

Income-Related Inequalities in Utilization of Health Services among Private Health Insurance Beneficiaries in Brazil

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2016 Brazilian Stata User Group Meeting

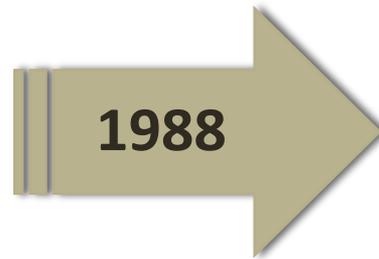
December 2nd, 2016

**FEA-USP, Av. Prof Luciano Gualberto, 908 - Cid Universitária
São Paulo - SP**

1. Background

Health Reform

Social Health Insurance
(formal workers)

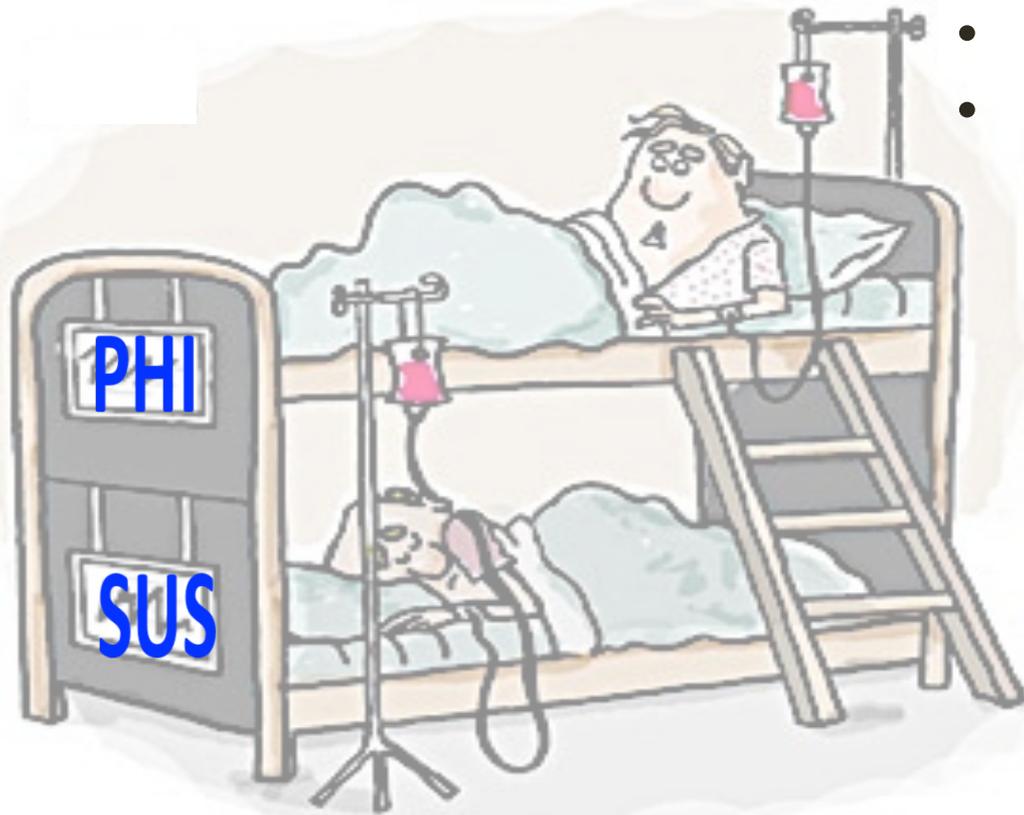


National Health Services
(Universal Coverage)

1. Background



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Two-tier system:

- Dual coverage (SUS & PHI)
- SUS dependent

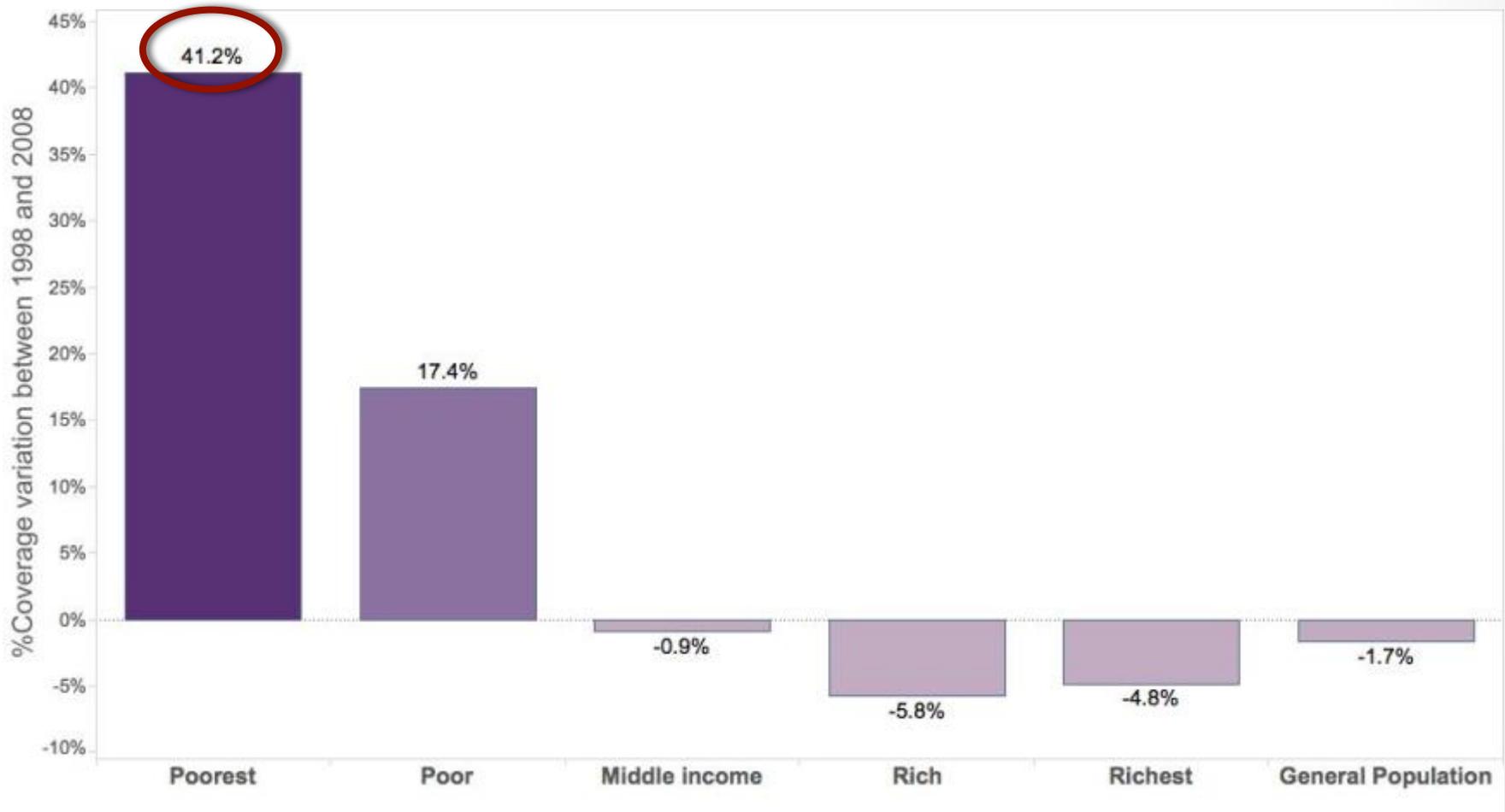
1. Background

PHI coverage by income quintiles, 1998, 2003, and 2008



1. Background

PHI coverage variation by income quintiles, 1998-2008



2. Building on the literature

The literature focuses on differences between privately insured and uninsured (SUS only) and reports higher levels of utilization among insured individuals.

3. Research Question & Objective

Accountability issue: Does private insurance improve access regardless of individuals' income?

Investigate inequalities in healthcare utilization among PHI beneficiaries across income.

4. Methods – measuring inequality

1. Need-standardized variations across income-quintiles
2. Concentration curves
3. Concentration Index / Horizontal inequality index
4. Decomposition analysis

4. Methods – data source

- **1998 & 2008** *Pesquisa Nacional por Amostra de Domicílios – PNAD*
- Administrative data on hospital beds and physician per capita at state level (RIPSA 2012).

4. Methods – analytical model

Dependent variables

Type	Unit of Analysis
Physician services	Any physician visit (contact)
	Number of physician visits (volume)
Hospital services (SUS financed & PHI financed)	Any hospitalization (contact)
	Number of inpatient days (volume)
Hospital services (admissions)	Number of hospital admissions (volume)

4. Methods – analytical model

Health services System variables

Resources & Distribution

- Hospital beds/1000
- Physician beds/1000

Organization (access)

- Family health program
- Geographical coverage
- Cost-sharing

Organization (structure)

- Premium amount
- PHI quality
- Employer-based coverage

Individual determinants

Predisposing & Enabling

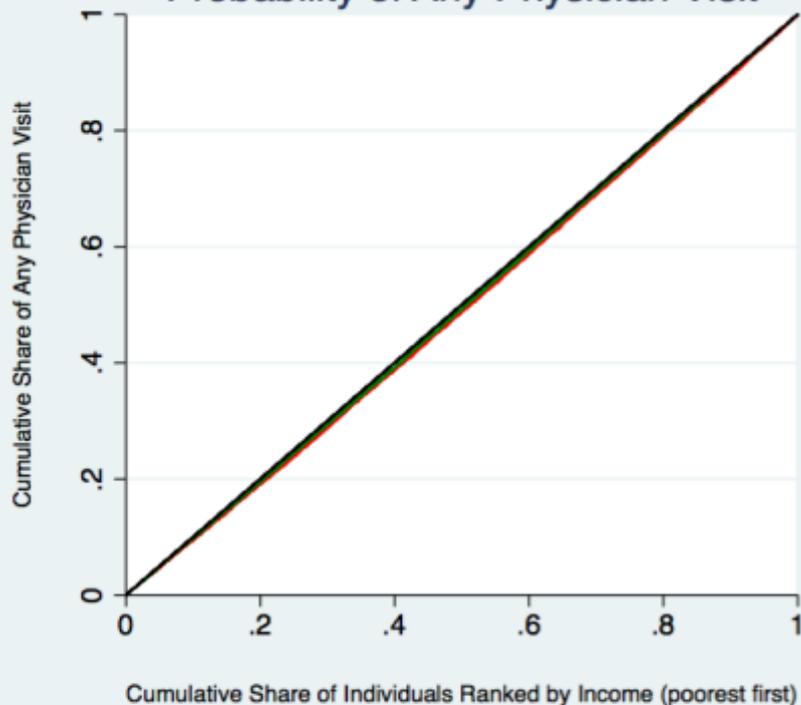
- *Age/Sex (confounding)*
- Income (living standard)
- Family type
- Education
- Economic activity
- Race/ethnicity
- Geographic region
- Area of residence (urban/rural)

Need (*confounding*)

- *Self-assessed health*
- *Impairment*
- *Physical limitations*

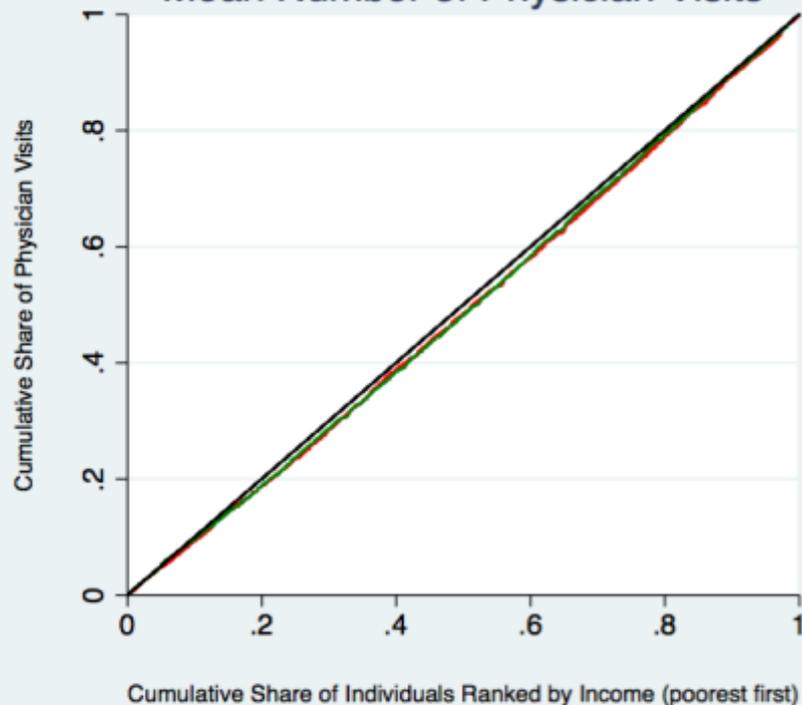
5. Results – physician services

Probability of Any Physician Visit



— PNAD 1998
— PNAD 2008
— Line of Equality

Mean Number of Physician Visits



— PNAD 1998
— PNAD 2008
— Line of Equality

5. Results – physician services

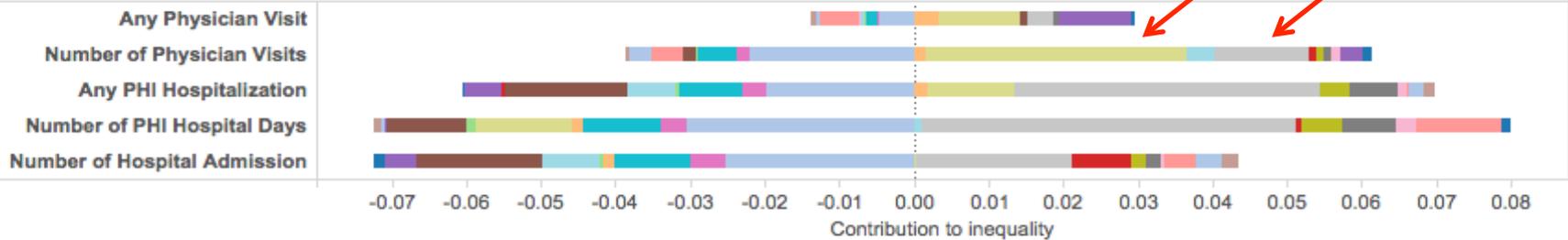


Note: Refers to actual distribution

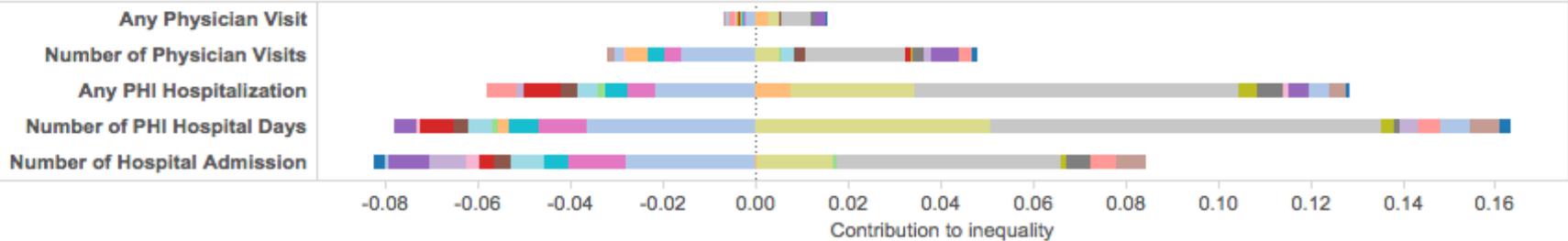
▼ Poorest 20%
 ● 2nd poorest 20%
 ◆ Middle
 ■ 2nd richest 20%
 ▲ Richest 20%
 × Mean

5. Results – physician services

Decomposition of Inequality in Healthcare Utilization - 1998



Decomposition of Inequality in Healthcare Utilization - 2008



- Self-Assessed Health
- Bed per thousand
- Insurance quality
- Family Head's Economic Activity
- Impairment
- Physician per thousand
- Insurance coverage area
- Race
- Physical Limitations
- Family type
- Insurance copay
- Geographic Region
- Age-Sex
- Insurance premium
- Family health program
- Rural Residence
- Log of Family Income
- Employer based coverage
- Family Head's Education

5. Results – physician services

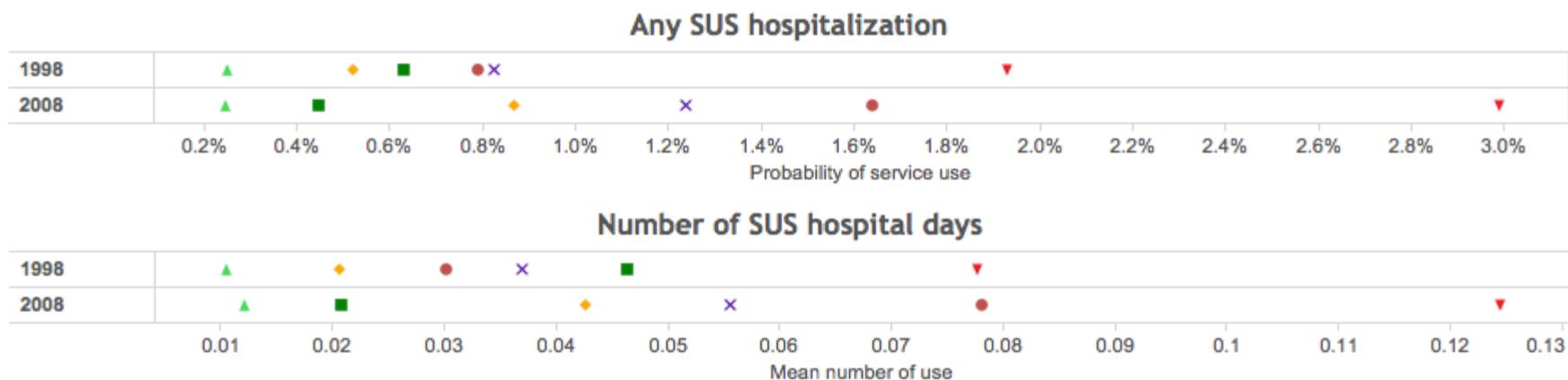
Quintile	Any Physician Visit			
	PHI1998	Brazil1998	PHI2008	Brazil2008
Poorest 20%	0.7163	0.5185	0.8139	0.6339
2nd poorest 20%	0.7312	0.5598	0.8249	0.6660
Middle	0.7447	0.5685	0.8393	0.6911
2nd richest 20%	0.7673	0.6006	0.8427	0.7134
Richest 20%	0.7919	0.6763	0.8578	0.7774
Mean	0.7503	0.5848	0.8357	0.6964
Horizontal Inequity Index (HI)	0.0206	0.0724	0.0099	0.0518

Quintile	Number of Physician Visits			
	PHI1998	Brazil1998	PHI2008	Brazil2008
Poorest 20%	3.0498	2.0079	3.4873	2.7120
2nd poorest 20%	3.3531	2.2932	3.8301	2.8667
Middle	3.2350	2.3360	3.9669	3.0265
2nd richest 20%	3.6090	2.4912	4.2303	3.0919
Richest 20%	3.9514	2.8358	4.4480	3.4691
Mean	3.4395	2.3928	3.9917	3.0332
Horizontal Inequity Index (HI)	0.0512	0.1200	0.0483	0.0868

Need-standardized with controls (OLS)

Source: Almeida et al (2013)

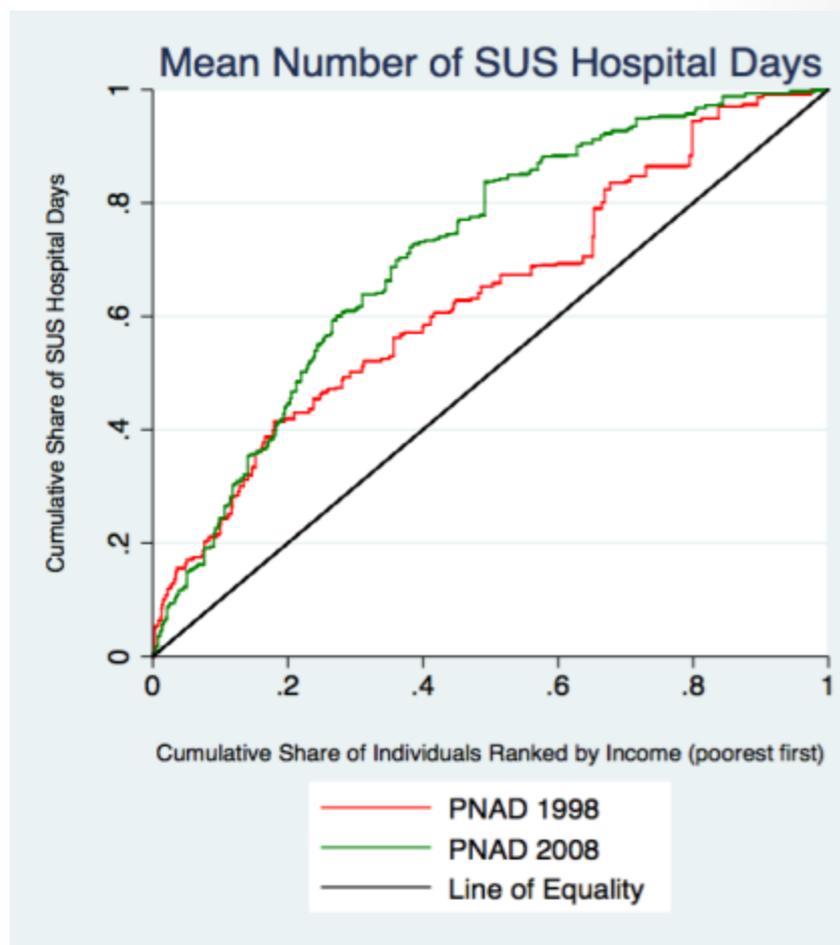
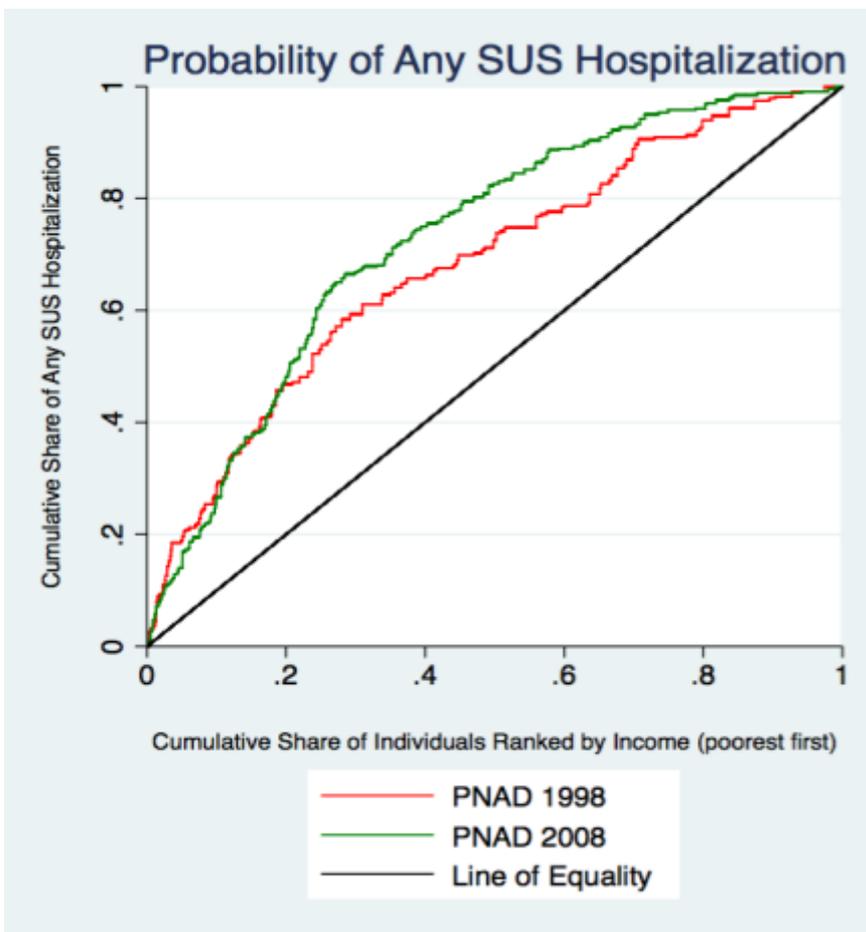
5. Results – hospital services (SUS)



Note: Refers to actual distribution

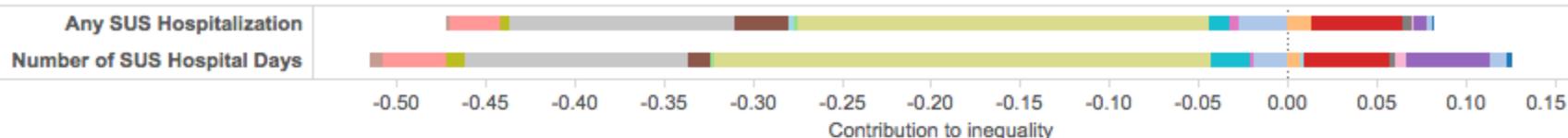
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5. Results – hospital services (SUS)



5. Results – hospital services (SUS)

Decomposition of Inequality in Healthcare Utilization - 1998

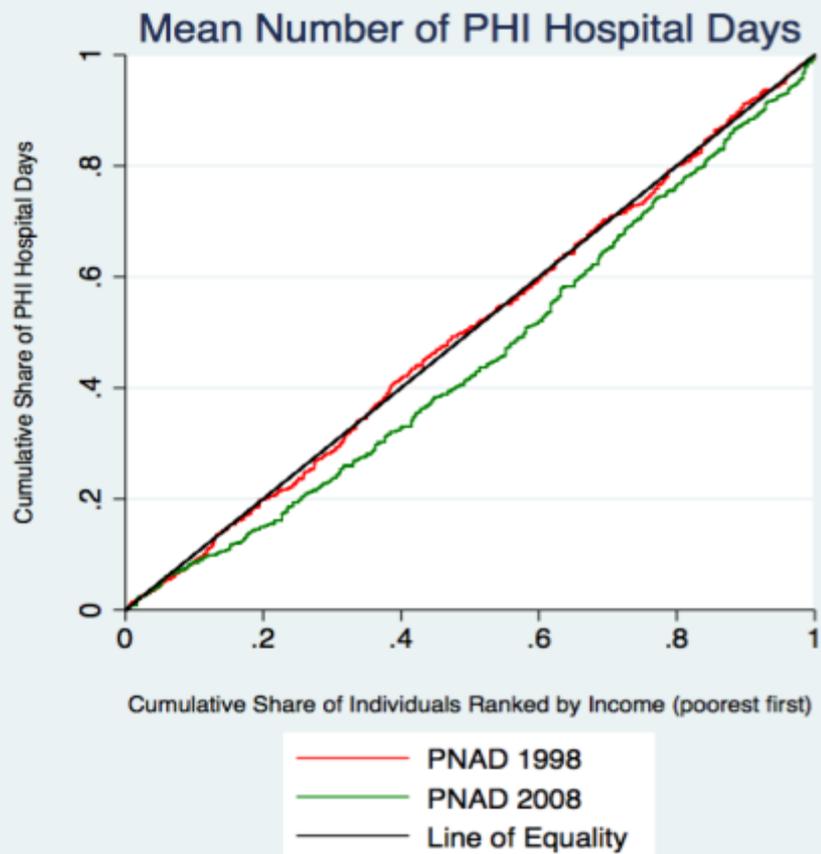
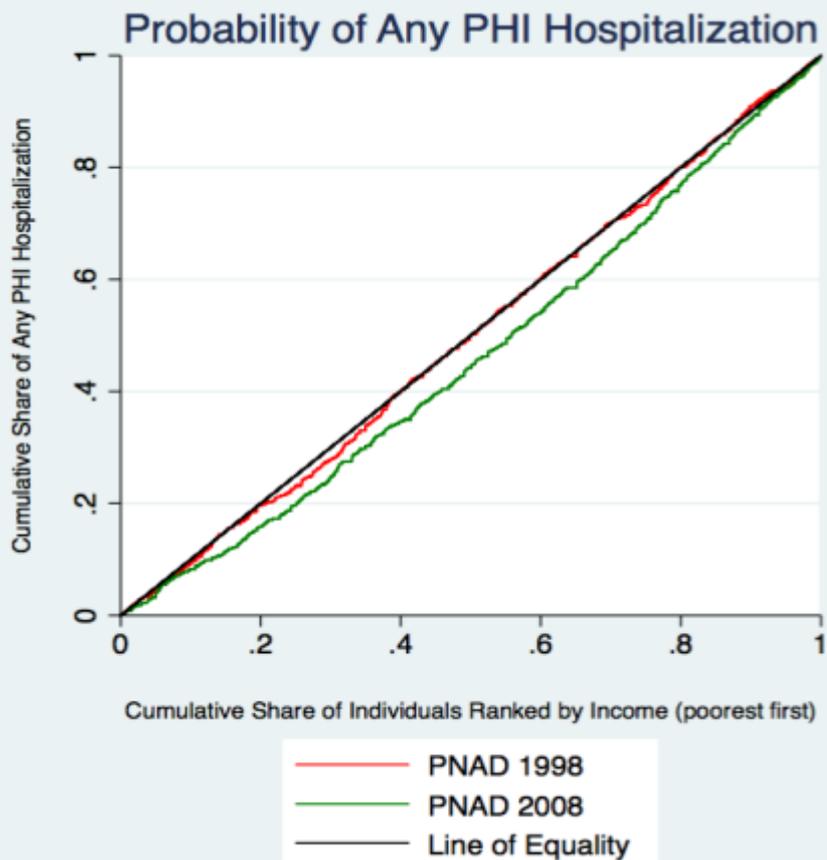


Decomposition of Inequality in Healthcare Utilization - 2008



- Self-Assessed Health
- Impairment
- Physical Limitations
- Age-Sex
- Log of Family Income
- Bed per thousand
- Physician per thousand
- Family type
- Insurance premium
- Employer based coverage
- Insurance quality
- Insurance coverage area
- Insurance copay
- Family health program
- Family Head's Education
- Family Head's Economic Activity
- Race
- Geographic Region
- Rural Residence

5. Results – hospital services (PHI)



5. Results – hospital services (PHI)

Any PHI Hospitalization				
Quintile	PHI1998	Brazil1998	PHI2008	Brazil2008
Poorest 20%	0.0747	0.1014	0.0550	0.0891
2nd poorest 20%	0.0783	0.0929	0.0704	0.0816
Middle	0.0782	0.0794	0.0737	0.0776
2nd richest 20%	0.0804	0.0730	0.0875	0.0731
Richest 20%	0.0879	0.0728	0.0925	0.0757
Mean	0.0799	0.0839	0.0758	0.0794
Health Inequity Index (HI)	0.0367	-0.0104	0.1002	0.0189

Number of PHI Hospital Days				
Quintile	PHI1998	Brazil1998	PHI2008	Brazil2008
Poorest 20%	0.2917	0.6241	0.1891	0.5967
2nd poorest 20%	0.3356	0.6460	0.2755	0.5882
Middle	0.2789	0.5644	0.3057	0.5818
2nd richest 20%	0.3428	0.4551	0.4029	0.5093
Richest 20%	0.3689	0.4150	0.4191	0.5027
Mean	0.3236	0.5409	0.3182	0.5557
Health Inequity Index (HI)	0.0472	0.0239	0.1491	0.0430

Need-standardized with controls (OLS)

Source: Almeida et al (2013)

6. Conclusion

Physician Services

- Poor PHI beneficiaries utilize physician services at comparable levels as the rich. Compared to national levels, they have an advantage.

Hospital Services

- Poor PHI beneficiaries utilize private hospital at lower levels than the rich. Compared at a national level, they are at a disadvantage. In 1998, this was not the case, suggesting that PHI may be developing mechanisms to deter utilization.

6. Policy implications

These findings suggest that PHI carriers are finding ways to game the system at the expense of their poorest beneficiaries.

The Brazilian government (ANS) needs to do a better job at monitoring utilization across income/premium and developing policies to increase the transparency and accountability of PHI products.

Thank you!



Questions?

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Extras slides

6. Discussion

Why might poor PHI beneficiaries be using SUS hospitals?

PHI “push factors”

- Insufficient supply (beds)
- Cost-sharing

SUS “pull factors”

- Family health program
- Cultural element (educational level)

4. Methods – indirect standardization

1. Actual (crude) utilization:

$$y_i = \alpha + \beta \ln inc_i + \sum_j \beta_j x_{ji} + \sum_k \gamma_k z_{ki} + \varepsilon_i$$

2. Expected utilization:

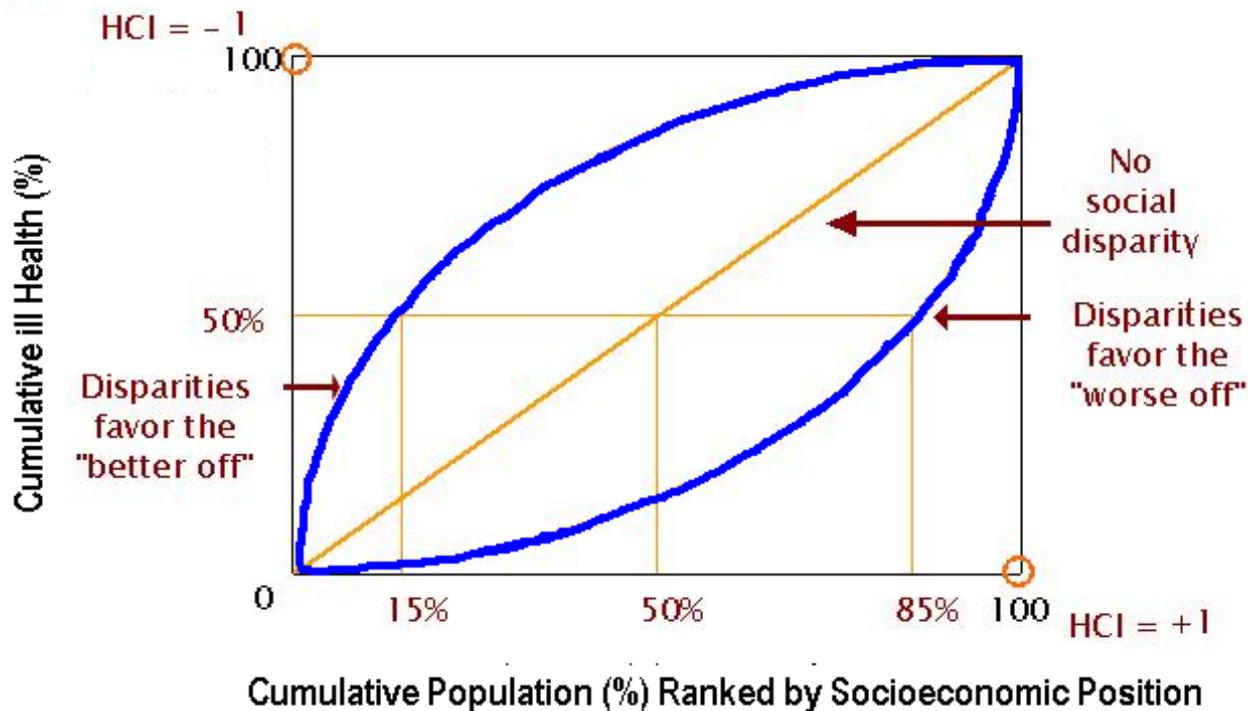
$$\hat{y}_i^X = \hat{\alpha} + \hat{\beta} \overline{\ln inc}_i + \sum_j \hat{\beta}_j x_{ji} + \sum_k \hat{\gamma}_k \bar{z}_p$$

3. Standardized utilization is:

$$y_i^{IS} = y_i - \hat{y}_i^X + \bar{y}$$

4. Methods – concentration curve

The share of the health variable accounted for by cumulative proportions of individuals in the population ordered by the socioeconomic variable.



4. Methods – concentration index

Convenient covariance formula:

$$C = \frac{2}{\mu} \text{cov}(h, r)$$

- The formula reflects the relationship between the health variable and rank in the income distribution.
- It is the covariance between these two variables scaled by 2 divided by the mean of the health variable.



7. Significance and Contribution of Research

- Brings innovation as no study to date has focused on inequality among PHI beneficiaries in Brazil.
- Builds on theory with the operationalization of contextual variables using Andersen's framework.
- Develops empirical evidence on the problem of utilization through private coverage.

8. Limitations

- Cross sectional survey not primarily designed to test equity in healthcare
- Recall period of 12 months
- Methods can only provide information on differences in quantities of healthcare and not on quality or appropriateness of healthcare