

# Cancer Statistics, 2013

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Each year, the American Cancer Society estimates the numbers of new cancer cases and deaths expected in the United States in the current year and compiles the most recent data on cancer incidence, mortality, and survival based on incidence data from the National Cancer Institute, the Centers for Disease Control and Prevention, and the North American Association of Central Cancer Registries and mortality data from the National Center for Health Statistics. A total of 1,660,290 new cancer cases and 580,350 cancer deaths are projected to occur in the United States in 2013. During the most recent 5 years for which there are data (2005-2009), delay-adjusted cancer incidence rates declined slightly in men (by 0.6% per year) and were stable in women, while cancer death rates decreased by 1.8% per year in men and by 1.5% per year in women. Overall, cancer death rates have declined 20% from their peak in 1991 (215.1 per 100,000 population) to 2009 (173.1 per 100,000 population). Death rates continue to decline for all 4 major cancer sites (lung, colorectum, breast, and prostate). Over the past 10 years of data (2000-2009), the largest annual declines in death rates were for chronic myeloid leukemia (8.4%), cancers of the stomach (3.1%) and colorectum (3.0%), and non-Hodgkin lymphoma (3.0%). The reduction in overall cancer death rates since 1990 in men and 1991 in women translates to the avoidance of approximately 1.18 million deaths from cancer, with 152,900 of these deaths averted in 2009 alone. Further progress can be accelerated by applying existing cancer control knowledge across all segments of the population, with an emphasis on those groups in the lowest socioeconomic bracket and other underserved populations. *CA Cancer J Clin* 2013;63:11-30. © 2013 American Cancer Society.

**Keywords:** cancer, incidence, mortality, survival, trends, deaths averted

## Introduction

Cancer is a major public health problem in the United States and many other parts of the world. One in 4 deaths in the United States is due to cancer. In this article, we provide the expected numbers of new cancer cases and deaths in 2013 nationally and by state, as well as an overview of current cancer statistics using data through 2009, including incidence, mortality, and survival rates and trends. We also estimate the total number of deaths averted as a result of the decline in cancer death rates since the early 1990s, and provide the actual reported numbers of deaths in 2009 by age for the 10 leading causes of death and the 5 leading cancer types.

## Materials and Methods

### Incidence and Mortality Data

Mortality data from 1930 to 2009 in the United States were obtained from the National Center for Health Statistics (NCHS).<sup>1,2</sup> There are several sources for cancer incidence data. The Surveillance, Epidemiology, and End Results (SEER) program of the National Cancer Institute reports long-term (beginning in 1973), high-quality, population-based incidence data covering up to 26% of the US population. Cancer incidence rates for long-term trends (1975-2009), 5-year relative and cause-specific survival rates (2002-2008), and estimations of the lifetime probability of developing cancer (2007-2009) were obtained from SEER registries.<sup>3-6</sup> The North American Association of Central Cancer Registries (NAACCR) compiles and reports incidence data from 1995 onward for cancer registries that participate in the SEER program or the Centers for Disease Control and Prevention's National Program of Cancer Registries (NPCR). Incidence data for state-level rates (2005-2009), trends by race/ethnicity (2000-2009), and estimated new cancer cases in 2013 were obtained from NAACCR.<sup>7</sup> Cancer cases were classified according to the *International Classification of Diseases for Oncology*.<sup>8</sup> All incidence and death rates are age-standardized to the 2000 US standard population and expressed per 100,000 persons.

Cancer incidence rates in this report are delay-adjusted whenever possible in order to account for anticipated future corrections to registry data due to inherent delays and errors in case reporting. Delay-adjusted rates primarily affect the most recent years of data for cancers that are frequently diagnosed in outpatient settings (eg, melanoma, leukemia, and prostate) and provide a more

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TABLE 1. Estimated New Cancer Cases and Deaths by Sex, United States, 2013\*

|                                               | ESTIMATED NEW CASES |                |                | ESTIMATED DEATHS |                |                |
|-----------------------------------------------|---------------------|----------------|----------------|------------------|----------------|----------------|
|                                               | BOTH SEXES          | MALE           | FEMALE         | BOTH SEXES       | MALE           | FEMALE         |
| <b>All sites</b>                              | <b>1,660,290</b>    | <b>854,790</b> | <b>805,500</b> | <b>580,350</b>   | <b>306,920</b> | <b>273,430</b> |
| <b>Oral cavity &amp; pharynx</b>              | <b>41,380</b>       | <b>29,620</b>  | <b>11,760</b>  | <b>7,890</b>     | <b>5,500</b>   | <b>2,390</b>   |
| Tongue                                        | 13,590              | 9,900          | 3,690          | 2,070            | 1,380          | 690            |
| Mouth                                         | 11,400              | 6,730          | 4,670          | 1,800            | 1,080          | 720            |
| Pharynx                                       | 13,930              | 11,200         | 2,730          | 2,400            | 1,790          | 610            |
| Other oral cavity                             | 2,460               | 1,790          | 670            | 1,640            | 1,260          | 380            |
| <b>Digestive system</b>                       | <b>290,200</b>      | <b>160,750</b> | <b>129,450</b> | <b>144,570</b>   | <b>82,700</b>  | <b>61,870</b>  |
| Esophagus                                     | 17,990              | 14,440         | 3,550          | 15,210           | 12,220         | 2,990          |
| Stomach                                       | 21,600              | 13,230         | 8,370          | 10,990           | 6,740          | 4,250          |
| Small intestine                               | 8,810               | 4,670          | 4,140          | 1,170            | 610            | 560            |
| Colon†                                        | 102,480             | 50,090         | 52,390         | 50,830           | 26,300         | 24,530         |
| Rectum                                        | 40,340              | 23,590         | 16,750         |                  |                |                |
| Anus, anal canal, & anorectum                 | 7,060               | 2,630          | 4,430          | 880              | 330            | 550            |
| Liver & intrahepatic bile duct                | 30,640              | 22,720         | 7,920          | 21,670           | 14,890         | 6,780          |
| Gallbladder & other biliary                   | 10,310              | 4,740          | 5,570          | 3,230            | 1,260          | 1,970          |
| Pancreas                                      | 45,220              | 22,740         | 22,480         | 38,460           | 19,480         | 18,980         |
| Other digestive organs                        | 5,750               | 1,900          | 3,850          | 2,130            | 870            | 1,260          |
| <b>Respiratory system</b>                     | <b>246,210</b>      | <b>131,760</b> | <b>114,450</b> | <b>163,890</b>   | <b>90,600</b>  | <b>73,290</b>  |
| Larynx                                        | 12,260              | 9,680          | 2,580          | 3,630            | 2,860          | 770            |
| Lung & bronchus                               | 228,190             | 118,080        | 110,110        | 159,480          | 87,260         | 72,220         |
| Other respiratory organs                      | 5,760               | 4,000          | 1,760          | 780              | 480            | 300            |
| <b>Bones &amp; joints</b>                     | <b>3,010</b>        | <b>1,680</b>   | <b>1,330</b>   | <b>1,440</b>     | <b>810</b>     | <b>630</b>     |
| <b>Soft tissue (including heart)</b>          | <b>11,410</b>       | <b>6,290</b>   | <b>5,120</b>   | <b>4,390</b>     | <b>2,500</b>   | <b>1,890</b>   |
| <b>Skin (excluding basal &amp; squamous)</b>  | <b>82,770</b>       | <b>48,660</b>  | <b>34,110</b>  | <b>12,650</b>    | <b>8,560</b>   | <b>4,090</b>   |
| Melanoma-skin                                 | 76,690              | 45,060         | 31,630         | 9,480            | 6,280          | 3,200          |
| Other nonepithelial skin                      | 6,080               | 3,600          | 2,480          | 3,170            | 2,280          | 890            |
| <b>Breast</b>                                 | <b>234,580</b>      | <b>2,240</b>   | <b>232,340</b> | <b>40,030</b>    | <b>410</b>     | <b>39,620</b>  |
| <b>Genital system</b>                         | <b>339,810</b>      | <b>248,080</b> | <b>91,730</b>  | <b>58,480</b>    | <b>30,400</b>  | <b>28,080</b>  |
| Uterine cervix                                | 12,340              |                | 12,340         | 4,030            |                | 4,030          |
| Uterine corpus                                | 49,560              |                | 49,560         | 8,190            |                | 8,190          |
| Ovary                                         | 22,240              |                | 22,240         | 14,030           |                | 14,030         |
| Vulva                                         | 4,700               |                | 4,700          | 990              |                | 990            |
| Vagina & other genital, female                | 2,890               |                | 2,890          | 840              |                | 840            |
| Prostate                                      | 238,590             | 238,590        |                | 29,720           | 29,720         |                |
| Testis                                        | 7,920               | 7,920          |                | 370              | 370            |                |
| Penis & other genital, male                   | 1,570               | 1,570          |                | 310              | 310            |                |
| <b>Urinary system</b>                         | <b>140,430</b>      | <b>96,800</b>  | <b>43,630</b>  | <b>29,790</b>    | <b>20,120</b>  | <b>9,670</b>   |
| Urinary bladder                               | 72,570              | 54,610         | 17,960         | 15,210           | 10,820         | 4,390          |
| Kidney & renal pelvis                         | 65,150              | 40,430         | 24,720         | 13,680           | 8,780          | 4,900          |
| Ureter & other urinary organs                 | 2,710               | 1,760          | 950            | 900              | 520            | 380            |
| <b>Eye &amp; orbit</b>                        | <b>2,800</b>        | <b>1,490</b>   | <b>1,310</b>   | <b>320</b>       | <b>120</b>     | <b>200</b>     |
| <b>Brain &amp; other nervous system</b>       | <b>23,130</b>       | <b>12,770</b>  | <b>10,360</b>  | <b>14,080</b>    | <b>7,930</b>   | <b>6,150</b>   |
| <b>Endocrine system</b>                       | <b>62,710</b>       | <b>16,210</b>  | <b>46,500</b>  | <b>2,770</b>     | <b>1,270</b>   | <b>1,500</b>   |
| Thyroid                                       | 60,220              | 14,910         | 45,310         | 1,850            | 810            | 1,040          |
| Other endocrine                               | 2,490               | 1,300          | 1,190          | 920              | 460            | 460            |
| <b>Lymphoma</b>                               | <b>79,030</b>       | <b>42,670</b>  | <b>36,360</b>  | <b>20,200</b>    | <b>11,250</b>  | <b>8,950</b>   |
| Hodgkin lymphoma                              | 9,290               | 5,070          | 4,220          | 1,180            | 660            | 520            |
| Non-Hodgkin lymphoma                          | 69,740              | 37,600         | 32,140         | 19,020           | 10,590         | 8,430          |
| <b>Myeloma</b>                                | <b>22,350</b>       | <b>12,440</b>  | <b>9,910</b>   | <b>10,710</b>    | <b>6,070</b>   | <b>4,640</b>   |
| <b>Leukemia</b>                               | <b>48,610</b>       | <b>27,880</b>  | <b>20,730</b>  | <b>23,720</b>    | <b>13,660</b>  | <b>10,060</b>  |
| Acute lymphocytic leukemia                    | 6,070               | 3,350          | 2,720          | 1,430            | 820            | 610            |
| Chronic lymphocytic leukemia                  | 15,680              | 9,720          | 5,960          | 4,580            | 2,750          | 1,830          |
| Acute myeloid leukemia                        | 14,590              | 7,820          | 6,770          | 10,370           | 5,930          | 4,440          |
| Chronic myeloid leukemia                      | 5,920               | 3,420          | 2,500          | 610              | 340            | 270            |
| Other leukemia‡                               | 6,350               | 3,570          | 2,780          | 6,730            | 3,820          | 2,910          |
| <b>Other &amp; unspecified primary sites†</b> | <b>31,860</b>       | <b>15,450</b>  | <b>16,410</b>  | <b>45,420</b>    | <b>25,020</b>  | <b>20,400</b>  |

\*Rounded to the nearest 10; estimated new cases exclude basal cell and squamous cell skin cancers and in situ carcinomas except urinary bladder. About 64,640 carcinoma in situ of the female breast and 61,300 melanoma in situ will be newly diagnosed in 2013.

†Estimated deaths for colon and rectum cancers are combined.

‡More deaths than cases may reflect lack of specificity in recording underlying cause of death on death certificates and/or an undercount in the case estimate.

accurate portrayal of the cancer burden in the most recent time period.<sup>9</sup> For example, melanoma incidence rates adjusted for delays in reporting are 14% higher than unadjusted rates in the most recent reporting year. Delay-adjusted rates are available

for SEER registry data and were obtained from the National Cancer Institute. Incidence trends presented for the most recent 5 years (2005-2009) are based on delay-adjusted rates from SEER 13 cancer registries.<sup>4</sup>

**TABLE 2. Incidence Rates for All Cancers Combined (2005-2009) and Estimated New Cases\* for Selected Cancers (2013) by State**

| STATE                | INCIDENCE RATE† | ALL SITES        | FEMALE BREAST  | UTERINE CERVIX | COLORECTUM     | UTERINE CORPUS | LEUKEMIA      | LUNG & BRONCHUS | MELANOMA OF THE SKIN | NON-HODGKIN LYMPHOMA | PROSTATE       | URINARY BLADDER |
|----------------------|-----------------|------------------|----------------|----------------|----------------|----------------|---------------|-----------------|----------------------|----------------------|----------------|-----------------|
| Alabama              | 473.2           | 27,080           | 3,720          | 200            | 2,390          | 610            | 640           | 4,550           | 1,300                | 990                  | 3,940          | 960             |
| Alaska               | 474.6           | 3,290            | 510            | ‡              | 310            | 90             | 100           | 470             | 90                   | 140                  | 440            | 140             |
| Arizona              | 394.9           | 34,010           | 4,660          | 220            | 2,630          | 860            | 920           | 4,250           | 1,400                | 1,360                | 4,340          | 1,400           |
| Arkansas§            | 461.8           | 16,330           | 2,280          | 150            | 1,540          | 370            | 450           | 2,700           | 530                  | 680                  | 2,370          | 610             |
| California           | 444.1           | 171,330          | 25,360         | 1,480          | 14,690         | 5,160          | 5,210         | 18,720          | 8,530                | 7,280                | 23,740         | 6,920           |
| Colorado             | 436.6           | 23,410           | 3,300          | 160            | 1,880          | 690            | 840           | 2,550           | 1,310                | 1,050                | 3,870          | 990             |
| Connecticut          | 515.0           | 21,180           | 3,050          | 110            | 1,670          | 740            | 570           | 2,780           | 1,080                | 890                  | 2,940          | 1,090           |
| Delaware             | 519.7           | 5,370            | 770            | ‡              | 430            | 170            | 140           | 760             | 300                  | 220                  | 860            | 250             |
| Dist. of Columbia§   | 468.5           | 2,920            | 450            | ‡              | 240            | 90             | 70            | 320             | 90                   | 100                  | 500            | 90              |
| Florida              | 458.1           | 118,320          | 15,710         | 940            | 10,290         | 3,110          | 3,490         | 17,960          | 5,330                | 5,060                | 17,330         | 5,720           |
| Georgia              | 467.3           | 49,280           | 7,310          | 420            | 3,970          | 1,230          | 1,290         | 6,690           | 2,360                | 1,810                | 7,930          | 1,610           |
| Hawaii               | 443.4           | 6,650            | 960            | 50             | 730            | 240            | 180           | 900             | 380                  | 240                  | 800            | 200             |
| Idaho                | 463.2           | 7,670            | 1,010          | 50             | 670            | 220            | 270           | 930             | 420                  | 360                  | 1,330          | 380             |
| Illinois             | 491.4           | 66,090           | 9,350          | 500            | 6,140          | 2,150          | 2,020         | 9,270           | 2,480                | 2,840                | 9,230          | 2,990           |
| Indiana              | 467.8           | 35,550           | 4,540          | 260            | 3,250          | 1,040          | 1,000         | 5,500           | 1,470                | 1,460                | 4,310          | 1,560           |
| Iowa                 | 489.9           | 17,480           | 2,310          | 90             | 1,640          | 580            | 590           | 2,350           | 980                  | 790                  | 2,270          | 810             |
| Kansas               | 480.3           | 14,370           | 2,160          | 90             | 1,250          | 440            | 450           | 1,930           | 800                  | 650                  | 2,020          | 600             |
| Kentucky             | 523.1           | 25,100           | 3,300          | 190            | 2,300          | 700            | 720           | 4,560           | 1,540                | 1,100                | 3,130          | 1,060           |
| Louisiana            | 496.6           | 24,930           | 3,630          | 220            | 2,400          | 550            | 660           | 3,740           | 770                  | 950                  | 4,040          | 930             |
| Maine                | 522.3           | 9,190            | 1,150          | 50             | 730            | 310            | 280           | 1,380           | 440                  | 390                  | 1,290          | 530             |
| Maryland             | 460.6           | 30,680           | 4,760          | 220            | 2,410          | 950            | 780           | 4,040           | 1,530                | 1,180                | 4,880          | 1,220           |
| Massachusetts        | 506.8           | 38,250           | 5,820          | 210            | 2,910          | 1,280          | 990           | 4,880           | 1,840                | 1,590                | 5,700          | 2,060           |
| Michigan             | 492.7           | 57,560           | 8,140          | 330            | 4,730          | 1,920          | 1,750         | 8,250           | 2,900                | 2,530                | 9,490          | 2,860           |
| Minnesota            | 483.8           | 28,410           | 4,260          | 120            | 2,220          | 890            | 950           | 3,860           | 1,020                | 1,210                | 4,090          | 1,190           |
| Mississippi          | 485.2           | 15,830           | 2,080          | 130            | 1,580          | 340            | 390           | 2,630           | 550                  | 560                  | 2,490          | 540             |
| Missouri             | 474.6           | 33,950           | 4,680          | 250            | 3,110          | 1,040          | 980           | 5,410           | 1,500                | 1,480                | 4,170          | 1,480           |
| Montana              | 468.8           | 5,450            | 740            | ‡              | 510            | 160            | 180           | 700             | 250                  | 260                  | 870            | 280             |
| Nebraska             | 475.9           | 9,060            | 1,230          | 50             | 910            | 290            | 310           | 1,220           | 460                  | 430                  | 1,290          | 420             |
| Nevada               | 454.6           | 13,830           | 1,760          | 120            | 1,350          | 330            | 400           | 1,970           | 440                  | 520                  | 1,900          | 660             |
| New Hampshire        | 507.6           | 8,470            | 1,180          | 50             | 640            | 290            | 240           | 1,150           | 410                  | 350                  | 1,180          | 460             |
| New Jersey           | 509.0           | 49,440           | 6,960          | 460            | 4,640          | 1,740          | 1,430         | 5,960           | 2,520                | 2,190                | 7,190          | 2,450           |
| New Mexico           | 418.8           | 10,090           | 1,360          | 80             | 860            | 270            | 330           | 1,050           | 460                  | 400                  | 1,610          | 380             |
| New York             | 498.5           | 108,760          | 14,950         | 850            | 9,210          | 3,850          | 3,270         | 13,480          | 4,200                | 4,740                | 16,720         | 5,510           |
| North Carolina       | 484.1           | 53,200           | 7,430          | 360            | 4,260          | 1,430          | 1,470         | 8,040           | 2,620                | 2,080                | 8,150          | 2,070           |
| North Dakota         | 478.4           | 3,510            | 450            | ‡              | 370            | 100            | 120           | 460             | 150                  | 150                  | 550            | 170             |
| Ohio                 | 470.8           | 66,610           | 9,060          | 440            | 5,890          | 2,230          | 1,770         | 10,230          | 2,960                | 2,840                | 8,530          | 3,020           |
| Oklahoma             | 484.2           | 20,160           | 2,690          | 170            | 1,780          | 500            | 610           | 3,370           | 770                  | 840                  | 2,500          | 790             |
| Oregon               | 469.3           | 21,720           | 3,310          | 120            | 1,610          | 670            | 620           | 2,860           | 1,410                | 950                  | 3,380          | 1,030           |
| Pennsylvania         | 505.3           | 79,560           | 10,490         | 480            | 7,390          | 2,720          | 2,240         | 10,980          | 3,890                | 3,440                | 9,450          | 3,980           |
| Rhode Island         | 514.1           | 6,280            | 900            | ‡              | 530            | 210            | 180           | 870             | 270                  | 250                  | 820            | 340             |
| South Carolina       | 465.6           | 27,620           | 3,580          | 220            | 2,340          | 710            | 760           | 4,390           | 1,320                | 1,040                | 4,160          | 1,070           |
| South Dakota         | 433.9           | 4,570            | 600            | ‡              | 430            | 140            | 150           | 620             | 200                  | 200                  | 730            | 220             |
| Tennessee            | 475.7           | 36,580           | 5,070          | 280            | 3,180          | 900            | 990           | 6,200           | 1,900                | 1,450                | 4,990          | 1,440           |
| Texas                | 452.1           | 112,230          | 14,980         | 1,110          | 9,750          | 2,870          | 3,740         | 15,000          | 3,930                | 4,830                | 15,730         | 4,030           |
| Utah                 | 400.1           | 10,810           | 1,550          | 70             | 740            | 320            | 380           | 800             | 720                  | 490                  | 1,960          | 420             |
| Vermont              | 496.3           | 4,200            | 550            | ‡              | 320            | 130            | 110           | 590             | 220                  | 170                  | 560            | 210             |
| Virginia§            | 460.3           | 40,870           | 6,280          | 300            | 3,270          | 1,240          | 990           | 5,380           | 2,380                | 1,590                | 6,840          | 1,590           |
| Washington           | 486.4           | 37,290           | 5,610          | 230            | 2,730          | 1,140          | 1,160         | 4,700           | 2,350                | 1,650                | 5,690          | 1,690           |
| West Virginia        | 496.8           | 11,450           | 1,460          | 80             | 1,180          | 350            | 330           | 2,100           | 540                  | 470                  | 1,470          | 530             |
| Wisconsin§           | 463.2           | 31,590           | 4,490          | 190            | 2,610          | 1,080          | 1,050         | 4,310           | 1,250                | 1,400                | 4,370          | 1,530           |
| Wyoming              | 444.7           | 2,700            | 380            | ‡              | 240            | 80             | 80            | 320             | 130                  | 120                  | 430            | 130             |
| <b>United States</b> | <b>473.4</b>    | <b>1,660,290</b> | <b>232,340</b> | <b>12,340</b>  | <b>142,820</b> | <b>49,560</b>  | <b>48,610</b> | <b>228,190</b>  | <b>76,690</b>        | <b>69,740</b>        | <b>238,590</b> | <b>72,570</b>   |

\*Rounded to the nearest 10; excludes basal cell and squamous cell skin cancers and in situ carcinomas except urinary bladder.

†Rates are per 100,000 and age adjusted to the 2000 US standard population.

‡Estimate is fewer than 50 cases.

§Rate is for cases diagnosed during 2005 to 2008.

Note: These model-based estimates are offered as a rough guide and should be interpreted with caution. State estimates may not add to US total due to rounding and the exclusion of states with fewer than 50 cases.

## Projected Cancer Cases and Deaths in 2013

The precise number of cancer cases diagnosed each year in the nation and in every state is unknown because cancer registration is incomplete in some states. Furthermore, the most recent

year for which incidence and mortality data are available lags 3 to 4 years behind the current year due to the time required for data collection, compilation, quality control, and dissemination. Therefore, we project the numbers of new cancer cases and

**Estimated New Cases\***

|                       |                |             | Males                                                                             | Females                                                                           |                       |                |             |
|-----------------------|----------------|-------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------|----------------|-------------|
| Prostate              | 238,590        | 28%         |  |  | Breast                | 232,340        | 29%         |
| Lung & bronchus       | 118,080        | 14%         |                                                                                   |                                                                                   | Lung & bronchus       | 110,110        | 14%         |
| Colorectum            | 73,680         | 9%          |                                                                                   |                                                                                   | Colorectum            | 69,140         | 9%          |
| Urinary bladder       | 54,610         | 6%          |                                                                                   |                                                                                   | Uterine corpus        | 49,560         | 6%          |
| Melanoma of the skin  | 45,060         | 5%          |                                                                                   |                                                                                   | Thyroid               | 45,310         | 6%          |
| Kidney & renal pelvis | 40,430         | 5%          |                                                                                   |                                                                                   | Non-Hodgkin lymphoma  | 32,140         | 4%          |
| Non-Hodgkin lymphoma  | 37,600         | 4%          |                                                                                   |                                                                                   | Melanoma of the skin  | 31,630         | 4%          |
| Oral cavity & pharynx | 29,620         | 3%          |                                                                                   |                                                                                   | Kidney & renal pelvis | 24,720         | 3%          |
| Leukemia              | 27,880         | 3%          |                                                                                   |                                                                                   | Pancreas              | 22,480         | 3%          |
| Pancreas              | 22,740         | 3%          |                                                                                   |                                                                                   | Ovary                 | 22,240         | 3%          |
| <b>All Sites</b>      | <b>854,790</b> | <b>100%</b> |                                                                                   |                                                                                   | <b>All Sites</b>      | <b>805,500</b> | <b>100%</b> |

**Estimated Deaths**

|                                |                |             | Males                                                                              | Females                                                                            |                                |                |             |
|--------------------------------|----------------|-------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------|----------------|-------------|
| Lung & bronchus                | 87,260         | 28%         |  |  | Lung & bronchus                | 72,220         | 26%         |
| Prostate                       | 29,720         | 10%         |                                                                                    |                                                                                    | Breast                         | 39,620         | 14%         |
| Colorectum                     | 26,300         | 9%          |                                                                                    |                                                                                    | Colorectum                     | 24,530         | 9%          |
| Pancreas                       | 19,480         | 6%          |                                                                                    |                                                                                    | Pancreas                       | 18,980         | 7%          |
| Liver & intrahepatic bile duct | 14,890         | 5%          |                                                                                    |                                                                                    | Ovary                          | 14,030         | 5%          |
| Leukemia                       | 13,660         | 4%          |                                                                                    |                                                                                    | Leukemia                       | 10,060         | 4%          |
| Esophagus                      | 12,220         | 4%          |                                                                                    |                                                                                    | Non-Hodgkin lymphoma           | 8,430          | 3%          |
| Urinary bladder                | 10,820         | 4%          |                                                                                    |                                                                                    | Uterine corpus                 | 8,190          | 3%          |
| Non-Hodgkin lymphoma           | 10,590         | 3%          |                                                                                    |                                                                                    | Liver & intrahepatic bile duct | 6,780          | 2%          |
| Kidney & renal pelvis          | 8,780          | 3%          |                                                                                    |                                                                                    | Brain & other nervous system   | 6,150          | 2%          |
| <b>All Sites</b>               | <b>306,920</b> | <b>100%</b> |                                                                                    |                                                                                    | <b>All Sites</b>               | <b>273,430</b> | <b>100%</b> |

**FIGURE 1. Ten Leading Cancer Types for the Estimated New Cancer Cases and Deaths by Sex, United States, 2013.**

\*Estimates are rounded to the nearest 10 and exclude basal cell and squamous cell skin cancers and in situ carcinoma except urinary bladder.

deaths in the United States in 2013 in order to provide an estimate of the contemporary cancer burden. The methods for projecting both new cases and deaths in the current year were recently modified so estimates should not be compared from year to year.

We projected the number of new invasive cancer cases that will be diagnosed in 2013 (with the exception of urinary bladder, for which in situ cases are included) using a 2-step process that first estimates complete incidence counts by state during years for which observed data are available, and then projects these counts 4 years ahead for the United States overall and each state individually.<sup>10</sup> To estimate counts for each state through 2009, we used a spatiotemporal model based on incidence data for 1995 through 2009 from 49 states and the District of Columbia that met NAACCR's high-quality data standard for incidence, covering about 98% of the US population.<sup>11</sup> (Minnesota cancer registry data could not be included in the model because county-level data were unavailable.) This method accounts for expected delays in case reporting and considers geographic variations in sociodemographic and lifestyle factors, medical settings,

and cancer screening behaviors as predictors of incidence. A temporal projection method (the vector autoregressive model) was then applied to the estimated counts to obtain projections for 2013. For the complete details of this methodology, please refer to Zhu et al.<sup>10</sup>

To estimate the numbers of new breast carcinoma in situ (female) and melanoma in situ cases in 2013, we first estimated the number of in situ cases occurring annually from 2000 through 2009 in the United States by applying the age-specific incidence rates in the 18 SEER areas to the corresponding US population estimates provided in SEER\*Stat.<sup>12</sup> We then projected the total number of cases in 2013 based on the annual percent change from 2000 through 2009 generated by the joinpoint regression model.<sup>13</sup>

We estimated the number of cancer deaths expected to occur in 2013 in the United States overall and in each state using the joinpoint regression model based on the actual numbers of cancer deaths from 1995 through 2009 at the state and national levels as reported to the NCHS.<sup>1</sup> For the complete details of this methodology, please refer to Chen et al.<sup>14</sup>

**TABLE 3. Death Rates for All Cancers Combined (2005-2009) and Estimated Deaths\* for Selected Cancers (2013) by State**

| STATE                | DEATH RATE†  | ALL SITES      | BRAIN & OTHER NERVOUS SYSTEM | FEMALE BREAST | COLORECTUM    | LEUKEMIA      | LIVER & INTRAHEPATIC BILE DUCT | LUNG & BRONCHUS | NON-HODGKIN LYMPHOMA | OVARY         | PANCREAS      | PROSTATE      |
|----------------------|--------------|----------------|------------------------------|---------------|---------------|---------------|--------------------------------|-----------------|----------------------|---------------|---------------|---------------|
| Alabama              | 198.2        | 10,430         | 250                          | 690           | 970           | 400           | 330                            | 3,290           | 320                  | 270           | 630           | 550           |
| Alaska               | 181.3        | 980            | ‡                            | 70            | 80            | ‡             | ‡                              | 270             | ‡                    | ‡             | 60            | 50            |
| Arizona              | 152.8        | 11,210         | 310                          | 790           | 990           | 480           | 460                            | 2,850           | 400                  | 310           | 740           | 630           |
| Arkansas             | 199.7        | 6,650          | 150                          | 420           | 610           | 270           | 200                            | 2,170           | 200                  | 150           | 390           | 320           |
| California           | 163.1        | 57,290         | 1,590                        | 4,220         | 5,150         | 2,460         | 2,980                          | 12,700          | 2,000                | 1,540         | 4,010         | 3,390         |
| Colorado             | 154.6        | 7,350          | 230                          | 510           | 680           | 320           | 290                            | 1,710           | 250                  | 230           | 500           | 440           |
| Connecticut          | 173.4        | 6,890          | 170                          | 460           | 470           | 290           | 230                            | 1,740           | 230                  | 170           | 530           | 400           |
| Delaware             | 190.4        | 1,940          | 50                           | 120           | 170           | 70            | 80                             | 580             | 60                   | 50            | 120           | 100           |
| Dist. of Columbia    | 196.5        | 1,030          | ‡                            | 80            | 100           | ‡             | 50                             | 240             | ‡                    | ‡             | 80            | 80            |
| Florida              | 170.0        | 42,370         | 880                          | 2,660         | 3,640         | 1,770         | 1,550                          | 12,070          | 1,400                | 930           | 2,770         | 2,200         |
| Georgia              | 179.2        | 16,010         | 360                          | 1,200         | 1,450         | 600           | 530                            | 4,670           | 460                  | 410           | 1,010         | 790           |
| Hawaii               | 147.8        | 2,400          | ‡                            | 140           | 230           | 80            | 120                            | 580             | 80                   | 50            | 210           | 110           |
| Idaho                | 165.8        | 2,660          | 90                           | 180           | 220           | 120           | 80                             | 670             | 100                  | 60            | 200           | 180           |
| Illinois             | 186.6        | 24,000         | 530                          | 1,610         | 2,230         | 1,010         | 750                            | 6,560           | 780                  | 550           | 1,620         | 1,230         |
| Indiana              | 195.4        | 13,250         | 320                          | 850           | 1,120         | 550           | 370                            | 4,110           | 440                  | 300           | 820           | 590           |
| Iowa                 | 178.3        | 6,420          | 190                          | 400           | 580           | 280           | 200                            | 1,780           | 230                  | 170           | 390           | 350           |
| Kansas               | 178.8        | 5,430          | 150                          | 360           | 490           | 250           | 170                            | 1,590           | 210                  | 140           | 350           | 240           |
| Kentucky             | 211.3        | 9,970          | 200                          | 590           | 880           | 340           | 270                            | 3,510           | 300                  | 200           | 540           | 390           |
| Louisiana            | 204.0        | 9,040          | 210                          | 650           | 860           | 330           | 380                            | 2,670           | 260                  | 190           | 580           | 420           |
| Maine                | 192.8        | 3,240          | 90                           | 190           | 250           | 130           | 90                             | 950             | 110                  | 60            | 200           | 160           |
| Maryland             | 184.1        | 10,480         | 230                          | 800           | 930           | 410           | 380                            | 2,810           | 310                  | 250           | 730           | 560           |
| Massachusetts        | 180.0        | 12,840         | 310                          | 810           | 1,020         | 500           | 500                            | 3,530           | 400                  | 340           | 910           | 650           |
| Michigan             | 187.5        | 20,570         | 540                          | 1,360         | 1,700         | 910           | 670                            | 5,940           | 730                  | 490           | 1,460         | 890           |
| Minnesota            | 169.9        | 9,610          | 250                          | 610           | 770           | 440           | 330                            | 2,500           | 340                  | 240           | 630           | 520           |
| Mississippi          | 204.7        | 6,300          | 140                          | 420           | 630           | 250           | 210                            | 2,010           | 170                  | 110           | 380           | 330           |
| Missouri             | 191.4        | 12,730         | 310                          | 890           | 1,100         | 540           | 420                            | 3,940           | 380                  | 240           | 820           | 560           |
| Montana              | 172.5        | 2,000          | 50                           | 120           | 180           | 90            | 50                             | 550             | 70                   | 50            | 130           | 140           |
| Nebraska             | 174.0        | 3,440          | 100                          | 210           | 340           | 140           | 90                             | 900             | 130                  | 80            | 230           | 210           |
| Nevada               | 183.0        | 4,760          | 140                          | 360           | 450           | 180           | 210                            | 1,480           | 140                  | 100           | 350           | 290           |
| New Hampshire        | 179.5        | 2,680          | 70                           | 170           | 200           | 100           | 80                             | 750             | 80                   | 60            | 200           | 140           |
| New Jersey           | 179.0        | 16,410         | 340                          | 1,330         | 1,560         | 630           | 570                            | 4,060           | 530                  | 440           | 1,180         | 750           |
| New Mexico           | 158.2        | 3,540          | 90                           | 240           | 350           | 140           | 170                            | 770             | 110                  | 90            | 240           | 230           |
| New York             | 166.7        | 34,240         | 780                          | 2,390         | 3,020         | 1,450         | 1,410                          | 8,790           | 1,090                | 900           | 2,500         | 1,770         |
| North Carolina       | 186.3        | 18,620         | 390                          | 1,260         | 1,510         | 710           | 620                            | 5,660           | 550                  | 420           | 1,150         | 910           |
| North Dakota         | 171.1        | 1,280          | ‡                            | 90            | 130           | 60            | ‡                              | 310             | ‡                    | ‡             | 90            | 80            |
| Ohio                 | 194.9        | 25,130         | 590                          | 1,720         | 2,170         | 980           | 750                            | 7,350           | 800                  | 560           | 1,620         | 1,240         |
| Oklahoma             | 194.8        | 7,850          | 190                          | 490           | 720           | 300           | 270                            | 2,440           | 260                  | 170           | 440           | 380           |
| Oregon               | 179.8        | 7,820          | 230                          | 490           | 660           | 320           | 310                            | 2,110           | 280                  | 220           | 520           | 460           |
| Pennsylvania         | 187.5        | 28,680         | 600                          | 1,950         | 2,540         | 1,190         | 930                            | 7,640           | 1,020                | 730           | 1,950         | 1,430         |
| Rhode Island         | 180.4        | 2,140          | 50                           | 130           | 170           | 100           | 80                             | 600             | 60                   | 50            | 130           | 100           |
| South Carolina       | 187.9        | 9,800          | 220                          | 660           | 820           | 360           | 340                            | 2,990           | 280                  | 210           | 600           | 500           |
| South Dakota         | 168.2        | 1,590          | 50                           | 110           | 150           | 60            | ‡                              | 440             | 50                   | ‡             | 110           | 90            |
| Tennessee            | 200.6        | 14,080         | 360                          | 910           | 1,220         | 520           | 460                            | 4,600           | 440                  | 280           | 800           | 630           |
| Texas                | 171.3        | 37,180         | 940                          | 2,650         | 3,390         | 1,490         | 1,950                          | 9,670           | 1,210                | 850           | 2,340         | 1,650         |
| Utah                 | 128.4        | 2,790          | 110                          | 260           | 240           | 150           | 90                             | 450             | 120                  | 80            | 220           | 210           |
| Vermont              | 176.2        | 1,300          | ‡                            | 80            | 100           | 50            | 50                             | 380             | ‡                    | ‡             | 90            | 60            |
| Virginia             | 183.2        | 14,720         | 320                          | 1,110         | 1,270         | 580           | 480                            | 4,130           | 460                  | 370           | 1,020         | 740           |
| Washington           | 176.7        | 12,390         | 350                          | 800           | 980           | 520           | 530                            | 3,260           | 440                  | 360           | 850           | 730           |
| West Virginia        | 206.6        | 4,660          | 100                          | 280           | 440           | 170           | 120                            | 1,480           | 160                  | 100           | 230           | 190           |
| Wisconsin            | 178.6        | 11,220         | 310                          | 700           | 880           | 520           | 370                            | 2,980           | 400                  | 300           | 770           | 630           |
| Wyoming              | 169.8        | 950            | ‡                            | 60            | 80            | ‡             | ‡                              | 240             | ‡                    | ‡             | 70            | 50            |
| <b>United States</b> | <b>178.7</b> | <b>580,350</b> | <b>14,080</b>                | <b>39,620</b> | <b>50,830</b> | <b>23,720</b> | <b>21,670</b>                  | <b>159,480</b>  | <b>19,020</b>        | <b>14,030</b> | <b>38,460</b> | <b>29,720</b> |

\*Rounded to the nearest 10.

†Rates are per 100,000 and age adjusted to the 2000 US standard population.

‡Estimate is fewer than 50 deaths.

Note: State estimates may not add to US total due to rounding and the exclusion of states with fewer than 50 deaths.

## Other Statistics

The estimated numbers of cancer deaths averted in men and women due to the reduction in overall cancer death rates were calculated by applying the 5-year age-specific cancer death rates in the peak year for age-standardized cancer death rates (1990 in men and 1991 in women) to the corresponding age-specific

populations in the subsequent years through 2009 to obtain the number of expected deaths in each calendar year if the death rates had not decreased. We then summed the difference between the number of expected and observed deaths in each age group and calendar year for men and women separately.



TABLE 4. Probability (%) of Developing Invasive Cancers Within Selected Age Intervals by Sex, United States, 2007 to 2009\*

|                              |        | BIRTH TO 39        | 40 TO 59        | 60 TO 69        | 70 AND OLDER    | BIRTH TO DEATH  |
|------------------------------|--------|--------------------|-----------------|-----------------|-----------------|-----------------|
| <b>All sites†</b>            | Male   | 1.46 (1 in 69)     | 8.79 (1 in 11)  | 16.03 (1 in 6)  | 38.07 (1 in 3)  | 44.81 (1 in 2)  |
|                              | Female | 2.20 (1 in 46)     | 9.19 (1 in 11)  | 10.39 (1 in 10) | 26.69 (1 in 4)  | 38.17 (1 in 3)  |
| <b>Urinary bladder‡</b>      | Male   | 0.02 (1 in 4,924)  | 0.37 (1 in 272) | 0.92 (1 in 109) | 3.69 (1 in 27)  | 3.81 (1 in 26)  |
|                              | Female | 0.01 (1 in 12,663) | 0.12 (1 in 864) | 0.24 (1 in 410) | 0.98 (1 in 106) | 1.15 (1 in 90)  |
| <b>Breast</b>                | Female | 0.50 (1 in 202)    | 3.78 (1 in 26)  | 3.56 (1 in 28)  | 6.65 (1 in 15)  | 12.38 (1 in 8)  |
|                              | Male   | 0.08 (1 in 1,212)  | 0.94 (1 in 106) | 1.40 (1 in 71)  | 4.19 (1 in 24)  | 5.17 (1 in 19)  |
| <b>Colorectum</b>            | Female | 0.08 (1 in 1,236)  | 0.75 (1 in 134) | 0.98 (1 in 102) | 3.80 (1 in 26)  | 4.78 (1 in 21)  |
|                              | Male   | 0.08 (1 in 1,212)  | 0.94 (1 in 106) | 1.40 (1 in 71)  | 4.19 (1 in 24)  | 5.17 (1 in 19)  |
| <b>Leukemia</b>              | Female | 0.13 (1 in 746)    | 0.15 (1 in 655) | 0.21 (1 in 481) | 0.81 (1 in 123) | 1.14 (1 in 88)  |
|                              | Male   | 0.03 (1 in 3,552)  | 0.92 (1 in 109) | 2.27 (1 in 44)  | 6.82 (1 in 15)  | 7.77 (1 in 13)  |
| <b>Lung &amp; bronchus</b>   | Female | 0.03 (1 in 3,287)  | 0.76 (1 in 131) | 1.72 (1 in 58)  | 4.93 (1 in 20)  | 6.35 (1 in 16)  |
|                              | Male   | 0.15 (1 in 691)    | 0.63 (1 in 160) | 0.77 (1 in 130) | 2.02 (1 in 50)  | 2.87 (1 in 35)  |
| <b>Melanoma of the skin§</b> | Female | 0.26 (1 in 391)    | 0.55 (1 in 181) | 0.40 (1 in 248) | 0.84 (1 in 120) | 1.85 (1 in 54)  |
|                              | Male   | 0.13 (1 in 753)    | 0.44 (1 in 225) | 0.60 (1 in 167) | 1.77 (1 in 57)  | 2.34 (1 in 43)  |
| <b>Non-Hodgkin lymphoma</b>  | Female | 0.09 (1 in 1,147)  | 0.31 (1 in 322) | 0.44 (1 in 229) | 1.40 (1 in 72)  | 1.93 (1 in 52)  |
|                              | Male   | 0.01 (1 in 7,964)  | 2.68 (1 in 37)  | 6.78 (1 in 15)  | 12.06 (1 in 8)  | 16.15 (1 in 6)  |
| <b>Prostate</b>              | Female | 0.16 (1 in 641)    | 0.27 (1 in 374) | 0.13 (1 in 795) | 0.18 (1 in 551) | 0.68 (1 in 147) |
|                              | Male   | 0.07 (1 in 1,348)  | 0.77 (1 in 129) | 0.89 (1 in 112) | 1.25 (1 in 80)  | 2.64 (1 in 38)  |

\*For people free of cancer at beginning of age interval.

†All sites excludes basal cell and squamous cell skin cancers and in situ cancers except urinary bladder.

‡Includes in situ cancer cases.

§Statistics for whites only.

## Selected Findings

### Expected Numbers of New Cancer Cases

Table 1 presents the estimated numbers of new cases of invasive cancer expected among men and women in the United States in 2013. The overall estimate of more than 1.6 million new cases does not include carcinoma in situ of any site except urinary bladder, nor does it include basal cell or squamous cell cancers of the skin. About 64,640 cases of breast carcinoma in situ and 61,300 cases of melanoma in situ are expected to be newly diagnosed in 2013. The estimated numbers of new cancer cases by state for selected cancer sites are shown in Table 2.

Figure 1 indicates the most common cancers expected to occur in men and women in 2013. Among men, cancers of the prostate, lung and bronchus, and colorectum will account for about 50% of all newly diagnosed cancers; prostate cancer alone will account for 28% (238,590) of incident cases in men. The 3 most commonly diagnosed types of cancer among women in 2013 will be breast, lung and bronchus, and colorectum, accounting for 51% of estimated cancer cases in women. Breast cancer alone is expected to account for 29% (232,340) of all new cancer cases among women.

### Expected Numbers of Cancer Deaths

Table 1 also shows the expected numbers of deaths from cancer projected for 2013. It is estimated that about 580,350 Americans will die from cancer this year, corresponding to almost 1600 deaths per day. Cancers of the lung and bronchus, prostate, and colorectum in men and cancers of the lung and bronchus, breast, and colorectum

in women continue to be the most common causes of cancer death. These 4 cancers account for almost half (48%) of the total cancer deaths among men and women (Fig. 1). In 2013, lung cancer is expected to account for 26% of all female cancer deaths and 28% of all male cancer deaths. Table 3 provides the estimated numbers of cancer deaths in 2013 by state for selected cancer sites.

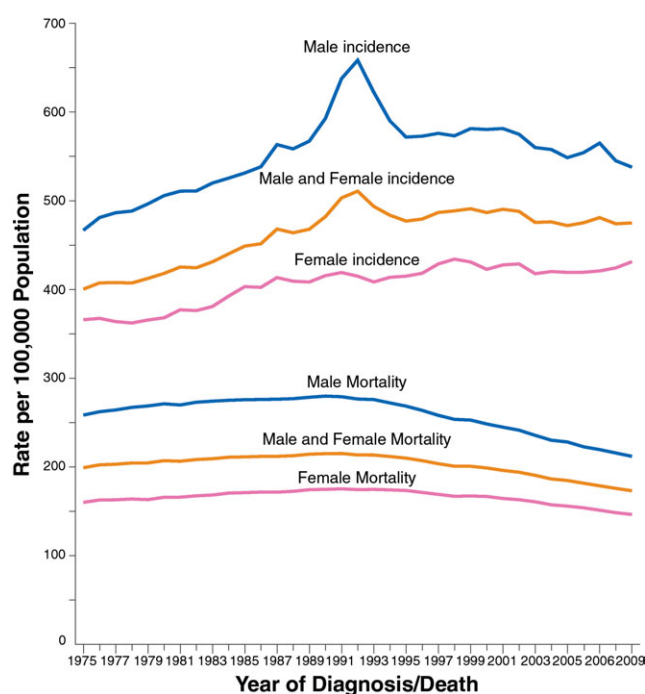
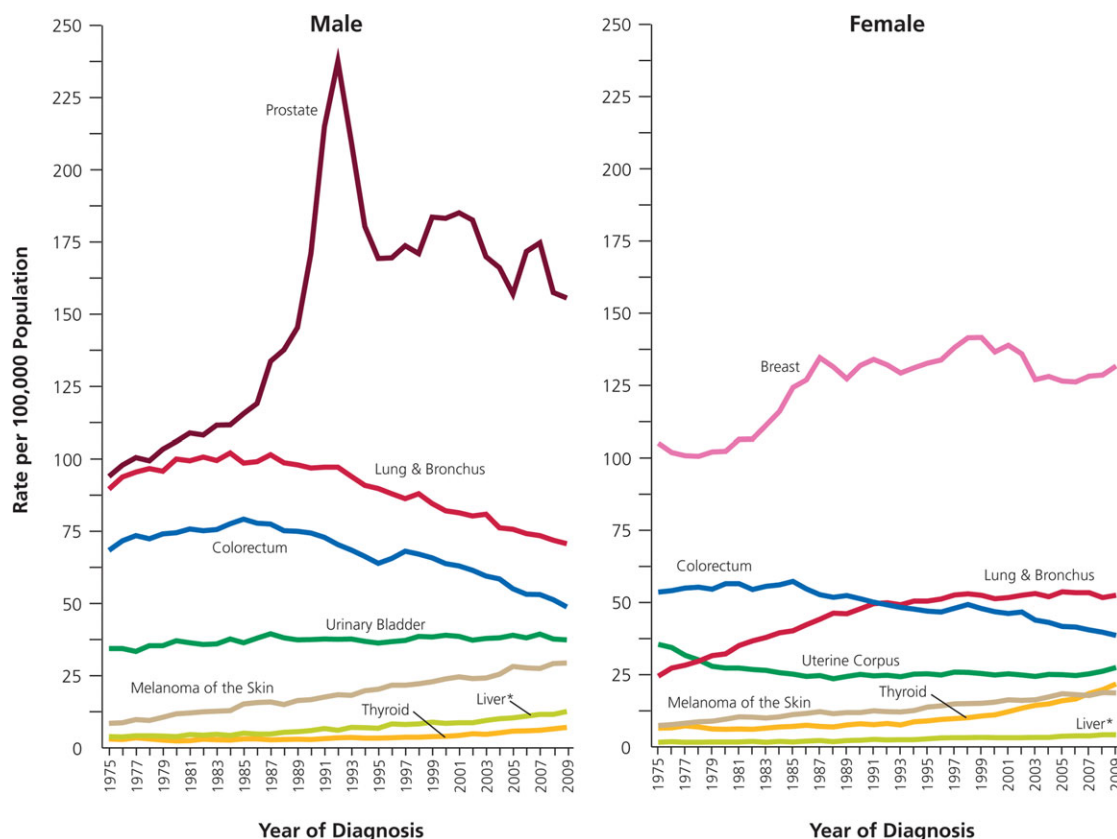


FIGURE 2. Trends in Cancer Incidence and Death Rates by Sex, United States, 1975 to 2009.

Rates are age adjusted to the 2000 US standard population. Incidence rates are adjusted for delays in reporting.



**FIGURE 3. Trends in Incidence Rates for Selected Cancers by Sex, United States, 1975 to 2009.**

Rates are age adjusted to the 2000 US standard population and adjusted for delays in reporting.

\*Liver includes intrahepatic bile duct.

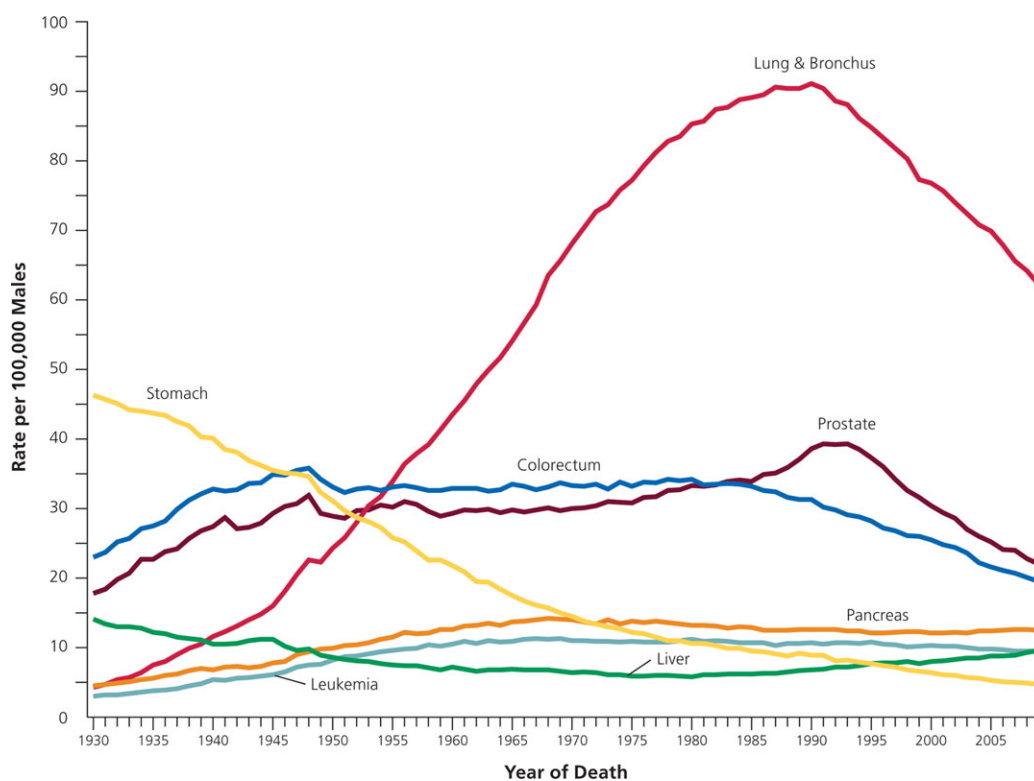
### Lifetime Probability of Developing Cancer

The lifetime probability of being diagnosed with an invasive cancer is higher for men (45%) than for women (38%) (Table 4). However, because of the earlier median age at diagnosis for breast cancer compared with other major cancers, women have a slightly higher probability of developing cancer before age 60 years. These estimates are based on the average experience of the general population and may over- or underestimate individual risk because of differences in exposure (eg, smoking history) and/or genetic susceptibility.

### Trends in Cancer Incidence

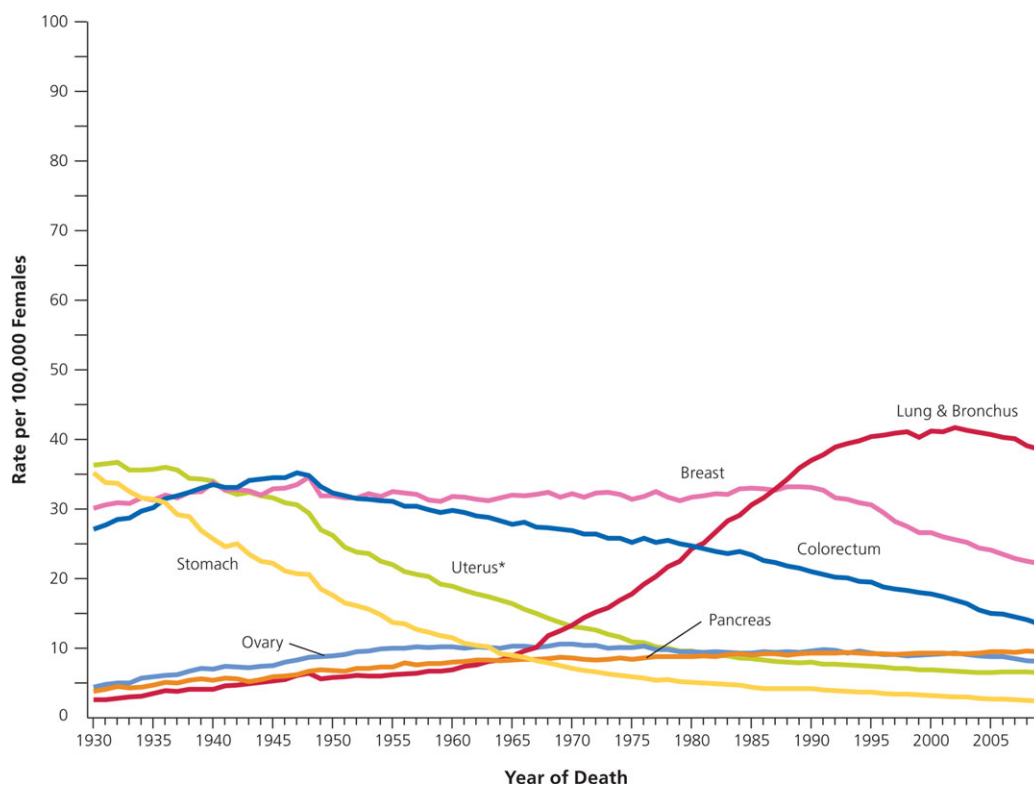
Figures 2 to 5 depict long-term trends in cancer incidence and death rates for all cancers combined and for selected cancer sites by sex. While incidence rates are declining for most cancer sites, they are increasing among both men and women for melanoma of the skin and cancers of the liver and thyroid (Fig. 3, Table 5). Table 5 shows incidence (delay-adjusted) and mortality trends for all cancers combined and for selected cancer sites based on joinpoint regression analysis. Joinpoint is a tool used to describe and quantify trends by fitting observed rates to lines connected at “joinpoints” where trends change in direction or magnitude.<sup>13,15</sup>

According to data from the SEER 13 cancer registries, incidence rates in the most recent 5 years (2005-2009) decreased in males by 0.6% per year and were stable in females (Table 5). Incidence rates are decreasing for all 4 major cancer sites except female breast, for which rates remained relatively stable from 2005 to 2009 after decreasing by 2% per year from 1999 to 2005. Lung cancer incidence rates in women began declining in the late 1990s, more than a decade after the decline began in men.<sup>6</sup> Differences in lung cancer incidence patterns between men and women reflect historical differences in tobacco use; cigarette smoking prevalence peaked about 20 years later in women than in men.<sup>16</sup> Recent rapid declines in colorectal cancer incidence rates have largely been attributed to increases in screening that can detect and allow the removal of precancerous polyps.<sup>17-19</sup> Although joinpoint trend analysis shows that the incidence rate for prostate cancer declined steadily by 1.9% per year from 2000 to 2009, it is important to realize that annual rates fluctuate widely (Fig. 3), likely reflecting variation in the prevalence of prostate-specific antigen testing for the detection of prostate cancer. For example, in the SEER 13 areas, the delay-adjusted prostate cancer incidence rate increased from 154 (per 100,000) to 164 from 2005 to 2006, then dropped from 168 to 153 from 2007 to 2008.



**FIGURE 4. Trends in Death Rates Among Males for Selected Cancers, United States, 1930 to 2009.**

Rates are age adjusted to the 2000 US standard population. Due to changes in International Classification of Diseases (ICD) coding, numerator information has changed over time. Rates for cancers of the lung and bronchus, colorectum, and liver are affected by these changes.



**FIGURE 5. Trends in Death Rates Among Females for Selected Cancers, United States, 1930 to 2009.**

Rates are age adjusted to the 2000 US standard population. Due to changes in International Classification of Diseases (ICD) coding, numerator information has changed over time. Rates for cancers of the uterus, ovary, lung and bronchus, and colorectum are affected by these changes.

\*Uterus includes uterine cervix and uterine corpus.



TABLE 5. Trends in Cancer Incidence (Delay-Adjusted) and Death Rates for Selected Cancers by Sex, United States, 1992 to 2009

|                                           | TREND 1   |        | TREND 2   |       | TREND 3   |       | 2005-2009 AAPC |
|-------------------------------------------|-----------|--------|-----------|-------|-----------|-------|----------------|
|                                           | YEARS     | APC    | YEARS     | APC   | YEARS     | APC   |                |
| <b>All sites</b>                          |           |        |           |       |           |       |                |
| <b>Incidence</b>                          |           |        |           |       |           |       |                |
| Male                                      | 1992-1994 | -5.6*  | 1994-2009 | -0.6* |           |       | -0.6*          |
| Female                                    | 1992-1998 | 0.8*   | 1998-2006 | -0.5* | 2006-2009 | 1.0   | 0.6            |
| <b>Death</b>                              |           |        |           |       |           |       |                |
| Male                                      | 1992-2001 | -1.4*  | 2001-2009 | -1.8* |           |       | -1.8*          |
| Female                                    | 1992-1994 | -0.2   | 1994-2002 | -0.8* | 2002-2009 | -1.5* | -1.5*          |
| <b>Lung &amp; bronchus</b>                |           |        |           |       |           |       |                |
| <b>Incidence</b>                          |           |        |           |       |           |       |                |
| Male                                      | 1992-2009 | -1.9*  |           |       |           |       | -1.9*          |
| Female                                    | 1992-1997 | 0.7    | 1997-2009 | -0.3* |           |       | -0.3*          |
| <b>Death</b>                              |           |        |           |       |           |       |                |
| Male                                      | 1992-2005 | -1.9*  | 2005-2009 | -2.8* |           |       | -2.8*          |
| Female                                    | 1992-2002 | 0.6*   | 2002-2009 | -1.0* |           |       | -1.0*          |
| <b>Colorectum</b>                         |           |        |           |       |           |       |                |
| <b>Incidence</b>                          |           |        |           |       |           |       |                |
| Male                                      | 1992-1995 | -2.6*  | 1995-1998 | 1.5   | 1998-2009 | -2.6* | -2.6*          |
| Female                                    | 1992-1995 | -1.8*  | 1995-1998 | 1.9   | 1998-2009 | -2.1* | -2.1*          |
| <b>Death</b>                              |           |        |           |       |           |       |                |
| Male                                      | 1992-2002 | -2.0*  | 2002-2005 | -4.0* | 2005-2009 | -2.4* | -2.4*          |
| Female                                    | 1992-2001 | -1.7*  | 2001-2009 | -3.1* |           |       | -3.1*          |
| <b>Liver &amp; intrahepatic bile duct</b> |           |        |           |       |           |       |                |
| <b>Incidence</b>                          |           |        |           |       |           |       |                |
| Male                                      | 1992-2009 | 3.7*   |           |       |           |       | 3.7*           |
| Female                                    | 1992-2009 | 3.0*   |           |       |           |       | 3.0*           |
| <b>Death</b>                              |           |        |           |       |           |       |                |
| Male                                      | 1992-2009 | 2.3*   |           |       |           |       | 2.3*           |
| Female                                    | 1992-2009 | 1.3*   |           |       |           |       | 1.3*           |
| <b>Melanoma of skin</b>                   |           |        |           |       |           |       |                |
| <b>Incidence</b>                          |           |        |           |       |           |       |                |
| Male                                      | 1992-2009 | 2.5*   |           |       |           |       | 2.5*           |
| Female                                    | 1992-1997 | 3.9*   | 1997-2009 | 1.7*  |           |       | 1.7*           |
| <b>Death</b>                              |           |        |           |       |           |       |                |
| Male                                      | 1992-2009 | 0.4*   |           |       |           |       | 0.4*           |
| Female                                    | 1992-2009 | -0.5*  |           |       |           |       | -0.5*          |
| <b>Thyroid</b>                            |           |        |           |       |           |       |                |
| <b>Incidence</b>                          |           |        |           |       |           |       |                |
| Male                                      | 1992-1996 | -1.4   | 1996-2009 | 5.6*  |           |       | 5.6*           |
| Female                                    | 1992-1999 | 4.1*   | 1999-2009 | 7.0*  |           |       | 7.0*           |
| <b>Death</b>                              |           |        |           |       |           |       |                |
| Male                                      | 1992-2009 | 1.6*   |           |       |           |       | 1.6*           |
| Female                                    | 1992-1994 | -6.4   | 1994-2009 | 0.8*  |           |       | 0.8*           |
| <b>Female breast</b>                      |           |        |           |       |           |       |                |
| <b>Incidence</b>                          | 1992-1999 | 1.3*   | 1999-2005 | -2.0* | 2005-2009 | 1.1   | 1.1            |
| <b>Death</b>                              | 1992-1995 | -1.3*  | 1995-1998 | -3.4* | 1998-2009 | -1.9* | -1.9*          |
| <b>Prostate</b>                           |           |        |           |       |           |       |                |
| <b>Incidence</b>                          | 1992-1995 | -11.1* | 1995-2000 | 2.0   | 2000-2009 | -1.9* | -1.9*          |
| <b>Death</b>                              | 1992-1994 | -1.3   | 1994-2009 | -3.7* |           |       | -3.7*          |

APC indicates annual percent change based on incidence (delay-adjusted) and mortality rates age adjusted to the 2000 US standard population; AAPC, average annual percent change.

\*The APC or AAPC is significantly different from 0 ( $P < .05$ ).

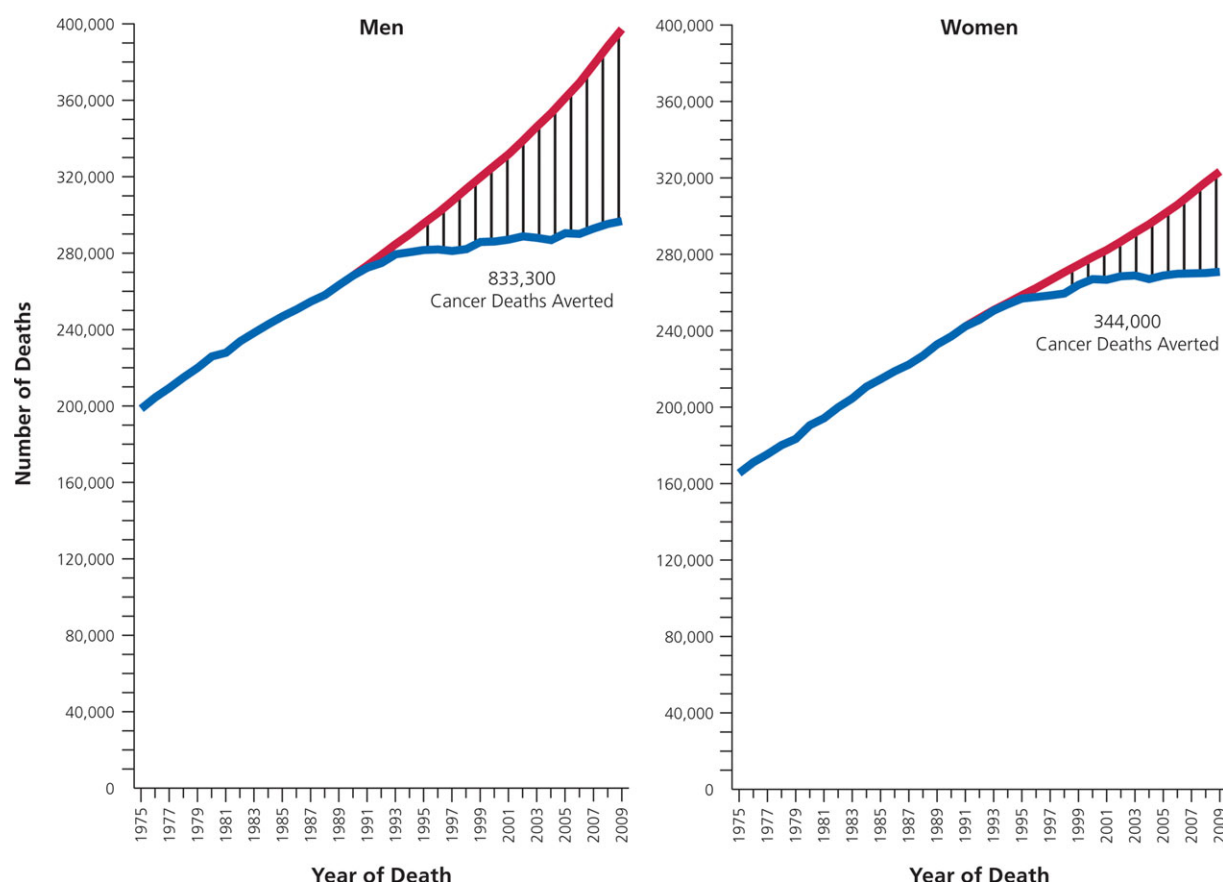
Note: Trends analyzed by the Joinpoint Regression Program, version 3.5.0, allowing up to 3 joinpoints. Incidence trends based on Surveillance, Epidemiology, and End Results (SEER) 13 areas.

## Trends in Cancer Mortality

Cancer death rates decreased by 1.8% per year in males and by 1.5% per year in females during the most recent 5 years of data (2005-2009). These declines have been consistent since 2001 and 2002 in men and women, respectively, and are larger in magnitude than those occurring in the previous decade (Table 5). Death rates peaked in men in 1990 (279.8 per 100,000), in women in 1991 (175.3 per 100,000), and overall in 1991 (215.1 per 100,000).

Between 1990/1991 and 2009, cancer death rates decreased 24% in men, 16% in women, and 20% overall. Figure 6 shows that as a result of almost two decades of consistent declines in cancer death rates, about 1,177,300 cancer deaths were averted, 152,900 of these in 2009 alone.

Death rates continue to decrease for the 4 major cancer sites (Figs. 4 and 5). Over the past two decades of data, death rates have decreased from their peak by more than 30% for cancers of the colorectum, female breast, and male



**FIGURE 6. Total Number of Cancer Deaths Averted From 1991 to 2009 in Men and From 1992 to 2009 in Women.**

The blue line represents the actual number of cancer deaths recorded in each year, and the red line represents the number of cancer deaths that would have been expected if cancer death rates had remained at their peak.

lung, and by more than 40% for prostate cancer. The decrease in lung cancer death rates—among men since 1990 and among women since 2002—is due to the reduction in tobacco use,<sup>20</sup> while the decrease in death rates for female breast, colorectal, and prostate cancers largely reflects improvements in early detection and/or treatment.<sup>17,21,22</sup> Over the past 10 years of data (2000–2009), the largest annual declines in death rates were for chronic myeloid leukemia (8.4%), cancers of the stomach (3.1%) and colorectum (3.0%), and non-Hodgkin lymphoma (3.0%).

#### Recorded Number of Deaths From Cancer in 2009

A total of 2,437,163 deaths were recorded in the United States in 2009, 567,628 of these from cancer.<sup>23</sup> Cancer is the second leading cause of death, following heart disease, accounting for 23% of all deaths. However, within 20-year age groups, cancer is the leading cause of death among both men and women aged 40 to 79 years (Table 6).

Table 7 presents the numbers of deaths for all cancers combined and for the 5 most common sites for each 20-year age group. Among males, leukemia is the leading cause of cancer death among those aged younger than

40 years, while lung cancer ranks first among men aged 40 years and older. Among females, tumors of the brain and other nervous system are the leading cause of cancer death among children and adolescents (aged younger than 20 years), breast cancer ranks first among women aged 20 to 59 years, and lung cancer causes the most cancer deaths in those aged 60 years and older.

#### Regional Variations in Cancer Rates

Tables 8 and 9 depict cancer incidence and death rates for selected cancers by state. Lung cancer shows the largest geographic variation in cancer occurrence by far, reflecting the large historical and continuing differences in smoking prevalence among states.<sup>20</sup> For example, lung cancer incidence rates in Kentucky, which has historically had the highest smoking prevalence, are almost 4-fold higher than those in Utah, which has the lowest smoking prevalence (128 vs 34 cases per 100,000 men). In contrast, state variations for other cancer sites are smaller in both absolute and proportionate terms. For example, the breast cancer incidence rate in Connecticut, which has the highest rate (137 per 100,000 women), is only 28% higher than that in Arizona, which has the lowest

TABLE 6. Ten Leading Causes of Death by Age and Sex, United States, 2009

|    | ALL AGES                                            |                                                     | AGES 1 TO 19                                |                                             | AGES 20 TO 39                                |                                             | AGES 40 TO 59                                |                                              | AGES 60 TO 79                                      |                                                    | AGES ≥80                                            |                                                      |
|----|-----------------------------------------------------|-----------------------------------------------------|---------------------------------------------|---------------------------------------------|----------------------------------------------|---------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------------|----------------------------------------------------|-----------------------------------------------------|------------------------------------------------------|
|    | MALE<br>All Causes<br>1,217,379                     | FEMALE<br>All Causes<br>1,219,784                   | MALE<br>All Causes<br>13,919                | FEMALE<br>All Causes<br>7,702               | MALE<br>All Causes<br>62,116                 | FEMALE<br>All Causes<br>28,792              | MALE<br>All Causes<br>227,801                | FEMALE<br>All Causes<br>142,628              | MALE<br>All Causes<br>467,962                      | FEMALE<br>All Causes<br>373,658                    | MALE<br>All Causes<br>430,581                       | FEMALE<br>All Causes<br>655,337                      |
| 1  | Heart diseases<br>307,225                           | Heart diseases<br>292,188                           | Accidents (unintentional injuries)<br>5,317 | Accidents (unintentional injuries)<br>2,645 | Accidents (unintentional injuries)<br>21,388 | Accidents (unintentional injuries)<br>7,228 | Cancer<br>54,483                             | Cancer<br>50,579                             | Cancer<br>154,168                                  | Cancer<br>127,506                                  | Heart diseases<br>130,332                           | Heart diseases<br>193,676                            |
| 2  | Cancer<br>296,763                                   | Cancer<br>270,865                                   | Assault (homicide)<br>2,031                 | Cancer<br>848                               | Intentional self-harm (suicide)<br>8,977     | Cancer<br>4,629                             | Heart diseases<br>52,826                     | Heart diseases<br>21,353                     | Heart diseases<br>118,163                          | Heart diseases<br>74,294                           | Cancer<br>82,765                                    | Cancer<br>87,264                                     |
| 3  | Accidents (unintentional injuries)<br>75,022        | Cerebro-vascular disease<br>76,769                  | Intentional self-harm (suicide)<br>1,500    | Assault (homicide)<br>569                   | Assault (homicide)<br>7,214                  | Heart diseases<br>2,393                     | Accidents (unintentional injuries)<br>24,265 | Accidents (unintentional injuries)<br>11,333 | Chronic lower respiratory diseases<br>31,425       | Chronic lower respiratory diseases<br>31,457       | Chronic lower respiratory diseases<br>27,930        | Cerebro-vascular disease<br>51,445                   |
| 4  | Chronic lower respiratory diseases<br>65,119        | Chronic lower respiratory diseases<br>72,234        | Cancer<br>1,042                             | Congenital anomalies<br>495                 | Heart diseases<br>5,256                      | Intentional self-harm (suicide)<br>2,140    | Intentional self-harm (suicide)<br>11,858    | Cerebro-vascular disease<br>5,283            | Cerebro-vascular disease<br>19,751                 | Cerebro-vascular disease<br>19,317                 | Cerebro-vascular disease<br>24,649                  | Alzheimer disease<br>47,856                          |
| 5  | Cerebro-vascular disease<br>52,073                  | Alzheimer disease<br>55,103                         | Congenital anomalies<br>563                 | Intentional self-harm (suicide)<br>434      | Cancer<br>4,256                              | Assault (homicide)<br>1,443                 | Chronic liver disease & cirrhosis<br>10,562  | Chronic lower respiratory diseases<br>5,134  | Diabetes mellitus<br>16,646                        | Diabetes mellitus<br>13,572                        | Alzheimer disease<br>18,689                         | Chronic lower respiratory diseases<br>35,212         |
| 6  | Diabetes mellitus<br>35,054                         | Accidents (unintentional injuries)<br>42,999        | Heart diseases<br>411                       | Heart diseases<br>295                       | HIV disease<br>1,295                         | Pregnancy, childbirth & puerperium<br>721   | Diabetes mellitus<br>7,346                   | Chronic liver disease & cirrhosis<br>4,654   | Accidents (unintentional injuries)<br>12,728       | Nephritis, nephrotic syndrome & nephrosis<br>8,254 | Influenza & pneumonia<br>13,134                     | Influenza & pneumonia<br>18,559                      |
| 7  | Intentional self-harm (suicide)<br>29,089           | Diabetes mellitus<br>33,651                         | Influenza & pneumonia<br>265                | Influenza & pneumonia<br>272                | Influenza & pneumonia<br>847                 | Influenza & pneumonia<br>718                | Cerebro-vascular disease<br>6,730            | Diabetes mellitus<br>4,477                   | Nephritis, nephrotic syndrome & nephrosis<br>9,174 | Accidents (unintentional injuries)<br>7,431        | Nephritis, nephrotic syndrome & nephrosis<br>11,482 | Diabetes mellitus<br>15,002                          |
| 8  | Influenza & pneumonia<br>25,128                     | Influenza & pneumonia<br>28,564                     | Chronic lower respiratory diseases<br>157   | Chronic lower respiratory diseases<br>118   | Chronic liver disease & cirrhosis<br>825     | HIV disease<br>686                          | Chronic lower respiratory diseases<br>5,265  | Intentional self-harm (suicide)<br>3,813     | Influenza & pneumonia<br>7,616                     | Alzheimer disease<br>7,060                         | Accidents (unintentional injuries)<br>10,590        | Nephritis, nephrotic syndrome & nephrosis<br>14,302  |
| 9  | Nephritis, nephrotic syndrome & nephrosis<br>23,930 | Nephritis, nephrotic syndrome & nephrosis<br>25,005 | Cerebro-vascular disease<br>109             | Septicemia<br>99                            | Diabetes mellitus<br>812                     | Cerebro-vascular disease<br>591             | HIV disease<br>4,462                         | Influenza & pneumonia<br>2,564               | Chronic liver disease & cirrhosis<br>7,183         | Septicemia<br>6,919                                | Diabetes mellitus<br>10,209                         | Accidents (unintentional injuries)<br>13,870         |
| 10 | Alzheimer disease<br>23,900                         | Septicemia<br>19,268                                | Septicemia<br>103                           | Cerebro-vascular disease<br>72              | Cerebro-vascular disease<br>744              | Diabetes mellitus<br>564                    | Viral hepatitis<br>3,456                     | Septicemia<br>2,384                          | Septicemia<br>6,955                                | Influenza & pneumonia<br>6,350                     | Parkinson disease<br>7,864                          | Hypertension & hypertensive renal disease*<br>10,444 |

HIV indicates human immunodeficiency virus.

\*Includes primary and secondary hypertension

Note: Deaths within each age group do not sum to all ages combined due to the inclusion of unknown ages. In accordance with the National Center for Health Statistics' cause-of-death ranking, "Symptoms, signs, and abnormal clinical or laboratory findings" and categories that begin with "Other" and "All other" were not ranked.

Source: US Mortality Data, 2009, National Center for Health Statistics, Centers for Disease Control and Prevention, 2012.

rate (107 per 100,000 women). For cancers that can be detected by screening or other testing practices, such as those of the prostate, female breast, and colorectum, state

variation in incidence rates reflects differences in the utilization of these tests as well as differences in disease occurrence.

TABLE 7. Five Leading Types of Cancer Death by Age and Sex, United States, 2009

| ALL AGES                                 | <20                          | 20 TO 39                    | 40 TO 59                                | 60 TO 79                                | ≥80                           |
|------------------------------------------|------------------------------|-----------------------------|-----------------------------------------|-----------------------------------------|-------------------------------|
| MALE                                     |                              |                             |                                         |                                         |                               |
| <b>ALL SITES</b><br>296,758              | <b>ALL SITES</b><br>1,086    | <b>ALL SITES</b><br>4,256   | <b>ALL SITES</b><br>54,483              | <b>ALL SITES</b><br>154,168             | <b>ALL SITES</b><br>82,765    |
| Lung & bronchus<br>87,697                | Leukemia<br>330              | Leukemia<br>590             | Lung & bronchus<br>14,960               | Lung & bronchus<br>52,272               | Lung & bronchus<br>20,171     |
| Prostate<br>28,088                       | Brain & ONS<br>281           | Brain & ONS<br>556          | Colorectum<br>5,495                     | Colorectum<br>13,200                    | Prostate<br>15,099            |
| Colorectum<br>26,807                     | Other endocrine system<br>99 | Colorectum<br>456           | Liver & intrahepatic bile duct<br>4,553 | Prostate<br>11,717                      | Colorectum<br>7,652           |
| Pancreas<br>17,870                       | Bones & joints<br>93         | Non-Hodgkin lymphoma<br>305 | Pancreas<br>3,662                       | Pancreas<br>9,871                       | Urinary bladder<br>4,579      |
| Liver & intrahepatic bile duct<br>13,035 | Soft tissue<br>83            | Lung & bronchus<br>279      | Esophagus<br>2,615                      | Liver & intrahepatic bile duct<br>6,309 | Pancreas<br>4,215             |
| FEMALE                                   |                              |                             |                                         |                                         |                               |
| <b>ALL SITES</b><br>270,856              | <b>ALL SITES</b><br>878      | <b>ALL SITES</b><br>4,629   | <b>ALL SITES</b><br>50,579              | <b>ALL SITES</b><br>127,506             | <b>ALL SITES</b><br>87,264    |
| Lung & bronchus<br>70,389                | Brain & ONS<br>241           | Breast<br>1,056             | Breast<br>11,572                        | Lung & bronchus<br>39,782               | Lung & bronchus<br>19,188     |
| Breast<br>40,678                         | Leukemia<br>231              | Uterine cervix<br>438       | Lung & bronchus<br>11,174               | Breast<br>17,165                        | Breast<br>10,882              |
| Colorectum<br>25,042                     | Bones & joints<br>86         | Leukemia<br>388             | Colorectum<br>4,139                     | Colorectum<br>9,968                     | Colorectum<br>10,600          |
| Pancreas<br>17,758                       | Soft tissue<br>81            | Brain & ONS<br>333          | Ovary<br>3,189                          | Pancreas<br>8,782                       | Pancreas<br>6,371             |
| Ovary<br>14,436                          | Other endocrine system<br>63 | Colorectum<br>331           | Pancreas<br>2,523                       | Ovary<br>7,171                          | Non-Hodgkin lymphoma<br>4,129 |

ONS indicates other nervous system.

Note: Ranking order excludes "Miscellaneous malignant cancer" and "In situ, benign, or unknown behavior neoplasm."

## Cancer Occurrence by Race/Ethnicity

Cancer incidence and death rates vary considerably among racial and ethnic groups (Table 10). For all cancer sites combined, African American men have a 14% higher incidence rate and a 33% higher death rate than white men, whereas African American women have a 6% lower incidence rate but a 16% higher death rate than white women. Cancer incidence and death rates are higher among African American men than white men for every cancer site listed in Table 10. Factors known to contribute to racial disparities in mortality vary by cancer site and include differences in exposure to underlying risk factors (eg, historical smoking prevalence for lung cancer), access to high-quality screening (breast, cervical, and colorectal cancers), and timely diagnosis and treatment.<sup>24</sup> The higher breast cancer incidence rate among whites compared to women of other racial or ethnic groups is thought to reflect a combination of factors that affect both diagnosis (ie, more prevalent mammography among white women) and underlying disease occurrence (eg, later age at first birth and greater use of menopausal hormone therapy among white women).<sup>25</sup>

Cancer incidence and death rates are lower in other racial and ethnic groups than in whites and African Americans for all cancer sites combined and for the 4 most common cancer sites. However, incidence and death rates for cancers related to infectious agents, such as uterine cervix, stomach, and liver, are generally higher in minority populations than in whites. Stomach and liver cancer incidence and death rates are twice as high in Asian Americans/Pacific Islanders as in whites, reflecting an increased prevalence of chronic infection with *Helicobacter pylori* and hepatitis B virus in this population.<sup>26</sup> Kidney cancer incidence and death rates are the highest among American Indians/Alaskan Natives, which may reflect the high prevalence of obesity and smoking in this population.<sup>27</sup>

Cancer incidence rates can only be adjusted for delayed reporting in whites and African Americans because the long-term incidence data required for delay adjustment are not available for other racial and ethnic groups. During the past 10 years of data (2000–2009), while incidence rates (unadjusted for delayed reporting) declined by 1% or more per year among men of all

TABLE 8. Incidence Rates for Selected Cancers by State, United States, 2005 to 2009

| STATE                | ALL CANCERS  |              | BREAST       | COLORECTUM  |             | LUNG & BRONCHUS |             | NON-HODGKIN LYMPHOMA |             | PROSTATE     | URINARY BLADDER |            |
|----------------------|--------------|--------------|--------------|-------------|-------------|-----------------|-------------|----------------------|-------------|--------------|-----------------|------------|
|                      | MALE         | FEMALE       | FEMALE       | MALE        | FEMALE      | MALE            | FEMALE      | MALE                 | FEMALE      | MALE         | MALE            | FEMALE     |
| Alabama*             | 582.4        | 395.4        | 119.4        | 59.7        | 41.3        | 104.8           | 54.6        | 19.5                 | 13.4        | 162.1        | 33.2            | 7.4        |
| Alaska               | 523.7        | 435.7        | 130.0        | 55.4        | 44.2        | 83.8            | 63.0        | 22.0                 | 18.3        | 139.9        | 38.2            | 9.5        |
| Arizona              | 439.6        | 361.0        | 106.7        | 41.9        | 31.8        | 62.5            | 48.2        | 17.6                 | 13.3        | 118.1        | 31.5            | 8.3        |
| Arkansas†            | 551.6        | 381.6        | 109.2        | 54.7        | 39.8        | 107.4           | 59.6        | 21.9                 | 15.0        | 153.4        | 32.5            | 7.9        |
| California           | 510.5        | 398.9        | 123.3        | 50.7        | 38.1        | 62.4            | 45.2        | 23.0                 | 15.6        | 143.0        | 33.9            | 8.0        |
| Colorado             | 493.9        | 396.4        | 125.4        | 46.0        | 35.1        | 57.2            | 44.6        | 22.2                 | 15.8        | 152.3        | 31.8            | 8.3        |
| Connecticut          | 594.1        | 462.5        | 137.3        | 55.3        | 41.1        | 78.5            | 61.0        | 25.9                 | 17.9        | 165.2        | 47.9            | 12.5       |
| Delaware             | 613.1        | 448.2        | 127.9        | 56.4        | 41.4        | 90.6            | 68.8        | 24.0                 | 17.1        | 182.8        | 44.2            | 11.3       |
| Dist. of Columbia†   | 562.6        | 399.0        | 128.3        | 53.0        | 42.2        | 77.2            | 45.9        | 21.3                 | 13.5        | 185.1        | 24.6            | 8.0        |
| Florida              | 528.3        | 403.1        | 114.9        | 49.6        | 37.9        | 82.8            | 58.1        | 21.7                 | 15.2        | 137.7        | 35.6            | 8.8        |
| Georgia              | 569.8        | 397.2        | 119.7        | 53.4        | 38.8        | 95.6            | 54.7        | 21.6                 | 14.2        | 167.8        | 33.0            | 7.8        |
| Hawaii               | 504.3        | 401.6        | 125.1        | 59.6        | 38.7        | 68.7            | 40.4        | 20.9                 | 13.0        | 128.4        | 26.2            | 6.4        |
| Idaho                | 528.7        | 411.6        | 119.1        | 45.8        | 36.5        | 64.6            | 48.1        | 22.1                 | 17.3        | 160.1        | 36.7            | 8.9        |
| Illinois             | 573.5        | 437.8        | 125.4        | 61.3        | 44.8        | 88.9            | 60.6        | 23.8                 | 16.3        | 157.9        | 40.2            | 10.3       |
| Indiana              | 539.3        | 421.5        | 116.9        | 57.5        | 43.3        | 99.5            | 64.0        | 23.1                 | 17.0        | 129.2        | 36.3            | 8.9        |
| Iowa                 | 568.2        | 436.5        | 123.5        | 59.6        | 45.9        | 87.6            | 56.3        | 26.5                 | 18.5        | 142.2        | 43.0            | 8.7        |
| Kansas               | 563.8        | 422.2        | 124.6        | 57.6        | 40.4        | 85.0            | 55.0        | 23.6                 | 17.2        | 157.3        | 38.2            | 9.3        |
| Kentucky             | 615.4        | 459.7        | 121.2        | 65.7        | 46.9        | 128.2           | 80.1        | 25.1                 | 17.3        | 139.0        | 40.3            | 9.9        |
| Louisiana*           | 614.5        | 410.9        | 118.9        | 64.6        | 43.7        | 101.9           | 58.2        | 24.2                 | 16.8        | 173.7        | 34.4            | 8.2        |
| Maine                | 600.1        | 467.3        | 128.5        | 55.8        | 43.9        | 95.5            | 67.6        | 25.6                 | 18.4        | 153.6        | 48.1            | 13.5       |
| Maryland             | 532.8        | 411.8        | 124.8        | 49.9        | 37.9        | 77.3            | 56.6        | 21.1                 | 14.2        | 158.4        | 33.5            | 9.3        |
| Massachusetts        | 581.1        | 459.2        | 132.8        | 53.3        | 40.3        | 81.0            | 64.0        | 25.1                 | 16.3        | 157.5        | 45.0            | 12.3       |
| Michigan             | 578.0        | 433.3        | 120.3        | 52.9        | 40.9        | 87.3            | 61.3        | 24.8                 | 17.8        | 166.5        | 42.5            | 10.9       |
| Minnesota            | 566.5        | 424.4        | 128.5        | 51.2        | 40.1        | 66.7            | 49.8        | 26.9                 | 18.1        | 179.0        | 40.0            | 9.6        |
| Mississippi*         | 612.1        | 395.5        | 114.3        | 62.7        | 44.7        | 116.4           | 56.3        | 21.8                 | 14.4        | 174.2        | 31.4            | 7.2        |
| Missouri             | 548.3        | 423.4        | 121.9        | 58.3        | 42.0        | 100.0           | 64.7        | 22.3                 | 15.9        | 132.9        | 36.3            | 8.4        |
| Montana              | 531.6        | 417.9        | 123.0        | 52.7        | 38.5        | 73.0            | 58.5        | 23.0                 | 15.3        | 164.1        | 37.6            | 9.7        |
| Nebraska             | 547.1        | 426.6        | 124.7        | 62.8        | 46.2        | 78.2            | 51.7        | 24.2                 | 17.7        | 150.9        | 35.8            | 8.9        |
| Nevada               | 514.4        | 405.1        | 114.3        | 52.1        | 39.3        | 76.8            | 65.5        | 20.9                 | 15.4        | 138.4        | 38.4            | 11.0       |
| New Hampshire        | 584.8        | 452.4        | 132.5        | 51.9        | 39.5        | 81.4            | 62.2        | 23.9                 | 17.4        | 155.1        | 48.1            | 13.3       |
| New Jersey           | 593.0        | 454.1        | 130.0        | 58.2        | 43.0        | 76.1            | 56.8        | 25.5                 | 17.6        | 172.4        | 45.1            | 11.8       |
| New Mexico           | 480.8        | 370.5        | 111.4        | 46.4        | 34.6        | 55.7            | 39.3        | 19.1                 | 14.5        | 141.6        | 26.9            | 6.4        |
| New York             | 583.3        | 442.7        | 125.8        | 54.6        | 41.5        | 77.1            | 55.1        | 25.9                 | 17.8        | 167.2        | 42.5            | 10.9       |
| North Carolina       | 579.2        | 418.1        | 125.0        | 54.5        | 38.7        | 100.1           | 58.2        | 23.0                 | 15.6        | 158.3        | 37.5            | 9.1        |
| North Dakota         | 555.6        | 421.0        | 126.4        | 62.9        | 44.1        | 71.5            | 46.2        | 22.0                 | 17.8        | 169.4        | 40.9            | 10.1       |
| Ohio                 | 546.5        | 421.5        | 119.6        | 56.3        | 42.3        | 93.2            | 60.0        | 23.0                 | 16.0        | 144.1        | 39.0            | 9.7        |
| Oklahoma             | 567.8        | 426.7        | 123.9        | 56.1        | 42.1        | 101.9           | 64.7        | 22.6                 | 17.6        | 153.2        | 35.5            | 8.7        |
| Oregon               | 521.7        | 432.3        | 130.7        | 47.9        | 38.3        | 74.2            | 59.2        | 23.3                 | 16.1        | 145.1        | 37.6            | 10.0       |
| Pennsylvania         | 583.8        | 453.7        | 125.8        | 59.4        | 44.5        | 87.5            | 58.2        | 25.4                 | 17.8        | 154.1        | 44.5            | 11.0       |
| Rhode Island         | 590.8        | 466.7        | 133.2        | 55.2        | 43.0        | 88.2            | 64.7        | 23.9                 | 17.6        | 152.6        | 52.4            | 13.8       |
| South Carolina       | 559.9        | 397.7        | 121.4        | 52.2        | 38.7        | 96.7            | 53.7        | 20.6                 | 13.6        | 159.0        | 30.4            | 8.0        |
| South Dakota         | 494.3        | 389.8        | 118.4        | 54.2        | 41.0        | 72.2            | 47.1        | 20.5                 | 16.0        | 149.1        | 34.2            | 8.0        |
| Tennessee            | 565.6        | 413.7        | 119.6        | 56.2        | 41.3        | 106.1           | 61.5        | 23.0                 | 16.2        | 145.6        | 34.9            | 8.4        |
| Texas*               | 533.7        | 394.6        | 116.1        | 53.0        | 37.0        | 81.8            | 49.9        | 22.6                 | 15.9        | 142.7        | 30.1            | 6.9        |
| Utah                 | 469.7        | 345.2        | 108.0        | 39.3        | 31.3        | 33.8            | 22.8        | 23.0                 | 15.5        | 169.8        | 28.8            | 5.6        |
| Vermont              | 554.3        | 455.5        | 129.4        | 45.8        | 40.4        | 82.0            | 64.6        | 24.0                 | 17.7        | 150.9        | 43.6            | 12.6       |
| Virginia†            | 537.0        | 396.9        | 124.0        | 49.8        | 37.9        | 85.2            | 54.5        | 21.4                 | 14.3        | 157.7        | 33.8            | 8.1        |
| Washington           | 552.6        | 438.4        | 131.8        | 48.6        | 37.2        | 73.3            | 57.7        | 26.6                 | 17.5        | 155.3        | 39.5            | 9.5        |
| West Virginia        | 576.5        | 441.6        | 112.2        | 61.8        | 45.4        | 112.7           | 73.6        | 24.0                 | 16.8        | 138.4        | 39.3            | 11.4       |
| Wisconsin†           | 513.8        | 404.6        | 118.8        | 48.2        | 37.4        | 70.6            | 51.2        | 22.5                 | 16.5        | 144.4        | 36.4            | 9.3        |
| Wyoming              | 513.8        | 388.8        | 113.2        | 49.5        | 38.7        | 59.7            | 47.9        | 20.9                 | 15.5        | 162.6        | 42.6            | 10.4       |
| <b>United States</b> | <b>550.7</b> | <b>419.3</b> | <b>122.3</b> | <b>54.0</b> | <b>40.3</b> | <b>82.7</b>     | <b>55.9</b> | <b>23.3</b>          | <b>16.2</b> | <b>151.4</b> | <b>37.5</b>     | <b>9.3</b> |

Rates are per 100,000 and age adjusted to the 2000 US standard population.

\*Data for 2005 are limited to cases diagnosed from January through June due to the effect of large migrations of populations on this state as a result of Hurricane Katrina in September 2005.

†This state's incidence data are not included in overall US rates because registry data submitted for 2009 did not meet high-quality standards according to the North American Association of Central Cancer Registries.

racial/ethnic groups except American Indians/Alaska Natives, among women only slight declines (0.2%-0.3% per year) occurred among non-Hispanic whites and Hispanics (Table 11). In contrast, cancer death rates

declined by 1.5% or more per year among men and by 1.1% or more per year among women of all races/ethnicities except American Indians/Alaska Natives, among whom rates were stable. Notably, the largest



TABLE 9. Death Rates for Selected Cancers by State, United States, 2005 to 2009

| STATE                | ALL SITES    |              | BREAST      | COLORECTUM  |             | LUNG & BRONCHUS |             | NON-HODGKIN LYMPHOMA |            | PANCREAS    |            | PROSTATE    |
|----------------------|--------------|--------------|-------------|-------------|-------------|-----------------|-------------|----------------------|------------|-------------|------------|-------------|
|                      | MALE         | FEMALE       | FEMALE      | MALE        | FEMALE      | MALE            | FEMALE      | MALE                 | FEMALE     | MALE        | FEMALE     | MALE        |
| Alabama              | 259.0        | 157.4        | 24.0        | 22.9        | 15.1        | 89.4            | 41.1        | 8.3                  | 5.3        | 13.3        | 9.5        | 28.7        |
| Alaska               | 209.5        | 159.6        | 23.5        | 20.0        | 14.1        | 62.9            | 45.5        | 7.9                  | 5.8        | 12.3        | 10.0       | 22.1        |
| Arizona              | 182.1        | 130.0        | 20.5        | 16.8        | 11.6        | 50.2            | 33.2        | 7.5                  | 4.8        | 10.9        | 7.9        | 19.7        |
| Arkansas             | 253.7        | 161.2        | 23.6        | 22.5        | 15.2        | 92.5            | 46.3        | 8.8                  | 5.2        | 13.6        | 9.4        | 25.3        |
| California           | 194.9        | 141.7        | 22.3        | 18.1        | 12.9        | 49.2            | 33.1        | 8.1                  | 5.0        | 11.8        | 9.4        | 23.2        |
| Colorado             | 185.0        | 134.4        | 19.9        | 17.4        | 13.0        | 45.1            | 31.9        | 8.0                  | 4.4        | 10.9        | 8.9        | 23.8        |
| Connecticut          | 212.0        | 149.6        | 22.5        | 17.3        | 13.0        | 55.9            | 38.8        | 8.1                  | 5.2        | 14.7        | 10.2       | 24.8        |
| Delaware             | 229.6        | 162.8        | 23.0        | 20.3        | 14.3        | 69.2            | 48.5        | 8.4                  | 5.0        | 12.3        | 9.7        | 24.9        |
| Dist. of Columbia    | 256.3        | 160.4        | 28.0        | 23.1        | 17.7        | 64.7            | 34.8        | 9.4                  | 3.5        | 16.3        | 10.7       | 41.3        |
| Florida              | 206.0        | 141.9        | 21.5        | 18.3        | 13.0        | 63.5            | 39.3        | 7.8                  | 4.9        | 12.0        | 8.7        | 19.6        |
| Georgia              | 230.8        | 146.8        | 23.0        | 20.2        | 13.8        | 75.8            | 38.7        | 7.7                  | 4.6        | 12.4        | 8.9        | 27.5        |
| Hawaii               | 184.6        | 119.6        | 17.8        | 18.7        | 10.8        | 51.2            | 27.0        | 7.5                  | 4.2        | 12.9        | 9.4        | 16.2        |
| Idaho                | 195.9        | 143.5        | 21.3        | 15.9        | 13.4        | 51.3            | 35.6        | 8.1                  | 5.4        | 11.5        | 9.8        | 26.7        |
| Illinois             | 229.4        | 160.1        | 24.2        | 22.5        | 15.6        | 67.8            | 41.9        | 8.8                  | 5.5        | 13.1        | 10.1       | 25.5        |
| Indiana              | 244.9        | 163.2        | 23.9        | 22.5        | 15.0        | 82.0            | 47.2        | 9.7                  | 5.6        | 13.1        | 9.4        | 23.8        |
| Iowa                 | 220.1        | 151.0        | 21.8        | 20.6        | 15.2        | 67.5            | 39.4        | 9.2                  | 5.5        | 12.0        | 8.8        | 23.9        |
| Kansas               | 221.5        | 149.9        | 22.9        | 21.2        | 14.0        | 70.6            | 41.0        | 9.6                  | 5.2        | 12.5        | 9.4        | 21.4        |
| Kentucky             | 267.2        | 173.6        | 23.4        | 24.3        | 16.6        | 99.7            | 55.5        | 9.2                  | 5.9        | 12.5        | 9.4        | 24.6        |
| Louisiana            | 260.8        | 165.8        | 26.3        | 25.1        | 15.7        | 84.4            | 44.1        | 9.0                  | 5.2        | 13.8        | 11.0       | 27.1        |
| Maine                | 240.0        | 161.6        | 21.4        | 20.5        | 14.4        | 73.1            | 46.4        | 9.2                  | 5.5        | 12.2        | 9.8        | 24.4        |
| Maryland             | 226.5        | 157.3        | 24.9        | 22.0        | 14.6        | 65.6            | 41.8        | 7.9                  | 4.9        | 12.9        | 10.4       | 26.7        |
| Massachusetts        | 222.6        | 154.0        | 21.9        | 19.6        | 13.8        | 62.6            | 42.5        | 8.3                  | 5.1        | 13.1        | 10.3       | 23.4        |
| Michigan             | 228.1        | 160.9        | 24.0        | 20.2        | 14.7        | 70.3            | 43.9        | 9.2                  | 6.1        | 13.9        | 10.1       | 22.6        |
| Minnesota            | 206.8        | 146.0        | 21.3        | 18.0        | 12.6        | 55.2            | 37.2        | 9.6                  | 5.2        | 11.8        | 9.5        | 24.3        |
| Mississippi          | 274.2        | 158.8        | 24.9        | 24.9        | 16.2        | 97.3            | 42.3        | 8.3                  | 4.8        | 13.8        | 9.9        | 31.0        |
| Missouri             | 237.6        | 160.4        | 24.9        | 21.6        | 14.6        | 79.8            | 46.0        | 8.4                  | 5.3        | 13.1        | 9.7        | 22.7        |
| Montana              | 203.4        | 150.5        | 20.5        | 17.8        | 14.7        | 57.1            | 41.3        | 8.1                  | 5.4        | 12.4        | 8.7        | 27.2        |
| Nebraska             | 215.2        | 145.7        | 21.2        | 22.5        | 15.1        | 62.4            | 36.0        | 9.0                  | 5.7        | 12.2        | 9.4        | 24.7        |
| Nevada               | 213.3        | 158.4        | 23.3        | 20.7        | 15.3        | 62.5            | 48.8        | 6.7                  | 4.8        | 12.3        | 9.8        | 23.4        |
| New Hampshire        | 218.2        | 154.7        | 21.4        | 19.3        | 13.2        | 62.0            | 43.0        | 7.7                  | 5.0        | 13.4        | 10.6       | 23.2        |
| New Jersey           | 213.8        | 157.7        | 26.1        | 22.0        | 15.5        | 57.9            | 38.3        | 8.1                  | 5.5        | 13.3        | 10.0       | 22.4        |
| New Mexico           | 190.1        | 134.3        | 21.1        | 18.7        | 13.5        | 44.4            | 29.1        | 6.7                  | 4.4        | 11.6        | 8.9        | 24.3        |
| New York             | 201.3        | 145.2        | 22.5        | 19.4        | 14.0        | 55.2            | 35.8        | 8.0                  | 4.9        | 12.6        | 9.7        | 22.2        |
| North Carolina       | 236.9        | 152.7        | 23.5        | 19.8        | 13.6        | 79.3            | 41.6        | 7.6                  | 5.0        | 12.1        | 9.7        | 25.9        |
| North Dakota         | 210.2        | 144.1        | 22.0        | 21.6        | 14.8        | 56.5            | 34.3        | 7.4                  | 5.5        | 12.8        | 8.7        | 25.2        |
| Ohio                 | 243.4        | 163.4        | 25.2        | 22.5        | 15.5        | 77.4            | 44.5        | 9.4                  | 5.6        | 13.1        | 9.9        | 25.4        |
| Oklahoma             | 243.0        | 161.2        | 23.8        | 22.9        | 14.8        | 82.7            | 46.9        | 8.9                  | 5.9        | 12.0        | 8.7        | 23.6        |
| Oregon               | 214.4        | 155.5        | 21.5        | 18.5        | 13.9        | 61.2            | 43.6        | 8.6                  | 5.7        | 12.2        | 10.0       | 25.7        |
| Pennsylvania         | 232.4        | 158.5        | 24.1        | 22.3        | 15.2        | 68.5            | 40.0        | 9.2                  | 5.6        | 13.4        | 10.0       | 23.7        |
| Rhode Island         | 228.8        | 151.3        | 21.9        | 19.6        | 13.3        | 66.3            | 43.0        | 8.8                  | 4.6        | 12.4        | 8.4        | 22.5        |
| South Carolina       | 241.3        | 151.0        | 24.0        | 20.5        | 14.1        | 79.6            | 40.0        | 8.0                  | 4.8        | 12.5        | 9.7        | 26.9        |
| South Dakota         | 206.0        | 141.5        | 20.9        | 20.1        | 14.2        | 62.2            | 35.5        | 7.8                  | 5.1        | 11.1        | 9.1        | 22.9        |
| Tennessee            | 257.9        | 162.0        | 24.0        | 22.4        | 15.1        | 91.5            | 47.2        | 9.3                  | 5.5        | 13.0        | 9.3        | 25.3        |
| Texas                | 212.5        | 142.8        | 22.2        | 20.2        | 13.1        | 63.4            | 35.9        | 8.1                  | 5.0        | 11.7        | 8.7        | 21.4        |
| Utah                 | 154.1        | 109.6        | 21.5        | 14.3        | 10.4        | 28.1            | 16.1        | 7.5                  | 4.6        | 9.5         | 8.0        | 24.5        |
| Vermont              | 211.9        | 152.8        | 20.7        | 18.8        | 14.2        | 61.6            | 44.3        | 8.1                  | 5.0        | 12.5        | 9.6        | 22.0        |
| Virginia             | 228.5        | 153.9        | 24.8        | 19.9        | 14.2        | 70.6            | 40.7        | 8.3                  | 5.0        | 13.0        | 9.9        | 26.0        |
| Washington           | 209.6        | 153.9        | 21.9        | 17.7        | 12.7        | 58.1            | 42.8        | 8.8                  | 5.5        | 12.4        | 9.8        | 24.9        |
| West Virginia        | 254.8        | 173.2        | 23.6        | 24.2        | 16.8        | 87.5            | 51.9        | 9.1                  | 6.4        | 11.2        | 7.7        | 21.7        |
| Wisconsin            | 218.8        | 152.0        | 21.6        | 18.7        | 13.1        | 59.9            | 38.7        | 9.4                  | 5.7        | 12.9        | 9.8        | 25.6        |
| Wyoming              | 199.5        | 148.3        | 21.4        | 18.9        | 14.2        | 52.8            | 38.5        | 8.1                  | 5.9        | 13.2        | 9.7        | 20.9        |
| <b>United States</b> | <b>219.4</b> | <b>151.1</b> | <b>23.0</b> | <b>20.2</b> | <b>14.1</b> | <b>65.7</b>     | <b>39.6</b> | <b>8.4</b>           | <b>5.2</b> | <b>12.5</b> | <b>9.5</b> | <b>23.6</b> |

Rates are per 100,000 and age adjusted to the 2000 US standard population.

declines in death rates occurred among men of African American (2.4% per year) and Hispanic (2.3% per year) heritage.

### Cancer Survival

African Americans are less likely to survive cancer than whites. The 5-year relative survival is lower among African Americans for every stage of diagnosis for nearly every type

of cancer (Fig. 7). These disparities may result from inequalities in access to and receipt of quality health care and/or from differences in comorbidities. As shown in Figure 8, African Americans are less likely than whites to be diagnosed with cancer at a localized stage, when treatment is usually less extensive and more successful. The extent to which factors other than stage at diagnosis contribute to the overall survival differential is unclear.<sup>28</sup> A study of Medicare-insured patients

TABLE 10. Incidence and Death Rates by Site, Race, and Ethnicity, United States, 2005 to 2009

|                                           | WHITE | AFRICAN AMERICAN | ASIAN AMERICAN AND PACIFIC ISLANDER | AMERICAN INDIAN AND ALASKA NATIVE* | HISPANIC/LATINO |
|-------------------------------------------|-------|------------------|-------------------------------------|------------------------------------|-----------------|
| <b>Incidence</b>                          |       |                  |                                     |                                    |                 |
| <b>All sites</b>                          |       |                  |                                     |                                    |                 |
| Male                                      | 543.1 | 619.7            | 327.5                               | 423.2                              | 418.7           |
| Female                                    | 424.0 | 396.8            | 286.2                               | 360.3                              | 333.2           |
| <b>Breast (female)</b>                    | 123.3 | 118.0            | 85.9                                | 89.1                               | 93.0            |
| <b>Colorectum</b>                         |       |                  |                                     |                                    |                 |
| Male                                      | 52.8  | 65.1             | 41.4                                | 50.7                               | 46.9            |
| Female                                    | 39.2  | 48.0             | 32.1                                | 41.1                               | 33.3            |
| <b>Kidney &amp; renal pelvis</b>          |       |                  |                                     |                                    |                 |
| Male                                      | 21.2  | 23.3             | 10.1                                | 29.0                               | 19.8            |
| Female                                    | 11.2  | 12.1             | 5.1                                 | 16.6                               | 11.4            |
| <b>Liver &amp; intrahepatic bile duct</b> |       |                  |                                     |                                    |                 |
| Male                                      | 9.1   | 15.0             | 21.6                                | 16.4                               | 17.5            |
| Female                                    | 3.1   | 4.2              | 8.1                                 | 7.6                                | 6.6             |
| <b>Lung &amp; bronchus</b>                |       |                  |                                     |                                    |                 |
| Male                                      | 82.3  | 99.3             | 49.4                                | 67.4                               | 45.4            |
| Female                                    | 57.5  | 51.3             | 28.1                                | 49.5                               | 26.6            |
| <b>Prostate</b>                           | 141.0 | 228.7            | 77.2                                | 98.8                               | 124.9           |
| <b>Stomach</b>                            |       |                  |                                     |                                    |                 |
| Male                                      | 8.4   | 16.3             | 16.1                                | 13.0                               | 13.5            |
| Female                                    | 4.0   | 8.2              | 9.3                                 | 6.4                                | 8.1             |
| <b>Uterine cervix</b>                     | 7.8   | 10.4             | 7.2                                 | 10.1                               | 11.8            |
| <b>Mortality</b>                          |       |                  |                                     |                                    |                 |
| <b>All sites</b>                          |       |                  |                                     |                                    |                 |
| Male                                      | 216.7 | 288.3            | 132.6                               | 184.9                              | 146.4           |
| Female                                    | 150.8 | 174.6            | 93.2                                | 135.9                              | 100.6           |
| <b>Breast (female)</b>                    | 22.4  | 31.6             | 11.9                                | 16.6                               | 14.9            |
| <b>Colorectum</b>                         |       |                  |                                     |                                    |                 |
| Male                                      | 19.5  | 29.8             | 13.1                                | 18.8                               | 15.3            |
| Female                                    | 13.6  | 19.8             | 9.6                                 | 14.6                               | 10.2            |
| <b>Kidney &amp; renal pelvis</b>          |       |                  |                                     |                                    |                 |
| Male                                      | 5.9   | 6.0              | 2.9                                 | 8.8                                | 5.0             |
| Female                                    | 2.7   | 2.6              | 1.3                                 | 4.1                                | 2.3             |
| <b>Liver &amp; intrahepatic bile duct</b> |       |                  |                                     |                                    |                 |
| Male                                      | 7.4   | 11.9             | 14.5                                | 11.9                               | 11.8            |
| Female                                    | 3.1   | 4.0              | 6.1                                 | 5.9                                | 5.3             |
| <b>Lung &amp; bronchus</b>                |       |                  |                                     |                                    |                 |
| Male                                      | 65.3  | 82.6             | 35.9                                | 48.3                               | 30.8            |
| Female                                    | 40.8  | 38.0             | 18.5                                | 33.2                               | 14.1            |
| <b>Prostate</b>                           | 21.7  | 53.1             | 10.0                                | 19.7                               | 17.8            |
| <b>Stomach</b>                            |       |                  |                                     |                                    |                 |
| Male                                      | 4.3   | 10.3             | 9.0                                 | 8.3                                | 7.4             |
| Female                                    | 2.2   | 4.8              | 5.3                                 | 3.8                                | 4.3             |
| <b>Uterine cervix</b>                     | 2.2   | 4.3              | 2.0                                 | 3.5                                | 3.0             |

Rates are per 100,000 population and age adjusted to the 2000 US standard population. Race and ethnicity categories are not mutually exclusive of Hispanic origin.

\*Data based on Indian Health Service Contract Health Service Delivery Areas.

TABLE 11. Ten-Year Trends in Cancer Incidence and Mortality Rates by Race/Ethnicity, United States, 2000 to 2009

|                                 | 2000-2009 AAPC |        |           |        |
|---------------------------------|----------------|--------|-----------|--------|
|                                 | INCIDENCE      |        | MORTALITY |        |
|                                 | MALE           | FEMALE | MALE      | FEMALE |
| All races/ethnicities           | -1.1*          | -0.3*  | -1.8*     | -1.4*  |
| Non-Hispanic white              | -1.0*          | -0.2*  | -1.5*     | -1.3*  |
| African American                | -1.4*          | 0.0    | -2.4*     | -1.5*  |
| Asian American/Pacific Islander | -1.8*          | 0.2    | -1.5*     | -1.1*  |
| American Indian/Alaska Native†  | -0.7           | 0.0    | -0.8      | -0.8   |
| Hispanic‡                       | -1.7*          | -0.3*  | -2.3*     | -1.4*  |

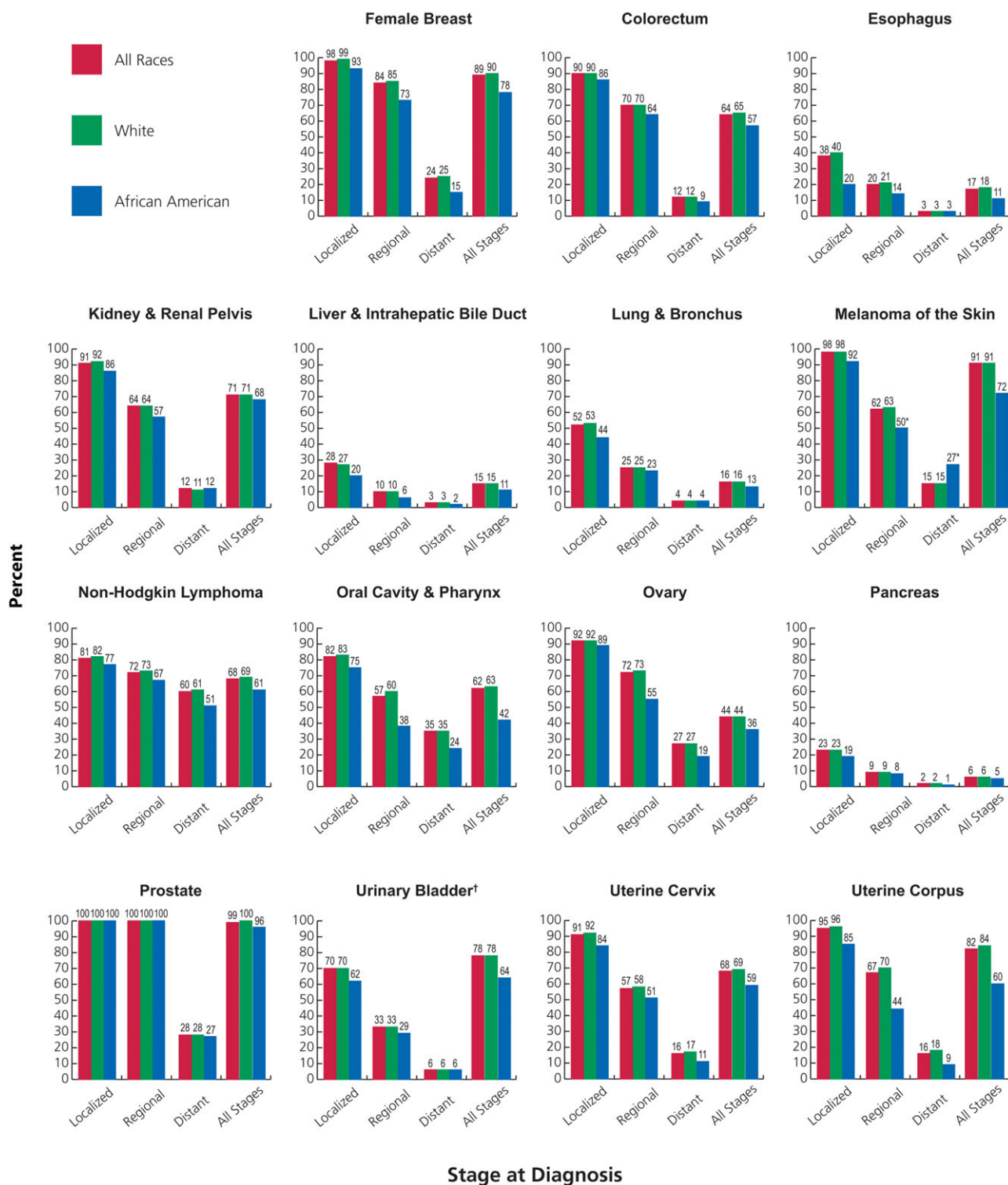
AAPC indicates average annual percent change.

\*AAPC is statistically significant ( $P < .05$ ).

†Data based on Indian Health Service Contract Health Service Delivery Areas.

‡Excludes deaths from the District of Columbia, Minnesota, New Hampshire, and North Dakota due to unreliable Hispanic origin data for some years.

Notes: Trends analyzed by the Joinpoint Regression Program, version 3.5.0, allowing up to 2 joinpoints. Incidence trends based on the North American Association of Central Cancer Registries (NAACCR) data. Race and ethnicity categories are not mutually exclusive of Hispanic origin.



### Stage at Diagnosis

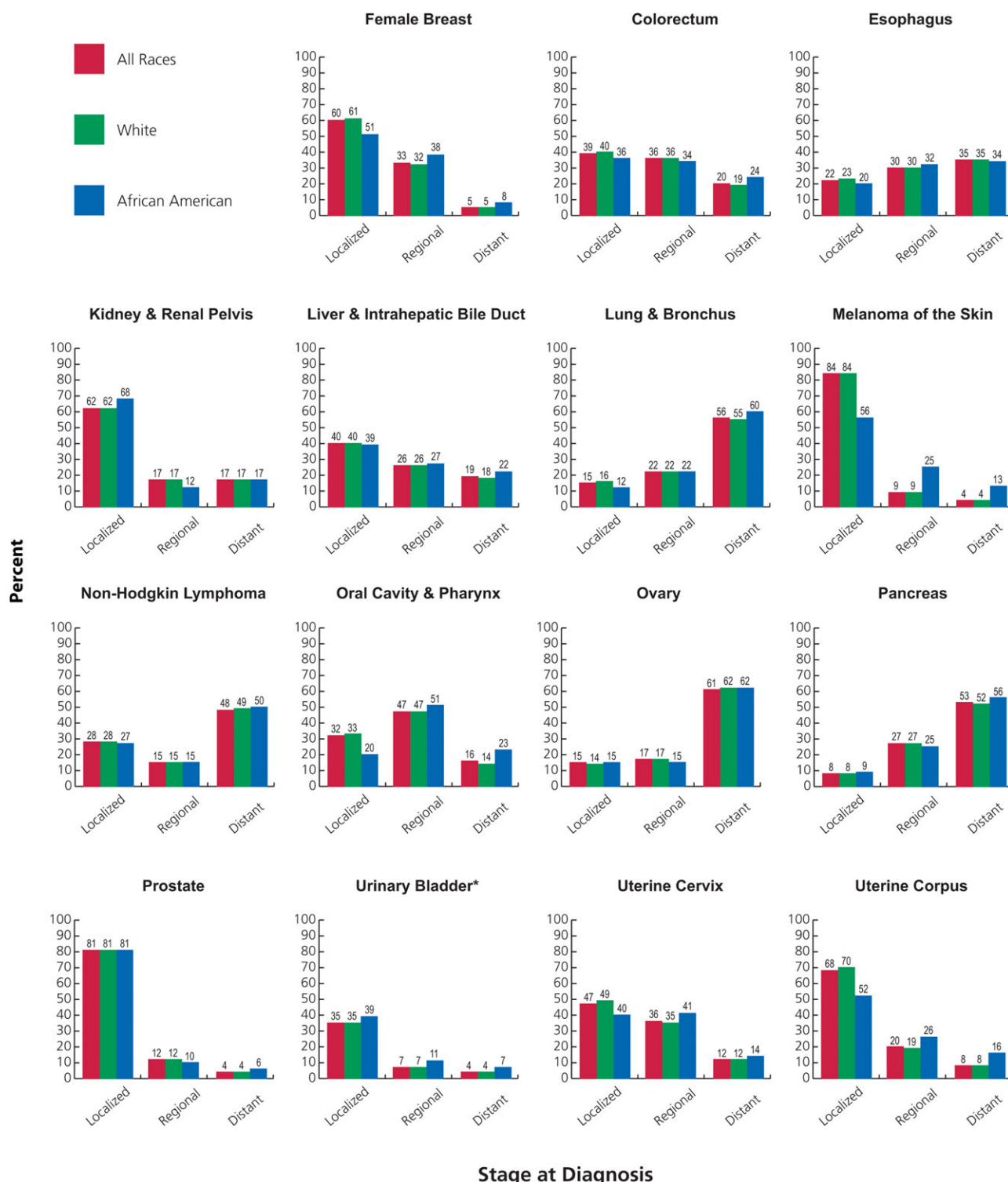
**FIGURE 7. Five-Year Relative Survival Rates for Selected Cancers by Race and Stage at Diagnosis, United States, 2002 to 2008.**

\*The standard error of the survival rate is between 5 and 10 percentage points.

†The survival rate for carcinoma in situ of the urinary bladder is 96% for All Races, 97% for Whites, and 91% for African Americans.

showed that African Americans remain less likely than whites to receive standard cancer therapies for lung, breast, colorectal, and prostate cancers.<sup>29</sup> Some studies suggest that African Americans who receive cancer treatment and medical care similar to that of whites experience similar outcomes.<sup>30</sup>

There have been notable improvements in survival over the past 3 decades for most cancers for both whites and African Americans (Table 12). Between 1975 to 1977 and 2002 to 2008, overall 5-year relative survival rates increased 19% among whites and 21% among African Americans.



### Stage at Diagnosis

**FIGURE 8. Distribution of Selected Cancers by Race and Stage at Diagnosis, United States, 2002 to 2008.**

\*The proportions of carcinoma in situ of the urinary bladder are 51% for All Races, 52% for Whites, and 37% for African Americans. Stage categories do not sum to 100% because sufficient information is not available to assign a stage to all cancer cases.

The largest improvements in survival have been for leukemia and non-Hodgkin lymphoma, while cancers of the lung and pancreas have shown the least improvement.

Relative survival rates cannot be calculated for some minority populations because accurate life expectancies are not available. Comparison of cause-specific survival rates of

cancer patients diagnosed from 2002 to 2008 in SEER registry areas of the United States indicate that all minority male populations have a greater probability than whites of dying from cancer within 5 years of diagnosis, although the difference is small for Hispanic men.<sup>6</sup> In contrast, among women, Asian Americans/Pacific Islanders (69.1%) and

**TABLE 12. Trends in 5-Year Relative Survival Rates\* (%) by Race and Year of Diagnosis, United States, 1975 to 2008**

|                                | ALL RACES    |              |              | WHITE        |              |              | AFRICAN AMERICAN |              |              |
|--------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|------------------|--------------|--------------|
|                                | 1975 TO 1977 | 1987 TO 1989 | 2002 TO 2008 | 1975 TO 1977 | 1987 TO 1989 | 2002 TO 2008 | 1975 TO 1977     | 1987 TO 1989 | 2002 TO 2008 |
| All sites                      | 49           | 56           | 68†          | 50           | 57           | 69†          | 39               | 43           | 60†          |
| Brain & other nervous system   | 22           | 29           | 35†          | 22           | 28           | 34†          | 25               | 32           | 41†          |
| Breast (female)                | 75           | 84           | 90†          | 76           | 85           | 92†          | 62               | 71           | 78†          |
| Colon                          | 51           | 61           | 65†          | 51           | 61           | 66†          | 45               | 53           | 55†          |
| Esophagus                      | 5            | 10           | 19†          | 6            | 11           | 21†          | 3                | 7            | 14†          |
| Hodgkin lymphoma               | 72           | 79           | 87†          | 72           | 80           | 88†          | 70               | 72           | 83†          |
| Kidney & renal pelvis          | 50           | 57           | 72†          | 50           | 57           | 72†          | 49               | 55           | 70†          |
| Larynx                         | 66           | 66           | 63†          | 67           | 67           | 65           | 59               | 56           | 51           |
| Leukemia                       | 34           | 43           | 58†          | 35           | 44           | 59†          | 33               | 35           | 51†          |
| Liver & intrahepatic bile duct | 3            | 5            | 16†          | 3            | 6            | 16†          | 2                | 3            | 11†          |
| Lung & bronchus                | 12           | 13           | 17†          | 12           | 13           | 17†          | 11               | 11           | 14†          |
| Melanoma of the skin           | 82           | 88           | 93†          | 82           | 88           | 93†          | 57‡              | 79‡          | 70‡          |
| Myeloma                        | 25           | 28           | 43†          | 25           | 27           | 43†          | 30               | 30           | 43†          |
| Non-Hodgkin lymphoma           | 47           | 51           | 71†          | 47           | 52           | 72†          | 48               | 46           | 63†          |
| Oral cavity & pharynx          | 53           | 54           | 65†          | 54           | 56           | 67†          | 36               | 34           | 45†          |
| Ovary                          | 36           | 38           | 43†          | 35           | 38           | 43†          | 42               | 34           | 36           |
| Pancreas                       | 2            | 4            | 6†           | 3            | 3            | 6†           | 2                | 6            | 5†           |
| Prostate                       | 68           | 83           | 100†         | 69           | 85           | 100†         | 61               | 72           | 98†          |
| Rectum                         | 48           | 58           | 68†          | 48           | 59           | 69†          | 45               | 52           | 61†          |
| Stomach                        | 15           | 20           | 28†          | 14           | 19           | 27†          | 16               | 19           | 28†          |
| Testis                         | 83           | 95           | 96†          | 83           | 96           | 97†          | 73‡,§            | 88‡          | 89           |
| Thyroid                        | 92           | 95           | 98†          | 92           | 94           | 98†          | 90               | 92           | 96†          |
| Urinary bladder                | 73           | 79           | 80†          | 74           | 80           | 81†          | 50               | 63           | 62†          |
| Uterine cervix                 | 69           | 70           | 69           | 70           | 73           | 70           | 65               | 57           | 61           |
| Uterine corpus                 | 87           | 83           | 83†          | 88           | 84           | 85†          | 60               | 57           | 63           |

\*Survival rates are adjusted for normal life expectancy and are based on cases diagnosed in the Surveillance, Epidemiology, and End Results (SEER) 9 areas from 1975 to 1977, 1987 to 1989, and 2002 to 2008 and followed through 2009.

†The difference in rates between 1975 to 1977 and 2002 to 2008 is statistically significant ( $P < .05$ ).

‡The standard error of the survival rate is between 5 and 10 percentage points.

§Survival rate is for 1978 to 1980.

Hispanics (67.2%) have the highest 5-year cause-specific survival, followed by whites (66.2%), American Indians/Alaska Natives (60.6%), and African Americans (57.6%). Minority populations are generally more likely than non-Hispanic whites to be diagnosed at a distant stage of disease for all 4 major cancer sites.<sup>31</sup>

## Cancer in Children

Cancer is the second most common cause of death among children ages 1 to 14 years in the United States, surpassed only by accidents; 1,320 children died from cancer in 2009.<sup>1</sup> Leukemia accounts for almost one-third of all cancers (including benign brain tumors) diagnosed in

**TABLE 13. Trends in 5-Year Relative Survival Rates\* (%) for Children (0 to 14 Years) by Year of Diagnosis, United States, 1975 to 2008**

|                              | 1975 TO 1977 | 1978 TO 1980 | 1981 TO 1983 | 1984 TO 1986 | 1987 TO 1989 | 1990 TO 1992 | 1993 TO 1995 | 1996 TO 1998 | 1999 TO 2001 | 2002 TO 2008 |
|------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| All sites                    | 58           | 63           | 67           | 68           | 72           | 76           | 77           | 79           | 81           | 83†          |
| Acute lymphocytic leukemia   | 58           | 66           | 71           | 73           | 78           | 83           | 84           | 87           | 88           | 91†          |
| Acute myeloid leukemia       | 19           | 26           | 27‡          | 31‡          | 37‡          | 42           | 42‡          | 49           | 58           | 64†          |
| Bone & joint                 | 50†          | 48           | 57‡          | 57‡          | 67‡          | 67           | 74           | 70           | 70           | 79†          |
| Brain & other nervous system | 57           | 58           | 56           | 62           | 64           | 65           | 71           | 75           | 74           | 75           |
| Hodgkin lymphoma             | 81           | 87           | 88           | 91           | 87           | 97           | 95           | 96           | 94           | 97†          |
| Neuroblastoma                | 53           | 57           | 55           | 52           | 63           | 76           | 67           | 66           | 73           | 74†          |
| Non-Hodgkin lymphoma         | 43           | 53           | 67           | 70           | 71           | 77           | 81           | 84           | 89           | 85†          |
| Soft tissue                  | 61           | 75           | 69           | 73           | 66           | 80           | 77           | 70           | 77           | 82†          |
| Wilms tumor                  | 73           | 79           | 87           | 91           | 92           | 92           | 92           | 92           | 94           | 90†          |

\*Survival rates are adjusted for normal life expectancy and are based on follow-up of patients through 2009.

†The difference in rates between 1975 to 1977 and 2002 to 2008 is statistically significant ( $P < .05$ ).

‡The standard error of the survival rate is between 5 and 10 percentage points.



children aged 0 to 14 years, 77% of which are acute lymphocytic leukemias. Cancers of the brain and other nervous system are the second most common cancer type (25%), followed by soft tissue sarcomas (7%, half of which are rhabdomyosarcoma), neuroblastoma (6%), renal (Wilms) tumors (5%), and Hodgkin and non-Hodgkin lymphomas (4% each).<sup>6</sup> From 2005 to 2009, the overall incidence rate for cancer in children aged 14 years and younger increased slightly by 0.5% per year, a trend that has been consistent since 1975. The death rate for childhood cancer has decreased by more than half over the past 3 decades, from 4.9 (per 100,000) in 1975 to 2.1 in 2009. Table 13 provides trends in survival rates for the most common childhood cancers. The 5-year relative survival rate for all cancer sites combined improved from 58% for children diagnosed between 1975 and 1977 to 83% for those diagnosed between 2002 and 2008. The substantial progress for all of the major childhood cancers reflects both improvements in treatment and high levels of participation in clinical trials.

## Limitations

The projected numbers of new cancer cases and cancer deaths should be interpreted cautiously because these estimates are model-based and may vary considerably from year to year for reasons other than changes in cancer occurrence. For instance, estimates are affected by changes in method, which occur regularly as modeling techniques improve over time and cancer registration becomes more complete. In addition, not all changes in cancer trends can be captured by modeling techniques. For these reasons, we

discourage the use of these estimates to track year-to-year changes in cancer occurrence and death. The data used for tracking cancer trends are age-standardized or age-specific cancer death rates from the NCHS and cancer incidence rates from SEER and/or NPCR. Nevertheless, the American Cancer Society projections of the numbers of new cancer cases and deaths provide a reasonably accurate estimate of the current cancer burden in the United States.

Errors in reporting race/ethnicity in medical records and on death certificates may result in underestimates of cancer incidence and mortality rates in nonwhite and non-African American populations. It is also important to note that cancer data in the United States are primarily reported for broad racial and ethnic minority groups that are not homogenous, and thus important differences in the cancer burden within racial/ethnic subgroups are masked.

## Conclusions

In 2009, Americans had a 20% lower risk of death from cancer than in 1991, when cancer death rates peaked. Despite this substantial progress, all demographic groups have not benefitted equally, particularly for cancers such as colorectal and breast, for which mortality declines have been attributed to earlier detection and improvements in treatment. Further progress can be accelerated by applying existing cancer control knowledge across all segments of the population, with an emphasis on those groups in the lowest socioeconomic bracket as well as other disadvantaged populations. ■

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