



# Cancer Statistics for the US Hispanic/Latino Population, 2021

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**DISCLOSURES:** Kimberly D. Miller, Priti Bandi, Adair Minihan, Hannah E. Fuchs, Stacey A. Fedewa, Ahmedin M. Jemal, and Rebecca L. Siegel are employed by the American Cancer Society, which receives grants from private and corporate foundations, including foundations associated with companies in the health sector for research outside of the submitted work. The authors are not funded by or key personnel for any of these grants and their salaries are solely funded through American Cancer Society funds. Ana Patricia Ortiz reports a University of Puerto Rico/The University of Texas MD Anderson Cancer Center partnership grant (2U54CA096297-16) and consulting fees and speaker fees from Merck. The remaining authors made no disclosures.

doi: 10.3322/caac.21695. Available online at [cacancerjournal.com](http://cacancerjournal.com)

**Abstract:** The Hispanic/Latino population is the second largest racial/ethnic group in the continental United States and Hawaii, accounting for 18% (60.6 million) of the total population. An additional 3 million Hispanic Americans live in Puerto Rico. Every 3 years, the American Cancer Society reports on cancer occurrence, risk factors, and screening for Hispanic individuals in the United States using the most recent population-based data. An estimated 176,600 new cancer cases and 46,500 cancer deaths will occur among Hispanic individuals in the continental United States and Hawaii in 2021. Compared to non-Hispanic Whites (NHWs), Hispanic men and women had 25%-30% lower incidence (2014-2018) and mortality (2015-2019) rates for all cancers combined and lower rates for the most common cancers, although this gap is diminishing. For example, the colorectal cancer (CRC) incidence rate ratio for Hispanic compared with NHW individuals narrowed from 0.75 (95% CI, 0.73-0.78) in 1995 to 0.91 (95% CI, 0.89-0.93) in 2018, reflecting delayed declines in CRC rates among Hispanic individuals in part because of slower uptake of screening. In contrast, Hispanic individuals have higher rates of infection-related cancers, including approximately two-fold higher incidence of liver and stomach cancer. Cervical cancer incidence is 32% higher among Hispanic women in the continental US and Hawaii and 78% higher among women in Puerto Rico compared to NHW women, yet is largely preventable through screening. Less access to care may be similarly reflected in the low prevalence of localized-stage breast cancer among Hispanic women, 59% versus 67% among NHW women. Evidence-based strategies for decreasing the cancer burden among the Hispanic population include the use of culturally appropriate lay health advisors and patient navigators and targeted, community-based intervention programs to facilitate access to screening and promote healthy behaviors. In addition, the impact of the COVID-19 pandemic on cancer trends and disparities in the Hispanic population should be closely monitored.

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**Keywords:** Hispanics, Latinos, statistics, surveillance

## Introduction

The Hispanic population is the second largest racial/ethnic group in the United States after non-Hispanic Whites (NHWs). The US Census Bureau estimated that approximately 60.6 million Hispanic individuals lived in the continental United States (Alaska inclusive) and Hawaii in 2019, comprising 18% of the population overall and more than one-third in some Southern and Western states (eg, California, Texas, and New Mexico).<sup>1,2</sup> In addition, more than 3 million Hispanic US citizens live in Puerto Rico.<sup>2</sup> The term Hispanic is used interchangeably with Latino/Latina/Latinx herein to refer to individuals who self-identify as being of Mexican (61.9%), Puerto Rican (9.7%), Cuban (4.0%), Salvadoran (3.9%), Dominican (3.5%), or

other Central or South American or other Spanish descent.<sup>3</sup> Federal standards currently define race and ethnicity as distinct concepts; therefore, individuals of Hispanic origin may identify as any race, including combinations of European, American Indian, and African ancestry. According to the US Census Bureau, 80% of US Hispanic individuals are White.<sup>2</sup>

Cancer surveillance data are often only available for the Hispanic population in aggregate, masking substantial heterogeneity among Hispanic groups. Despite the lack of granularity, presenting available data for the US Hispanic population is important to guide public health efforts. Hispanic individuals are especially vulnerable to cancer inequalities because of disproportionate poverty, higher percentage uninsured, and other barriers to optimal health. Among nonelderly (ages 18-64 years) patients who were diagnosed with cancer during 2014 through 2017, Hispanic individuals continued to be more than twice as likely as NHWs to be uninsured.<sup>4</sup> This disparity has persisted even in Medicaid expansion states despite rapid declines in the percentage of Hispanic individuals who were uninsured.<sup>5</sup> In addition, compared with other major racial/ethnic groups, the Hispanic population has among the highest prevalence of important potentially modifiable cancer risk factors, including obesity and type 2 diabetes.<sup>6</sup> Third, the Hispanic population is the second most rapidly growing racial/ethnic group in the United States after the Asian/Pacific Islander population.<sup>1</sup> The Hispanic population is becoming increasingly US-born as immigration has slowed in the last decade, which has important implications for the future cancer burden as the US-born population ages. Studies suggest that cancer risk for the US-born Hispanic population, which is currently younger than the foreign-born population,<sup>7</sup> approaches or surpasses that of NHWs.<sup>8,9</sup> Finally, relative to NHW individuals, Hispanic individuals have been disproportionately affected by the COVID-19 pandemic,<sup>10,11</sup> and careful monitoring of the pandemic's impact on cancer screening, incidence, and mortality among the US Hispanic population is warranted.

This report provides current cancer incidence, survival, and mortality statistics for Hispanic individuals living in the continental United States and Hawaii, including the projected numbers of new cases and deaths in 2021, as well as the prevalence of selected cancer risk factors and screening uptake. Incidence, mortality, and selected risk factors are also presented separately for Puerto Rico, where 98.9% of the population identifies as Hispanic.

## Materials and Methods

### Incidence, Survival, and Mortality for the Continental United States and Hawaii

Cancer incidence data in the United States are collected and disseminated by the National Cancer Institute's (NCI's) Surveillance, Epidemiology, and End Results (SEER) program and the Centers for Disease Control and Prevention's

(CDC's) National Program of Cancer Registries (NPCR). The North American Association of Central Cancer Registries (NAACCR) compiles and reports incidence data from 1995 forward from cancer registries that participate in the SEER program and/or the NPCR and certifies registries according to data quality, completeness, and timeliness. Data from registries that met NAACCR's highest quality certification standards were the source for long-term trends in incidence rates (1995-2018), cross-sectional 5-year average annual incidence rates (2014-2018), stage at diagnosis (2014-2018), and the 2021 new cancer case projections.<sup>12,13</sup> Long-term incidence trends were based on 28 registries that met NAACCR high-quality data standards for the entire 1995 to 2018 time period, covering 88% of the Hispanic population in the continental United States and Hawaii, and were used to calculate the 10-year average annual percent change in incidence rates (2009-2018).

The SEER program began coding Hispanic ethnicity in 1992 and was the source for contemporary 5-year relative population-based survival (2011-2017), based on the 17 oldest SEER registries (Connecticut, Greater California, Greater Georgia, Hawaii, Iowa, Louisiana, Kentucky, New Jersey, New Mexico, Utah, rural Georgia, and the metropolitan areas of Atlanta, Detroit, Los Angeles, San Francisco-Oakland, San Jose-Monterey, and Seattle-Puget Sound), covering approximately 28% of the US population and 38% of the US Hispanic population.<sup>14</sup> Five-year relative survival rates are presented herein and thus cannot be compared with cause-specific survival rates reported in previous versions of this article. The calculation of relative survival for Hispanic individuals, which is consistent with how population-level cancer survival is generally reported, is made possible by the recent availability of detailed life tables for this population.<sup>15</sup> The lifetime probability of developing cancer was based on the entire SEER catchment area (SEER 17 and Idaho, Massachusetts, and New York) and was calculated using the NCI's DevCan software (version 6.7.9).<sup>16</sup>

Mortality data by Hispanic origin for the United States have been available since 1990 from the CDC's National Center for Health Statistics.<sup>17</sup> However, long-term mortality trends presented herein (1990-2019) and the 10-year AAPCs based on these rates (2010-2019) exclude deaths from Louisiana, New Hampshire, and Oklahoma because high-quality information on Hispanic origin for these states was not available for  $\geq 1$  year between 1990 and 1996. All other mortality statistics for the United States combined for 2015 to 2019 are based on data from all 50 states and the District of Columbia.

All cancer cases were classified according to the *International Classification of Diseases for Oncology*, third edition.<sup>18,19</sup> Causes of death were classified according to the *International Classification of Diseases, Injuries, and Causes of Death*, ninth and tenth revisions.<sup>20,21</sup> Incidence and death

rates were calculated using SEER\*Stat software (version 8.3.9) based on population estimates from the US Census Bureau, age adjusted to the 2000 US standard population, and expressed per 100,000 population. Ten-year trends in incidence (2009–2018) and mortality (2010–2019) are based on the AAPC in rates using joinpoint regression analysis (Joinpoint, version 4.9.0.1; Surveillance Research Program, NCI). Trends are described as increasing or decreasing when the slope of the fitted line segment is statistically different from zero (2-sided  $P$  value  $< .05$ ).

### Puerto Rico Incidence and Mortality

The Puerto Rico Central Cancer Registry has collected information on cancer cases in the territory since 1950, joined the NPCR in 1997, and achieved NAACCR gold certification for completeness, high quality, and reliability in 2017.<sup>22,23</sup> Five-year average annual incidence rates for Puerto Rico (2014–2018) were adjusted for the impact of Hurricane Maria. Puerto Rico mortality rates (2014–2018) for selected cancers herein were previously published in NAACCR's *Cancer Incidence in North America*, volume 3.<sup>24</sup> Puerto Rico cancer incidence and mortality rates are presented for all races and ethnicities combined because the population is 98.9% Hispanic.<sup>2</sup>

### Projected Cancer Cases and Deaths in 2021

The most recent year for which cancer incidence and mortality data are available lags 2 to 4 years behind the current year because of the time required for data collection, compilation, quality control, and dissemination. Therefore, we projected the numbers of new cancer cases and deaths among Hispanic individuals in the continental United States and Hawaii in 2021 to provide an estimate of the contemporary cancer burden. First, the complete number of cases diagnosed each year from 2009 through 2018 was estimated by applying annual age-specific and sex-specific incidence rates, based on data from 49 (excluding Nevada) states and the District of Columbia that met NAACCR's high-quality standards for all 10 years (covering 98.5% of the Hispanic population in the continental US and Hawaii), to the corresponding US Census Bureau's population estimates. Estimated case counts were adjusted for delays in case reporting using age-specific composite delay factors derived from the NAACCR 2020 data submission (personal communication, Don Green [Information Management Services on behalf of NAACCR] and Eric Feuer [NCI]). Then, case counts were projected to 2021 based on the average annual percent change from 2009 through 2018 generated by joinpoint regression modeling. The number of cancer deaths was estimated using the 4-year average annual percent change for 2015 through 2019, based on the actual numbers of cancer deaths from 2005 through 2019. For the complete details of this methodology, please refer to Miller et al.<sup>25</sup>

### Cancer Risk Factors, Screening, and Other Statistics

Data on cigarette smoking, e-cigarette use, alcohol consumption, and receipt of cancer screening for adults in the continental United States and Hawaii were derived from the National Health Interview Survey (NHIS).<sup>26–28</sup> The prevalence of obesity, defined as a body mass index  $\geq 30.0$  kg/m<sup>2</sup>, was obtained from the National Health and Nutrition Examination Survey (NHANES) and is historically only available for Hispanic individuals of Mexican origin, although NHANES has begun to report data for all Hispanic individuals combined in recent years.<sup>29</sup> Human papillomavirus (HPV) vaccination coverage among adolescents in the continental United States and Hawaii was obtained from the National Immunization Survey for Teens.<sup>30</sup> The NHIS and NHANES were analyzed using SUDAAN (version 11.0.3; RTI International) to obtain weighted prevalence estimates, which are considered representative of the noninstitutionalized civilian population. Cancer screening and risk factor data for Puerto Rico were obtained from the Behavioral Risk Factor Surveillance System<sup>31</sup> because NHIS data are not available for individual states or territories. Demographic characteristics for the Hispanic population were based on the 2015 to 2019 American Community Survey and were accessed using the US Census Bureau's Explore Data tool ([data.census.gov/cedsci/](https://data.census.gov/cedsci/)).

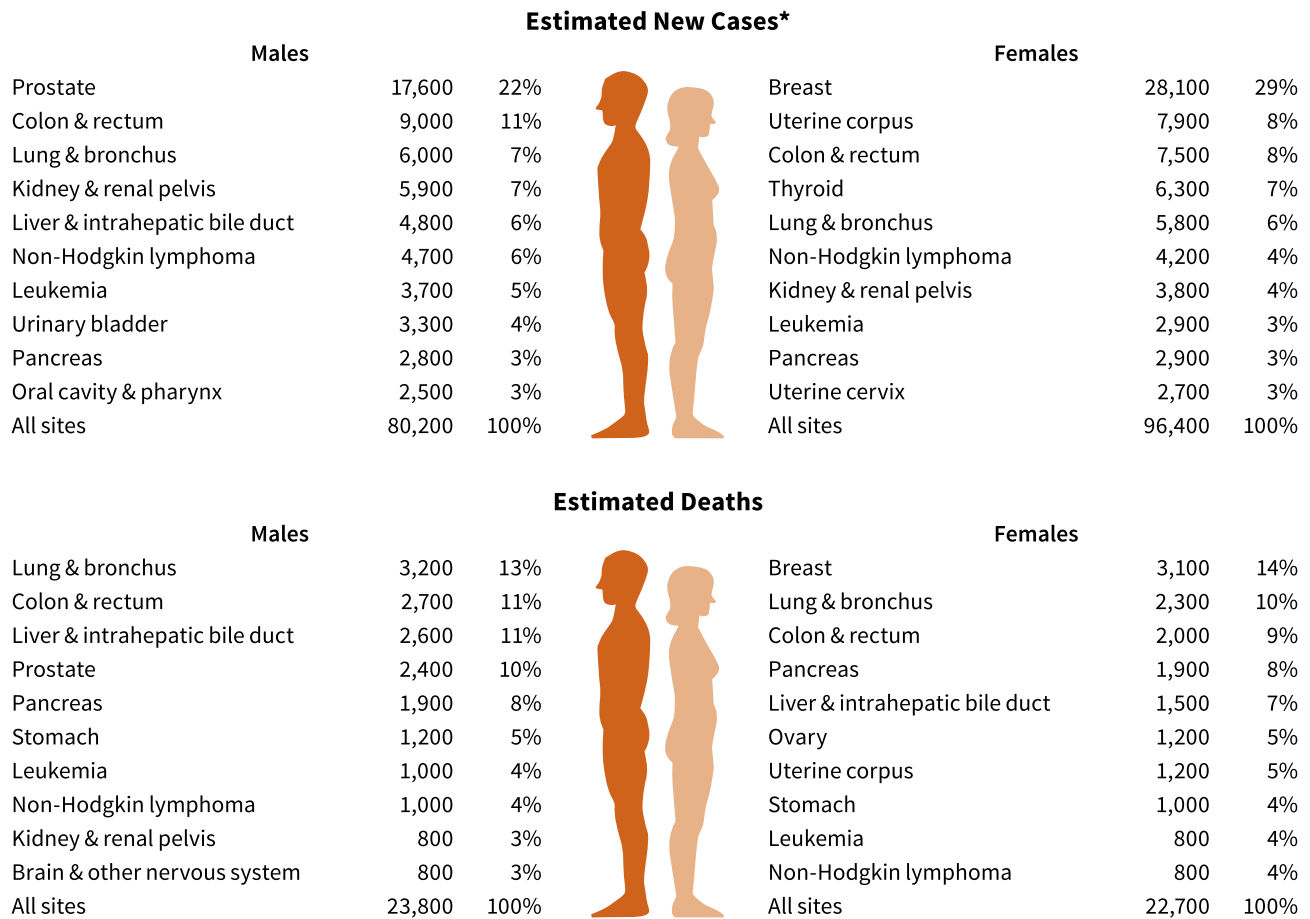
### Selected Findings

The following sections present cancer incidence, survival, and mortality statistics for Hispanic individuals in the continental United States and Hawaii; data for Puerto Rico are presented separately.

### Overall Cancer Occurrence

#### Incidence

In 2021, approximately 176,600 new cancer cases are expected to be diagnosed among Hispanic individuals living in the continental United States and Hawaii (Fig. 1). The most commonly diagnosed cancers among Hispanic men are prostate cancer (22%), colorectal cancer (CRC) (11%), and lung and bronchus (lung) cancer (7%), whereas the most commonly diagnosed cancers among Hispanic women are breast cancer (29%), uterine corpus cancer (8%), and CRC (8%). The distribution of cancers in the US Hispanic population varies from that in the general population because of differences in the prevalence of risk factors and the younger age structure (in 2019, the median age among Hispanic individuals was 30 years compared with 40 years among NHWs).<sup>2</sup> For example, thyroid cancer is the seventh most commonly diagnosed cancer among women in the general population<sup>32</sup> but the fourth in Hispanic women (Fig. 2), largely because it has a younger median age at diagnosis compared with most other cancers (age 51 vs 66 years for all sites combined among women).<sup>33</sup>

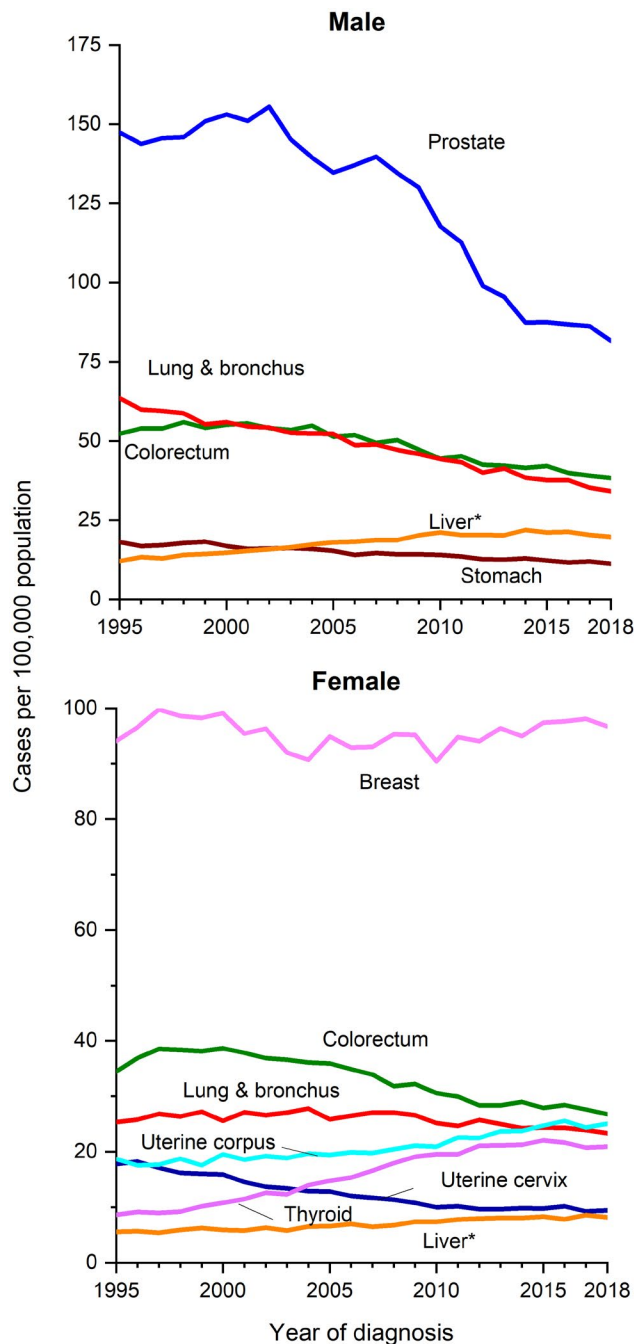


**FIGURE 1.** Leading Sites of New Cancer Cases and Deaths Among the US Hispanic Population—2021 Estimates. \*Estimates are rounded to the nearest 100 and exclude basal and squamous cell skin cancers and in situ carcinoma except urinary bladder. Estimates exclude Puerto Rico. Rankings are based on modeled projections and may differ from the most recent observed data.

The lifetime probability of developing cancer among US Hispanic men and women is 37% and 36%, respectively, compared with 41% and 40% among NHWs, respectively, although probabilities vary greatly by cancer type (Table 1). Incidence rates among Hispanic men and women are approximately 25% lower than those among NHWs overall (Table 2), and rates are lower for every age group except ages 5 to 14 years, among whom rates are similar (data not shown). The cancer profile of US Hispanic individuals resembles that in Latin America because at least one-third of the population is foreign-born (Table 3). Hispanic men and women are less likely than NHWs to be diagnosed with the 4 most common cancers (prostate, breast, lung and bronchus, and CRC) but have a higher risk of infection-related cancers (stomach, liver, and cervix) and gallbladder cancers (Table 2), all of which occur more frequently in Latin America, with the exception of liver cancer.<sup>34</sup> However, incidence varies substantially by nativity, Hispanic origin group, and duration of US residence, with rates in some groups approaching or surpassing those of NHWs, particularly among US-born Hispanic individuals.<sup>8,9</sup>

From 2009 through 2018, overall cancer incidence rates declined by about 2% per year among Hispanic men, similar to declines among NHW men; rates were stable among Hispanic and NHW women over the same time period (Fig. 3, Table 4), but have begun to increase in more recent years.<sup>35,36</sup> Although incidence rates continue to be higher in Hispanic men than in Hispanic women, the disparity is narrowing (Fig. 3). The female-to-male rate ratio has narrowed from 0.69 (95% CI, 0.68-0.70) in 1995 to 0.95 (95% CI, 0.94-0.96) in 2018.<sup>35</sup> This pattern is similar to that in the general population, for which rates in men remain 14% higher than those in women,<sup>32</sup> and reflects the finding that declines in lung cancer and CRC in both men and women have been offset among women by increasing rates of breast and uterine corpus cancers. The smaller gap in Hispanic individuals compared with the general population likely reflects the younger age structure of the population, as rates among Hispanic women younger than 50 years were approximately double those among young Hispanic men in 2018 (incidence rate ratio [IRR], 1.85; 95% CI, 1.81-1.90), slightly wider than the gap for NHWs in the same age group (IRR, 1.69; 95% CI, 1.67-1.72).





**FIGURE 2.** Trends in Cancer Incidence Rates Among the Hispanic Population, 1995 to 2018. Rates are age adjusted to the 2000 US standard population. Cases diagnosed in Puerto Rico were excluded. \*Liver includes the intrahepatic bile duct.

### Stage at diagnosis and survival

Hispanic cancer patients are less likely than NHWs to be diagnosed early stage disease for many cancers, with some exceptions (eg, uterine cervix, liver, and gallbladder) (Fig. 4). The largest disparities are for melanoma and female breast cancer. Less access to high-quality care because of lower socioeconomic status contributes to this disparity,<sup>37</sup> although some studies have shown that Hispanic individuals

are at higher risk of advanced-stage diagnosis even when socioeconomic status and health care access are similar.<sup>38,39</sup>

Consequently, 5-year relative survival in Hispanic patients is generally lower than that in NHWs (Fig. 5), especially among men, for whom the largest gap in 5-year relative survival was for melanoma (78.3% [95% CI, 75.2%-81.0%] vs 91.4% [95% CI, 91.0%-91.9%]). Cancers for which survival in Hispanic patients is higher than or similar to that in NHWs (ie, the so-called Hispanic paradox) may partly reflect incomplete death ascertainment, especially for more fatal cancers,<sup>40</sup> because of logistical challenges associated with case follow-up that are exacerbated by return migration after diagnosis (*salmon bias*). A selectively healthy immigrant population probably also biases survival statistics for US Hispanics.<sup>41,42</sup> Survival differences are also likely influenced by differences in age structure, as survival statistics herein are unadjusted for age.

### Mortality

On the basis of recorded vital statistics data for 2019, cancer is the leading cause among Hispanic individuals, whereas the leading cause of death in the US overall and among NHW individuals is heart disease (Table 5), reflecting the younger age structure of the Hispanic population compared with the general population. However, by sex, heart disease is the leading cause of death among Hispanic men, as in the general population, whereas cancer remains the leading cause among Hispanic women.<sup>17</sup> This overall distribution may shift as a result of disparities exacerbated by the COVID-19 pandemic. A preliminary life-expectancy analysis based on provisional 2020 mortality data has shown that life expectancy decreased by 3 years among Hispanic individuals in 2020 (compared with a 1-year decrease in NHWs), with 90% of the decline attributed to COVID-19 deaths (compared with 68% in NHWs).<sup>43</sup>

In 2021, an estimated 46,500 Hispanic men and women will die from cancer (Fig. 1). The most common causes of cancer death are lung cancer (13%), CRC (11%) and liver cancer (11%) among men and breast cancer (14%), lung cancer (10%), and CRC (9%) among women. Notably, lung cancer accounts for a much lower proportion of cancer deaths among Hispanic men and women than among the general population (12% vs 22% of deaths), whereas liver cancer accounts for a much higher proportion, particularly among men (11% vs 6% of deaths).

Overall cancer death rates are approximately 30% lower in Hispanic men and women than in NHWs (Table 2). However, cancer mortality is higher in Hispanic individuals than in NHWs among males ages 15 to 29 years (IRR, 1.23; 95% CI, 1.16-1.29) and among Hispanic females ages 25 to 29 years (IRR, 1.18; 95% CI, 1.04-1.33), and it is the same among children ages birth to 14 years. Higher mortality rates in Hispanic adolescents and young adults may reflect the lower survival among young Hispanic males for testicular

**TABLE 1. Lifetime Probability (%) of Developing or Dying From Invasive Cancer Among Hispanic Versus Non-Hispanic (NH) White People by Sex, United States, 2016 to 2018**

	DEVELOPING				DYING			
	HISPANIC (%)		NH WHITE (%)		HISPANIC (%)		NH WHITE (%)	
<b>All cancer types<sup>a</sup></b>								
Male	36.9	(1 in 3)	41.0	(1 in 2)	18.8	(1 in 5)	20.8	(1 in 5)
Female	36.2	(1 in 3)	39.9	(1 in 3)	15.4	(1 in 7)	18.2	(1 in 5)
<b>Breast (female)</b>	10.7	(1 in 9)	13.6	(1 in 7)	2.0	(1 in 49)	2.5	(1 in 39)
<b>Colon &amp; rectum</b>								
Male	4.4	(1 in 22)	4.2	(1 in 24)	1.9	(1 in 52)	1.7	(1 in 58)
Female	3.8	(1 in 26)	3.9	(1 in 25)	1.5	(1 in 66)	1.6	(1 in 63)
<b>Gallbladder</b>								
Male	0.2	(1 in 556)	0.1	(1 in 1,307)	0.1	(1 in 1,333)	<0.1	(1 in 2,471)
Female	0.4	(1 in 262)	0.2	(1 in 658)	0.2	(1 in 613)	0.1	(1 in 1,257)
<b>Kidney &amp; renal pelvis</b>								
Male	2.3	(1 in 43)	2.3	(1 in 44)	0.7	(1 in 154)	0.6	(1 in 172)
Female	1.5	(1 in 68)	1.3	(1 in 79)	0.4	(1 in 267)	0.3	(1 in 306)
<b>Liver &amp; intrahepatic bile duct</b>								
Male	2.4	(1 in 42)	1.2	(1 in 85)	1.7	(1 in 59)	0.9	(1 in 111)
Female	1.2	(1 in 81)	0.5	(1 in 200)	1.0	(1 in 99)	0.5	(1 in 209)
<b>Lung &amp; bronchus</b>								
Male	4.4	(1 in 23)	6.7	(1 in 15)	3.1	(1 in 32)	5.2	(1 in 19)
Female	3.6	(1 in 28)	6.7	(1 in 15)	2.0	(1 in 49)	4.6	(1 in 22)
<b>Prostate</b>	11.1	(1 in 9)	12.0	(1 in 8)	2.8	(1 in 36)	2.3	(1 in 44)
<b>Stomach</b>								
Male	1.6	(1 in 64)	0.8	(1 in 122)	0.8	(1 in 124)	0.3	(1 in 311)
Female	1.1	(1 in 89)	0.5	(1 in 210)	0.6	(1 in 163)	0.2	(1 in 487)
<b>Thyroid</b>								
Male	0.6	(1 in 174)	0.8	(1 in 132)	0.1	(1 in 1,109)	0.1	(1 in 1,718)
Female	1.9	(1 in 51)	1.9	(1 in 52)	0.1	(1 in 785)	0.1	(1 in 1,562)
<b>Uterine cervix</b>	0.9	(1 in 115)	0.6	(1 in 180)	0.3	(1 in 350)	0.2	(1 in 516)
<b>Uterine corpus</b>	2.9	(1 in 34)	3.2	(1 in 31)	0.6	(1 in 165)	0.6	(1 in 167)

Note: Percentages and “1 in” numbers may not be equivalent due to rounding. The probabilities presented here are based on the Surveillance, Epidemiology, and End Results registry areas and may not be representative of the probabilities for all Hispanic individuals living in the United States.

<sup>a</sup>All sites excludes basal cell and squamous cell skin cancers and in situ cancers except urinary bladder. Data exclude Puerto Rico.

Source: DevCan: Probability of Developing or Dying of Cancer Software, version 6.7.9.

cancer,<sup>44,45</sup> which is the most commonly diagnosed cancer in this age group, and acute lymphocytic leukemia (ALL), which is more common in Hispanic youths than in NHWs.<sup>12</sup>

There are also marked differences in cancer death rates between Hispanic origin groups.<sup>46,47</sup> For example, CRC death rates in Florida are nearly twice as high in Cuban men as in Mexican men (18.9 vs 10.2 per 100,000, respectively, during 2008-2012).<sup>47</sup> The impact of acculturation on cancer rates is also substantial. In Texas, cancer death rates in US-born Hispanic men were 61% higher than those in foreign-born Hispanic men (201.4 vs 124.8 per 100,000, respectively, during 2008-2012) and were only slightly lower

than those in NHW men (210.1 per 100,000), largely driven by differences in lung cancer death rates.<sup>8</sup>

Cancer death rates among Hispanic men and women peaked 4 years later than those in NHWs and have been decreasing since the mid-1990s slightly more rapidly in men than in women (Fig. 3). Rates in Hispanic men and NHW women converged in the mid-2000s and have since remained similar. From 2010 through 2019, cancer death rates in Hispanic individuals declined by 1.6% per year in men and 0.9% per year in women, similar to declines in NHWs (1.8% and 1.5% per year, respectively) (Table 4). Notably, in contrast to patterns for incidence, sex differences

**TABLE 2. Cancer Incidence and Mortality Rates in Hispanic Versus Non-Hispanic (NH) White People, United States, 2014 to 2019**

CANCER	INCIDENCE, 2014-2018						MORTALITY, 2015-2019					
	HISPANIC RATE	MALE		FEMALE		HISPANIC RATE	MALE		FEMALE			
		NH WHITE RATE	RATE RATIO <sup>a</sup>	HISPANIC RATE	NH WHITE RATE		RATE RATIO <sup>a</sup>	HISPANIC RATE	NH WHITE RATE	RATE RATIO <sup>a</sup>	HISPANIC RATE	NH WHITE RATE
Acute lymphocytic leukemia	2.8	1.8	1.57	2.2	1.4	1.55	0.8	0.5	1.57	0.6	0.3	1.86
Breast (female)				96.3	132.5	0.73				13.7	19.9	0.69
Colon & rectum <sup>b</sup>	39.2	41.5	0.95	27.6	31.3	0.88	13.7	15.8	0.87	8.5	11.3	0.75
Gallbladder	1.2	0.7	1.88	2.5	1.1	2.29	0.5	0.4	1.46	1.1	0.6	1.91
Kidney & renal pelvis	22.3	23.5	0.95	12.7	11.8	1.07	4.9	5.4	0.90	2.2	2.3	0.95
Liver & intrahepatic bile duct	20.3	10.9	1.86	8.1	3.9	2.06	13.2	8.5	1.57	6.0	3.6	1.67
Lung & bronchus	36.1	69.0	0.52	24.2	56.0	0.43	22.1	47.0	0.47	11.8	34.2	0.35
Non-Hodgkin lymphoma	20.1	24.2	0.83	15.6	16.5	0.94	5.7	7.2	0.79	3.6	4.2	0.85
Oral cavity & pharynx	10.5	20.0	0.52	4.3	7.0	0.61	2.4	4.1	0.59	0.8	1.5	0.56
Ovary				10.0	11.1	0.90				5.0	6.9	0.73
Pancreas	12.5	15.1	0.83	10.8	11.2	0.96	9.6	13.0	0.74	7.9	9.6	0.82
Prostate	85.3	99.9	0.85				15.6	17.8	0.88			
Stomach	12.0	7.4	1.62	7.7	3.5	2.22	6.1	3.0	2.04	3.9	1.5	2.58
Thyroid	5.8	8.1	0.72	21.2	22.0	0.97	0.6	0.5	1.13	0.7	0.4	1.58
Urinary bladder	18.6	38.0	0.49	4.9	9.4	0.52	3.9	8.1	0.49	1.3	2.2	0.58
Uterine cervix				9.6	7.2	1.32				2.5	2.0	1.24
Uterine corpus				24.5	27.8	0.88				4.2	4.6	0.92
<b>All sites</b>	<b>370.2</b>	<b>501.3</b>	<b>0.74</b>	<b>339.2</b>	<b>442.8</b>	<b>0.77</b>	<b>132.2</b>	<b>186.2</b>	<b>0.71</b>	<b>93.9</b>	<b>135.4</b>	<b>0.69</b>

<sup>a</sup>All rate ratios presented were statistically significant ( $P < .05$ ). Rates are per 100,000 and age adjusted to the 2000 US standard population. Rate ratios are the unrounded rates in Hispanic individuals divided by the unrounded rates in NH Whites.

<sup>b</sup>Colorectal cancer incidence rates exclude cancers of the appendix.

Source: Incidence, North American Association of Central Cancer Registries, 2021; mortality, National Center for Health Statistics, Centers for Disease Control and Prevention, 2021. Data exclude Puerto Rico.

in mortality rates among Hispanic individuals have only narrowed slightly, from a female-to-male mortality rate ratio of 0.64 (95% CI, 0.61-0.66) in 1990 to 0.72 (95% CI, 0.71-0.74) in 2019.

## The Four Major Cancer Sites

### Female breast

Invasive breast cancer is the most commonly diagnosed cancer and the leading cause of cancer death among Hispanic women in the United States, with 28,100 new cases and 3100 deaths expected in 2021. Both incidence and death rates are approximately 30% lower in Hispanic individuals than in NHWs (Table 2), largely because of differences in reproductive patterns and other hormonal factors that influence breast cancer risk, as well as lower mammography prevalence among screening-aged women (60% vs 64%, respectively, were up to date in 2018) (Table 6), resulting

in less overdiagnosis.<sup>48</sup> A younger age at first birth, higher parity, and higher prevalence of breastfeeding are all associated with lower breast cancer risk and are more common in Hispanic women, particularly among those who are foreign-born.<sup>49,50</sup> For example, breast cancer mortality rates in foreign-born Mexican women living in California were 28% lower than those in their US-born counterparts (12.9 vs 18.0 per 100,000, respectively, during 2008-2012).<sup>9</sup> Similarly, an analysis of Florida vital statistics data found that, compared with other Hispanic groups, Puerto Rican and Cuban women had the highest breast cancer mortality rates, approaching those of NHWs, consistent with the lower parity in these groups.<sup>47</sup>

Breast cancer incidence rates in both Hispanic and NHW women have generally increased since the early 2000s (Fig. 2); from 2009 to 2018, rates among Hispanic women increased by approximately 0.5% annually on average, similar

**TABLE 3. Socioeconomic Characteristics and Health Care Access (%) in Hispanic Versus Non-Hispanic (NH) White People, United States, 2015-2019**

SOCIOECONOMIC CHARACTERISTICS, 2015-2019	HISPANIC							NH WHITE
	ALL	MEXICAN	PUERTO RICAN	CUBAN	CENTRAL AMERICAN	SOUTH AMERICAN	DOMINICAN	
Foreign-born	33	31	2	56	58	62	54	4
Speak English "not well" or "not at all" <sup>a</sup>	24	23	13	33	34	21	30	11
Less than high school diploma, adults ages ≥25 y	31	36	20	19	42	13	29	7
Income below federal poverty level	20	20	22	16	23	20	12	10

HEALTH CARE ACCESS CHARACTERISTICS, 2017-2018	HISPANIC						NH WHITE
	ALL	MEXICAN	PUERTO RICAN	CUBAN	CENTRAL/SOUTH AMERICAN	DOMINICAN	
<b>No health care coverage</b>							
By age:							
<18 y	8	8	b	b	10	b	4
18-64 y	26	30	11	23	28	13	9
≥65 y	3	b	0	b	b	b	0
By nativity (ages ≥18 y):							
US-born	12	13	8	14	b	b	7
Foreign-born	32	37	b	22	28	10	9
<b>No usual source of medical care (ages 18-64 y)</b>							
Overall	25	25	19	29	28	14	15
Men	30	30	21	30	34	22	19
Women	19	19	17	28	22	9	11

Notes: Estimates for healthcare characteristics in adults 18 years or older are age adjusted to the 2000 US standard population.

<sup>a</sup>Among respondents ages 5 years and older who indicated that a language other than English was spoken at home. Respondents were asked to rank English-speaking ability as "not at all," "not well," "well," or "very well."

<sup>b</sup>An estimate is not presented due to instability.

Source: Socioeconomic characteristics, US Census Bureau, American Community Survey, Public Use Microdata File, 2015 to 2019 (available at: [data.census.gov/tables/#/socioeconomic](https://data.census.gov/tables/#/socioeconomic); accessed March 26, 2021); health care access characteristics, National Health Interview Surveys, 2017 and 2018. Data exclude Puerto Rico.

to trends in NHW women. In contrast, the breast cancer death rate declined by 0.8% per year in Hispanic women and by 1.3% per year in NHW women from 2010 to 2019 (Table 4). Improvements in early detection and treatment<sup>51</sup> have resulted in overall declines in breast cancer mortality during 1990 to 2019 of 29% in Hispanic women (from 19.6 to 13.9 per 100,000) (Fig. 6) and 42% in NHW women (from 33.2 to 19.3 per 100,000).

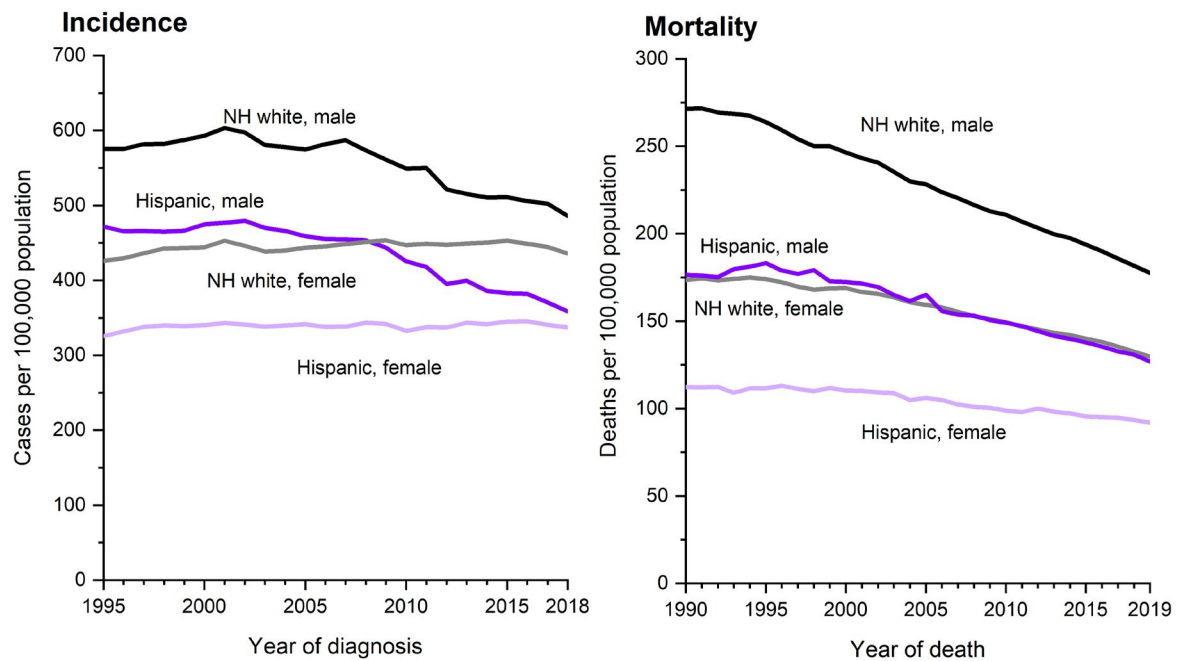
Hispanic women are less likely than NHW women to be diagnosed with breast cancer at a localized stage (59% vs 67%) (Fig. 4), likely because of lower mammography utilization (Table 6) and delayed follow-up after an abnormal mammogram.<sup>52,53</sup> Hispanic women also are more likely than NHW women to be diagnosed with higher grade and hormone receptor-negative tumors.<sup>54,55</sup> However, research is conflicted about differences in breast cancer survival between Hispanic and NHW women after controlling for these and other factors. Analyses from the California Cancer Registry and the National Comprehensive Cancer Network Breast

Cancer Outcomes Database found that Hispanic women have a lower risk of breast cancer-specific death than NHW women after controlling for sociodemographics, tumor characteristics, and treatment factors.<sup>54,55</sup> However, multivariate analysis studies of SEER registry data report borderline increased risk of breast cancer death for Hispanic women.<sup>39,56</sup> Current 5-year relative survival (cases diagnosed during 2011 through 2017) based on SEER data is lower for Hispanic women (88%) than for NHW women (92%) (Fig. 5).<sup>14</sup>

#### Colon and rectum

In 2021, an estimated 16,500 Hispanic men and women will be diagnosed with CRC, and 4700 will die from the disease (Fig. 1). CRC incidence rates among Hispanic men and women are approximately 5% to 12% lower than those among NHWs, respectively, and death rates are 13% to 25% lower, respectively (Table 2). However, the rates vary substantially between Hispanic groups and may be similar to or higher than those in NHWs among some US-born Hispanic individuals. For example, a study of Texas residents found that





**FIGURE 3.** Trends in Cancer Incidence and Death Rates by Ethnicity, 1990 to 2019. Rates are age adjusted to the 2000 US standard population. Rates exclude cases and deaths occurring in Puerto Rico. NH indicates non-Hispanic.

CRC mortality rates in US-born Hispanic men surpassed those in NHW men (24.1 vs 18.1 per 100,000, respectively) and were the same among women (12.6 per 100,000).<sup>8</sup>

Although current trends in Hispanic and NHW individuals are similar, declines in CRC incidence rates began later and were historically slower among Hispanic individuals, resulting in a striking reduction in the lower risk for Hispanic individuals compared with NHWs, from an IRR of 0.75 (95% CI, 0.73–0.78) in 1995 to 0.91 (95% CI, 0.89–0.93) in 2018.<sup>13</sup> Part of the delay in the decline among Hispanic individuals may be caused by slower uptake of and less access to colonoscopy.<sup>57</sup> Mirroring incidence, the lower risk for CRC mortality among Hispanic individuals has similarly narrowed, from a mortality rate ratio of 0.61 (95% CI, 0.58–0.64) in 1990 to 0.81 (95% CI, 0.78–0.84) in 2019.

The proportion of Hispanic individuals diagnosed with CRC at a localized stage is slightly lower than that of NHW individuals (33% versus 35%, respectively; Fig. 4), which is likely because of lower CRC screening prevalence among Hispanic adults compared with NHWs (49% versus 58%, respectively, were up to date in 2018 in individuals aged 45 years and older) (Table 6). Five-year relative survival is similar among Hispanic and NHW patients with CRC overall (64% and 65%, respectively; Fig. 5) and for those with rectal cancer (67%), but it is slightly lower in Hispanic patients for cancers of both the proximal (63% vs 65%) and distal (66% vs 68%) colon.

### Lung and bronchus

In 2021, an estimated 11,800 Hispanic men and women will be diagnosed with lung cancer, and 5500 will die from the disease (Fig. 1). Among Hispanic individuals, lung cancer

is the leading cause of cancer death in men and the second leading cause in women; however, compared with NHWs, lung cancer incidence and death rates are approximately 50% lower in men and 65% lower in women (Table 2), reflecting historic differences in smoking. Among all races combined, approximately 80% of all lung cancer deaths in the United States are caused by cigarette smoking.<sup>58</sup> However, smoking prevalence is nearly 40% lower in Hispanic individuals (9%) than in NHWs (16%), with substantial variation by sex, origin group, and nativity but with less heterogeneity by poverty level (compared with NHWs) (Table 7). In addition to being less likely to smoke, Hispanic individuals who do smoke are more likely to smoke less ( $\leq 10$  cigarettes per day) and/or intermittently (nondaily smokers, regardless of cigarettes per day) than NHWs.<sup>59</sup>

However, substantial differences in historical smoking intensity by Hispanic origin group have been noted and continue to be reflected in contemporary lung cancer rates.<sup>60</sup> For example, in a study of Florida vital statistics data,<sup>47</sup> the lung cancer death rate in Cuban men (49.4 per 100,000 during 2008–2012) was almost double that in Mexican men (26.2 per 100,000 during 2008–2012) because Cuban men were historically more likely to be heavier smokers than Mexican men.<sup>61,62</sup> However, there has been a general evolution away from heavy smoking toward light/intermittent smoking across most Hispanic origin groups since the 1990s.<sup>63</sup>

Over the past decade of available data, lung cancer incidence rates declined by approximately 3% annually in Hispanic men and 1% annually in Hispanic women, similar to trends

**TABLE 4. Fixed Interval Trends (Average Annual Percent Change) in Cancer Incidence and Death Rates, United States, 2009-2019**

	INCIDENCE, 2009-2018 <sup>a</sup>		MORTALITY, 2010-2019 <sup>b</sup>	
	HISPANIC	NH WHITE	HISPANIC	NH WHITE
All sites				
Male	-2.4 <sup>c</sup>	-1.5 <sup>c</sup>	-1.6 <sup>c</sup>	-1.8 <sup>c</sup>
Female	-0.1	-0.3	-0.9 <sup>c</sup>	-1.5 <sup>c</sup>
Breast (female)	0.4 <sup>c</sup>	0.4 <sup>c</sup>	-0.8 <sup>c</sup>	-1.3 <sup>c</sup>
Colon and rectum				
Male	-2.3 <sup>c</sup>	-2.4 <sup>c</sup>	-1.6 <sup>c</sup>	-2.0 <sup>c</sup>
Female	-1.6 <sup>c</sup>	-2.4 <sup>c</sup>	-2.0 <sup>c</sup>	-1.8 <sup>c</sup>
Gallbladder				
Male	-1.3 <sup>c</sup>	-0.9 <sup>c</sup>	-2.4 <sup>c</sup>	-1.7 <sup>c</sup>
Female	-1.7 <sup>c</sup>	-1.1 <sup>c</sup>	-2.6 <sup>c</sup>	-2.2 <sup>c</sup>
Liver and intrahepatic bile duct				
Male	0.2	1.8 <sup>c</sup>	0.2	1.3 <sup>c</sup>
Female	2.0 <sup>c</sup>	2.6 <sup>c</sup>	1.1 <sup>c</sup>	1.9 <sup>c</sup>
Lung and bronchus				
Male	-3.1 <sup>c</sup>	-2.8 <sup>c</sup>	-4.2 <sup>c</sup>	-4.2 <sup>c</sup>
Female	-1.0 <sup>c</sup>	-1.2 <sup>c</sup>	-2.8 <sup>c</sup>	-3.0 <sup>c</sup>
Prostate	-4.6 <sup>c</sup>	-3.3 <sup>c</sup>	-1.8 <sup>c</sup>	-1.3 <sup>c</sup>
Thyroid				
Male	1.7 <sup>c</sup>	0.1	2.5 <sup>c</sup>	0.1
Female	0.9	-1.2 <sup>c</sup>	0.1	0.1
Stomach				
Male	-2.0 <sup>c</sup>	-1.3 <sup>c</sup>	-2.4 <sup>c</sup>	-2.8 <sup>c</sup>
Female	-1.2 <sup>c</sup>	-0.5	-1.7 <sup>c</sup>	-3.0 <sup>c</sup>
Uterine cervix <sup>d</sup>	-1.4 <sup>c</sup>	-0.7	-2.2 <sup>c</sup>	-0.2

Abbreviation: NH, non-Hispanic.

Note: Incidence and mortality trends are not directly comparable due to differences in data years and population coverage. Data exclude Puerto Rico.

<sup>a</sup>Incidence trends are based on 1995 to 2018 incidence rates from 28 North American Association of Central Cancer Registries that met high-quality data standards for all years.

<sup>b</sup>Mortality trends are based on 1990 to 2019 mortality rates and exclude data from Louisiana, New Hampshire, and Oklahoma.

<sup>c</sup>The average annual percent change is significantly different from zero ( $P < .05$ ).

<sup>d</sup>The analysis was unadjusted for hysterectomy prevalence.

in NHWs. Lung cancer death rates have been declining for 2 decades among Hispanic men, but only since 2003 in Hispanic women (Fig. 6), similar to trends in NHWs. From 2010 through 2019, lung cancer death rates decreased by 5.1% per year in Hispanic men and by 4.6% per year in Hispanic women (Table 4), largely reflecting improvements in treatment.

Hispanic patients are somewhat more likely than NHWs to be diagnosed at a distant stage of lung cancer (48% versus 45%) (Fig. 4), although stage-specific survival rates are similar. For example, the 5-year survival rate for regional stage disease is 33.2% (95% CI, 31.1%-35.3%) in Hispanic patients compared with 32.4% (95% CI, 31.8%-32.9%) in NHWs. However, lung cancer survival data for Hispanics

are particularly prone to artificial inflation because of the higher likelihood of loss to follow-up.<sup>40</sup>

### Prostate

In 2021, there will be approximately 17,600 new cases of prostate cancer in Hispanic men and 2400 deaths from the disease (Fig. 1). Hispanic men have incidence and mortality rates that are 15% and 12% lower than those in NHWs, respectively (Table 2). The substantial heterogeneity in prostate cancer incidence rates by country of origin<sup>64</sup> is thought to largely reflect differences in disease detection through screening with the prostate-specific antigen (PSA) test, given that well established risk factors are limited to older age and African ancestry.

Prostate cancer incidence rates have generally declined in both Hispanic and NHW men since the early 2000s but have stabilized in both groups in the last 5 data years. Recent fluctuations in incidence reflect changes in the US Preventive Services Task Force guidelines, which recommended against routine use of the PSA test in average-risk men aged 75 years and older in 2008 and in all men in 2012.<sup>65</sup> In 2018, the US Preventive Services Task Force recommended informed decision making for prostate cancer screening for men ages 55 to 69 years.<sup>66</sup> Prostate cancer death rates have declined 37% among Hispanic men since the mid-1990s and have leveled off in the most recent 5 data years, similar to NHWs.

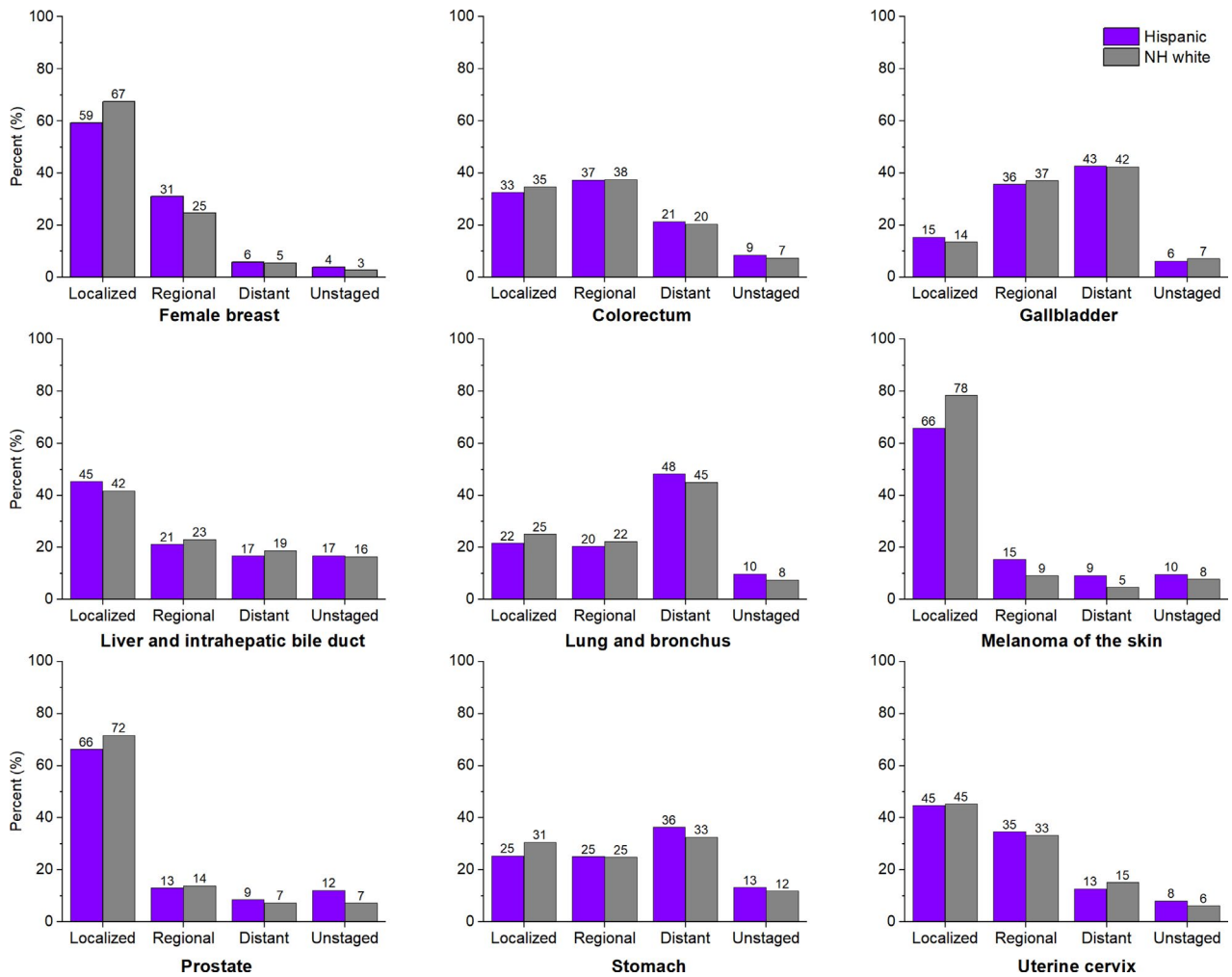
Most prostate cancers are diagnosed at an early stage, although Hispanic men are less likely than NHW men to be diagnosed with localized stage disease (66% vs 72%) (Fig. 4), for which 5-year relative survival approaches 100%. Differences in stage distribution most likely reflect lower PSA screening uptake among Hispanic men. Five-year relative survival for all stages combined is 94% in Hispanics and 98% in NHWs (Fig. 5).

## Cancer Sites with Higher Rates for the US Hispanic/Latino Population

### Acute lymphocytic leukemia

The lifetime risk of ALL is higher in Hispanic individuals than in NHW individuals but is especially elevated among Hispanic children (ages birth to 14 years), for whom ALL rates are approximately 20% higher than those in their NHW counterparts.<sup>12</sup> Reasons for the higher rates in Hispanic individuals, especially children, are not understood but may result from variation in collective genetic and environmental exposures.<sup>49,67</sup>

From 2009 to 2018, rates for ALL increased by approximately 0.5% per year in Hispanic children but were stable for NHW children. Death rates (2010 to 2019) for ALL declined by approximately 4% per year in both groups.<sup>17</sup> Hispanic children have inferior ALL survival, which appears to stem from a higher likelihood of relapse, perhaps due to differences in drug efficacy that might be overcome with a more individualized chemotherapy regimen.<sup>68,69</sup> The 5-year



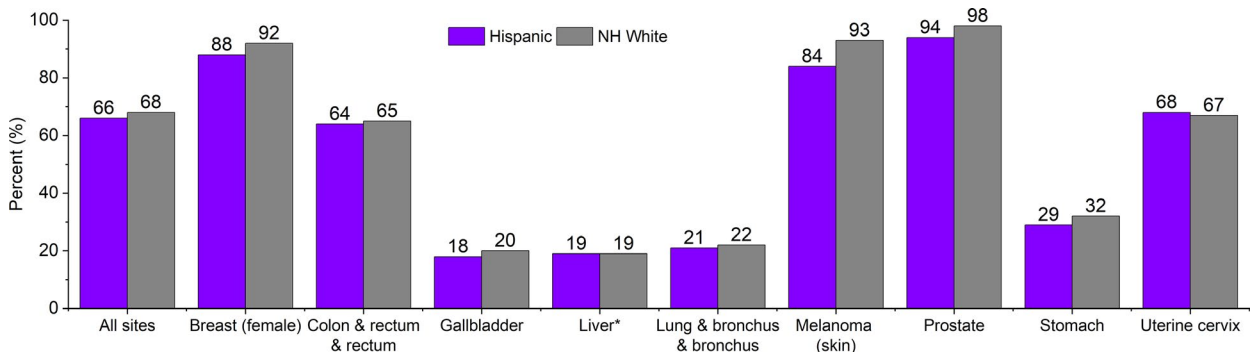
**FIGURE 4.** Stage Distribution for Selected Cancers in Hispanic and Non-Hispanic White Patients, United States, 2014 to 2018. Cases diagnosed in Puerto Rico were excluded. Percentages may not total 100% due to rounding. NH indicates non-Hispanic.

survival rate for ALL is 91% in Hispanic children and 93% in NHW children.<sup>14</sup>

**Gallbladder**

Gallbladder cancer is one of the few cancers diagnosed more often in women than in men, although trends in occurrence are generally similar by sex. In 2021, an estimated 1100

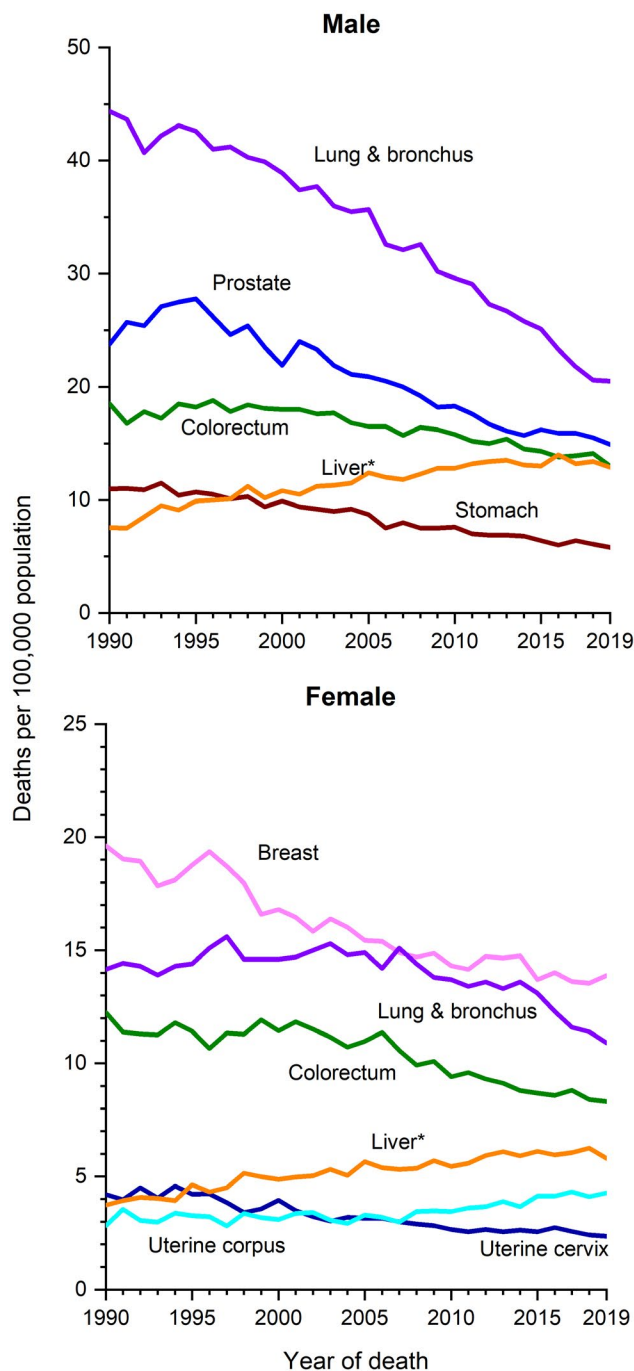
Hispanic women and 800 Hispanic men will be diagnosed with gallbladder cancer. Hispanic women in the United States have the second highest incidence and mortality rates, following American Indian/Alaska Native women.<sup>70</sup> The incidence rate in Hispanic women (2.5 per 100,000) is double that of Hispanic men (1.2 per 100,000) and NHW women (1.1 per



**FIGURE 5.** Five-Year Relative Survival (%) for Hispanic Versus Non-Hispanic White Patients, 2011 to 2017. Patients were diagnosed from 2011 through 2017, and all were followed through 2018. \*Liver includes the intrahepatic bile duct. NH indicates non-Hispanic.







**FIGURE 6.** Trends in Cancer Death Rates Among the Hispanic Population, 1990 to 2019. Rates are age adjusted to the 2000 US standard population. Deaths occurring in Puerto Rico were excluded. \*Liver includes the intrahepatic bile duct.

100,000) and triple that of NHW men (0.7 per 100,000) (Table 2). There is limited information on gallbladder cancer by Hispanic origin group in the United States largely because of the disease's rarity and low survival. Globally, the disease burden has a unique distribution, with the highest occurrence by far in Chile, where rates in women are more than 3 times those in any other country.<sup>71</sup> Rates are also high in

Mexico and in some South American countries (eg, Uruguay, Argentina, and Colombia), although they are similar to rates in the United States in most of Central America and Cuba.

Reasons for higher risk in women, and in Hispanic women in particular, are not well understood. The strongest known risk factor for gallbladder cancer is chronic gallstones (cholelithiasis); however, only a small proportion (1%-3%) of those with the condition develop cancer, and the presence of stones is neither sufficient nor necessary for malignancy.<sup>72,73</sup> Some risk factors for cholesterol gallstones, which are more prevalent and more strongly linked to gallbladder cancer than other types, are more common in Hispanic individuals than non-Hispanic individuals, including excess body weight, physical inactivity, and higher parity.<sup>72,74</sup> In addition, older age, exogenous estrogen use, and certain hereditary factors that affect cholesterol secretion in the bile also increase cholesterol gallstone risk.<sup>72,75</sup> Hormonal factors influencing gallstone disease risk may contribute to higher gallbladder cancer rates among women in general. Gallbladder cancer risk is also increased through chronic cholecystitis (inflammation), which may be due to multiple causes, including gallstones, primary sclerosing cholangitis, and possibly certain infections.<sup>72</sup>

Gallbladder cancer incidence and mortality trends are similar because of the high fatality rate. Over the past decade, incidence rates declined by approximately 1.5% per year in Hispanic individuals compared to 1% per year in NHWs (Table 4). Similarly, gallbladder cancer death rates declined by about 2.5% per year and 2% per year in Hispanic and NHW people, respectively. The disease typically does not exhibit symptoms until it is advanced, resulting in a late stage at diagnosis and a poor prognosis. The 5-year survival rate, which is similar by sex, is 18% among Hispanic patients and 20% among NHW patients. Approximately 1 in 7 Hispanic patients are diagnosed at a localized stage, for which 5-year relative survival is 62%. However, most patients are typically diagnosed with regional- or distant-stage disease, for which 5-year relative survival declines to 26% and 2%, respectively.

#### **Liver and intrahepatic bile duct**

In 2021, an estimated 7100 Hispanic men and women will be diagnosed with liver cancer, and 4100 will die from the disease. Incidence rates in Hispanic men and women are double those in NHWs (Table 2), similar to non-White racial and ethnic groups in the United States.<sup>32</sup> Notably, the risk of liver cancer in US-born Hispanic men is double that in foreign-born men.<sup>76</sup> For example, liver cancer death rates in California among US-born Mexican men were 21.6 per 100,000 during 2008 through 2012 versus 11.8 per 100,000 among foreign-born Mexican men.<sup>9</sup> The cause for this pattern is unclear but may reflect greater acculturation and a higher prevalence of liver cancer risk factors, such as hepatitis C virus (HCV) infection, obesity, and type 2 diabetes,

**TABLE 7. Current Cigarette Smoking, Electronic Cigarette Use, and Alcohol Consumption (%), Adults 18 Years and Older, United States, 2017 to 2019**

	HISPANIC			NH WHITE		
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
<b>Cigarette smoking (NHIS 2019)<sup>a</sup></b>	12	6	9	16	16	16
Origin (NHIS 2017-2018) <sup>b</sup>						
Puerto Rican	17	16	17	—	—	—
Mexican	14	6	10	—	—	—
Cuban	7	12	9	—	—	—
Dominican	c	c	c	—	—	—
Central/South American	9	4	6	—	—	—
Education (ages 25 y and older)						
≤12 y, no diploma	c	c	14	36	27	34
GED	c	c	22	37	41	38
High school diploma	15	5	10	26	25	25
Some college	9	6	7	18	19	19
College degree	8	5	7	6	6	6
Poverty status <sup>d</sup>						
Poor	15	10	12	33	36	35
Near poor	13	5	8	30	29	30
Non-poor	10	5	8	13	11	12
Health insurance status (ages 18-64 y)						
Uninsured	14	6	10	32	35	33
Insured	11	7	9	16	16	16
Immigration status <sup>e</sup>						
US-born	13	10	11	16	16	16
Foreign-born	11	3	7	17	8	13
<b>E-cigarette use (NHIS 2019)<sup>f</sup></b>	3	2	2	7	5	6
<b>Alcohol consumption (NHIS 2018)<sup>g</sup></b>	66	50	58	75	72	73
Light	33	29	31	33	37	35
Moderate	18	4	11	26	12	19
Heavy	4	1	3	6	7	7
Binge	31	14	23	36	27	32
Origin (NHIS 2017-2018) <sup>h</sup>						
Puerto Rican	23	21	22	—	—	—
Mexican	34	14	24	—	—	—
Cuban	24	c	16	—	—	—
Dominican	c	c	17	—	—	—
Central/South American	26	11	18	—	—	—

Abbreviations: GED, General Educational Development high school equivalency; NHIS, National Health Interview Survey; NH, non-Hispanic.

Note: Estimates are age adjusted to the 2000 US standard population. Estimates in this report may differ from earlier reports.

<sup>a</sup>These were individuals who ever smoked 100 cigarettes in lifetime and smoking every day or some days at time of survey.

<sup>b</sup>Estimates are based on 2017 and 2018 National Health Interview Survey data combined.

<sup>c</sup>An estimate is not provided due to instability.

<sup>d</sup>Poor indicates <99% of poverty threshold; near poor, 100% to ≤199% of poverty threshold; non-poor, ≥200% of poverty threshold.

<sup>e</sup>US-born includes those born in a US territory.

<sup>f</sup>This was defined as using e-cigarettes every day or some days at the time of the survey.

<sup>g</sup>Current consumption indicates ≥12 drinks in lifetime and ≥1 drink in past year; light, ≥12 drinks in lifetime and ≤3 drinks/week in past year; moderate, ≥12 drinks in lifetime and (male) 3-14 drinks/week in past year or (female) 3-7 drinks/week in past year; heavy, ≥12 drinks in lifetime and (male) >14 drinks/week in past year or (female) >7 drinks/week in past year; binge, current drinker and (male) ≥5 or (female) ≥4 drinks on at least 1 day in the past year.

<sup>h</sup>Estimates are based on 2017 and 2018 National Health Interview Survey data combined.

Source: National Health Interview Surveys, 2017, 2018, and 2019. Data exclude Puerto Rico.

among Hispanic men who are US-born compared with women.<sup>9,77</sup>

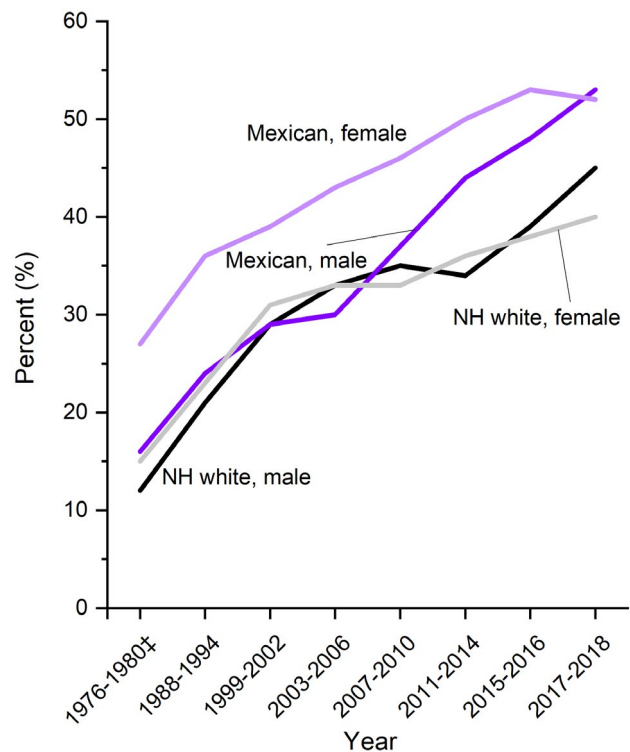
Trends in liver cancer mortality mirror those for incidence because of the disease's high fatality rate (Figs. 2 and 6). The long-term increase in liver cancer rates in the United States has primarily been attributed to the HCV infection epidemic beginning in the 1960s and peaking in the late 1980s.<sup>78,79</sup> Patterns of liver cancer occurrence in Hispanic individuals have been similar to those in NHWs since the early 1990s, when ethnicity information was first recorded in health and vital statistics data. Since 1995, incidence rates have increased by >50% in both Hispanic men and women. From 2009 through 2018, incidence rates in Hispanic individuals increased by 2% per year in women but were stable in men (Table 4). However, rates in both Hispanic and NHW individuals have begun to level off in the most recent 5 data years, which may reflect a maturation of the liver cancer burden associated with HCV infections in US-born baby boomers (those born between 1945 and 1965) in both groups.<sup>80</sup>

Contemporary HCV incidence appears to be higher in NHW individuals than in Hispanic individuals,<sup>81</sup> although prevalence varies by Hispanic origin group.<sup>82</sup> HCV-associated hepatocellular carcinoma accounts for more cases in Hispanic individuals than metabolic causes,<sup>83,84</sup> although obesity and type 2 diabetes will likely account for an increasing proportion of cases in the future.<sup>83</sup> Although obesity prevalence has begun to level off in NHWs in the past decade, it has continued to increase among Mexican individuals, particularly men (Fig. 7).<sup>85</sup> Among all Hispanic adults aged 20 years and older combined, 46% of women and 44% of men were obese in 2017 and 2018 compared with 45% and 40% of NHW men and women, respectively.<sup>6</sup> In addition, Hispanic individuals are twice as likely as NHWs to report being diagnosed with type 2 diabetes and are 50% more likely to die from the disease<sup>86</sup>; as such, Hispanic men and women face a disproportionate burden of metabolic-associated liver cancer.<sup>83</sup>

Five-year relative survival for liver cancer is approximately 19% for both Hispanic and NHW patients (Fig. 5). Even for the 45% of Hispanic patients diagnosed with localized disease (Fig. 4), 5-year relative survival is only 31%.<sup>14</sup>

### Stomach (gastric)

An estimated 4400 Hispanic men and women will be diagnosed with gastric cancer in 2021, and 2200 will die from the disease. Similar to liver cancer, gastric cancer rates in Hispanic individuals are similar to those in Asian/Pacific Islander, non-Hispanic Black, and American Indian/Alaska Native individuals<sup>32</sup> and are approximately double those in NHW individuals (Table 2). There is also variation among Hispanic origin groups, likely reflecting underlying differences in the prevalence of chronic infection with *Helicobacter*



**FIGURE 7.** Obesity\* (%) Trends in Mexican Americans and Non-Hispanic Whites, Adults Ages 20 to 74 years, United States, 1976 to 2018. Estimates are age adjusted to the 2000 US standard population. Data exclude Puerto Rico. \*Body mass index (BMI)  $\geq 30.0$  kg/m<sup>2</sup>. †Data for Mexican individuals are for 1982 to 1984. NH indicates non-Hispanic.

*pylori* (*H. pylori*), the strongest risk factor for noncardia cancers (90% of gastric cancers).<sup>87</sup> For example, gastric cancer death rates in Central and South American individuals are more than 2-fold those for Cuban individuals,<sup>46,47</sup> which may be partly explained by generally higher socioeconomic status among the latter and the low-to-intermediate prevalence of *H. pylori* in Cuba.<sup>88</sup> Conversely, infection is common in Central and South American immigrant countries of origin, where gastric cancer also remains common.<sup>34,89</sup>

The ethnic disparity in gastric cancer is driven exclusively by noncardia tumors, for which the incidence rate is 5.9 per 100,000 in Hispanics compared with 2.1 per 100,000 in NHWs. Conversely, the rate for cardia tumors, which are inversely associated with *H. pylori* infection and more strongly linked to obesity, is slightly lower in Hispanics (1.5 per 100,000) than in NHWs (2.3 per 100,000). Stomach cancer incidence and death rates have been declining in Hispanic individuals since at least the early 1990s (Fig. 6), probably because of declining *H. pylori* prevalence as a result of improved hygiene and advances in food preservation (eg, refrigeration).<sup>90</sup> The pace of the decline in stomach cancer rates has historically been more rapid in NHWs than in Hispanic individuals but has accelerated in recent years among the latter; from 2009 to 2018, stomach incidence rates declined by 1% to 2% per year in Hispanic men and women

and non-Hispanic White men but were stable among non-Hispanic White women. However, death rates for stomach cancer declined during the last 10 data years by approximately 2% per year in Hispanic men and women compared with 3% per year in NHW men and women (Table 4).

Five-year relative survival is lower in Hispanic versus NHW patients (29% vs 32%, respectively), which partly reflects the higher proportion of Hispanic patients diagnosed with distant-stage disease (36% vs 33%) as well as noncardia tumors. The 5-year relative survival for noncardia tumors is higher for NHW patients (38.4%; 95% CI, 37.2%-39.7%) than for Hispanic patients (32.6%; 95% CI, 31.1%-34.1%), whereas that for cardia tumors is more similar (23.5% [95% CI, 22.5%-24.5%] vs 22.3% [95% CI, 19.7%-25.1%], respectively).

### **Uterine cervix**

In 2021, an estimated 2700 Hispanic women will be diagnosed with cervical cancer (Fig. 1), and 600 will die from the disease. Hispanic women have among the highest incidence of cervical cancer in the United States compared with other major racial/ethnic groups, with rates 32% higher than those in NHWs (Table 2). Variation in rates between Hispanic groups may in part reflect differences in background rates in immigrant countries of origin, which vary up to 3-fold across Central and South America,<sup>91</sup> as well as differences in access to and uptake of cervical cancer screening (Table 6).

Between 1995 and 2018, incidence rates for cervical cancer declined by nearly one-half in Hispanic women (from 17.8 to 9.4 per 100,000) and by almost 30% in NHW women (from 9.4 to 6.8 per 100,000), whereas death rates declined by >35% from 1990 to 2019 in both groups (Figs. 2 and 6). These long-term declines are largely because of the uptake of cytologic screening with the Papanicolaou test for cervical cancer.<sup>92</sup> During the most recent 5 years of available data, however, incidence stabilized in both Hispanic and NHW women,<sup>36</sup> as did mortality in NHW women, whereas the death rate continued to decline among Hispanic women during 2010-2019 by approximately 2% per year (Table 4). Incidence trends may reflect stabilizing rates of cervical squamous cell carcinoma in NHW women and in some age groups among Hispanic women.<sup>93</sup> Rates for cervical adenocarcinoma are increasing among NHW women but, among Hispanic women, are stable (aged younger than 50 years) or declining (aged 50 years and older).

Hispanic women are as likely as NHW women to be diagnosed with local-stage disease (45%), despite a slightly lower prevalence of cervical cancer screening (83% vs 86%) (Table 6). Overall the 5-year relative survival rate for cervical cancer is similar for Hispanic women (68%) and NHW women (67%) (Fig. 5), although, when confined to women younger than 50 years, Hispanic women have slightly lower 5-year survival (75% vs 79%). It is important to note that the

American Cancer Society cervical cancer screening guidelines were revised in 2020 to recommend primary HPV testing for women ages 25 to 65 years.<sup>94</sup>

The 9-valent HPV vaccine has the potential to avert nearly 90% of all cancers caused by HPV.<sup>95</sup> A recent population-based study in Sweden to evaluate the efficacy of the quadrivalent vaccine in preventing invasive cervical cancer reported adjusted incidence rate ratios of 0.12 (95% CI, 0.00-0.34) and 0.47 (95% CI, 0.27-0.75) for women who had been vaccinated before age 17 years and between ages 17 and 30 years, respectively, compared with women who had not been vaccinated.<sup>96</sup> However, population-based US data to date are limited to ecologic studies.<sup>97</sup> In 2019, the proportion of Hispanic adolescents ages 13 to 17 years who had completed the HPV vaccination series was higher than the proportion of NHW adolescents for both girls (63% vs 54%, respectively) and boys (53% vs 49%, respectively).<sup>30</sup>

### **Cancer Occurrence in Puerto Rico**

Puerto Rico residents are especially vulnerable to cancer disparities because of socioeconomic inequalities; in 2019, approximately 44% of the population lived in poverty,<sup>98</sup> compared with 16% of other US Hispanic individuals and 7% of NHWs.<sup>99</sup> In addition, the population demographics of Puerto Rico have rapidly shifted in the last decade due to ongoing outmigration of young adults, as well as those displaced by Hurricane Maria in 2017, with the proportion of residents aged 65 years and older increasing from 14% in 2008 to 21% in 2018.<sup>100,101</sup> Although cancer data are only available for all races/ethnicities combined for Puerto Rico, 99% of the territory identifies as Hispanic; by race, 12% of residents identify as Black, and 5% identify as mixed race.<sup>102</sup>

Previous studies have reported that cancer trends and occurrence in Puerto Rico differ strikingly from those in the continental United States and Hawaii.<sup>23,103-106</sup> For example, one study found increasing CRC incidence and mortality rates among men in Puerto Rico in the early 2000s, when trends among all races/ethnicities combined were rapidly declining in the continental United States and Hawaii.<sup>104</sup> According to data for the most recent 5 years (2014-2018), CRC and prostate cancer incidence rates among men in Puerto Rico are 18% and 44% higher, respectively, than those in NHWs (Table 8),<sup>24</sup> in contrast to lower rates among other US Hispanic individuals. Conversely, lung cancer incidence rates are substantially lower among Puerto Rico residents compared with both NHWs and other US Hispanic individuals. Incidence rates for infection-related cancers in Puerto Rico are higher than those in NHWs but lower than those in other US Hispanic individuals, with the exception of certain HPV-related cancers (ie, cervical and oropharyngeal), for which rates in Puerto Rico are higher than those in other US Hispanic individuals. Rates for gallbladder cancer



**TABLE 8. Puerto Rico Cancer Incidence and Mortality Rates Compared With the Continental United States and Hawaii, 2014 to 2018**

	INCIDENCE					MORTALITY		
	PUERTO RICO <sup>a</sup>	NH WHITE		OTHER US HISPANIC		PUERTO RICO <sup>b</sup>	NH WHITE	OTHER US HISPANIC
	RATE	RATE	RATE RATIO <sup>c,d</sup>	RATE	RATE RATIO <sup>c,d</sup>	RATE	RATE	RATE
<b>All sites</b>								
Male	410.0	501.3	0.82	370.2	1.11	140.3	190.2	134.0
Female	334.3	442.8	0.76	339.2	0.99	89.2	137.8	94.6
<b>Breast (female)</b>	95.2	132.5	0.72	96.3	0.99 (NS)	17.6	20.1	13.8
<b>Colon &amp; rectum</b>								
Male	48.8	41.5	1.18	39.2	1.24	19.1	16.1	14.0
Female	33.6	31.3	1.07	27.6	1.21	11.5	11.5	8.6
<b>Liver &amp; intrahepatic bile duct</b>								
Male	13.3	10.9	1.22	20.3	0.66	9.1	8.4	13.3
Female	4.4	3.9	1.12	8.1	0.54	3.4	3.6	6.0
<b>Lung &amp; bronchus</b>								
Male	22.6	69.0	0.33	36.1	0.63	16.9	49.4	23.0
Female	11.5	56.0	0.21	24.2	0.48	7.8	35.6	12.3
<b>Oral cavity &amp; pharynx</b>								
Male	15.7	20.0	0.79	10.5	1.50	4.6	4.1	2.4
Female	4.9	7.0	0.70	4.3	1.15	0.9	1.4	0.8
<b>Prostate</b>	144.3	99.9	1.44	85.3	1.69	23.8	17.9	15.6
<b>Stomach</b>								
Male	9.4	7.4	1.28	12.0	0.79	5.4	3.1	6.3
Female	5.9	3.5	1.68	7.7	0.76	3.0	1.6	3.9
<b>Thyroid</b>								
Male	11.9	8.1	1.46	5.8	2.04	0.4	0.5	0.6
Female	44.5	22.0	2.03	21.2	2.10	0.4	0.5	0.7
<b>Uterine cervix</b>	12.9	7.2	1.78	9.6	1.34	2.2	2.0	2.6

Abbreviations: NH, non-Hispanic; NS, not statistically significant ( $P > .05$ ).

<sup>a</sup>Puerto Rico incidence data include all races/ethnicities combined.

<sup>b</sup>Mortality rates for Puerto Rico were derived from Sherman et al 2021<sup>24</sup>; mortality rate ratios are unavailable.

<sup>c</sup>The incidence rate ratio is the unrounded Puerto Rico incidence rate divided by unrounded incidence rate in the continental United States and Hawaii NH White or Hispanic populations.

<sup>d</sup>Rate ratios are statistically significant ( $P < .05$ ) unless otherwise indicated. Rates are age adjusted to the 2000 US standard population.

Source: Incidence and Puerto Rico mortality, North American Association of Central Cancer Registries, 2021; all other mortality, National Center for Health Statistics, Centers for Disease Control and Prevention, 2021.

and ALL, which disproportionately burden Hispanic individuals in the continental United States, were similar between Puerto Rico residents and NHWs (ALL: 1.5 vs 1.6 per 100,000, respectively; gallbladder cancer: 0.8 vs 0.9 per 100,000, respectively) and thus were 39% to 55% lower than the rates in other US Hispanic individuals.

Mortality differences generally mirror those for incidence, with higher rates among men in Puerto Rico compared with those in NHWs for cancers of the prostate (23.8 vs 17.9 per 100,000 during 2014–2018, respectively) and colorectum (19.1 vs 16.1 per 100,000).<sup>17,24</sup> Notably, despite having breast cancer incidence rates similar to those in

other US Hispanic women, women in Puerto Rico had 28% higher breast cancer mortality rates during 2014 through 2018 (17.6 vs 13.8 per 100,000, respectively) (Table 8). This disparity appears to have grown over time. Breast cancer is the leading cancer cause of death among women in Puerto Rico, accounting for 19% of cancer deaths during 2014 through 2018, whereas prostate cancer is the leading cancer cause of death among men in Puerto Rico (17%).

Cancer patterns in Puerto Rico reflect underlying cancer risk factors as well as differences in health care access and infrastructure. According to Behavioral Risk Factor Surveillance System data for all races/ethnicities combined,

current cigarette smoking prevalence was lower in Puerto Rico (10%) than in any US state except Utah (8%) and California (9%) in 2019,<sup>6</sup> which may reflect strong tobacco control policies (including against e-cigarette use) in the territory, such as high excise taxes and smoke-free/indoor use laws.<sup>107</sup> These policies have helped reduce current smoking prevalence in Puerto Rico from 15% in 2011 to 10% in 2019. Conversely, smoking levels are highest among Puerto Rican individuals in the continental United States and Hawaii (particularly US-born and females) versus individuals of other Hispanic origin (Table 7), pointing to the complex role of acculturation and gender in smoking behaviors.<sup>61,62</sup>

Prevalence in 2019 was similar or higher in Puerto Rico for other cancer risk factors, such as obesity (33% vs 32% [US median] for ages 18 years and older), physical inactivity (92% did not meet physical activity guidelines vs 77% [US median] for ages 18 years and older), and diabetes (14% vs 11% [US median] for ages 18 years and older).<sup>31</sup> In addition, CRC and cervical cancer screening rates are substantially lower in Puerto Rico compared with those in the United States overall,<sup>31</sup> although cancer control plans have been recently implemented to address this difference.<sup>108</sup> Conversely, higher use of the PSA test in Puerto Rico compared with the continental United States and Hawaii overall (but not compared with US Hispanic men) has been reported,<sup>31,105</sup> which likely influences higher prostate cancer incidence rates compared with US NHWs, in addition to the diverse racial makeup of residents, among whom 12% identify as Black.<sup>102</sup>

There are also several challenges for Puerto Rico's health care system, including an ongoing government debt crisis, outmigration of health care personnel, and federal disenfranchisement. The region largely is excluded from major national legislation, such as expansion of Medicaid to a broader group of low-income adults through the Affordable Care Act.<sup>109,110</sup> Furthermore, federal assistance to the Medicaid program in Puerto Rico functions as an annual block grant, with the federal government matching up to a set maximum amount; in contrast, state programs have no annual cap on the amount to which the federal matching assistance percentage applies. This is particularly challenging given that nearly one-half (46%) of the population is Medicaid-insured, compared with 20% in the continental United States overall.<sup>111</sup> In 2015, the disparity in federal support for health care resources in Puerto Rico compared with states was estimated to account for approximately \$25 billion of Puerto Rico's >\$70 billion debt.<sup>110</sup> Although some federal cancer control programs operate in Puerto Rico, such as the CDC's National Breast and Cervical Cancer Early Detection Program, which provides low-income and uninsured women access to breast and cervical cancer screening, most federal support is limited. However, despite these challenges and the additional infrastructure obstacles faced in

the aftermath of Hurricane Maria, experts have developed and implemented oncology protocols and support the development of plans within the official cancer control plans of states and territories, which are intended to limit the impact on patients in the event of future disasters.<sup>112,113</sup>

## Data Limitations and Future Challenges

Although the term *Hispanic* encompasses an extremely heterogeneous population with various lifestyle behaviors and cancer risks, population-based surveillance data in the United States are mostly limited to the aggregated Hispanic population, masking important differences between the different groups, eg, Mexican, Cuban, and Puerto Rican individuals, etc. In particular, caution should be used in comparing rates for Puerto Rico with aggregated rates for other US Hispanic individuals combined because it is not a direct comparison of the cancer risk in Puerto Rico with the risk among Puerto Rican individuals living in the continental United States and Hawaii.<sup>64,77,114</sup> In addition, cancer incidence and mortality in Hispanic individuals have only been available for the past 3 decades. Uniform coding of ethnicity in SEER registries began in 1992 and is based on medical records or through a match to a Spanish surname list.<sup>115</sup> Although the algorithm adds to initial counts of self-reported Hispanic individuals, undercounting may persist. In addition, although classification has improved substantially over time, mortality data for Hispanics should also be interpreted with caution because of potential inconsistencies in reporting ethnicity on death certificates.<sup>116</sup> Although some states reported Hispanic origin on death certificates as early as 1979, an Hispanic-origin item was not added to the US Standard Death Certificate until 1989 and was not adopted by every state until 1997. Finally, although the projected numbers of new cancer cases and deaths provide a reasonably accurate estimate of the current cancer burden in the United States, they cannot be used to track trends over time because they are model-based; age-standardized or age-specific cancer death rates from the National Center for Health Statistics and cancer incidence rates from SEER or NAACCR are the most accurate indicators of changes in cancer occurrence. These estimates also cannot account for the COVID-19 pandemic because final incidence and mortality data for 2020 are not yet available.

## Conclusions

Although cancer risk in US Hispanic individuals overall is generally low for the most common cancers compared with the risk in NHW individuals, death rates among Hispanic descendants approach or surpass those in NHWs, which will result in a growing cancer burden given that the majority of Hispanic population growth is now driven by birth rather than immigration. Efforts to further progress in cancer control in the continental United States, Hawaii, and Puerto

Rico must consider the substantial differences in cancer risk within this heterogeneous population as well as language barriers and cultural differences in values and beliefs. Evidence-based strategies for decreasing the cancer burden among Hispanic individuals include the use of culturally appropriate lay health advisors and patient navigators as well as targeted, community-based intervention programs to facilitate health care access and promote healthy behaviors.<sup>117-119</sup> Further funding for cancer control programs in Puerto Rico and support for cancer research and surveillance in the territory are necessary to reduce disparities for residents. Future research should continue to assess not only the

impact of the COVID-19 pandemic on utilization of cancer prevention and treatment services but also the subsequent impact on cancer incidence and mortality trends, stage at diagnosis, and cancer-related outcomes in the United States among Hispanic individuals and other racial/ethnic groups. Furthermore, given that the COVID-19 pandemic has disproportionately affected minority populations in the United States and that patients with cancer are more susceptible to COVID-19 complications, future studies should further evaluate the midterm and long-term impact of the pandemic on racial/ethnic disparities in cancer occurrence, complications, and death. ■

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