

Chapter 2

Cancer Disparities: Data Systems, Sources, and Interpretation

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Overall cancer death rates in the United States have continued to decrease since the early 1990s largely because of reduction in smoking and improved treatment for many cancers. However, this overall decrease masks the continued and often increasing gaps in cancer incidence, mortality, and survivorship between and within racial/ethnic minority groups as well as other specific population groups in this country. These differences extend across the cancer continuum of prevention, detection, diagnosis, treatment, survivorship, and end of life.

Evidence for these disparities has been mounting since 1973, when Hensechke et al. documented increasing cancer mortality among African Americans over the previous 25 years (Hensechke et al., 1973). Then, in 1985, the Heckler report formally called the nation's attention to the fact that there were significant differences in health care outcomes for African Americans, Native Americans, Hispanics, and Asian/Pacific Islanders compared to Caucasians and that these poorer outcomes resulted in higher death rates (US Department of Health and Human Services, 1985). Freeman, in a special report on cancer in the socioeconomically disadvantaged (Freeman, 1989), concluded that the poorer outcome in African Americans compared to Caucasians is primarily linked to lower socioeconomic status. Further, the report concluded that poor Americans, irrespective of race, have a 10–15% lower 5-year cancer survival rate than more affluent Americans. Based on this type of mounting evidence, US Surgeon General David Satcher refocused the nation's attention by setting a national goal of eliminating disparities (US Department of Health and Human Services, 2001).

Reaching this goal, however, continues to be a challenge. The issue of disparities is complex, and effectively examining the magnitude of and progress toward decreasing disparities depends on the ability to collect, analyze, and interpret relevant data appropriately. To that end, this chapter outlines current data tracking systems (domestic and international) and provides an overview of existing disparities in cancer burden by race/ethnicity, socioeconomic status, and country. It will also discuss the implications of these findings for future research.

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Definitions of Disparities and Implications for Data Interpretation

There are many definitions and terms used in the global discussion of disparities. In Chapter 1 of this book, Krieger and colleagues review such definitions in a detailed way. Consistent and universally accepted definitions are crucial because the way in which “disparities” and related terms are defined can significantly influence what questions are asked, how data are collected, how data are interpreted, and how the results of this interpretation are applied to efforts to reduce disparities. Other factors that have to be considered when defining, monitoring, and interpreting disparities are whether the interest lies in total disparities, whether the measurement emphasis should be on absolute or relative disparities, and who is considered to be the referent group. Because of the complexity of these types of data, this chapter uses (1) the NIH definition of disparities that focuses on group disparities; (2) Caucasians as the reference group in describing racial/ethnic disparities; (3) educational attainment as a marker for socioeconomic status; and (4) relative and absolute disparities when presenting data. Below is a brief overview of the generally accepted meanings of these key terms.

Disparities and Group Disparities. Several federal and public health agencies in the United States define health disparities as differences in the incidence, prevalence, survival, mortality, and burden of diseases and other adverse health conditions that exist in specific population groups. According to the 106th Congress of the United States, health disparities exist “. . .if there is a significant disparity in the overall rate of disease incidence, prevalence, morbidity, mortality, or survival rates in the population as compared to the health status of the general population. In addition, such a term includes populations for which there is a considerable disparity in the quality, outcomes, cost, or use of health care services or access to or satisfaction with such services as compared to the general population” (106th Congress of the United States, 2000). One form of disparity, for example, might be “excess deaths” in a minority population, i.e., the difference between the number of deaths observed in the minority population and the number of deaths that would have been expected in that population if they had the same age- and sex-specific death rate as the non-minority population (US Department of Health and Human Services, 1985).

Disparities can involve biological, environmental, and behavioral factors, as well as income and education, and may be characterized by gender, age, ethnicity, education, income, social class, disability status, geographic location, or sexual orientation (National Cancer Institute, 2007; Centers for Disease Control and Prevention, Division of Cancer Prevention and Control, 2007; US Department of Health and Human Services, 2001). See Chapter 1 of this book for a more detailed discussion of these dimensions.

Social Disparities/Group Disparities Versus Total Disparity. When these differences in health conditions or outcomes are linked to specific groups (e.g., race/ethnicity, poverty, education, social status), they are referred to as

“social disparities” or “group disparities.” For example, in the United States, group disparities have been cited between the racial and ethnic minority populations of African Americans, Asians, Pacific Islanders, Hispanics and Latinos, Native Americans, and Native Alaskans—specific groups that have been identified as disparate populations with regard to cancer incidence, mortality, and survival (National Cancer Institute, 2007b). In contrast, the measure “total disparity” reflects the univariate distribution of health among all individuals in a population without regard to their group membership (Harper & Lynch, 2005).

Absolute Versus Relative Disparity. Disparities can be estimated in different ways, depending on the purpose of the measurement. The term “absolute disparity” is the raw numeric difference between the rates or other values of two groups. For example, the absolute disparity in cancer mortality rates between males and females would be the numerical difference between their respective rates (Harper & Lynch, 2005). “Relative disparity,” on the other hand, is the percentage difference or ratio between two groups. This measure allows two groups to be compared without regard to the magnitude of the rates. Thus, even if rates of stomach cancer decreased for both males and females, the relative disparity, or ratio of male-to-female mortality, could simultaneously increase (Harper & Lynch, 2005). An absolute disparity measure can be used to indicate the number of people affected and to evaluate the public health impact of this number by comparing it to a standard or target rate; a relative disparity measure, in contrast, can be used to indicate how much one group differs from another and thus compare various health indicators or evaluate changes in disparities over time.

Inequality and Inequity. Terms such as inequality and inequity are also used when referring to disparities (See Chapter 1). While these terms and definitions have similarities, they are often interpreted quite differently, which can lead to differences in data collection and analysis. Although sometimes used synonymously with “inequity,” “inequality” is more accurately a generic term used to designate differences, variations, and disparities in the health of individuals and groups (Kawachi et al., 2002) without judgment about the fairness or controllability of the differences. For example, the World Health Organization (WHO) defines inequality as differences in health status or in the distribution of health determinants between different population groups, some of these health inequalities “attributable to biological variations or free choice. . . [and] others . . . to the external environment and conditions mainly outside the control of the individuals concerned” (World Health Organization, 2007). In contrast, the term “health inequity” relies not only on an observed difference in outcomes but also on a moral/judgment about justice, usually related to social, political, or ethical beliefs (Harper & Lynch, 2005; Peter & Evans, 2001). These inequitable differences are deemed unnecessary and avoidable, and also considered unfair and/or to stem from injustice (Kawachi et al., 2002), a term that is taken to mean a “denial or violation of economic, sociocultural, political, or civil rights by certain population groups within a society (Levy & Sidel, 2006). The crux of the distinction between inequality and inequity is that the identification of health

inequities entails normative judgment premised upon (a) one's theory of justice, (b) one's theories of society, and (c) one's reasoning underlying the genesis of health inequalities (Public Health Agency of Canada, 2007). The chapter by Krieger et al. in this volume closely examines these critical terms (see Chapter 1).

Excess Deaths. This term is defined as the difference between the number of deaths observed in a minority population and the number of deaths which would have been expected in a minority population if they had the same age- and sex-specific death rate as the non-minority population (US Department of Health and Human Services, 1985).

Overview of Current Data Tracking Systems

Inconsistencies and gaps in how and what data health care systems collect undermine efforts to obtain data that allow effective and full evaluation of the extent of disparities (Ver Ploeg & Perrin, 2004). For example, in the United States there are insufficient linkages to facilitate data sharing confidentially across systems (i.e., national, state, local government agencies). Furthermore, medical records submitted from hospitals, clinics, and other health facilities to cancer registries are often missing data points, including information on socioeconomic status. There is also a substantial time lag in getting this data from the patient to the hospital record system and finally, to a state's cancer registry. Further, national surveys often omit data about certain racial/ethnic minority groups. In fact, prior to 1970 cancer mortality data were generally classified based on only three racial/ethnic groups: "black," "white," and "other" (Ver Ploeg & Perrin, 2004).

Current data that describe disparities in cancer incidence, survival, and mortality in the United States are available from the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute (NCI), the National Program of Cancer Registries (NPCR) of the Centers for Disease Control and Prevention (CDC), and the National Center for Health Statistics (NCHS). Data on trends in international cancer disparities, as well as several other published reports, are available from the International Agency for Research on Cancer (IARC). A brief description of these data sources follows.

SEER. Between 1973 and 1975, the SEER Program collected population-based cancer incidence and survival data in nine geographic areas, covering 10% of the United States population. Since then, this NCI-sponsored program has continued to collect data on patient demographics, primary tumor site, tumor morphology and stage at diagnosis, first course of treatment, and follow-up for vital status (National Cancer Institute, 2007a). In 1992, SEER began collecting this data by expanded racial/ethnic categories and has since expanded its coverage to 18 registries covering 25% of the nation's population.

NPCR. Administered by the CDC, the NPCR was established in 1992 through the Cancer Registries Amendment Act. The NPCR collects and codes data on the incidence, type, extent, and location, as well as the initial

treatment of the cancer (Centers for Disease Control and Prevention Division of Cancer Prevention and Control, 2007). Currently, this program supports cancer registries in 45 states, the District of Columbia, Puerto Rico, the Republic of Palau, and the Virgin Islands. These state-based cancer registries collect, manage, and analyze data from medical facilities (hospitals, physicians' offices, therapeutic radiation facilities, freestanding surgical centers, and pathology laboratories) and report these data to a central cancer registry. The NPCR and SEER programs collectively monitor cancer occurrence for approximately 96% of the population (Centers for Disease Control and Prevention Division of Cancer Prevention and Control, 2007).

NCHS. The NCHS, housed in the CDC, is another leading source for statistical health data. National mortality data have been abstracted from death certificates annually since 1930. These data are classified according to the current International Classification of Diseases (ICD) codes and selection rules of underlying cause of death at the year of death (National Center for Health Statistics, 2007).

IARC. Lastly, international data on cancer incidence and mortality can be accessed from the IARC, which is a part of the WHO. Its mission is to "coordinate and conduct research on the causes of human cancer, the mechanisms of carcinogenesis, and to develop scientific strategies for cancer control" (International Agency for Research on Cancer, 2007). The IARC monitors cancer incidence data for approximately 20% and mortality data for approximately 30% of the world's population.

Cancer Disparities by Race/Ethnicity and Socioeconomic Status

This section provides data on the disparities in cancer rates and trends in incidence, mortality, and survival among the major racial/ethnic groups in the United States. Data are provided for all cancers combined and for selected cancer sites. Trend data are provided for Caucasians and African Americans from 1975 to 2004. The trend data for the other racial/ethnic groups are only provided for all cancers combined because the year-to-year rates for specific cancer types were unstable over time. This section also provides limited information on cancer disparity by socioeconomic status (SES) using educational attainment and health insurance status as indicators of SES, although data showing the SES cancer disparity over time are lacking.

African Americans. African Americans are more likely to develop and die from all cancers combined than any other racial or ethnic population (Tables 2.2 and 2.3). The death rate from cancer among African American males is about 37% higher than among white males; for African American females, it is about 17% higher than among white females. Importantly, the disparities in mortality rates between African Americans and whites have widened over the years for all cancers combined as well as for most of the major cancers (Figs. 2.1–2.6).

Hispanics. Hispanics have lower incidence rates for all cancers combined and for most common types of cancer than whites, but they generally have higher

Table 2.1 Definitions of terms***Disparities**

Differences in the incidence, prevalence, mortality, and burden of cancer and related adverse health conditions that exist among specific population groups in the United States. These population groups may be characterized by gender, age, ethnicity, education, income, social class, disability, geographic location, or sexual orientation (National Cancer Institute, 2007).

Differences that occur by gender, race or ethnicity, education, or income, disability, living in rural localities or sexual orientation (US Department of Health and Human Services, 2001).

Health disparities occur when one group of people has a higher incidence or mortality rate than another, or when survival rates are less for one group than another. Disparities are most often identified along racial and ethnic lines that show that African Americans, Hispanics, Native Americans, Asian Americans, Alaska Natives, and whites have different disease rates and survival rates. Disparities are determined and measured by three health statistics—incidence rates (the number of newly diagnosed cancers in a specified population over a defined time period), mortality rates (the number of cancer deaths in a specified population over a defined time period), and survival rates (the length of survival following diagnosis of cancer). Disparities can involve biological, environmental, and behavioral factors, as well as differences based on income and education (Centers for Disease Control and Prevention Division of Cancer Prevention and Control, 2007)

A population is a health disparity population if there is a significant disparity in the overall rate of disease incidence, prevalence, morbidity, mortality, or survival rates in the population as compared to the health status of the general population. In addition, such term includes populations for which there is a considerable disparity in the quality, outcomes, cost, or use of health care services or access to, or satisfaction with such services as compared to the general population (106th Congress of the United States, 2000).

Excess Deaths

Difference between the number of deaths observed in a minority population and the number of deaths which would have been expected in a minority population if they had the same age- and sex-specific death rate as the non-minority population (US Department of Health and Human Services, 1985).

Inequities

Relies on a moral, ethical judgment about justice and thus is not unambiguously measurable or observable. Judgments concerning inequity rely on social, political, and ethical discourse about what a society believes is unfair (Harper & Lynch, 2005; Harper & Lynch, 2005; Peter & Evans, 2001).

Inequities in health that are deemed to be unfair or stemming from some form of injustice. The crux of the distinction between equality and equity is that (a) the identification of health inequities entails normative judgment premised upon one's theory of justice, (b) one's theories of society, and (c) one's reasoning underlying the genesis of health inequalities (Public Health Agency of Canada, 2007).

Those inequalities in health deemed to be unfair or to stem from injustice. The dimensions of being avoidable or unnecessary have often been added to this concept (Kawachi et al., 2002).

Inequality

Differences in health status or in the distribution of health determinants between different population groups. Differences are unnecessary, avoidable, and considered unfair and unjust. Some health inequalities are attributable to biological variations or free choice and others are attributable to the external environment and conditions mainly outside the control of the individuals concerned (World Health Organization, 2007).

A generic term used to designate differences, variations, and disparities in the health of individuals and groups (Kawachi et al., 2002).

Injustice

Denial or violation of economic, sociocultural, political, or civil rights by certain population groups within a society (Levy & Sidel, 2006).

Table 2.1 (continued)

Absolute Disparities
Reflects the difference in values. For example, the actual difference between male and female stomach cancer mortality rates is the absolute disparity (Harper & Lynch, 2005).
Relative Disparities
Reflects differences in outcome ratios. For example, as rates of stomach cancer decreased for males and females, the ratio of male-to-female mortality increased (Harper & Lynch, 2005).
Total Disparity
Reflects the univariate distribution of health among all individuals in a population without regard to their group membership (Harper & Lynch, 2005).
Social-Group Disparities
Reflects differences between groups based on an identified parameter such as race/ethnicity or education, to name a few (Harper & Lynch, 2005).

*See also Chapter 1

Table 2.2 Cancer incidence rates by site, race, and ethnicity, US, 2000–2004

Incidence	White	African American	Asian American/ Pacific Islander	American Indian/Alaska Native [†]	Hispanic/Latino ^{‡§}
All sites					
Males	556.7	663.7	359.9	321.2	421.3
Females	423.9	396.9	285.8	282.4	314.2
Breast (female)	132.5	118.3	89.0	69.8	89.3
Colon & rectum					
Males	60.4	72.6	49.7	42.1	47.5
Females	44.0	55.0	35.3	39.6	32.9
Kidney & renal pelvis					
Males	18.3	20.4	8.9	18.5	16.5
Females	9.1	9.7	4.3	11.5	9.1
Liver & bile duct					
Males	7.9	12.7	21.3	14.8	14.4
Females	2.9	3.8	7.9	5.5	5.7
Lung & bronchus					
Males	81.0	110.6	55.1	53.7	44.7
Females	54.6	53.7	27.7	36.7	25.2
Prostate	161.4	255.5	96.5	68.2	140.8
Stomach					
Males	10.2	17.5	18.9	16.3	16.0
Females	4.7	9.1	10.8	7.9	9.6
Uterine cervix	8.5	11.4	8.0	6.6	13.8

Per 100,000 population, age adjusted to the 2000 US standard population. [†] Data based on Contract Health Service Delivery Areas (CHSDA), 624 counties comprising 54% of the US American Indian/Alaska Native population; [‡] Persons of Hispanic/Latino origin may be of any race. [§] Data unavailable from the Alaska Native Registry and Kentucky. Data unavailable from Minnesota, New Hampshire, and North Dakota (Ries et al., 2007).

Table 2.3 Cancer death rates by site, race, and ethnicity, US, 2000–2004

Mortality	White	African American	Asian American Pacific Islander	American Indian/Alaska Native [†]	Hispanic/Latino ^{‡¶}
All sites					
Males	234.7	321.8	141.7	187.9	162.2
Females	161.4	189.3	96.7	141.2	106.7
Breast (female)	25.0	33.8	12.6	16.1	16.1
Colon & rectum					
Males	22.9	32.7	15.0	20.6	17.0
Females	15.9	22.9	10.3	14.3	11.1
Kidney & renal pelvis					
Males	6.2	6.1	2.4	9.3	5.4
Females	2.8	2.8	1.1	4.3	2.3
Liver & bile duct					
Males	6.5	10.0	15.5	10.7	10.8
Females	2.8	3.9	6.7	6.4	5.0
Lung & bronchus					
Males	72.6	95.8	38.3	49.6	36.0
Females	42.1	39.8	18.5	32.7	14.6
Prostate	25.6	62.3	11.3	21.5	21.2
Stomach					
Males	5.2	11.9	10.5	9.6	9.1
Females	2.6	5.8	6.2	5.5	5.1
Uterine cervix	2.3	4.9	2.4	4.0	3.3

Per 100,000 population, age adjusted to the 2000 US standard population. [†]Data based on Contract Health Service Delivery Areas (CHSDA), 624 counties comprising 54% of the US American Indian/Alaska Native population; [‡]Persons of Hispanic/Latino origin may be of any race. Data unavailable from the Alaska Native Registry and Kentucky. [¶]Data unavailable from Minnesota, New Hampshire, and North Dakota (Ries et al., 2007).

rates of cancers associated with infection, such as uterine, cervix, liver, and stomach cancers. For example, incidence rates of liver cancer are twice as high in Hispanic men and women as in non-Hispanic Caucasians.

Asian Americans and Pacific Islanders. Similar to Hispanics, Asian Americans and Pacific Islanders have lower incidence rates than whites for the most common cancer sites but have a higher incidence of many of the cancers related to infection. On the other hand, this population has the highest incidence and death rates from liver and stomach cancers of all racial/ethnic groups in both men and women, with the exception of deaths from stomach cancer in men.

American Indians and Alaska Natives. Incidence and death rates from kidney cancer in American Indian and Alaska Native men and women are higher than in any other racial/ethnic population. Cancer rates for American Indians and Alaska Natives should be interpreted with caution, however, because available

Table 2.4 Trends in 5-year relative survival rates (%) by race and year of diagnosis, US, 1975–2003

	White				African American				All Races			
	1975–1977	1984–1986	1996–2003		1975–1977	1984–1986	1996–2003		1975–1977	1984–1986	1996–2003	
All sites	51	55	67 [†]		40	41	57 [†]		50	54	66 [†]	
Brain	23	28	34 [†]		27	33	37 [†]		24	29	35 [†]	
Breast (female)	76	80	90 [†]		62	65	78 [†]		75	79	89 [†]	
Colon	52	60	66 [†]		46	50	55 [†]		51	59	65 [†]	
Esophagus	6	11	18 [†]		3	8	11 [†]		5	10	16 [†]	
Hodgkin lymphoma	74	80	87 [†]		71	75	81 [†]		74	79	86 [†]	
Kidney	51	56	66 [†]		50	54	66 [†]		51	56	66 [†]	
Larynx	67	68	66		59	53	50		67	66	64	
Leukemia	36	43	51 [†]		34	34	40		35	42	50 [†]	
Liver [#]	4	6	10 [†]		2	5	7 [†]		4	6	11 [†]	
Lung & bronchus	13	14	16 [†]		12	11	13 [†]		13	13	16 [†]	
Melanoma of the skin	82	87	92 [†]		60 [†]	70 [§]	77		82	87	92 [†]	
Myeloma	25	27	34 [†]		31	32	32		26	29	34 [†]	
Non-Hodgkin lymphoma	48	54	65 [†]		49	48	56		48	53	64 [†]	
Oral cavity	55	57	62 [†]		36	36	41		53	55	60 [†]	
Ovary [†]	37	39	45 [†]		43	41	38		37	40	45 [†]	
Pancreas	3	3	5 [†]		2	5	5 [†]		2	3	5 [†]	
Prostate	70	77	99 [†]		61	66	95 [†]		69	76	99 [†]	
Rectum	49	58	66 [†]		45	46	58 [†]		49	57	66 [†]	
Stomach	15	18	22 [†]		16	20	24 [†]		16	18	24 [†]	
Testis	83	93	96 [†]		82 [†]	87 [†]	88		83	93	96 [†]	

Table 2.4 (continued)

	White				African American				All Races			
	1975-1977	1984-1986	1996-2003		1975-1977	1984-1986	1996-2003		1975-1977	1984-1986	1996-2003	
Thyroid	93	94	97 [†]		91	90	94		93	94	97 [†]	
Urinary bladder	75	79	81 [†]		51	61	65 [†]		74	78	81 [†]	
Uterine cervix	71	70	74 [†]		65	58	66		70	68	73 [†]	
Uterine corpus	89	85	86 [†]		61	58	61		88	84	84 [†]	

Survival rates are adjusted for normal life expectancy and are based on cases diagnosed in the SEER 9 areas from 1975-77, 1984-86, and 1996 to 2003 and followed through 2004. [†] The difference in rates between 1975-1977 and 1996-2003 is statistically significant ($p<0.05$). [‡] The standard error of the survival rate is between 5 and 10 percentage points. [§] The standard error of the survival rate is greater than 10 percentage points. [¶] Recent changes in classification of ovarian cancer, namely excluding borderline tumors, have affected 1996-2002 survival rates. [#] Includes intrahepatic bile duct (Ries et al., 2007).

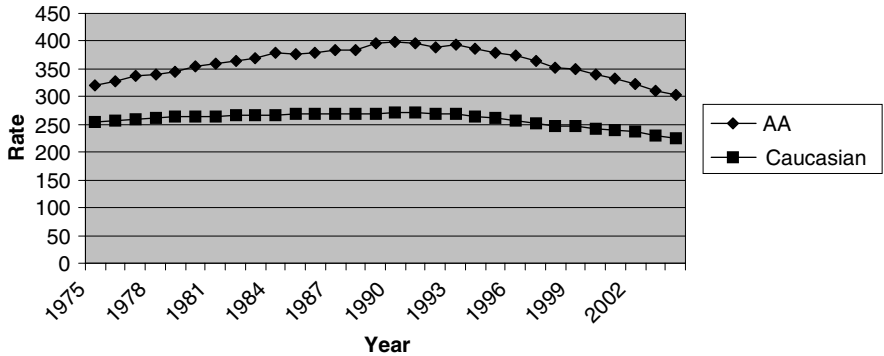


Fig. 2.1 Trends in age-standardized death rates for males (All Malignant Cancers) by race, 1975–2004
Underlying mortality data provided by the National Center for Health Statistics. Rates are per 100,000 and age adjusted to the 2000 US Std Population (19 age groups—Census P25-1130) standard; AA = African American.

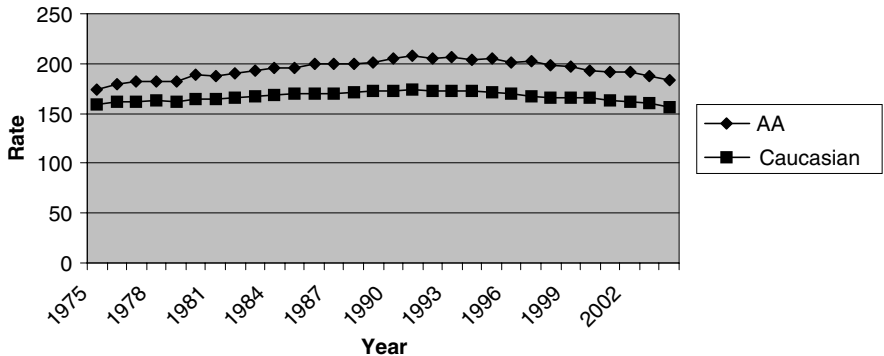


Fig. 2.2 Trends in age-standardized death rates for females (All Malignant Cancers) by race, 1975–2004
Underlying mortality data provided by the National Center for Health Statistics. Rates are per 100,000 and age adjusted to the 2000 US Std Population (19 age groups—Census P25-1130) standard; AA = African American.

data are not considered representative. To resolve this issue, a linkage of cancer registry data and the Indian Health Service patient database has been developed.

In addition to the variation in cancer burden between different racial/ethnic groups, significant disparities exist among sub-populations. For example, incidence rates for cervical cancer are almost three times higher in Vietnamese American women than in Chinese and Japanese Americans; this is partly because the Vietnamese, in general, immigrated more recently, are poorer, and have less access to cervical cancer screening. Trend data for

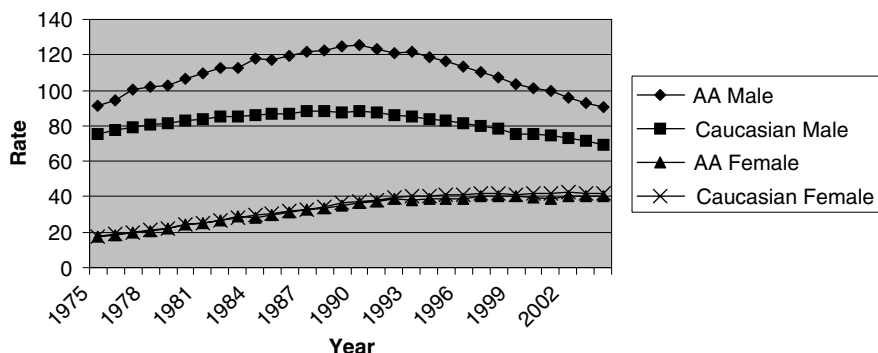


Fig. 2.3 Lung cancer: Trends in age-standardized death rates by race and sex, 1975–2004. Underlying mortality data provided by the National Center for Health Statistics. Rates are per 100,000 and age adjusted to the 2000 US Std Population (19 age groups—Census P25-1130) standard; AA = African American.

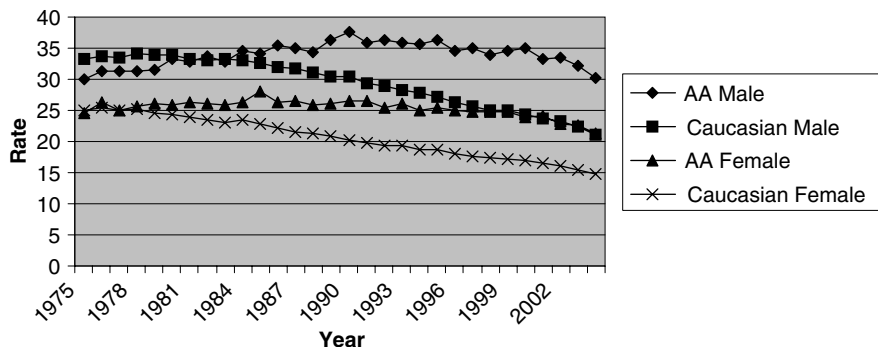


Fig. 2.4 Colorectal cancer: Trends in age-standardized death rates by race and sex, 1975–2004. Underlying mortality data provided by the National Center for Health Statistics. Rates are per 100,000 and age adjusted to the 2000 US Std Population (19 age groups—Census P25-1130) standard; AA = African American.

other racial/ethnic minority groups are unstable over time due to lack of data and therefore are not presented.

Factors contributing to these disparities are complex and will be explored in depth throughout the remainder of this book. Overall, however, it is clear that many disparities are related to the many obstacles faced by various racial and ethnic minorities in receiving health care services relating to cancer prevention, early detection, and high-quality treatment. These obstacles include low income; inadequate health insurance; geographic, cultural, and language barriers; racial bias; and stereotyping. For example, poverty influences both the prevalence of underlying risk factors for cancer (such as tobacco use and

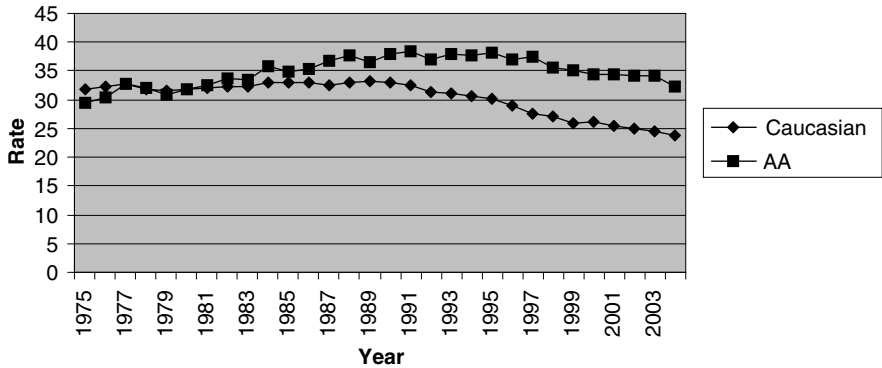


Fig. 2.5 Female breast cancer: Trends in age-standardized death rates by race and sex, 1975–2004
Underlying mortality data provided by the National Center for Health Statistics. Rates are per 100,000 and age adjusted to the 2000 US Std Population (19 age groups—Census P25-1130) standard; AA = African American.

obesity) and the access to health care services. Compared with just 11% of whites, 25% of African Americans and 22% of Hispanics/Latinos live below the poverty line. Moreover, 18% of African Americans and 33% of Hispanics/Latinos are uninsured, compared to only 12% of whites. These differences have considerable relevance to health disparities, given that low-income and uninsured people in particular are more likely to be diagnosed with cancer at later stages, receive substandard clinical care and services, and die from cancer. Not surprisingly, then, the 5-year relative survival rate for all cancers combined is lower for African Americans (57%) than it is for whites (67%).

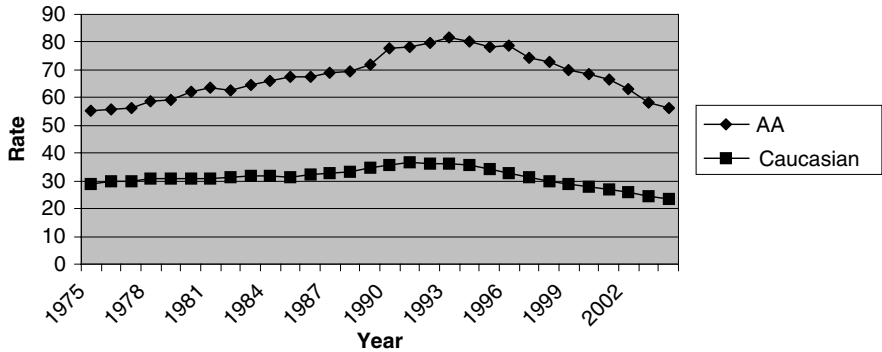


Fig. 2.6 Prostate Cancer: Trends in age-standardized death rates by race and sex, 1975–2004
Underlying mortality data provided by the National Center for Health Statistics. Rates are per 100,000 and age adjusted to the 2000 US Std Population (19 age groups—Census P25-1130) standard; AA = African American.

Table 2.5 Cancer death rates by educational attainment, race, and sex, US, 2001*

	Men		Women	
	Black	Non-Hispanic white	Black	Non-Hispanic white
All sites		Absolute difference		Absolute difference
< = 12 years of education	214.43	163.78	148.10	128.79
> 12 years of education	90.14	73.00	103.30	73.02
RR (95% CI)	2.38 (2.33–2.43)	2.24 (2.23–2.26)	1.43 (1.41–1.46)	1.76 (1.75–1.78)
Absolute difference	124.29	90.78	44.80	55.77
Lung				
< = 12 years of education	73.23	60.99	30.82	37.06
> 12 years of education	25.78	18.13	17.92	14.20
RR (95% CI)	2.84 (2.69–3.00)	3.36 (3.30–3.43)	1.72 (1.61–1.84)	2.6 (2.53–2.67)
Absolute difference	47.45	42.86	12.90	22.86
Colorectal				
< = 12 years of education	20.59	14.23	14.13	9.36
> 12 years of education	11.30	7.88	10.82	5.44
RR (95% CI)	1.81 (1.63–2.02)	1.81 (1.73–1.89)	1.31 (1.18–1.45)	1.72 (1.63–1.82)
Absolute difference	9.29	6.35	3.31	3.92
Prostate				
< = 12 years of education	10.52	3.26	NA	
> 12 years of education	4.80	2.22		
RR (95% CI)	2.17 (1.82–2.58)	1.47 (1.34–1.62)		
Absolute difference	5.72	1.04		
Breast				
< = 12 years of education	NA		36.06	25.20
> 12 years of education			31.13	18.50
RR (95% CI)			1.16 (1.10–1.22)	1.36 (1.32–1.40)
Absolute difference			4.93	6.70

*Rates are for individuals 25–64 years at death, per 100,000, and age-adjusted to the 2000 US standard population (Albano et al., 2007).
RR=relative risk; CI= confidence interval; NA=not applicable.

Socioeconomic Status

Factors associated with SES contribute to substantial differences in cancer incidence and mortality within and among racial/ethnic groups. SES is highly correlated with cancer risk and outcomes across the continuum from prevention to palliative care (Woods et al., 2006). Some of the explanations for these disparities may be that persons with lower SES are more likely to engage in behaviors such as tobacco use and physical inactivity, that increase cancer risk in part because of marketing strategies that target these populations and environmental or community influences, such as opportunities for physical activity and access to fresh fruits and vegetables. Lower SES is also associated with financial, structural, and personal barriers to health care, including lack of or inadequate health insurance, reduced access to recommended preventive care and treatment services, lower literacy rates, and lower levels of education.

Cancer mortality rates among both African American and Caucasian men with 12 or fewer years of education are more than twice those of men with higher levels of education (Table 2.5). In the United States, moreover, approximately 26% of African Americans and 45% of Hispanics do not graduate high school, compared to 15% of Caucasians and 17% of Asian Americans. In fact, potentially avoidable factors associated with lower educational status may account for almost half of all deaths, not only cancer deaths, among working-aged adults in the United States, regardless of race (Jemal et al., 2008). Death rates for each of the four major cancer sites are higher in less-educated black and white men and women than in those with more years of education. Furthermore, there is a clear link between educational attainment and rates of poverty. Specifically, African Americans who do not graduate high school have a 37% poverty rate compared to a rate of 31% for Hispanics, 16% for Asian Americans, and 22% for Caucasians with equivalent educational level (US Census Bureau, 2007a; US Census Bureau, 2007b). Moreover, findings suggest that African American patients between ages 18 and 56 years who resided in ZIP codes with low proportions of high-school graduates or low median household incomes were more likely to be diagnosed with advanced disease and/or larger tumors than their counterparts in other racial/ethnic groups (Chen et al., 2007b,a; Halpern et al., 2007).

The presence of health insurance—a factor interrelated with poverty and educational attainment—is another key contributor to the cancer disparities. More than 45 million Americans under the age of 65 lack health insurance or are underinsured (Ward et al., 2008). For several cancers, those who are uninsured are less likely to receive recommended cancer screening tests and more likely to be diagnosed with later stage disease and to have lower survival rates than those with private insurance (Ward et al., 2008). Several studies, for example, have found that patients with advanced-stage cancer (breast, laryngeal, oropharyngeal) at diagnosis were more likely to be uninsured or covered by Medicaid than those with private insurance. Similarly, patients were more

likely to present with the largest tumors if they were uninsured or covered by Medicaid (Chen et al., 2007a,b; Halpern et al., 2007). Ward and colleagues (Ward et al., 2008) also found that among Caucasian women diagnosed with all stages of breast cancer, only 76% of those who were uninsured survived 5 years compared to 89% of those with private insurance. Yet among the African American women in this study, 65% of those who were uninsured survived 5 years compared to 81% of those who were privately insured. In Hispanic women, moreover, the 5-year survival rate was 83% for uninsured versus 86% for insured patients. Therefore, while insurance status clearly plays a role in survival rates, this factor alone cannot explain remaining disparities between racial/ethnic groups.

International Cancer Disparities

The burden of cancer strikingly varies across countries as well, largely due to differences in prevalence of major risk factors and the availability of screening and treatment services. In Eastern European Countries and China, for example, lung cancer is the most common cancer among men, in contrast to prostate cancer in North America, North and Western Europe, and Australia, and liver cancer and Kaposi Sarcoma (AIDS-related cancer) in many African countries (Fig. 2.7). Among women, the most common cancer is breast cancer in North America, Europe, Australia, and parts of South America, and North America; cervix cancer in South Asia, parts of Sub-Saharan Africa, and parts of South America; and stomach cancer in China. In general, cancers related to smoking (lung), reproductive factors (breast), screening (breast and prostate), and dietary factors (colon) predominate in economically developed countries; whereas cancers related to infections (e.g., cervix, liver, Kaposi sarcoma, and stomach) predominate in economically developing countries. For example, the incidence rate of cervical cancer in some African countries is five times as high as in the United States and North and West European countries where routine pap testing has been in place for many decades (Kogevinas et al., 1997).

Furthermore, the burden of cancers related to smoking, dietary habits, and reproductive factors—such as lung, breast, and colorectal cancers—is also increasing in economically developing countries as people in these countries live longer and adopt Western life styles (Mackay et al., 2006). In fact, tobacco-attributable deaths are projected to double from 3.4 million in 2007 to 6.8 million in 2050 in low- and middle-income countries (American Cancer Society, 2007).

Lack of screening services for early detectable cancers (e.g., cervix, breast, colon, and rectum) as well as lack of treatment for treatable cancers (e.g., leukemia, lymphoma, testis, breast, colon and rectum) also contribute to relatively lower survival rate of cancer after diagnosis in developing countries. The 5-year survival rate for breast cancer, for example, is less than 40% in many African and Asian countries, compared to over 80% in the United States

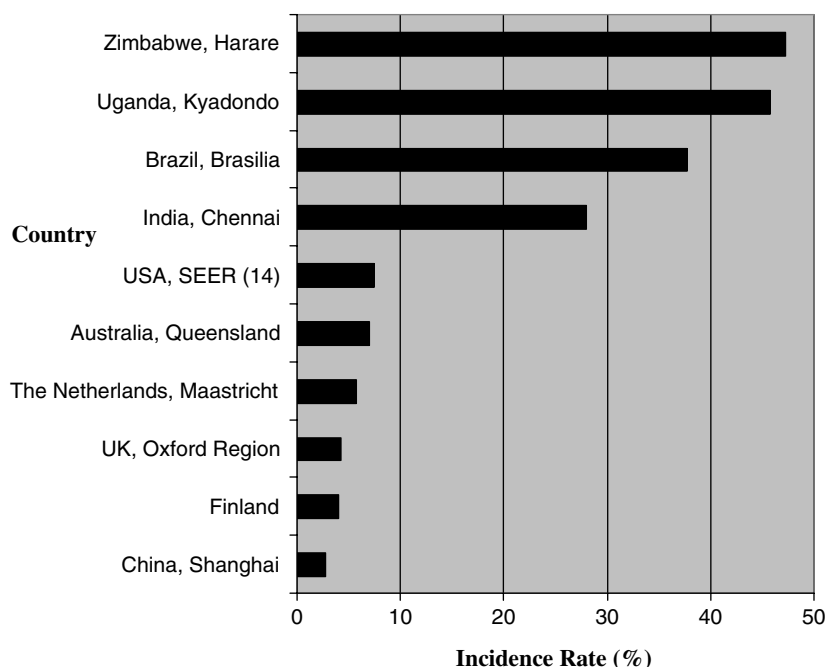


Fig. 2.7 Cervical cancer incidence rates by country (age-standardized rates (1960 world standard population); Mackay et al., 2006)

and Northern and Western European countries. Moreover, the 5-year survival rate for childhood cancers rose to over 70% in Northern and Western Europe and the United States over the past four decades because of improved treatment (e.g., chemotherapy), while survival remains low in many developing countries. The worldwide disparity in the availability of cancer treatment is best described by the considerable global variation in distribution of radiotherapy centers, appropriate for treating approximately 50% of all cancer patients (Mackay et al., 2006). Economically developing countries comprise more than 80% of the world population but possess only 20% of all electron accelerator machines and 70% of all cobalt machines (Kogevinas et al., 1997). Several countries in African and Asia lack even one such machine.

In addition to disparities between countries, there are disparities in the burden of cancer based on race/ethnicity or socioeconomic position among population groups within various countries (Woods et al., 2006; Kogevinas et al., 1997). For example, in Australia cancers of the liver and cervix are more than three times as high in indigenous (i.e., Aborigines and Torres Strait Islanders) than in non-indigenous populations (Condon, 2003). One review of socioeconomic differential in incidence and mortality for all cancers combined and for 24 types of cancer in 20 countries found that men with lower SES consistently show excess risk for smoking-related cancers (i.e., lung, larynx, oral cavity and pharynx, and

esophagus) as well as stomach and liver cancers (Kogevinas et al., 1997). Excess risk was also noted among women of lower SES for cancers of the stomach, esophagus, and cervix. These disparities have widened over time in many countries including the United Kingdom and the United States.

Implications

Despite growing knowledge about disparities between Caucasians and African Americans, numerous gaps in data monitoring and tracking still need to be addressed to better understand the source of these disparities so that effective and targeted interventions can be implemented. Furthermore, data tracking systems still have not systematically collected data over time on racial/ethnic minority groups other than African Americans and have not tracked disparities within subgroups of these minorities. For example, Hispanics are currently categorized into one group, despite the fact that persons classified as Hispanic may be from any of a variety of cultures (e.g., Puerto Rico, Cuba, Mexico, or the Dominican Republic), with the burden of cancer varying significantly within these subpopulations. The same case can be made for persons of Asian descent or for rural versus urban dwellers. Collecting detailed data will provide greater insight into differences in cancer mortality as well as screening and treatment issues that could translate into more effectively tailored interventions.

While not discussed in detail in the current chapter, other sociocultural factors (e.g., language barriers, geographic region, behaviors, lifestyles, discrimination, segregation, and culture, to name a few) play a role in disparities. Unfortunately, however, data on these factors are not currently tracked for a variety of reasons. Among them, many of the national data systems rely on telephone interviews, a method that may not be the optimally effective method for some underserved racial/ethnic minority groups who may mistrust interviewers, speak little or no English, and/or lack a telephone altogether—resulting in missing and unreliable data. Moreover, despite the high proportion of uninsured and underinsured persons within certain racial/ethnic minority groups, no clear method of collecting and monitoring insurance trends and their influence on disparities has yet been developed. While quality of care is clearly another key indicator in monitoring disparities—given that the ability to receive state-of-the-art care has a direct impact on mortality and survivorship rates—there is still no method for systematically collecting data on quality of care and its relationship to disparities among various racial/ethnic minority groups.

Lastly, international data systems have to be better utilized. Hardly limited to the United States, cancer is a global concern and utilizing as many domestic and international resources as possible to assess disparities between countries would be in everyone's best interest. Initiatives such as the Joint Canada/United States Survey of Health (JCUSH) may provide the opportunity to explore similarities and differences with regard to cancer disparities.

Conclusion

Eliminating disparities in the cancer burden between different segments of the United States population is one of the overarching themes of Healthy People 2010. Effectively tracking and monitoring data trends is crucial to evaluating efforts to reduce disparities on a national (as well as international) level. Yet the complex, interrelated causes of these health disparities are unlikely to be determined by race/ethnicity alone. Instead, these disparities are most likely fueled by socioeconomic disparities in work, wealth, income, education, housing and overall standard of living, and other economic and social barriers to high-quality cancer prevention, early detection, and treatment services, as well as the impact of racial and ethnic discrimination on all of these factors. Elucidating and eventually counteracting these factors will first require the researchers, educators, public health providers, and policy makers who rely on these data trends to speak the same language and develop consistent methodologies with regard to defining disparities, tracking disparities, and monitoring progress toward eliminating the disparities.

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