Bridging Gaps: Investigating COVID-19's Influence on Health Disparities in Connecticut

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Abstract

Social determinants of health (SDOH) are the conditions in which people are born, grow, live, work, and age, which significantly influence their overall health and well-being. These determinants include factors such as socioeconomic status, education, access to healthcare, and the physical environment. Understanding the interactions of these elements will be essential for addressing health disparities and developing more effective public health policies and interventions.

1 Introduction

Current research focuses on how social determinants of health (SDoH) plays a massive impact on one's health; it is estimated that 80 percent of a population's health outcomes are dictated by SDoH (Hood et al., 2016). Often, SDoH, when referring to an individual, can result in racial disparities in care when looking at a population(Monroe et al., 2023). It has been shown that major inefficiencies in the health system are attributed to overlooked prevention opportunities and unequal access to care.(Allin et al., 2014)

Understanding the intricate interplay of these social determinants is crucial in addressing health disparities and developing effective public health policies and interventions. The COVID-19 pandemic has shed new light on these disparities, amplifying existing inequalities within various communities. This research topic gains paramount importance in the current context as it seeks to delve into the specific impact of COVID-19 on key social determinants of health in different counties and racial groups in Connecticut.

The existing literature underscores the pressing need for research in this area. Studies have shown that predominantly black counties in the United States experience significantly higher COVID-19 infection and mortality rates, emphasizing the racial disparities prevalent in healthcare outcomes. The pandemic has magnified these discrepancies, leading to mortality rates among historically marginalized minority communities that are 1.9 to 2.4 times higher compared to the general population (Badalov et al., 2022). Additionally, inefficiencies

in the healthcare system have been attributed to overlooked prevention opportunities and unequal access to care, necessitating a comprehensive examination of these social determinants in the context of the pandemic.

Despite the growing body of research on SDOH, there is a notable gap concerning the specific impact of COVID-19 on these determinants within diverse communities. This research aims to bridge this gap by comprehensively assessing how the pandemic has influenced key social determinants of health across various counties and racial groups in Connecticut. By identifying the specific ways in which different communities were affected, this study contributes valuable insights for targeted interventions, policy-making, and the development of equitable healthcare strategies.

The rest of the paper is organized as follows.

The data will be presented in Section3

The methods are described in Section2

The results are reported in Section4

A discussion concludes in Section5

2   Methods

In this study, descriptive statistics is utilized to outline the total population, racial composition, education levels, and average rehospitalization rate across the 8 counties in Connecticut. ANOVA tests were conducted to assess the significance of the difference of the variables of median income, poverty level, health insurance, utilities access, and electronics access between counties and across the four years (2017, 2018, 2019, 2020). Additional Tukey's HSD tests were conducted to determine the specific counties and years that have had significant differences within each of the variables for each county.

3   Data

Data was collected from The Agency for Healthcare Research and Quality (AHRQ).The dataset comprises 7 variables spanning a period of 4 years (2017, 2018, 2019, 2020) with observations across the 8 counties in Connecticut. These variables encompass a total of 56 observations. The variables questions include housing, education level, income, insurance, rehospitalization rates, food stamps usage, and population racial characteristics. The dataset includes a range of calculated percentages, median values, and raw observations, providing a holistic view of various factors affecting the communities in these counties.

4   Results

5   Discussion

The results of the analysis shed light on the intricate relationships between county, race, and key variables such as median income, housing affordability, rehospitalization rates, food stamps usage, uninsured rates, and racial demographics. Understanding these correlations

| County		Fairfield County	Hartford County	Litchfield County	Middlesex County	New Haven County	New London County	Tolland County	Windham County
Total Population		944977	894465.25	182657.5	163318.25	858678	268477.75	151218.75	116608.75
Race	American Indian and Alaska Native race alone	0.24	0.3075	0.2025	0.195	0.1725	0.605	0.05	0.565
	Asian	5.2925	5.2925	1.9	3.0625	4.005	4.12	4.675	1.3675
	Black or African American	11.405	13.7025	1.83	5.385	13.34	5.8175	3.1075	2.33
	Native Hawaiian and Pacific Islander	0.055	0.035	0	0.005	0.0225	0.025	0	0.015
	White	72.6325	70.67	92.6025	88.0875	73.2875	80.6175	88.025	88.8725
Ethnicity	Hispanic	19.53	17.8275	6.15	6.12	17.885	10.5	5.4475	11.6375
Education	Associates	20.74	25	27.9225	26.46	24.4175	29.2675	26.315	30.9775
	Bachelor	26.53	21.4575	20.635	23.3325	18.785	18.3175	23.4075	14.595
	Graduate Degree	21.14	16.475	14.6975	18.4525	16.3425	15.18	17.865	9.55
	HS Graduate	21.4725	26.7175	29.5875	26.0275	30.565	29.46	27.03	33.5125
	Less the High School	10.12	10.3525	7.1575	5.7275	9.8875	7.7725	5.385	11.365
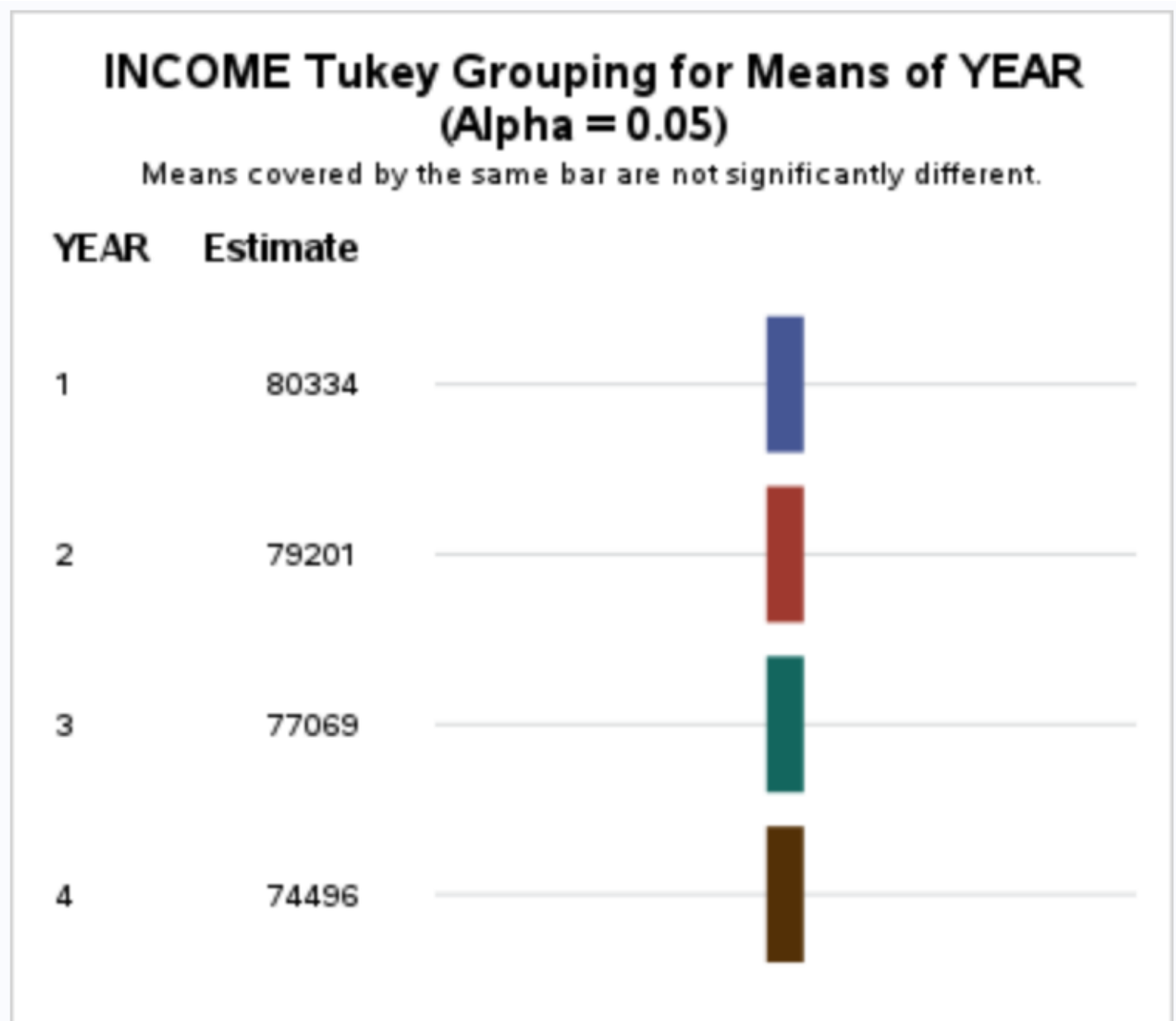
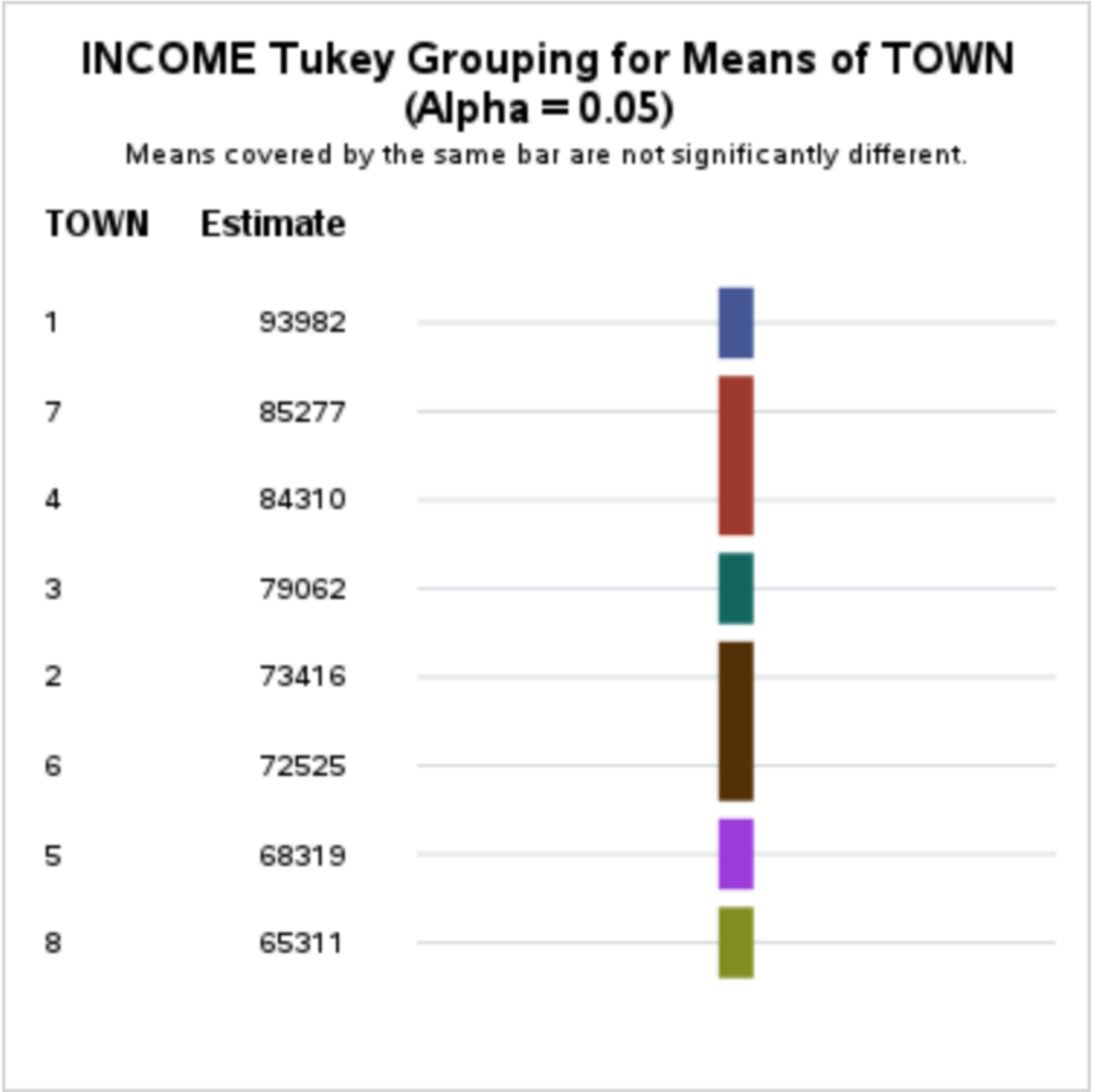Figure 1: Median Income by Year.

Figure 2: Median Income by County.

Multiple Comparisons

Dependent Variable: Income
Tukey HSD

(I) County	(J) County	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1.00	2.00	20565.50000*	1883.47243	<.001	14327.6034	26803.3966
	3.00	14919.50000*	1883.47243	<.001	8681.6034	21157.3966
	4.00	9671.75000*	1883.47243	<.001	3433.8534	15909.6466
	5.00	25662.75000*	1883.47243	<.001	19424.8534	31900.6466
	6.00	21456.50000*	1883.47243	<.001	15218.6034	27694.3966
	7.00	8705.00000*	1883.47243	.002	2467.1034	14942.8966
	8.00	28671.00000*	1883.47243	<.001	22433.1034	34908.8966
2.00	1.00	-20565.50000*	1883.47243	<.001	-26803.3966	-14327.6034
	3.00	-5646.00000	1883.47243	.096	-11883.8966	591.8966
	4.00	-10893.75000*	1883.47243	<.001	-17131.6466	-4655.8534
	5.00	5097.25000	1883.47243	.169	-1140.6466	11335.1466
	6.00	891.00000	1883.47243	1.000	-5346.8966	7128.8966
	7.00	-11860.50000*	1883.47243	<.001	-18098.3966	-5622.6034
	8.00	8105.50000*	1883.47243	.005	1867.6034	14343.3966
3.00	1.00	-14919.50000*	1883.47243	<.001	-21157.3966	-8681.6034
	2.00	5646.00000	1883.47243	.096	-591.8966	11883.8966
	4.00	-5247.75000	1883.47243	.145	-11485.6466	990.1466
	5.00	10743.25000*	1883.47243	<.001	4505.3534	16981.1466
	6.00	6537.00000*	1883.47243	.035	299.1034	12774.8966
	7.00	-6214.50000	1883.47243	.051	-12452.3966	23.3966
	8.00	13751.50000*	1883.47243	<.001	7513.6034	19989.3966
4.00	1.00	-9671.75000*	1883.47243	<.001	-15909.6466	-3433.8534
	2.00	10893.75000*	1883.47243	<.001	4655.8534	17131.6466
	3.00	5247.75000	1883.47243	.145	-990.1466	11485.6466
	5.00	15991.00000*	1883.47243	<.001	9753.1034	22228.8966
	6.00	11784.75000*	1883.47243	<.001	5546.8534	18022.6466
	7.00	-966.75000	1883.47243	.999	-7204.6466	5271.1466
	8.00	18999.25000*	1883.47243	<.001	12761.3534	25237.1466
5.00	1.00	-25662.75000*	1883.47243	<.001	-31900.6466	-19424.8534
	2.00	-5097.25000	1883.47243	.169	-11335.1466	1140.6466
	3.00	-10743.25000*	1883.47243	<.001	-16981.1466	-4505.3534
	4.00	-15991.00000*	1883.47243	<.001	-22228.8966	-9753.1034
	6.00	-4206.25000	1883.47243	.368	-10444.1466	2031.6466
	7.00	-16957.75000*	1883.47243	<.001	-23195.6466	-10719.8534
	8.00	3008.25000	1883.47243	.747	-3229.6466	9246.1466
6.00	1.00	-21456.50000*	1883.47243	<.001	-27694.3966	-15218.6034
	2.00	-891.00000	1883.47243	1.000	-7128.8966	5346.8966
	3.00	-6537.00000*	1883.47243	.035	-12774.8966	-299.1034
	4.00	-11784.75000*	1883.47243	<.001	-18022.6466	-5546.8534
	5.00	4206.25000	1883.47243	.368	-2031.6466	10444.1466

Figure 3: Median Income by County.

is vital in comprehending the socio-economic and racial disparities prevalent in the studied region.

The disparity in median income over the studied years, particularly the peak observed in 2020, signifies economic fluctuations. Notably, county 1 stands out with significantly higher income compared to other counties, indicating potential disparities in resource access and opportunities. This wealth gap implies potential repercussions on community health outcomes. The consistent trend in the percentage of income spent on rent underscores a persistent challenge for residents, especially noticeable in counties 1 and 5, indicating enduring economic pressure.

Rehospitalization rates demonstrate stability across counties and years leading up to 2020, suggesting a consistent healthcare landscape. Counties 8, 2, and 5 exhibiting higher food stamp usage point to economic challenges faced by residents in these regions. This trend aligns with housing affordability issues, indicating a correlation between financial stress and reliance on government assistance programs.

The notably high uninsured rate in county 1 raises concerns about healthcare accessibility, likely linked to economic factors impacting insurance affordability. Conversely, the lower uninsured rate in Year 3 (2019) signifies positive progress. Analyzing the policies or interventions implemented during this period could provide valuable insights for effective healthcare reforms, offering potential guidance for future initiatives.

The racial demographics highlight disparities in various counties. County 3's higher percentage of white individuals, coupled with County 2, 5, and 1 having the highest black population, points to the need for targeted interventions addressing racial health inequalities. These disparities might be indicative of historical, social, and economic factors influencing the healthcare experiences of different racial groups.

5.1   Limitations

One limitation lies in the availability and quality of data. This dataset does not have any data from years after 2020 which may serve to limit potential external validity considerations. There may also be variability in data collection methods and discrepancies in reporting standards leading to missing or incomplete data over the course of 4 years. Another limitation involves the scope of the study, focusing on specific counties in Connecticut may not fully capture nationwide disparities. Additionally, the research is limited to the factor parameters selected to investigate which might not encompass all relevant social determinants affecting health outcomes.

5.2   Future Directions

These findings underscore the complex interplay between socio-economic status, race, and health outcomes. Addressing these disparities requires multifaceted interventions, including economic support, affordable housing initiatives, and targeted healthcare access programs. Future research should delve deeper into the root causes of these disparities, considering historical and systemic factors. Additionally, policy interventions and community-based programs should be designed to specifically target areas and populations facing the most significant challenges, aiming for a more equitable healthcare landscape for all residents.

References

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