

# The Impact of Health Insurance on Cancer Care in Disadvantaged Communities

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**BACKGROUND:** Individuals from disadvantaged communities are among the millions of uninsured Americans gaining insurance under the Affordable Care Act. The extent to which health insurance can mitigate the effects of the social determinants of health on cancer care is unknown. **METHODS:** This study linked the Surveillance, Epidemiology, and End Results registries to US Census data to study patients diagnosed with the 4 leading causes of cancer deaths between 2007 and 2011. A county-level social determinant score was developed with 5 measures of wealth, education, and employment. Patients were stratified into quintiles, with the lowest quintile representing the most disadvantaged communities. Logistic regression and Cox proportional hazards models were used to estimate associations and cancer-specific survival. **RESULTS:** A total of 364,507 patients aged 18 to 64 years were identified (134,105 with breast cancer, 106,914 with prostate cancer, 62,606 with lung cancer, and 60,882 with colorectal cancer). Overall, patients from the most disadvantaged communities (median household income, \$42,885; patients below the poverty level, 22%; patients completing college, 17%) were more likely to present with distant disease (odds ratio, 1.6;  $P < .001$ ) and were less likely to receive cancer-directed surgery (odds ratio, 0.8;  $P < .001$ ) than the least disadvantaged communities (median income, \$78,249; patients below the poverty level, 9%; patients completing college, 42%). The differences persisted across quintiles regardless of the insurance status. The effect of having insurance on cancer-specific survival was more pronounced in disadvantaged communities (relative benefit at 3 years, 40% vs 31%). However, it did not fully mitigate the effect of social determinants on mortality (hazard ratio, 0.75 vs 0.68;  $P < .001$ ). **CONCLUSIONS:** Cancer patients from disadvantaged communities benefit most from health insurance, and there is a reduction in disparities in outcome. However, the gap produced by social determinants of health cannot be bridged by insurance alone. *Cancer* 2017;123:1219-27. © 2016 American Cancer Society.

**KEYWORDS:** access, cancer, insurance, outcomes, social determinants.

## INTRODUCTION

Cancer is the second leading cause of death in the United States and is responsible for 1 in every 4 deaths.<sup>1</sup> Despite significant strides in overall cancer survival, several factors prevent many Americans from receiving optimal cancer care.<sup>2-6</sup> Individuals without health insurance lack access to health care and are more likely to be diagnosed with cancer at a later stage and have worse outcomes.<sup>7,8</sup> The Affordable Care Act (ACA) is aimed at expanding access to care, largely through the Medicaid expansion, to individuals with incomes near the national poverty levels.<sup>9</sup> In fact, it is estimated that Medicaid will cover 93 million individuals by 2024.<sup>10</sup> Thus, millions of individuals from disadvantaged communities and with poor social determinants of health are among those gaining health insurance.

However, it is unknown whether health insurance can mitigate the effects of the social determinants of health in patients from disadvantaged communities, and the complex interplay between these factors is not well understood. Social determinants of health are defined by the World Health Organization as the conditions in which people are born, live, learn, play, work, and age.<sup>11</sup> These community-level determinants, such as income inequality and high rates of unemployment, shape the disparities in access to health care<sup>12</sup> and are also associated with disproportionately lower cancer survival rates.<sup>13,14</sup> How expanded insurance coverage will affect cancer care for Americans living in communities with varying social determinants has not been examined, and the effect of health insurance on cancer outcomes in varying social strata is unknown.<sup>4,8,15-17</sup>

In this context, we use a contemporary and nationally representative sample of nonelderly adult patients diagnosed with 1 of the 4 leading causes of cancer deaths to explore the impact of health insurance on cancer care in different

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communities with varying social determinants of health. The results of this study will help us to anticipate the effects of the ACA on cancer care and the extent to which insurance can mitigate the effects of the social determinants of health.

## MATERIALS AND METHODS

We conducted a retrospective cohort study with the Surveillance, Epidemiology, and End Results (SEER) database.<sup>18</sup> The SEER database is the authoritative source for cancer incidence, survival, and prevalence; it currently captures 28% of the US population and is representative of its geographic, racial, and ethnic diversity. SEER collects demographic information (eg, age, sex, and race/ethnicity) and clinical information (eg, primary tumor site, tumor histology, stage, treatment, and survival) from 18 cancer registries. Institutional review board approval is not required for publicly available data.

### *Patient Population*

Adult patients aged 18 to 64 years who were diagnosed with 1 of the 4 leading causes of cancer deaths (lung cancer, female breast cancer, prostate cancer, and colorectal cancer) according to the *International Classification of Diseases for Oncology* site and histology codes between January 2007 and December 2011 were included. Patients who were 65 years and older were excluded because most were likely to be covered by Medicare. Patients for whom this was not the first and only malignancy were excluded. SEER started collecting patient-level insurance data in January 2007 and released this information only this past year.

### *Main Exposure and Stratification Variables*

Insurance status was the main exposure variable. Patients were categorized as uninsured, covered by Medicaid, or insured. The insured category included those with private insurance (managed care, health maintenance organization, or preferred provider organization), Medicare, and coverage from the military or Veterans Affairs. Patients with an unknown insurance status were excluded.

Using data on income (median household income and percentage of residents below the federal poverty level), education (percentage not completing high school and percentage finishing college), and occupation (percentage unemployed) from the 2008-2012 US Census, we constructed a summary measure of the social determinants of health for each state-county code, and we then linked this information to each patient's state-county code of residence in the SEER data files. The summary

measure was based on previously developed methods.<sup>19,20</sup> In brief, a  $z$  score for each variable was estimated by subtraction of the overall mean and division by the standard deviation for each county. Thus, a score of 2 for the median household income in a county meant that it was 2.0 standard deviations above the mean. These  $z$  scores were then summed for each of the 5 variables to obtain a summary measure of the social determinants. Summary scores ranged from  $-21$  to  $10$ , with larger scores corresponding to a community with better social determinants. This score was used to group patients into quintiles of social determinants. The reliability (Cronbach's  $\alpha$ ) of this summary score was 88.3%.

### *Statistical Analyses*

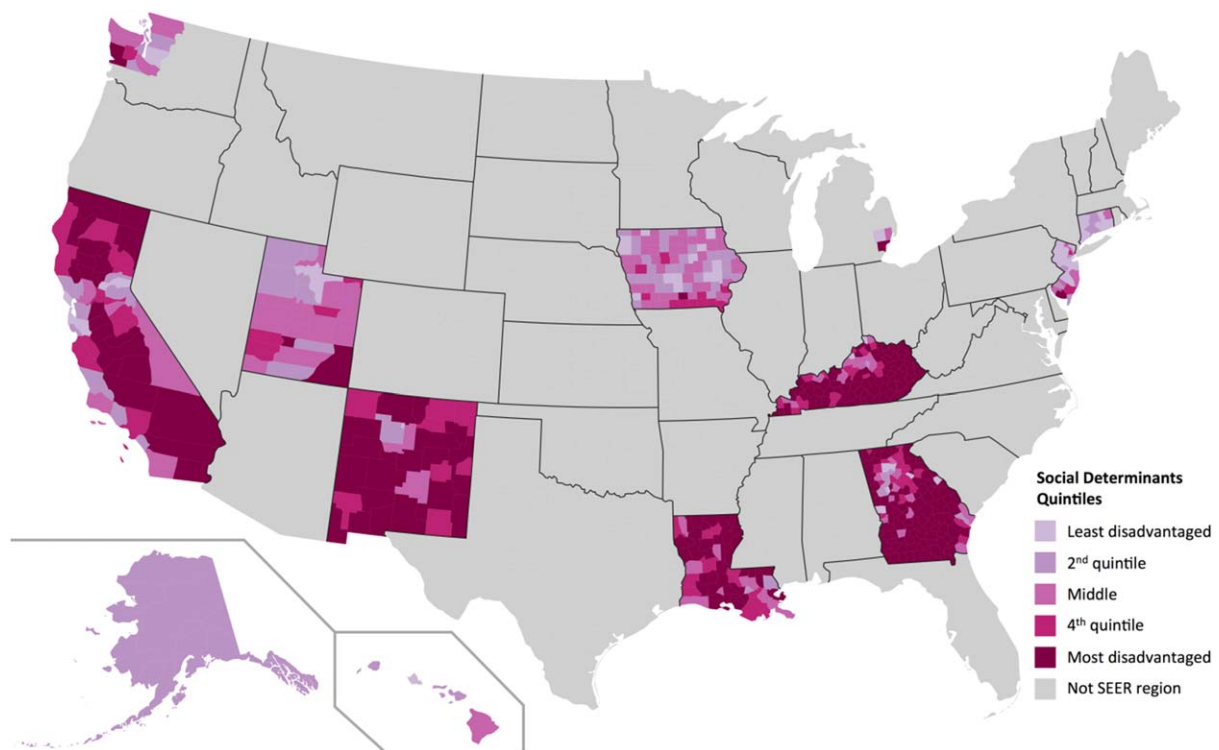
To quantify the differences in the effects of health insurance on varying social strata, we conducted a stratified analysis. Analyses were stratified by the quintiles of summary scores used to measure social determinants of health. Baseline patient characteristics across quintiles and insurance statuses were compared with logistic regression for categorical variables and with a 1-way analysis of variance for continuous variables with the Scheffé method.<sup>21</sup> Unadjusted associations between the different insurance groups and cancer-specific survival were displayed with Kaplan-Meier curves and were compared with the log-rank test within each social determinant quintile.

A multivariate logistic regression model was used to determine the association between the insurance status and the receipt of cancer-directed surgery among patients with nondistant disease. The model was adjusted for age, sex, race/ethnicity, marital status, cancer type, and stage. A multivariate Cox proportional hazards model, which was adjusted for age, sex, race/ethnicity, cancer type, stage, and receipt of cancer-directed surgery, was used to assess the effect of insurance on the endpoint of cancer-specific death for patients within each social determinant quintile. The adjusted odds ratios, the adjusted hazard ratios, and their 95% confidence intervals are reported.

Because of the inherent limitation of interpreting hazard ratios between groups<sup>22</sup> and to facilitate comparisons of the relative benefits of having health insurance across quintiles, we calculated an unmodeled measure by subtracting the difference of the probability of 3-year cancer-specific survival among those uninsured (ie, control event rate) from those insured (ie, treated event rate) and dividing it by the control event rate. This relative benefit measure is akin to the calculation of the relative risk reduction and is easily estimated from Kaplan-Meier curves.

**TABLE 1.** Distribution of Social Determinants According to the Summary Score Quintiles

Area-Level Social Determinants of Health	Social Determinant Quintiles				
	Most Disadvantaged	2	Middle	4	Least Disadvantaged
No. of patients	79,019	69,990	70,456	72,788	72,254
Mean summary score	-6.1	-1.8	0.68	2.7	5.1
Wealth/income					
Median household income, \$	42,885	53,008	55,891	67,301	78,249
Persons below federal poverty level, %	21.9	16.9	14.1	11.6	8.6
Education					
Adult residents who completed high school, %	77.8	80.2	86.9	87.9	90.7
Adult residents who completed college, %	17.1	26.8	28.0	34.8	41.9
Employment: employed residents, %	86.7	89.1	90.7	90.9	92.1

**Figure 1.** Map of the United States showing the geographic distribution of the social determinant quintiles across communities within the 18 SEER regions. Darker colors correspond to communities with greater social disadvantage. SEER indicates Surveillance, Epidemiology, and End Results.

All statistical tests were 2-sided, and  $P$  values  $< 0.05$  were considered significant. Statistical analyses were conducted with Stata/SE (version 13.1; StataCorp, College Station, Texas).

## RESULTS

A total of 364,507 patients between the ages of 18 and 64 years were diagnosed with 1 of the 4 leading causes of cancer deaths in the United States between January 2007 and December 2011. Specifically, 134,105 (36.8%) had

breast cancer, 106,914 (29.3%) had prostate cancer, 62,606 (17.2%) had lung cancer, and 60,882 (16.7%) had colorectal cancer. In the entire cohort, 304,224 patients (83.5%) were insured, 43,572 (12%) had Medicaid coverage, and 16,711 (4.6%) were uninsured.

The distributions of each of the county-level social determinants of health within each quintile are given in Table 1. For example, the median household income increased in a linear fashion from \$42,885 in the most disadvantaged quintile to \$78,249 in the least disadvantaged

**TABLE 2.** Patient Characteristics by the Insurance Status in the Most and Least Disadvantaged Communities

Characteristics	Most Disadvantaged Communities			Least Disadvantaged Communities		
	Uninsured	Medicaid	Insured	Uninsured	Medicaid	Insured
Patients, No. (%)	4709 (6.0)	13,815 (17.5)	60,495 (76.6)	2174 (3.0)	4808 (6.7)	65,272 (90.3)
Age, mean $\pm$ SD, y	53.9 $\pm$ 7.7	53.1 $\pm$ 8.2	55.1 $\pm$ 7.3	54 $\pm$ 8.2	53.2 $\pm$ 8.2	54.2 $\pm$ 7.7
Sex: female, No. (%)	2189 (46.5)	8552 (61.9)	28,617 (47.3)	1086 (50)	2885 (60)	34,062 (52.2)
Marital status: married, No. (%)	1935 (41.1)	4757 (34.4)	39,699 (65.6)	825 (37.9)	1470 (30.6)	45,419 (69.6)
Race and ethnicity, No. (%)						
Non-Hispanic white	2754 (58.5)	7103 (51.4)	39,948 (66)	1348 (62)	2466 (51.3)	48,116 (73.7)
Non-Hispanic black	1338 (28.4)	3611 (26.1)	12,393 (20.5)	273 (12.6)	745 (15.5)	4530 (6.9)
Hispanic	508 (10.8)	2494 (18.1)	6174 (10.2)	295 (13.6)	654 (13.6)	3539 (5.4)
Other	109 (2.3)	607 (4.4)	1980 (3.3)	258 (11.9)	943 (19.6)	9087 (13.9)
Tumor type, No. (%)						
Lung	1762 (37.4)	4645 (33.6)	11,126 (18.4)	631 (29)	1443 (30)	8245 (12.6)
Colorectal	1329 (28.2)	2450 (17.7)	10,328 (17.1)	513 (23.6)	939 (19.5)	9652 (14.8)
Breast	884 (18.8)	5212 (37.7)	19,678 (32.5)	621 (28.6)	1878 (39.1)	25,895 (39.7)
Prostate	734 (15.6)	1508 (10.9)	19,363 (32)	409 (18.8)	548 (11.4)	21,480 (32.9)
Stage at presentation, No. (%)						
Distant disease (overall)	1959 (41.6)	4625 (33.5)	10,594 (17.5)	756 (34.8)	1571 (32.7)	8654 (13.3)
Distant disease (lung)	1268 (72)	2949 (63.5)	6552 (58.9)	440 (69.7)	936 (64.9)	4946 (60)
Distant disease (colorectal)	442 (33.3)	766 (31.3)	2296 (22.2)	181 (35.3)	319 (34)	1998 (20.7)
Distant disease (breast)	148 (16.7)	736 (14.1)	1280 (6.5)	92 (14.8)	243 (12.9)	1308 (5.1)
Distant disease (prostate)	101 (13.8)	174 (11.5)	466 (2.4)	43 (10.5)	73 (13.3)	402 (1.9)
Cancer-directed surgery, No. (%) <sup>a</sup>	1894 (68.9)	6831 (74.3)	38,387 (76.9)	993 (70)	2526 (78)	45,937 (81.1)

Abbreviation: SD, standard deviation.

<sup>a</sup>Patients with distant disease were excluded.

quintile; the proportion of adult residents completing college increased from 17.1% to 41.9%; and employment increased from 86.7% to 92.1%. Notably, poverty rates and median household incomes in the middle quintile were similar to national averages from the US Census Bureau for the year 2011.<sup>23</sup> The geographic distribution of the social determinant quintiles within SEER regions is shown in Figure 1.

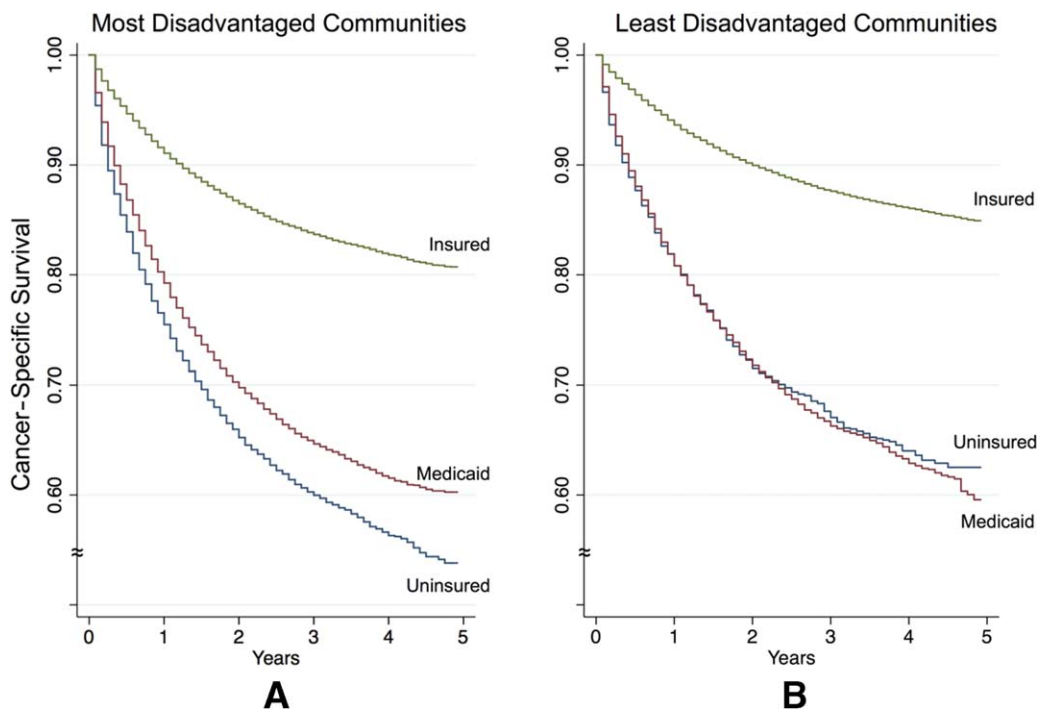
The patient characteristics in the most disadvantaged and least disadvantaged communities are described in Table 2. Notably, patients in the most disadvantaged quintile were twice as likely to be uninsured (6.0% vs 3.0%;  $P < .001$ ) and 3 times as likely to be covered by Medicaid (17.5% vs 6.7%;  $P < .001$ ) than those in the least disadvantaged communities. The average age across insurance statuses and quintiles was clinically similar to the average age of the overall cohort (54.4  $\pm$  7.7 years). Notably, Medicaid coverage across all quintiles predominantly included females and unmarried individuals.

Across all quintiles, lung cancer was the most common cancer among those uninsured, whereas breast cancer was the most common for those covered by Medicaid or those insured. Uninsured patients and those covered by Medicaid were more likely to present with distant disease than insured patients across all cancers. This effect was present within all social determinant quintiles. In

addition, the effect of the social determinants is apparent because insured patients from the most disadvantaged communities were still more likely to present with distant disease than insured patients from the least disadvantaged communities (17.5% vs 13.3%;  $P < .001$ ).

As shown in Figure 2, patients from the most disadvantaged communities had poor survival if they were uninsured, and their cancer-specific survival markedly improved with insurance ( $P < .001$ ). Medicaid insurance was associated with a modest survival benefit for patients from disadvantaged communities ( $P < .001$ ) in comparison with the uninsured group, but its effect in patients from the least disadvantaged communities was negligible ( $P = .19$ ; Fig. 2). Despite being insured, patients from the most disadvantaged quintiles still had lower cancer-specific survival than insured patients from the least disadvantaged quintiles. However, the relative benefit of having insurance versus being uninsured was more pronounced in patients from the most disadvantaged communities versus those from the least disadvantaged communities (40% vs 31%).

Table 3 shows the adjusted effects of insurance on the receipt of cancer-directed surgery and cancer-specific survival. First, health insurance was associated with higher rates of cancer-directed surgery for patients with nondistant disease and improved cancer-specific survival across



**Figure 2.** Kaplan-Meier curves for cancer-specific survival by insurance status for (A) patients living in the most disadvantaged communities and (B) patients living in the least disadvantaged communities. The insured patients in panel A had worse survival than the insured patients in panel B. However, the relative survival benefit from health insurance at 3 years was greater for patients from disadvantaged communities versus less disadvantaged patients (40% vs 31%).

all communities. When we adjusted for other covariates and considered the baseline rates, despite having health insurance, patients from the most disadvantaged communities were still less likely to receive cancer-directed surgery (adjusted odds ratios, 1.68 vs 1.86) and had lower cancer-specific survival (adjusted hazard ratio, 0.75 vs 0.68) than insured patients from the least disadvantaged communities.

To assess the robustness of the findings, we conducted a sensitivity analysis by each cancer type. We excluded patients with distant disease. Using a Weibull survival model, we saw that insured patients from less disadvantaged communities had better cancer-specific survival than insured patients from the most disadvantaged communities across all cancer types.

## DISCUSSION

In this nationally representative study of patients diagnosed with 1 of the 4 leading causes of cancer deaths, we sought to examine the association between health insurance and cancer survival for patients living in communities with varying social determinants of health. We found a consistent relation between a community's relative advantage, as measured by social determinants of health,

and cancer care and outcomes, as measured by the receipt of cancer-directed surgery and cancer-specific survival. Although health insurance appeared to mitigate this relation, it did not fully abrogate the differences caused by the social determinants of health. Importantly, patients from disadvantaged communities had a larger relative benefit from health insurance, and this demonstrated their substantial need for improved access to care. Finally, Medicaid insurance was associated with a modest benefit for cancer survival for patients living in disadvantaged communities (in comparison with the uninsured), but it did not have an appreciable effect in more advantaged communities.

Although previous studies had shown disparities in cancer outcomes and processes of care,<sup>7,24</sup> to the best of our knowledge, this is the first national study to explore the interplay between health insurance and social determinants of health and the impact on cancer care and outcomes. The findings presented herein highlight the inequities in the structure of the health care system in the United States and have several implications. The intent of the ACA was to provide broader coverage and better access to care for millions of Americans who are largely from socially disadvantaged communities. Although this is a

**TABLE 3.** Effect of Health Insurance on Cancer Care Stratified by the Social Determinant Quintile

Measures of Effect	Social Determinant Quintiles		
	Most Disadvantaged	Middle	Least Disadvantaged
Receipt of cancer-directed surgery, aOR (95% CI) <sup>a</sup>		Reference	
Uninsured			
Medicaid	1.04 (0.91-1.18)	0.98 (0.84-1.15)	1.05 (0.86-1.28)
Insured	1.68 (1.50-1.89)	1.60 (1.40-1.84)	1.86 (1.58-2.19)
Cancer-specific mortality, aHR (95% CI) <sup>b</sup>		Reference	
Uninsured			
Medicaid	1.02 (0.96-1.09)	1.03 (0.95-1.11)	0.98 (0.88-1.09)
Insured	0.75 (0.71-0.79)	0.78 (0.74-0.85)	0.68 (0.62-0.75)

Abbreviations: aHR, adjusted hazard ratio; aOR, adjusted odds ratio; CI, confidence interval.

<sup>a</sup> Patients with distant disease were excluded.

<sup>b</sup> The survival model was adjusted for the following: age, sex, race/ethnicity, marital status, cancer type, stage, and receipt of cancer-directed surgery.

steppingstone in crossing the quality chasm,<sup>25</sup> our results demonstrate that providing better access to care alone is not sufficient for equitable cancer care.

Although health insurance improved cancer care and survival across all communities, community-level social determinants significantly affected its effectiveness. Insured patients from less disadvantaged communities still had higher odds of receiving cancer-directed surgery and better cancer-specific survival than insured patients from disadvantaged communities. This differential access despite health insurance is compounded by the baseline disparities between the communities.

The mechanisms underlying the persistent gap in cancer care and survival despite health insurance are unclear but probably multifactorial. Several studies have shown that patients from disadvantaged communities and minority groups may develop cancers with a more aggressive biology or present with advanced disease.<sup>26,27</sup> Other patient-related factors, including advanced age, differences in comorbid conditions,<sup>28</sup> obesity,<sup>29</sup> and health behaviors such as smoking, may also influence the receipt of therapy and survival.<sup>8</sup> It is also plausible that less disadvantaged communities have better hospitals that in turn provide better care. Although this is not specific to cancer outcomes, Birkmeyer et al<sup>20</sup> previously showed that disparities in surgical mortality were largely attributable to differences in the hospitals at which patients received their care. This was the case for lung resection and colectomy, 2 procedures commonly performed for cancer. Other factors may stem directly from the public infrastructure (eg, transportation) or the lack of social support, which causes a differential ability to interact with the health care system.

Furthermore, the increased resources in less disadvantaged communities may allow patients to absorb

indirect and additional uncovered costs. These costs are particularly burdensome for cancer patients because they have higher out-of-pocket burdens than other chronically ill patients to begin with.<sup>30</sup> Furthermore, patients in less disadvantaged communities might have “better” insurance plans with lower deductibles and out-of-pocket maximums by virtue of their employment benefit package because not all insurance plans are equal. In a population-based study, Shankaran et al<sup>31</sup> found that a significant proportion of colon cancer patients undergoing adjuvant therapy experienced financial hardship even though a large proportion of the patients had health insurance. In their study, 40% of the patients had to sell or refinance their home, borrowed money, or experienced a >20% decline in annual income. As insurance plans increase deductibles, copayments, or coinsurance fees, one can easily appreciate the prohibitive effect that this may have on cancer care in communities with poor social determinants. The financial toxicity of cancer should be taken into consideration by cost-sharing plans as more individuals from “financially frail” communities acquire health insurance.<sup>32</sup>

As we anticipate the downstream impact of the ACA, an interesting finding is that Medicaid provided a modest benefit for cancer care in disadvantaged communities but not in less disadvantaged ones. This highlights the critical need for access to health care in disadvantaged communities and provides evidence showing that providing Medicaid to patients in poor communities may save lives. Because we are unable to assess the timing of Medicaid coverage with respect to a cancer diagnosis, the effect of having regular health care on when cancer is diagnosed is unknown. It is possible that those in more disadvantaged communities did not have coverage until the time of

diagnosis, whereas those in less disadvantaged communities had the benefit of more routine health care before their cancer diagnosis.<sup>33</sup> However, these findings may also suggest that Medicaid, at least in its pre-ACA form, is not sufficient. In fact, patients with Medicaid had survival equivalent to that of uninsured patients in less disadvantaged communities. This may be explained by the fact that Medicaid reimburses at lower levels and is not uniformly accepted by many health care providers and institutions<sup>2</sup>; this may be particularly true in more “affluent” hospitals. This finding may also shed light on why the published literature on the impact of Medicaid on cancer care presents mixed results.<sup>7</sup> It may also be the case that health care institutions in more affluent communities provide more effective charity care to uninsured patients.

The realization that population health is in large part determined by the characteristics of the community in which people live as well as the clinical care that they receive has driven many payers, hospitals, and health systems to invest in stronger social support systems for their patients. However, addressing the social determinants of health and the gaps produced by them requires a coordinated effort that goes beyond the capabilities of the health care system alone. Rather, the pursuit of equitable cancer care should involve a multifaceted approach including concerted efforts that stretch across public and private sectors and government agencies.<sup>34</sup> Providing health insurance to the poor is an essential first step, but disadvantaged communities also require partnerships between health care facilities, community organizations, and public health agencies.<sup>35</sup> For example, other authors have shown that both Medicaid and uninsured patients are much more likely to present with advanced cancer,<sup>7</sup> and this further indicates that community-based cancer screening promotion might be a logical strategy in disadvantaged communities.

By intent, the social determinant summary score is based on area-level data and not patient-level socioeconomic status. The distinction between the two is important. Social determinants are shaped by the distribution of resources at the area level and can be a target for community interventions. Although it would have been ideal to assess both the community’s determinants and an individual’s socioeconomic status, the latter is not reported in SEER, and each has its strengths and weaknesses. For example, patient-level measures of educational attainment are erroneous in young adults because their education may not yet be complete. Similarly, area-level measures may misclassify patients on both ends of the spectrum, although this reportedly occurs at random.<sup>36</sup> The strength of area-based measures is that they provide contextual

information on the social factors that may influence cancer care for all residents of the community, and this is consistent with the primary focus of this study. It is also important to acknowledge that measuring county-level social determinants blurs the reality of neighborhood-level experiences and may miss factors that would be significant if measured at the census level.

This study has several limitations. First, the patient-level insurance status in SEER is a broad classification. Nuances of covered services are unknown, and the timing of insurance coverage with respect to the time of the cancer diagnosis is unknown. Furthermore, some uninsured patients who are diagnosed with cancer are enrolled in Medicaid either soon thereafter or at some point just before treatment, and this is not clearly reported in the primary payer variable that SEER collects, which is defined as “primary payer/insurance carrier at the time of initial diagnosis and/or treatment.” Second, nonelderly patients who are insured with Medicare might include a higher proportion of disabled individuals, which may bias the results in the disadvantaged community. In addition, excluding patients 65 years and older may affect the external validity of the results for all cancer patients; however, the age group included in the study is the most affected by the ACA and Medicaid expansion. Furthermore, SEER does not include data on a patient’s functional status or chemotherapy, and these are important confounders and may proportionately differ according to social determinants.

Another important limitation of this study and other studies measuring the social determinants of health is the fact that the currently used indices for social determinants are derived with a deprivation perspective rather than a strength-based approach. Ideally, measuring adverse social determinants should be accompanied by the identification of the strengths and assets of communities. A focus on community assets, opportunities, and resiliencies within the build and structure of the social environment within communities would be an additional resource for health promotion. This asset-based community development approach is still relatively new to researchers and policymakers but may facilitate unique interventions at the community level.

The intersection of race, poverty, and health is complex. It is evident that the most disadvantaged communities are composed of more individuals from nonwhite races and ethnicities. Because of the previously established racial-ethnic disparities in cancer outcomes, the associations between black race and various other indices of socioeconomic disadvantage, and the historical trust issues related to how black communities have interacted with

cutting-edge cancer centers, these factors may have had an effect on the impact of health insurance in these communities. Although we controlled for race/ethnicity in our models in hopes of mitigating these effects, a more in-depth examination of this specific exposure goes beyond the scope of this article.

In conclusion, cancer patients who are from disadvantaged communities benefit most from health insurance, and this decreases disparities in access to care and outcomes. However, the disparity gap produced by the social determinants of health cannot be bridged by insurance alone. As millions of Americans gain health insurance with the ACA, policymakers and payers need to keep in mind that providing health care insurance is necessary but not sufficient to eliminate inequities in cancer care, and substantial community-level efforts must be considered. Significant reform is needed for Medicaid to be successful in the ACA era.

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## CONFLICT OF INTEREST DISCLOSURES

The authors made no disclosure.

## AUTHOR CONTRIBUTIONS

**Zaid M. Abdelsattar:** Full access to all the data in the study, responsibility for the integrity of the data and the accuracy of the data analysis, conception and design, data acquisition, analysis and interpretation, drafting of the manuscript, critical revision, and final approval. **Samantha Hendren:** Analysis and interpretation, drafting of the manuscript, critical revision, and final approval. **Sandra L. Wong:** Full access to all the data in the study, responsibility for the integrity of the data and the accuracy of the data analysis, conception and design, analysis and interpretation, drafting of the manuscript, critical revision, and final approval.

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