# Poverty and Healthcare Utilization among People with Cancer: Analysis of 2022 National Health Interview Survey (NHIS)

**Nayung Youn[1], Soomin Koh[2], Alithea Zorn[3], Stephanie Gilbertson-White[1], Yamnia Cortes[1]**

[1]Univeristy of Iowa College of Nursing, [2]Williams College [3]University of Iowa College of Public Health, Center for Public Health Statistics

## INTRODUCTION

- Poverty contributes to disparities in cancer care, such as timely diagnosis, optimal treatment, and access to healthcare[1,2]
- Poverty-related factors, including food insecurity, financial instability, household income, and employment are associated with frequent acute care rather than routine care[3,4]
- In the context of cancer, the extent that individuals living in poverty rely on acute care has not been well studied

## PURPOSE

- To explore the association between poverty and acute care utilization among people with cancer, using the National Health Interview Survey (NHIS)[5].

## METHODS

**Design:**

- A cross-sectional analysis of the 2022 NHIS

**Sample:**

- Nationally representative 3,412 adults with cancer
- Excluded people with cancer in their childhood (n=18)

**Study Variables & Measures:**

- **Exposure:** Poverty using federal poverty level (FPL) calculated from household size and annual income, with four ordinal categories
- **Outcome:** Acute care utilization using the sum of the number of emergency department (ED) and urgent care (UC) visits in the past year, with five ordinal categories

**Analysis**

- Descriptive statistics for characteristics
- Bivariate analyses using Chi-square and ANOVA to evaluate the relationship of ED/UC utilization with covariates of interest
- Ordinal logistic regression for the association between ED/UC utilization and FPL
- Followed the survey sampling weights and recommended practices to account for the complex survey design of NHIS

## RESULTS

**Table 1.** Study Sample Characteristic & Estimated Sample Characteristics Stratified by FPL

| Variables | Unweighted Whole sample | Weighted sample FPL<100% | 100≤FPL<200% | 200≤FPL<400% | FPL≥400% | p-value |
|---|---|---|---|---|---|---|
| | N = 3,412 | N= 1,847,721 | N = 3,941,611 | N = 7,043,980 | N = 11,457,128 | |
| **Age**, mean (SD) | 68.65 (12.73) | 63.23 (14.82) | 66.99 (13.81) | 67.59 (14.21) | 65.23 (12.94) | <0.001* |
| | **n (%)** | | | **%** | | |
| **Sex** = Female | 1,970 (57.7) | 37 | 39 | 40 | 49 | <0.001* |
| **Race/Ethnicity** = Non-Hispanic White | 2,945 (86.3) | 65 | 75 | 84 | 91 | <0.001* |
| **Marital status** = Partnered | 1,837 (52.4) | 36 | 47 | 60 | 79 | <0.001* |
| **Employment** = Currently Not Working | 2,312 (69.8) | 88 | 81 | 70 | 52 | <0.001* |
| **Number of ED/UC visits** | | | | | | <0.001* |
| 0 | 1,857 (54.9) | 49 | 55 | 55 | 55 | |
| 1 | 713 (21.1) | 21 | 19 | 22 | 22 | |
| 2 | 386 (11.4) | 8.3 | 13 | 11 | 12 | |
| 3 | 168 (5.0) | 5 | 5.8 | 4 | 5.8 | |
| ≥4 | 260 (7.7) | 17 | 7.8 | 8.0 | 6.1 | |
| **Number of Comorbidities** | | | | | | <0.001* |
| 0 | 339 (9.9) | 4.4 | 7.8 | 7.6 | 15 | |
| 1-2 | 1,158 (33.9) | 19 | 26 | 32 | 41 | |
| 3-4 | 1,074 (31.5) | 30 | 29 | 35 | 28 | |
| ≥5 | 841 (24.6) | 47 | 37 | 25 | 16 | |

**Table 2.** Associations between FPL and ED/UC Utilization

| Variables | OR[a] | 95% CI[b] | | p-value |
|---|---|---|---|---|
| **Unadjusted Model** | | | | |
| FPL < 100% | 1.45 | 1.04 | 2.03 | 0.03* |
| FPL 100% to 200% | 1.06 | 0.85 | 1.30 | 0.62 |
| FPL 200% to < 400% | 0.99 | 0.83 | 1.17 | 0.90 |
| FPL ≥ 400% (Reference) | -- | -- | -- | -- |
| **Adjusted Model[a]** | | | | |
| FPL < 100% | 1.05 | 0.74 | 1.46 | 0.82 |
| FPL 100% to 200% | 0.88 | 0.7 | 1.07 | 0.19 |
| FPL 200% to < 400% | 0.92 | 0.77 | 1.09 | 0.31 |
| FPL ≥ 400% (Reference) | -- | -- | -- | -- |

[a]Adjusted model is adjusted for age, sex, and the number of comorbidities

*After adjusting for age, sex, and the number of comorbidities, the relationship between FPL and ED/UC visits were not longer significant.

*Age (OR: 0.98, 95% CI: 0.98–0.99) and higher category of comorbidities (OR: 1.36; 1.88; 3.33 for 1~2, 3~4, ≥ 5 comorbidities, respectively) were significantly associated with increased ED/UC visits.

## CONCLUSION

- While poverty may be associated with more ED/UC visits, this relationship is not independent of age or the number of comorbidities, which are significant predictors of increased ED/UC visits.
- Practice implication: Intervention programs merely for those living in poverty may miss the high-risk individuals with complex health needs
- Research implication: The mediating roles of age and comorbidity should be considered when examining the association between poverty and ED/UC utilization
- Education implication: Education should emphasize interprofessional training and care navigation

## LIMITATIONS & NEXT STEPS

- With a cross-sectional analysis, the causal relationship cannot be established
- The NHIS dataset used in this study did not provide specific information regarding cancer (e.g., treatment type, cancer stage, etc.), making it impossible to investigate the cancer related factors
- Further research is needed to identify factors contributing to ED/UC visits for people with cancer living in poverty
- Further investigation is needed if supplemental poverty measure shows different results instead of income-based poverty

## REFERENCES

[1]Gawron, A. J., Staub, J., & Bielefeldt, K. (2021). Impact of Health Insurance, Poverty, and Comorbidities on Colorectal Cancer Screening: Insights from the Medical Expenditure Panel Survey. *Digestive Diseases and Sciences, 66*(1), 70-77.

[2]Papageorge, M. V., et al. (2023). The Persistence of Poverty and its Impact on Cancer Diagnosis, Treatment and Survival. *Ann Surg, 277*(6), 995-1001. .

[3]Agarwal, G., Lee, J., McLeod, B., Mahmuda, S., Howard, M., Cockrell, K., & Angeles, R. (2019). Social factors in frequent callers: a description of isolation, poverty and quality of life in those calling emergency medical services frequently. BMC Public Health, 19(1), 684.

[4]Lim, A., Benjasirisan, C., Liu, X., Ogungbe, O., Himmelfarb, C. D., Davidson, P., & Koirala, B. (2024). Social determinants of health and emergency department visits among older adults with multimorbidity: insight from 2010 to 2018 National Health Interview Survey. BMC Public Health, 24(1), 1153.

[5]National Center for Health Statistics. National Health Interview Survey, 2022. Public-use data file and documentation. https://www.cdc.gov/nchs/nhis/data-questionnaires-documentation.htm. 2023.

## CONTACT INFORMATION

**Nayung Youn**
**Phone**:+1–319–936–6090
**email:** nayung-youn@uiowa.edu

## ACKNOWLEDGEMENT

The original source: National Center for Health Statistics, National Health Interview Survey