

Cancer mortality rates by racial/ethnic groups in the United States, 2018–2020

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ABSTRACT

Background: Starting in 2018, national death certificates included a new racial classification system that accounts for multiple-race decedents and separates Native Hawaiian and Pacific Islander (NHPI) individuals from Asian individuals. We estimated cancer death rates across updated racial/ethnic categories, sex, and age.

Methods: Age-standardized U.S. cancer mortality rates and rate ratios from 2018-2020 among ≥ 20 -year-olds were estimated with national death certificate data by race/ethnicity, sex, age, and cancer site.

Results: In 2018, there were approximately 597,000 cancer deaths, 598,000 in 2019, and 601,000 in 2020. Among men, cancer death rates were highest in Black men (298.2/100,000; n=105,632), followed by White (250.8; n=736,319), American Indian/Alaska Native (AI/AN) (249.2; n=3,376), NHPI (205.6; n=1,080), Latino (177.2; n=66,167), and Asian (147.9; n=26,591) men. Among women, Black women had the highest cancer death rates (206.5/100,000; n= 104,437), followed by NHPI (192.1; n= 1,141), AI/AN (189.9; n=3,239), White (183.0; n= 646,865), Latina (128.4; n= 61,579), and Asian women (111.4; n= 26,396). The highest death rates by age group occurred among NHPI individuals aged 20–49 years, and Black individuals aged 50-69 and ≥ 70 years. Asian individuals had the lowest cancer death rates across age groups. Compared to Asian individuals, total cancer death rates were 39% higher in NHPI men and 73% higher in NHPI women.

Conclusions: There were striking racial/ethnic disparities in cancer death rates during 2018-2020. Separating NHPI and Asian individuals revealed large differences in cancer mortality between two groups that were previously combined in vital statistics data.

Keywords: Cancer; Epidemiology; Native Hawaiian and Pacific Islander; Ethnic group

In the United States (U.S.), cancer is the second most common cause of death, accounting for approximately 602,400 deaths in 2020 [1]. There are notable racial/ethnic disparities in cancer death rates, driven by differences in cancer incidence and survival, barriers to accessing health care, and other structural factors [2-4]. During 2013-2017, cancer incidence rates were highest in White and Black individuals, compared to Asian/Pacific Islander (aggregated group), American Indian/Alaska Native (AI/AN), and Hispanic/Latino individuals [5]. Additionally, Black and AI/AN cancer patients had lower 5-year cancer survival rates across most cancers compared to White cancer patients, highlighting racial/ethnic disparities in cancer outcomes [6]. As a result, the highest cancer death rates were observed among Black individuals in the U.S. in 2019 [7]. Although reports examine cancer mortality rates in the U.S. annually, more detailed analyses are needed to capture disparities by cancer site across and within racial/ethnic groups, sex, and age [2, 8].

In 1997, the Office of Management and Budget updated federal race classifications to include Native Hawaiian and Pacific Islander (NHPI) individuals as a distinct racial group separate from Asian individuals, and a separate category for “more than one race” [9]. However, the National Center for Health Statistics (NCHS) did not transition to releasing single race mortality data until 2018 when all states had implemented the new classification on death certificates [10, 11]. NHPI individuals represent about 0.4% of the U.S. population and have known health disparities that have been masked through the aggregation of their data with the larger Asian population [12-15]. We provide a systematic assessment of cancer deaths across racial/ethnic groups using this updated classification system to provide an update on disparities in cancer death rates in the U.S., and to establish a baseline for future analyses examining trends over time.

Methods

All cancer deaths among those aged ≥ 20 years in the U.S. (excluding Puerto Rico or any of the U.S. territories) during 2018-2020, were obtained from the NCHS death certificate data [11]. Underlying causes of death were classified based on the International Classification of Disease 10th Revision codes. The 2018-2020 population counts were ascertained from the U.S. Census Bureau and grouped by year, self-identified racial/ethnic group, sex, and age group (20-49, 50-69, ≥ 70 years) [11]. Race on death certificates is recorded by a funeral director with information provided by an informant, usually the closest living relative, or based on observation [11]. The following mutually exclusive racial/ethnicity categories were used: Hispanic/Latino all races (i.e., Latino/a), non-Hispanic AI/AN, non-Hispanic Asian, non-Hispanic Black or African American (i.e., Black), non-Hispanic NHPI, non-Hispanic White, and non-Hispanic more than one race (i.e., multi-racial). Mortality rates for those who identified as multi-racial were notably lower than all other groups and thus not presented, as these lower rates are likely due to an under ascertainment of this category on death certificates [16-18]. When analyzing the AI/AN population we restricted to Purchased/Referred Care Delivery Areas counties, where sensitivity of capturing AI/AN race was known to be higher [19, 20].

Statistical Analyses

Overall, age-specific, and cancer-specific age-standardized death rates and mortality rate ratios (RRs) were compared across racial/ethnic groups. White individuals served as the reference group for RRs, as they were the largest racial/ethnic group in the U.S. Estimates were further stratified by sex and age group. Cancer rates in NHPI and Asian individuals were also directly compared, as these groups are often aggregated in cancer mortality data. All data analyses were conducted in SEER*stat software version 8.4.0 [21]. We considered associations

with a P-value of <0.05 as statistically significant. Rates based on fewer than 10 deaths were suppressed. All statistical tests were 2-sided.

Results

In 2018, there were approximately 597,000 cancer deaths, 598,000 in 2019, and 601,000 in 2020 among those ages 20 and older. Though number of cancer deaths increased each year, the rates declined after age standardization from 208.4 to 200.8 per 100,000 person-years.

Cancer Mortality in the Overall Study Population

Among men, cancer death rates were highest in Black men (298.2 per 100,000; n=105,632), followed by White (250.8; n= 736,319), AI/AN (249.2; n=3,376), NHPI (205.6; n=1,080), Latino (177.2; n=66,167), and Asian (147.9; n=26,591) men (Table 1, Figure 1). Among women, cancer death rates were highest in Black women (206.5 per 100,000; n= 104,437), followed by NHPI (192.1; n= 1,141), AI/AN (189.9; n=3,239), White (183.0; n= 646,865), Latina (128.4; n= 61,579), and Asian women (111.4; n= 26,396) (Table 1, Figure 1). NHPI individuals had the highest cancer death rates among 20–49-year-olds (43.7/100,000), whereas Black individuals had the highest cancer death rates among 50-69 and ≥ 70 -year-olds (327.8 and 1070.8/100,000). Asian individuals had the lowest cancer death rates across every age group (15.9, 146.7, and 613.0/100,000). When combined, cancer death rates among Asian and NHPI populations largely reflect cancer death rates in Asian individuals, and are not representative of NHPI individuals (Supplementary Table 1).

Cancer Mortality in American Indian and Alaska Native Individuals

During 2018-2020, lung cancer caused the largest number of cancer deaths among AI/AN men overall and among 50–69 and ≥ 70 -year-olds, while colorectal cancer was the leading cause of cancer death among 20-49-year-olds (Table 1, Supplementary Table 2). Compared to all other

racial/ethnic groups, AI/AN men had the highest death rates for liver and kidney cancers (Table 1). Compared to White men, AI/AN men had significantly higher death rates due to cancers of the colorectum, kidney, liver, and stomach (RRs 1.30-2.68; all P-value <0.05), and statistically significantly lower death rates for leukemia, and cancers of the bladder, central nervous system (CNS), oral cavity and pharynx, esophagus, and lung (RRs 0.43-0.84; all P-value <0.05).

Among AI/AN women, lung cancer caused the largest number of cancer deaths overall and among 50–69 and ≥ 70 -year-olds, while breast cancer caused the largest number of cancer deaths among 20–49-year-olds (Table 1, Supplementary Table 2). Compared to all other racial/ethnic groups, AI/AN women had the highest death rates for esophageal, colorectal, liver, and kidney cancers (Table 1). Death rates among AI/AN women were statistically significantly higher than White women for cancer of the colorectum, cervix, kidney, liver, and stomach (RRs 1.30-2.78; all P-value <0.05) and were significantly lower for leukemia (RR=0.76; 95% CI 0.60-0.95), and cancers of the CNS (RR=0.59; 95% CI 0.44-0.77).

Cancer Mortality in Asian Individuals

During 2018-2020, lung cancer caused the largest number of cancer deaths among Asian men overall and among 50-69 and ≥ 70 -year-olds, while colorectal cancer was the leading cause of cancer death among 20-49-year-olds (Table 1, Supplementary Table 2). Compared to White men, Asian men (RRs 0.33-0.74; all P-value <0.05) had lower death rates for nearly all cancers , except for liver (RR=1.43; 95% CI 1.38-1.49), and stomach cancer (RR=1.90; 95% CI 1.79-2.01).

Among Asian women, lung cancer caused the largest number of cancer deaths overall and among those aged ≥ 70 -year-olds (Table 1, Supplementary Table 2), and breast cancer caused the largest number of cancer deaths among 20–49 and 50–69-year-olds. Cancer death rates

among Asian women were statistically significantly lower than White women for most cancers (RRs 0.39-0.75; all P-value<0.05), with the exception of statistically significantly higher death rates for liver (RR=1.36; 95% CI 1.29-1.44) and stomach cancers (RR=2.36; 95% CI 2.21-2.51).

Cancer Mortality in Black Individuals

During 2018-2020, lung cancer caused the largest number of cancer deaths among Black men overall and among 50–69 and ≥ 70 -year-olds, while colorectal cancer was the leading cause of death among 20-49-year-olds (Table 1, Supplementary Table 2).

Compared to all other racial/ethnic groups, Black men had the highest death rates for multiple myeloma and cancers of the colorectum, pancreas, lung, prostate, oral cavity and pharynx, and soft tissue including heart. Compared to White men, Black men had significantly elevated death rates due to multiple myeloma and cancers of the lung, pancreas, colorectum, liver, prostate, and stomach (RRs 1.15 to 2.46; all P-value <0.05), and statistically significantly lower death rates for leukemia, NHL, and cancers of the bladder, esophagus, kidney, and CNS (RRs 0.55 to 0.96; all P-value <0.05) (Table 1).

Among Black women, breast cancer caused the largest number of cancer deaths overall and among 20–49 and 50–69-year-olds, while lung cancer was the leading cause of cancer death among ≥ 70 -year-olds (Table 1, Supplementary Table 2). Compared to all other racial/ethnic groups, Black women had the highest death rates for multiple myeloma and cancers of the pancreas, breast, and bladder (Table 1). Compared to White women, death rates were statistically significantly higher among Black women for multiple myeloma and cancers of the soft tissue including heart, pancreas, colorectum, liver, breast, cervix, uterus, and stomach (RRs 1.28 to 2.40; all P-value <0.05), and were significantly lower for deaths due to NHL, leukemia, and

cancers of the CNS; lung; kidney; oral cavity and pharynx; and ovary (RRs 0.57 to 0.94; all P-value <0.05).

Cancer Mortality in Latino/a Individuals

During 2018-2020, lung cancer caused the largest number of cancer deaths among Latinos overall and aged ≥ 70 years old (Table 1, Supplementary Table 2). Colorectal cancer was the leading cause of cancer death among 20-49-year-old Latinos and liver and intrahepatic bile duct cancer (i.e., liver cancer) was the leading cause of cancer death among 50-69-year-old men. Compared to White men, Latinos (RRs 0.46-0.87; all P-value <0.05) had lower death rates for nearly all cancers, except for liver (RR=1.52; 95% CI 1.48-1.56), and stomach cancers (RR=2.03; 95% CI 1.95-2.12).

Among Latinas, breast cancer caused the largest number of cancer deaths overall and among 20-49 and 50-69-year-old- (Table 1, Supplementary Table 2), while lung cancer was the leading cause of death among ≥ 70 -year-olds. Cancer death rates among Latinas were lower than White women for most cancers (RRs 0.35-0.93; all P-value <0.05), except for liver (RR=1.64; 95% CI 1.58-1.70), stomach (RR=2.65; 95% CI 2.53-2.77) and cervical cancers (RR= 1.19; 95% CI 1.12-1.25).

Cancer Mortality in NHPI Individuals

During 2018-2020, lung cancer caused the largest number of cancer deaths among NHPI men overall and among 50-69 and ≥ 70 -year-olds, while liver cancer was the leading cause of cancer death among 20-49-year-olds (Table 1, Supplementary Table 2). Compared to all other racial/ethnic groups, NHPI men had the highest death rates for stomach cancer (Table 1). Compared to White men, NHPI men had statistically significantly higher death rates due to cancers of the liver (RR=1.83, 95% CI 1.51-2.20) and stomach (RR=2.81; 95% CI 2.09-3.70),

and statistically significantly lower death rates due to cancers of the esophagus, CNS, bladder, pancreas, colorectum, and lung (RRs 0.42-0.80; all P-value <0.05). Relative to Asian men, NHPI men had statistically significantly higher death rates for leukemia, multiple myeloma and immunoproliferative neoplasms, and cancers of the stomach, liver, lung, prostate, bladder and kidney (RRs 1.28 to 1.99; all P-value <0.05) (Figure 2).

Among NHPI women, breast cancer caused the largest number of cancer deaths overall and among 50-69-year-olds (Table 1, Supplementary Table 2). Uterine cancer and lung cancer caused the largest number of deaths among 20-49 and ≥ 70 -year-olds, respectively. Compared to all other racial/ethnic groups, NHPI women had the highest death rates for non-Hodgkin lymphoma (NHL), leukemia, and cancers of the oral cavity and pharynx, stomach, soft tissue including heart, cervix, and uterus (Table 1). Compared to White women, cancer death rates among NHPI women were statistically significantly higher for cancers of the stomach, uterus, cervix, soft tissue including heart, liver, and breast (RRs 1.21-3.32; all P-value <0.05), and lower for lung cancer (RR=0.69; 95% CI 0.59-0.81). Relative to Asian women, NHPI women had statistically significantly elevated death rates for leukemia, NHL, multiple myeloma, and cancers of the breast, cervix, uterus, soft tissue including heart, and lung (RRs 1.49-4.25; all P-value <0.05) (Figure 2).

Cancer Mortality in White Individuals

During 2018-2020, lung cancer caused the largest number of cancer deaths among White men overall and among 50-69 and ≥ 70 -year-olds, while colorectal cancer was the leading cause of cancer death among 20-49-year-olds (Table 1, Supplementary Table 2). Compared to all other racial/ethnic groups, White men had the highest death rates for NHL, leukemia and cancers of the esophagus, soft tissue including heart, bladder, and CNS (Table 1).

Among White women, lung cancer caused the largest number of cancer deaths overall and among 50–69 and ≥ 70 -year-olds, while breast cancer was the leading cause of cancer death among 20-49-year-olds (Table 1, Supplementary Table 2). Compared to all other racial/ethnic groups, White women had the highest death rates for cancers of the CNS, lung, and ovary (Table 1).

Discussion

Our study revealed that the historical aggregation of NHPI and Asian individuals in mortality statistics has masked substantial health disparities among NHPI individuals for decades. In 2018-2020, cancer death rates for NHPI men and women were higher than Asian men and women for many cancers. For example, NHPI women had uterine cancer death rates that exceeded all groups by 50% or more. Additionally, striking racial/ethnic disparities in cancer mortality persisted in the U.S. across major racial/ethnic groups, with Black men having more than twice the prostate cancer mortality rate of any other group. Cancer death rates for NHPI individuals were the highest of any racial/ethnic group among 20-49-year-olds.

The disaggregation of the NHPI and Asian populations reveals a stark difference in cancer mortality patterns, consistent with studies that have shown disparities in cancer survival [22]. Compared to Asian or White individuals, NHPI individuals are known to have lower median household income, lower educational attainment, and a higher percentage of the population living in poverty [12, 13, 23, 24]. However, it is important to note that Asian and NHPI populations are each comprised of a diverse range of ethnic groups with vastly different healthcare outcomes and socioeconomic status [25, 26]. We were not able to further disaggregate these populations using the current dataset, though this is an important area for future research.

Cancer death rates are influenced by cancer incidence and survival, which in turn are impacted by risk and protective behaviors, biology, access to care, and other structural factors [2-4]. Racial/ethnic disparities can occur at multiple points along the cancer care continuum including differences in exposure to cancer risk factors, and access to cancer prevention, early detection, time to treatment, and quality of treatment [3, 4, 27]. Structural racism systematically disadvantages structurally marginalized populations and consequently is an underlying cause of racial/ethnic disparities in health [2, 3]. For example, The American Cancer Society's guidelines for cancer prevention focus on modifiable lifestyle factors to lower cancer risk, including obesity and physical activity [28]. Obesity rates are high among Black, Latino, AI/AN and NHPI individuals, who are more likely to live in communities with high rates of economic insecurity, food deserts, and greater barriers to engaging in physical activity [12, 29-40]. Structurally marginalized populations, especially AI/AN and Latino individuals, have higher percentages of people with limited access to quality care and coverage [4, 41-43]. Unequal access to health insurance and care has likely influenced higher death rates due to many cancers among Black and NHPI individuals, including breast, colorectal, cervical, and prostate cancers, all screen-detectable cancers [44, 45]. Additionally, structurally marginalized populations are more likely to receive suboptimal cancer treatment that is inconsistent with recommended clinical practice guidelines and are less likely to be enrolled in clinical trials for new cancer treatments [46-49].

While Asian and Latino men and women had lower overall cancer death rates than White men and women, liver and stomach cancer death rates were higher. Liver cancer death rates were also elevated in Black, NHPI, and AI/AN men and women. This is partially driven by chronic infection with hepatitis C virus (HCV) and hepatitis B virus (HBV), which can cause liver cancer [50]. Foreign-born Asian individuals from HBV-endemic countries have the highest

seroprevalence of HBV, while Black and AI/AN individuals have a high prevalence of HCV [50-54]. Non-alcoholic fatty liver disease, heavy alcohol consumption, obesity, and diabetes-metabolic diseases also contribute to liver cancer risk [50]. For stomach cancer, the prevalence of *Helicobacter pylori* infection, a known etiological risk factor, is particularly elevated among AI/AN individuals in the southwestern US, foreign-born Latino individuals and in Southeast and South Asian countries [55-62].

The main strength of our study is the inclusion of all cancer deaths in the U.S. during 2018-2020, allowing us to examine disparities in cancer death rates across many cancers. This study examines the updated “single race” classification recently implemented by NCHS; allowing for the estimation of cancer deaths rates separately for Asian and NHPI individuals, and no longer bridging multiple race individuals into single racial/ethnic categories.

There are limitations to this study that warrant consideration. Demographic data on death certificates are subject to misclassification of race/ethnicity [63]. Additionally, there is potential for misclassification of underlying cause of death, which could result from differential reporting of cause of death by race/ethnicity due to racial bias [64]. Potential bias introduced by the assignment of race on death certificates by funeral directors is possible also. Further, we chose to compare all racial/ethnic groups to White individuals in the discussion of our results, because this is the largest racial/ethnic group, and we wanted to use a consistent reference group. These comparisons should not imply that cancer rates among White individuals are ideal; indeed, White individuals only have the lowest death rates for liver and stomach cancer deaths. We present age-standardized death rates in the tables so that readers can directly compare any of the groups presented. There are known health disparities within the six racial/ethnic groups presented here; however, we were unable to examine cancer death rates in more granular groups based on

national heritage or nativity. Finally, it is likely that the COVID-19 pandemic impacted cancer death rates in 2020 due to COVID-19 as a competing cause of death [65].

We have shown the importance of disaggregating Asian and NHPI individuals, as these groups have disparate cancer mortality rates that are hidden when analyzed together [9]. Additionally, we demonstrated that racial/ethnic disparities in cancer mortality persisted across racial/ethnic groups in recent years [2, 8]. Policies aimed at equitable cancer prevention, early detection, and treatment, as well as disaggregation of data for racial/ethnic subpopulations are needed to address disparities in cancer mortality across racial/ethnic groups.

Data Availability

The data is publicly available in Centers for Disease Control and Prevention Wide-ranging Online Data for Epidemiologic Research, found at <https://wonder.cdc.gov/ucd-icd10-expanded.html>.

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Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

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References:

1. Centers for Disease Control and Prevention [CDC]. *An Update on Cancer Deaths in the United States*. <https://www.cdc.gov/cancer/dcpc/research/update-on-cancer-deaths/index.htm>.
2. Aizer AA, Wilhite TJ, Chen M-H, *et al*. Lack of reduction in racial disparities in cancer-specific mortality over a 20-year period. *Cancer* 2014;120(10):1532-1539.
3. Williams DR, Priest N, Anderson NB. Understanding associations among race, socioeconomic status, and health: Patterns and prospects. *Health psychology : official journal of the Division of Health Psychology, American Psychological Association* 2016;35(4):407-411.
4. Lee D-C, Liang H, Shi L. The convergence of racial and income disparities in health insurance coverage in the United States. *International Journal for Equity in Health* 2021;20(1).
5. Islami F, Ward EM, Sung H, *et al*. Annual Report to the Nation on the Status of Cancer, Part 1: National Cancer Statistics. *JNCI: Journal of the National Cancer Institute* 2021; 10.1093/jnci/djab131.
6. Jemal A, Ward EM, Johnson CJ, *et al*. Annual Report to the Nation on the Status of Cancer, 1975–2014, Featuring Survival. *JNCI: Journal of the National Cancer Institute* 2017;109(9).
7. Lawrence WR, McGee-Avila JK, Vo JB, *et al*. Trends in Cancer Mortality Among Black Individuals in the US From 1999 to 2019. *JAMA Oncology* 2022; 10.1001/jamaoncol.2022.1472.
8. Siegel RL, Miller KD, Fuchs HE, *et al*. *Cancer Statistics, 2021*. CA: A Cancer Journal for Clinicians 2021;71(1):7-33.
9. Taparra K, Pellegrin K. Data aggregation hides Pacific Islander health disparities. *The Lancet* 2022;400(10345):2-3.
10. Heron M. Comparability of Race-specific Mortality Data Based on 1977 Versus 1997 Reporting Standards. *Natl Vital Stat Rep* 2021;70(3):1-31.
11. Centers for Disease Control and Prevention Wonder [CDC Wonder]. *Underlying Cause of Death by Single Race 2018-2019*. <https://wonder.cdc.gov/wonder/help/ucd-expanded.html#>.
12. US Department of Health and Human Services (US) Office of Minority Health. *Profile: Native Hawaiians/Pacific Islanders*. <https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=3&lvlid=65>.
13. Taparra K, Miller RC, Deville C. Navigating Native Hawaiian and Pacific Islander Cancer Disparities From a Cultural and Historical Perspective. *JCO Oncology Practice* 2021;17(3):130-134.
14. Taparra K, Fukui J, Killeen J, *et al*. Racial and Ethnic Disparities in Rates of Invasive Second Breast Cancer Among Women With Ductal Carcinoma In Situ in Hawai'i. *JAMA Network Open* 2021;4(10):e2128977.
15. Taparra K, Dee EC, Dao D, *et al*. Disaggregation of Asian American and Pacific Islander Women With Stage 0-II Breast Cancer Unmasks Disparities in Survival and Surgery-to-Radiation Intervals: A National Cancer Database Analysis From 2004 to 2017. *JCO Oncology Practice* 2022; 10.1200/op.22.00001.
16. Arias E, Heron M, Hakes J. The validity of race and Hispanic-origin reporting on death certificates in the United States: An update. *National Center for Health Statistics. Vital Health Stat* 2016;2(172).
17. Arias E, Xu J, Curtin S, *et al*. Mortality Profile of the Non-Hispanic American Indian or Alaska Native Population, 2019. *Natl Vital Stat Rep* 2021;70(12):1-27.
18. Campbell ME, Troyer L. The Implications of Racial Misclassification by Observers. *American Sociological Review* 2007;72(5):750-765.
19. Espey DK, Jim MA, Richards TB, *et al*. Methods for Improving the Quality and Completeness of Mortality Data for American Indians and Alaska Natives. *American Journal of Public Health* 2014;104(S3):S286-S294.

20. Anderson RN, Copeland G, Hayes JM. Linkages to Improve Mortality Data for American Indians and Alaska Natives: A New Model for Death Reporting? *American Journal of Public Health* 2014;104(S3):S258-S262.
21. Surveillance Research Program, National Cancer Institute SEER*Stat software (seer.cancer.gov/seerstat), version 8.4.0. In.
22. Taparra K, Qu V, Pollom E. Disparities in Survival and Comorbidity Burden Between Asian and Native Hawaiian and Other Pacific Islander Patients With Cancer. *JAMA Netw Open* 2022;5(8):e2226327.
23. *National Healthcare Quality and Disparities Report Healthcare for Asians and Native Hawaiians/Pacific Islanders*. Rockville, MD: Agency for Healthcare Research and Quality: AHRQ Pub. No. 20-0043; May 2020.
24. Taparra K, Harding M, Deville C. Healing and Health Equity for Asian American, Native Hawaiian, and Pacific Islander Populations. *JAMA* 2021;326(23):2432.
25. Gomez SL, Glaser SL, Horn-Ross PL, *et al.* Cancer Research in Asian American, Native Hawaiian, and Pacific Islander Populations: Accelerating Cancer Knowledge by Acknowledging and Leveraging Heterogeneity. *Cancer Epidemiology Biomarkers & Prevention* 2014;23(11):2202-2205.
26. Holland AT, Palaniappan LP. Problems With the Collection and Interpretation of Asian-American Health Data: Omission, Aggregation, and Extrapolation. *Annals of Epidemiology* 2012;22(6):397-405.
27. Goding Sauer A, Siegel RL, Jemal A, *et al.* Current Prevalence of Major Cancer Risk Factors and Screening Test Use in the United States: Disparities by Education and Race/Ethnicity. *Cancer Epidemiology, Biomarkers & Prevention* 2019;28(4):629-642.
28. Rock CL, Thomson C, Gansler T, *et al.* American Cancer Society guideline for diet and physical activity for cancer prevention. *CA: A Cancer Journal for Clinicians* 2020;70(4):245-271.
29. Hales CM, Carroll MD, Fryar CD, *et al.* Prevalence of Obesity and Severe Obesity Among Adults: United States, 2017-2018. *NCHS Data Brief* 2020, (360):1-8.
30. Coleman-Jensen A, Gregory C, Singh A. Household food security in the United States in 2013. *USDA-ERS Economic Research Report* 2014, (173).
31. US Department of Health and Human Services (US) Office of Minority Health. *Obesity and American Indians/Alaska Natives*. <https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=40>.
32. Zhao G, Hsia J, Vigo-Valentín A, *et al.* Health-Related Behavioral Risk Factors and Obesity Among American Indians and Alaska Natives of the United States: Assessing Variations by Indian Health Service Region. *Preventing Chronic Disease* 2022;19.
33. Jernigan VBB, Huyser KR, Valdes J, *et al.* Food Insecurity Among American Indians and Alaska Natives: A National Profile Using the Current Population Survey–Food Security Supplement. *Journal of Hunger & Environmental Nutrition* 2017;12(1):1-10.
34. Cobb N, Espey D, King J. Health Behaviors and Risk Factors Among American Indians and Alaska Natives, 2000–2010. *American Journal of Public Health* 2014;104(S3):S481-S489.
35. Moradi S, Mirzababaei A, Dadfarma A, *et al.* Food insecurity and adult weight abnormality risk: a systematic review and meta-analysis. *European Journal of Nutrition* 2019;58(1):45-61.
36. Petrelli F, Cortellini A, Indini A, *et al.* Association of Obesity With Survival Outcomes in Patients With Cancer. *JAMA Network Open* 2021;4(3):e213520.
37. Suglia SF, Shelton RC, Hsiao A, *et al.* Why the Neighborhood Social Environment Is Critical in Obesity Prevention. *Journal of Urban Health* 2016;93(1):206-212.
38. Thornton CM, Conway TL, Cain KL, *et al.* Disparities in pedestrian streetscape environments by income and race/ethnicity. *SSM - Population Health* 2016;2:206-216.
39. US Department of Health and Human Services (US) Office of Minority Health. *Obesity and Native Hawaiians/Pacific Islanders*. <https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=85>.

40. Long CR, Rowland B, McElfish PA, *et al.* Food Security Status of Native Hawaiians and Pacific Islanders in the US: Analysis of a National Survey. *Journal of nutrition education and behavior* 2020;52(8):788-795.
41. Buchmueller TC, Levy HG. The ACA's Impact On Racial And Ethnic Disparities In Health Insurance Coverage And Access To Care. *Health Affairs* 2020;39(3):395-402.
42. US Department of Health and Human Services. *Issue Brief No. HP-2021-18 Health Insurance Coverage and Access to Care for American Indians and Alaska Natives: Current Trends and Key Challenges*. <https://aspe.hhs.gov/reports/health-insurance-coverage-changes-aian>.
43. US Department of Health and Human Services (US) Office of Minority Health. *Profile: American Indian/Alaska Native*. <https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=3&lvlid=62>.
44. Smith RA, Andrews KS, Brooks D, *et al.* Cancer screening in the United States, 2019: A review of current American Cancer Society guidelines and current issues in cancer screening. *CA: A Cancer Journal for Clinicians* 2019;69(3):184-210.
45. Jain B, Ng K, Santos PMG, *et al.* Prostate Cancer Disparities in Risk Group at Presentation and Access to Treatment for Asian Americans, Native Hawaiians, and Pacific Islanders: A Study With Disaggregated Ethnic Groups. *JCO Oncology Practice* 2022;18(1):e204-e218.
46. Gross CP, Smith BD, Wolf E, *et al.* Racial disparities in cancer therapy. *Cancer* 2008;112(4):900-908.
47. Chen L, Li CI. Racial Disparities in Breast Cancer Diagnosis and Treatment by Hormone Receptor and HER2 Status. *Cancer Epidemiology Biomarkers & Prevention* 2015;24(11):1666-1672.
48. Ooi SL, Martinez ME, Li CI. Disparities in breast cancer characteristics and outcomes by race/ethnicity. *Breast Cancer Research and Treatment* 2011;127(3):729-738.
49. Loree JM, Anand S, Dasari A, *et al.* Disparity of Race Reporting and Representation in Clinical Trials Leading to Cancer Drug Approvals From 2008 to 2018. *JAMA Oncology* 2019;5(10):e191870.
50. Welzel TM, Graubard BI, Quraishi S, *et al.* Population-Attributable Fractions of Risk Factors for Hepatocellular Carcinoma in the United States. *American Journal of Gastroenterology* 2013;108(8):1314-1321.
51. Kruszon-Moran D, Paulose-Ram R, Denniston M, *et al.* *Viral hepatitis among non-Hispanic Asian adults in the United States, 2011–2014*.
52. White DL, Thrift AP, Kanwal F, *et al.* Incidence of Hepatocellular Carcinoma in All 50 United States, From 2000 Through 2012. *Gastroenterology* 2017;152(4):812-820.e5.
53. U.S. Department of Health and Human Services. *Viral Hepatitis National Strategic Plan: Priority Populations*. <https://www.hhs.gov/hepatitis/viral-hepatitis-national-strategic-plan/priority-populations/index.html>.
54. Indian Health Service: The Federal Health Program for American Indians and Alaska Natives. *Hepatitis C*. <https://www.ihs.gov/dccs/hcv/>.
55. Melkonian SC, Pete D, Jim MA, *et al.* Gastric Cancer Among American Indian and Alaska Native Populations in the United States, 2005-2016. *Am J Gastroenterol* 2020;115(12):1989-1997.
56. Nolen LD, Bruden D, Miernyk K, *et al.* *H. pylori*-associated pathologic findings among Alaska native patients. *International Journal of Circumpolar Health* 2018;77(1):1510715.
57. Harris RB, Brown HE, Begay RL, *et al.* *Helicobacter pylori* Prevalence and Risk Factors in Three Rural Indigenous Communities of Northern Arizona. *International Journal of Environmental Research and Public Health* 2022;19(2):797.
58. Zali H, Rezaei-Tavirani M, Azodi M. Gastric cancer: prevention, risk factors and treatment. *Gastroenterology and hepatology from bed to bench* 2011;4(4):175-185.
59. Kharel S, Bist A, Shrestha S, *et al.* *Helicobacter pylori* healthy South Asians. *JGH Open* 2020;4(6):1037-1046.

60. Everhart E, James, Kruszon-Moran D, Perez-Perez I, Guillermo, *et al.* Seroprevalence and Ethnic Differences in *Helicobacter pylori* Infection among Adults in the United States. *The Journal of Infectious Diseases* 2000;181(4):1359-1363.
61. Tsang SH, Avilés-Santa ML, Abnet CC, *et al.* Seroprevalence and Determinants of *Helicobacter pylori* Infection in the Hispanic Community Health Study/Study of Latinos. *Clinical Gastroenterology and Hepatology* 2021; <https://doi.org/10.1016/j.cgh.2021.02.042>.
62. Zaidi SF. *Helicobacter pylori* associated Asian enigma: Does diet deserve distinction? *World Journal of Gastrointestinal Oncology* 2016;8(4):341.
63. Arias E, Heron M, Xu J. United States Life Tables, 2012. *Natl Vital Stat Rep* 2016;65(8):1-65.
64. Noymer A, Penner AM, Saperstein A. Cause of death affects racial classification on death certificates. *PLoS One* 2011;6(1):e15812.
65. Shiels MS, Haque AT, Haozous EA, *et al.* Racial and Ethnic Disparities in Excess Deaths During the COVID-19 Pandemic, March to December 2020. *Annals of Internal Medicine* 2021;174(12):1693-1699.

Table 1: Age Adjusted Malignant Cancer Death Rate by Race/Ethnicity in the US, Aged 20 or Older From 2018 to 2020

	Overall	Men	Rate Ratio (95% CIs) ^a	Women	Rate Ratio (95% CIs) ^b	20-49 Year- olds	50-69 Year- olds	70+ Year- olds
American Indian/Alaska Native Individuals								
<i>All Cancers</i>	214.9	249.2	0.99(0.96,1.03)	189.9	1.04(1.00,1.08)*	28.7	279.6	968.6
<i>Oral Cavity and Pharynx</i>	2.9	4.3	0.75(0.57,0.97)*	1.7	0.79(0.53,1.15)	—	5.6	8.4
<i>Esophagus</i>	5.1	8.1	0.77(0.62,0.93)*	2.6	1.26(0.92,1.69)	—	8.1	20.9
<i>Stomach</i>	7.8	10.7	2.68(2.23,3.19)*	5.6	2.78(2.23,3.42)*	2.1	9.8	30.8
<i>Colorectum</i>	23.5	27.9	1.30(1.17,1.45)*	19.8	1.30(1.16,1.46)*	4.9	30.7	97.0
<i>Liver</i>	17.6	24.8	2.10(1.88,2.34)*	12.0	2.33(2.02,2.68)*	1.0	32.2	67.3
<i>Pancreas</i>	14.4	16.1	0.88(0.76,1.01)	12.9	0.95(0.83,1.09)	1.4	20.4	63.7
<i>Lung</i>	45.2	50.1	0.84(0.77,0.91)*	41.5	0.94(0.87,1.01)	1.9	57.9	225.6
<i>Soft Tissue including Heart</i>	1.4	1.6	0.77(0.47,1.19)	1.3	0.87(0.53,1.34)	0.6	1.8	4.8
<i>Breast</i>	24.8	—	—	24.8	0.91(0.82,1.00)	6.9	31.3	97.1
<i>Cervix</i>	4.1	—	—	4.1	1.43(1.10,1.82)*	2.8	7.3	—
<i>Uterus</i>	6.5	—	—	6.5	1.00(0.82,1.21)	1.3	9.7	25.2
<i>Ovary</i>	8.3	—	—	8.3	0.92(0.77,1.09)	2.1	10.6	33.2
<i>Prostate</i>	25.4	25.4	1.02(0.90,1.16)	—	—	—	14.8	164.3
<i>Bladder</i>	3.3	4.7	0.43(0.32,0.57)*	2.2	0.74(0.51,1.03)	—	2.9	18.9
<i>Kidney</i>	9.2	13.2	1.79(1.52,2.08)*	5.9	1.92(1.55,2.35)*	1.1	12.7	40.3
<i>CNS</i>	3.5	3.8	0.45(0.33,0.59)*	3.2	0.59(0.44,0.77)*	1.4	5.0	10.2
<i>Non-Hodgkin Lymphoma</i>	6.4	8.6	0.88(0.71,1.07)	4.8	0.85(0.67,1.07)	0.7	7.3	31.8
<i>Myeloma</i>	4.3	5.2	1.02(0.78,1.30)	3.6	1.18(0.89,1.53)	—	4.8	21.9
<i>Leukemia</i>	6.3	8.1	0.70(0.57,0.84)*	4.8	0.76(0.60,0.95)*	1.5	5.7	30.4
Asian Individuals								
<i>All Cancers</i>	126.8	147.9	0.59(0.58,0.60)*	111.4	0.61(0.60,0.62)*	15.9	146.7	613.0
<i>Oral Cavity and Pharynx</i>	2.8	4.3	0.74(0.69,0.80)*	1.6	0.75(0.68,0.84)*	0.6	4.3	10.3
<i>Esophagus</i>	2.1	3.5	0.33(0.31,0.36)*	1.0	0.45(0.39,0.52)*	0.2	2.8	9.4
<i>Stomach</i>	6.0	7.6	1.90(1.79,2.01)*	4.8	2.36(2.21,2.51)*	1.0	6.6	28.7
<i>Colorectum</i>	12.5	15.0	0.70(0.67,0.73)*	10.5	0.69(0.66,0.72)*	2.1	15.3	55.9
<i>Liver</i>	11.4	17.0	1.43(1.38,1.49)*	7.0	1.36(1.29,1.44)*	1.1	14.7	53.6
<i>Pancreas</i>	10.5	11.4	0.62(0.59,0.65)*	9.7	0.71(0.68,0.75)*	0.7	11.0	55.6
<i>Lung</i>	26.1	33.5	0.56(0.55,0.58)*	20.6	0.47(0.45,0.48)*	1.6	27.9	139.0
<i>Soft Tissue including Heart</i>	1.2	1.4	0.66(0.58,0.74)*	1.1	0.73(0.64,0.83)*	0.5	1.5	4.2
<i>Breast</i>	15.9	—	—	15.9	0.58(0.56,0.60)*	4.5	25.1	51.5
<i>Cervix</i>	2.1	—	—	2.1	0.73(0.67,0.80)*	0.8	3.5	5.3
<i>Uterus</i>	4.6	—	—	4.6	0.70(0.66,0.75)*	0.7	7.7	17.1
<i>Ovary</i>	6.0	—	—	6.0	0.66(0.63,0.70)*	1.2	10.7	19.0
<i>Prostate</i>	11.6	11.6	0.47(0.44,0.49)*	—	—	—	5.3	78.5
<i>Bladder</i>	2.3	3.9	0.36(0.33,0.38)*	1.2	0.39(0.34,0.44)*	0.1	1.3	15.0
<i>Kidney</i>	2.1	3.1	0.42(0.39,0.46)*	1.3	0.44(0.39,0.49)*	0.2	2.4	10.7
<i>CNS</i>	3.0	3.9	0.46(0.43,0.50)*	2.3	0.43(0.39,0.47)*	1.0	4.4	10.3
<i>Non-Hodgkin Lymphoma</i>	4.9	6.4	0.66(0.62,0.70)*	3.7	0.67(0.63,0.72)*	0.4	4.7	26.7
<i>Myeloma</i>	2.0	2.6	0.49(0.45,0.54)*	1.6	0.54(0.48,0.60)*	0.1	1.9	11.7
<i>Leukemia</i>	4.4	5.9	0.50(0.47,0.54)*	3.3	0.52(0.48,0.55)*	0.7	4.1	22.3
Black Individuals								
<i>All Cancers</i>	241.5	298.2	1.19(1.18,1.20)*	206.5	1.13(1.12,1.14)*	30.2	327.8	1070.8
<i>Oral Cavity and Pharynx</i>	3.5	6.0	1.04(1.00,1.09)	1.7	0.80(0.74,0.86)*	0.5	6.4	11.7
<i>Esophagus</i>	4.0	6.5	0.61(0.59,0.64)*	2.1	1.02(0.96,1.09)	0.4	7.2	14.5
<i>Stomach</i>	6.9	9.8	2.46(2.36,2.56)*	4.9	2.40(2.28,2.51)*	1.0	8.3	31.8
<i>Colorectum</i>	24.1	30.8	1.44(1.41,1.47)*	19.4	1.28(1.25,1.31)*	4.1	33.3	100.5
<i>Liver</i>	11.4	17.9	1.51(1.47,1.55)*	6.6	1.28(1.23,1.33)*	1.0	21.9	39.7

<i>Pancreas</i>	19.3	21.8	1.19(1.16,1.22)*	17.4	1.28(1.25,1.31)*	1.5	27.3	87.7
<i>Lung</i>	50.2	68.7	1.15(1.13,1.17)*	37.6	0.85(0.84,0.86)*	2.5	70.5	235.7
<i>Soft Tissue including Heart</i>	2.1	2.1	1.02(0.94,1.11)	2.0	1.37(1.28,1.47)*	0.9	2.9	6.1
<i>Breast</i>	38.7	—	—	38.7	1.41(1.39,1.44)*	12.1	58.7	125.3
<i>Cervix</i>	4.7	—	—	4.7	1.64(1.56,1.72)*	2.4	7.0	10.8
<i>Uterus</i>	13.1	—	—	13.1	2.00(1.95,2.06)*	1.1	21.7	52.4
<i>Ovary</i>	8.0	—	—	8.0	0.88(0.85,0.91)*	1.1	12.9	30.5
<i>Prostate</i>	52.6	52.6	2.12(2.08,2.16)*	—	—	0.5	38.2	328.6
<i>Bladder</i>	4.7	7.3	0.66(0.63,0.69)*	3.1	1.02(0.96,1.08)	0.2	4.2	26.8
<i>Kidney</i>	4.6	7.1	0.96(0.92,1.00)*	2.9	0.94(0.89,0.99)*	0.7	6.1	20.1
<i>CNS</i>	3.8	4.7	0.55(0.52,0.58)*	3.1	0.57(0.54,0.60)*	1.2	5.6	12.4
<i>Non-Hodgkin Lymphoma</i>	5.3	7.0	0.72(0.69,0.75)*	4.1	0.74(0.70,0.77)*	1.1	6.4	23.4
<i>Myeloma</i>	8.2	10.2	1.97(1.89,2.05)*	6.9	2.27(2.18,2.36)*	0.5	8.7	43.7
<i>Leukemia</i>	7.1	9.3	0.80(0.77,0.83)*	5.7	0.89(0.86,0.93)*	1.5	7.6	33.1
Latino Individuals								
<i>All Cancers</i>	148.5	177.2	0.71(0.70,0.71)*	128.4	0.70(0.70,0.71)*	18.9	172.6	715.0
<i>Oral Cavity and Pharynx</i>	2.0	3.2	0.56(0.52,0.59)*	1.1	0.52(0.47,0.57)*	0.3	2.8	9.1
<i>Esophagus</i>	2.7	4.9	0.46(0.44,0.48)*	0.9	0.43(0.39,0.48)*	0.3	3.7	11.9
<i>Stomach</i>	6.5	8.1	2.03(1.95,2.12)*	5.4	2.65(2.53,2.77)*	1.6	7.9	27.1
<i>Colorectum</i>	14.8	18.7	0.87(0.85,0.90)*	11.7	0.77(0.75,0.79)*	2.4	18.5	66.5
<i>Liver</i>	12.7	18.0	1.52(1.48,1.56)*	8.4	1.64(1.58,1.70)*	0.7	19.4	56.4
<i>Pancreas</i>	12.4	13.6	0.74(0.72,0.76)*	11.3	0.84(0.81,0.86)*	0.8	15.0	62.2
<i>Lung</i>	20.8	28.0	0.47(0.46,0.48)*	15.5	0.35(0.34,0.36)*	0.9	20.7	115.4
<i>Soft Tissue including Heart</i>	1.5	1.6	0.77(0.71,0.84)*	1.4	0.92(0.85,1.00)*	0.6	2.0	4.4
<i>Breast</i>	19.0	—	—	19.0	0.69(0.68,0.71)*	5.1	28.4	66.2
<i>Cervix</i>	3.4	—	—	3.4	1.19(1.12,1.25)*	2.0	4.8	7.2
<i>Uterus</i>	6.0	—	—	6.0	0.92(0.88,0.96)*	0.9	9.5	23.0
<i>Ovary</i>	6.7	—	—	6.7	0.74(0.71,0.76)*	1.2	10.5	24.7
<i>Prostate</i>	20.9	20.9	0.84(0.82,0.87)*	—	—	0.1	10.8	139.8
<i>Bladder</i>	3.2	5.3	0.48(0.46,0.51)*	1.7	0.57(0.53,0.61)*	0.1	2.1	20.0
<i>Kidney</i>	4.5	6.5	0.87(0.84,0.91)*	2.9	0.93(0.87,0.98)*	0.5	5.6	21.0
<i>CNS</i>	4.1	4.8	0.57(0.54,0.59)*	3.6	0.66(0.62,0.69)*	1.1	5.7	15.4
<i>Non-Hodgkin Lymphoma</i>	6.1	7.8	0.81(0.77,0.84)*	4.8	0.86(0.82,0.90)*	0.6	5.7	33.0
<i>Myeloma</i>	3.6	4.3	0.84(0.79,0.89)*	3.0	0.98(0.92,1.04)	0.2	3.7	19.4
<i>Leukemia</i>	5.6	7.0	0.60(0.58,0.63)*	4.5	0.70(0.67,0.74)*	1.4	4.8	26.7
Native Hawaiian and Pacific Islander Individuals								
<i>All Cancers</i>	197.3	205.6	0.82(0.77,0.87)*	192.1	1.05(0.99,1.11)	43.7	288.4	743.1
<i>Oral Cavity and Pharynx</i>	3.7	4.7	0.82(0.55,1.18)	2.8	1.32(0.74,2.15)	1.7	7.4	—
<i>Esophagus</i>	2.8	4.5	0.42(0.27,0.62)*	—	—	—	4.9	9.6
<i>Stomach</i>	8.7	11.2	2.81(2.09,3.70)*	6.7	3.32(2.34,4.55)*	2.3	10.4	35.8
<i>Colorectum</i>	14.6	16.6	0.77(0.62,0.95)*	12.6	0.83(0.65,1.04)	5.4	24.4	38.7
<i>Liver</i>	15.1	21.6	1.83(1.51,2.20)*	9.0	1.76(1.30,2.32)*	4.8	24.7	45.1
<i>Pancreas</i>	12.2	11.8	0.64(0.49,0.84)*	12.5	0.92(0.71,1.17)	1.6	17.5	51.5
<i>Lung</i>	38.5	47.5	0.80(0.69,0.91)*	30.7	0.69(0.59,0.81)*	3.2	53.5	175.8
<i>Soft Tissue including Heart</i>	2.7	1.9	0.90(0.46,1.61)	3.3	2.23(1.36,3.46)*	—	5.4	—
<i>Breast</i>	33.2	—	—	33.2	1.21(1.05,1.39)*	8.2	61.0	95.8
<i>Cervix</i>	6.9	—	—	6.9	2.43(1.75,3.30)*	4.4	8.7	15.5
<i>Uterus</i>	19.5	—	—	19.5	2.99(2.47,3.58)*	9.4	34.1	38.0
<i>Ovary</i>	7.8	—	—	7.8	0.86(0.63,1.16)	—	13.3	22.0
<i>Prostate</i>	23.0	23.0	0.92(0.74,1.13)	—	—	—	16.4	143.6
<i>Bladder</i>	4.0	6.2	0.57(0.36,0.84)*	2.1	0.71(0.36,1.26)	—	—	24.0
<i>Kidney</i>	3.7	5.5	0.74(0.49,1.08)	2.1	0.68(0.35,1.18)	—	5.9	13.9
<i>CNS</i>	3.8	3.9	0.46(0.27,0.72)*	3.7	0.69(0.43,1.04)	—	5.3	12.5
<i>Non-Hodgkin Lymphoma</i>	6.8	7.2	0.74(0.52,1.04)	6.4	1.15(0.79,1.61)	1.5	7.9	29.8
<i>Myeloma</i>	3.8	4.4	0.86(0.52,1.32)	3.4	1.12(0.66,1.77)	—	4.9	19.2

<i>Leukemia</i>	7.9	9.5	0.81(0.59,1.09)	6.5	1.02(0.71,1.42)	2.3	8.8	32.4
White Individuals								
<i>All Cancers</i>	212.3	250.8	—	183.0	—	23.5	255.7	1020.3
<i>Oral Cavity and Pharynx</i>	3.8	5.8	—	2.1	—	0.5	6.3	14.7
<i>Esophagus</i>	6.0	10.6	—	2.1	—	0.6	9.4	25.0
<i>Stomach</i>	2.9	4.0	—	2.0	—	0.5	3.6	12.9
<i>Colorectum</i>	18.1	21.4	—	15.2	—	3.2	22.4	80.2
<i>Liver</i>	8.2	11.8	—	5.1	—	0.6	13.2	34.3
<i>Pancreas</i>	15.8	18.4	—	13.6	—	1.2	20.1	76.7
<i>Lung</i>	51.1	59.7	—	44.3	—	2.4	66.6	251.3
<i>Soft Tissue including Heart</i>	1.8	2.1	—	1.5	—	0.6	2.2	6.5
<i>Breast</i>	27.4	—	—	27.4	—	6.5	37.2	106.7
<i>Cervix</i>	2.9	—	—	2.9	—	1.9	4.2	4.6
<i>Uterus</i>	6.5	—	—	6.5	—	0.7	9.4	28.4
<i>Ovary</i>	9.0	—	—	9.0	—	1.4	12.9	37.4
<i>Prostate</i>	24.8	24.8	—	—	—	0.2	12.8	165.8
<i>Bladder</i>	6.4	10.9	—	3.0	—	0.2	4.6	39.2
<i>Kidney</i>	5.1	7.4	—	3.1	—	0.5	6.3	24.2
<i>CNS</i>	6.9	8.5	—	5.4	—	2.2	10.4	22.0
<i>Non-Hodgkin Lymphoma</i>	7.4	9.7	—	5.6	—	0.6	6.1	42.3
<i>Myeloma</i>	4.0	5.2	—	3.1	—	0.2	3.6	22.8
<i>Leukemia</i>	8.7	11.7	—	6.3	—	1.1	6.8	48.3

*Denotes Statistical Significance (p<0.05)

— Statistic not displayed due to fewer than 10 cases or not applicable

Rate ratios compare to ^aWhite men or ^bWhite women.

Abbreviations: CI=Confidence Interval; CNS= Central Nervous System

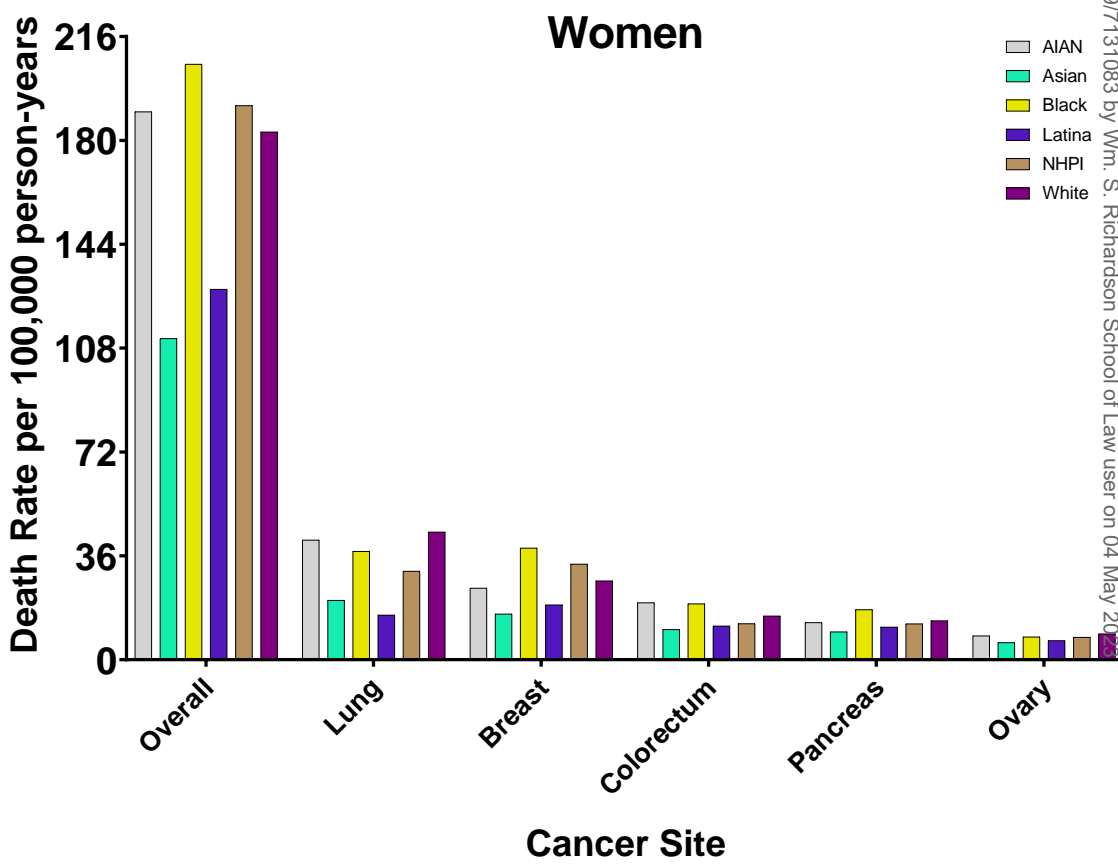
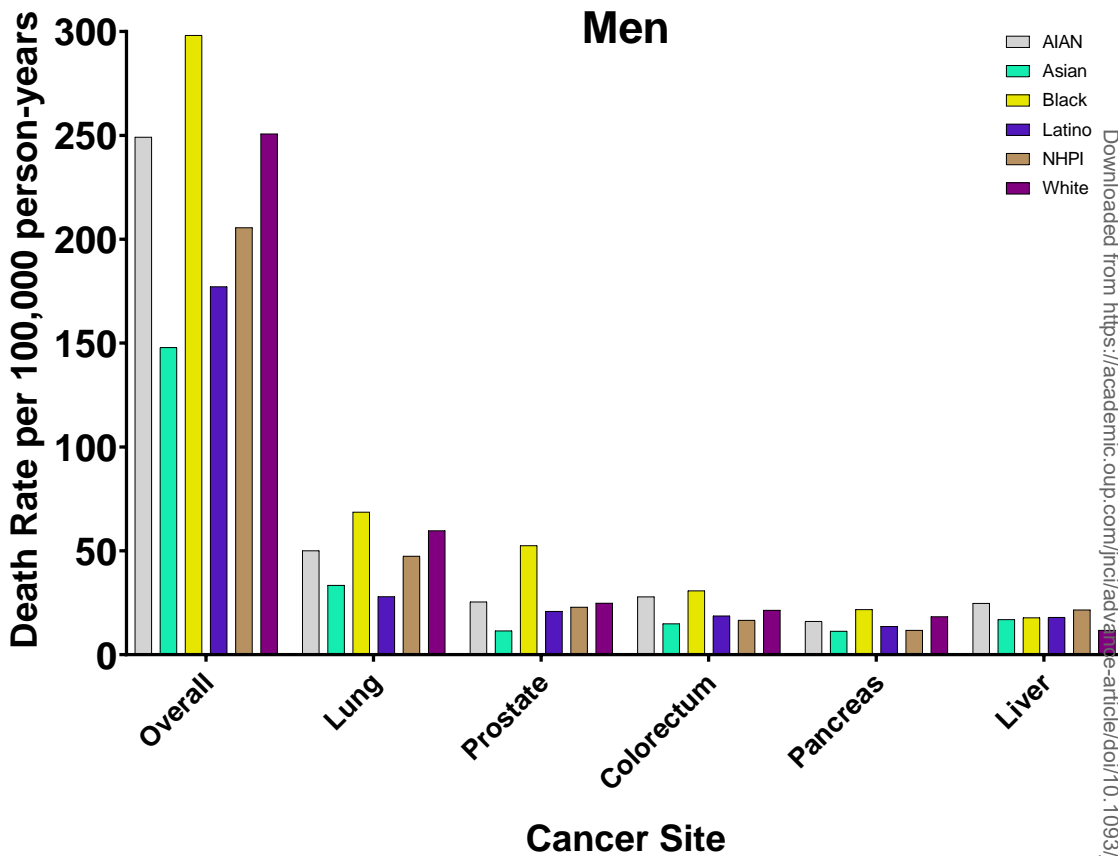
Figure legend.

Figure 1. Cancer specific death rates for overall cancer deaths and the five leading causes of cancer deaths by racial/ethnic groups, stratified by sex from 2018 to 2020, among those aged 20 or older. Bars indicate the cancer death rates. Colors are consistent by racial/ethnic groups; however, scales differ. NHPI: Native Hawaiian and Pacific Islander; CNS: central nervous system.

Figure 2. Cancer specific rate ratios for the NHPI population compared to the Asian population stratified by sex from 2018 to 2020, among those aged 20 or older. The diamonds represent the rate ratio. The error bars represent the 95% confidence interval; NHPI: Native Hawaiian and Pacific Islander; CNS: central nervous system.

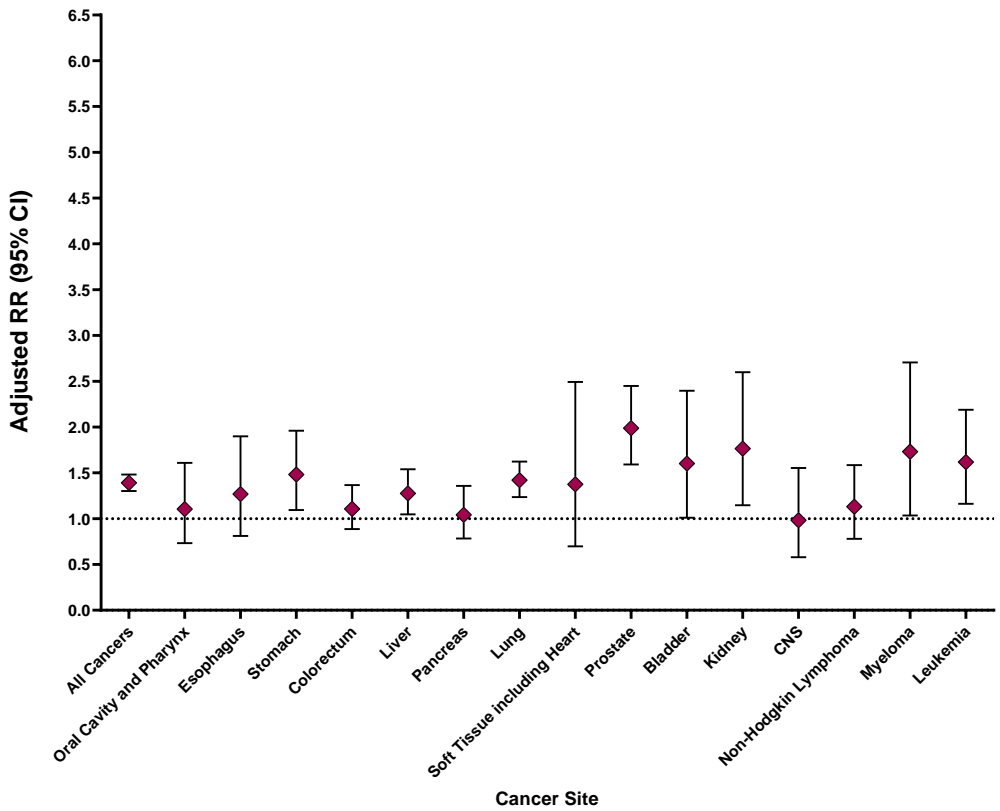


Figure 1



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**Male Rate Ratio (RR)
NHPI vs Asian**



**Female Rate Ratio (RR)
NHPI vs Asian**

