

Income inequality, socioeconomic segregation and death risks in poorest and richest Brazilian regions

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Introduction (1)

- Income inequality in a society tends to be associated with poorer population health
- But also within societies, much narrower contexts, such as census tracts, has been found to have health effect on its residents



Introduction (2)

- The mechanisms behind these types of relation are far from clear
- It has been argued that economic residential segregation is causally related to income inequality, but are they also parts of the same mechanism in relation to population health?



Objectives

- To investigate if income inequality within greater areas is associated with the level of socioeconomic segregation
- If and how inequality and segregation are associated with the overall and cause-specific mortality rates



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Method (1)

- An ecological cross-sectional study was conducted to compare Brazilian biggest cities (50,000 inhabitants and more) in South Eastern (richer) with North Eastern (poorer) regions
- Age standardised total mortality but also specific mortality rates (by neoplasms and cardiovascular diseases) were estimated by sex, by using triennial averages (1999-2001)

Method (2)

- We decomposed total income inequality into “between” and “within” components by census tracts, in which the relative size (proportion) of the “between” component was defined as “segregation”.
- Multivariate models were adjusted by linear regression, with income inequality and segregation as independent and mortality rates as dependent variables. For analysis, all models were weighed by population city size and adjusted by mean income and mean household size.

Results (1)

Table 1. Regression of mortality rates (all causes) using overall inequality and residential segregation (BTI/WTI) in the same model. Brazilian municipalities $\geq 50,000$ inhabitants, 1999-2001.

Death rates	Regression results				
	Overall inequality		Segregation (BTI/WTI)		Adj R ²
	β	p	β	p	
0-14 years					
m	0.20	0.0000	0.21	0.0001	0.12
f	0.19	0.0001	0.19	0.0004	0.11
15-34 years					
m	-0.03	0.605	-0.02	0.671	0.05
f	0.08	0.112	-0.02	0.714	0.04
35-64 years					
m	-0.02	0.565	0.02	0.622	0.32
f	0.06	0.214	0.04	0.457	0.20
65 and over					
m	-0.05	0.236	-0.03	0.514	0.45
f	0.01	0.809	-0.03	0.487	0.27
All ages					
m	-0.06	0.175	-0.03	0.528	0.37
f	0.03	0.581	-0.04	0.458	0.21

Results (2)

Table 2. Regression of mortality rates (neoplasms) using overall inequality and residential segregation (BTI/WTI) in the same model. Brazilian municipalities $\geq 50,000$ inhabitants, 1999-2001.

Death rates	Regression results					Adj R ²
	Overall inequality		Segregation (BTI/WTI)			
	β	p	β	p		
<i>0-14 years</i>						
m	-0.02	0.652	-0.08	0.165	0.02	
f	0.05	0.323	-0.002	0.973	0.03	
<i>15-34 years</i>						
m	-0.01	0.895	-0.05	0.386	0.14	
f	0.08	0.122	0.002	0.977	0.06	
<i>35-64 years</i>						
m	-0.09	0.005	-0.06	0.096	0.566	
f	-0.02	0.540	-0.05	0.239	0.45	
<i>65 and over</i>						
m	-0.08	0.011	-0.06	0.071	0.60	
f	-0.06	0.062	-0.05	0.201	0.57	
<i>All ages</i>						
m	-0.10	0.002	-0.08	0.023	0.62	
f	-0.05	0.115	-0.07	0.081	0.55	

Results (3)

Table 2. Regression of mortality rates (CVD) using overall inequality and residential segregation (BTI/WTI) in the same model. Brazilian municipalities $\geq 50,000$ inhabitants, 1999-2001.

Death rates	Regression results					Adj R ²
	Overall inequality		Segregation (BTI/WTI)			
	β	<i>p</i>	β	<i>p</i>		
0–14 years						
m	0.09	0.067	0.11	0.051	0.004	
f	0.15	0.002	0.27	0.0000	0.07	
15–34 years						
m	0.13	0.009	0.05	0.353	0.01	
f	0.11	0.030	0.08	0.162	0.03	
35–64 years						
m	-0.02	0.593	0.05	0.270	0.33	
f	0.04	0.386	0.05	0.323	0.22	
65 and over						
m	-0.04	0.268	-0.04	0.349	0.43	
f	-0.05	0.189	-0.07	0.105	0.43	
All ages						
m	-0.05	0.193	-0.04	0.380	0.41	
f	-0.05	0.251	-0.07	0.103	0.36	

Discussion

- Overall inequality was directly associated to all causes mortality in Northeast, for 0 – 14 years old males and females
- Its “between” component was directly associated to all causes mortality in Southeast for the same age groups in both sexes, and to cardiovascular mortality for 15 – 34 years old males and females, and 35 – 64 years old females
- Segregation was inversely associated, for many models, to all causes and neoplasms adult (more than 35 years old) mortality in Southeast



Conclusion

- This exploratory study shows that, in extremely unequal countries like Brazil, inequality shows different effects on death risks for different regions
- In this case, the effects were more evident in richest areas
- Health inequalities reduction measures must be implemented taking into account regional differences

