The Relationship Between Federal Housing Assistance and Uptake of Cancer Screening Among Low-Income Adults

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INTRODUCTION

Lower rates of cancer screening among racial/ethnic minorities and low-income populations may contribute to disparate cancer outcomes.[1] Federal housing assistance programs may potentially influence cancer screening disparities but has received relatively little attention. These programs, which are administered through the U.S. Department of Housing and Urban Development (HUD) and include public housing and rental assistance (i.e., Housing Choice Vouchers), currently serve approximately 10 million individuals.[2] Similar to populations in the USA with the lowest cancer screening rates, HUD housing assistance recipients are nearly exclusively low-income and disproportionately non-white.[3] Federal housing assistance may affect cancer screening rates through several mechanisms. For example, housing assistance programs may increase household financial resources through rental subsidies, improve healthcare access by collocating housing with health centers and social services, and change the residential neighborhood context.[3, 4] The primary aim of this study was to examine the relationship between participation in federal housing assistance programs and self-reported cancer screening among low-income adults.

METHODS

We used 2004–2012 data from the National Health Interview Survey (NHIS), a nationally representative, cross-sectional survey, linked with 2004–2012 HUD administrative data (for

housing assistance status) and the 2007–2011 American Community Survey 5-year estimate files (for neighborhood characteristics information).[5] We limited the analysis to individuals in low-income households (< 250% the income-to-poverty ratio) without a prior diagnosis of the cancer of interest. Our primary exposure was the receipt of housing assistance at the time of the NHIS. To help address potential confounding, we constructed two comparison groups: (1) a "quasi-waitlist" group who was not currently receiving housing assistance at the time of the survey but who would go on to receive housing assistance within 2 years (the average housing assistance waitlist time)[4] and (2) a propensity score–weighted group constructed using inverse probability weights. Our outcomes were the receipt of colorectal (men and women ages 50 to 75), breast (women ages 40 to 74), and cervical cancer screening (women ages 21 to 65) in the past 12 months. We constructed separate logistic regression models for each cancer type, employing a doubly robust model for our propensity score–weighted group, accounting for individual and neighborhood characteristics (Table 1), and incorporating the NHIS survey weights.

RESULTS

In the quasi-waitlist approach, there were 1394 individuals eligible for colorectal cancer (CRC) screening, 1251 for breast cancer screening, and 2028 individuals for cervical cancer screening. Overall, the proportion of non-Hispanic Black adults ranged from 23.3 to 43.8% across cancer screening types and receipt of housing assistance; around one-third of participants had at least some college (32.2–34.6%); and approximately half had Medicaid coverage (52.0–56.8%). Current and quasi-waitlist housing assistance groups were similar with few exceptions. The propensity score analysis yielded larger samples (CRC 15,594 adults; breast cancer 12,398 women; cervical cancer 21,216 women) with appropriate balance on observable covariates.

Overall, in the quasi-waitlist comparisons, 22.4% of adults reported receiving CRC screening, 63.6% of women for breast cancer, and 69.8% of women for cervical cancer, in the past 12 months. Proportions were similar in both the current and

Table 1 Quasi-Waitlist Sample Characteristics for Each Screening Subpopulation Stratified by Housing Assistance Status

	Colorectal cancer screening *N* = 1384			Breast cancer screening *N* = 1251			Cervical cancer screening *N* = 2028		
	Current *n* = 1199	**Future** *n* = 195	***p* value**	**Current** *n* = 1083	**Future** *n* = 168	***p* value**	**Current** *n* = 1729	**Future** *n* = 299	***p* value**
Cancer screening	21.2	26.0	0.581	62.3	67.7	0.653	70.7	67.1	0.655
Age (mean, SD)	61.6 (9.4)	62.5 (9.9)	0.576	56.5 (13.0)	55.1 (13.3)	0.552	40.0 (17.1)	37.5 (14.4)	0.089
Sex									
Male	26.8	28.6	0.821	0	0	–	0	0	–
Race/ethnicity									
NH White	54.5	50.7	0.782	44.3	44.1	0.806	25.6	37.5	0.173
NH Black	23.1	23.6		24.8	32.1		44.5	41.8	
Hispanic	14.8	12.4		14.8	11.0		19.4	20.7	
NH other	7.6	13.3		16.0	12.8		10.6	0	
Marital status									
Single/never married	18.1	17.1	0.372	21.2	21.8	0.877	55.4	41.4	0.227
Married	13.3	24.7		18.9	23.1		14.0	22.4	
Widowed, divorced, separated	68.7	58.3		59.9	55.1		30.7	36.2	
Highest level of family educational attainment									
Less than high school	39.0	27.7	*0.024*	33.3	30.9	0.775	29.0	24.6	0.476
Completed high school/GED	25.3	49.8		31.1	37.7		35.1	44.8	
At least some college	35.7	22.5		35.6	31.3		35.9	30.6	
Employment status									
Employed	17.0	24.1	0.212	25.2	40.1	*0.037*	57.9	67.6	0.401
Unemployed	71.8	55.0		62.5	34.7		33.6	22.7	
Out of workforce/retired	11.2	20.9		12.3	25.3		8.4	9.8	
Family income-to-poverty ratio									
< 0.50	6.5	3.5	0.620	10.6	7.2	0.502	27.4	18.1	0.268
0.50–0.99	50.9	50.8		48.3	47.3		47.3	39.6	
1.00–1.49	33.2	36.2		28.0	34.0		115.3	20.3	
1.50–1.99	6.2	9.5		6.7	11.5		5.1	11.5	
2.00–2.49	3.2	0		6.4	0		4.9	10.5	
Insurance coverage*									
Private insurance	13.3	14.8	0.832	18.2	25.4	0.422	16.6	13.4	0.621
Medicaid	50.8	67.7	0.101	54.8	62.5	0.491	53.2	48.5	0.628
Medicare	55.2	9.6	0.771	40.6	38.3	0.828	9.9	9.9	0.861
No coverage	15.0	9.6	0.426	15.8	14.6	0.864	24.4	35.1	0.206
Mortality risk index (mean, SD)†	8.6 (5.7)	8.0 (5.9)	0.469	7.6 (5.1)	6.4 (5.2)	0.191	N/A		
Self-rated health									
Excellent/very good	N/A						35.3	53.1	0.398
Good/fair/poor							64.7	46.9	
Region									
Northeast	28.5	24.8	0.868	27.2	14.0	*0.027*	18.0	10.8	0.163
Midwest	21.4	20.9		31.1	16.4		25.1	19.5	
South	29.7	35.0		24.1	38.6		37.2	54.9	
West	20.5	19.3		17.5	31.1		19.7	14.7	
Neighborhood deprivation quartile‡									
Quartile 1 (highest deprivation)	28.1	15.3	0.452	11.5	22.3	0.421	11.4	26.3	*0.041*
Quartile 2	22.7	21.3		25.6	29.6		20.2	9.2	
Quartile 3	24.6	33.5		25.8	20.1		30.1	23.0	
Quartile 4	24.6	29.9		37.1	28.0		41.5	38.3	

Italicize entries denote statistically significant differences between the current and future housing assistance groups at p < 0.05
*Insurance coverage categories are not mutually exclusive as respondents can report multiple types of coverage at time of survey. Proportions represent anyone who indicated having that source of insurance coverage
*†Mortality risk score[6] predicts 5-year mortality among older adults. We calculated and adjusted for this in the colorectal and breast cancer screening samples, but not for the cervical cancer as that sample is younger. Instead, we calculated and adjusted for self-rated health for the cervical cancer sample*
‡Neighborhood deprivation calculated from six U.S. Census measures in the American Community Survey data identified through a factor analysis: % of residents with less than a high school education; % of residents with less than a 4-year college degree, unemployment rate, poverty rate; % of working residents in a non-management (primary) occupation, and the vacancy rate of housing units

quasi-waitlist housing assistance groups. After adjustment for potential confounders, receipt of housing assistance was not associated with a significantly higher odds of cancer screening compared to the quasi-waitlist or propensity score–weighted groups (Fig. 1). Associations between housing assistance and cancer screening remained non-significant in sensitivity analyses in which we (a) included those with a prior cancer diagnosis and (b) used guideline-concordant screening intervals (available for a subset of NHIS years).

DISCUSSION

As clinicians and policymakers attempt to address the known racial/ethnic and socioeconomic disparities in cancer mortality, it is important to examine social determinants of health like federal housing assistance that may influence these efforts. Our findings from a cross-sectional study with nationally representative survey data reinforce the need to improve rates of screening and suggest that providing housing assistance, in
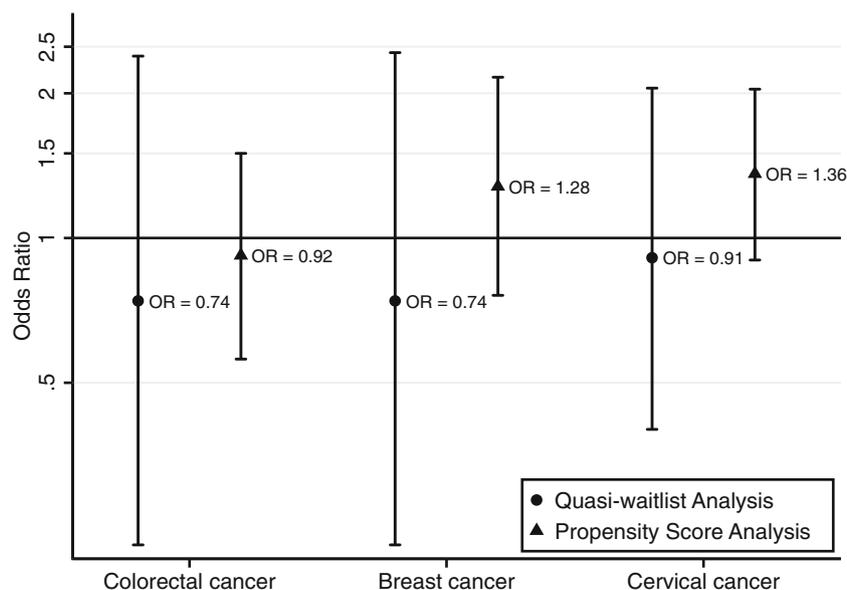
Fig. 1 Adjusted odds ratios of the associations between receipt of cancer screening in the past 12 months and housing assistance. Models adjusted for the following: colorectal cancer: sex, age, race/ethnicity, marital status, employment status, insurance status, education, income, mortality index, year, region, year-by-region interactions, and neighborhood SES; breast cancer: age, race/ethnicity, marital status, employment status, insurance status, education, income, mortality index, year, region, year-by-region interactions, and neighborhood SES; and cervical cancer: age, race/ethnicity, marital status, employment status, insurance status, education, income, self-rated health, year, region, year-by-region interactions, and neighborhood SE.

and of itself, may be insufficient to overcome the multiple access barriers that low-income populations face. Other psychosocial, clinically related, and structural barriers to preventive services should be considered in improving cancer screening for low-income adults. As housing authorities, developers, and health systems work to use housing as a platform for service coordination and health promotion, greater attention should be given to improving cancer screening in this vulnerable population.

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Compliance with Ethical Standards:

Conflict of Interest: *The authors declare that they do not have a conflict of interest.*

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