

Disease, Disparities, and Development: Evidence from Chagas Disease Control in Brazil

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Motivation: Chronic Disease Burden

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→ Can combating chronic disease affect income and health inequalities and intergenerational cycles of poverty?

Chronic Disease of Interest: Chagas Disease

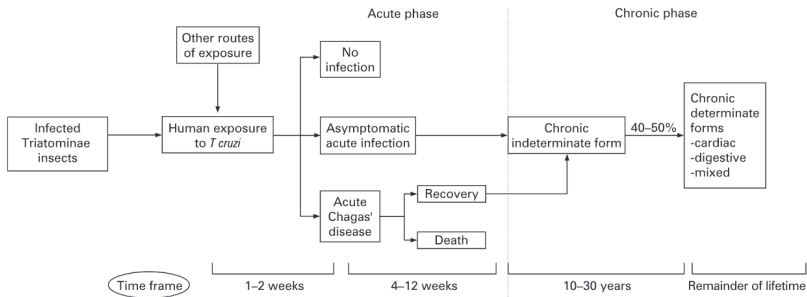
Parasitic infection: Chronic and debilitating symptoms, like many other neglected tropical diseases

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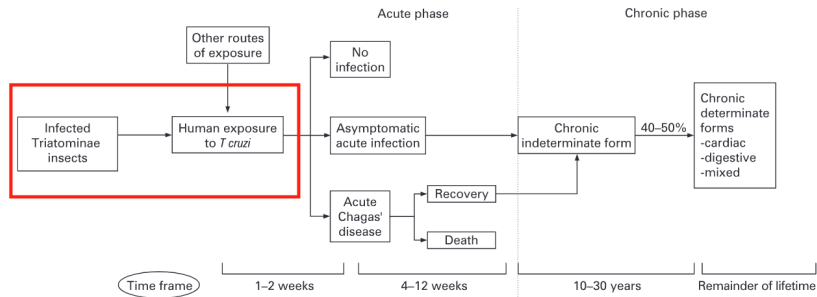


Source: Rassi et al. (2009)

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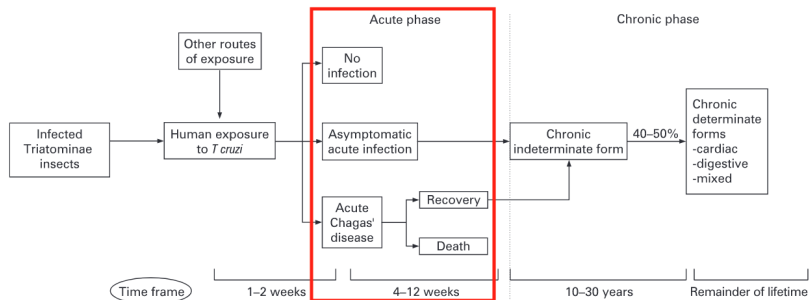
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More common in poor housing → More exposure if non-white?

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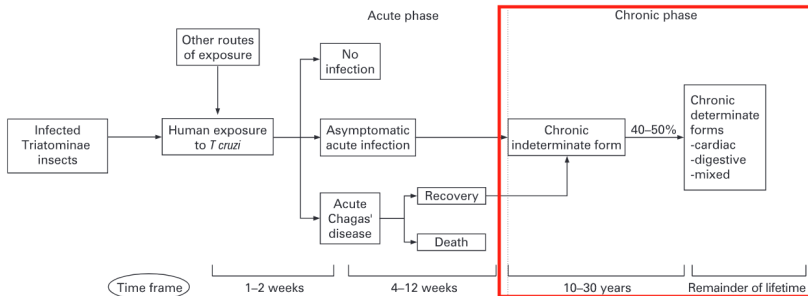
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Fever and malaise for children and adults, **can be reinfected**

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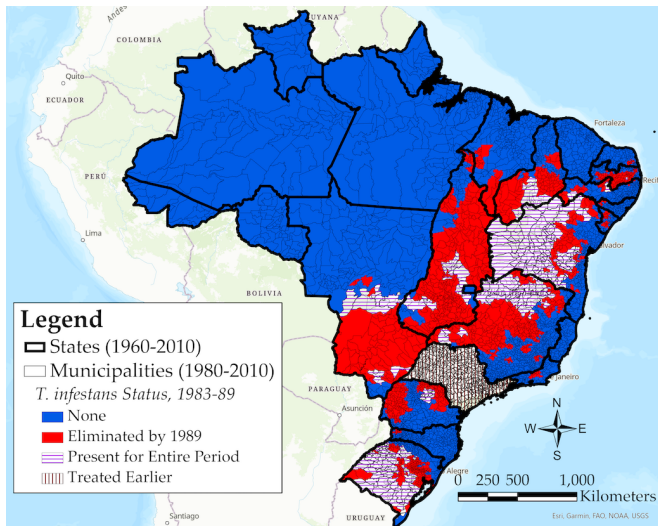


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Heart disease as adults → Adult income, next gen's outcomes?

Setting: Brazil's Triatomine Control Campaign, 1984-89

1975-83 survey: 8% rural seroprevalence, vector in 1/3 of territory



Data and Empirical Strategy (I)

Data: IPUMS 10-percent sample of 2010 Brazilian census

Diff-in-diff 1: Long-run effects on adults treated in childhood

- ▶ Birth municipality: {None (C), eliminated in 1984-89 (T)}
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Diff-in-diff 2: Effects on children of adults treated in childhood

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Interpretation: Effect of years in (father's) childhood free from exposure to Chagas Disease

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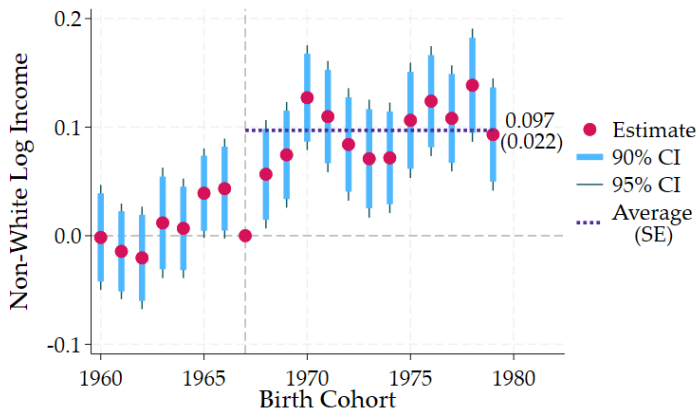
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TWFE: Show OLS results (all robust to new estimators)

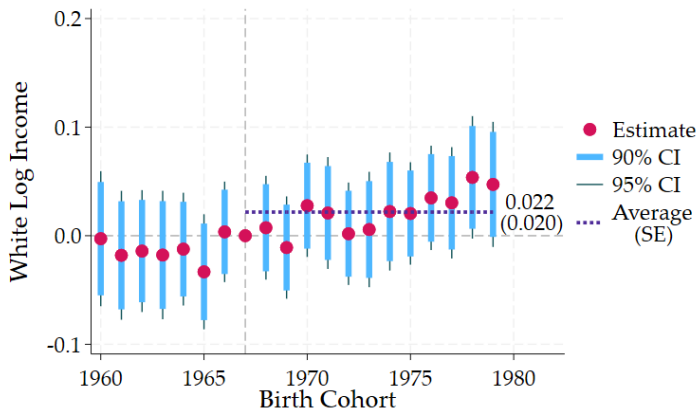
Result 1: Reducing (Racial) Income Inequality



Notes: Regression uses 2,471,553 observations. Standard errors clustered by municipality of birth in parentheses. For pre-treatment cohorts, mean log monthly income was 4.82.

More Chagas-free childhood years: Non-white incomes \uparrow 9.7%

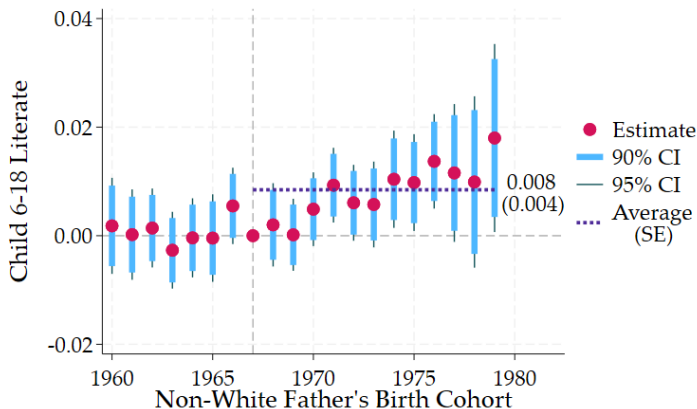
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More Chagas-free childhood years: White incomes \uparrow 2.2%

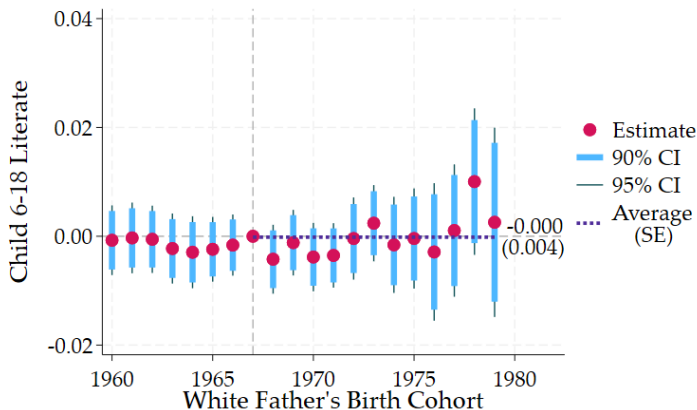
Result 2: Reducing (Racial) Intergenerational Inequality



Notes: Regression uses 1,200,140 observations. Standard errors clustered by father's municipality of birth in parentheses. For children with non-white fathers in pre-treatment cohorts, the literacy rate was 92.0 percent.

More Chagas-free childhood years: Non-white father's children
↑ 0.8 p.p. literate (↑ 0.9% literacy, or ↓ 10% non-literacy)

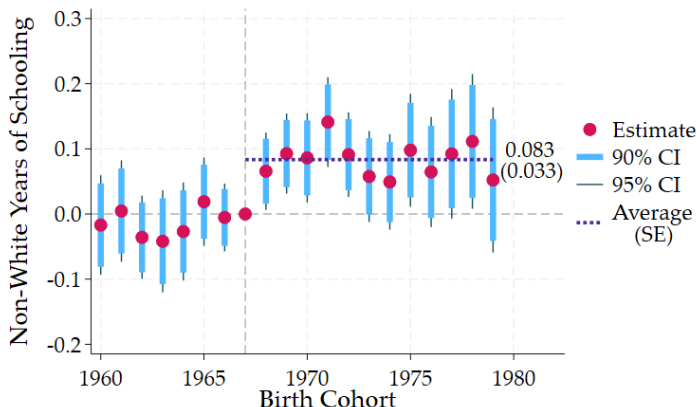
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Notes: Regression uses 773,051 observations. Standard errors clustered by father's municipality of birth in parentheses. For children with white fathers in pre-treatment cohorts, the literacy rate was 96.2 percent.

More Chagas-free childhood years: White father's children experience no effect on literacy

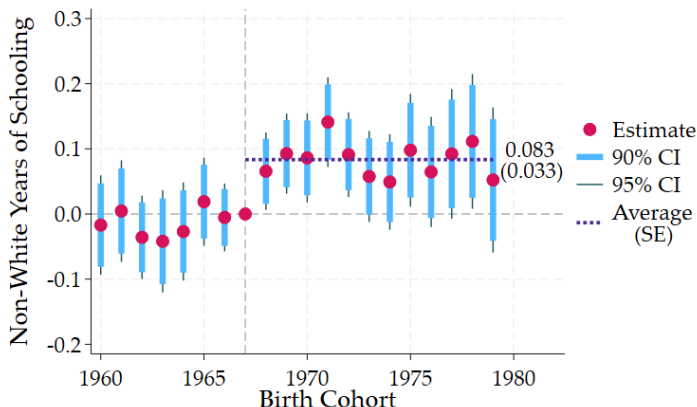
Mechanism: Not (Just) Schooling of Treated Adults



Notes: Regression uses 2,471,553 observations. Standard errors clustered by municipality of birth in parentheses. For pre-treatment cohorts, mean years of schooling was 5.11.

More Chagas-free childhood years: Non-white years of schooling
↑ 0.08 (1.6%)

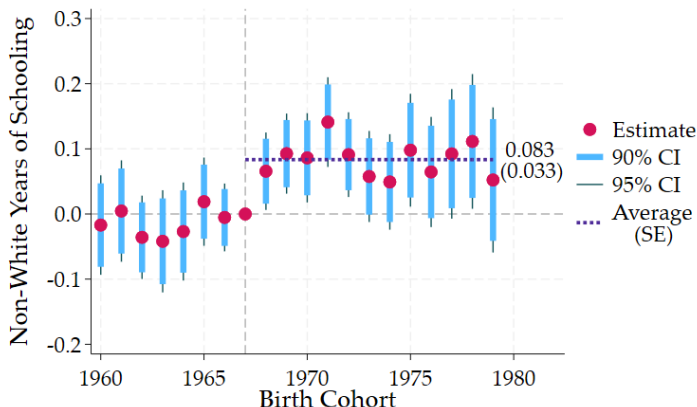
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but ↑ 9.7% income → Other channels matter (e.g., adult health)

Data and Empirical Strategy (II)

Data: Days in hospital paid for by Unified Health Service (SUS) for 1995-2019

Triple-diff:

- ▶ Municipality of residence: {None, eliminated in 1984-89}
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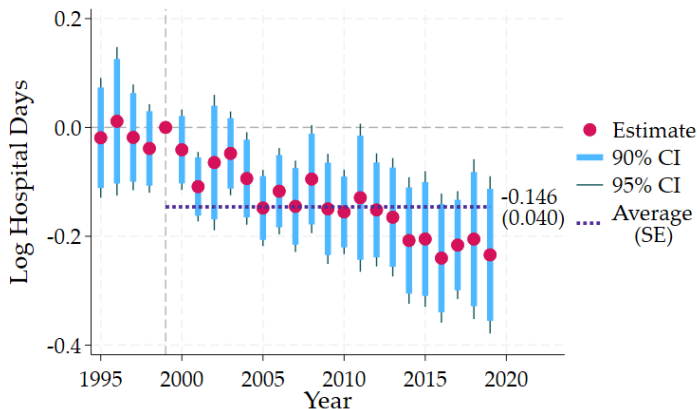
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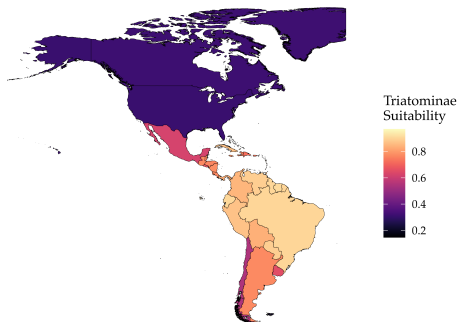
Result 3: Reducing Health Inequality



Notes: Regression uses 187,700 municipality of residence-year-disease category observations. Standard errors clustered by state of residence in parentheses. For non-circulatory disease causes of hospitalization in years prior to 2000, mean log hospital days was 7.96.

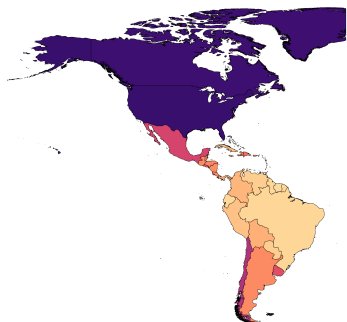
Reducing residents' exposure to Chagas (re)infection: Days in hospital due to circulatory diseases ↓ 14.6%

Broader Relevance: Chagas Disease in the Americas

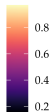


(a) Suitability for Triatomine Bugs

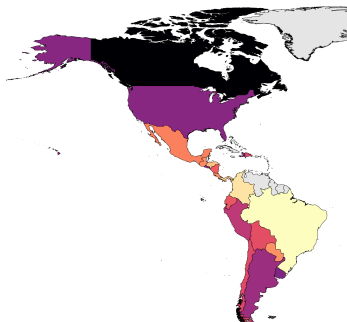
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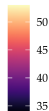
Triatominae
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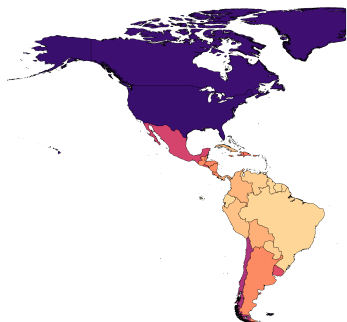
Gini
Coefficient
(2010s)



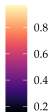
(b) Gini Coefficient

Correlation: Suitability for main Chagas Disease vector linked to inequality in Americas – but not for any other continents

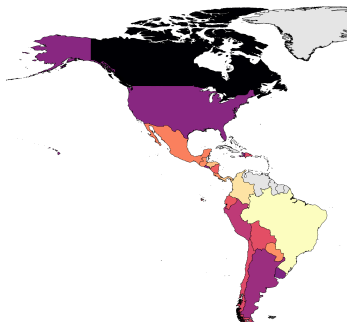
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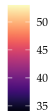
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→ Important to understand as climate change pushes vector into USA

Thank you!

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