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SOCIOECONOMICS OF CANCER: A LITERATURE REVIEW OF HOW SOCIAL INEQUALITY EXPLAINS CANCER SURVIVAL

Abdy Javadzadeh, Ph.D.; Andrea Echeverri

St. Thomas University

ABSTRACT

The socioeconomics of health care in America as a fundamental dynamic is very seldom talked about in main stream discussions, especially in relation to cancer, cancer diagnosis, and cancer treatment. As the cost of cancer diagnosis and treatment increases, it becomes less accessible to the general population. Some cancer patients will refuse treatment in order to keep their families and themselves out of debt. The purpose of this comprehensive literature review is to identify the socioeconomic limitations and financial constraints for those Americans without adequate health care. In addition, we examine the many types of necessary medical therapies a cancer patient will not receive while undergoing treatment. This presentation also delves into cases in which patients refused treatment which they were unable to afford and the outcomes of these actions. Consistently, we are able to demonstrate that there is a strong correlation between the affordability and availability of cancer treatment and socioeconomic status. Moreover, our research shows that financial constraints of getting cancer treatment and deterioration of health have become a social phenomenon/problem in need of an enhanced remedy. Through this research we found that despite the availability of universal healthcare low SES still makes a significant difference in rates of cancer treatments and death.

Keywords: Cancer, Deprivation, Poverty, Social class, Socio-economic status, Survival analysis.

The accessibility of cancer treatment seems to become more limited as socioeconomic status (SES)[1] falls. Studies indicate that people with lower SES have lower survival rates than people with higher SES contingent upon many factors including education, location, quality of treatment, awareness about type of cancer and hierarchy of cancer. Some research has shown that availability of public healthcare seems to make little or no difference in relation to the rate of cancer survival. Despite treatment being more accessible in countries with public healthcare survival rates for patients with lower SES are still lesser than survival rates for patients with higher SES.

[1] SES consists of income, education, occupation, and wealth. SES is consistently low or high when occupation, education, income, wealth is low or high.

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Most research indicates that SES is essentially a more fundamental factor contributing to death due to lack of treatment than any other single variable. Considering these other variables such as race, ethnicity, age, availability of health insurance, geography (internationally and domestically), rural and urban areas, and gender, SES consistently plays the most significant role. It exceeds all other variables as the single cause of not receiving treatment and ultimately death. Socioeconomic inequalities in cancer treatment result from differences in access to care, but countries with public healthcare still show disparities between SES and survival, indicating that other system factors influence this inequality (Forrest, et.al. 2013). Although the majority of research indicates that financial ability is one of the greatest factors affecting survival rates, it is very seldom talked about in main stream discussions and cancer resources.

Information and knowledge about cancer and cancer treatment seems to follow a quantitative criterion that is the higher the number of cancer patients correlates with more information about the cancer and its treatment. Inversely, the lower the number of cancer patients the less knowledge and information available to the public. This by default creates a hierarchy among cancers. For example, the general population knows more about breast cancer than eye cancer because there are more breast cancer patients compared to eye cancer patients (Cancer Facts and Figures, 2015). Therefore, a quantitative difference in the number of patients makes qualitative difference in the knowledge about cancer.

The American Cancer Society (ACS) publishes an edition of "Cancer Facts and Figures" annually. In their 2016 edition they discuss the different factors that affect survival or risk of cancer. In their recommendations of a healthy diet, which is one of the factors that might put an individual at risk for cancer, they mention "barriers that have collectively contributed to increased obesity: limited access to affordable, healthy foods; increased portion sizes especially in restaurant meals; marketing and advertising of foods and beverages high in calories, fat, and added sugar, particularly to kids; schools and worksites that are non-conducive to good health; community design that hinders physical activity and promotes sedentary behavior, and economic and time constraints." (Cancer Facts and Figures 2016, pg. 50). In this publication the ACS expands on the factors that affect cancer survival, yet it only has two paragraphs assigned to SES, whereas gender, age, race, and ethnicity have multiple pages of numbers, statistics, and data. ACS annual report on cancer would be more helpful if affordability, finances, and in general SES was addressed.

Previous Investigations

Research has found that in India financial constraint has been found to be one of the major reasons for the delay in requesting and accessing treatment. This holds true even for patients who are suspected of having cancer or have been diagnosed with cancer. Low awareness of existing

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signs and symptoms of cancer and lack of knowledge on whether treatment is available for cancer diagnosis is also a major contributing factor to delay. Meanwhile, family support looks to be like a major enabling factor toward seeking treatment (Pati, et.al. 2013). Cancer patients with low SES have more advanced cancers when being diagnosed they also receive less aggressive treatment and have a higher risk of dying in the next five years (Pati, et.al. 2013).

While SES is not shown to be consistent in different countries there seems to be a trend in relation to low SES in developed and developing countries. Therefore, in regions of India where low SES prevails in a developed country with highly sophisticated public health insurance and high SES such as Sweden, SES remains a major contributing factor to knowledge of and receiving treatment. In Sweden, women diagnosed with breast cancer risk of death was higher among women with low SES compared to women with high SES. Research has found that socioeconomic disparities persist in breast cancer survivors. Interestingly, women of lower SES are at lower risk of developing breast cancer in Sweden but show to have poorer survival rates compared to women in higher SES (Lagerlund et.al. 2004).

In a comparative study of effects of socioeconomic status on colon cancer treatment accessibility and survival between the cities of Toronto, Ontario and San Francisco, California interestingly income made a great difference. Income was directly associated with survival in San Francisco but not Toronto. People with high income had better survival rates in San Francisco than in Toronto. Because of availability of state sponsored health insurance low income patients were more likely to receive therapy in Toronto than San Francisco. (Gory et.al. 2011). Gory has found colon cancer survival in San Francisco was worse among people with lower income. Low income patients in San Francisco also experienced less thorough evaluation and less access to chemotherapy, while in Toronto the authors found no associations between SES and colon cancer care and survival. (Gory et.al, 2013, pg. 115).

In a long-term study Singh has found that from 1969 to 2007 “both white and black women in nonmetropolitan areas maintained significantly higher cervical cancer mortality rates than their metropolitan counterparts” (Singh, 2011, pg. 217). The major difference between nonmetropolitan and metropolitan areas are not mere infrastructure and superstructure. The major difference is socioeconomic difference between the populations. “Trends in cervical cancer mortality are often analyzed by age and race in the U.S. A few studies have also examined long -term trends and disparities in U.S cervical cancer mortality according to socioeconomic status. However, the extent to which disparities in cervical cancer mortality rates between metropolitan and not metropolitan areas have changed over time has not been studied” (Singh, 2011, pg. 218). In this study Singh seems to have separated nonmetropolitan areas from metropolitan areas by geography alone, where as it could be argued that the main significant

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difference between those two areas is accessibility of treatment which persistently relates to socioeconomic status.

Some studies have shown educational differences as a measure of SES on survival of cancer patients (Nowara and Suwinski, 2012). Based on their analysis the educational status of patients had an independent influence on local recurrence-free survival. The highest recurrence accordingly, was found in patients with only an elementary education. It also demonstrated that the level of education has a significant influence on overall survival. "Patients with the highest educational status also lived longer." (Nowara and Suwinski, 2012, pg. 347). In some studies, education has shown to be weakly associated with cancer stage. (Ibfelt et.al. 2015). In a study on comorbidity or access to treatment it is reported that "lower income and living without a partner were related to poorer survival after ovarian cancer" (Ibfelt, et.al. 2015, pg. 353). In a cross cultural study of American and Norwegian patients Ibfelt et.al. have found significant socioeconomic differences in survival after ovarian cancer. Norwegian patients with a higher education had a lower mortality rate than those less educated (Ibfelt, et.al. 2015). However, studies in the U.S found no significant difference in survival between women with higher and lower educational levels (Ibfelt, et.al. 2015).

In an analysis conducted by Forrest, et.al it is reported that "Incidence of lung cancer is higher, and survival poorer, in the most deprived patient groups" (Forrest, et.al. 2013, pg. 5). In lung cancer patients, those with lower SES present later stages of cancer at the time of diagnosis. Later diagnosis causes their prognosis to be worse than a patient diagnosed at an earlier stage of the disease (Forrest, et.al. 2013). In this analysis Forrest, et.al. also found that patients with lower SES are less likely to receive surgery and chemotherapy, and this ironically holds true in countries where public healthcare is available (Forrest, et.al. 2013). Patients with later stages of cancer are less likely to receive surgery as treatment, but the association between SES and likelihood of surgery remained even after the data was adjusted by stage of the disease (Forrest, et.al. 2013). In a data-linkage study, evidence shows socioeconomic inequalities in survival and receipt of treatment of lung cancer in the U.S and U.K (Forrest, et.al. 2013).

In an analysis from the Surveillance, Epidemiology, and End Results (SEER) program it was shown that cancer patients from high poverty areas had lower five-year survival rates than those in wealthier areas (Singh, et.al. 2003). In another study, which evaluated cancer survival disparities in New Jersey, Niu, et.al. found "An area poverty-level gradient was observed for all cancers combined, with patients residing in the highest-poverty areas having significantly increased risk of cancer death than those in wealthiest areas, adjusting for age and stage at diagnosis" (Nui, et.al. 2010, pg. 150). Patients with lower SES encountered other issues when seeking medical care that affect their survival rates; lack of transportation, health literacy, pressure from work, and family support.

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In most industrialized countries mortality rates for breast cancer have steadily decreased however, in low and middle income countries the mortality rates have increased (Pedraza, et.al. 2012). “In Colombia, breast cancer was the most frequent tumor and the second cause of cancer-related death in women in 2008” (Pedraza, et.al. 2012, pg. 1200). Studies suggest that the increase in breast cancer mortality in Colombia is related to screening practices and inequalities in access to medical treatment (Pedraza, et.al. 2012). In this study Pedraza, et.al. found a relationship between breast cancer mortality and socioeconomic level. In Colombia individuals with high SES have a higher risk of breast cancer, but have better access to early diagnosis and treatment. However, individuals in lower SES are associated with tumors with worse prognosis (Pedraza, et.al. 2012). The access to quality medical care, and early intervention, from the time of diagnosis to palliative care has a great impact on the survival and quality of life of the patients (Strombom, 2006).

According to Kent et. al., in California, leukemia represents a significant portion of all cancers in children. Poorer survival has been previously noted in individuals living with lower socioeconomic status (SES) areas. Researchers have explored the relationship between SES and survival as modified by age and race/ethnicity using data from the California Cancer Registry. Results showed that overall survival and lymphoid cancer–specific survival was reduced in those individuals aged 15–39 compared to children aged 0–14. Although shorter survival was observed in nonwhites, an association between lower-SES neighborhood and shorter survival was significant only for non-Hispanic whites. Contrary to some findings, authors have shown that a lack of insurance was significantly associated with shorter survival for all race/ethnicities examined except Asian/Pacific Islanders. They have concluded that lower survival in individuals diagnosed with leukemia was observed in adolescents and young adults compared to children and in non-whites compared to NHWs. Further, the independent effects on survival of both low SES and lack of insurance while being diagnosed persisted across race/ethnicity (Kent, et.al. 2009).

Contradictions, gaps, and inconsistencies in the literature

Research has yet to look into whether public healthcare makes a difference for patients who are either diagnosed or receiving treatment. Some authors have found that public healthcare does not make a significant difference in receiving care where as a few have indicated otherwise. Also, literature does not address why some cancers are more talked about and paid attention to than the rest. Additionally, it is not clear why some cancer research receives more funding than others. Despite most research agreeing on SES as significantly important, American Cancer Society does not address that SES is an important factor. Research needs to look into why that has been a reality for many years.

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There is also a disagreement in literature on whether cancer treatment is less available for those who live in rural areas. There is further disagreement whether more deaths occur to women who live in urban areas. Furthermore, literature has not shown whether formal education makes a difference in overall survival.

Solution and Discussion

This research is conceptual in nature and delves into the availability of cancer treatment for those who are unable to afford it. We have argued for the necessity of availability of cancer treatment despite and beyond financial constraints. As we have demonstrated in this paper there is a strong correlation between diagnosis, treatment, and remission. Studies have shown how the treatment-seeking therapy of the cancer patients is greatly affected by financial constraints and limited resources. They also indicate that low awareness of the presenting signs and symptoms of cancer and limited knowledge of the availability of cancer diagnosis and treatment facilities are major forces contributing to delay. There is strong indication that due to lack of access to resources simple information on diagnostic treatments and services appears to be non-existent. In some studies, disparities in treatment and outcomes of cancer care were recognized. Many patients refuse to go through treatment in order to avoid getting themselves and their families into debt which has resulted into a great many number of working and non-working Americans without health insurance to go untreated with devastating consequences. We have identified the socioeconomic limitations and financial constraints for those Americans without adequate healthcare. We however believe that research is needed to examine the many types of necessary medical therapies a cancer patient will not receive while undergoing treatment. Consistently, we were able to demonstrate a strong correlation between the affordability and availability of cancer treatment and socioeconomic status. Moreover, our research shows that financial constraints of getting cancer treatment and consequentially deterioration of health has become a social phenomenon/problem in need of an enhanced remedy. We believe that American Cancer Society as an institution with such high credentials should not only report on inaccessibility of treatment due to low SES but should also make recommendations to the state on improving those conditions. Survival rates increase with health literacy, encouragement form the work place, family support, and general information disseminated by state agencies.

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