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BACKGROUND AND PURPOSE

- Previous studies have suggested that nearly one in three cancer survivors experience cancer-related financial problems that may lead to delaying or forgoing medical care. ^{1,2}
- Rural cancer patients may experience greater financial problems related to their cancer due to higher treatment-related travel costs, higher rates of no insurance/under-insurance, and less flexible work leave policies. ³
- Rural cancer patients are more likely than their urban counterparts to forego medical care (e.g. surveillance, screening, prescription medication) following treatment due to financial concerns. ^{4,5}

Purpose

To examine rural-urban differences in reported financial problems due to cancer using a nationally representative survey.

METHODS

Data Source: 2012, 2014, and 2017 data from the National Cancer Institute's (NCI's) Health Information National Trends Survey (HINTS), a nationally representative, cross-sectional survey on cancer-relevant health behaviors, information seeking, etc.

Outcome Variable: A Likert scale question was asked of those reporting a previous or current cancer diagnosis: "Looking back, since the time you were first diagnosed with cancer, how much, if at all, has cancer and its treatment hurt your financial situation?" We collapsed responses to "not at all" vs. "a little, some, a lot" for our analysis.

Rural Definition: Rural-urban status was defined using 2003 Rural-Urban Continuum Codes (RUCCs).⁶ RUCCs of 1-3 were considered urban; 4-9 were considered rural.

Statistical Analysis:

- We calculated weighted percentages and Wald chi-square statistics to assess rural-urban differences in survivor-level (e.g. age) and cancer experience (e.g. time since last treatment) characteristics.
- We performed multivariable logistic regression to examine rural-urban differences in reported financial problems after accounting for survivor-level and cancer experience characteristics. We reported corresponding predicted probabilities.

RESULTS

Table 1: Selected Survivor-Level and Cancer Experience Characteristics

	Rural (n=223) Weighted %	Urban (n=1,136) Weighted %
Gender		
Male	41.8%	43.2%
Female	58.2%	56.8%
Age Group		
18-49	18.4%	16.3%
50-64	30.6%	35.0%
65+	51.0%	48.6%
Marital Status		
Married/Living as Married	73.9%	65.4%
Not Married	26.1%	34.6%
Race/Ethnicity		
Non-Hispanic White	85.3%	79.1%
Other	14.7%	20.9%
Income		
\$0-19,999	23.7%	15.3%
\$20-49,999	31.2%	26.1%
\$50-74,999	15.8%	20.9%
\$75,000+	29.3%	37.8%
Census Region		
Northeast	11.8%	18.8%
Midwest	28.3%	20.5%
South	46.7%	36.1%
West	13.1%	24.6%
Occupational Status		
Employed	23.5%	39.7%
Retired	51.4%	44.1%
Disabled	9.7%	6.0%
Other (unemployed/student/homemaker)	15.4%	10.3%
Insurance Status		
Yes	93.3%	95.8%
No	6.7%	4.2%
Non-Cancer Co-morbidities*		
0	12.6%	18.9%
1-2	43.7%	48.0%
3+	43.7%	33.1%
Receipt of Surgery, Yes	71.9%	77.2%
Receipt of Chemotherapy, Yes	21.5%	21.2%
Receipt of Radiation, Yes	25.6%	27.7%
Time since last treatment		
No treatment received	12.2%	8.2%
Current to <1 year	9.4%	15.5%
1-4 years	21.9%	23.4%
5+ years	56.4%	52.9%

Wald p-values <0.05 are indicated in bold

Figure 1: Rural-Urban Differences in Reported Financial Problems by HINTS Cycle

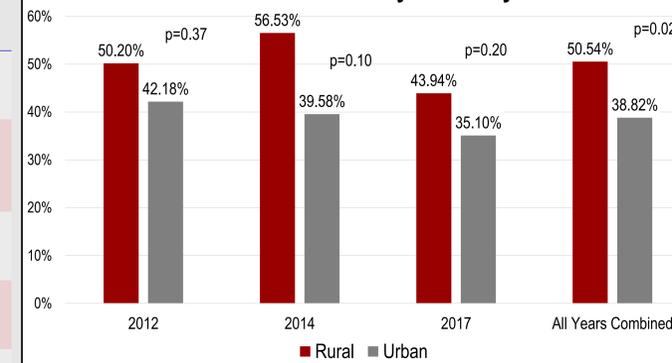
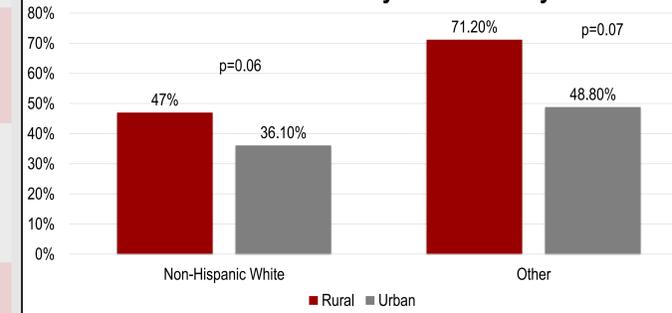


Figure 2: Rural-Urban Differences in Reported Financial Problems by Race/Ethnicity



Key Findings

- Rural cancer survivors were more likely to report financial problems associated with their cancer compared to urban survivors (50.54% vs. 38.82%, p=0.02), but this was attenuated to non-statistical significance in adjusted analysis.
- Adjusted analysis showed that those with low income, who received chemotherapy and/or radiation, and those in current or recent treatment were more likely to report financial problems associated with their cancer diagnosis and treatment.

Table 2: Factors Associated with Cancer Survivors Noting Financial Problems after Cancer Diagnosis and Treatment

Factor	Adjusted Predicted Probability (95% CI)
Rural-Urban Status	
Rural	49.3 (30.6-67.9)
Urban	38.7 (23.1-56.2)
Gender	
Female	44.3 (27.2-62.2)
Male	35.2 (20.3-52.5)
Age	
18-49	54.7 (33.3-74.5)
50-64	44.2 (26.9-62.9)
65+	35.7 (21.2-52.7)
Race/Ethnicity	
Other	51.4 (31.7-70.7)
Non-Hispanic White	37.1 (22.1-54.3)
Income	
\$0-19,999	55.2 (35.2-73.5)
\$20-49,999	43.7 (26.4-62.0)
\$50-74,999	36.9 (21.9-54.4)
\$75,000+	29.7 (16.6-46.5)
Census Region	
Northeast	36.7 (21.2-54.7)
Midwest	45.5 (27.9-63.6)
South	42.2 (25.8-59.6)
West	35.8 (20.7-53.4)
Occupational Status	
Employed	43.0 (26.0-61.0)
Retired	35.5 (21.2-52.1)
Disabled	66.4 (43.8-84.0)
Other	38.8 (20.4-60.6)
Insurance Status	
No	49.6 (24.9-74.8)
Yes	39.9 (24.3-57.2)
Receipt of Surgery	
Yes	40.8 (25.2-57.6)
No	39.4 (21.6-59.5)
Receipt of Chemotherapy	
Yes	64.6 (43.9-80.8)
No	34.0 (19.1-52.0)
Receipt of Radiation	
Yes	54.8 (35.9-72.1)
No	35.1 (20.0-52.9)
Time since last treatment	
No treatment received	34.3 (16.4-56.9)
Current to <1 year	51.7 (32.9-69.6)
1-4 years	43.2 (26.8-60.6)
5+ years	37.0 (22.2-54.0)

Wald p-values <0.05 are indicated in bold; Model also adjusted for co-morbidities and marital status

DISCUSSION

- More than half of rural cancer survivors reported financial problems associated with their cancer, which is notably higher than estimates from earlier population-based surveys. ^{1,2}
- Higher levels of reported financial problems related to cancer among rural survivors underscores the importance of improving provider-level and system-level processes to address these financial burdens.
- Treatment factors were associated with higher reported financial problems. With the increased use of expensive targeted therapies and immunotherapies, this finding should continue to be explored, particularly as rural cancer patients are more likely to forgo treatment due to costs.

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