

## Cancer incidence and mortality patterns among specific Asian and Pacific Islander populations in the U.S.

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Received: 6 April 2007 / Accepted: 19 October 2007 / Published online: 27 November 2007  
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### Abstract

**Objectives** We report cancer incidence, mortality, and stage distributions among Asians and Pacific Islanders (API) residing in the U.S. and note health disparities, using the cancer experience of the non-Hispanic white population as the referent group. New databases added to publicly available SEER\*Stat software will enable public health researchers to further investigate cancer patterns among API groups.

**Methods** Cancer diagnoses among API groups occurring from 1 January 1998 to 31 December 2002 were included from 14 Surveillance, Epidemiology, and End Results (SEER) Program state and regional population-based cancer registries covering 54% of the U.S. API population. Cancer deaths were included from the seven states that report death information for detailed API groups and which cover over 68% of the total U.S. API population. Using detailed racial/ethnic population data from the 2000 decennial census, we produced incidence rates centered on the census year for Asian Indians/Pakistanis, Chinese, Filipinos, Guamanians, Native Hawaiians, Japanese,

Kampuchean, Koreans, Laotians, Samoans, Tongans, and Vietnamese. State vital records offices do not report API deaths separately for Kampuchean, Laotians, Pakistanis, and Tongans, so mortality rates were analyzed only for the remaining API groups.

**Results** Overall cancer incidence rates for the API groups tended to be lower than overall rates for non-Hispanic whites, with the exception of Native Hawaiian women (All cancers rate = 488.5 per 100,000 vs. 448.5 for non-Hispanic white women). Among the API groups, overall cancer incidence and death rates were highest for Native Hawaiian and Samoan men and women due to high rates for cancers of the prostate, lung, and colorectum among Native Hawaiian men; cancers of the prostate, lung, liver, and stomach among Samoan men; and cancers of the breast and lung among Native Hawaiian and Samoan women. Incidence and death rates for cancers of the liver, stomach, and nasopharynx were notably high in several of the API groups and exceeded rates generally seen for non-Hispanic white men and women. Incidence rates were lowest among Asian Indian/Pakistani and Guamanian men and women and Kampuchean women. Asian Indian and Guamanian men and women also had the lowest cancer death rates. Selected API groups had less favorable distributions of stage at diagnosis for certain cancers than non-Hispanic whites.

**Conclusions** Possible disparities in cancer incidence or mortality between specific API groups in our study and non-Hispanic whites (referent group) were identified for several cancers. Unfavorable patterns of stage at diagnosis for cancers of the colon and rectum, breast, cervix uteri, and prostate suggest a need for cancer control interventions in selected groups. The observed variation in cancer patterns among API groups indicates the importance of monitoring these groups separately, as these patterns may

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provide etiologic clues that could be investigated by analytic epidemiological studies.

**Key words** Cancer · Incidence · Mortality · Race · Ethnicity · Asian · Pacific Islander · SEER Program

## Introduction

A goal of the U.S. Department of Health and Human Service's Healthy People 2010 program is the elimination of health disparities that occur by race and ethnicity [1]. Health disparities have been defined as "...differences in the incidence, prevalence, mortality, and burden of diseases and other adverse health conditions that exist among specific population groups in the United States [2]." This definition implies that a cancer health disparity exists when one segment of a population is found to have higher cancer rates (or some other measure of interest that indicates adverse conditions) than another population segment, or referent group. In this study, we report cancer incidence, mortality, and stage distributions among Asians and Pacific Islanders (API) residing in the U.S. and note health disparities, using the cancer experience of the non-Hispanic white population as the referent group. We identify specific API groups that may benefit from cancer control interventions or from further analytic epidemiologic research to follow up on etiologic leads.

Cancer surveillance systems, composed of high quality population-based (state or metropolitan area) central cancer registries, enable the monitoring of health disparities related to cancer incidence, mortality, patient survival, treatment, and quality of life [3]. The broad geographic coverage of national surveillance programs, such as the National Cancer Institute's (NCI) Surveillance, Epidemiology, and End Results (SEER) Program which currently includes 26% of the U.S. population, facilitates the inclusion of more detailed racial/ethnic groups in such analyses by virtue of the large population base. Similarly, data from several state vital records offices that collect and report death information for an expanded set of racial/ethnic groups enables the identification of disparities in cancer mortality [4]. The lack of comparably-detailed racial/ethnic population estimates, however, often constrains U.S. health surveillance systems to report cancer rates for combined groups, such as API. This limitation obscures important differences in the cancer experience of heterogeneous populations [5–7]. As a result, national statistics on cancer for Asian ethnic groups are not routinely available [8]. In this study, we have taken advantage of population data from the 2000 decennial census for detailed racial/ethnic groups, to calculate incidence and mortality rates for several specific API groups: Asian Indian/Pakistani, Chinese,

Filipino, Guamanian, Native Hawaiian, Japanese, Kampuchean, Korean, Laotian, Samoan, Tongan, and Vietnamese (mortality data only are available for a subset of these groups—see Materials and methods). The databases used in these analyses can be accessed, under a data user agreement, from the SEER Web site [9].

## Material and methods

### Study data

Information on new cancer diagnoses among API groups and non-Hispanic whites (referent group) occurring during the 5-year period from 1 January 1998 to 31 December 2002 was obtained from U.S. state and regional population-based cancer registries that participate in the NCI's SEER Program. The reporting areas included in this analysis were: Atlanta, Detroit, Seattle/Puget Sound; and the states of California (registries for Los Angeles County, the Greater San Francisco Bay Area, and the rest of California), Connecticut, Hawaii, Iowa, Kentucky, Louisiana, New Jersey, New Mexico, and Utah. These registries cover 54% of the U.S. API population [10]. The specific API groups included in the incidence comparisons were Asian Indian/Pakistani (combined, due to SEER coding rules [11]), Chinese, Filipino, Guamanian, Native Hawaiian, Japanese, Kampuchean, Korean, Laotian, Samoan, Tongan, and Vietnamese. Approximately 7% of the API cancer cases were classified as "Asian not otherwise specified" (NOS) or "Pacific Islander NOS" and could not be included in the analysis. Only invasive cancers were analyzed, with the exception of the urinary bladder. Bladder cancers reported as either *in situ* or invasive were combined, since information in medical records needed to distinguish between these types of tumors is frequently either unavailable or unreliable [12]. The primary cancer type was coded according to the International Classification of Diseases for Oncology (ICD-O) edition in use at the time of diagnosis, converted to ICD-O Third Edition, and then categorized into cancer site groupings [13].

Cancer deaths occurring during the 1998–2002 study period were identified from all deaths reported to state vital records offices and consolidated by the National Vital Statistics System of the National Center for Health Statistics. The underlying cause of death was coded based on the version of the International Classification of Diseases (ICD) in use at the time of death. Deaths due to malignant neoplasm were then grouped to ensure comparability of disease categories across the ICD versions [13]. Since specification of expanded API racial categories on death certificates is currently required for seven states only (California, Hawaii, Illinois, New Jersey, New York,

Texas, and Washington) and for nine API ethnic groups [14], we restricted our mortality analyses to these areas and groups (Table 1). Thus, the geographic coverage differs between the incidence and mortality analyses. Approximately 72% of the API population covered in the mortality analysis is also included in the incidence analysis. The seven states in the mortality analysis include over 68% of the total U.S. API population; representing 80% of Native Hawaiians, 79% of Filipinos, 77% of Japanese, 74% of Chinese and of Samoans, 65% of Koreans, 62% of Vietnamese, 61% of Guamanians, and 60% of Asian Indians [15]. Less than 0.1% of the API deaths were classified as “API NOS” and were excluded from the analysis. Deaths among non-Hispanic whites in these states are also included for purposes of comparison.

Data analysis

Cancer incidence and mortality rates were calculated for the combined 5-year study period, 1998–2002, as cases or deaths per 100,000 persons. The rates were age-adjusted to the 2000 U.S. standard population using 19 age groups

(<1, 1–4, 5–9, ..., 80–84, 85+). Rates and 95% confidence intervals (95% CI) [16] were generated using SEER\*Stat software [http://www.seer.cancer.gov/seerstat/]. As rates based on small counts (either the number of diagnosed cases or deaths) tend to have poor reliability, they are not shown in tables if the case or death count is <16 [17, 18].

Detailed population data for specific API groups are available only from the decennial U.S. census. Therefore, we centered our study on the 2000 census and used the population counts, multiplied by five, as denominators for incidence and mortality rate calculations. In the 2000 census, individuals were able to indicate multiple race/ethnic responses on the census form [19]. These responses can be tabulated as two population values for detailed API groups; namely, the specific API group alone (counting those who self-identified with only one API group) and the specific API group alone or in combination with any other racial/ethnic groups (counting those who self-identified with either a single API group or with more than one racial/ethnic group, at least one of which was the specific API group of interest). Thus, the population counts for each of the specific API groups are not mutually exclusive. Population data for non-Hispanic whites consist of bridged

**Table 1** Geographic areas included in cancer incidence and mortality rates for each racial/ethnic group, 1998–2002

	Incidence rates											Mortality rates	
	CA <sup>a</sup>	CT	HI	IA	KY	LA	NJ	NM	UT	Atlanta metro	Detroit metro	Seattle–Puget Sound <sup>b</sup>	CA, HI, IL, NJ, NY, TX, and WA
Asian Indian or Pakistani <sup>c</sup>	X	X	– <sup>d</sup>	X	X	X	X	X	X	X	X	2	X
Chinese	X	X	X	X	X	X	X	X	X	X	X	9	X
Filipino	X	X	X	X	X	X	X	X	X	X	X	11	X
Guamanian	X	– <sup>e</sup>	X	– <sup>e</sup>	– <sup>e</sup>	– <sup>e</sup>	– <sup>e</sup>	– <sup>e</sup>	– <sup>e</sup>	– <sup>d</sup>	– <sup>d</sup>	6	X
Native Hawaiian			X <sup>f</sup>										X <sup>f</sup>
Japanese	X	X	X	X	X	X	X	X	X	X	X	9	X
Kampuchean	X	X	– <sup>e</sup>	– <sup>e</sup>	– <sup>e</sup>	– <sup>e</sup>	– <sup>e</sup>	– <sup>d</sup>	X	X	– <sup>d</sup>	6	– <sup>g</sup>
Korean	X	X	X	X	X	X	X	X	X	X	X	10	X
Laotian	X	X	X	X	– <sup>e</sup>	X	– <sup>e</sup>	– <sup>e</sup>	X	X	X	4	– <sup>g</sup>
Samoan	X	– <sup>e</sup>	X	– <sup>e</sup>	– <sup>e</sup>	– <sup>e</sup>	– <sup>e</sup>	– <sup>e</sup>	X	– <sup>d</sup>	– <sup>d</sup>	5	X
Tongan	X	– <sup>d</sup>	X	– <sup>d</sup>	– <sup>d</sup>	– <sup>d</sup>	– <sup>d</sup>	– <sup>d</sup>	X	– <sup>d</sup>	– <sup>d</sup>	1 <sup>e</sup>	– <sup>g</sup>
Vietnamese	X	X	X	X	X	X	X	X	X	X	X	6	X

X—Indicates area was included in rate calculations

<sup>a</sup> Includes cancer registries for Los Angeles, San Francisco/Oakland, San Jose/Monterey, and all remaining areas in California combined

<sup>b</sup> Indicates number of counties within the 11-county Seattle–Puget Sound area for which population estimates were NOT suppressed by the Census Bureau; and thus could be included in the incidence analyses

<sup>c</sup> Incidence rates calculated for combined group of Asian Indians & Pakistanis due to SEER program coding rules; mortality rates calculated only for Asian Indians due to NCHS coding rules

<sup>d</sup> Area not included in rate calculation due to suppression of population data by Census Bureau

<sup>e</sup> Area not included in rate calculation due to small population size (<1,000); see materials and methods and Statistical analysis

<sup>f</sup> Native Hawaiian rates calculated only for the state of Hawaii

<sup>g</sup> Mortality data not available from NCHS for these race/ethnic groups [3]

single-race estimates available for each year from 1998 to 2002 [20, 21].

Cancer registries and state vital records offices have also begun collecting and reporting multiple race and ethnicity information from medical records and death certificates. These sources, however, generally include only a single race or ethnicity designation (>99.95% of cancer diagnoses in SEER registries, data not shown). Therefore, only single race or ethnicity information was used for classifying cases and deaths in this study [11, 22].

Due to the lack of consistency between racial/ethnic information for the numerators (generally, single race from medical records or state vital records offices) and population denominators (either self-reported single race alone; or single race alone or in combination with other races), we calculated two rates for each cancer type, specific API group, and gender. These may be considered as representing a maximum rate (based on the smaller, single-race/ethnicity alone denominator) [23] and a minimum rate (based on the larger denominator that includes both multiple-race/ethnicity and single-race/ethnicity respondents) [24].

Census Bureau policy for Census 2000 data is to not disclose race/ethnicity-specific population counts below 100 for a particular geographic area [25]. Thus, we were unable to obtain comprehensive population denominators for some of the SEER reporting areas. When race/ethnicity-specific census population data were suppressed for an entire registry, the registry was excluded from rate calculations for that particular API group. However, when the census population data were suppressed for a subset of the counties within the Seattle/Puget Sound metropolitan area, we chose to calculate an incidence rate that included all remaining counties for which the race/ethnic-specific population data were not suppressed. This resulted in the exclusion of selected counties in Seattle/Puget Sound from incidence rate calculations for each of the API groups, with the exception of Filipinos (Table 1).

In addition, when a specific API population group in a SEER registry coverage area was less than 1,000 (based on single race/ethnicity alone population data), the data for that area was excluded from the cancer incidence rate calculations for that group. The rationale for this exclusion was that incidence rates for specific API groups in these registries with small populations were generally low; suggesting that misclassification of API ethnic information in medical records may be a bigger problem in these areas. Using this population threshold limited the number of geographic areas for Guamanians, Kampuchean, Laotians, Samoans, and Tongans (Table 1), but excluded just 1–2% of the total number of cancer cases in these groups. Cancer incidence and mortality rates for Native Hawaiians are reported only for the State of Hawaii due to the extensive efforts at the Hawaii Tumor Registry to classify all cancer

patients with any native Hawaiian ancestry and because of the unique cultural and environmental characteristics of this group [26]. About 60% of the total U.S. Native Hawaiian population resides in Hawaii.

We examined the distribution of stage of disease at diagnosis for cancers of the colon and rectum, female breast, cervix uteri, and prostate using the SEER historical stage categories of localized, regional, and distant disease [27]. Due to changing medical practices in characterizing prostate cancers, we combined localized and regional prostate cancer cases for the analysis by stage. The age-adjusted distribution of stage at diagnosis for selected cancers was calculated in the following manner. An age-adjusted incidence rate was computed using the direct method for each particular stage group for a specific cancer site, it was then divided by the age-adjusted incidence rate for all stages combined, and the resulting proportion was converted to a percentage.

## Results

To simplify the presentation of our findings, incidence, and mortality rates appearing in the tables are limited to those based on the single race/ethnicity denominators, with the exception of Native Hawaiian rates. Since the Hawaii Tumor Registry collects extensive multiple race/ethnicity information on their cancer patients and classifies a patient with any native Hawaiian ancestry as native Hawaiian, the most appropriate population denominator for a native Hawaiian rate is the one that includes Hawaiian alone or in any combination. Regardless of which denominators were used, the relative rankings of the cancer sites remained the same for all API groups, however, the magnitude of all the rates were reduced when larger denominators (i.e., population counts based on the specific API group alone or in combination with other any other racial/ethnic group), were used. Rates based on both single race/ethnicity and one or more race/ethnicity denominators are included as appendices. The appendices also include case counts and 95% CI for the rates.

### Incidence rates: Men

The overall cancer incidence rates were highest among Native Hawaiian and Samoan men, due to high rates of prostate and lung cancers (Table 2), but they do not exceed the overall cancer rate for non-Hispanic white men (Table 4). Lung cancer incidence in Native Hawaiian men, however, was higher than that for non-Hispanic white men. Asian Indian/Pakistani and Guamanian men had the lowest overall cancer rates among the API groups, and Asian

**Table 2** Top five age-adjusted cancer incidence rates<sup>a</sup> and 95% CI by Asian or Pacific Islander subgroup, 1998–2002: Men

Rank	Asian Indian or Pakistani			Chinese			Filipino		
		Rate	(95% CI)		Rate	(95% CI)		Rate	(95% CI)
	All cancers	292.1	(277.3, 307.9)	All cancers	348.8	(341.5, 356.2)	All cancers	393.2	(385.0, 401.5)
1	Prostate	98.4	(90.0, 107.7)	Prostate	84.8	(81.2, 88.5)	Prostate	121.9	(117.3, 126.6)
2	Lung	30.8	(25.7, 36.8)	Colorectum	54.0	(51.2, 57.0)	Lung	72.5	(69.0, 76.1)
3	Colorectum	23.1	(19.3, 27.9)	Lung	53.0	(50.1, 56.0)	Colorectum	50.4	(47.5, 53.4)
4	Non-Hodgn	15.8	(12.5, 20.1)	Liver	24.0	(22.1, 25.9)	Non-Hodgn	19.4	(17.7, 21.4)
5	Bladder	15.8	(12.1, 20.5)	Stomach	18.3	(16.6, 20.2)	Liver	17.2	(15.5, 19.0)
	Guamanian			Native Hawaiian <sup>b</sup>			Japanese		
	All cancers	252.1	(189.8, 336.7)	All cancers	531.6	(503.7, 561.1)	All Cancers	422.4	(412.8, 432.3)
1	Prostate	131.5	(85.0, 202.4)	Prostate	119.7	(106.1, 135.1)	Prostate	115.0	(110.1, 120.1)
2	nr			Lung	109.8	(97.4, 123.9)	Colorectal	75.9	(71.9, 80.2)
3	nr			Colorectal	65.7	(56.1, 77.1)	Lung	49.8	(46.6, 53.3)
4	nr			Bladder	21.2	(15.3, 29.1)	Stomach	29.3	(26.9, 32.1)
5	nr			Non-Hodgn	19.6	(14.8, 26.3)	Bladder	22.9	(20.8, 25.4)
	Kampuchean			Korean			Laotian		
	All cancers	372.0	(325.3, 425.5)	All cancers	372.6	(357.4, 388.4)	All Cancers	407.2	(360.7, 460.3)
1	Lung	82.6	(60.1, 112.6)	Lung	61.1	(54.8, 68.2)	Lung	87.3	(64.9, 117.4)
2	Liver	49.1	(36.3, 68.5)	Colorectum	55.9	(50.2, 62.2)	Liver	79.4	(60.7, 105.0)
3	Prostate	39.7	(25.0, 62.2)	Prostate	55.7	(49.8, 62.3)	Stomach	33.1	(19.1, 55.8)
4	Colorectum	30.0	(18.3, 49.5)	Stomach	55.0	(44.6, 56.2)	Prostate	30.9	(18.2, 51.9)
5	Stomach	23.8	(12.1, 44.3)	Liver	35.9	(31.6, 40.8)	Colorectum	30.2	(19.4, 48.8)
	Samoan			Tongan			Vietnamese		
	All cancers	566.7	(498.8, 645.5)	All cancers	428.8	(329.9, 555.9)	All Cancers	374.3	(358.5, 390.9)
1	Prostate	144.1	(110.0, 190.4)	Lung	107.0	(55.2, 193.0)	Lung	72.3	(65.3, 80.2)
2	Lung	111.9	(84.4, 151.1)	Prostate	85.0	(44.5, 157.4)	Prostate	59.1	(52.8, 66.3)
3	Liver	54.5	(35.2, 86.9)	nr			Liver	55.5	(49.9, 62.0)
4	Stomach	53.0	(33.2, 86.1)	nr			Colorectum	41.2	(36.1, 47.1)
5	Colorectum	43.1	(26.6, 72.8)	nr			Stomach	25.6	(21.2, 30.9)

<sup>a</sup> Rates are average annual per 100,000 age-adjusted to the 2000 U.S. standard population for the following SEER areas: Atlanta, Detroit, Seattle/Puget Sound; and the states of California (registries for Los Angeles County, the Greater San Francisco Bay Area, and the rest of California), Connecticut, Hawaii, Iowa, Kentucky, Louisiana, New Jersey, New Mexico, and Utah

<sup>b</sup> Rates for Native Hawaiians are calculated using the one or more race/ethnicities population denominators for Hawaii only (See Materials and methods)

Abbreviations: Lung = lung and bronchus; Liver = liver and intrahepatic bile duct; Non-Hodgn = non-Hodgkin lymphoma

Indians/Pakistanis had relatively low rates for lung and colorectal cancers. Prostate cancer was the leading cancer in Asian Indian/Pakistani, Chinese, Filipino, Guamanian, Native Hawaiian, Japanese, and Samoan men, while lung cancer rates were highest in Kampuchean, Korean, Laotian, Tongan, and Vietnamese men. Colorectal cancer was among the top three cancers in Asian Indian/Pakistani, Chinese, Filipino, Native Hawaiian, Japanese, Korean, and men; whereas liver cancer was among the top three in Kampuchean, Laotian, Samoan, and Vietnamese men.

Japanese men had the highest colorectal cancer rate (75.9 per 100,000; 95% CI: 71.9, 80.2) and this exceeded the rate in non-Hispanic white men. Among Laotian men, incidence rates for lung, liver, and stomach cancers all exceeded the rate for prostate cancer; in fact, their prostate cancer rate (30.9; 95% CI: 18.2, 51.9) was lowest among the API groups in our study. Stomach cancer was among the top five cancers in all API groups, with the exception of Asian Indian/Pakistani and Filipino men, but ranked much lower in non-Hispanic white men (Appendix Table 1).

Rates of stomach cancer were particularly high for Korean (50.0; 95% CI: 44.6, 56.2) and Samoan men (53.0; 95% CI: 33.2, 86.1). Liver cancer was also among the top five cancers in Chinese, Filipino, Kampuchean, Korean, Laotian, Samoan, and Vietnamese men. The liver cancer rate was highest in Laotian men (79.4; 95% CI: 60.7, 105.0). Rates for nasopharyngeal cancer were highest in Chinese and Vietnamese men, but not among the top five cancers for any group, and greatly exceeded the rate in non-Hispanic white men (Appendix Table 1). Nasopharyngeal cancer may also have been high in other API groups, but the number of cases in our study were too small to produce reliable rates.

#### Incidence rates: Women

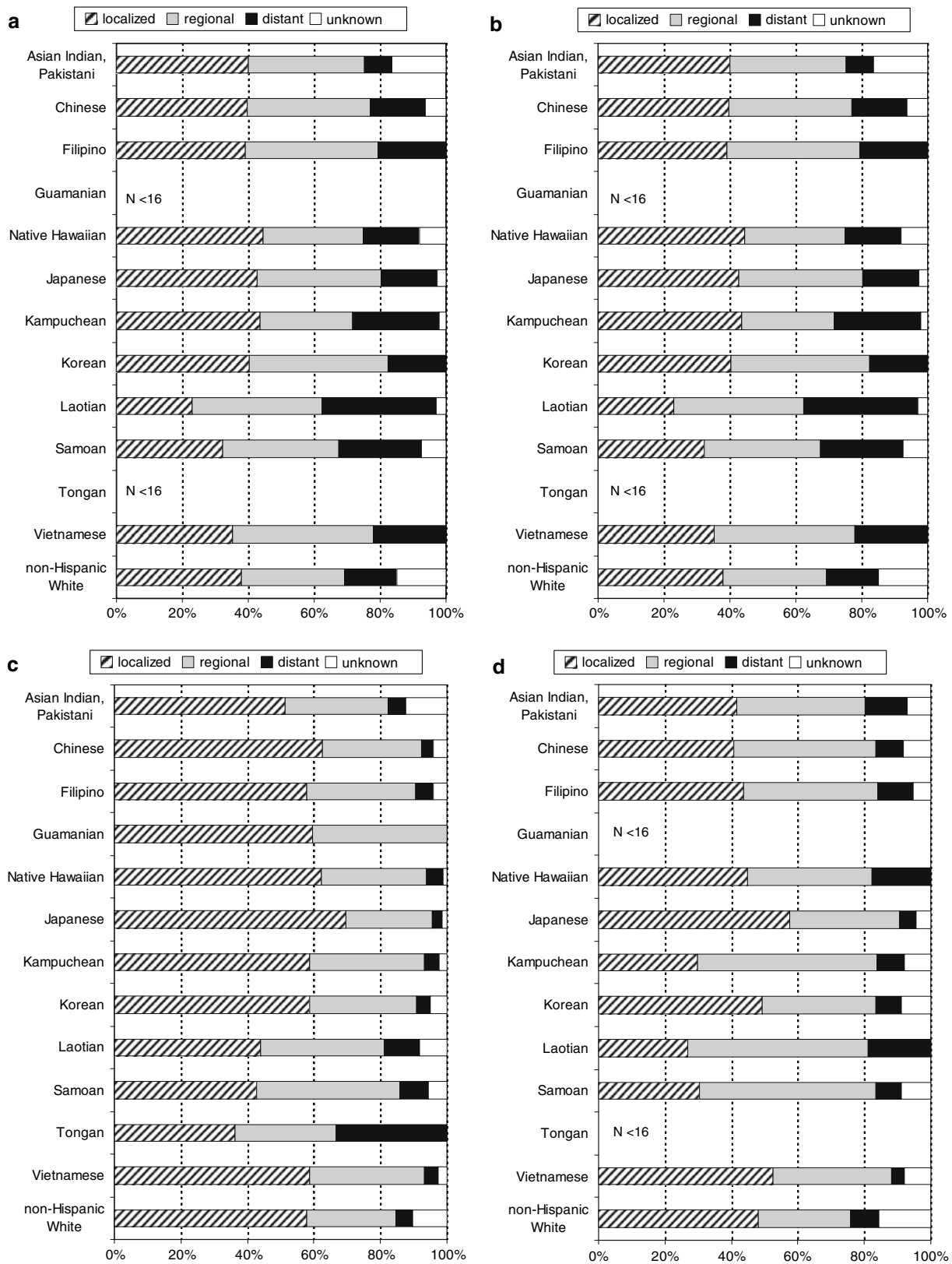
Native Hawaiian, Samoan, and Tongan women had the highest overall cancer incidence rates, while Asian Indian/Pakistani, Guamanian, and Kampuchean women had the lowest rates (Table 3). The cancer rate in Native Hawaiian women even exceeds that of non-Hispanic white women (Table 4). Breast cancer was the leading cancer in each female API group with the exception of Laotian women, for whom lung cancer had the highest age-adjusted incidence rate and breast cancer had the second highest rate, though the variability associated with each of these rates was large. Breast cancer incidence was highest among Native Hawaiian women (175.8; 95% CI: 163.0, 189.4) and exceeded the rate in non-Hispanic white women. Lung cancer was among the top four cancers in every female API group and Native Hawaiian women had the highest rate (69.7; 95% CI: 61.2, 79.1). Colorectal cancer was one of the top four cancers in all groups for whom there were sufficient data. Japanese women, similar to the men, had the highest colorectal cancer rate (51.9; 95% CI: 49.1, 55.0) among the racial/ethnic groups, even exceeding the rate in non-Hispanic white women. Cervical cancer was among the top five cancers in Kampuchean, Laotian, Samoan, and Vietnamese women and their rates exceeded that for non-Hispanic white women (Appendix Table 1). Endometrial cancer was among the top four leading cancers for all groups with the exception of Kampuchean, Korean, Laotian, and Vietnamese women. Liver cancer was the fifth leading cancer in Kampuchean, Korean, Laotian, and Vietnamese women. Stomach cancer was among the top five cancers for Chinese, Japanese, and Korean women, and greatly exceeded the rate in non-Hispanic white women. As observed in men, nasopharyngeal cancer rates were highest in Chinese and Vietnamese women, while small numbers of cases precluded an evaluation of the rates in many of the other API groups (Appendix Table 1).

#### Stage distribution

Age-adjusted percentage stage distributions are shown for cancers of the colon and rectum, female breast, cervix uteri, and prostate in Figs. 1a–d, 1e. Laotian, Samoan, and Vietnamese men had lower percentages of colorectal cancers diagnosed at an early (localized) stage relative to the other API groups and to non-Hispanic whites. The total number of cases was fairly small, however, for Laotian ( $n = 30$ ) and Samoan ( $n = 31$ ) men. Among women, Laotians again had a lower percentage of localized stage diagnoses, but this was also based on a small total number of colorectal cancers ( $n = 24$ ). For female breast cancer, Laotian, Samoan, and Tongan women had a smaller percentage of cases diagnosed at localized stage than the other groups. The total number of breast cancer cases in each of these groups was 45, 94, and 35, respectively. Kampuchean, Laotian, and Samoan women had smaller percentages of cervical cancers diagnosed at localized stage (total number of cervical cancers = 22, 28, and 19, respectively). Comparisons of the stage distribution of prostate cancer across the API groups indicated that Kampuchean, Samoan, and Tongan men had smaller percentages of local/regional cancers than the other groups, though the total number of cases was limited ( $n = 27, 77, \text{ and } 16$ , respectively).

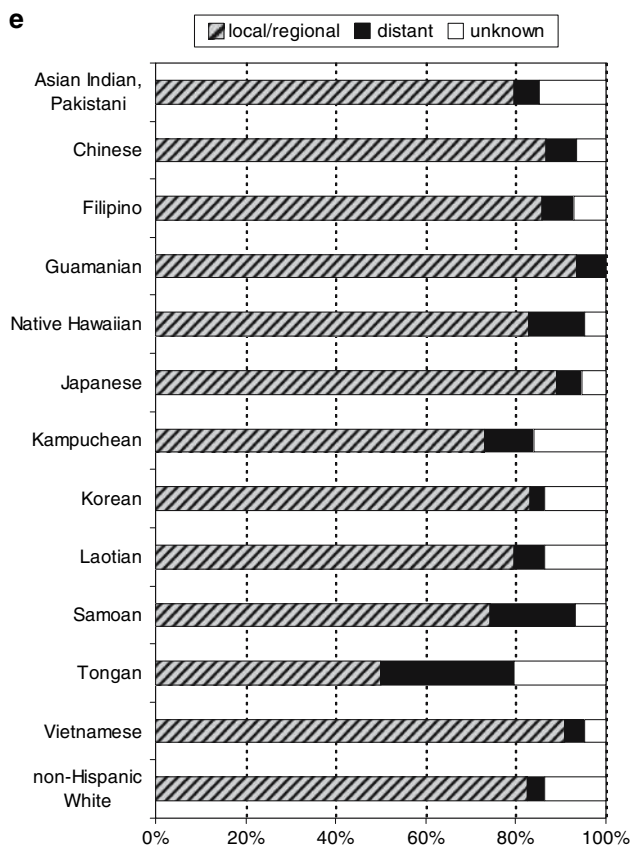
#### Mortality rates: Men

The overall cancer death rates were highest among Samoan and Native Hawaiian men (Table 5) and, unlike the incidence rates, exceeded the overall cancer death rate for non-Hispanic white men (Table 4). Asian Indian men had the lowest overall cancer mortality rate among the API groups, largely due to relatively low rates for lung and colorectal cancers. Lung and bronchus cancer had the highest age-adjusted death rate for each Asian ethnic group. Native Hawaiian men had the highest lung cancer rate (87.7 per 100,000; 95% CI: 76.4, 100.7), and exceeded the rate in non-Hispanic white men (72.2 per 100,000; 95% CI: 71.8, 72.7). Prostate cancer mortality was among the top three causes of cancer death in Asian Indian, Filipino, Native Hawaiian, and Samoan men. Samoan men had the highest rate (36.2 per 100,000; 95% CI: 18.9, 64.4), but it is based on relatively few deaths and its confidence interval includes the rates seen for native Hawaiian and non-Hispanic white men. Colorectal cancer was among the top three causes of cancer death in Chinese, Filipino, Native Hawaiian, and Japanese men. Samoans had the highest rate (31.6 per 100,000; 95% CI: 17.2, 56.0). Liver cancer was in the top four causes of cancer death for all male Asian ethnic groups, except, Native Hawaiians and Japanese. Samoans also had the highest rate for this site



**Fig. 1** (a) Age-adjusted percentage distributions of stage at diagnosis for colorectal cancer, 1998–2002: Men. (b) Age-adjusted percentage distributions of stage at diagnosis for colorectal cancer, 1998–2002: Women. (c) Age-adjusted percentage distributions of stage at

diagnosis for breast cancer, 1998–2002: Women. (d) Age-adjusted percentage distributions of stage at diagnosis for cervix uteri cancer, 1998–2002: Women. (e) Age-adjusted percentage distributions of stage at diagnosis for prostate cancer, 1998–2002: Men



**Fig. 1** continued

(32.9 per 100,000; 95% CI: 19.3, 56.1). Stomach cancers were in the top four causes of cancer death for all male Asian ethnic groups, except Asian Indians and Filipinos. Samoans had the highest rate for this site as well (40.9 per 100,000; 95% CI: 24.1, 67.6).

#### Mortality rates: Women

Samoan and Native Hawaiian women had the highest overall cancer death rates (Table 6), and even exceed the cancer mortality rate for non-Hispanic white women (Table 4). Asian Indian women had the lowest overall cancer death rate. Lung cancer was the leading cause of cancer death in each female API group, with the exception of Asian Indian women, for whom breast cancer had the highest age-adjusted rate (Table 6). Native Hawaiian women had the highest lung cancer death rate of all the API groups (47.6 per 100,000; 95% CI: 40.6, 55.6), but the confidence interval included the rate seen for non-Hispanic white women. Breast cancer was among the top three cancer causes of death for each female Asian ethnic group, except Koreans, where it was in the top five. Samoan and native Hawaiian women had the highest breast cancer

death rates among the API groups. Colorectal cancer was among the top four cancers in every female API group, except Guamanian and Samoan women, for whom the data were too sparse to evaluate for this cancer. Liver cancer was among the top four cancer causes of death in Chinese, Korean, and Vietnamese women and their rates exceeded the liver cancer mortality rate for non-Hispanic white women (Appendix Table 2). Stomach cancer was among the top five cancer causes of death for Chinese, Native Hawaiian, Japanese, Korean, and Vietnamese women and their rates exceeded the rate in non-Hispanic white women (Appendix Table 2). The cervical cancer death rate in Vietnamese women, though not among the top five cancers, exceeded the rate in non-Hispanic white women (Appendix Table 2).

#### Discussion

Possible disparities in cancer incidence and mortality were identified for some of the API populations studied, using non-Hispanic whites as the referent. Liver cancer incidence and death rates were notably high among Chinese, Kampuchean, Korean, Laotian, Samoan, and Vietnamese men; and the rates for all API groups and both sexes in our study exceeded those for non-Hispanic white men and women. Infection with hepatitis B and C viruses is the major cause of liver cancer and individuals migrating from Asian, Middle Eastern, and African countries, where the viruses are endemic have been widely reported to be at increased risk for this cancer [28]. Stomach cancer incidence and death rates were higher for many of the API groups in our study when compared to rates for non-Hispanic whites. Asian Indian/Pakistani, and Filipinos were the exceptions, with their rates being closer to those for non-Hispanic whites. Studies of migrant populations suggest that exposure early in life to *Helicobacter pylori* plays a role in stomach cancer risk, in addition to possible dietary factors [29]. A majority of the API cancer patients in our study were born outside of the U.S., with the exception of Japanese-Americans and Native Hawaiians (data not shown). Birthplace information was missing from registry records, however, for about 28% of the API in this study. Incidence and death rates for nasopharyngeal cancer among Chinese, Filipino, and Vietnamese groups in our study are several times the magnitude of rates seen in other U.S. racial/ethnic groups [30]. Rates may also be high in other U.S. API groups, but the number of cases in our study is too small to provide precise estimates. Chinese and several Southeast populations—including Filipinos, Thais, and Vietnamese—have previously been reported at increased risk for this cancer [31] and rates are known to remain high among Chinese immigrants to the U.S. and other countries [32]. Consumption of preserved foods beginning at an early age



**Table 3** Top five age-adjusted cancer incidence rates<sup>a</sup> and 95% CI by Asian or Pacific Islander subgroup, 1998–2002: Women

Rank	Asian Indian or Pakistani			Chinese		Filipina			
		Rate	(95% CI)		Rate	(95% CI)		Rate	(95% CI)
	All cancers	238.1	(226.7, 250.2)	All cancers	270.4	(264.7, 276.2)	All cancers	291.1	(285.3, 297.1)
1	Breast	82.1	(76.1, 88.8)	Breast	77.6	(74.6, 80.6)	Breast	100.4	(97.1, 103.8)
2	Colorectum	18.8	(15.5, 23.0)	Colorectum	40.2	(38.0, 42.5)	Colorectum	29.4	(27.5, 31.4)
3	Endometrium	13.5	(10.9, 16.7)	Lung	29.7	(27.8, 31.7)	Lung	26.0	(24.1, 27.9)
4	Lung	13.1	(10.2, 16.9)	Endometrium	12.0	(10.9, 13.3)	Endometrium	18.6	(17.2, 20.1)
5	Ovary	12.0	(9.7, 15.1)	Stomach	11.1	(10.0, 12.4)	Thyroid	17.7	(16.4, 19.2)
	Guamanian			Native Hawaiian <sup>b</sup>		Japanese			
	All cancers	175.6	(132.7, 233.8)	All cancers	488.5	(466.5, 511.3)	All Cancers	342.4	(334.5, 350.2)
1	Breast	45.0	(28.3, 78.1)	Breast	175.8	(163.0, 189.4)	Breast	126.5	(121.7, 131.5)
2	Lung	40.7	(22.4, 76.4)	Lung	69.7	(61.2, 79.1)	Colorectum	51.9	(49.1, 55.0)
3	nr			Colorectum	44.0	(37.3, 51.6)	Lung	24.7	(22.8, 26.8)
4	nr			Endometrium	37.5	(31.9, 44.1)	Endometrium	20.4	(18.5, 22.6)
5	nr			Pancreas	18.6	(14.3, 23.9)	Stomach	15.0	(13.6, 16.8)
	Kampuchean			Korean		Laotian			
	All cancers	212.3	(185.9, 242.4)	All cancers	254.5	(245.2, 264.1)	All Cancers	297.9	(263.0, 337.1)
1	Breast	38.2	(28.3, 51.8)	Breast	53.5	(49.7, 57.6)	Lung	44.4	(31.2, 62.3)
2	Lung	24.6	(15.6, 37.8)	Colorectum	35.9	(32.3, 39.8)	Breast	36.9	(26.5, 51.5)
3	Colorectum	21.1	(13.1, 33.2)	Lung	27.5	(24.3, 31.0)	Colorectum	27.5	(17.1, 42.7)
4	Cervix Uteri	15.3	(9.3, 25.3)	Stomach	26.3	(23.3, 29.7)	Cervix Uteri	24.8	(16.0, 38.0)
5	Liver	14.1	(7.6, 24.9)	Liver	14.4	(12.2, 17.0)	Liver	23.1	(14.5, 36.4)
	Samoan			Tongan		Vietnamese			
	All cancers	472.0	(421.5, 528.6)	All cancers	504.7	(414.1, 616.6)	All Cancers	270.6	(259.6, 282.2)
1	Breast	102.5	(81.7, 129.5)	Breast	118.0	(78.1, 181.2)	Breast	52.8	(48.6, 57.5)
2	Endometrium	66.1	(50.3, 88.2)	Endometrium	91.2	(56.4, 150.1)	Lung	34.4	(30.3, 39.1)
3	Lung	56.9	(39.6, 81.3)	nr			Colorectum	33.3	(29.3, 37.8)
4	Colorectum	38.6	(24.1, 60.5)	nr			Cervix Uteri	16.8	(14.3, 19.8)
5	Cervix Uteri	18.1	(10.6, 32.7)	nr			Liver	16.8	(14.0, 20.1)

<sup>a</sup> Rates are average annual per 100,000 age-adjusted to the 2000 U.S. standard population for the following SEER areas: Atlanta, Detroit, Seattle/Puget Sound; and the states of California (registries for Los Angeles County, the Greater San Francisco Bay Area, and the rest of California), Connecticut, Hawaii, Iowa, Kentucky, Louisiana, New Jersey, New Mexico, and Utah

<sup>b</sup> Rates for Native Hawaiians are calculated using the one or more race/ethnicities population denominators for Hawaii only (See Materials and methods)

Abbreviations: Lung = lung and bronchus; Liver = liver and intrahepatic bile duct; Endometrium = corpus uterus, NOS

is frequent among these groups and has been associated with this cancer [31].

The low rates of lung, colorectal, and stomach cancers we observed among Asian Indians, either living in India or residing in other countries, have also been reported by others [33–35]. Factors such as lower tobacco use and components of the South Asian diet have been suggested as playing important roles in these patterns [36–38]. Breast cancer was a leading cancer among API women in our study, as it is in other racial/ethnic groups [39], but the breast cancer incidence rate in each API group, with the

exception of native Hawaiians, was lower than that for non-Hispanic white women.

Though based on small numbers, we note that Samoan women had a smaller percentage of breast cancers diagnosed at an early stage and their breast cancer death rate was among the highest of the API groups. Others have reported low screening rates among Samoan women and note the need for targeted efforts to improve doctor–patient communication on prevention behavior [40, 41]. Samoan men had lower percentages of colorectal and prostate cancers diagnosed at an early stage and this may be reflected in their

**Table 4** Top five age-adjusted cancer rates and 95% CI for non-Hispanic white men and women, 1998–2002

Rank	Men		Women			
	Rate	(95% CI)	Rate	(95% CI)		
<i>Incidence<sup>a</sup></i>						
	All cancers	587.0	(585.6, 588.5)	All cancers	448.5	(447.3, 449.6)
1	Prostate	170.0	(169.3, 170.8)	Breast	145.2	(144.5, 145.8)
2	Lung	89.2	(88.7, 89.8)	Lung	59.0	(58.6, 59.4)
3	Colorectum	65.6	(65.2, 66.1)	Colorectum	47.6	(47.2, 47.9)
4	Bladder	43.0	(42.6, 43.4)	Endometrium	26.0	(25.7, 26.2)
5	Melanoma	29.3	(29.0, 29.6)	Melanoma	19.3	(19.0, 19.5)
<i>Mortality<sup>b</sup></i>						
	All cancers	241.3	(240.5, 242.1)	All cancers	171.7	(171.1, 172.2)
1	Lung	72.2	(71.8, 72.7)	Lung	44.5	(44.2, 44.8)
2	Prostate	27.7	(27.4, 28.0)	Breast	27.8	(27.5, 28.0)
3	Colorectum	24.6	(24.3, 24.8)	Colorectum	17.3	(17.1, 17.5)
4	Pancreas	12.6	(12.4, 12.8)	Ovary	9.8	(9.7, 9.9)
5	Non-Hodgkin	10.6	(10.5, 10.8)	Pancreas	9.5	(9.4, 9.6)

<sup>a</sup> Rates are average annual per 100,000 age-adjusted to the 2000 U.S. standard population for the following SEER areas: Atlanta, Detroit, Seattle/Puget Sound; and the states of California (registries for Los Angeles County, the Greater San Francisco Bay Area, and the rest of California), Connecticut, Hawaii, Iowa, Kentucky, Louisiana, New Jersey, New Mexico, and Utah

<sup>b</sup> Rates are average annual per 100,000 age-adjusted to the 2000 U.S. standard population for the following States: California, Hawaii, Illinois, New Jersey, New York, Texas, and Washington

Abbreviations: Lung = lung and bronchus; Endometrium = corpus uterus, NOS; Non-Hodgkin = non-Hodgkin lymphoma

**Table 5** Top five age-adjusted cancer mortality rates<sup>a</sup> and 95% CI by Asian or Pacific Islander subgroup, 1998–2002: Men

Rank	Korean		Samoan		Vietnamese				
	Rate	(95% CI)	Rate	(95% CI)	Rate	(95% CI)			
	All cancers	82.8	(75.7, 90.5)	All cancers	167.8	(163.4, 172.4)	All Cancers	155.6	(150.6, 160.8)
1	Lung	17.2	(14.1, 21.1)	Lung	47.0	(44.78, 49.5)	Lung	47.9	(45.7, 50.8)
2	Prostate	10.6	(7.8, 14.2)	Liver	20.3	(18.8, 21.9)	Prostate	17.8	(16.1, 19.8)
3	Pancreas	5.8	(4.1, 8.3)	Colorectum	19.5	(18.0, 21.2)	Colorectum	16.1	(14.6, 17.8)
4	Liver	5.3	(3.6, 7.7)	Stomach	11.7	(10.5, 12.9)	Liver	11.3	(10.1, 12.7)
5	Leukemia	4.8	(3.3, 7.1)	Prostate	10.4	(9.2, 11.7)	Non-Hodgkin	9.1	(7.9, 10.4)
Guamanian			Native Hawaiian <sup>b</sup>			Japanese			
	All cancers	147.0	(106.5, 201.8)	All cancers	263.7	(243.7, 285.4)	All Cancers	173.7	(167.7, 179.9)
1	Lung	47.4	(28.4, 81.0)	Lung	87.7	(76.4, 100.7)	Lung	39.5	(36.7, 42.5)
2	nr			Colorectum	26.9	(20.8, 34.9)	Colorectum	25.8	(23.6, 28.3)
3	nr			Prostate	21.9	(15.7, 30.1)	Stomach	16.6	(14.8, 18.7)
4	nr			Stomach	14.1	(9.9, 20.2)	Prostate	15.2	(13.5, 17.3)
5	nr			Liver	11.8	(7.9, 17.7)	Pancreas	12.2	(10.6, 14.0)
Korean			Samoan			Vietnamese			
	All cancers	196.5	(186.2, 207.4)	All cancers	293.9	(247.6, 348.6)	All Cancers	159.9	(149.9, 170.7)
1	Lung	50.6	(45.3, 56.2)	Lung	74.0	(53.6, 102.9)	Lung	43.9	(38.7, 49.9)
2	Stomach	31.5	(27.5, 36.0)	Stomach	40.9	(24.1, 67.6)	Liver	33.8	(29.6, 38.8)
3	Liver	26.3	(23.0, 30.2)	Prostate	36.2	(18.9, 64.4)	Stomach	12.7	(9.8, 16.4)

**Table 5** continued

Rank	Korean		Samoan			Vietnamese			
		Rate	(95% CI)		Rate	(95% CI)	Rate	(95% CI)	
4	Colorectum	17.6	(14.6, 21.3)	Liver	32.9	(19.3, 56.1)	Pancreas	8.9	(6.6, 11.9)
5	Pancreas	11.4	(9.1, 14.3)	Colorectum	31.6	(17.2, 56.0)	Colorectum	8.8	(6.6, 11.7)

<sup>a</sup> Rates are average annual per 100,000 age-adjusted to the 2000 U.S. standard population for the following States: California, Hawaii, Illinois, New Jersey, New York, Texas, and Washington

<sup>b</sup> Rates for Native Hawaiians are calculated using the one or more race/ethnicities population denominators for Hawaii only (See Materials and methods)

Abbreviations: Lung = lung and bronchus; Liver = liver and intrahepatic bile duct; Non-Hodgkin = non-Hodgkin lymphoma

**Table 6** Top five age-adjusted cancer mortality rates<sup>a</sup> and 95% CI by Asian or Pacific Islander subgroup, 1998–2002: Women

Rank	Asian Indian		Chinese			Filipina			
		Rate	(95% CI)		Rate	(95% CI)	Rate	(95% CI)	
	All cancers	67.4	(62.2, 73.1)	All cancers	107.7	(104.5, 110.9)	All Cancers	96.1	(92.8, 99.5)
1	Breast	11.2	(9.4, 13.5)	Lung	23.8	(22.4, 25.4)	Breast	17.2	(15.9, 18.6)
2	Lung	6.4	(4.8, 8.5)	Colorectum	12.8	(11.7, 13.9)	Lung	17.2	(15.8, 18.7)
3	Colorectum	5.3	(3.8, 7.3)	Breast	12.3	(11.3, 13.4)	Colorectum	9.0	(8.0, 10.1)
4	Ovary	5.0	(3.7, 6.8)	Liver	7.4	(6.5, 8.2)	Pancreas	6.3	(5.4, 7.2)
5	Pancreas	3.5	(2.4, 5.2)	Stomach	7.3	(6.5, 8.2)	Ovary	5.6	(4.9, 6.5)
	Guamanian		Native Hawaiian <sup>b</sup>			Japanese			
	All cancers	98.5	(69.5, 138.8)	All cancers	198.9	(184.4, 214.4)	All Cancers	117.0	(112.9, 121.4)
1	nr			Lung	47.6	(40.6, 55.6)	Lung	19.7	(18.1, 21.5)
2	nr			Breast	33.5	(27.9, 40.1)	Colorectal	15.3	(13.8, 17.0)
3	nr			Pancreas	16.8	(12.7, 21.8)	Breast	15.1	(13.6, 16.9)
4	nr			Colorectum	13.1	(9.5, 17.7)	Pancreas	10.6	(9.4, 12.1)
5	nr			Stomach	10.3	(9.5, 17.7)	Stomach	10.2	(9.0, 11.6)
	Korean		Samoan			Vietnamese			
	All cancers	108.2	(102.6, 114.1)	All cancers	209.3	(176.5, 248.2)	All Cancers	97.8	(91.2, 104.9)
1	Lung	20.7	(18.2, 23.4)	Lung	42.0	(27.1, 63.7)	Lung	20.2	(17.1, 23.7)
2	Stomach	14.5	(12.5, 16.8)	Breast	36.2	(24.0, 54.9)	Liver	10.9	(8.8, 13.6)
3	Colorectum	12.1	(10.3, 14.2)	nr			Breast	7.6	(6.1, 9.5)
4	Liver	11.7	(9.9, 13.7)	nr			Colorectum	7.4	(5.6, 9.7)
5	Breast	7.8	(6.5, 9.3)	nr			Stomach	7.0	(5.3, 9.2)

<sup>a</sup> Rates are average annual per 100,000 age-adjusted to the 2000 U.S. standard population for the following States: California, Hawaii, Illinois, New Jersey, New York, Texas, and Washington

<sup>b</sup> Rates for Native Hawaiians are calculated using the one or more race/ethnicities population denominators for Hawaii only (See Materials and methods)

Abbreviations: Lung = lung and bronchus; Liver = liver and intrahepatic bile duct; Non-Hodgkin = non-Hodgkin lymphoma

higher mortality rates for these cancers. Increased efforts to improve screening for these cancers in specific API groups may be needed. These results are based on small numbers of deaths among Samoans, however, and need to be confirmed in other studies. Furthermore, our findings must be interpreted cautiously, since the geographic coverage of the API study populations included in the incidence and mortality analyses are somewhat different.

Limitations of the source data must be recognized when analyzing racial/ethnic patterns of disease. Evaluations of the accuracy of cancer registry data on race/ethnicity, which is extracted from patient medical records, have shown varying levels of misclassification [42–47]. A recent comparison of self-reported race/ethnicity obtained from interview studies with that from registry records was conducted by the Greater Bay Area Cancer Registry

(comprising the San Francisco/Oakland and San Jose/Monterey regions of California) [42]. They found that sensitivities and positive predictive values (PV+) were high for non-Hispanic Whites and Blacks and were moderately high for Chinese (sensitivity = 77%, PV+ = 92%) leading to a 16% underestimate of Chinese cases. For Japanese and Filipinos, they reported comparable results of about 80% for both sensitivity and PV+; while for Vietnamese they reported low sensitivity (47%) and moderate PV+ (75%), yielding a 37% underestimate for this group. There were too few Koreans, South Asians (mostly Asian Indians), Laotians, Kampuchean, and Pacific Islanders to provide reliable estimates of sensitivity or PV+ in their study. In addition, about 7% of the diagnosed cancer cases in our incidence analysis were classified as Asian NOS or Pacific Islander NOS, thereby depressing the rates we reported for specific Asian or Pacific Islander groups. To address this problem, collaborative efforts are underway between the SEER Program registries and the National Association of Central Cancer Registries to improve how central registries classify cancer patients into specific Asian or Pacific Islander groups by using name lists and information on

birthplace. Similar misclassification problems have been identified for death certificate information on race/ethnicity and have been reported to result in an 11% underestimate of mortality rates for the API group as a whole [48]. The impact of nonspecific API race on the mortality rates in our study is small, however, since less than 0.1% of deaths were coded as “API, NOS.” These limitations suggest that the API rates we have reported are generally biased downward, in spite of the fact that we used the single race population denominators in our rate calculations.

In conclusion, we found some evidence for cancer health disparities between specific API populations and non-Hispanic whites. The addition of population denominators for detailed API groups to SEER\*Stat software developed by the National Cancer Institute’s Surveillance Research Program will enable public health researchers to utilize SEER databases to further investigate cancer incidence and mortality rates among these groups in the US [8]. Additional studies might include analyses that incorporate tumor characteristics (e.g., cancer subsite, histology, and grade) or other sociodemographic factors when examining racial/ethnic differences in cancer patterns.

## Appendix

**Appendix 1 Age-adjusted incidence rates<sup>a</sup> for major cancers<sup>b</sup> by race/ethnicity and sex, 1998–2002**

	Count	Rate based on single race/ethnicity alone denominator			Rate based on one or more race/ethnicities denominator		
		Rate	95% CI		Rate	95% CI	
			LL	UL		LL	UL
<i>Asian Indian &amp; Pakistani/Men</i>							
All Sites	2,314	292.1	277.3	307.9	255.5	242.5	269.1
Prostate	701	98.4	90.0	107.7	86.1	78.8	94.2
Lung and bronchus	207	30.8	25.7	36.8	26.9	22.5	32.1
Colon and rectum	199	23.1	19.3	27.9	20.3	17.0	24.4
Lymphoma—Non-Hodgkin	142	15.8	12.5	20.1	13.8	11.0	17.5
Urinary bladder	98	15.8	12.1	20.5	13.8	10.6	17.8
Leukemia	138	12.2	9.5	15.9	10.7	8.3	13.9
Oral cavity (excl nasopharynx)	102	11.4	8.7	15.1	10.0	7.6	13.2
Liver and intrahepatic bile duct	60	8.7	6.2	12.3	7.6	5.4	10.7
Kidney and renal pelvis	64	8.4	6.0	11.7	7.3	5.3	10.2
Stomach	61	8.2	5.8	11.6	7.1	5.1	10.1
Pancreas	52	8.0	5.4	11.7	7.0	4.8	10.2
Brain and other nervous system	84	6.7	5.0	9.3	5.9	4.4	8.1
Myeloma	43	4.8	3.3	7.3	4.2	2.9	6.4
Larynx	23	4.5	2.5	7.7	3.9	2.2	6.6
Esophagus	27	3.6	2.1	6.2	3.2	1.9	5.4
Thyroid	40	2.7	1.8	4.7	2.4	1.6	4.1
Testis	38	2.3	1.3	4.5	2.0	1.2	3.9
Lymphoma—Hodgkin	36	2.0	1.4	3.7	1.7	1.2	3.2

## Appendix 1 continued

	Count	Rate based on single race/ethnicity alone denominator			Rate based on one or more race/ethnicities denominator		
		Rate	95% CI		Rate	95% CI	
			LL	UL		LL	UL
<i>Asian Indian &amp; Pakistani/Women</i>							
All sites	2,229	238.1	226.7	250.2	208.2	198.4	218.6
Breast	864	82.1	76.1	88.8	72.3	67.0	78.1
Colon and rectum	147	18.8	15.5	23.0	16.4	13.5	19.9
Corpus and uterus, NOS	127	13.5	10.9	16.7	11.8	9.6	14.6
Lung and bronchus	90	13.1	10.2	16.9	11.3	8.9	14.5
Ovary	123	12.0	9.7	15.1	10.6	8.6	13.2
Lymphoma—Non-Hodgkin	92	9.4	7.3	12.3	8.2	6.4	10.7
Leukemia	86	9.0	6.8	12.0	7.8	5.9	10.4
Thyroid	111	8.3	6.6	10.7	7.3	5.9	9.4
Cervix Uteri	59	6.1	4.5	8.4	5.4	4.0	7.4
Brain and other nervous system	56	5.6	4.0	8.1	4.9	3.5	7.0
Esophagus	35	5.2	3.4	8.0	4.5	3.0	6.8
Oral cavity (excl nasopharynx)	41	5.0	3.3	7.6	4.3	2.9	6.5
Stomach	31	4.7	3.0	7.2	4.1	2.6	6.2
Pancreas	31	4.4	2.8	6.8	3.8	2.4	5.9
Myeloma	31	4.3	2.7	6.9	3.7	2.3	5.9
Liver and intrahepatic bile duct	31	3.9	2.6	6.2	3.4	2.2	5.4
Gallbladder	25	3.5	2.1	5.9	3.1	1.9	5.1
Urinary bladder	23	3.0	1.8	5.1	2.6	1.6	4.4
Kidney and renal pelvis	26	2.8	1.8	4.7	2.5	1.6	4.1
Lymphoma—Hodgkin	23	1.8	1.0	3.6	1.6	0.8	3.1
<i>Chinese/Men</i>							
All sites	9,175	348.8	341.5	356.2	318.9	312.2	325.7
Prostate	2,209	84.8	81.2	88.5	78.2	74.9	81.7
Colon and rectum	1,400	54.0	51.2	57.0	49.6	46.9	52.3
Lung and bronchus	1,340	53.0	50.1	56.0	48.9	46.2	51.7
Liver and intrahepatic bile duct	666	24.0	22.1	25.9	21.7	20.1	23.5
Stomach	461	18.3	16.6	20.2	16.8	15.3	18.5
Urinary bladder	389	15.7	14.1	17.4	14.5	13.1	16.1
Lymphoma—Non-Hodgkin	401	14.8	13.4	16.4	13.5	12.1	14.9
Pancreas	243	9.8	8.5	11.1	9.0	7.9	10.3
Nasopharynx	277	8.9	7.9	10.1	7.9	7.0	8.9
Leukemia	231	8.7	7.6	10.0	7.6	6.6	8.7
Kidney and renal pelvis	192	7.2	6.2	8.4	6.6	5.7	7.7
Oral cavity (excl nasopharynx)	166	6.2	5.3	7.3	5.7	4.8	6.6
Esophagus	124	4.5	3.7	5.4	4.1	3.4	5.0
Brain and other nervous system	123	4.3	3.5	5.1	3.7	3.0	4.4
Thyroid	96	3.2	2.5	3.9	2.8	2.2	3.5
Larynx	78	3.0	2.3	3.8	2.7	2.2	3.5
Myeloma	74	2.7	2.1	3.5	2.5	2.0	3.2
Testis	57	1.7	1.3	2.2	1.4	1.1	1.9
Lymphoma—Hodgkin	40	1.3	0.9	1.8	1.1	0.8	1.6
Melanoma of the skin	35	1.2	0.8	1.7	1.1	0.8	1.6
Gallbladder	24	0.9	0.6	1.4	0.9	0.6	1.3

## Appendix 1 continued

	Count	Rate based on single race/ethnicity alone denominator			Rate based on one or more race/ethnicities denominator		
		Rate	95% CI		Rate	95% CI	
			LL	UL		LL	UL
<i>Chinese/Women</i>							
All Sites	8,817	270.4	264.7	276.2	243.5	238.4	248.7
Breast	2,652	77.6	74.6	80.6	69.3	66.6	72.0
Colon and rectum	1,257	40.2	38.0	42.5	36.7	34.7	38.8
Lung and bronchus	923	29.7	27.8	31.7	27.2	25.5	29.0
Corpus and uterus, NOS	406	12.0	10.9	13.3	10.8	9.8	11.9
Stomach	344	11.1	10.0	12.4	10.2	9.1	11.3
Thyroid	358	10.0	9.0	11.2	8.8	7.9	9.7
Ovary	335	10.0	8.9	11.1	8.8	7.9	9.9
Lymphoma—Non-Hodgkin	316	10.0	8.9	11.1	9.0	8.0	10.0
Liver and intrahepatic bile duct	258	8.2	7.3	9.3	7.5	6.6	8.5
Pancreas	209	6.8	5.9	7.8	6.3	5.4	7.2
Leukemia	188	5.9	5.1	6.9	5.1	4.4	6.0
Cervix Uteri	193	5.6	4.9	6.5	5.0	4.3	5.8
Urinary bladder	133	4.4	3.7	5.3	4.1	3.4	4.8
Kidney and renal pelvis	126	4.0	3.3	4.8	3.6	3.0	4.3
Oral cavity (excl nasopharynx)	119	3.6	3.0	4.4	3.3	2.7	3.9
Nasopharynx	125	3.5	2.9	4.2	3.1	2.6	3.7
Brain and other nervous system	90	2.7	2.2	3.4	2.3	1.9	2.9
Myeloma	76	2.5	2.0	3.1	2.3	1.8	2.9
Gallbladder	41	1.3	1.0	1.8	1.2	0.9	1.7
Esophagus	32	1.0	0.7	1.5	0.9	0.6	1.3
Melanoma of the skin	32	1.0	0.7	1.4	0.9	0.6	1.2
Lymphoma—Hodgkin	22	0.7	0.4	1.0	0.6	0.4	0.9
<i>Filipino/Men</i>							
All Sites	9,206	393.2	385.1	401.5	357.3	349.8	364.9
Prostate	2,768	121.9	117.3	126.6	111.6	107.4	115.9
Lung and bronchus	1,665	72.5	69.0	76.1	66.2	63.0	69.6
Colon and rectum	1,194	50.4	47.5	53.4	45.9	43.2	48.6
Lymphoma—Non-Hodgkin	467	19.4	17.7	21.4	17.5	15.9	19.3
Liver and intrahepatic bile duct	413	17.2	15.5	19.0	15.6	14.1	17.2
Urinary bladder	267	12.4	10.9	14.0	11.4	10.0	12.9
Leukemia	249	10.0	8.8	11.4	8.7	7.6	10.0
Stomach	216	9.4	8.1	10.8	8.6	7.4	9.8
Pancreas	206	9.2	8.0	10.6	8.4	7.3	9.7
Kidney and renal pelvis	232	9.2	8.0	10.5	8.3	7.3	9.5
Thyroid	163	6.1	5.1	7.1	5.4	4.6	6.3
Myeloma	131	5.8	4.9	6.9	5.3	4.4	6.4
Oral cavity (excl nasopharynx)	138	5.8	4.8	6.9	5.2	4.4	6.2
Nasopharynx	129	4.8	4.0	5.7	4.3	3.5	5.1
Brain and other nervous system	100	3.8	3.1	4.7	3.2	2.6	4.0
Larynx	65	2.9	2.2	3.7	2.6	2.0	3.4
Esophagus	65	2.7	2.1	3.5	2.5	1.9	3.2
Testis	56	1.8	1.3	2.4	1.5	1.1	2.0

## Appendix 1 continued

	Count	Rate based on single race/ethnicity alone denominator			Rate based on one or more race/ethnicities denominator		
		Rate	95% CI		Rate	95% CI	
			LL	UL		LL	UL
Lymphoma—Hodgkin	43	1.5	1.1	2.1	1.3	1.0	1.9
Melanoma of the skin	27	1.2	0.8	1.8	1.1	0.7	1.6
Gallbladder	22	1.0	0.6	1.6	0.9	0.6	1.5
Breast	18	0.9	0.5	1.4	0.8	0.5	1.3
Kaposi Sarcoma	24	0.8	0.5	1.3	0.7	0.5	1.1
<i>Filipina/Women</i>							
All Sites	9,847	291.1	285.3	297.1	264.3	259.0	269.8
Breast	3,610	100.4	97.1	103.8	91.1	88.1	94.2
Colon and rectum	935	29.4	27.5	31.4	27.0	25.2	28.9
Lung and bronchus	802	26.0	24.1	27.9	23.9	22.3	25.8
Corpus and uterus, NOS	667	18.6	17.2	20.1	16.9	15.6	18.3
Thyroid	652	17.7	16.4	19.2	15.7	14.5	17.0
Lymphoma—Non-Hodgkin	379	12.2	11.0	13.6	11.2	10.0	12.4
Ovary	369	10.5	9.5	11.7	9.5	8.5	10.6
Cervix Uteri	361	10.0	9.0	11.2	9.0	8.1	10.1
Pancreas	233	7.7	6.7	8.9	7.1	6.2	8.2
Leukemia	183	5.8	4.9	6.7	5.0	4.2	5.8
Stomach	162	5.6	4.7	6.6	5.1	4.4	6.1
Liver and intrahepatic bile duct	150	5.1	4.3	6.0	4.7	3.9	5.6
Kidney and renal pelvis	162	4.8	4.1	5.7	4.4	3.7	5.1
Myeloma	126	4.2	3.5	5.0	3.9	3.2	4.7
Oral cavity (excl nasopharynx)	127	4.0	3.3	4.8	3.6	3.0	4.4
Brain and other nervous system	77	2.4	1.9	3.1	2.1	1.6	2.6
Urinary bladder	68	2.4	1.8	3.1	2.2	1.7	2.9
Lymphoma—Hodgkin	55	1.6	1.2	2.1	1.3	1.0	1.8
Nasopharynx	55	1.6	1.2	2.1	1.4	1.0	1.9
Gallbladder	43	1.4	1.0	2.0	1.3	0.9	1.8
Esophagus	34	1.1	0.8	1.6	1.0	0.7	1.5
Melanoma of the skin	27	0.8	0.5	1.2	0.7	0.5	1.1
<i>Guamanian/Men</i>							
All Sites	79	252.1	189.8	336.7	197.8	148.8	264.7
Prostate	32	131.5	85.0	202.4	102.6	66.3	158.6
<i>Guamanian/Women</i>							
All Sites	77	175.6	132.7	233.8	136.7	103.9	180.3
Breast	25	45.0	28.3	78.1	35.8	22.4	60.5
Lung and bronchus	16	40.7	22.4	76.4	33.0	18.2	60.1
<i>Native Hawaiian (HI only)/Men<sup>c</sup></i>							
All Sites	1,664	–	–	–	531.6	503.7	561.1
Prostate	328	–	–	–	119.7	106.1	135.1
Lung and bronchus	329	–	–	–	109.8	97.4	123.9
Colon and rectum	198	–	–	–	65.7	56.1	77.1
Urinary bladder	55	–	–	–	21.2	15.3	29.1
Lymphoma—Non-Hodgkin	68	–	–	–	19.6	14.8	26.3
Stomach	62	–	–	–	18.8	14.1	25.3
Leukemia	58	–	–	–	16.3	11.8	22.7

## Appendix 1 continued

	Count	Rate based on single race/ethnicity alone denominator			Rate based on one or more race/ethnicities denominator		
		Rate	95% CI		Rate	95% CI	
			LL	UL		LL	UL
Liver and intrahepatic bile duct	54	–	–	–	16.3	11.8	22.6
Kidney and renal pelvis	54	–	–	–	15.5	11.4	21.4
Pancreas	48	–	–	–	15.1	10.8	21.4
Oral cavity (excl nasopharynx)	53	–	–	–	13.7	10.1	19.2
Esophagus	33	–	–	–	9.6	6.4	14.7
Myeloma	26	–	–	–	8.6	5.3	14.0
Larynx	22	–	–	–	6.9	4.2	11.7
Brain and other nervous system	29	–	–	–	6.0	3.8	10.2
Testis	29	–	–	–	5.3	3.5	9.0
Thyroid	23	–	–	–	5.1	3.1	9.1
<i>Native Hawaiian (HI only)/Women<sup>c</sup></i>							
All Sites	1,979	–	–	–	488.5	466.5	511.3
Breast	736	–	–	–	175.8	163.0	189.4
Lung and bronchus	258	–	–	–	69.7	61.2	79.1
Colon and rectum	166	–	–	–	44.0	37.3	51.6
Corpus and uterus, NOS	162	–	–	–	37.5	31.9	44.1
Pancreas	68	–	–	–	18.6	14.3	23.9
Stomach	51	–	–	–	14.5	10.7	19.4
Thyroid	61	–	–	–	12.6	9.5	16.5
Cervix Uteri	56	–	–	–	12.3	9.2	16.4
Ovary	50	–	–	–	12.1	8.9	16.3
Lymphoma—Non-Hodgkin	47	–	–	–	11.7	8.5	16.0
Leukemia	45	–	–	–	9.4	6.7	13.1
Liver and intrahepatic bile duct	27	–	–	–	7.7	5.0	11.5
Urinary bladder	24	–	–	–	6.8	4.3	10.4
Myeloma	24	–	–	–	6.8	4.3	10.4
Oral cavity (excl nasopharynx)	25	–	–	–	5.8	3.7	8.9
Kidney and renal pelvis	22	–	–	–	5.4	3.4	8.5
Brain and other nervous system	25	–	–	–	5.0	3.2	7.9
<i>Japanese/Men</i>							
All Sites	7,765	422.4	412.8	432.3	389.4	380.7	398.3
Prostate	2,211	115.0	110.1	120.1	108.9	104.3	113.6
Colon and rectum	1,402	75.9	71.9	80.2	70.7	67.0	74.6
Lung and bronchus	952	49.8	46.6	53.3	47.0	44.0	50.1
Stomach	542	29.3	26.9	32.1	27.6	25.3	30.1
Urinary bladder	438	22.9	20.8	25.4	21.6	19.6	23.8
Lymphoma—Non-Hodgkin	323	18.3	16.3	20.6	16.4	14.7	18.4
Pancreas	231	12.5	10.9	14.4	11.8	10.3	13.5
Kidney and renal pelvis	210	11.5	10.0	13.4	10.6	9.2	12.1
Liver and intrahepatic bile duct	199	11.4	9.8	13.3	10.3	8.9	11.9
Leukemia	173	11.4	9.6	13.5	8.8	7.5	10.2
Oral cavity (excl nasopharynx)	155	8.5	7.2	10.2	7.9	6.7	9.3
Esophagus	131	7.5	6.2	9.1	6.9	5.8	8.2
Testis	63	4.6	3.5	6.0	3.3	2.6	4.3
Brain and other nervous system	59	4.3	3.2	5.8	3.0	2.3	4.0



## Appendix 1 continued

	Count	Rate based on single race/ethnicity alone denominator			Rate based on one or more race/ethnicities denominator		
		Rate	95% CI		Rate	95% CI	
			LL	UL		LL	UL
Thyroid	53	3.3	2.4	4.5	2.8	2.1	3.7
Larynx	57	3.1	2.4	4.2	2.9	2.2	3.8
Myeloma	52	2.8	2.1	3.8	2.6	1.9	3.4
Melanoma of the skin	35	2.1	1.5	3.2	1.8	1.3	2.6
Lymphoma—Hodgkin	17	1.5	0.8	2.5	0.9	0.5	1.5
<i>Japanese/Women</i>							
All Sites	8,306	342.2	334.5	350.2	310.4	303.5	317.3
Breast	2,890	126.5	121.7	131.5	113.7	109.5	118.1
Colon and rectum	1,373	51.9	49.1	55.0	48.5	45.9	51.2
Lung and bronchus	691	24.7	22.8	26.8	23.4	21.6	25.3
Corpus and uterus, NOS	454	20.4	18.5	22.6	18.3	16.6	20.1
Stomach	414	15.0	13.6	16.8	14.2	12.8	15.7
Lymphoma—Non-Hodgkin	313	12.2	10.8	13.9	11.2	9.9	12.5
Pancreas	309	11.3	10.0	12.9	10.7	9.5	12.0
Ovary	242	11.1	9.6	12.8	9.7	8.5	11.1
Thyroid	156	8.2	6.9	9.8	6.8	5.7	8.0
Liver and intrahepatic bile duct	219	7.9	6.9	9.3	7.4	6.4	8.5
Leukemia	147	7.0	5.8	8.6	5.8	4.9	6.9
Cervix Uteri	118	6.2	5.1	7.6	5.2	4.3	6.3
Kidney and renal pelvis	122	4.8	4.0	6.0	4.4	3.6	5.3
Urinary bladder	130	4.7	3.9	5.8	4.4	3.7	5.3
Oral cavity (excl nasopharynx)	99	4.2	3.4	5.4	3.8	3.1	4.7
Brain and other nervous system	44	2.8	1.9	4.1	1.9	1.4	2.6
Myeloma	56	2.2	1.6	3.1	2.0	1.5	2.7
Melanoma of the skin	43	2.0	1.5	3.0	1.8	1.3	2.5
Esophagus	34	1.3	0.9	2.1	1.2	0.8	1.7
Gallbladder	23	0.9	0.6	1.6	0.8	0.5	1.3
<i>Kampuchean/Men</i>							
All Sites	319	372.0	325.3	425.5	316.0	276.4	361.5
Lung and bronchus	56	82.6	60.1	112.6	69.3	50.6	94.7
Liver and intrahepatic bile duct	59	49.1	36.3	68.5	41.6	30.9	58.2
Prostate	27	39.7	25.0	62.2	33.6	21.3	52.8
Colon and rectum	30	30.0	18.3	49.5	25.8	15.7	42.7
Stomach	16	23.8	12.1	44.3	20.6	10.4	38.5
Lymphoma—Non-Hodgkin	23	22.1	12.8	39.2	18.6	10.8	33.1
<i>Kampuchean/Women</i>							
All Sites	278	212.3	185.9	242.4	180.7	158.2	206.3
Breast	58	38.2	28.3	51.8	32.5	24.1	44.1
Lung and bronchus	26	24.6	15.6	37.8	21.0	13.3	32.4
Colon and rectum	25	21.1	13.1	33.2	17.9	11.2	28.3
Cervix Uteri	22	15.3	9.3	25.3	13.0	7.9	21.5
Liver and intrahepatic bile duct	16	14.1	7.6	24.9	12.0	6.5	21.3
Thyroid	20	13.4	7.8	23.2	11.4	6.6	19.7
<i>Korean/Men</i>							
All Sites	2,832	372.6	357.4	388.4	356.2	341.6	371.3
Lung and bronchus	414	61.1	54.8	68.2	58.6	52.5	65.4

## Appendix 1 continued

	Count	Rate based on single race/ethnicity alone denominator			Rate based on one or more race/ethnicities denominator		
		Rate	95% CI		Rate	95% CI	
			LL	UL		LL	UL
Colon and rectum	437	55.9	50.2	62.2	53.5	48.1	59.6
Prostate	383	55.7	49.8	62.3	53.5	47.8	59.8
Stomach	384	50.0	44.6	56.2	47.9	42.7	53.8
Liver and intrahepatic bile duct	319	35.9	31.6	40.8	34.3	30.2	39.0
Urinary bladder	106	14.6	11.7	18.3	14.0	11.2	17.6
Lymphoma—Non-Hodgkin	112	14.5	11.7	18.1	13.8	11.1	17.2
Pancreas	88	12.5	9.7	16.0	12.0	9.3	15.4
Kidney and renal pelvis	70	9.4	7.1	12.4	8.9	6.7	11.7
Oral cavity (excl nasopharynx)	69	8.6	6.5	11.4	8.2	6.2	10.9
Leukemia	67	8.1	6.1	10.9	7.5	5.6	10.1
Esophagus	35	5.2	3.4	7.7	4.9	3.3	7.4
Gallbladder	22	4.3	2.5	7.0	4.1	2.4	6.7
Thyroid	39	3.7	2.6	5.6	3.5	2.4	5.3
Larynx	26	3.2	2.0	5.2	3.1	2.0	5.0
Brain and other nervous system	32	2.9	2.0	4.6	2.7	1.8	4.3
Myeloma	17	2.1	1.1	4.0	2.0	1.1	3.8
Nasopharynx	16	1.7	0.8	3.3	1.6	0.8	3.2
<i>Korean/Women</i>							
All Sites	3,135	254.5	245.2	264.1	243.5	234.6	252.7
Breast	779	53.5	49.7	57.6	51.0	47.4	54.9
Colon and rectum	408	35.9	32.3	39.8	34.5	31.1	38.3
Lung and bronchus	300	27.5	24.3	31.0	26.5	23.5	29.9
Stomach	294	26.3	23.3	29.7	25.3	22.4	28.6
Liver and intrahepatic bile duct	164	14.4	12.2	17.0	13.9	11.8	16.4
Cervix Uteri	142	10.8	9.0	12.8	10.3	8.6	12.3
Thyroid	145	9.8	8.2	11.7	9.2	7.8	11.0
Pancreas	87	8.4	6.6	10.5	8.1	6.4	10.1
Corpus and uterus, NOS	115	8.0	6.6	9.8	7.7	6.3	9.3
Ovary	102	7.5	6.1	9.3	7.2	5.8	8.9
Lymphoma—Non-Hodgkin	82	7.4	5.8	9.3	7.1	5.6	9.0
Urinary bladder	47	4.9	3.6	6.7	4.8	3.4	6.4
Leukemia	61	4.6	3.5	6.1	4.2	3.2	5.6
Kidney and renal pelvis	49	4.2	3.1	5.7	4.0	2.9	5.4
Gallbladder	36	3.4	2.4	4.9	3.3	2.3	4.7
Oral cavity (excl nasopharynx)	35	2.8	1.9	4.0	2.6	1.8	3.8
Brain and other nervous system	30	2.4	1.6	3.5	2.1	1.4	3.2
Myeloma	20	2.0	1.2	3.2	1.9	1.2	3.1
<i>Laotian/Men</i>							
All Sites	376	407.2	360.7	460.3	357.2	316.0	404.4
Lung and bronchus	64	87.3	64.9	117.4	76.6	56.8	103.6
Liver and intrahepatic bile duct	80	79.4	60.7	105.0	69.8	53.2	92.8
Stomach	22	33.1	19.1	55.8	29.6	16.9	50.3
Prostate	21	30.9	18.2	51.9	27.0	15.9	45.9
Colon and rectum	30	30.2	19.4	48.8	26.2	16.9	42.8
Pancreas	21	21.6	12.5	38.7	18.8	10.9	34.1

## Appendix 1 continued

	Count	Rate based on single race/ethnicity alone denominator			Rate based on one or more race/ethnicities denominator		
		Rate	95% CI		Rate	95% CI	
			LL	UL		LL	UL
Lymphoma—Non-Hodgkin	26	20.3	11.6	37.0	17.9	10.1	33.3
<i>Laotian/Women</i>							
All Sites	299	297.9	263.0	337.1	260.5	229.9	294.7
Lung and bronchus	40	44.4	31.2	62.3	38.8	27.3	54.4
Breast	45	36.9	26.5	51.5	32.3	23.2	45.0
Colon and rectum	24	27.5	17.1	42.7	24.0	15.0	37.3
Cervix Uteri	28	24.8	16.0	38.0	21.7	14.0	33.3
Liver and intrahepatic bile duct	24	23.1	14.5	36.4	20.3	12.7	31.9
<i>Samoan/Men</i>							
All Sites	356	566.7	498.8	645.5	471.2	415.1	535.6
Prostate	77	144.1	110.0	190.4	120.6	92.2	158.0
Lung and bronchus	70	111.9	84.4	151.1	94.1	71.0	126.0
Liver and intrahepatic bile duct	35	54.5	35.2	86.9	45.1	29.4	70.3
Stomach	30	53.0	33.2	86.1	44.7	28.0	71.3
Colon and rectum	31	43.1	26.6	72.8	35.8	22.0	59.3
Leukemia	19	23.0	10.9	49.7	18.8	8.6	39.8
<i>Samoan/Women</i>							
All Sites	396	472.0	421.5	528.6	394.5	352.2	441.9
Breast	94	102.5	81.7	129.5	86.2	68.6	108.9
Corpus and uterus, NOS	67	66.1	50.3	88.2	55.2	41.8	73.7
Lung and bronchus	41	56.9	39.6	81.3	48.1	33.4	68.6
Colon and rectum	28	38.6	24.1	60.5	32.2	20.2	50.3
Cervix Uteri	19	18.1	10.6	32.7	15.1	8.8	27.3
<i>Tongan/Men</i>							
All Sites	95	428.8	329.9	555.9	367.4	283.6	473.6
Lung and bronchus	18	107.0	55.2	193.0	87.9	46.3	156.2
Prostate	16	85.0	44.5	157.4	74.7	39.3	135.5
<i>Tongan/Women</i>							
All Sites	139	504.7	414.1	616.6	430.5	352.8	526.5
Breast	35	118.0	78.1	181.2	100.8	66.7	154.9
Corpus and uterus, NOS	26	91.2	56.4	150.1	77.8	48.0	128.3
<i>Vietnamese/Men</i>							
All Sites	3,020	374.3	358.5	390.9	351.7	336.9	367.2
Lung and bronchus	543	72.3	65.3	80.2	68.0	61.4	75.3
Prostate	415	59.1	52.8	66.3	55.6	49.6	62.3
Liver and intrahepatic bile duct	493	55.5	49.9	62.0	52.4	47.1	58.4
Colon and rectum	338	41.2	36.1	47.1	38.8	34.0	44.3
Stomach	178	25.6	21.2	30.9	24.0	19.9	28.9
Lymphoma—Non-Hodgkin	143	14.7	11.9	18.5	13.8	11.1	17.3
Urinary bladder	86	13.6	10.4	17.8	12.7	9.7	16.6
Pancreas	86	11.4	8.7	15.0	10.7	8.2	14.1
Leukemia	84	9.9	7.5	13.2	9.2	7.0	12.3
Oral cavity (excl nasopharynx)	69	7.7	5.6	10.7	7.2	5.3	10.0
Nasopharynx	75	6.7	5.1	9.1	6.3	4.8	8.6
Esophagus	43	6.5	4.4	9.7	6.1	4.1	9.1

## Appendix 1 continued

	Count	Rate based on single race/ethnicity alone denominator			Rate based on one or more race/ethnicities denominator		
		Rate	95% CI		Rate	95% CI	
			LL	UL		LL	UL
Kidney and renal pelvis	44	5.0	3.5	7.5	4.7	3.3	7.1
Brain and other nervous system	52	4.9	3.4	7.4	4.6	3.2	6.9
Larynx	29	4.3	2.6	7.0	4.0	2.5	6.6
Thyroid	48	4.0	2.8	6.2	3.8	2.7	5.8
Myeloma	23	2.7	1.6	4.7	2.5	1.5	4.5
Testis	19	1.2	0.7	2.8	1.1	0.7	2.6
<i>Vietnamese/Women</i>							
All Sites	2,720	270.6	259.6	282.2	254.9	244.5	265.8
Breast	647	52.8	48.6	57.5	49.9	45.9	54.3
Lung and bronchus	290	34.4	30.3	39.1	32.5	28.5	36.9
Colon and rectum	302	33.3	29.3	37.8	31.4	27.6	35.6
Cervix Uteri	189	16.8	14.3	19.8	15.9	13.6	18.7
Liver and intrahepatic bile duct	146	16.8	14.0	20.1	15.8	13.2	18.9
Stomach	110	13.8	11.1	17.0	13.0	10.5	16.0
Thyroid	174	13.3	11.2	15.8	12.5	10.6	14.8
Lymphoma—Non-Hodgkin	116	12.0	9.7	14.8	11.3	9.1	13.9
Pancreas	81	10.0	7.8	12.7	9.4	7.3	12.0
Ovary	100	8.6	6.9	10.8	8.1	6.5	10.2
Corpus and uterus, NOS	95	8.2	6.5	10.4	7.8	6.2	9.8
Leukemia	70	6.6	4.9	8.7	6.1	4.6	8.1
Oral cavity (excl nasopharynx)	46	5.0	3.5	7.0	4.7	3.3	6.6
Myeloma	34	4.3	2.9	6.2	4.0	2.7	5.9
Urinary bladder	24	3.6	2.3	5.6	3.4	2.1	5.2
Brain and other nervous system	31	2.7	1.7	4.1	2.5	1.6	3.8
Nasopharynx	27	2.3	1.5	3.7	2.2	1.4	3.5
Gallbladder	19	2.2	1.3	3.7	2.1	1.2	3.5
Kidney and renal pelvis	16	1.7	0.9	3.1	1.6	0.9	2.9
<i>Non – Hispanic White/Men<sup>d</sup></i>							
All Sites	649,731	587.0	585.6	588.5			
Prostate	189,678	170.0	169.3	170.8			
Lung and bronchus	98,625	89.2	88.7	89.8			
Colon and rectum	71,656	65.6	65.2	66.1			
Urinary bladder	46,682	43.0	42.6	43.4			
Melanoma of the skin	32,981	29.3	29.0	29.6			
Lymphoma—Non-Hodgkin	27,294	24.6	24.3	24.9			
Kidney and renal pelvis	19,671	17.5	17.2	17.7			
Leukemia	18,718	17.3	17.1	17.6			
Oral cavity (excl nasopharynx)	18,462	16.2	16.0	16.5			
Pancreas	14,220	13.0	12.8	13.2			
Stomach	10,797	9.9	9.7	10.1			
Brain and other nervous system	9,893	8.9	8.7	9.1			
Esophagus	9,079	8.1	8.0	8.3			
Larynx	8,101	7.1	7.0	7.3			
Testis	7,816	7.0	6.9	7.2			
Liver and intrahepatic bile duct	7,445	6.7	6.5	6.8			

## Appendix 1 continued

	Count	Rate based on single race/ethnicity alone denominator			Rate based on one or more race/ethnicities denominator		
		Rate	95% CI		Rate	95% CI	
			LL	UL		LL	UL
Myeloma	7,264	6.6	6.4	6.8			
Thyroid	4,996	4.3	4.2	4.5			
Lymphoma—Hodgkin	3,833	3.5	3.4	3.6			
Kaposi Sarcoma	1,247	1.1	1.1	1.2			
Gallbladder	768	0.7	0.7	0.8			
Nasopharynx	717	0.6	0.6	0.7			
<i>Non – Hispanic White/Women<sup>d</sup></i>							
All Sites	617,158	448.5	447.3	449.6			
Breast	195,231	145.2	144.5	145.8			
Lung and bronchus	83,387	59.0	58.6	59.4			
Colon and rectum	70,298	47.6	47.2	47.9			
Corpus and uterus, NOS	35,224	26.0	25.7	26.2			
Melanoma of the skin	24,455	19.3	19.0	19.5			
Lymphoma—Non-Hodgkin	24,177	17.2	17.0	17.5			
Ovary	20,736	15.3	15.1	15.5			
Thyroid	14,103	11.8	11.6	12.0			
Urinary bladder	15,480	10.6	10.4	10.8			
Leukemia	13,800	10.0	9.8	10.1			
Pancreas	14,520	9.8	9.6	9.9			
Kidney and renal pelvis	11,787	8.5	8.4	8.7			
Cervix Uteri	9,930	8.1	7.9	8.3			
Oral cavity (excl nasopharynx)	8,996	6.5	6.3	6.6			
Brain and other nervous system	7,911	6.2	6.1	6.4			
Stomach	6,430	4.3	4.2	4.4			
Myeloma	5,986	4.1	4.0	4.2			
Lymphoma—Hodgkin	3,348	2.9	2.8	3.0			
Liver and intrahepatic bile duct	3,689	2.6	2.5	2.6			
Esophagus	3,067	2.1	2.0	2.2			
Larynx	2,255	1.7	1.6	1.7			
Gallbladder	1,754	1.2	1.1	1.2			
Nasopharynx	315	0.2	0.2	0.3			
Kaposi Sarcoma	169	0.1	0.1	0.1			

<sup>a</sup> Rates are average annual per 100,000 age-adjusted to the 2000 U.S. standard population for the following SEER areas: Atlanta, Detroit, Seattle/Puget Sound, CA (Los Angeles, Greater Bay Region, remainder of State), CT, HI, IA, KY, LA, NJ, NM, UT

<sup>b</sup> Cancers are sorted in descending order of the rate within each race/ethnic and sex group

<sup>c</sup> Rates for Native Hawaiians are calculated using only the one or more race/ethnicities population denominator (See Materials and methods)

<sup>d</sup> Rates for Non-Hispanic Whites are calculated using the bridged single-race population denominator (See Materials and methods)

**Appendix 2 Age-adjusted mortality rates<sup>a</sup> for major cancers<sup>b</sup> by race/ethnicity and sex, 1998–2002**

	Count	Rate based on single race/ethnicity alone denominator			Rate based on one or more race/ethnicities denominator		
		Rate <sup>b</sup>	95% CI		Rate <sup>b</sup>	95% CI	
			LL	UL		LL	UL
<i>Asian Indian/Male</i>							
All Sites	852	82.8	75.7	90.5	72.1	66.0	78.8
Lung and bronchus	160	17.2	14.1	21.1	15.0	12.3	18.4
Prostate	62	10.6	7.8	14.2	9.1	6.7	12.2
Pancreas	53	5.8	4.1	8.3	5.1	3.6	7.2
Liver and intrahepatic bile duct	54	5.3	3.6	7.7	4.6	3.1	6.7
Leukemia	73	4.8	3.3	7.1	4.2	2.9	6.1
Colon and rectum	48	4.1	2.6	6.3	3.6	2.3	5.4
Stomach	44	3.7	2.5	5.7	3.3	2.2	5.0
Urinary bladder	21	3.7	2.1	6.1	3.2	1.8	5.3
Lymphoma—Non-Hodgkin	40	3.7	2.4	5.7	3.2	2.1	5.0
Esophagus	33	3.5	2.2	5.7	3.1	1.9	4.9
Brain and other nervous system	55	3.3	2.3	5.1	2.9	2.0	4.4
Oral cavity (excl nasopharynx)	36	2.9	1.7	4.8	2.5	1.5	4.2
Myeloma	27	2.2	1.4	3.8	1.9	1.2	3.3
<i>Asian Indian/Female</i>							
All Sites	821	67.4	62.2	73.1	58.7	54.2	63.6
Breast	178	11.2	9.4	13.5	9.9	8.3	11.8
Lung and bronchus	70	6.4	4.8	8.5	5.6	4.2	7.4
Colon and rectum	55	5.3	3.8	7.3	4.6	3.3	6.3
Ovary	66	5.0	3.7	6.8	4.3	3.2	5.9
Pancreas	37	3.5	2.4	5.2	3.1	2.1	4.5
Leukemia	48	3.5	2.4	5.1	3.0	2.1	4.4
Esophagus	28	2.8	1.7	4.4	2.4	1.5	3.7
Lymphoma—Non-Hodgkin	29	2.6	1.7	4.1	2.3	1.4	3.5
Liver and intrahepatic bile duct	29	2.6	1.7	4.0	2.3	1.5	3.5
Stomach	24	2.4	1.4	4.0	2.1	1.2	3.4
Brain and other nervous system	29	2.4	1.5	3.8	2.1	1.3	3.3
Cervix Uteri	28	2.2	1.4	3.6	1.9	1.2	3.1
Myeloma	25	2.1	1.3	3.4	1.8	1.1	2.9
Corpus and uterus, NOS	22	1.6	1.0	2.7	1.4	0.8	2.4
Gallbladder	20	1.5	0.9	2.6	1.3	0.8	2.3
<i>Chinese/Male</i>							
All Sites	5,807	167.8	163.4	172.4	156.2	152.0	160.4
Lung and bronchus	1,603	47.0	44.7	49.5	43.9	41.7	46.2
Liver and intrahepatic bile duct	761	20.3	18.8	21.9	18.8	17.4	20.2
Colon and rectum	657	19.5	18.0	21.2	18.2	16.8	19.7
Stomach	404	11.7	10.5	12.9	10.9	9.8	12.1
Prostate	292	10.4	9.2	11.7	9.8	8.7	11.0
Pancreas	291	8.5	7.5	9.6	7.9	7.0	9.0
Leukemia	216	6.1	5.3	7.1	5.7	4.9	6.5
Lymphoma—Non-Hodgkin	205	6.0	5.2	6.9	5.6	4.8	6.4
Nasopharynx	192	4.5	3.9	5.2	4.1	3.5	4.7
Esophagus	134	3.8	3.1	4.5	3.5	2.9	4.2

## Appendix 2 continued

	Count	Rate based on single race/ethnicity alone denominator			Rate based on one or more race/ethnicities denominator		
		Rate <sup>b</sup>	95% CI		Rate <sup>b</sup>	95% CI	
			LL	UL		LL	UL
Urinary bladder	109	3.6	3.0	4.4	3.4	2.8	4.2
Kidney and renal pelvis	102	2.9	2.3	3.5	2.7	2.2	3.3
Brain and other nervous system	94	2.5	2.0	3.1	2.3	1.8	2.8
Oral cavity (excl nasopharynx)	65	1.8	1.4	2.4	1.7	1.3	2.2
Myeloma	58	1.7	1.3	2.2	1.6	1.2	2.1
Larynx	33	0.9	0.6	1.3	0.9	0.6	1.2
Gallbladder	24	0.7	0.5	1.1	0.7	0.4	1.0
Melanoma of the skin	21	0.6	0.3	0.9	0.5	0.3	0.8
<i>Chinese/Female</i>							
All Sites	4,537	107.7	104.5	110.9	99.6	96.6	102.5
Lung and bronchus	984	23.8	22.4	25.4	22.1	20.8	23.6
Colon and rectum	524	12.8	11.7	13.9	11.9	10.9	12.9
Breast	564	12.3	11.3	13.4	11.3	10.4	12.3
Liver and intrahepatic bile duct	308	7.4	6.5	8.2	6.8	6.1	7.6
Stomach	305	7.3	6.5	8.2	6.8	6.1	7.6
Pancreas	273	6.7	6.0	7.6	6.3	5.6	7.1
Ovary	229	5.2	4.6	6.0	4.8	4.2	5.5
Lymphoma—Non-Hodgkin	172	4.1	3.5	4.8	3.8	3.2	4.4
Leukemia	132	3.1	2.6	3.7	2.8	2.4	3.4
Cervix Uteri	93	2.2	1.8	2.7	2.0	1.6	2.5
Corpus and uterus, NOS	89	2.1	1.6	2.5	1.9	1.5	2.3
Brain and other nervous system	81	1.8	1.4	2.3	1.6	1.3	2.0
Kidney and renal pelvis	63	1.6	1.2	2.0	1.5	1.1	1.9
Nasopharynx	65	1.4	1.1	1.8	1.3	1.0	1.7
Myeloma	49	1.2	0.9	1.6	1.2	0.9	1.5
Esophagus	45	1.1	0.8	1.5	1.0	0.7	1.4
Urinary bladder	38	1.0	0.7	1.4	0.9	0.7	1.3
Oral cavity (excl nasopharynx)	34	0.8	0.6	1.1	0.8	0.5	1.1
Gallbladder	28	0.7	0.5	1.0	0.7	0.4	1.0
Thyroid	20	0.5	0.3	0.8	0.5	0.3	0.8
<i>Filipino/Male</i>							
All Sites	3,890	155.6	150.6	160.8	142.3	137.7	147.0
Lung and bronchus	1,200	47.9	45.1	50.8	43.8	41.3	46.5
Prostate	377	17.8	16.1	19.8	16.6	14.9	18.3
Colon and rectum	411	16.1	14.6	17.8	14.8	13.3	16.3
Liver and intrahepatic bile duct	304	11.3	10.1	12.7	10.3	9.1	11.6
Lymphoma—Non-Hodgkin	226	9.1	7.9	10.4	8.3	7.2	9.5
Pancreas	171	7.0	6.0	8.2	6.5	5.5	7.5
Leukemia	155	5.7	4.8	6.7	5.1	4.3	6.0
Stomach	123	4.9	4.1	5.9	4.5	3.7	5.4
Myeloma	77	3.2	2.5	4.0	2.9	2.3	3.7
Kidney and renal pelvis	80	3.0	2.3	3.7	2.7	2.1	3.4
Brain and other nervous system	74	2.7	2.1	3.4	2.4	1.9	3.1
Esophagus	66	2.6	2.0	3.3	2.4	1.8	3.0

## Appendix 2 continued

	Count	Rate based on single race/ethnicity alone denominator			Rate based on one or more race/ethnicities denominator		
		Rate <sup>b</sup>	95% CI		Rate <sup>b</sup>	95% CI	
			LL	UL		LL	UL
Urinary bladder	43	2.0	1.4	2.7	1.9	1.3	2.5
Oral cavity (excl nasopharynx)	46	1.8	1.3	2.5	1.7	1.2	2.3
Nasopharynx	45	1.5	1.1	2.1	1.4	1.0	1.9
Larynx	20	0.8	0.5	1.3	0.8	0.5	1.2
Thyroid	21	0.8	0.5	1.3	0.8	0.5	1.2
Gallbladder	18	0.7	0.4	1.2	0.7	0.4	1.1
<i>Filipino/Female</i>							
All Sites	3,429	96.1	92.8	99.5	88.4	85.3	91.5
Breast	693	17.2	15.9	18.6	15.7	14.5	17.0
Lung and bronchus	592	17.2	15.8	18.7	15.9	14.6	17.3
Colon and rectum	314	9.0	8.0	10.1	8.3	7.3	9.3
Pancreas	207	6.3	5.4	7.2	5.8	5.0	6.7
Ovary	212	5.6	4.9	6.5	5.2	4.5	6.0
Lymphoma—Non-Hodgkin	143	4.4	3.7	5.3	4.1	3.4	4.9
Liver and intrahepatic bile duct	127	3.9	3.3	4.7	3.7	3.0	4.4
Stomach	101	3.2	2.6	3.9	2.9	2.4	3.6
Leukemia	112	3.1	2.5	3.8	2.8	2.3	3.4
Cervix Uteri	113	2.8	2.3	3.5	2.6	2.1	3.2
Corpus and uterus, NOS	106	2.8	2.3	3.4	2.5	2.1	3.1
Myeloma	80	2.4	1.9	3.0	2.2	1.8	2.8
Kidney and renal pelvis	52	1.4	1.1	1.9	1.3	1.0	1.8
Brain and other nervous system	50	1.4	1.0	1.9	1.2	0.9	1.7
Thyroid	41	1.2	0.8	1.6	1.1	0.8	1.5
Urinary bladder	20	0.7	0.4	1.1	0.6	0.4	1.0
Oral cavity (excl nasopharynx)	22	0.7	0.4	1.0	0.6	0.4	1.0
Gallbladder	21	0.7	0.4	1.0	0.6	0.4	1.0
Esophagus	21	0.6	0.4	1.0	0.6	0.3	0.9
Nasopharynx	17	0.5	0.3	0.8	0.4	0.2	0.7
<i>Guamanian/Male</i>							
All Sites	60	147.0	106.5	201.8	111.8	81.6	152.4
Lung and bronchus	23	47.4	28.4	81.0	37.4	22.7	62.8
<i>Guamanian/Female</i>							
All Sites	48	98.5	69.5	138.8	73.4	52.4	101.9
<i>Native Hawaiian/Male<sup>c</sup></i>							
All Sites	790	—	—	—	263.7	243.7	285.4
Lung and bronchus	257	—	—	—	87.7	76.4	100.7
Colon and rectum	81	—	—	—	26.9	20.8	34.9
Prostate	48	—	—	—	21.9	15.7	30.1
Stomach	44	—	—	—	14.1	9.9	20.2
Liver and intrahepatic bile duct	38	—	—	—	11.8	7.9	17.7
Pancreas	38	—	—	—	11.4	7.8	16.9
Leukemia	29	—	—	—	9.0	5.6	14.3
Esophagus	27	—	—	—	8.4	5.4	13.4
Lymphoma—Non-Hodgkin	26	—	—	—	8.0	4.9	13.2



## Appendix 2 continued

	Count	Rate based on single race/ethnicity alone denominator			Rate based on one or more race/ethnicities denominator		
		Rate <sup>b</sup>	95% CI		Rate <sup>b</sup>	95% CI	
			LL	UL		LL	UL
Myeloma	18	–	–	–	5.2	3.0	9.5
Brain and other nervous system	16	–	–	–	3.9	2.1	7.8
<i>Native Hawaiian/Female<sup>c</sup></i>							
All Sites	738	–	–	–	198.9	184.4	214.4
Lung and bronchus	173	–	–	–	47.6	40.6	55.6
Breast	132	–	–	–	33.5	27.9	40.1
Pancreas	61	–	–	–	16.8	12.7	21.8
Colon and rectum	48	–	–	–	13.1	9.5	17.7
Stomach	36	–	–	–	10.3	7.1	14.6
Ovary	30	–	–	–	8.4	5.6	12.3
Corpus and uterus, NOS	26	–	–	–	6.7	4.3	10.2
Lymphoma—Non-Hodgkin	24	–	–	–	6.6	4.2	10.2
Liver and intrahepatic bile duct	22	–	–	–	6.4	3.9	10.0
Myeloma	18	–	–	–	5.2	3.1	8.5
Cervix Uteri	21	–	–	–	5.2	3.2	8.3
Leukemia	18	–	–	–	4.6	2.7	7.7
<i>Japanese/Male</i>							
All Sites	3,327	173.7	167.7	179.9	162.7	157.1	168.4
Lung and bronchus	777	39.5	36.7	42.5	37.3	34.7	40.0
Colon and rectum	497	25.8	23.6	28.3	24.2	22.1	26.5
Stomach	315	16.6	14.8	18.7	15.6	13.9	17.5
Prostate	284	15.2	13.5	17.3	14.6	12.9	16.5
Pancreas	234	12.2	10.6	14.0	11.5	10.0	13.1
Liver and intrahepatic bile duct	170	9.1	7.8	10.8	8.5	7.2	9.9
Esophagus	142	7.8	6.6	9.3	7.2	6.1	8.5
Lymphoma—Non-Hodgkin	146	7.5	6.3	8.9	7.0	5.9	8.3
Leukemia	111	5.9	4.9	7.3	5.4	4.4	6.5
Kidney and renal pelvis	89	4.7	3.8	5.9	4.3	3.5	5.4
Urinary bladder	88	4.6	3.6	5.8	4.3	3.5	5.4
Brain and other nervous system	45	2.6	1.9	3.7	2.2	1.6	2.9
Oral cavity (excl nasopharynx)	37	1.9	1.4	2.9	1.8	1.3	2.5
Myeloma	30	1.4	1.0	2.2	1.4	0.9	2.0
<i>Japanese/Female</i>							
All Sites	3,276	117.0	112.9	121.4	109.2	105.4	113.2
Lung and bronchus	585	19.7	18.1	21.5	18.6	17.1	20.3
Colon and rectum	421	15.3	13.8	17.0	14.4	13.0	15.9
Breast	385	15.1	13.6	16.9	13.9	12.5	15.4
Pancreas	314	10.6	9.4	12.1	10.1	9.0	11.3
Stomach	289	10.2	9.0	11.6	9.6	8.5	10.8
Liver and intrahepatic bile duct	196	6.5	5.6	7.7	6.1	5.2	7.0
Ovary	134	5.1	4.2	6.2	4.7	3.9	5.6
Lymphoma—Non-Hodgkin	143	5.0	4.2	6.1	4.7	4.0	5.6
Leukemia	104	4.0	3.2	5.1	3.6	3.0	4.4
Corpus and uterus, NOS	83	3.1	2.5	4.1	2.9	2.3	3.6
Cervix Uteri	40	1.7	1.2	2.5	1.5	1.1	2.1

## Appendix 2 continued

	Count	Rate based on single race/ethnicity alone denominator			Rate based on one or more race/ethnicities denominator		
		Rate <sup>b</sup>	95% CI		Rate <sup>b</sup>	95% CI	
			LL	UL		LL	UL
Myeloma	47	1.6	1.2	2.3	1.5	1.1	2.0
Urinary bladder	42	1.4	1.0	2.2	1.4	1.0	1.9
Kidney and renal pelvis	37	1.3	0.9	2.1	1.2	0.9	1.8
Brain and other nervous system	28	1.2	0.8	2.0	1.0	0.7	1.5
Esophagus	33	1.1	0.8	1.8	1.1	0.7	1.6
Oral cavity (excl nasopharynx)	25	0.9	0.6	1.6	0.9	0.6	1.3
Gallbladder	23	0.8	0.5	1.4	0.7	0.5	1.1
<i>Korean/Male</i>							
All Sites	1,762	196.5	186.2	207.4	188.6	178.6	199.0
Lung and bronchus	415	50.6	45.3	56.5	48.6	43.6	54.3
Stomach	302	31.5	27.5	36.0	30.2	26.4	34.6
Liver and intrahepatic bile duct	288	26.3	23.0	30.2	25.2	22.0	28.9
Colon and rectum	151	17.6	14.6	21.3	16.9	14.0	20.5
Pancreas	105	11.4	9.1	14.3	11.0	8.8	13.8
Prostate	43	6.8	4.7	9.5	6.5	4.6	9.2
Lymphoma—Non-Hodgkin	53	6.2	4.4	8.5	5.9	4.2	8.2
Leukemia	58	5.5	4.0	7.5	5.2	3.8	7.2
Urinary bladder	30	4.1	2.6	6.2	3.9	2.5	6.0
Esophagus	34	3.7	2.4	5.7	3.6	2.3	5.5
Gallbladder	20	3.1	1.8	5.2	3.0	1.7	5.0
Kidney and renal pelvis	28	3.0	1.9	4.7	2.9	1.9	4.5
Brain and other nervous system	27	2.0	1.3	3.4	1.9	1.2	3.3
<i>Korean/Female</i>							
All Sites	1,561	108.2	102.6	114.1	104.2	98.8	109.9
Lung and bronchus	276	20.7	18.2	23.4	20.0	17.6	22.6
Stomach	211	14.5	12.5	16.8	14.0	12.1	16.2
Colon and rectum	171	12.1	10.3	14.2	11.7	9.9	13.7
Liver and intrahepatic bile duct	169	11.7	9.9	13.7	11.3	9.6	13.2
Breast	144	7.8	6.5	9.3	7.5	6.3	8.9
Pancreas	97	7.5	6.1	9.3	7.3	5.9	9.0
Ovary	71	4.5	3.5	5.8	4.3	3.3	5.6
Cervix Uteri	53	3.1	2.3	4.2	3.0	2.2	4.0
Lymphoma—Non-Hodgkin	39	2.9	2.1	4.1	2.8	2.0	4.0
Leukemia	43	2.6	1.8	3.6	2.5	1.7	3.5
Gallbladder	27	2.2	1.4	3.3	2.1	1.4	3.2
Corpus and uterus, NOS	26	1.7	1.1	2.6	1.6	1.0	2.5
Kidney and renal pelvis	20	1.7	1.0	2.6	1.6	1.0	2.5
Brain and other nervous system	23	1.5	0.9	2.3	1.4	0.9	2.2
Myeloma	18	1.4	0.8	2.3	1.4	0.8	2.2
<i>Samoan/Male</i>							
All Sites	193	293.9	247.6	348.6	240.0	202.5	284.1
Lung and bronchus	54	74.0	53.6	102.9	61.2	44.4	84.6
Stomach	22	40.9	24.1	67.6	33.6	19.9	55.0
Prostate	14	36.2	18.9	64.4	29.2	15.3	51.5

## Appendix 2 continued

	Count	Rate based on single race/ethnicity alone denominator			Rate based on one or more race/ethnicities denominator		
		Rate <sup>b</sup>	95% CI		Rate <sup>b</sup>	95% CI	
			LL	UL		LL	UL
Liver and intrahepatic bile duct	22	32.9	19.3	56.1	26.8	15.8	44.9
Colon and rectum	19	31.6	17.2	56.0	25.2	13.9	44.1
<i>Samoan/Female</i>							
All Sites	172	209.3	176.5	248.2	170.7	144.0	202.1
Lung and bronchus	29	42.0	27.1	63.7	34.1	22.2	51.4
Breast	32	36.2	24.0	54.9	29.7	19.7	44.7
<i>Vietnamese/Male</i>							
All Sites	1,398	159.9	149.9	170.7	150.6	141.1	160.7
Lung and bronchus	368	43.9	38.7	49.9	41.4	36.5	46.9
Liver and intrahepatic bile duct	335	33.8	29.6	38.8	31.9	27.9	36.6
Stomach	95	12.7	9.8	16.4	11.9	9.2	15.4
Pancreas	76	8.9	6.6	11.9	8.4	6.3	11.2
Colon and rectum	84	8.8	6.6	11.7	8.3	6.3	11.0
Leukemia	58	7.2	5.1	10.1	6.7	4.8	9.4
Prostate	30	6.7	4.3	10.0	6.2	4.0	9.4
Lymphoma—Non-Hodgkin	53	5.2	3.6	7.5	4.9	3.4	7.1
Oral cavity (excl nasopharynx)	30	3.6	2.2	5.9	3.4	2.0	5.5
Brain and other nervous system	31	2.9	1.7	4.9	2.7	1.6	4.6
Kidney and renal pelvis	18	2.6	1.3	4.8	2.4	1.3	4.5
Esophagus	19	2.6	1.4	4.7	2.4	1.3	4.4
Urinary bladder	18	2.0	1.1	3.8	1.9	1.1	3.6
Nasopharynx	22	1.7	1.0	3.3	1.6	0.9	3.1
<i>Vietnamese/Female</i>							
All Sites	992	97.8	91.2	104.9	92.0	85.8	98.6
Lung and bronchus	181	20.2	17.1	23.7	19.0	16.1	22.3
Liver and intrahepatic bile duct	102	10.9	8.8	13.6	10.3	8.2	12.8
Breast	102	7.6	6.1	9.5	7.2	5.7	9.0
Colon and rectum	73	7.4	5.6	9.7	7.0	5.3	9.1
Stomach	72	7.0	5.3	9.2	6.6	5.0	8.7
Pancreas	62	6.2	4.7	8.3	5.9	4.4	7.8
Ovary	54	4.5	3.3	6.2	4.3	3.1	5.9
Cervix Uteri	52	4.4	3.2	6.1	4.2	3.0	5.8
Leukemia	51	4.2	3.0	5.8	3.9	2.8	5.4
Lymphoma—Non-Hodgkin	34	4.0	2.7	5.9	3.8	2.6	5.5
Myeloma	13	1.6	0.8	3.0	1.5	0.8	2.8
Brain and other nervous system	17	1.5	0.8	2.6	1.4	0.8	2.4
Corpus and uterus, NOS	17	1.4	0.8	2.6	1.4	0.8	2.4
<i>Non – Hispanic White/Men<sup>d</sup></i>							
All Sites	349,031	241.3	240.5	242.1			
Lung and bronchus	106,623	72.2	71.8	72.7			
Prostate	37,137	27.7	27.4	28.0			
Colon and rectum	35,261	24.6	24.3	24.8			
Pancreas	18,399	12.6	12.4	12.8			
Lymphoma—Non-Hodgkin	15,368	10.6	10.5	10.8			
Leukemia	15,119	10.6	10.4	10.8			
Urinary bladder	11,682	8.4	8.2	8.6			

## Appendix 2 continued

	Count	Rate based on single race/ethnicity alone denominator			Rate based on one or more race/ethnicities denominator		
		Rate <sup>b</sup>	95% CI		Rate <sup>b</sup>	95% CI	
			LL	UL		LL	UL
Esophagus	11,536	7.7	7.6	7.9			
Brain and other nervous system	9,477	6.3	6.2	6.4			
Kidney and renal pelvis	9,135	6.2	6.1	6.3			
Liver and intrahepatic bile duct	9,091	6.1	6.0	6.3			
Stomach	8,395	5.8	5.7	5.9			
Melanoma of the skin	6,998	4.7	4.6	4.8			
Myeloma	6,454	4.5	4.4	4.6			
Oral cavity a(excluding Nasopharynx)	5,605	3.7	3.6	3.8			
Larynx	3,316	2.2	2.2	2.3			
Lymphoma—Hodgkin	936	0.6	0.6	0.7			
Gallbladder	683	0.5	0.4	0.5			
Thyroid	673	0.5	0.4	0.5			
Breast	504	0.3	0.3	0.4			
Testis	475	0.3	0.3	0.4			
Nasopharynx	383	0.3	0.2	0.3			
<i>Non – Hispanic White/Women<sup>d</sup></i>							
All Sites	341,117	171.7	171.1	172.2			
Lung and bronchus	87,084	44.5	44.2	44.8			
Breast	53,534	27.8	27.5	28.0			
Colon and rectum	36,430	17.3	17.1	17.5			
Ovary	18,962	9.8	9.6	9.9			
Pancreas	19,471	9.5	9.4	9.6			
Lymphoma—Non-Hodgkin	14,024	6.8	6.7	7.0			
Leukemia	12,132	6.0	5.9	6.1			
Corpus and uterus, NOS	8,368	4.2	4.1	4.3			
Brain and other nervous system	7,602	4.2	4.1	4.3			
Myeloma	5,948	2.9	2.8	3.0			
Stomach	5,930	2.8	2.8	2.9			
Kidney and renal pelvis	5,611	2.8	2.7	2.9			
Liver and intrahepatic bile duct	5,546	2.7	2.7	2.8			
Urinary bladder	5,228	2.4	2.3	2.5			
Cervix Uteri	4,206	2.4	2.3	2.5			
Melanoma of the skin	4,075	2.2	2.1	2.2			
Corpus Uteri	3,822	1.9	1.9	2.0			
Esophagus	3,766	1.8	1.8	1.9			
Oral cavity a(excluding Nasopharynx)	3,142	1.6	1.5	1.6			
Gallbladder	1,675	0.8	0.8	0.9			
Larynx	992	0.5	0.5	0.6			
Lymphoma—Hodgkin	800	0.5	0.4	0.5			
Thyroid	917	0.5	0.4	0.5			
Nasopharynx	245	0.1	0.1	0.1			

<sup>a</sup> Rates are average annual per 100,000 age-adjusted to the 2000 U.S. standard population for the following States: CA, HI, IL, NJ, NY, TX, and WA

<sup>b</sup> Cancers are sorted in descending order of the rate within each race/ethnic and sex group

<sup>c</sup> Rates for Native Hawaiians are calculated using only the one or more race/ethnicities population denominator (See Materials and methods)

<sup>d</sup> Rates for Non-Hispanic Whites are calculated using the bridged single-race population denominator (See Materials and methods)

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