

Structural Barriers to Care: Neighborhood-Level Financial Exclusion and Cancer Screening in the U.S., 2017-2022

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128. Contributed Papers: Statistical Tools for Health Policy Evaluation and Decision-Making

John R. Bassler, Department of Biostatistics, University of Alabama at Birmingham

David T. Redden, Department of Biostatistics, University of Alabama at Birmingham

S. M. Qasim Hussaini, Department of Medicine, Division of Hematology & Oncology,
University of Alabama at Birmingham

Key Takeaways

- ▶ Neighborhood-level financial exclusion, reflected through **home mortgage denial rates**, is a novel structural determinant of health
- ▶ Home mortgage denial serves as a reliable proxy for structural inequity and a predictor of suboptimal cancer screening rates
- ▶ Integrating metrics of financial exclusion into federal outreach strategies is essential for targeting cancer screening outreach

Background

- ▶ Cancer disparities are driven by social determinants of health (SDoH), shaped by policies and structural inequities [1,2]
- ▶ In the United States, home equity is the primary driver of intergenerational wealth.
- ▶ Financial exclusion, or mortgage lending bias, is an under utilized SDoH
- ▶ Communities facing lending bias often have lower access to preventive care, including cancer screening



Figure 1, Abdullah et al. (2025) [2]

1. Tucker-Seeley R, Maysa Abu-Khalaf, Bona K, et al. Social Determinants of Health and Cancer Care: An ASCO Policy Statement. JCO Oncology Practice. 2024;20(5):621-630. doi:<https://doi.org/10.1200/op.23.00810>

2. Abdullah A, Liu Z, Molinari M. From Diagnosis to Survivorship: The Role of Social Determinants in Cancer Care. Cancers (Basel). 2025 Mar 22;17(7):1067. doi: 10.3390/cancers17071067. PMID: 40227566; PMCID: PMC11987860.



Methods

▶ Home Mortgage Disclosure Act (HMDA)

- ▶ Lending Bias, as determined through the estimation of home loan denial rates (HLDRs) by census tract (2017-2018, 2019-2020, 2021-2022)

$$\text{HLDR} = \text{Denied Home Loans} / (\text{Approved} + \text{Denied Home Loans})$$

▶ Cancer Screening

- ▶ Prevalence rates of cancer screening (colorectal, breast, and cervical) were obtained from the Center for Disease Control and Prevention (CDC) Population Level Analysis and Community Estimates (PLACES) database (2018, 2020, 2022)

▶ Statistical Analysis

- ▶ Beta Generalized Linear Mixed Models for longitudinal data



Results

Home Loan Denial Rate (HLDR), 2021 - 2022

	<10.6% (N=15,985)	10.6 - 13.4% (N=16,526)	13.5 - 16.6% (N=16,710)	16.7 - 21.8% (N=16,902)	≥ 21.9% (N=16,184)
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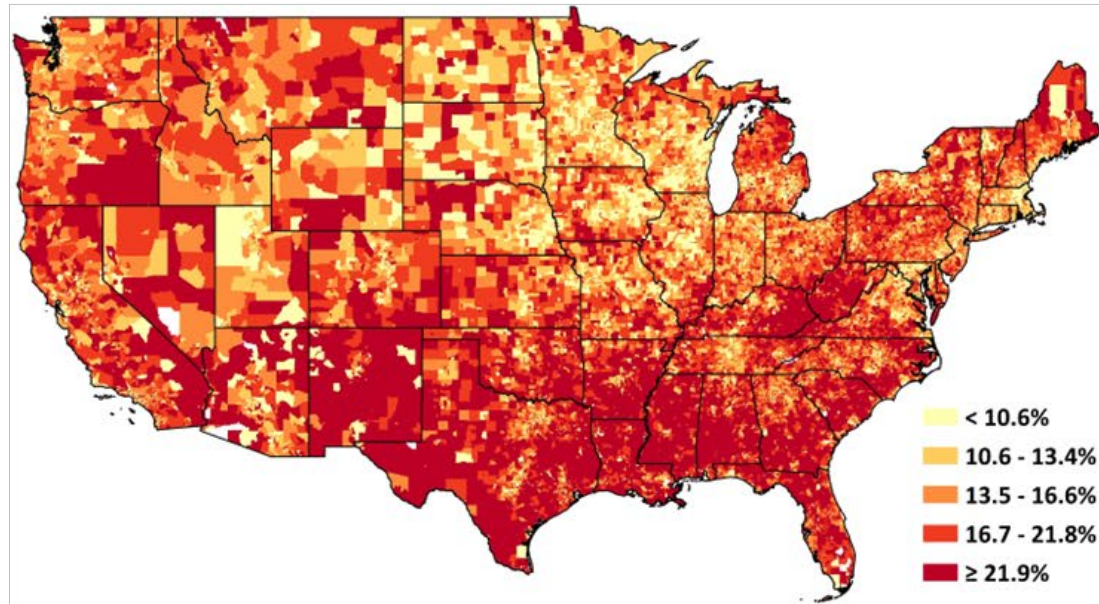
Cancer Screening (%)

Colorectal Cancer	68 (64, 71)	67 (62, 70)	66 (60, 69)	64 (59, 68)	62 (57, 66)
Breast Cancer	78 (75, 81)	77 (74, 80)	76 (73, 79)	75 (72, 78)	74 (71, 77)
Cervical Cancer	84 (81, 86)	83 (80, 85)	82 (80, 84)	81 (79, 84)	80 (77, 83)

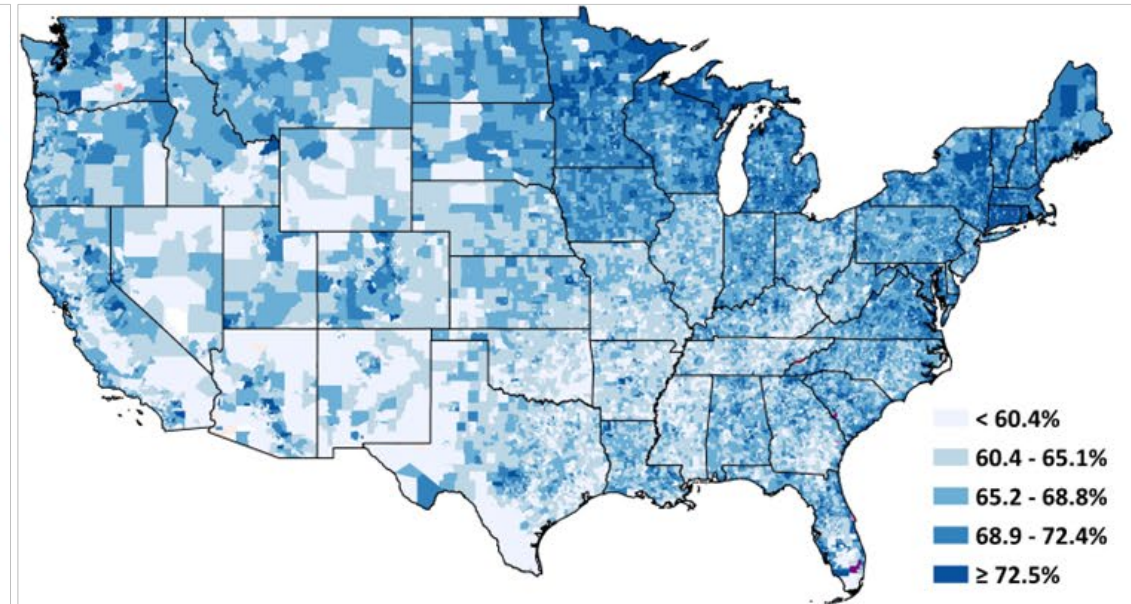
Census tracts within the highest HLDR had lower percentages of White (non-Hispanic) residents, higher percentages of female residents, and lower median incomes



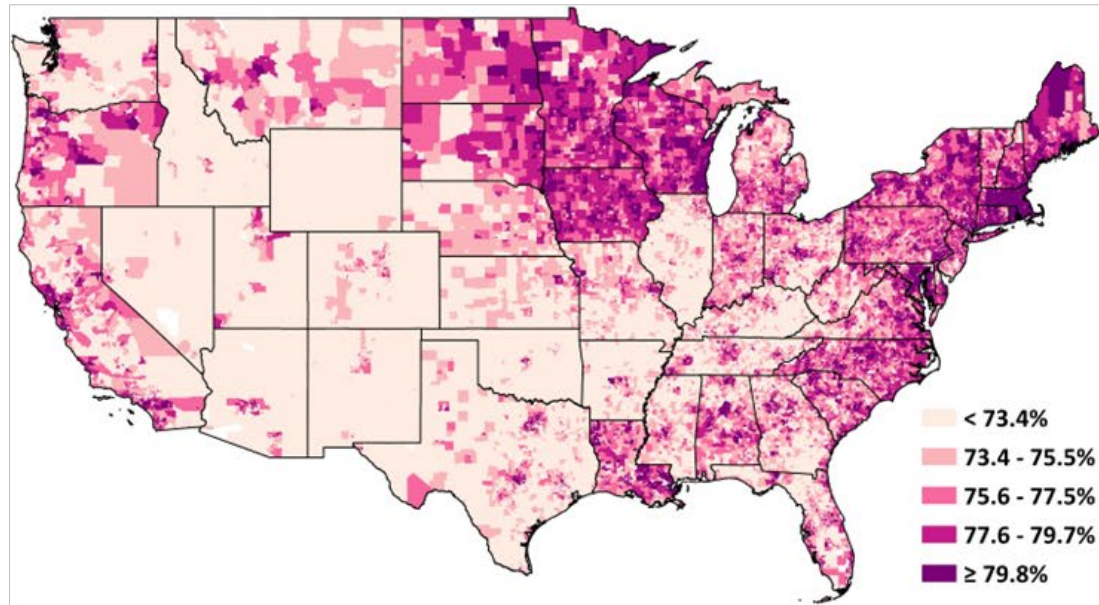
Home Loan Denial Rates^b (2021-2022)



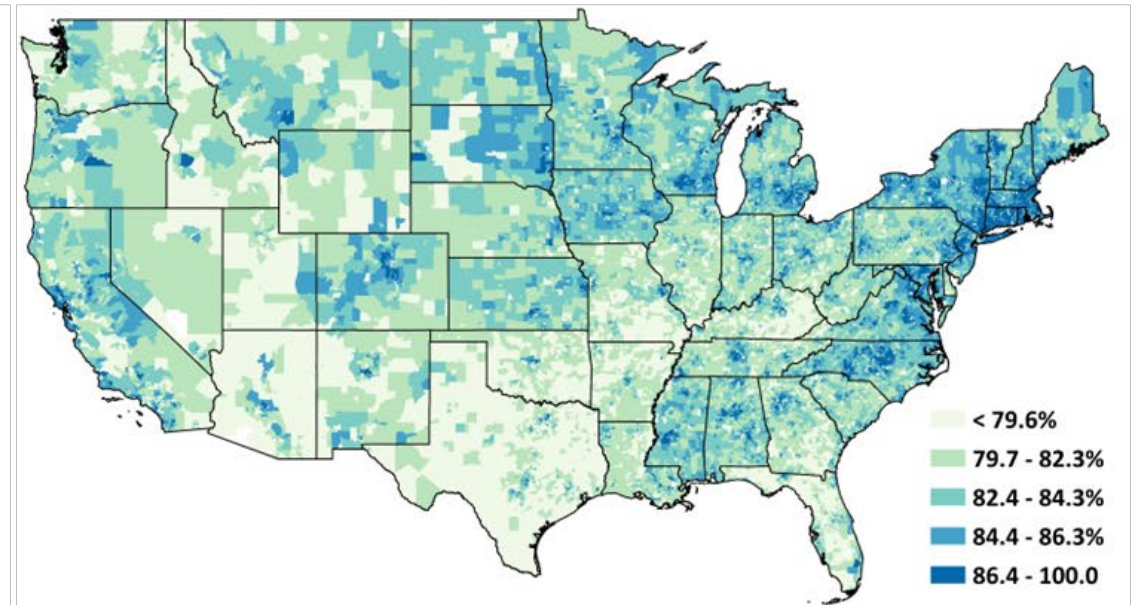
Colorectal Cancer Screening^c (2021-2022)



Breast Cancer Screening^d (2021-2022)



Cervical Cancer Screening^e (2019-2020)





	Model 1 ^a	Model 2 ^b	Model 3 ^c	Model 4 ^d	Model 5 ^e
HLDR	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Colorectal Cancer ^f					
<10.6% (Low)	Ref	Ref	Ref	Ref	Ref
10.6 - 13.4%	0.99 (0.99, 0.99)	0.99 (0.99, 0.99)	0.98 (0.98, 0.98)	1.00 (1.00, 1.00)	0.99 (0.99, 0.99)
13.5 - 16.6%	0.98 (0.98, 0.98)	0.98 (0.97, 0.98)	0.96 (0.95, 0.96)	1.00 (1.00, 1.01)	0.98 (0.98, 0.99)
16.7 - 21.8%	0.97 (0.96, 0.97)	0.96 (0.96, 0.97)	0.93 (0.93, 0.94)	1.01 (1.00, 1.01)	0.98 (0.98, 0.98)
≥21.9% (High)	0.93 (0.93, 0.93)	0.93 (0.92, 0.93)	0.88 (0.88, 0.88)	0.99 (0.98, 0.99)	0.96 (0.96, 0.96)
Breast Cancer ^g					
<10.6% (Low)	Ref	Ref	Ref	Ref	Ref
10.6 - 13.4%	0.99 (0.99, 0.99)	0.99 (0.99, 0.99)	0.98 (0.98, 0.98)	1.00 (0.99, 1.00)	0.99 (0.99, 0.99)
13.5 - 16.6%	0.98 (0.98, 0.98)	0.98 (0.98, 0.99)	0.97 (0.96, 0.97)	1.00 (1.00, 1.00)	0.99 (0.99, 1.00)
16.7 - 21.8%	0.98 (0.97, 0.98)	0.98 (0.98, 0.98)	0.96 (0.95, 0.96)	1.00 (1.00, 1.01)	1.00 (0.99, 1.00)
≥21.9% (High)	0.97 (0.97, 0.97)	0.98 (0.97, 0.98)	0.94 (0.94, 0.94)	1.01 (1.01, 1.01)	1.00 (1.00, 1.00)
Cervical Cancer ^h					
<10.6% (Low)	Ref	Ref	Ref	Ref	Ref
10.6 - 13.4%	0.99 (0.99, 1.00)	0.99 (0.99, 1.00)	0.99 (0.99, 1.00)	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
13.5 - 16.6%	0.99 (0.98, 0.99)	0.99 (0.98, 0.99)	0.98 (0.98, 0.99)	0.99 (0.99, 1.00)	0.99 (1.00, 0.99)
16.7 - 21.8%	0.98 (0.97, 0.98)	0.97 (0.97, 0.98)	0.97 (0.97, 0.97)	0.99 (0.98, 0.99)	0.98 (0.98, 0.99)
≥21.9% (High)	0.96 (0.96, 0.97)	0.96 (0.96, 0.96)	0.96 (0.95, 0.96)	0.98 (0.97, 0.98)	0.98 (0.97, 0.98)

Abbreviations: HLDR = Home Loan Denial Rate, OR = Odds Ratio, CI = Confidence Interval, Ref = Reference Group

a Model 1: Beta GLMM, modeling cancer screening prevalence, adjusted for HLDR and Year

b Model 2: Beta GLMM, modeling cancer screening prevalence, adjusted for HLDR, Year, and Rural Designation

c Model 3: Beta GLMM, modeling cancer screening prevalence, adjusted for HLDR, Year, and Routine Checkup

d Model 4: Beta GLMM, modeling cancer screening prevalence, adjusted for HLDR, Year, and No Health Insurance

e Model 5: Beta GLMM, modeling cancer screening prevalence, adjusted for HLDR, Year, Rural Designation, Routine Checkup, and No Health Insurance

f Prevalence rate (possible range: 0% - 100%) of Colorectal cancer screening among adults aged 45–75 years

g Prevalence rate (possible range: 0% - 100%) of Mammography use among women aged 50–74 years

h Prevalence rate (possible range: 0% - 100%) of Cervical cancer screening among women aged 21–65 years (data for 2022 is not available)

Limitations

- ▶ HLDR is an aggregate-level measure, estimated for each census tract
 - ▶ Limited by population size/loan amounts
 - ▶ Solution in development: population weighted HLDRs
- ▶ Cervical cancer screening prevalence rates were not published in the 2024 PLACES data release
- ▶ This national analysis does not include patient-level covariates or outcomes
 - ▶ Future studies including patient data should consider HLDRs as a measure of SDoH

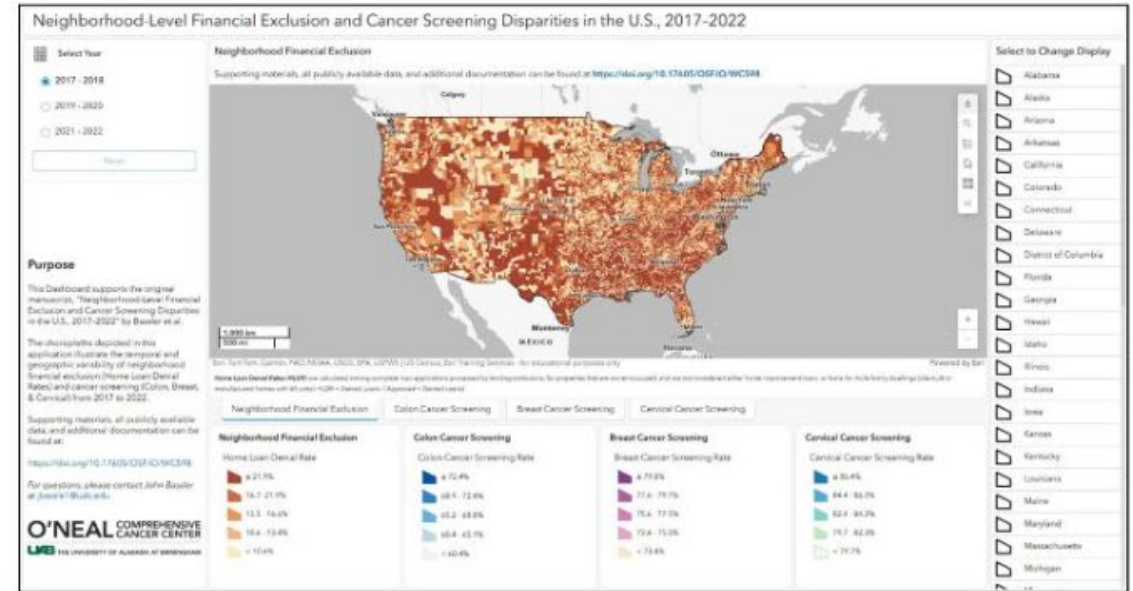
Why not just use other measures?

Measure	Definition	Or in other words...	Primary Use/Application
Social Vulnerability Index (SVI)	A set of socioeconomic and demographic factors—like poverty and lack of transportation—that weaken a community's ability to withstand and recover from disasters, disease outbreaks, or environmental hazards	Measures how social and economic barriers make it harder for certain neighborhoods to survive and bounce back from a crisis	Emergency management, disaster response
Area Deprivation Index (ADI)	A measure of the adverse social exposome (i.e., neighborhood disadvantage) that can be used to evaluate and improve factors that impact health across populations	Measures the socioeconomic disadvantage of a specific neighborhood	Healthcare, clinical research, health policy
Home Loan Denial Rate (HLDR)	Lending Bias, as determined through the estimation of home loan denial rates	Measure structural financial exclusion and identify geographic or demographic gaps in wealth-building opportunities	Identify systemic barriers to credit access, guide community reinvestment

NEXT STEPS

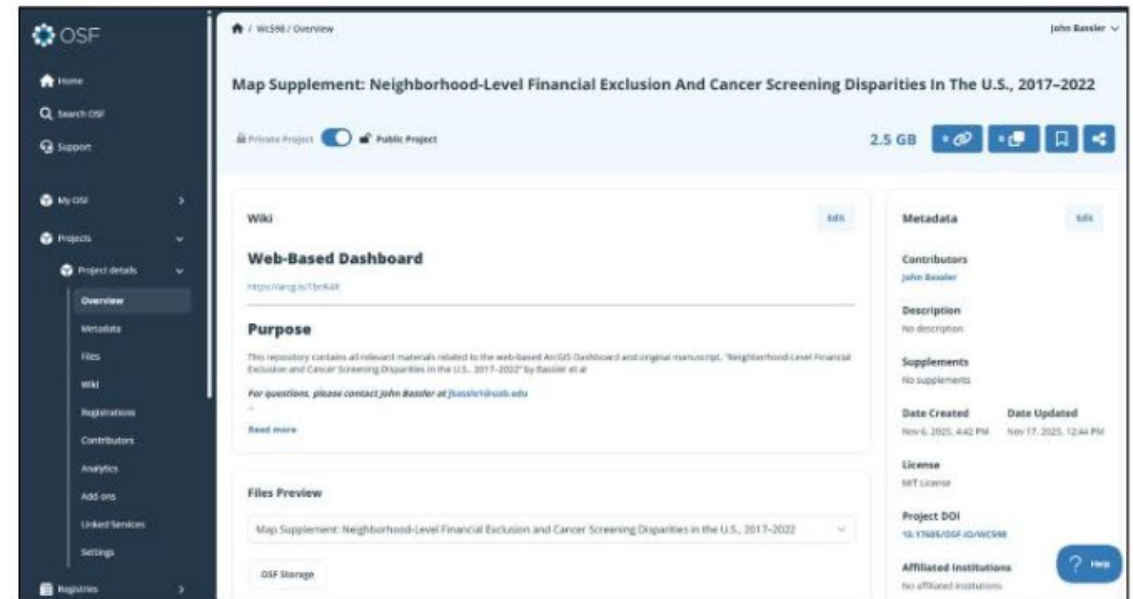
Public Dashboard

<https://arcg.is/1bnK4K>



Repository

<https://doi.org/10.17605/OSF.IO/WC598>



Conclusions

Neighborhood-level financial exclusion, evidenced by HLDRs, offers a valuable summary of a neighborhood's socioeconomic outlook

Federal policy efforts should integrate financial access measures to guide cancer screening outreach and tackle structural cancer disparities



HLDR data could be integrated into electronic medical records to guide targeted outreach and patient navigation



Financial exclusion metrics should be formally incorporated into public health planning and linked with broader reforms in housing and lending policy

Thank you!

John R. Bassler

jbassle1@uab.edu