



# Association of Living in Urban Food Deserts with Mortality from Breast and Colorectal Cancer

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## ABSTRACT

**Background.** Food deserts are neighborhoods with low access to healthy foods and are associated with poor health metrics. We investigated association of food desert residence and cancer outcomes.

**Methods.** In this population-based study, data from the 2000–2012 California Cancer Registry was used to identify patients with stage II/III breast or colorectal cancer. Patient residence at time of diagnosis was linked by census tract to food desert using the USDA Food Access Research Atlas. Treatment and outcomes were compared by food desert residential status.

**Results.** Among 64,987 female breast cancer patients identified, 66.8% were < 65 years old, and 5.7% resided in food deserts. Five-year survival for food desert residents was 78% compared with 80% for non-desert residents ( $p < 0.0001$ ). Among 48,666 colorectal cancer patients identified, 50.4% were female, 39% were > 65 years old, and 6.4% resided in food deserts. Five-year survival for food desert residents was 60% compared with 64% for non-desert residents ( $p < 0.001$ ). Living in food deserts was significantly associated with diabetes, tobacco use, poor insurance coverage, and low socioeconomic status ( $p < 0.05$ ) for both cancers. There was no significant difference in rates of surgery or chemotherapy by food desert

residential status for either diagnosis. Multivariable analyses showed that food desert residence was associated with higher mortality.

**Conclusion.** Survival, despite treatment for stage II/III breast and colorectal cancers was worse for those living in food deserts. This association remained significant without differences in use of surgery or chemotherapy, suggesting factors other than differential care access may link food desert residence and cancer outcomes.

Health care disparities continue to be a major issue in the US despite advances in overall health care strategies and environment. Studies have shown relationships between race, neighborhood segregation, socioeconomic status, and poor cancer outcomes.<sup>1</sup> Although the concept of a food desert has existed since the 1990s<sup>2</sup>, and has been investigated as a possible contributor to health and wellness outcomes<sup>1,3,4</sup>, few studies have investigated the potential associations between food deserts and cancer outcomes.

Those who live greater distances from supermarkets tend to have less healthy diets compared with residents of neighborhoods with supermarket access. Supermarket access is associated with improved compliance with the US Department of Agriculture (USDA) recommended fruit and vegetable intake.<sup>5,6</sup> Additionally, food deserts, low socioeconomic status (SES) neighborhoods, and long distances to grocery stores are associated with higher BMI.<sup>5,7–9</sup> A pre-diagnosis diet high in green vegetables and fiber is associated with improved outcomes in cancer,<sup>10,11</sup> indicating that these dietary elements play a role in cancer outcomes.

In the current study, we investigated this relationship by analyzing the cause of differences in health outcomes by economic status, location, race, sex, and other metrics.

Presented at the Pacific Coast Surgical Association meeting in February 2019.

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First Received: 14 May 2020

Accepted: 3 August 2020;

Published Online: 25 August 2020

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## METHODS

### *Definition of Food Deserts*

The CDC defines food deserts as “areas that lack access to affordable fruits, vegetables, whole grains, low-fat milk, and other foods that make up a full and healthy diet”.<sup>12</sup> Although there is no standard definition, the USDA defines areas of low access as those where the populace is at least 500 people, and/or at least 1/3rd of the census tract lives > 1 mile in urban communities, or > 10 miles in rural communities from a grocery store.<sup>13</sup> What is known is that food deserts are not randomly dispersed, but are clustered in low income and often minority neighborhoods.<sup>3</sup> Though a causal link between food availability and health outcomes has not been definitively proven, food deserts have been associated with many poor health outcomes.<sup>14,15</sup>

Adults age 18 or older diagnosed with stage II or III breast or colorectal cancers between 2000 and 2012 were identified from the California Cancer Registry (CCR).<sup>16</sup> The CCR data set includes patient demographic (age, sex, race, insurance, socioeconomic status), clinical (site, histopathology, stage), and treatment information (surgery, chemotherapy). Additionally, CCR records include patient vital status, with December 31, 2015, as the latest date available for follow-up among those diagnosed between 2000 and 2012. CCR unique and anonymized patient identification numbers (PINs) were linked to corresponding PINs in the inpatient discharge records available from the California Office of Statewide Health Planning and Development (OSHPD). This linkage permitted collection of patient-specific risk factors by using ICD-9-CM diagnosis codes associated with diabetes, hypertension, obesity, and tobacco smoking. CCR cases were linked by the residential census tract to the USDA food desert data set. Compared with zip code level measures, census tract level measures of inequality are more reliably associated with cancer mortality risk,<sup>17</sup> and represent the smallest patient-linked residential area available for analysis at the population level. CCR cases without linked inpatient discharge data or matching food desert census tracts were excluded. Males were included in the cohort of breast cancer cases. The study focused on stage II or III cancer as these are cases most likely to receive curative-intent surgical intervention. The outcome of stage IV disease is much more dependent on systemic therapies and access to clinical trials, and involves many issues of access to trials not easily deciphered from retrospective databases.

The California State Committee for the Protection of Human Subjects approved our use of this CCR-OSHPD data set for health care disparities research.

### *Statistics*

Statistical analysis was performed using commercially available software (Stata v. 14; StataCorp, College Station, TX). Univariate mortality outcomes were compared by Kaplan–Meier analysis and frequencies compared by Pearson Chi squared analysis. For survival analyses, cases who remained alive up to 5 years or longer or who were lost to follow-up were treated as censored, and the patients who died within the initial 5 years of follow-up were uncensored in the standard manner. Cases with missing information were included in the analysis but treated as a separate category labeled “missing” or “unknown”. Univariate Cox proportional hazards analyses were performed to identify potential covariates to include with food desert status in multivariable survival analyses. An alpha of  $p < 0.05$  was the criterion applied in tests of statistical significance. Model development was performed according to TRIPOD guidance.

## RESULTS

### *Demographics*

Of the 64,987 breast cancer patients identified, 99% were female, 66.8% were < 65 years of age, and 5.7% resided in food deserts. Compared with the cohort not residing in the food desert, patients residing in a food desert were more likely to have diabetes, hypertension, obesity, be a smoker, and have Medicare/Medicaid/uninsured insurance status (Table 1). The incidence of surgery or chemotherapy was not different between patients living in food desert and those not living in food deserts (Table 1).

Of the 48,666 colorectal cancer patients identified 50.4% were female, 39% were < 65 years of age, and 6.4% resided in a food desert. Compared with the cohort not residing in the food desert, patients residing in a food desert were more likely to have diabetes, obesity, be a smoker, and have Medicare/Medicaid/uninsured insurance status (Table 2). The incidence of surgery or chemotherapy was not different between patients living in food desert and those not living in food deserts (Table 2).

### *Survival Analysis*

For breast cancer patients living in food deserts, 5-year survival was 78%, compared with 80% for non-desert residents ( $p < 0.0001$ ).

Among the colorectal cancer patients living in food deserts, 5-year survival was 60%, compared with 64% for non-desert residents ( $p < 0.001$ ).

Kaplan–Meier analyses indicate greater mortality for food desert residents with stage II/III breast cancer (log-

**TABLE 1** Characteristics of patients with stage II or III breast cancer

Parameter		Not desert	Desert	<i>p</i>
Age	<65	67%	65%	0.02
	>65	33%	35%	
Stage	II	77%	76%	0.05
	III	23%	24%	
Surgery	No	3%	3%	0.4
	Yes	97%	97%	
Chemotherapy	No	37%	37%	0.2
	Yes	63%	63%	
Diabetes	No	95%	93%	0.001
	Yes	5%	7%	
Hypertension	No	71%	68%	0.001
	Yes	29%	32%	
Obesity	No	93%	91%	0.001
	Yes	7%	9%	
Smoker	No	89%	85%	0.001
	Yes	11%	15%	
Insurance	Private/PPO	46%	39%	0.001
	HMO	17%	13%	
	Medicare	23%	28%	
	Medicaid/uninsured	11%	17%	
	Other	3%	4%	
Socioeconomic status	Very low	11%	31%	0.001
	Low	15%	31%	
	Middle	19%	21%	
	High	22%	7%	
	Very high	25%	2%	
	Missing	10%	8%	
Race	White	60%	62%	0.001
	Black	7%	7%	
	Hispanic	18%	24%	
	Asian/Pacific Islander	12%	5%	
	Other	3%	2%	

rank  $p < 0.001$ , Fig. 1), and colorectal cancer (log-rank  $p < 0.001$ , Fig. 2).

### Univariate Analysis

Univariate Cox proportional hazard analyses indicated that breast cancer patients (hazard ratio [HR] = 1.15,  $p < 0.001$ , 95% CI = 1.07–1.24) and colorectal cancer patients (HR = 1.12,  $p < 0.001$ , 95% CI = 1.05–1.19) residing in food deserts have greater 5-year mortality risk compared with non-desert residents (Tables 3, 4).

Other factors associated with lower survival by univariate analysis for both breast cancer (Table 3) and colorectal cancer (Table 4) included age, gender, stage, not receiving surgery, not receiving chemotherapy, insurance type, and SES.

### Multivariate Factors Associated with Outcome

Multivariable survival analysis of food desert residential status in the context of potential co-predictors was performed. The analysis included as covariates age, sex, stage, effects of treatment (surgery and chemotherapy), known health risks (diabetes, hypertension, obesity, and smoking), SES, race, and insurance status. Overall survival at 5 years was the outcome analyzed.

For breast cancer patients, living in a food desert was associated with greater mortality risk controlling for treatment factors (Table 5, HR = 1.16, 95% CI = 1.07–1.25,  $p < 0.001$ ), health risks, SES, race, and insurance status. Similarly, among colorectal patients, food desert residence was associated with greater 5-year mortality risk controlling for treatment (Table 5, HR = 1.18,

**TABLE 2** Characteristics of patients with stage II or III colorectal cancer

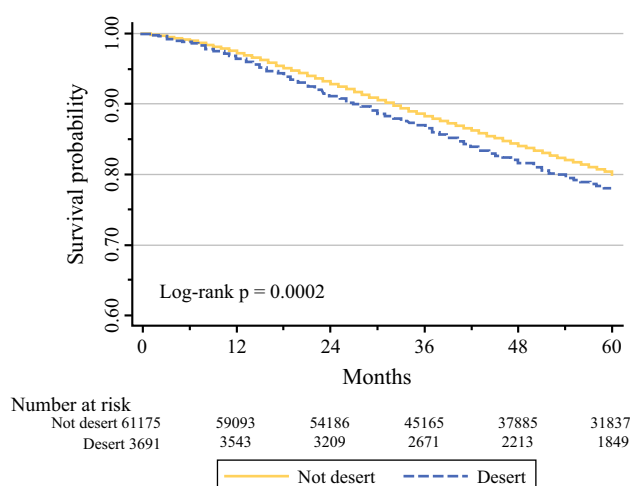
Parameter		Not desert	Desert	<i>p</i>
Age	<65	39%	38%	0.5
	>65	61%	62%	
Gender	Male	50%	50%	0.3
	Female	50%	50%	
Stage	II	50%	51%	0.2
	III	50%	49%	
Anatomic site	Colon	74%	73%	0.2
	Rectum	26%	27%	
Surgery	No	2%	3%	0.3
	Yes	98%	97%	
Chemotherapy	No	53%	55%	0.08
	Yes	43%	41%	
	Unknown	3%	3%	
Diabetes	No	89%	87%	0.005
	Yes	11%	13%	
Hypertension	No	59%	59%	0.5
	Yes	41%	41%	
Obesity	No	92%	92%	0.2
	Yes	8%	8%	
Smoker	No	82%	79%	0.001
	Yes	18%	21%	
Insurance	Private/PPO	36%	31%	0.001
	HMO	14%	11%	
	Medicare	40%	45%	
	Medicaid/uninsured	8%	11%	
	Other	2%	2%	
Socioeconomic status	Very low	12%	32%	0.001
	Low	16%	32%	
	Middle	20%	19%	
	High	21%	3%	
	Very high	23%	2%	
	Missing	9%	9%	
Race	White	61%	65%	0.001
	Black	6%	7%	
	Hispanic	16%	21%	
	Asian/Pacific Islander	14%	5%	
	Other	3%	2%	

95% CI = 1.05–1.19,  $p < 0.001$ ), health risks, SES, race, and insurance status.

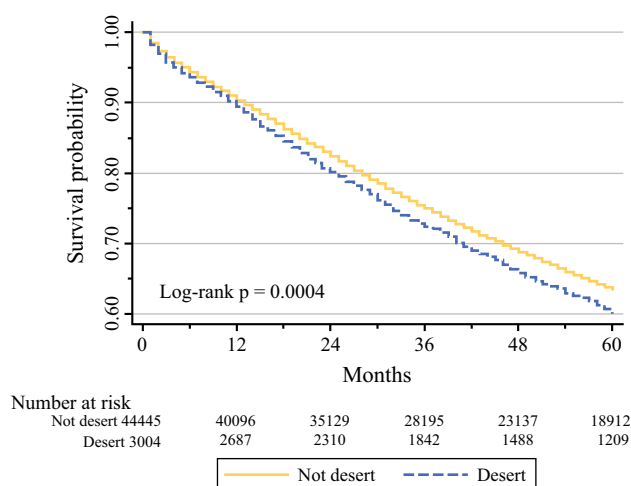
## DISCUSSION

The national rates of breast and colon cancer are high, with an estimated 268,600 new cases of invasive breast cancer and 145,600 new cases of colon cancer diagnosed in 2019 (SEER, Cancer Stat Facts).<sup>18</sup> Survival rates for both cancers have increased over the past decade. New chemotherapy and hormonal agents, as well as new

surgical techniques, have played roles in the decreased mortality rates. Nevertheless, improvements in cancer outcomes are not uniform across the United States. Previous studies have shown that socioeconomic factors, poverty, and segregation are associated with worse health care and cancer outcomes.<sup>19–24</sup> The driving forces behind the worse outcomes are debated but may be due to differences in access to care. Interestingly, our data show that despite comparable rates of surgery and chemotherapy for patients living in and not living in food deserts for stage II/III breast cancer or stage II/III colorectal cancer, patients



**FIG. 1** Survival of patients with surgically treatable stage II and III breast cancer. Kaplan–Meier plot showing the survival probability of breast cancer patients with surgically treatable stage II and III breast cancer. [hazard ratio (HR) = 1.15,  $p < 0.001$ , 95% CI = 1.07–1.24]  $p$  value obtained by the log-rank test. Hazard ratio and 95% CI obtained by Cox proportional-hazards analysis



**FIG. 2** Survival of patients with surgically treatable stage II and III colorectal cancer. Kaplan–Meier plot showing the survival probability of colorectal cancer patients with surgically treatable stage II and III colorectal cancer. [Hazard ratio (HR) = 1.12,  $p < 0.001$ , 95% CI = 1.05–1.19].  $p$ -value obtained by the log-rank test. Hazard ratio and 95% CI obtained by Cox proportional-hazards analysis

living in areas classified as food deserts had higher mortality risk compared with non-food desert patients. Results from our multivariable analysis suggest that food desert residence mortality risk may be independent of access to care since insurance status was included as a co-predictor. While these data demonstrate no difference in access to cancer care, we cannot determine from the current database the quality of care, as data on margins of resection, surgical complications, and duration of chemotherapy are not available.

Univariate analyses showed several predictors independently associated with mortality risk, including age  $> 65$ , sex, race, SES, insurance, surgery at primary site, chemotherapy, and health risks including hypertension, diabetes, obesity, and tobacco use. These predictors of mortality are well known, and our findings are also consistent with studies linking socioeconomic status or neighborhood characteristics with worse outcomes for cancer and heart disease.<sup>20–24</sup> What is novel is our finding of greater mortality risk for cancer patients living in food deserts in a multivariate analysis controlling for treatment, health risks, or insurance, and controlling for age, sex, and stage.

At least two theories have been proposed to explain how neighborhoods may become food deserts. One proposes that food deserts result from competition from larger stores that drive out smaller grocers. A second theory postulates that low SES urban neighborhoods lack a large enough market to attract grocers.<sup>25</sup> Regardless of the theorized causes, food deserts are a public health issue in California. Based on 2010 data, approximately 1 million people were identified as living in food deserts, and about 45% of food deserts were classified as low income. The majority of food desert census tracts (85%) were located in urban areas.<sup>16</sup>

A relationship exists among race, neighborhood segregation, socioeconomic status and worse cancer outcomes.<sup>26–29</sup> Our results suggest that food desert residential status may be another socio-geographical risk factor associated with survival outcomes. Factors correlated with food desert status, including diet or exposure to pollution, noise, crime, violence, absence of recreational facilities, or other environmental stressors may partially account for the effect of food deserts on mortality. It will be difficult to completely resolve the exact reason for the influence of residency in a food desert on cancer outcome through a retrospective study. Future studies of environmental pollutants, obesity, exercise, insulin resistance and many other factors will be needed to determine the best interventions to eliminate this association. These additional factors warrant further prospective study.

This may be the first study linking food desert residential status with cancer mortality risk, but we are mindful of its limitations. As with most studies based on retrospective data, our results only represent a correlational, and not a causal, relationship between food desert status and cancer mortality risk. Food desert residential status was based on where patients lived at the time of cancer diagnosis and there is no information about how long patients lived at this address. Long-term residents of food deserts would represent greater exposure to the effects of this risk factor compared with short-term or recently located residents. Consequently, with these data, it is not possible to compare differences by short- or long-term food desert residency on

**TABLE 3** Univariate analysis for predictors of survival in stage II and III breast cancer

Variables	Category	<i>n</i> (%)	Survival at 5 years	<i>P</i> -value (log-rank)	HR on 5-year survival (95% CI, <i>p</i> -value)
Stage	Stage II	50,189 (77.2)	84%	<0.0001	Reference
	Stage III	14,798 (22.3)	66%		2.45 (2.36 - 2.55, < 0.001)
Age	Age < 65	43,147 (66.8)	86%	<0.0001	Reference
	Age 65+	21,570 (31.2)	69%		2.40 (2.31 - 2.49, < 0.001)
Gender	Female	64,415 (99.1)	80%	<0.0001	Reference
	Male	572 (0.9)	72%		1.45 (1.22 - 1.72, < 0.001)
Surgery at primary site	No	1849 (2.8)	47%	<0.0001	Reference
	Yes	63,138 (97.2)	81%		0.26 (0.24–0.28, < 0.001)
Chemotherapy	No	23,749 (36.5)	74%	<0.0001	Reference
	Yes	39,734 (61.2)	83%		0.61 (0.59–0.63, < 0.001)
	Unknown	1486 (2.3)	83%		0.66 (0.58–0.75, < 0.001)
Diabetes	No	61,751 (95.0)	81%	<0.0001	Reference
	Yes	3236 (5.0)	66%		2.01 (1.89–2.14, < 0.001)
Hypertension	No	46,073 (70.9)	82%	<0.0001	Reference
	Yes	18,914 (29.1)	75%		1.45 (1.39–1.50, < 0.001)
Obese	No	60,250 (92.7)	80%	0.2331	Reference
	Yes	4737 (7.3)	80%		1.04 (0.97–1.12, = 0.234)
Tobacco use	No	57,994 (89.2)	80%	<0.0001	Reference
	Yes	6993 (10.8)	77%		1.22 (1.15–1.29, < 0.001)
Insurance	Private or PPO	29,249 (45.0)	84%	<0.0001	Reference
	HMO	10,999 (16.9)	84%		1.03 (0.97–1.10, = 0.321)
	Medicare	15,143 (23.3)	69%		2.33 (2.23–2.44, < 0.001)
	Medicaid/uninsured	7445 (11.5)	77%		1.61 (1.15–1.71, < 0.001)
	Other	2151 (3.3)	83%		1.12 (1.00–1.25, = 0.052)
Socioeconomic status	Very low	7745 (11.9)	73%	<0.0001	Reference
	Low	10,140 (15.6)	78%		0.82 (0.77–0.88, < 0.001)
	Middle	12,121 (18.6)	79%		0.75 (0.71–0.80, < 0.001)
	High	13,455 (20.7)	81%		0.68 (0.64–0.73, < 0.001)
	Very high	15,389 (23.7)	85%		0.53 (0.50–0.56, < 0.001)
	Missing	6137 (9.4)	82%		0.64 (0.59–0.70, < 0.001)
Race	Non-Hispanic White	39,211 (60.3)	80%	<0.0001	Reference
	Non-Hispanic Black	4644 (7.2)	72%		1.51 (1.42–1.61, < 0.001)
	Hispanic	11,585 (17.8)	81%		0.94 (0.89–0.99, = 0.012)
	Asian/Pacific Islander	7734 (11.9)	86%		0.66 (0.62–0.71, < 0.001)
	Other	1813 (2.8)	84%		0.73 (0.64–0.83, < 0.001)
Food desert	No	61,292 (94.3)	80%	0.0002	Reference
	Yes	3695 (5.7)	78%		1.15 (1.07–1.24, < 0.001)

mortality risk. Additionally, if patients moved after the diagnosis date this may have resulted in misclassification of food desert status for an undetermined number of cases. Furthermore, as defined and measured by the USDA data we linked to, cancer patients' food desert status may be confounded with other socioeconomic and race-related variables associated with diet, health, and vital status, including access to resources.<sup>30</sup>

Clearly, lack of access to fresh, healthy foods is an important component of the higher health risk associated with food desert residential status. Therefore, interventions have been tried to increase access to fresh food in an attempt to change health outcomes. The results from these interventional studies have been conflicting. For example, one study found that opening a grocery store in a food desert was not associated with improved health, while other studies found that health improves among people who



**TABLE 4** Univariate analysis for predictors of survival in stage II and III colorectal cancer

Variables	Category	<i>n</i> (%)	Survival at 5 years	<i>P</i> -value (log-rank)	HR on 5-year survival (95% CI, <i>p</i> -value)
Stage	Stage II	24,514 (50.4)	69%	<0.0001	Reference
	Stage III	24,152 (49.6)	58%		1.47 (1.43–1.52, < 0.001)
Age	Age < 65	18,961 (39.0)	76%	<0.0001	Reference
	Age 65+	29,705 (61.0)	55%		2.23 (2.15–2.31, < 0.001)
Gender	Female	24,529 (50.4)	63%	0.414	Reference
	Male	24,137 (49.6)	63%		1.01 (0.96–1.02, = 0.413)
Surgery at primary site	No	1114 (2.9)	28%	<0.0001	Reference
	Yes	47,552 (97.7)	64%		0.31 (0.29–0.33, < 0.001)
Chemotherapy	No	26,075 (53.6)	59%	<0.0001	Reference
	Yes	21,043 (43.2)	68%		0.69 (0.67–0.71, < 0.001)
	Unknown	1548 (3.2)	64%		0.84 (0.77–0.92, < 0.001)
Diabetes	No	42,997 (88.4)	64%	<0.0001	Reference
	Yes	5669 (11.6)	58%		1.22 (1.17–1.28, < 0.001)
Hypertension	No	28,787 (59.2)	65%	<0.0001	Reference
	Yes	19,879 (40.8)	61%		1.12 (1.08–1.15, < 0.001)
Obese	No	44,926 (92.3)	63%	<0.0001	Reference
	Yes	3740 (7.7)	67%		0.84 (0.79–0.90, < 0.001)
Tobacco use	No	39,915 (82.0)	64%	<0.0001	Reference
	Yes	8751 (18.0)	60%		1.11 (1.06–1.15, < 0.001)
Insurance	Private or PPO	17,486 (35.9)	70%	<0.0001	Reference
	HMO	6566 (13.5)	69%		1.01 (0.95–1.07, = 0.794)
	Medicare	19,684 (40.4)	55%		1.75 (1.68–1.81, < 0.001)
	Medicaid/uninsured	4130 (8.5)	64%		1.25 (1.18–1.33, < 0.001)
	Other	800 (1.6)	65%		1.25 (1.10–1.41, = 0.001)
Socioeconomic status	Very low	6278 (12.9)	59%	<0.0001	Reference
	Low	8305 (17.1)	60%		0.95 (0.90–1.00, = 0.060)
	Middle	9550 (19.6)	62%		0.91 (0.86–0.96, = 0.001)
	High	9640 (19.8)	65%		0.81 (0.77–0.86, < 0.001)
	Very High	10,349 (21.3)	68%		0.71 (0.67–0.75, < 0.001)
Race	Missing	4544 (9.3)	64%	<0.0001	0.83 (0.77–0.90, < 0.001)
	Non-Hispanic White	29,859 (61.3)	62%		Reference
	Non-Hispanic Black	3050 (6.3)	58%		1.12 (1.06–1.19, < 0.001)
	Hispanic	7769 (16.0)	66%		0.86 (0.82–0.90, < 0.001)
	Asian/Pacific Islander	6684 (13.7)	70%		0.74 (0.71–0.78, < 0.001)
Food desert	Other	1304 (2.7)	71%	0.0004	0.70 (0.63–0.78, < 0.001)
	No	45,563 (93.6)	64%		Reference
	Yes	3103 (6.4)	60%		1.12 (1.05–1.19, < 0.001)

moved out of food deserts.<sup>31</sup> Whether changing access to fresh food may alter cancer outcomes is not currently known. Residency in a food desert may be merely a proxy for poverty and the associated poor outcome in many diseases. However, rigorous studies to examine whether changing access to fresh food may change cancer outcome

warrants further investigation. It would also be important to study potential biomarkers of cancer outcome such as insulin resistance, proteomics, or exosomics to serve as targets as well as endpoints for interventional studies in the future.

**TABLE 5** Multivariate analysis for breast or colorectal cancer outcomes

Components	Breast cancer			Colorectal cancer		
	HR	P-value	95% CI	HR	P-value	95% CI
Age 65+	2.39	<0.001	2.31–2.49	2.23	<0.001	2.15–2.31
Gender-female	–	–	–	1.01	0.41	0.98–1.05
Stage III	2.45	<0.001	2.36–2.55	1.47	<0.001	1.43–1.52
Surgery receipt	0.26	<0.001	0.24–0.27	0.31	<0.001	0.29–0.33
Chemotherapy receipt	0.61	<0.001	0.59–0.64	0.69	<0.001	0.67–0.71
Diabetes	2.01	<0.001	1.89–2.14	1.22	<0.001	1.17–1.28
Hypertension	1.45	<0.001	1.39–1.51	1.19	<0.001	1.08–1.15
Obesity	1.05	0.19	0.98–1.13	0.84	<0.001	0.79–0.90
Smoking	1.22	<0.001	1.15–1.29	1.11	<0.001	1.06–1.15
SES-low	1.21	<0.001	1.20–1.22	1.15	<0.001	1.14–1.17
Race-Black	1.51	<0.001	1.42–1.61	1.12	<0.001	1.06–1.19
Race-Hispanic	0.94	0.017	0.89–0.99	0.86	<0.001	0.77–0.89
Insurance						
Private	Reference			Reference		
HMO	1.02	0.51	0.96–1.09	1.01	0.80	0.95–1.07
Medicare	2.33	<0.001	2.23–2.43	1.75	<0.001	1.68–1.81
Medicaid/uninsured	1.61	<0.001	1.52–1.71	1.25	<0.001	1.18–1.34
Other insurance	1.13	0.04	1.00–1.26	1.25	=0.001	1.10–1.41
Food desert	1.16	<0.001	1.07–1.25	1.12	<0.001	1.05–1.19

**ACKNOWLEDGMENT** Yuman Fong, MD had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. The authors would like to thank Supriya Deshpande, PhD for assistance with manuscript editing.

**FUNDING** Supported by grant P30 CA033572 from the NIH.

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