
Introduction

Since the launching of the national initiative in disease prevention and health promotion *Healthy People 2000* more than a decade ago, socioeconomic inequalities in health and disease in the United States have been documented with increasing frequency. This health initiative presented a national strategy for reducing health disparities among Americans. The current initiative, *Healthy People 2010*, has taken an even bolder step, calling for the elimination of health disparities among racial/ethnic and socioeconomic groups during this decade (1).

Socioeconomic characteristics have long been studied in relation to health, disease, and mortality differentials in the United States as well as in other industrialized countries (2–12). Individuals of lower socioeconomic status (SES) or geographic areas with higher levels of socioeconomic disadvantage have generally been associated with poorer health than their more advantaged counterparts (2–14). The relationship between SES and health, both at the individual and area levels, is not simply confined to the difference between the most and least disadvantaged strata. Rather, a social gradient exists, implying that as we move along the socioeconomic continuum or the deprivation scale, we tend to observe a corresponding improvement or deterioration in health (4,5,13,14). Cancer incidence and mortality have also been associated with both individual- and area-level socioeconomic

position, although the pattern of association varies for specific cancers (15–38). Moreover, socioeconomic patterns for some cancers can change substantially over time (16–17). Contemporary data indicate that higher SES is consistently associated with lower incidence or mortality rates of lung, stomach, cervical, esophageal, oropharyngeal, and liver cancer and higher rates of breast cancer and melanoma (18,20–23,25,27,31,34–36). Current research also indicates consistently higher rates of advanced stage of cancer at diagnosis (39–42) and lower rates of survival among cancer patients of lower socioeconomic position or among patients residing in more disadvantaged areas (43–44). Furthermore, the major behavioral, environmental, and health care determinants of cancer, such as smoking, diet, alcohol use, reproductive behavior, occupational and environmental exposures, and cancer screening are themselves substantially influenced by individual- and area-level socioeconomic factors (7,18,45–51).

Documenting socioeconomic disparities in cancer is important for several reasons (13,52,53). First, estimating the cancer-related health disparities between the least and most advantaged socioeconomic groups can tell us about the extent to which improvements in specific cancer outcomes can be achieved in a given population. Second, presenting cancer statistics according to socioeconomic factors can help identify socioeconomic groups or areas

that are at greatest risk of cancer morbidity, mortality, or poor survival and that may therefore benefit from focused social and medical interventions. Third, analysis of such data may provide important insights into cancer rates and trends, particularly with regard to the impact of cancer control interventions that are known to vary by socioeconomic characteristics (16,17). Fourth, although socioeconomic factors may not be direct determinants of cancer, they may represent underlying factors that (1) create conditions that give rise to risk factors such as smoking, alcohol use, fatty diet, lack of physical activity, and environmental exposures to carcinogens, and (2) influence health care accessibility and use (such as cancer screening and treatment) that may be more directly linked to cancer mortality and survival (13,53). An understanding of the extent and causes of socioeconomic inequalities in cancer incidence, mortality, and survival is therefore crucial to the development and implementation of a comprehensive and effective strategy for cancer control and prevention and for general health improvement (13,18).

Individual-level data on key socioeconomic variables, such as educational attainment, occupation, and income, are not available for cancer patients in the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) database (16,54–56). Reliable socioeconomic data are also lacking on U.S. death certificates, which provide the basis for computing cancer mortality rates for various demographic groups and geographic areas (16,17,57). Consequently, population-based surveillance studies of cancer incidence,

mortality, and patient survival in the U.S. have mostly relied on ecological SES data linked to both individual- and aggregate-level cancer data.

In this report, we focus on all cancers combined and six major cancers: lung and bronchus, colon/rectum, breast, prostate, uterine cervix, and melanoma of the skin. These are not only among the most commonly diagnosed cancers, but most are also leading causes of cancer mortality in the United States (55,57–59). Taken together, these six cancers accounted for 53% of all cancer deaths in the U.S. in 1999 and 62% of all new cancer cases diagnosed in 1999 in the 11 SEER registration areas (55,57). These are also the cancers for which cancer control interventions have been introduced into the general population (16).

In this report, we use “the percentage of population below the poverty level” as the area socioeconomic measure, our primary covariate of interest. We link this area measure to the U.S. cancer mortality data using the county of residence of the decedent and to the cancer incidence data from the 11 population-based SEER cancer registries using the county and census tract residence of the cancer patient at the time of diagnosis. We examine the extent to which socioeconomic differentials in cancer outcomes vary by race/ethnicity and sex. Where possible, we present socioeconomic differentials separately for specific racial/ethnic groups. This allows one to assess how the impact of area socioeconomic position on cancer varies according to race/ethnicity and the extent to which racial/ethnic differences in cancer may be accounted for by differences in area SES.

The results in this report have been organized into four sections: incidence and mortality, stage of disease at diagnosis, treatment (cancer-directed surgery), and survival. These sections contain interpretive and analytic text and graphical presentations of the most important data and findings, followed by detailed tables. Wherever possible, both temporal patterns and recent cross-sectional data are presented. Data are first analyzed for mortality and incidence rates because variations in cancer mortality rates could logically be interpreted in terms of variations in incidence rates, stage distribution, treatment, and survival rates.