Overview

Overview

The Overview highlights some of the key findings of this report and summarizes the status of cancer in California.

A total of 128,381 cases of invasive cancer were diagnosed among California residents in 1999. The overall age-adjusted cancer incidence rate decreased by nearly ten percent since 1988 when cancer reporting became mandatory statewide, a reduction from 475.0 new cases per 100,000 persons in 1988 to 427.4 in 1999. For the first year, decline in cancer incidence rates is statistically significant among both males and females. For females, the age-adjusted incidence rates have dropped from 427.8 new cases per 100,000 women in 1988 to 389.5 in 1999, a decline of nine percent. The incidence rate among males shows a different pattern, increasing sharply for three years from 557.3 in 1989 to 620.2 in 1992, and then decreasing in each of the subsequent years. In 1999, the incidence rate among men was 485.9, the lowest rate since 1988. The fluctuation in overall cancer rates among men is largely due to changes in prostate cancer incidence reporting that resulted from changes in prostate screening procedures. Excluding prostate cancer, the incidence rate among men declined significantly by about 16 percent over the 12-year period.

Cancer remains the second leading cause of death in the state. In 1999, 52,877 Californians died with cancer listed as the underlying cause of death on the death certificate. However, the overall cancer mortality rate decreased significantly by 17 percent over the 12-year period, from 209.7 cancer-related deaths per 100,000 persons in 1988 to 179.9 in 1999. The decline in mortality rates (by 17 percent among men and 12 percent among women) is statistically significant among men and women of all four major race/ethnic groups.

Leading Cancer Sites

By Sex

Figures 1 and 2 show the ten most commonly diagnosed cancers and the ten leading causes of cancer-related deaths among California men and women in 1999. These ten sites accounted for approximately 80 percent of all cancer diagnoses and deaths. Breast cancer was the most common cancer, accounting for 21,390 new invasive cases in 1999, or approximately one of every three (33.2 percent) invasive cancers diagnosed among women. Prostate cancer was the second most commonly diagnosed cancer overall and the most common cancer among males, accounting for 19,123 new cases in 1999 and somewhat less than a third (29.7 percent) of all invasive cancers diagnosed among men.

For both men and women, lung and bronchus cancer was the second most commonly diagnosed cancer and the leading cause of cancer-related mortality, accounting for approximately one of every three cancer deaths among men and one of every four cancer deaths among women. A total of 16,585 Californians were diagnosed with and 13,489 died of lung and bronchus cancer in 1998. Colorectal cancer was the third most commonly diagnosed cancer and the third leading cause of cancer-related death among both men and women, accounting for eleven percent of cases and ten percent of deaths. Together, these four cancers (prostate, breast, lung and bronchus, and colorectal) accounted for more than 50 percent of all diagnoses of invasive cancer and cancer deaths in California in 1998.

By Sex and Race/Ethnicity

Tables 1 and 2 show the five most commonly diagnosed cancers and the five most common cancer-related deaths in California over the five-year period 1995-1999 among men and women in the following nine race/ethnic groups: non-Hispanic white, black, Hispanic, Asian/Pacific Islander; and within Asian/Pacific Islander, Chinese, Filipino, Japanese, Korean, and selected Southeast Asian (Cambodian, Hmong, Laotian, and Vietnamese).

Among males, prostate cancer was the most commonly diagnosed cancer in most of the race/ethnic groups, with lung and colorectal cancers ranked second or third. The most notable exceptions were Korean males, for whom stomach cancer was the most common cancer, with prostate ranking fifth, and Southeast Asian males, for whom lung cancer ranked first, liver cancer second, and prostate cancer third. Among females, breast cancer was the most commonly diagnosed cancer among each of the nine race/ethnic groups, without exception. As with males, lung and colon and rectum cancers were usually the second or third most frequently diagnosed. Although invasive cervical cancer did not rank in the top five most commonly diagnosed cancers among non-Hispanic white or black females, it was the third most common cancer among Southeast Asian and Hispanic women, and fifth among Korean women.

Lung/bronchus cancer was the leading cause of cancer-related mortality among men, regardless of race/ethnicity, while prostate or liver often ranked second, and colon and rectum third. Liver cancer was the second leading cause of cancer mortality among Chinese, Southeast Asian, and Asian/Pacific Islander men as a group, ranking third among Korean men. Lung and bronchus, breast, and colorectal cancers were the three leading causes of cancer-related mortality among women from most race/ethnic groups,

although the rank order varied somewhat. The exceptions were Korean females, for whom stomach cancer was the second leading cause of cancer-related death and liver cancer ranked third, and Southeast Asian women, for whom liver cancer was the third leading cause of cancer-related death.

By Sex and Age at Diagnosis or Death

Tables 3 and 4 show the five most commonly diagnosed cancers and the five most common cancer-related deaths in California during 1999 by sex and age at diagnosis or death. The majority of cancers were diagnosed among the elderly; close to 60 percent of all cancer diagnoses and 70 percent of all cancer deaths were among 65 years old and older persons (who account for about 11 percent of the California population). Although childhood cancer is quite rare, leukemia or brain and central nervous system cancer were the most commonly diagnosed cancers among children less than 15 years old, and were the most common cause of cancer-related death in this age group as well.

Among men 15 to 34 years old, testicular cancer was the most common cancer, and among men 35-44 years old, melanoma of the skin was the most commonly diagnosed cancer. Prostate cancer was the most common cancer among men who were 45 years and older. Breast cancer was the most common cancer among adult women, regardless of age. Cancer of the cervix, thyroid, and melanoma were common among women 15 to 44 years old, and after that age, cancer of the lung, colon and rectum, or uterus were the other three most commonly diagnosed cancers. Lung cancer was the leading cause of cancer-related death among men over 35. Breast cancer was the leading cause of cancer-related death among women from age 35 to 54, after which lung cancer death became the most common.

The median age of cancer patients at diagnosis and death are shown by primary site, race/ethnicity, and sex in Tables 8 and 9, aggregating data over the most recent five-year period, 1995-1999.

Race/Ethnic Differences in Cancer Rates

Black males are the most likely group to develop cancer and die from the disease. In 1999, the overall cancer incidence rate among black males in California (623.0 per 100,000) was 18 percent higher than among non-Hispanic white males (511.8 per 100,000), and over 40 percent higher than among Hispanic or Asian/Pacific Islander men (349.1 and 339.0 per 100,000, respectively). The mortality rate for black males was about 30 percent higher than for white males (325.3 vs. 230.8 per 100,000, respectively), and twice as high as the rates for Hispanic and Asian/Pacific Islander males (158.3 and 160.4 per 100,000, respectively). While the overall cancer incidence was somewhat higher among non-Hispanic white women than among black women (424.8 vs. 388.3 per 100,000, respectively), black women had an 18 percent higher cancer mortality rate (201.9 vs. 166.0 per 100,000, respectively). Hispanic and Asian/Pacific Islander females had much lower cancer rates than their non-Hispanic white and black counterparts.

Figures 3 through 5 compare age-adjusted cancer incidence and mortality rates during 1995-1999 among Asian/Pacific Islanders, blacks, and Hispanics to rates among non-Hispanic whites for all cancer sites combined and for each of the most common cancers. In these figures, a rate ratio, or relative risk, close to one indicates that the rates are very similar in the two groups; the rate ratio is greater than one if the rate is higher in the nonwhite population, and is less than one if the rate is lower in the nonwhite population than in non-Hispanic whites.

Although persons of Asian/Pacific Islander race/ethnicity are significantly less likely to develop or die from cancer than non-Hispanic whites, they are about 2.5 times more likely to develop stomach cancer and 4.6 times more likely to develop liver cancer, with a similarly elevated risk of dying from these cancers (Figure 3). The thyroid cancer incidence rate among Asian/Pacific Islanders is modestly elevated (rate ratio 1.3), but the mortality rate is twice as high. Asian/Pacific Islander women are significantly more likely to be diagnosed with or to die from invasive cervical cancer than non-Hispanic white women.

Black persons have twice the risk of non-Hispanic white persons of developing multiple myeloma and cancers of the stomach and liver, and about 60 to 70 percent higher risk of developing cancers of the larynx, and Kaposi's Sarcoma (Figure 4). Compared to non-Hispanic whites, black women have a 50 percent higher risk of developing invasive cervical cancer, and black men are 60 percent more likely to be diagnosed with prostate cancer. Incidence rates among blacks are significantly lower but mortality rates are the same or higher than among non-Hispanic whites for urinary bladder, leukemia, Hodgkin's disease, and cancers of the female breast or uterus, reflecting poorer survival. Cancer incidence and mortality rates are significantly lower among blacks than whites for non-Hodgkin's lymphoma, brain and central nervous system cancer, testicular cancer, ovarian cancer, and melanoma of the skin.

Overview

Persons of Hispanic ethnicity are significantly less likely to develop most cancers than non-Hispanic whites, but are almost twice as likely to develop stomach cancer and liver cancer, and have the same probability of developing kidney cancer, multiple myeloma, and thyroid cancer (Figure 5). Incidence rates among Hispanics are lower but mortality rates are the same or higher than among non-Hispanic whites for Hodgkin's disease, and cancers of the thyroid and testis. Hispanic women have the highest rate of invasive cervical cancer in California, more than twice as high as among non-Hispanic white women.

Female Breast Cancer

Tables on breast cancer are presented in Section III. Female breast cancer incidence in California is presented by stage at diagnosis as well as for all invasive breast cancers combined. The following American Joint Committee on Cancer (AJCC) definitions for stage at diagnosis are used for invasive breast cancer (14):

Stage I Tumor less than two cm in greatest dimension with no spread to axillary lymph nodes

Stage IIa Tumor less than two cm, lymph nodes involved, but movable ***or*** tumor two to five cm with no spread to ax-illary lymph nodes

Stage IIb Tumor two to five cm, lymph nodes involved, but movable ***or*** tumor more than five cm with no spread to lymph nodes

Stage III Tumor more than five cm, lymph nodes involved, but movable ***or*** tumor of any size, lymph nodes involved and fixed to each other ***or*** other structures

Stage IV Spread to other organs

Breast cancer was the most commonly diagnosed cancer overall, and the most common among adult women regardless of age and race/ethnicity, accounting for 21,254 new invasive cancers and 4,150 *in situ* cancers in California women in 1999. Among invasive female breast cancers diagnosed in 1999, 9,054 (42.6 percent) were Stage I, 4,685 (22.0 percent) were Stage IIa, 2,417 (11.4 percent) were Stage IIb, 1,321 (6.2 percent) were Stage III, 796 (3.7 percent) were Stage IV, and 2,198 (10.3 percent) were of unknown stage.

In 1999, incidence rates of invasive breast cancer were highest among non-Hispanic white women (147.3 new cases per 100,000 women), followed by black women (121.3), Asian/Pacific Islander women (92.3), and Hispanic women (84.9). However, rates of more advanced disease (Stages III and IV) were higher among black women than among non-Hispanic white women.

Roughly 50 percent of breast cancers were diagnosed among women who were 65 years old and older, 30 percent among women 50 to 64 years old, and 20 percent among women who were less than 50 years old. Although breast cancer is very common, survival is relatively high and has significantly improved since 1974: the five-year relative survival rate for invasive cases in the Surveillance, Epidemiology, and End Results (SEER) Program (22) was 85.5 percent among women diagnosed between 1992 and 1997, and 74.7 percent among women diagnosed between 1974 and 1976. However, survival is strongly associated with how advanced the disease is when diagnosed. Relative five-year survival for women with invasive tumors confined to the breast (i.e., no lymph node involvement) is 96.4 percent; for women with tumors that have spread to lymph nodes or adjacent tissues when diagnosed, relative five-year survival is 77.7 percent; and for women with tumors that have already metastasized, relative five-year survival is 21.1 percent (22).

Data from the Northern California Cancer Center, which has collected population-based cancer data in the San Francisco Bay Area since 1973, show that breast cancer rates in that area increased by about 35 percent from the late 1970s to 1987, and since then have decreased slightly (28). Similar increases have been reported in the geographic areas covered by SEER (22). It is likely that some of the apparent increase in breast cancer incidence is due to more effective breast cancer screening, but the extent to which other factors may be involved is unclear and remains the source of scientific and public debate.

The invasive breast cancer incidence rate among women in California has been fairly stable since 1989, fluctuating between 124.8 and 130.9 new cases per 100,00 women per year. However, incidence rates for Asian/Pacific Islander women have increased by approximately 24 percent during the same period, from 74.6 in 1989 to 92.3 in 1999. Incidence rates by stage at diagnosis show that rates of early-stage disease have increased, while rates of late-stage disease have decreased (Table III-5). The age-adjusted rate of Stage I tumors increased significantly by about 13 percent since 1988. The incidence of Stage IIa, IIb, and Stage IV tumors decreased significantly by 0.9, 1.1, and 1.9 percent, respectively, a year (Table 12). The age-adjusted rate of *in situ* female breast cancer increased significantly by 56 percent during the 12-year period, from 16.3 per 100,000 in 1988 to 25.5 per 100,000 in 1999. Statistically significant increased rates of *in situ* tumors were observed in all four major race/ethnic groups, varying from 4.0 percent per year among white non-Hispanic women to 8.8 percent among Asian/Pacific Islander women. These trends are consistent with a shift to earlier diagnosis due to more effective breast cancer screening, and indicate that advances are being made in reducing the morbidity and mortality associated with this cancer.

A total of 4,039 women died of breast cancer in California in 1999, for an age-adjusted mortality rate of 24.5 deaths per 100,000 women. Although breast cancer incidence is highest among non-Hispanic white women, mortality is highest among black women (31.8 per 100,000 in 1999). The mortality rate decreased significantly by 2.6 percent per year over the 12-year period, from 32.4 deaths per 100,000 women in 1988 to 24.5 in 1999. Decreases in breast cancer mortality have been observed in all four race/ethnic groups; the trend is now statistically significant among women of all race/ethnicities except Asian/Pacific Islanders.

Based on current incidence and mortality rates in California, a 35 year old woman has a 2.8 percent risk of being diagnosed with invasive breast cancer by age 55 (one in 36). At age 55, she has a 3.1 percent risk (one in 34) of developing breast cancer by age 65, a 6.7 percent risk (one in 15) of developing breast cancer by age 75, and a 11.0 percent risk (one in nine) of developing breast cancer before she dies. If current incidence and mortality rates do not change, a female born in 1999 will have a 13.0 percent risk (one in eight), of developing invasive breast cancer sometime during her lifetime, and a 3.1 percent risk (one in 32) of dying of breast cancer.

PROSTATE GLAND CANCER

Data on prostate cancer are presented in Section XXVI. Cancer of the prostate gland was the most commonly diagnosed invasive cancer among men in California, accounting for 19,123 new cases in 1999. Moreover, it was the most common cancer among men in each of the four largest race/ethnic groups: non-Hispanic white, black, Hispanic, and Asian/Pacific Islander. Black men had the highest incidence of prostate cancer (237.5 new cases per 100,000 men in 1999), about 65 percent higher than the rate among non-Hispanic white men (143.2 per 100,000), more than twice the rate among Hispanic men (112.1 per 100,000), and nearly three times the rate among Asian/Pacific Islander men (83.1 per 100,000). About 70 percent of prostate cancers were diagnosed among men who were 65 years old or older. Survival is relatively high and has significantly improved over time; the five-year relative survival rate in the SEER program (22) was 96.2 percent among men diagnosed between 1992 and 1997 compared to 67.1 percent among men diagnosed between 1974 and 1976.

The incidence of prostate cancer has varied considerably since statewide cancer reporting was implemented in California. These changes probably reflect improvements in the detection of prostate cancer following the introduction and widespread use of the prostate specific antigen (PSA) test in the late 1980s. The age-adjusted incidence rate for men of all races combined increased sharply (over 70 percent) from 102.5 new cases per 100,000 men in 1988 to 175.3 in 1992. Incidence rates began to decline in 1993, and in 1997 the age-adjusted rate (125.2 per 100,000) was similar to the rate in 1990 (122.9 per 100,000). These trends are consistent with the rapid introduction of a new, sensitive screening method. Incidence rates peaked in 1992 among non-Hispanic white men, and one year later among Asian/Pacific Islander, Hispanic, and black men, suggesting an earlier widespread use of the PSA test among white men.

A total of 3,085 California men died of prostate cancer in 1999, accounting for 11.3 percent of cancer-related deaths among men. The age-adjusted mortality rate for prostate cancer has fluctuated from a high of 37.2 deaths per 100,000 in 1991 to a low of 27.6 in 1998. In 1999, the mortality rate for prostate cancer increases slightly to 28.1 deaths per 100,000. Mortality rates have significantly declined by 2.3 percent per year over the 12-year period, and the decrease was most marked among Asian/Pacific Islander men (5.4 percent per year).

Based on current incidence and mortality rates in California, a 45-year old man has a 3.8 percent risk (one in 26) of being diagnosed with prostate cancer by age 65. At age 65, if still cancer-free, he has a 7.6 percent risk (one in 13) of being diagnosed with prostate cancer by age 75 and a 12.4 percent risk (one in eight) of being diagnosed with prostate cancer by age 85. If current incidence and mortality rates do not change, a male born in 1999 has a 14.5 percent risk (one in seven) of developing prostate cancer sometime during his lifetime, and a 3.3 percent risk (one in 30) of dying of prostate cancer.

LUNG AND BRONCHUS CANCER

Tables on lung and bronchus cancer, referred to in this narrative as lung cancer, are presented in Section XIX. Lung cancer is the second most commonly diagnosed cancer and the leading cause of cancer-related death among both men and women, accounting for 16,457 new cases and 13,737 deaths in California in 1999. Overall age-adjusted lung cancer incidence and mortality rates in 1999 were 55.9 and 46.9 per 100,000 persons, respectively. Black men had the highest incidence of lung cancer (102.2 new cases per 100,000 men), almost 40 percent higher than the rate among non-Hispanic white men (75.1), almost twice the rate among Asian/Pacific Islander men (54.9), and nearly three times higher than the rate among Hispanic men (36.7). Incidence rates among non-Hispanic white women (54.6) and black women (54.8) were much higher than the rates among Hispanic and Asian/Pacific Islander women (21.7 and 25.4, respectively), reflecting substantially lower historical smoking prevalence rates among these women than in the other men and women race/ethnic groups.

OVERVIEW

Almost 70 percent of lung cancers were diagnosed among persons 65 years old and older. Survival is still very poor; the five-year relative survival rate was 14.5 percent among lung cancer cases diagnosed between 1992 and 1997 in the SEER program (22).

It is estimated that cigarette smoking, not including exposure to environmental tobacco smoke (29), causes 85 percent of lung cancer. Following the rapid increase in popularity of cigarette smoking among men in the early 1900s, the male lung cancer mortality rate increased from five deaths per 100,000 in 1930 to over 70 deaths per 100,000 in 1980 (30). In contrast, women, who began smoking in significant numbers around World War II, did not begin showing a dramatic increase in lung cancer until the early 1960s (30). Reducing the prevalence of smoking has been a public health priority in California, and the successes have been reflected in lower mortality rates (31).

Lung cancer incidence and mortality rates among men decreased steadily and significantly in California from 1988 to 1999, decreasing by 22 and 15 percent, respectively, over the 12-year period. Incidence and mortality rates decreased significantly among men from all four race/ethnic groups. Incidence rates have decreased by about 11 percent from 1988 to 1999 among women of all four major race/ethnic groups, although the decrease was statistically significant among non-Hispanic white and Hispanic women only. Notwithstanding an increase in mortality rates of about 18 percent among black women, trends in lung cancer mortality were not statistically significant for women of any race/ethnicity. A more gradual decrease in lung cancer among women than men is consistent with the fact that smoking prevalence began declining earlier among men, and declined at a faster rate during the 1970s and 1980s (32).

Based on current incidence and mortality rates in California, one in thirteen men (7.6 percent) and one in seventeen women (6.0 percent) will develop lung cancer during his or her lifetime, and the majority of these persons will die of the disease. However, the risk of lung cancer is ten to twenty times higher among persons who smoke than among those who have never smoked. Since California Cancer Registry (CCR) does not collect information on the smoking history of cancer patients, the data presented here combine the lifetime risk among non-smokers and current and former smokers. These lifetime risks, therefore, vastly underestimate the risk of lung cancer among smokers and overestimate the risk among non-smokers.

COLON AND RECTUM CANCER

Tables on colon and rectum cancer combined are presented in Section VI. Tables on colon cancer are presented separately in Section V, and on rectum and rectosigmoid cancer in Section XXIII. Incidence rates of invasive cancers of the colon and rectum are also presented by stage at diagnosis, based on the following AJCC definitions (14):

Stage I Tumor invades the submucosa ***or*** the muscularis propria.

Stage II Tumor invades through muscularis propria into subserosa, or into nonperitonealized pericolic or perirectal tissues ***or*** tumor directly invades other organs or structures and/or perforates the visceral peritoneum.

Stage III Presence of metastasis in regional lymph nodes, regardless of the extension of the tumor.

Stage IV Spread to other organs.

Colon and rectum cancer was the third most commonly diagnosed cancer and the third leading cause of cancer-related death among both men and women in California, accounting for 14,083 new invasive cases, 834 *in situ* cases, and 5,121 deaths in 1999. Age-adjusted colon and rectum cancer incidence rates were 47.9 new invasive cases and 2.8 *in situ* cases per 100,000 persons. The mortality rate was 17.6 deaths per 100,000 persons. Among all invasive colorectal cancers diagnosed in 1999, 3,513 (24.9 percent) were Stage I, 3,847 (27.3 percent) were Stage II, 3,105 (22.0 percent) were Stage III, 2,437 (17.3 percent) were Stage IV, and 819 (5.8 percent) were of unknown stage.

Black men had the highest incidence of colon and rectum cancer (70.6 new invasive cases per 100,000 men), approximately 20 percent higher than the rate among non-Hispanic white men (59.0), 48 percent higher than the rate among Asian/Pacific Islander men (47.7), and 70 percent higher than the rate among Hispanic men (41.4). Incidence rates were between 20 and 30 percent lower among women than men in each race/ethnic group: rates were 55.6, 42.8, 37.5, and 29.9 invasive cases per 100,000 among black, non-Hispanic white, Asian/Pacific Islander, and Hispanic women, respectively. More than 70 percent of colon and rectum cancers were diagnosed among persons who were 65 years old or older. Survival is lower than for breast and prostate cancer, but much higher than for lung cancer. Similar to what has been reported for breast and prostate cancer, the five-year relative survival rate has significantly improved over time, from 49.8 percent among cases diagnosed between 1974 and 1976 to 61.1 percent among cases diagnosed between 1992 and 1997 in the SEER program (22). Survival is also strongly associated with how advanced the disease is when diagnosed. Relative five-year survival for persons with invasive tumors confined to the colon and rectum is 89.7 percent; for persons with tumors that have spread to lymph nodes or adjacent tissues when diagnosed, relative five-year survival is 64.4 percent; and for persons with tumors that have already metastasized, relative five-year survival is only 8.3 percent (22).

Colon and rectum cancer incidence rates in California have decreased steadily and significantly since 1988 among both men and women by 1.8 percent per year for invasive cases and by five percent per year for *in situ* cases. Mortality rates have also decreased significantly since 1988 by almost three percent per year. Recent decreases in colon and rectum cancer rates have also been reported by the SEER program, and are believed to reflect increased use of endoscopic screening and benign polyp removal which may prevent progression to neoplastic disease (9). The incidence of colon and rectum cancer has decreased significantly during the 1988-1999 period in both sexes and all race/ethnic groups, except for Asian/Pacific Islanders that had a nonsignificant decrease. Mortality rates have also decreased in both sexes and all race/ethnic groups, although trends are significant among Asian/Pacific Islander men, black women, Hispanic women, and non-Hispanic white men and women. Trends in the incidence of colon and rectum cancer by AJCC stage at diagnosis were not analyzed due to the short period of time (5 years) for which such information has been available.

Based on current incidence and mortality rates in California, a 55 year old man has a 1.0 percent risk (one in 96) of developing colon or rectum cancer by age 65, a 2.9 percent risk (one in 34) of developing colon or rectum cancer by age 75, and a 5.9 percent risk (one in 17) by the end of his life. The corresponding figures for a 55 year old woman are a 0.7 percent risk (one in 137) by age 65, 2.1 percent risk (one in 48) by age 75, and a 5.2 percent risk (one in 19) by the end of her life. If current rates do not change, one in 43 males and one in 46 females born in 1999 are likely to die of colon or rectum cancer.

CERVICAL CANCER

Tables on invasive cervical cancer are presented in Section IV. Cervical cancer incidence in California is presented by stage at diagnosis as well as for all invasive cancers combined. The following AJCC definitions for stage at diagnosis are used for invasive cervical cancer (14):

Stage I Tumor confined to uterus.

Stage II Tumor invades beyond uterus but not to pelvic wall ***or*** to the lowest third of vagina.

Stage III Tumor involves lower third of vagina, or extends to pelvic wall and/or causes hydronephrosis or nonfunctioning kidney ***or*** presence of regional lymph node metastasis, regardless of the extension of the tumor.

Stage IV Tumor invades mucosa of bladder or rectum and/or extends beyond the true pelvis ***or*** spread to other organs.

Cervical cancer is among the ten leading cancers in California, accounting for 1,624 new invasive cases and 459 deaths in 1999. Among invasive cervical cancers diagnosed in 1999, 839 (51.6 percent) were Stage I, 252 (15.5 percent) were Stage II, 284 (17.5 percent) were Stage III, 168 (10.3 percent) were Stage IV, and 81 (5.0 percent) were of unknown stage.

In 1999, incidence rates of invasive cervical cancer were highest among Hispanic women (17.0 new cases per 100,000 women), 68 percent higher than the rate among black women (10.1), 81 percent higher than the rate among Asian/Pacific Islander women (10.1), and over twice as high as the rate among non-Hispanic white women (7.4). Data from the 1999 California's Behavioral Risk Factor Survey (33) show that screening with the Pap test, an important step to prevent the development of invasive cervical cancer, may still be less utilized among certain subgroups. Among adult Hispanic women responding to the survey, 14 percent had not received a recent Pap test in the past three years, and nine percent had never been screened. Though the percentage is lower than among women of all races combined, screening has improved (compared to 16 and eight percent, respectively, among women of all races combined).

Cervical cancer is diagnosed at a relatively young age, with over 55 percent of all invasive cervical cancers being diagnosed among women who were less than 50 years. Survival is highly associated with how advanced the disease is when diagnosed. Relative five-year survival for women with invasive tumors confined to the uterus is 91.9 percent; for women with tumors that have spread to lymph nodes or adjacent tissues when diagnosed, relative five-year survival drops to 49.1percent; and for women with tumors that have already metastasized, relative five-year survival is 14.6 percent (22).

During the 12-year period, the invasive cervical cancer incidence among California women has significantly declined by 1.9 percent per year, from 12.1 new cases per 100,000 women in 1988 to 9.8 in 1999. Incidence rates have decreased significantly during the 12-year period in all race/ethnic groups. As with colon and rectum cancer, trends in the incidence of invasive cervical cancer by AJCC stage at diagnosis were not analyzed due to the short period of time for which such information has been available. Trends in mortality were generally downward, and statistically significant for all four major race/ethnic groups, except Hispanics. When trends are examined for women of all race/ethnic groups combined, cervical cancer mortality rates in California have decreased significantly since 1988 by 2.0 percent per year.

OVERVIEW

Based on current incidence and mortality rates in California, a female born in 1999 will have a 0.9 percent risk (one in 109) of developing invasive cervical cancer sometime during her lifetime, and a 0.3 percent risk (one in 333) of dying of cervical cancer.

CANCER TRENDS IN CALIFORNIA

Tables 12 and 13 present trends in cancer incidence and mortality rates for the most common cancers by sex and race/ethnicity over the 12-year period 1988-1999. Trends were evaluated by calculating the estimated annual percent change (EAPC), which measures the average percent change per year in the age-adjusted rate. Figures 6 and 7 graph these trends by sex for all races combined. A bar to the right of zero (i.e., a positive percentage) means that the rate, on average, is increasing; a bar to the left (i.e., a negative percentage) means that the rate is decreasing; and an asterisks indicate that the change is statistically significant ($p < 0.05$). As discussed in the Materials and Methods section, this methodology assumes that the change is uniform over the entire time period, which may not be a valid assumption. Trends should be interpreted with caution because of the relatively short time period for which data are available.

Fifteen common cancers showed statistically significant decreases in incidence rates since 1988, when examined for both sexes (or the specific sex) and all races combined: cervix uteri (-1.8 percent per year), larynx (-3.7 percent), lung and bronchus (-2.2 percent), oral cavity and pharynx (-2.1 percent), pancreas (-1.8 percent), stomach (-1.9 percent), urinary bladder (-1.6 percent), colon and rectum (-2.1 percent), brain and nervous system (-1.4 percent), corpus uteri (-1.0 percent), ovary (-1.6 percent), leukemia (-1.6 percent), and Kaposi's sarcoma (-12.9 percent). The significant decrease in the incidence of leukemia reflects the decrease in the occurrence of chronic forms of both lymphocytic (-4.6 percent per year) and myeloid (-2.1 percent) leukemias. For most cancer sites, the decline in incidence rates was statistically significant among men and women. The first seven of the thirteen cancers are known to be associated with tobacco use (29). Decreases in smoking-related cancers may reflect decreases in the prevalence of smoking and smokeless tobacco use, which began two decades ago, and remain a public health priority. Except for esophageal cancer, liver cancer, thyroid cancer, non-Hodgkin's lymphoma, and acute myeloid leukemia, mortality rates have decreased for all common cancers since 1988, although the decreases were not always statistically significant.

Despite the decline in rates for many common cancers since 1988, liver cancer incidence and mortality rates have increased significantly by 45 percent and 26 percent, respectively. Liver cancer accounts for one percent of new cases and two percent of cancer-related deaths statewide. With the exception of black females, for whom there has been a non-significant decrease in mortality rates, liver cancer rates between 1988 and 1999 have increased in both sexes and all race/ethnic groups. These increasing trends, however, are statistically significant only among non-Hispanic white men and women (incidence and mortality), Hispanic males (incidence and mortality), Asian/PI females (incidence and mortality), and black males (incidence).

Incidence rates for *in situ* melanoma of the skin (Table 12) have also increased significantly by more than twofold between 1988 and 1999. Mortality rates during the same period appear to be declining, although the decrease is statistically significant among non-Hispanic white women only. These trends are consistent with an increase in screening, which uncovers more cancer cases, but at earlier stages.

The incidence of Kaposi's sarcoma among males has dramatically declined, from 11.1 new cases per 100,000 men in 1988 to 1.6 in 1999. The decrease in Kaposi's incidence parallels the reported decline in the incidence of male Acquired Immune Deficiency Syndrome (AIDS) in California since 1992 (34). Recent studies have also shown a decline in the incidence of Kaposi's as a presenting AIDS illness, possibly due to more effective antiretroviral therapies, which may impact the development of AIDS-associated malignancies (35).

Other significant trends over the 12-year period in California were a decrease in the incidence of esophageal cancer among black males, a decrease in the incidence of Hodgkin's Disease among non-Hispanic white males, an increase in the incidence of acute lymphocytic leukemia among Hispanic females, and an increase in the incidence of thyroid cancer among Asian/Pacific Islander, Hispanic, and non-Hispanic white females.

SUMMARY

Based on current incidence and mortality rates in California, one of every two men and two of every five women will develop some form of invasive cancer during his or her lifetime. However, many cancers are curable or have very high survival rates, so that a much lower proportion of the population is likely to die of cancer – one of every four men and one of every five women.

Although cancer remains a major cause of illness and death, incidence rates for most common cancers have declined among both men and women since statewide cancer reporting became mandatory in 1988. The overall cancer mortality rate has declined significantly by 0.9 percent per year, for a decrease of 12 percent for men and nine percent for women over the 12-year period 1988-1999.

Overview

Much of this decline is the result of significant decreases in smoking-related cancers such as lung and bronchus, oral cavity and pharynx, larynx, pancreas, stomach, cervix uteri, and bladder. If declining rates for these cancers are due to decreases in tobacco use that began two decades ago, it is likely that they will continue to decline in the future. The increase in incidence rates of early-stage breast cancer and *in situ* melanoma of the skin is consistent with a higher utilization of screening methods, and indicates that efforts have been made towards early cancer detection.

Race/ethnic differences in the risk of developing or dying from cancer remain evident, but the reasons are not well understood. Declining rates for many cancers are apparent among non-Hispanic white men and women, but not always among the other race/ethnic groups in California. CCR has proven to be the cornerstone of a substantial amount of applied research and public policy on cancer control. We hope that the data presented in this report continue to be used to the maximum possible extent for research and interventions towards reducing the burden of cancer in our population.