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.

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Health Policy for Rural Illinois, Data for Policy Development

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Abstract

This paper provides data for heath policy for rural Illinois; the state's metropolitan data are provided for comparison purposes. The construct, "health policy", is conceptualized to be a function of four factors: healthcare access, cost, quality, and equity; each facet, in turn, was measured using indicators derived from multiple data sources. Data analysis suggests that disparity in healthcare between the Whites and the minority population is more pronounced in the non-metro and is getting worse.

Introduction

Policy development is the process of identification of public issues and the elaboration of solutions to address these issues[2]. This paper focuses on health issues[3]; the World Health Organization (WHO) defines health as the *absence* of physical, mental, or social infirmity or disease[4].

The US Constitution doesn't address health *per se*, but it promises to promote general welfare; this situation, coupled with

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[2] Encyclopedia of Governance, 2007. Thousand Oaks, CA: Sage Publications, Inc.
[3] We conceptualize health as wellness, a positive state of being; hence, our measures will focus on distribution of wellness among the population and its determinants.
[4] See, https://www.who.int/about/frequently-asked-questions.

the 10th Amendment to the Constitution[5], have resulted in health policy initiatives from all levels of government, federal, state, and local.

Policy development for rural Illinois requires small-area studies that assess, for example, differences in healthcare costs and utilization rates; utilization rates for surgery could vary between the metro and the nonmetro and this information could help in cost analysis. Topic-wise, health policy[6] initiatives are concerned with four facets of healthcare: availability, cost, quality, and equity[7]. These data are spread across a number of 'big data' sources[8]; knowledge in data fusion is needed to assemble relevant data and gain insights for policy[9]. This paper does this for the policymaker; it provides relevant data for health policy for rural Illinois[10].

Conceptual Framework

Policy is formulated in a dynamic environment; changes in economic, political, and social conditions shape stakeholders' responses or policy; information informs every stage of the policy process (Figure 1).

Figure 1: The Policy Process

Problem Identification ⟶ Strategy and Tactics ⟶ Evaluation

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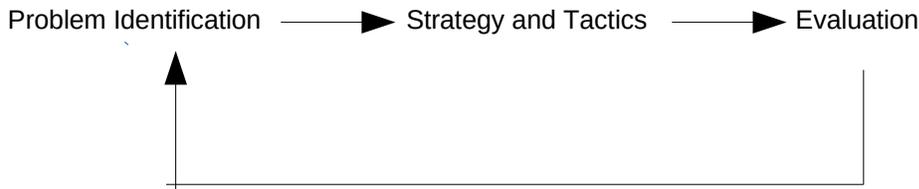
[5] The Tenth Amendment to the Constitution contains the following wording: "The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people."

[6] In this paper, the term 'policy' is defined as detailed responses (procedures) to accomplish the "big picture" for health set by policymakers. In other words, policy = business tactics and "big picture" = strategy.

[7] Henderson, J.W. (2004). *Health economics and policy.* Ohio: South-Western Publishing.

[8] The term big data refers to data from multiple sources; see Lee EW, Viswanath K (2020). Big data in context: addressing the twin perils of data absenteeism and chauvinism in the context of health disparities research. *Journal of Medical Internet Research*, 22(1): e16377.

[9] Policy research is concerned with addressing, "what would happen if ..." types of questions.

[10] Excel data files can be downloaded from www.i-ira.org/publications.

Problems are conditions that deviate from the ideal[11]; for example, policymakers may believe that waiting time in emergency departments (EDs) of hospitals is unacceptable and that action is needed to reduce waiting times. This 'evaluation' is contingent on "large" changes in the hospital ED's waiting-time; if the indicator doesn't change for the worse, then the policymaker will have little or no incentive to act on the deviation[12].

One indication of the importance of health issue for policymakers is its frequency as a topic for congressional bills[13]; Figure 2, extracted from the "legislative explorer", shows the salience of health policy for the 113th congress; compared to the topic of "community development and housing", health had 716% more bills tabled in the house of representatives[14].

Figure 2: Health Bills Considered by the 113th Congress
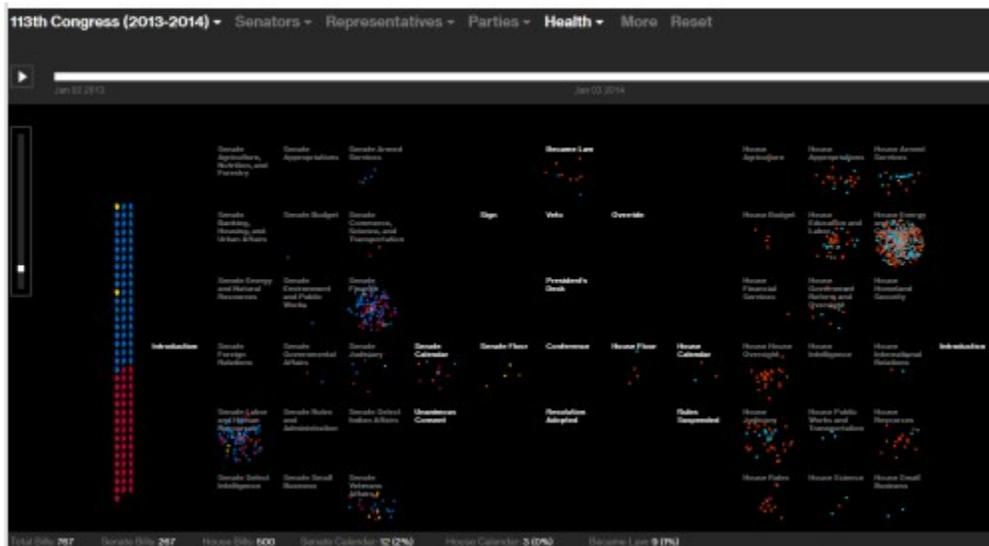
Note: The color-coded dots represent party affiliations; red = Republican; blue = democrat, and yellow = independent.

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[11] Athiyaman, A. (2021). An Empirical Analysis of Research Outputs in Community Economic Development: Implications for the Study Area. *Research Brief*, June 3, 3(9), 1-10.

[12] This is in line with the reasonings of the punctuated equilibria theory in public policymaking, that any activity consists of long periods of stability interspersed with bursts of frenetic activity; see Baumgartner, F. R. (2013). Discrediting the status quo: Ideas, levels of policy change, and punctuated equilibrium. *Governance*, 26(2), 239-258.

[13] Policymakers can attend to only a limited number of issues at any given time. In general, the more politically relevant a condition becomes, the more likely it will be dealt with.

[14] In all, 767 bills were considered by the houses; of these, n=9 became law; in comparison, 107 bills were related to "community development and housing" of which n=1 became law.

In summary, health problems in a geography can be identified by exploring changes to the region's health indicators; larger the dis-confirmation of expectations for the policymaker - deviation from her ideal level for the indicator, higher is the policy-maker's attention to the concept indicated by the measure. This thinking is behind the data analytic on health presented in the next section.

Methodology

Table 1 shows the data sets that had information on the health of Illinoisans and Illinois' healthcare system at the non-metro level. For each of the data set, core indicators for access to care, cost, healthcare quality, and equity were derived using the framework shown in Table 2, columns 1-2: the focal object being rated (for example, ambulatory facility such as doctor's clinic) and the dimension of judgment (concrete perceptual such as the cleanliness of the facility).

Table 1: Data Sets of Interest

Dataset	Attributes
American Community Survey	Provides demographic, socioeconomic, and housing information; samples approximately 3.5million addresses annually. https://www.census.gov/.
Area Health Resources File	The Area Health Resources File (AHRF) is made available by the Bureau of Health WorkForce annually for each county. Data is from the American Dental Association, the American Hospital Association, and the American Medical Association and other public data. https://data.hrsa.gov/data/
Small Area Health Insurance Estimates	The U.S. Census Bureau's Small Area Health Insurance Estimates (SAHIE) program produces single-year estimates of number and percent insured/uninsured. It is the only source of single-year estimates of health insurance coverage status for all counties in the United States by selected economic and demographic characteristics. The data is sourced from American Community Survey. https://www.census.gov/programs-surveys/sahie.html
Current Population Survey	Informs about labor force participation and unemployment for the civilian population. Samples approximately 1000,000 addresses, annually. https://www.census.gov/.
Behavioral Risk Factor Surveillance System	Collects data about the behavioral health of the population: samples more than 400,000 adult population annually. https://www.cdc.gov/brfss/.
Healthcare Cost and Utilization Project	In general, HCUP datasets are only available for purchase; however, the HCUP net query system could be used to generate some data, https://www.ahrq.gov/data/.
Consumer Expenditure Survey	Provides health expenses at the metro / nonmetro level; https://www.bls.gov/cex/pumd_.
Geographic Variation Public Use File 2021	The Medicare Geographic Comparison datasets from CMS provide information for each county in the use and quality of health care services for the the Original Medicare (fee-for-service) population. https://data.cms.gov/summary-statistics-on-use-and-payments/medicare-geographic-comparisons

Data were analyzed by computing measures of central tendency, dispersion, and correlation coefficient. To summarize changes in regional indicators overtime, between-wave scatter-plots and continuous growth rates were tabulated.

Table 2: Construct, Objects, and Attributes

Construct	Objects	Attribute	Measure	Value Labels
Access to healthcare	Healthcare service providers (collection of concrete objects, for example, urgent care, doctor's clinic, health facility, hospital's outpatient department, and military healthcare facility).	Patients' beliefs about: (i) Finding a 'source' for healthcare;	Do you have one person (or a group of doctors) that you think of as your personal health care provider?	Yes, one or more = 1.0 No = 0.0 Metro, N = 9,372,952 Non-Metro, N = 487,550
Cost of care		Patients' perceptions about: (i) Delayed medical care due to cost; (ii) Unmet need due to cost; (iii) Trouble paying medical bills;	Q1: 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?	Cannot afford = 1.0 Can afford = 2.0
			Q2: What changes, if any, have you made or do you plan to make to cope with the increase in prices? - Changes made to medical drugs due to cost?	Delay medical treatment (e.g., refill prescription, surgery) = 1.0
			Q3: In the last 12 months, how many months did your household reduce or forego expenses for basic household necessities, such as medicine or food, in order to pay an energy bill?	Every month = 1 Some months = 2 1 to 2 months = 3 Never = 4
Quality of care	Metro / non-metro regions and organizations as those listed above.	Pertains to variables that assess whether the patient receives the right service at the right time and place by the right caregiver. In summary, it answers the question, "patient's access to what".		

Construct	Objects	Attribute	Measure	Value Labels
		Indicators include:		
		(i) Primary care physicians per 1,000 population;	No. of Primary Care Physicians	
		(ii) Number of federally qualified health centers;	No. of Fed Qualified Health Centers	
		(iii) Number of teaching hospitals;	No. of Member Council Teaching Hospitals	
		(iv) Psychiatric physicians per 1,000 population;	Psychiatry, No. of Professionals	
		(v) Psychiatric hospital beds per 1,000 population;	Psychiatric Care, Beds Set Up	
		(vi) Mental health professional shortage;	HPSA Code - Mental Health	
		(vii) Dental health professional shortage.	HPSA Code - Dentists	
Equity	Populations such as Whites, Blacks, and Asians[15]	Indicators include:		
		(i) % diagnosed with CVDs such as hypertension, stroke, and heart attack.	Q1: (Ever told) (you had) a stroke	Yes = 1 No =0
		(ii) % with diabetes	Q2: Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?	Yes = 1 No =2
			Q3: Ever told you had angina or coronary heart disease?	Yes = 1 No =2
			Q4: Ever told you had diabetes?	Yes = 1 No =0

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[15] The National Institutes of Health (NIH) defines health disparities as differences in the incidence, prevalence, mortality, and burden of diseases and other health conditions that exist among specific population groups.

Findings

The data sets contained both individual, or micro data and 'meso', or county data. At the micro level, the Behavioral Risk Factor Surveillance System (BRFSS), 2021, had 9.4mil weighted responses for the metro and 488,000 responses for the non-metro. The Household Pulse Survey, January 4-16, 2023, had responses clustered based on the Statistical Metropolitan Area (SMA) definition[16]; the survey had 6.4mil weighted responses from the SMA and 3.0mil responses from the non-SMA (Table 2).

The Area Health Resources File contained 'meso' data, for all Illinois counties. The 62 rural counties were home to slightly more than 1.4mil residents; the metro counties had a population of 11.2mil.

Access to Healthcare

African Americans and Hispanics have poor access to healthcare providers. The disparity between the Whites and the minority population in healthcare access is more pronounced in the non-metro and is getting worse; in fact, the non-metro minority population has less access to healthcare providers now compared to four years ago (Table 3). Declines in health insurance coverage among the minorities could be one reason for their reduced access to healthcare (Figure 3).
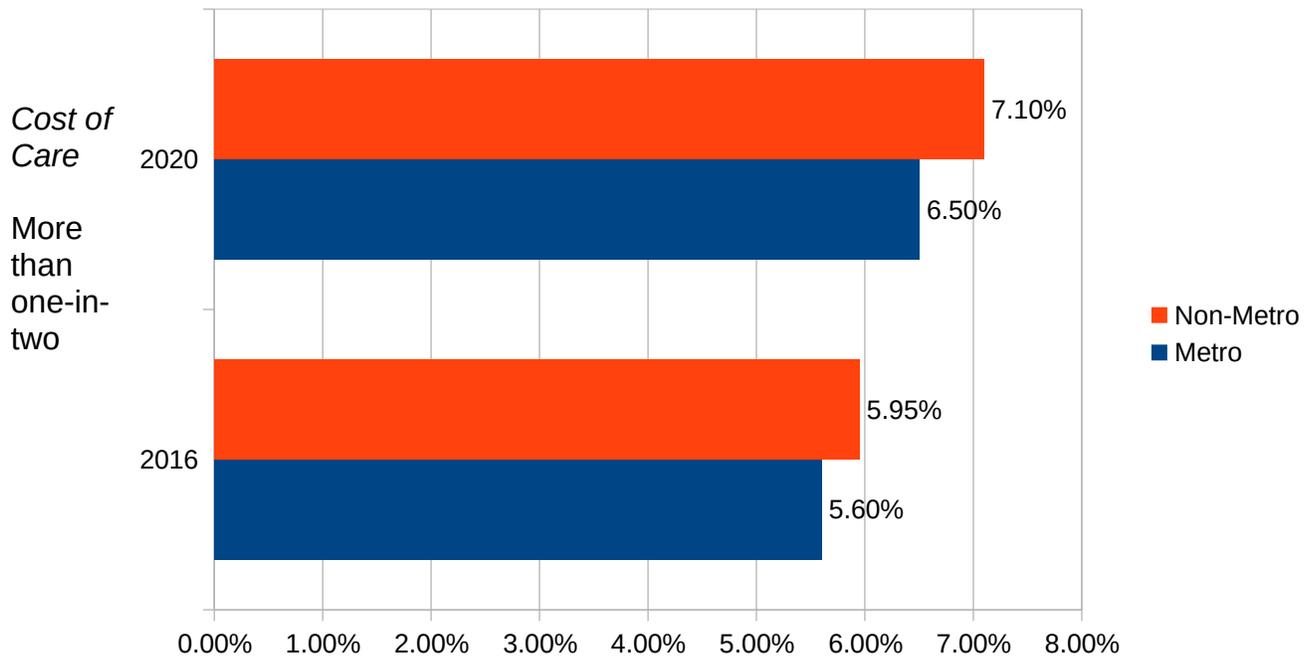
Table 3: Healthcare Access by Race and Geography, 2018 and 2021

	Metro (N = 9,097,906)				Non-Metro (N = 468,354)			
	White	**Black**	**Hispanic**	**Other**	**White**	**Black**	**Hispanic**	**Other**
Have one or more personal healthcare provider, **2021**	87%	83%	74%	78%	90%	NA	48%	42%

	Metro (N = 9,092,778)				Non-Metro (N = 533,105)			
	White	**Black**	**Hispanic**	**Other**	**White**	**Black**	**Hispanic**	**Other**
Have one or more personal healthcare provider, **2018**	87%	84%	69%	74%	90%	NA	64%	73%

Note: All Chi square significant at p < .05; correlations, phi coefficients, range from .13 to .31.

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[16]Metropolitan statistical areas (MSA) are delineated by the U.S. Office of Management and Budget (OMB) as having at least one urbanized area with a minimum population of 50,000; see https://www.cdc.gov/nchs/hus/sources-definitions/msa.htm
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Figure 3: Uninsured Population in the Metro and the Non-Metro, Median Rates

Cost of Care

More than one-in-two

2020: Non-Metro 7.10%, Metro 6.50%
2016: Non-Metro 5.95%, Metro 5.60%

Legend: Non-Metro (orange), Metro (blue)

Hispanics, 52%, and 32% of the Blacks in the non-metro couldn't afford to see a doctor when needed; the same number for the Whites is 6%. Although the metro has a lower proportion of minorities who find it difficult to see a doctor, the numbers are much higher for the minorities, 17% for the Hispanics compared to 8% for the Whites. The consequence? 21% of the

Hispanics in the metro and 34% in the non-metro report delaying their medical treatment, for example, refill prescriptions (Table 4). Furthermore, some 38% of the Hispanic households say that they had to forego basic necessities such as food and medicine to pay for essentials such as electricity.

Table 4: Impacts of Race on Healthcare Affordability, January 2023

	Metro (N = 9,179,487)				Non-Metro (N = 468,354)			
	White	**Black**	**Hispanic**	**Other**	**White**	**Black**	**Hispanic**	**Other**
Couldn't afford to see a doctor in the past 12 months	8%	9%	17%, of which	7%	6%	32%	52%, of which	31%
		21% delayed medical treatment				34% delayed medical treatment		

Note: All Chi square significant at p < .05

Quality of Care

The mean number of primary care physicians (PCPs) in the non-metro fell by .67 points from 2016 to 2020, but remained stable for the metro (Table 5). Data analysis indicates that both the metro and the non-metro suffer from health-professional shortages.

Table 5: Quality Metrics: Metro vs. Non-Metro

1. **Non-Metro**

Metric	Mean	Std. Dev.	Min.	Max.	*t*
PCPs, 2020	10.23	11.91	0	65	
PCPs, 2016	10.90	11.94	0	57	-2.46
FQHCs, 2021	1.78	1.64	0	10	
FQHCs, 2017	0.95	1.25	0	6	2.68
Psychiatric Professionals, 2020	0.29	0.95	0	6	
Psychiatric Professionals, 2015	0.40	1.26	0	6	-1.41
HPSA - Mental	Shortage Area,;Mean score = 1.02				
HPSA - Dental	Part of the region has shortages; Mean score = 1.8				

Note: t > |1.96| significant at the p < .05 level.

2. **Metro**

Metric	Mean	Std. Dev.	Min.	Max.	*t*
PCPs, 2020	239.50	791.20	0	4910	
PCPs, 2016	242.55	801.17	0	4977	-0.16
FQHCs, 2021	8.35	29.07	0	185	
FQHCs, 2017	7.55	25.81	0	164	0.14
Psychiatric Professionals, 2020	35.03	138.14	0	863	
Psychiatric Professionals, 2015	35.13	139.49	0	870	0.84
HPSA - Mental	Shortage Area,;Mean score = 1.1				
HPSA - Dental	Shortage Area; Mean score =1.3				

Note: t > |1.96| significant at the p < .05 level.

Equity

A majority of Hispanics in the non-metro suffer from coronary heart disease, stroke, and diabetes; more than two-in-three Hispanics suffer from mental health problems which include stress, depression, and problems with emotions. In the metro, it is the Black population that has a larger proportion of diabetics and who had stroke (Table 6). The proportion of Whites with coronary heart disease has decreased from 7% in 2018 to 5% in 2021 (Figure 4).

Table 6: Disparities among Races, Chronic Illness, 2021

| | Metro (N = 9,120,165) | | | | | Non-Metro (N = 462,623) | | | |
	White	Black	Hispanic	Other		White	Black	Hispanic	Other
Angina or coronary heart disease	5%	2%**	1%**	2%**		6%	NA	52%	NA
Stroke	3%	9%	2%	2%		2%	NA	52%	31%
Diabetes	10%	15%	12%	5%		17%	NA	52%	58%
Mental health issues	39%	38%	32%	33%		34%	37%	69%	31%

Note: All Chi square significant at p < .05.

Figure 4: Changes to Health Status, Whites and Minorities, 2018-2021
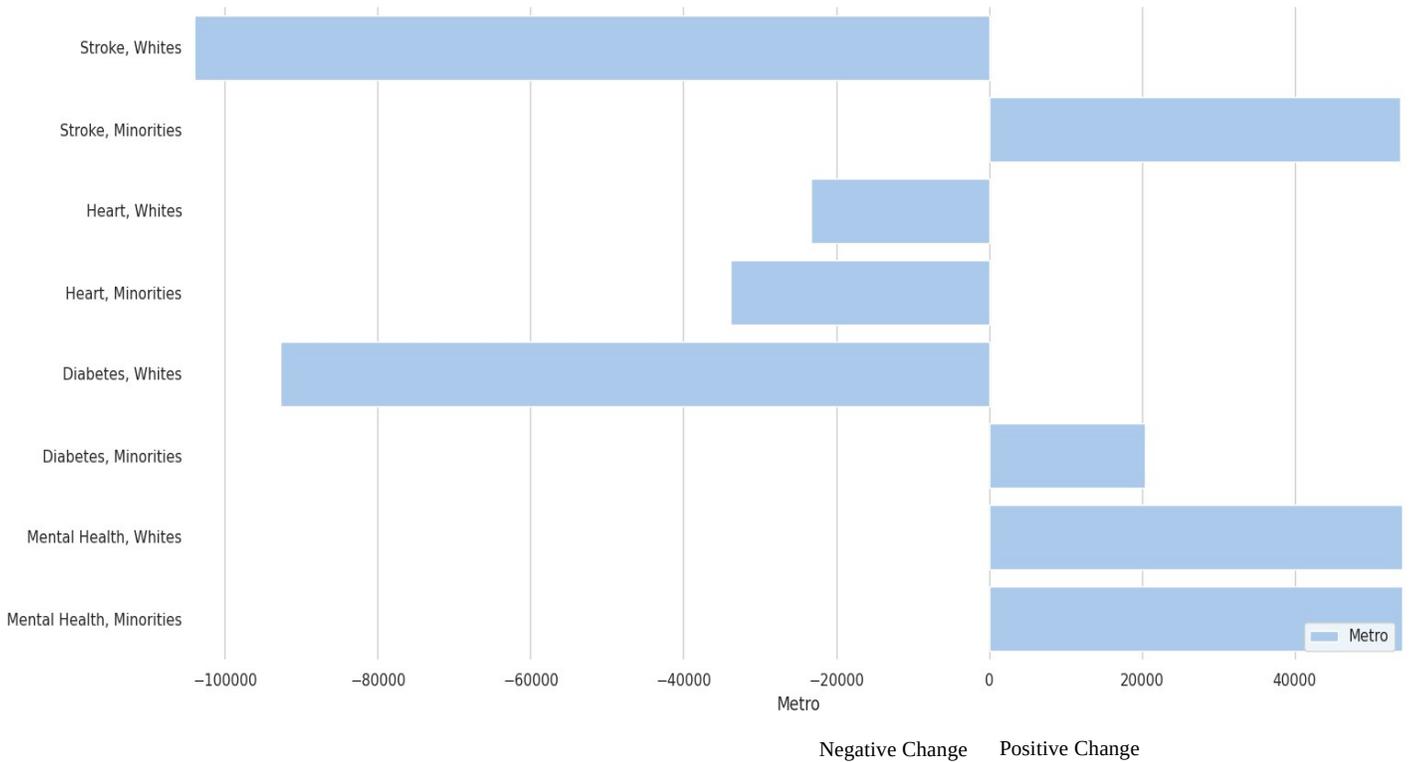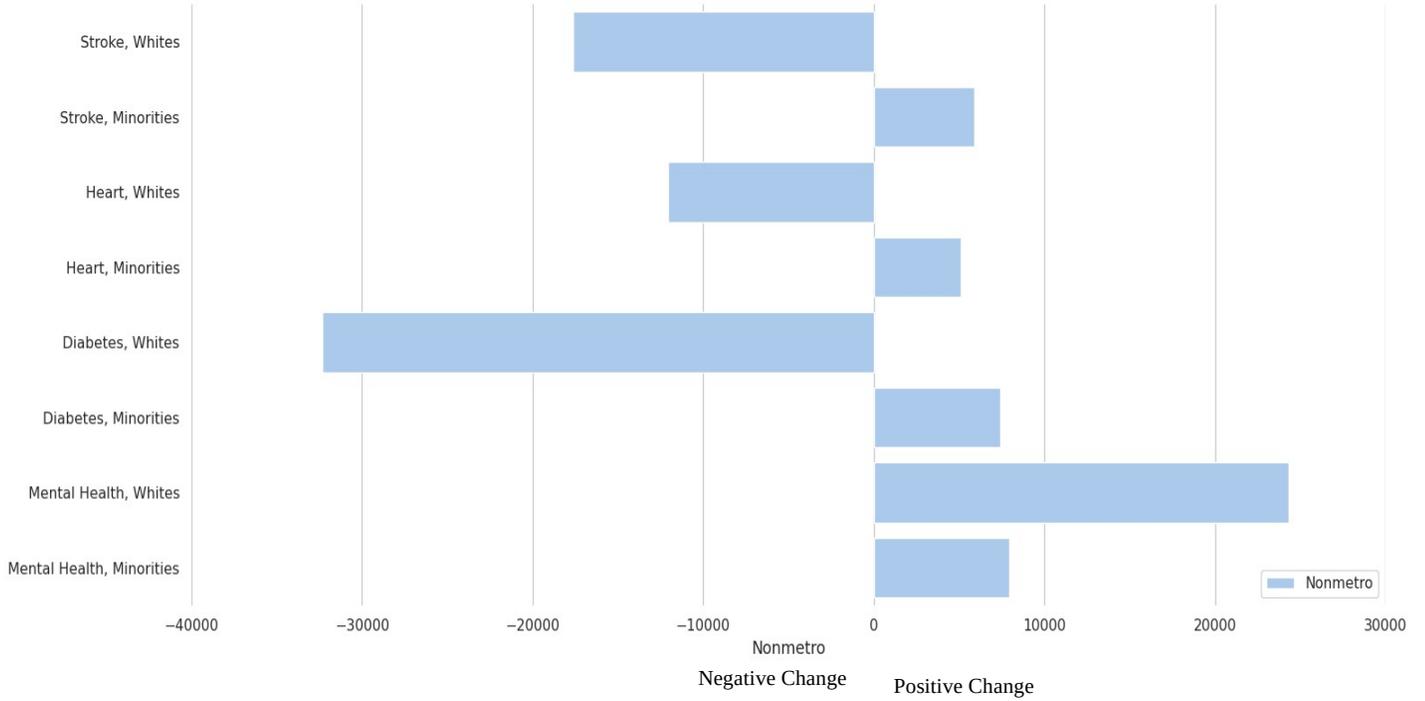
Summary and Conclusion

This paper provides data for heath policy for rural Illinois; the state's metropolitan data are provided for comparison purposes. The construct, "health policy", is conceptualized to be a function of four factors: healthcare access, cost, quality, and equity; each facet, in turn, was measured using indicators derived from the Household Panel Survey, 2023; AHRF, 2022, and BFRSS, 2018-2021.

Results of data analysis indicate:

(a) The *disparity between the Whites and the minority population in healthcare access is more pronounced in the non-metro and is getting worse*; for example, less than one-in-two minorities in the non-metro have a personal healthcare provider, whereas more than 90% of the Whites report having a personal healthcare provider.

(b) More than one-in-two Hispanics, 52%, and 32% of the Blacks in the non-metro *couldn't afford to see a doctor when needed*; the same number for the Whites is 6%.

(c) *Quality of care*, as indicated by number of primary care physicians in the region, number of dental professionals, etc. is lacking in both the metro and the non-metro, and

(d) A majority of Hispanics in the non-metro suffer from coronary heart disease, stroke, and diabetes and more than two-in-three Hispanics suffer from mental health problems.

Rural healthcare data are not easy to find and mine; our insights are based on fusing data from multiple sources, using valid indicators of healthcare, some of which have been collected a few months ago, in January, 2023. Study after study indicate that the nation's health status, healthcare costs, and equity lag far behind any other developed nation[17]. It is time that healthcare leaders and policymakers strengthen efforts to care for populations by improving the individual and social determinants of health.

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[17]See, for example, Levy, N (2022). 100 Million People in America are Saddled with Health Care Debt. https://khn.org/news/article/diagnosis-debt-investigation-100-million-americans-hidden-medical-debt/.