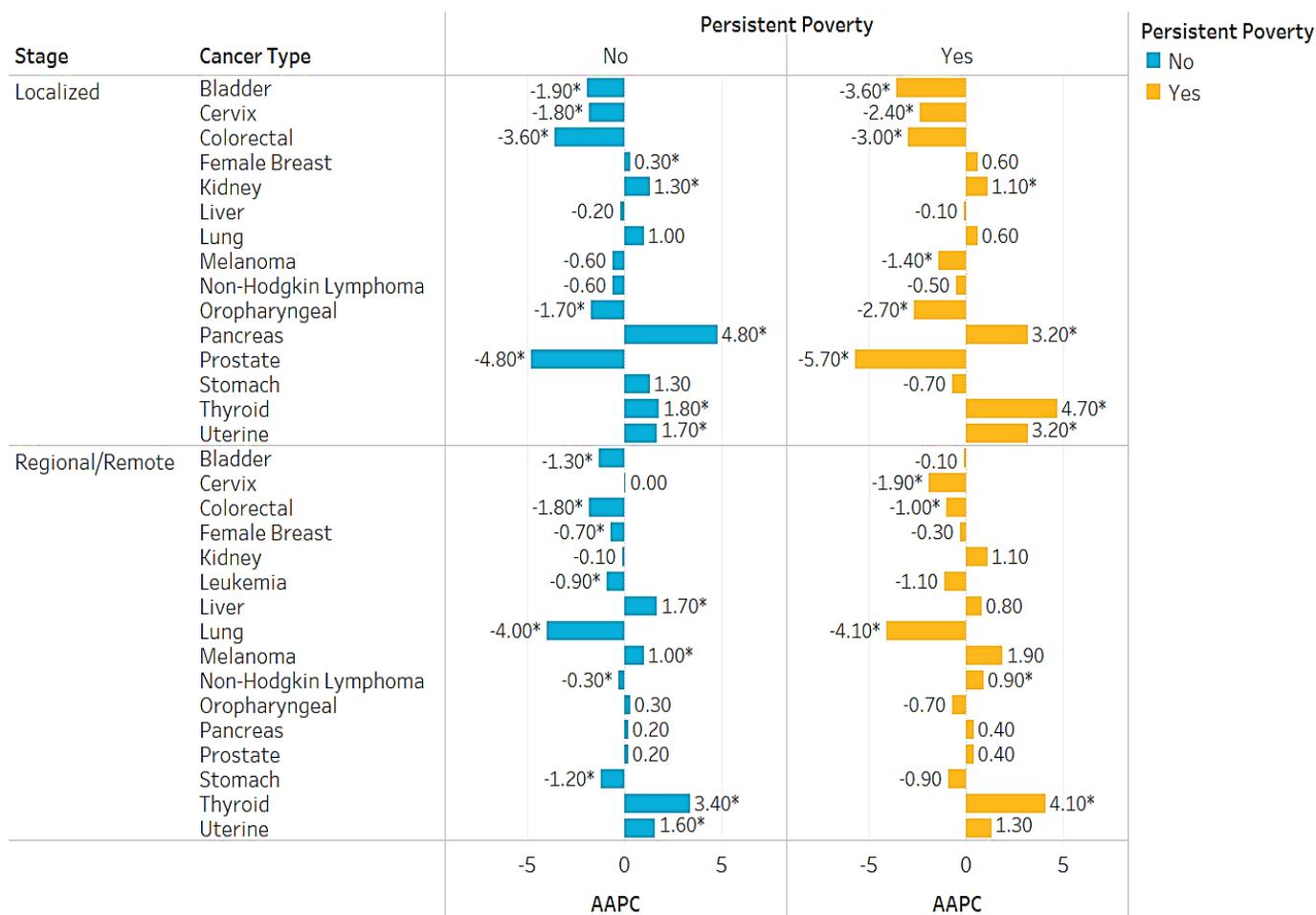
*The AAPC is significantly different from zero at $p < 0.05$.

FIGURE 17. AGE-ADJUSTED INCIDENCE RATES FOR 16 COMMON CANCERS BY PERSISTENT POVERTY, STAGE, AND YEAR OF DIAGNOSIS, 2006-2020



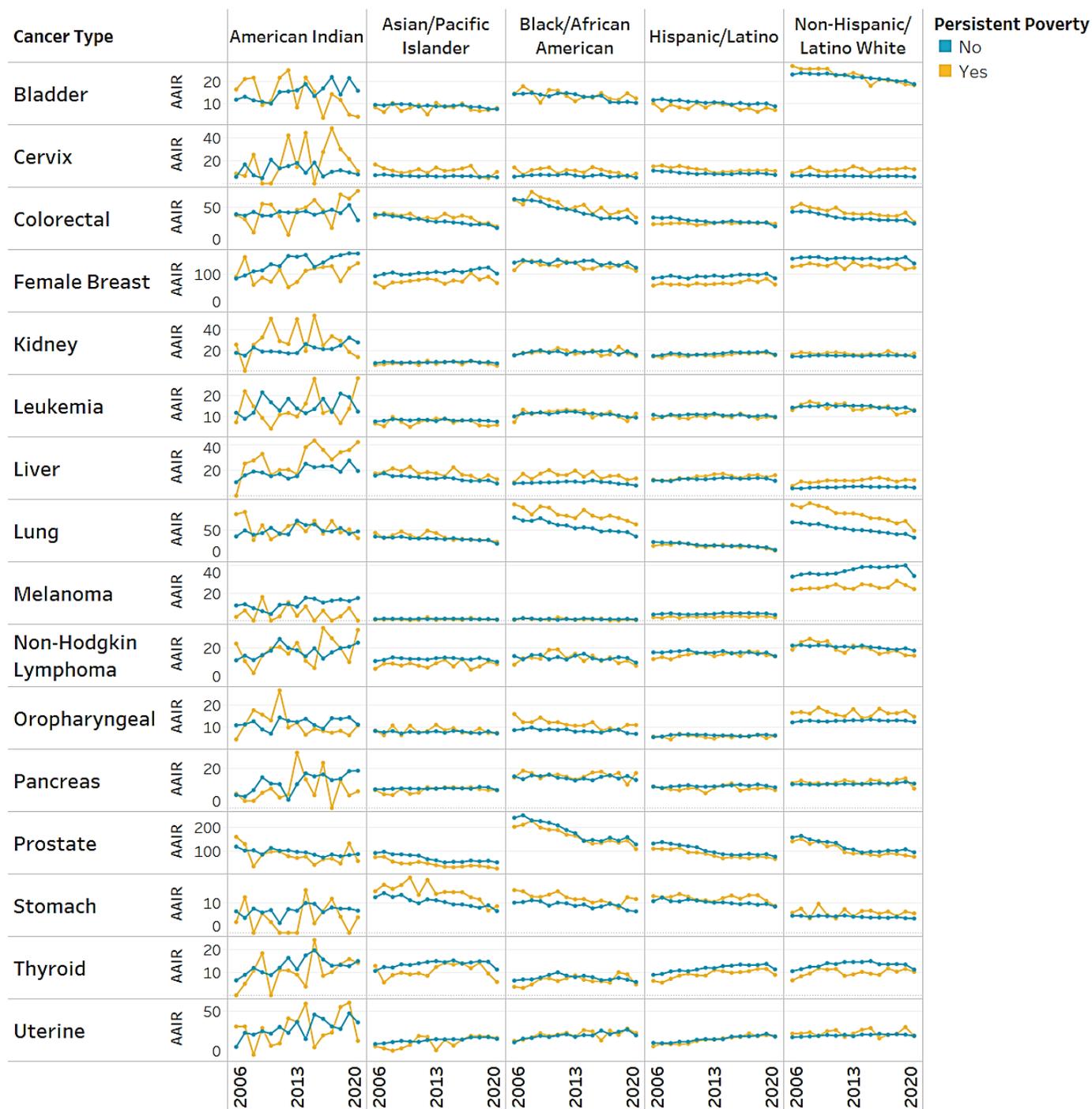
Source: California Cancer Registry, California Department of Public Health.
AAIR: Age-Adjusted Incidence Rate per 100,000

FIGURE 18. AVERAGE ANNUAL PERCENT CHANGE IN AGE-ADJUSTED INCIDENCE RATES FOR 16 COMMON CANCERS BY PERSISTENT POVERTY AND STAGE AT DIAGNOSIS, 2006-2019



AAPC: Average Annual Percent Change
 *The AAPC is significantly different from zero at $p < 0.05$.

FIGURE 19. AGE-ADJUSTED INCIDENCE RATES FOR 16 COMMON CANCERS BY PERSISTENT POVERTY, RACE/ETHNICITY, AND YEAR OF DIAGNOSIS, 2006-2020

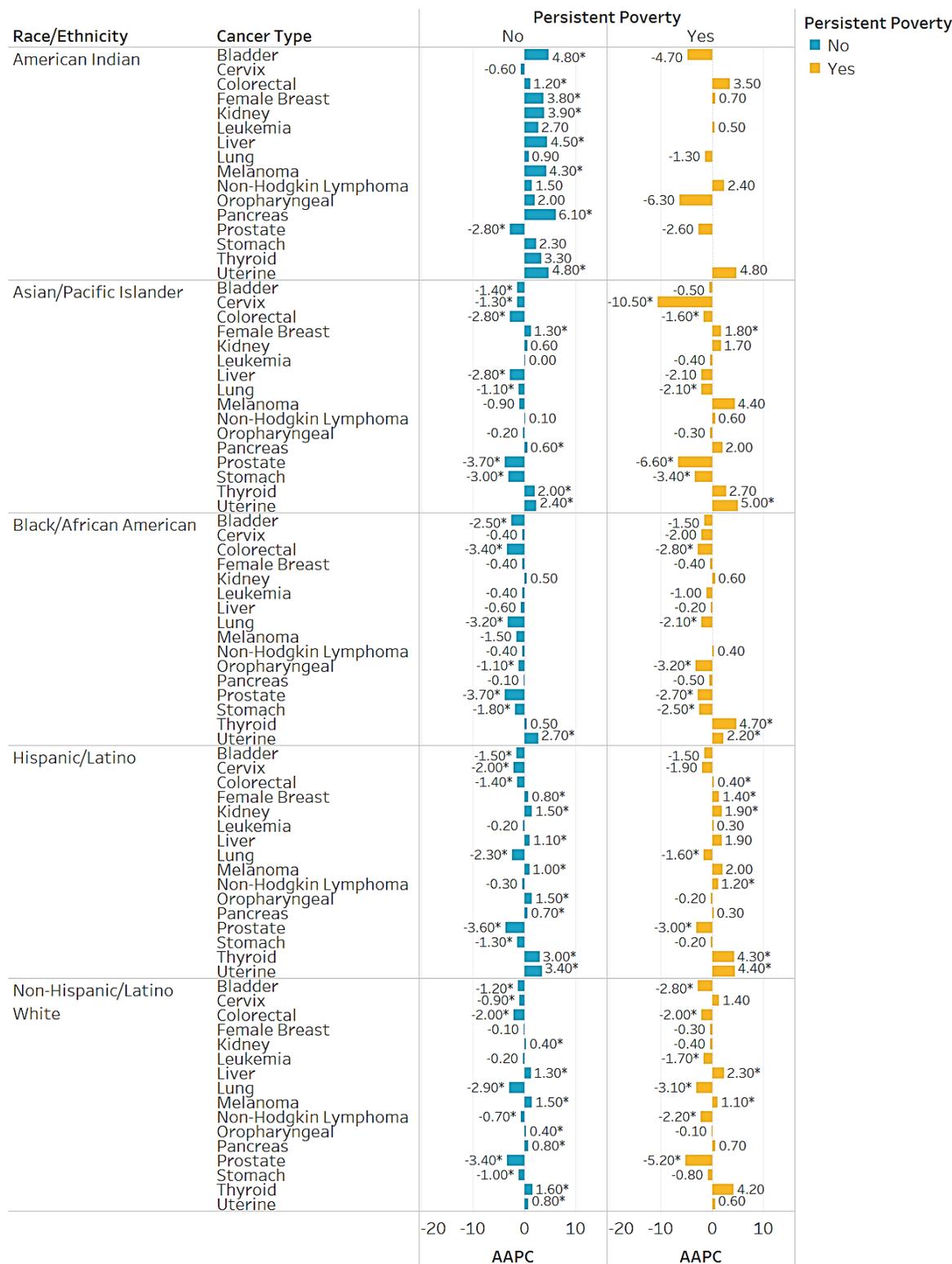


Source: California Cancer Registry, California Department of Public Health.

AAIR: Age-Adjusted Incidence Rate per 100,000

Note: American Indian AAIR may be unstable due to small case counts; interpret with caution.

FIGURE 20. AVERAGE ANNUAL PERCENT CHANGE IN AGE-ADJUSTED INCIDENCE RATES FOR 16 COMMON CANCERS BY PERSISTENT POVERTY AND RACE/ETHNICITY, 2006-2019



AAPC: Average Annual Percent Change

*The AAPC is significantly different from zero at $p < 0.05$.

Note: No bars indicate AAPC not calculated due to unstable AAIR.

CONCLUSIONS

Living in persistent poverty presents cancer patients with numerous challenges in addition to the physical, emotional, and financial difficulties accompanying a cancer diagnosis. In this report, we present cancer incidence among patients living in persistent poverty areas of California by sex, stage at diagnosis, and race/ethnicity. These findings may be used by public health professionals, physicians, cancer researchers, and policymakers to better serve patients and reduce the combined burdens of cancer and poverty.

In California, Tulare, Fresno, and Imperial counties have the highest percentages of census tracts meeting the USDA persistent poverty definition over a period of 30 years. Further, there were larger proportions of Hispanic/Latino and Black/African American patients in persistent poverty areas, and most patients in poverty were either uninsured or had public health insurance.

Notably higher incidence rates of specific cancers, including lung, liver, stomach, and cervical cancers were observed among those living in persistent poverty areas compared to those living in non-persistent poverty areas. Further, for all cancers combined, lower incidence rates of cancers diagnosed at localized stage for people living in persistent poverty areas compared to non-persistent poverty areas suggest there may be a need for greater access to health care and cancer screenings in persistent poverty areas to increase the detection of cancer in its earlier stages. Additionally, lung, colorectal, and cervical cancers, all screen-detectable cancers, had higher incidence rates of regional/remote stage at diagnosis in persistent poverty areas compared to non-persistent poverty areas. These results suggest that there may be differential risk factors both for developing cancer and for regional/remote stage diagnosis of certain cancer types associated with living in persistent poverty areas. However, this report excluded in situ cancer diagnoses which can provide a better evaluation of early detection of screen detectable cancers. Future research should examine in situ diagnoses for screen detectable cancers by persistent poverty status and further investigation of the reasons underlying the observed differences is warranted.

Analysis of cancer incidence trends over a period of 14 years showed that among Hispanic/Latinos living in persistent poverty areas, there was a significant increase in non-Hodgkin lymphoma and colorectal cancer that was not present among Hispanic/Latinos living in non-persistent poverty areas. Since a large proportion (41 percent) of the cancer patient population in persistent poverty areas of California is of Hispanic/Latino race/ethnicity, this population would benefit from public health interventions, including reduced barriers to healthcare, cancer screening, and access to reliable health insurance.¹⁵

This report identified significant disparities in cancer incidence and regional/remote stage diagnosis for several cancer types among people living in persistent poverty areas. Regional/remote cancer diagnoses and lack of health insurance or having public health insurance are known risk factors for worse cancer survival.^{1-3,15,16} Our findings of higher incidence rates of regional/remote stage diagnoses in persistent poverty areas highlight the need for targeted public health interventions for individuals living in persistent poverty. Evidence-based healthcare policy initiatives and public health interventions to increase resources for people living in economically disadvantaged areas, patients with unreliable or no health insurance, and historically marginalized racial/ethnic groups are needed to better serve California's most vulnerable cancer patients.

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