



Review

Elimination of socioeconomic and racial disparities related to lung cancer: Closing the gap at a high volume community cancer center



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ABSTRACT

Background: Healthcare disparities have afflicted the healthcare industry for decades and there have been many campaigns in recent years to identify and eliminate disparities. The purpose of this study was to identify disparities in the lung cancer population of a single community cancer center and to report the results in accordance with industry goals.

Methods: This was a retrospective cohort study of data on non-small cell lung cancer patients recorded in the Christiana Care Tumor Registry (CTTR) in Delaware. Gender, age, race, socioeconomic status and insurance status were used as potential variables in identifying disparities.

Results: We found no significant disparities between sexes, race or patients who were classified as having socioeconomic status 1–3. There was a lower survival rate associated with having the poorest socioeconomic status and in patients who used Medicare. Uninsured patients had the best survival outcomes and patients with Medicare had the poorest survival outcomes.

Conclusion: Although we have closed the gap on sex and racial disparities, there remains a difference in survival outcomes across socioeconomic classes and insurance types.

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Introduction

Health disparities have been well documented in all areas of healthcare since the 1980's. There have been many campaigns in recent years to eliminate these disparities. For example, in 1999, the Centers for Disease Control and Prevention (CDC) established the Racial and Ethnic Approaches to Community Health (REACH) program with the purpose of funding community coalitions focused on reducing disparities in six areas of cancer [1]. Similarly, the Healthy People campaigns and the American Cancer Society 2015 Challenge Goals charged the healthcare community with developing innovative ways to measure, track and decrease disparities in healthcare [2,3]. However, despite improvements, healthcare disparities are still a major cause for concern.

Lung cancer in particular, which remains the leading cause of cancer related death in the United States, is a major focus for measuring disparities as discussed in several studies [4–6]. For instance, it has been documented that African-Americans, Hispanics and those with low socioeconomic status have higher incidence and mortality rates of lung cancer when compared to non-Hispanic whites and those with high socioeconomic status [7]. Furthermore, analysis of the Surveillance, Epidemiology, and End Results (SEER) data shows that those from lower SES and minorities are more likely to be diagnosed with late stage cancers, including lung cancer [8,9]. Finally, a review by Lynne et al. provides supporting evidence from multiple studies showing patients from socioeconomically poor environments are less likely to receive lung cancer treatment of any kind [10].

One of the overarching goals for eliminating health disparities has been to put in place institutional and state level data collection systems to measure initial health status and track changes over time [11]. In 1998, the Christiana Care Tumor Registry (CCTR) was created to assess the impact that the Christiana Care Health System (CCHS) and later the Helen F. Graham Cancer Center (HFGCC), an NCI Selected Community Cancer Center Program (NCCCP), has on the cancer population of Delaware. The purpose of this study is to specifically evaluate the data collected for lung cancer patients in the CCTR to gauge our progress in eliminating healthcare disparities in this patient population.

Methods

After approval from the Christiana Care institutional review board, data was obtained from the Christiana Care Tumor Registry (CCTR). The CCTR included information regarding patient demographics, diagnoses, stage at diagnosis, histology, treatment types, surgical procedures, payment types, vital status and survival times. Excluding out-of-state patients, this study involved Delaware residents 18 years or older diagnosed with lung cancer at CCHS between the years of 1998 and 2012. The data was limited to patients with a final diagnosis of Non-Small Cell Lung Cancer (NSCLC), which included adenocarcinoma, adenosquamous carcinoma, bronchial alveolar carcinoma, and squamous cell carcinoma.

Race in the NSCLC population was divided into three groups: Non-Hispanic Whites, African-Americans and Other. The group "other" was excluded from the analysis due to the small patient population. Ethnicity other than non-Hispanic was also excluded due to a small patient population. Age at initial diagnosis was initially divided into 20 year incremental groups as follows: <20, 20–39, 40–59, 60–79, 80–99, & 100+. However, after initial evaluation it was clear that the statistical analysis would be inaccurate due to small populations in some of the groups, so they were further grouped as follows: < 60, 60–79 and 80+.

Staging at initial diagnosis in the CCTR was based on clinical staging and was recorded in the database as follows: OC, 0, 1A, 1B, 2A, 2B, 3A, 3B, 4, and 99. Those with a stage of 99 were excluded from the study, as they were found to have something other than NSCLC (i.e. carcinoid). Due to small patient populations in some of the groups, occult carcinoma (OC) and stage 0 were excluded and the remaining stages were further combined so that the final stages included 1, 2, 3 and 4, with stages 1 and 2 representing early stages and stages 3 and 4 representing late stages.

Socioeconomic status (SES) was determined by correlating patient zip codes with census tract data. The "Census 2010 ZIP Code to Census Tract Interactive Ranking and Equivalence Table" by Proximity was used to generate a list of every census tract within each Delaware ZIP code [12]. First, we used table B17001 entitled "Poverty Status in the Past 12 Months" from the 2011 summary file produced by the American Community Survey, to determine the percentage of the population in each census tract who fell below the poverty line [13]. Then we averaged the population percentages of each census tract within each ZIP code to create a better representation of poverty level for each ZIP code. ZIP codes 19809 and 99999 contained census tracts delineated as large bodies of water and were excluded from the ZIP code average as they were lacking population demographics. SES was then categorized into four groups corresponding to the area poverty levels: SES 1 (<5%), 2 (5–10%), 3 (10–20%) and 4 (>20%), where SES 1 represents the group with the higher status consisting of less than 5 percent of impoverished people compared with SES 4 which represents the group with the lowest status with greater than 20 percent of impoverished people.

Type of payment (insurance) was also recorded in the CCTR and was another parameter that we used for comparison. There were 12 types of payment recorded in the CCTR as follows: Health Maintenance Organization/Preferred Provider Organization (HMO/PPO), Insurance Not Otherwise Specified (Insurance NOS), Medicaid, Medicare, Medicare through a managed care plan, Medicare with Medicaid, Medicare with supplement, Military, Tricare (military), Uninsured, Unknown and Veterans Affairs. Due to variations in population size, the final grouped designations were as follows: Private, Medicaid, Medicare and Uninsured. Private includes HMO/PPO and Insurance NOS. Medicare includes Medicare through a managed health care plan, Medicare with Medicaid and Medicare with supplement. Those with unknown payer status and the military group, which includes military, Tricare and Veterans Affairs, were excluded due to small population.

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