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The Illinois Institute for Rural Affairs (IIRA) works to improve the quality of life for rural residents by partnering with public and private agencies on local development and enhancement efforts.



**Western Illinois
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Health and Healthcare Disparities in Illinois, Metro vs. Nonmetro

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Abstract

This paper addresses the question, “What is the status of health and healthcare disparities in Illinois” using data from three sources: American Community Survey, 2017-2021; Health Cost & Utilization Project, 2018-2020, and Behavioral Risk Factor Surveillance System (BRFSS), 2021. Data analysis suggests that health disparities exist in Illinois - affordability, or the inability to pay the doctor, has prevented a majority of the Hispanics in the nonmetro from seeing a doctor in the past 12 months. The largest potential for improvement in minority health lies in behavioral risk factors, smoking and lack of exercise.

Introduction

Two decades ago the Institute of Medicine published a report titled, *Unequal Treatment: Confronting Racial and Ethnic Disparities in Healthcare*². The report outlined how healthcare factors such as access and quality of care contribute to health disparities; the report concluded by providing a roadmap for what needed to be done to eliminate disparities. Unfortunately, differential care still exists³.

¹ Professor, Illinois Institute for Rural Affairs, Western Illinois University.

² <https://www.ncbi.nlm.nih.gov/books/NBK220358/>.

³ Duran DG, & Pérez-Stable EJ (2019). Science visioning to advance the next generation of health disparities research. *American Journal of Public Health*, 109(S1), S11–S13.

There are at least two types of disparities, health⁴ and healthcare disparities. *Health disparities* are differences in the burden of diseases that exist among specific population or groups, for example, racial minorities, a term ascribed to anyone who is a nonwhite, often suffer from chronic illness such as diabetes⁵. The other type, *healthcare disparities*, are differences in the quality of healthcare that are associated with the supply of healthcare, for example, little or no ambulatory care facilities in the community; it is also possible that racial minorities may fail to receive timely care because of lack of health insurance⁶. Also, cultural practices may influence some minorities from seeking treatment for ailments⁷.

Recent system-level changes such as the passage of the Patient Protection and Affordable Care Act⁸ (ACA) are designed to reduce health and healthcare disparities in the population.

What is the status of health and healthcare disparities in Illinois? This paper addresses this question using

indicators that are broader than those reported in the county health rankings⁹, see the methods section of the paper for details.

Conceptual Framework

Social conditions are fundamental causes of disease¹⁰; for example, low socioeconomic status (SES) is associated with illness, disability, and early death¹¹. A related explanation relates 'life chances', defined as the probabilities that individual has in life for need fulfilment, loosely, SES, to 'life choices', defined as one's lifestyle including health behavior¹². The outcome of the interaction between life chances and life choices could be positive or negative; for example, the lifestyles of the affluent may include healthier diets, little or no smoking, and annual physical checkups by physicians, all leading to positive health. In contrast, the poor may engage little in behavior that promote health and ward off illness.

⁴ Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity; see <https://www.who.int/about/governance/constitution>.

⁵ Williams, D. R. (1999). Race, socioeconomic status, and health the added effects of racism and discrimination. *Annals of the New York Academy of Sciences*, 896(1), 173-188.

⁶ Gaskin, D. J., & Hoffman, C. (2000). Racial and ethnic differences in preventable hospitalizations across 10 states. *Medical Care Research and Review*, 57(1_suppl), 85-107.

⁷ Hood, R. G. (2001). Confronting racial and ethnic disparities in health care. *Academic Medicine*, 76(6), 584-585.

⁸ ACA was enacted in 2014; see <https://www.govinfo.gov/app/details/PLAW-111publ148>.

⁹ <https://www.countyhealthrankings.org/explore-health-rankings/illinois?year=2022>.

¹⁰ This is the basic premise of the fundamental cause theory; see Phelan, J., and Link, B. (2003). Fundamental cause theory. In: Cockerham, W.C., editor, *Medical Sociology on the Move: New Directions in Theory*. Dordrecht: Springer.

¹¹ Lutfey, K., & Freese, J. (2005). Toward some fundamentals of fundamental causality: Socioeconomic status and health in the routine clinic visit for diabetes. *American Journal of Sociology*, 110(5), 1326-1372.

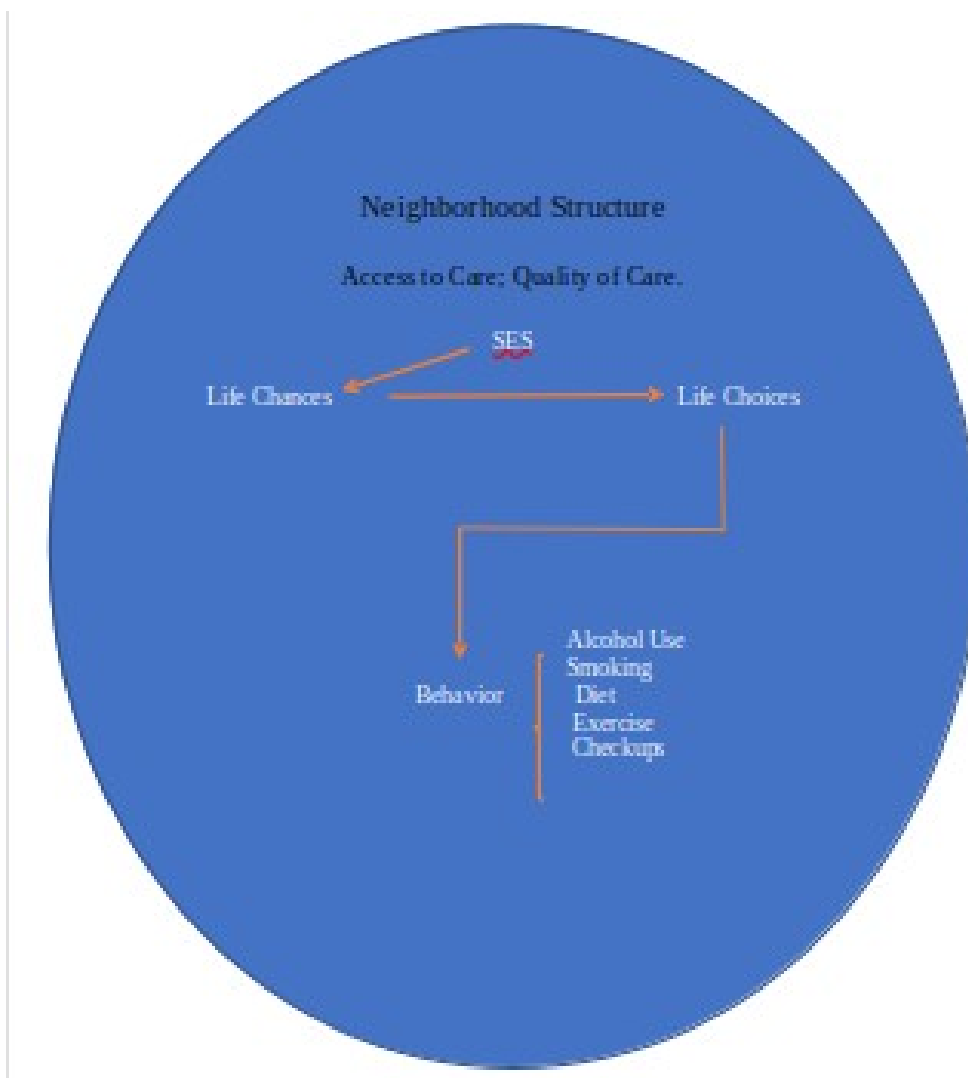
¹² Cockerham, W.C. (2013). *Social Causes of Health and Disease*, 2nd ed. Cambridge: Polity.

Another area of emerging research in health disparities is 'neighborhood disadvantage'¹³. It focuses on factors such as the physical environment (for example, water and air quality) and availability of services (for instance, parks and recreational areas) to explain 'health'; the thinking is that neighborhoods have resources to

produce good health, or conversely, harm it by being health-damaging.

Figure 1 places the constructs in a flow chart; SES determines life chances which in turn influence life choices or behavior; neighborhood 'structure' is the context in which the health behavior occurs.

Figure 1: Constructs Related to Health Behavior



Note: Indicators of healthcare disparities are part of the neighborhood structure.

¹³ Bernhardt, C., & King, C. (2022). Neighborhood disadvantage and prescription

drug misuse in low-income urban mothers. *Drug and alcohol dependence*, 231, 109245.

Methodology

Variables and Measures

The dataset had both county-level macro indicators, for example, median household income, and microdata at the metro and the nonmetro level, for example, individual-level behavioral variables shown in Figure 1.

Socio-Economic Status was measured using two county-level indicators, median household income and average monthly mortgage payment / rent; data were from the ACS, 5-year estimates, 2017-2021. Each county was then ranked, a rank of 1 signifies the highest SES. For data analysis purposes, the SES scores were combined into four categories, highest SES, higher, lower, and lowest SES.

Quality of care was measured using data from the Health Cost & Utilization Project, 2018-2020¹⁴. Two indicators were used: hospitalizations that involve Medicare Severity-Diagnosis Related Groups (MS-DRG) 870-872 and preventable hospitalization rate. As in SES, county rankings on the indicators were obtained and used as measures; data analysis were based on four levels of the variable: best quality of care, better quality, worse, and worst quality of care.

Table 1 lists the variables sourced from the Behavioral Risk Factor Surveillance System (BRFSS), 2021¹⁵. The table provides operational definitions of the variables and their value labels. Only microdata for Illinois were obtained.

Data were analyzed using crosstabulations; statistical significance of the associations among variables in the cross-classifications were assessed using the Chi-square test for contingency tables. For selective targeting of health communications, a Bayesian model was calibrated; the following characteristics of the respondents were used to screen their health behavior, for example, alcohol consumption, etc.:

- (i) z_1 – respondent’s SES, high or low;
- (ii) z_2 - respondent’s perceptions about access to healthcare, see the variable PREDCOS3 in Table 1, and
- (iii) z_3 - respondent’s ability to afford healthcare, see the variable and MEDCOST1 in Table 1.

¹⁴ <https://datatools.ahrq.gov/hcupnet>.

¹⁵ https://www.cdc.gov/brfss/annual_data/annual_2021.html.

Table 1: Operational Definitions of Variables, Microdata

BRFSS Variable	Definition / Question	Value Labels
PERSDOC3	Presence or absence of personal healthcare provider	Yes = 1; No = 2
MEDCOST1	Was there a time in the past 12 months when you needed to see a doctor but could not because you could not afford it?	Yes = 1; No = 2
RACEGR3	Race / ethnicity of the respondent	White = 1; Black = 2; Hispanic = 3; Other = 4.
METSTAT	Metropolitan status	Metro = 1; Nonmetro = 2.
AVEDRNK3	Alcohol consumption	Yes = 1; No = 0
RFSMOK3	Smoking behavior	
VEGLT1A	Consumes vegetables 1 or more times per day	
FRTL1A	Consumes fruit 1 or more times per day	
TOTINDA	Engaged in physical activity in the last 30 days	
CHECKUP1	Length of time since a routine checkup	Within past 1 year = 1; Within past 2 years = 2; Within past 5 years = 3; 5 or more years ago = 4; Never = 5.

Findings

Neighborhood Structure

Table 2 shows the distribution of counties in the SES and quality of care variables, for both the metro and the

nonmetro. A majority of rural counties in the highest SES grouping (52%) score better or best in the quality of care metric. The opposite is true for the metro counties with the highest SES score, a majority (70%) score worse or worst in the quality of care indicator.

Table 2: Quality of Care by SES, County Level Analysis

(i) Nonmetro Counties

Rank, quality of care	Rank, Socioeconomic status (SES)			
	Highest	Higher	Lower	Lowest
Best	2 Pulaski, Wayne	4	3	6
Better	6	1	5	4
Worse	1	7	5	3
Worst	6	4	3	2 (Douglas, Moultrie)

(i) Metro Counties

Rank, quality of care	Rank, Socioeconomic status (SES)			
	Highest	Higher	Lower	Lowest
Best	2(Alexander, Stark)	2	4	2
Better	1	2	3	4
Worse	4	3	1	2
Worst	3	3	2	2(Grundy, Will)

Note: Only the best and worst ranking counties on both the SES and the 'quality of care' variables are listed.

Race, Healthcare, and Health Behavior

The BRFSS, 2021, had polled 9,666,128 Illinoisans, weighted sample of 3,210 respondents. Of these, 468,354 respondents (6% of the total) were from the nonmetro. Population wise, nonmetro Illinois is predominantly

White; metro Illinois is also White, but to a lesser extent, 92% of Whites in the metro compared to 62% in the nonmetro. In other words, 38% of the metro residents are minorities (Table 3).

Table 3: Racial Composition of the Population, Metro and Nonmetro

Race	Metro	Nonmetro
White	62%	92%
Black	14%	4%
Hispanic	17%	2%
Other, including Asian	8%	3%
N	9,193,274	468,354

Note: χ^2 statistically significant at $p < .05$ level, $\phi = .13$.

To what extent does health and healthcare attributes differ among the races? Disparity exists in access to healthcare; majority of the White population in Illinois have a personal healthcare provider whereas less than one half of the Hispanic population that live in the nonmetro claim to have a personal healthcare provider. In fact, affordability, or the inability to pay the doctor, has prevented a majority of the

Hispanics in the nonmetro from seeing a doctor in the past 12 months (Table 4).

The poor access to care for minorities in the nonmetro is a concern because a majority of the Hispanics and other minority races residing in rural Illinois engage in unhealthy behavior such as smoking and not exercising (Table 5).

Table 4: Disparity in Access to Healthcare

Couldn't see a doctor in the past 12 months because couldn't afford it.

Race	Region		ϕ Coefficient	N
	Metro	Nonmetro		
White	8%	6%	.02	6,078,739
Black	9%	32%	.09	1,300,956
Hispanic	17%	52%	.08	1,567,699
Other	31%	7%	.12	700,447

Note: ϕ Coefficient shows the magnitude of association between the variables, 'region' and 'affordability'; ϕ is called the 'coefficient of contingency' and is a conservative index of the strength of the association; all χ^2 significant at the $p < .01$ level.

Have one or more personal healthcare provider.

Race	Region		ϕ Coefficient	N
	Metro	Nonmetro		
White	87%	90%	.03	6,048,728
Black	83%	~100%	.05	1,299,398
Hispanic	74%	48%	.05	1,537,448
Other	78%	42%	.12	680,686

Note: All χ^2 significant at the $p < .01$ level.

Table 5: Health Behavior by Race and Region

Drinking

Race	Region		ϕ Coefficient	N
	Metro	Nonmetro		
White	100%	100%	0.01	3,011,434
Black	98%	100%	0.02	516,185
Hispanic	99%	100%	0.01	690,077
Other	100%	100%	0.00	284,016

Smoking

Race	Region		ϕ Coefficient	N
	Metro	Nonmetro		
White	12%	19%	0.05	5,835,650
Black	13%	42%	0.10	1,237,252
Hispanic	9%	52%	0.12	1,496,336
Other	7%	74%	0.23	653,824

Daily Vegetable Intake

Race	Region		ϕ Coefficient	N
	Metro	Nonmetro		
White	86%	84%	0.01	5,413,200
Black	78%	~100%	0.07	1,064,908
Hispanic	78%	~100%	0.05	1,155,717
Other	79%	~100%	0.05	571,542

Daily Fruit Intake

Race	Region		ϕ Coefficient	N
	Metro	Nonmetro		
White	59%	55%	0.02	5,604,234
Black	63%	58%	0.01	1,119,691
Hispanic	67%	69%	0.01	1,293,461
Other	63%	100%	0.07	611,346

Exercised in the Last 30 Days

Race	Region		ϕ Coefficient	N
	Metro	Nonmetro		
White	76%	62%	0.08	6,072,111
Black	66%	58%	0.02	1,302,672
Hispanic	67%	48%	0.03	1,562,490
Other	79%	89%	0.03	704,198

Had a Routine Checkup

Race	Region		ϕ Coefficient	N
	Metro	Nonmetro		
White	87%	92%	0.04	5,506,291
Black	88%	~100%	0.04	1,248,059
Hispanic	81%	~100%	0.03	1,379,035
Other	88%	~100%	0.02	597,094

Bayesian Classification

Table 5 shows that unhealthy behaviors such as smoking and lack of exercise are more pronounced in the nonmetro especially among the minorities. The

estimated conditional probabilities of the association of attributes (Z_1-Z_3) with these behaviors, smoking and not exercising, are shown in Table 6.

Table 6: Attribute Patterns for Illinoisans' Characteristics and Associated Conditional Probabilities

SES	PCP	Affordability	Prob. (Attributes Smoking)
High	Yes	Cannot afford	0.44%
High	Yes	Can Afford	17.10%
High	No	Cannot afford	0.00%
High	No	Can Afford	3.32%
Low	Yes	Cannot afford	8.75%
Low	Yes	Can Afford	48.79%
Low	No	Cannot afford	8.32%
Low	No	Can Afford	13.27%

SES	PCP	Affordability	Prob. (Attributes Physical Activity)
High	Yes	Cannot afford	1.19%
High	Yes	Can Afford	40.73%
High	No	Cannot afford	0.48%
High	No	Can Afford	5.89%
Low	Yes	Cannot afford	4.59%
Low	Yes	Can Afford	36.43%
Low	No	Cannot afford	2.98%
Low	No	Can Afford	7.70%

Note: PCP refers to the variable “persdoc3” in Table 1 and affordability is labeled “medcost1” in Table 1.

Table 6 shows that given that the resident is classified as a “smoker”, the probability of his or her being of low SES, with no personal healthcare

provider, and had affordability issues with healthcare purchases is .0832; put differently, slightly more than 8% of all smokers in Illinois possess none of the

attributes z_1 - z_3 . In general, most smokers are categorized as low-income Illinoisans. In contrast, physical activity is unrelated to one's socio-economic status.

Summary and Conclusion

This paper explored health and healthcare disparities among Illinoisans in the metro and the nonmetro. Empirical analysis of multiple datasets reveals that:

- (i) Disparity exists in access to healthcare; majority of the White population in Illinois have a personal healthcare provider whereas less than one half of the Hispanic population that live in the

nonmetro claim to have a personal healthcare provider.

- (ii) unhealthy behaviors such as smoking and lack of exercise are more pronounced in the nonmetro especially among the minorities.
- (iii) most smokers are low-income Illinoisans.

The largest potential for improvement in minority health lies in behavioral risk factors, smoking and lack of exercise. We have tools to make progress in tobacco control¹⁶. Improvement in other factors such as eating fruits daily requires targeted communications, healthcare contacts in the counties should be the influencers of residents' behavior¹⁷.

¹⁶ Athiyaman, A. (2022). Youth E-Cigarette Use in Illinois and the Midwest: Insights from A Panel Study. *Research Brief*, 4(18), September 25, 1-10. Available: <http://www.iira.org/wp-content/uploads/2022/09/Youth-E-Cigarette-Use-RB418.pdf>.

¹⁷ National Standards for Culturally and Linguistically Appropriate Services (CLAS) in Health and Healthcare, <https://www.minorityhealth.hhs.gov/omh/browse.aspx?vl=2&vlid=11>.