The effect of mass migration on malaria incidence: Evidence from the Venezuelan refugee crisis

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ABSTRACT

This paper explores the effect of the recent Venezuelan exodus on malaria outbreaks in the Amazon Rainforest. In the last years, migration skyrocketed due to recurrent economic and political crises. Migrants heading to Brazil commonly travel by land, crossing the Brazil – Venezuela Border in Pacaraima - Roraima. The border is in the Amazon region, a malaria endemic place, home of numerous species of malaria mosquitoes. By exploiting mass migration in 2015 as a quasi-experiment, I find that incidence was 18.59% higher in the nearest municipality to the Venezuelan border after the crisis.

BACKGROUND

The Era of Human Mobility
- Conflict refugees: Syrians, Myanmar Rohingya, Somali, The “boat” people
- Climate change refugees: Mozambicans and Pacific Islanders
- Economic refugees: Central Americans migrating to the US

Venezuelans escaping the economic and political crisis

METHODS AND DATA

Identification strategy: Exploit the Venezuelan economic crash as exogenous variation to estimate the incidence of migration on malaria incidence under a difference-in-difference approach

\[
malaria_{mt} = \alpha_0 + \delta_t Postcrisis_{mt} + \beta X_{mt} + \gamma_{mt} + \lambda_t + \theta_{mt} + \epsilon_{mt} \tag{1}
\]

a) Effect of migration: Malaria rates increase significantly

<table>
<thead>
<tr>
<th>Table 1. Main results for Municipality of Pacaraima</th>
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<td>Post crisis</td>
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<td>Towns</td>
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<td>Baseline controls</td>
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<td>Municipality FE</td>
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<td>Municipality specific time FE</td>
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b) Disease transmission occurs within groups instead of across groups

\[
y_{mt} = \delta_t Postcrisis_{mt} + \gamma_{mt} + \lambda_t + \epsilon_{mt} \tag{2}
\]

Panel data consists of 583 municipalities observed over 22 years (1996-2018)

1. Reported cases of malaria - SIVEP, Brazilian Ministry of Health
2. Venezuelan arrivals to Brazil – Brazilian Federal Police
3. Sociodemographic covariates - Brazilian Ministry of Geography
4. Weather variables - Brazilian National Weather Agency

To what extent is this causal?
Is transmission of malaria within the refugee population or is it among the locals?

CONCLUSIONS

Migration after the Venezuelan economic crash increases significantly the cases of malaria
- The impact on malaria is not driven by a “border effect”
  The Bond-Arellano regressions show that disease transmission occurs within populations rather than across populations
  If trends continue, changes in the geography of malaria are anticipated: low endemic places can promptly become epidemic places
  A cost-efficient governmental policy would potentially be to support better conditions in refugee camps
- Less cases of malaria, thus less costs associated with prevention and intervention and investment
- Healthy migrants able to work and study and fully integrate to society

Questions/Comments/Suggestions
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