



8th European Congress on Tropical Medicine and International Health 2013 - Session #1.4.9

Chagas disease: Can a threshold for bug infestation rate exist?

12th September 2013
Copenhagen, Denmark

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Background & Objectives

Background

- Chagas disease is one of 14 NTDs, which causes **USD 1.2 billion** of productivity loss, per year.
- Vectoral transmission accounts for 80% of Chagas disease transmissions. ***Triatoma dimidiata* is one of major vectors** in Central America.
- **Without scientific justification, 5%** has been used as the *T. dimidiata* infestation rate threshold, to determine whether universal insecticide spraying must be done.

Background & Objectives

Research Question

- Does a justifiable threshold of infestation rate exist?

Objectives

- Assess the existence of a threshold for *T. dimidiata* infestation rate, below which Chagas disease transmission becomes unlikely.
- If it exists, crudely estimate increase/reduction in spray-related costs, through applying the threshold.

Methods-1/2

Study areas

[Targets]

59 communities infested only with *Td* bugs in 15 highly-endemic provinces

[Survey type]

Census = all houses + all children 6mo-15yr of age

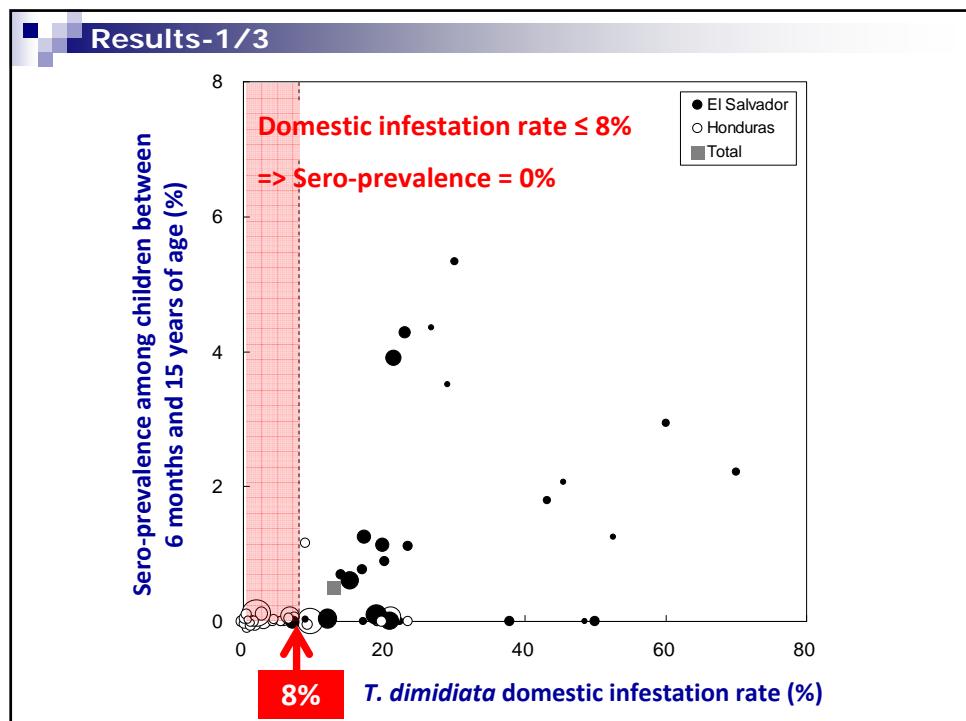
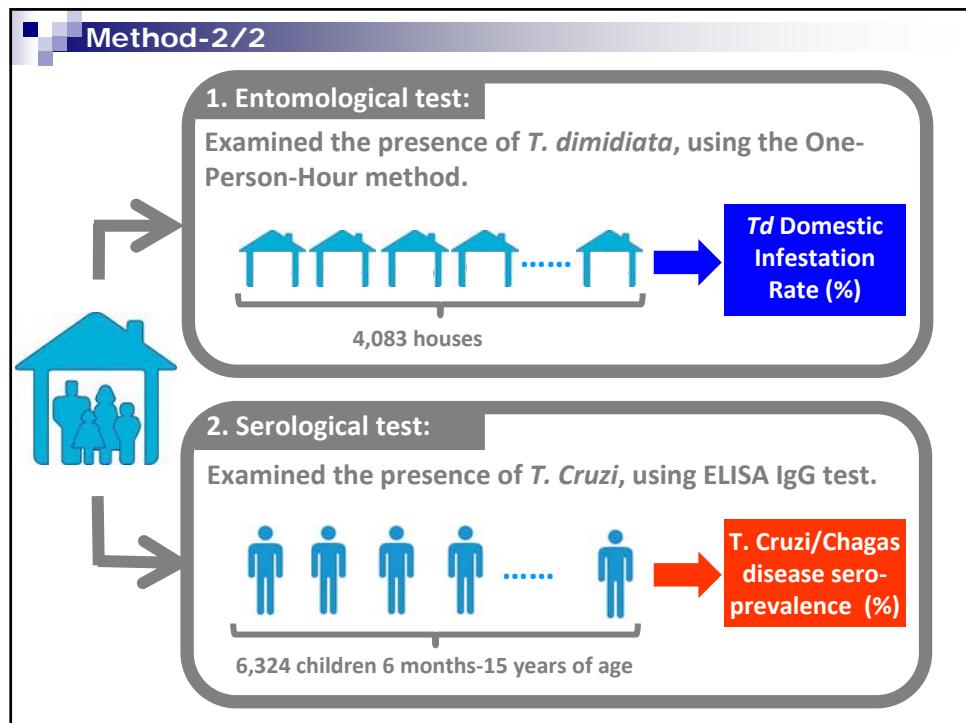


8 highly-endemic provinces



7 highly-endemic provinces





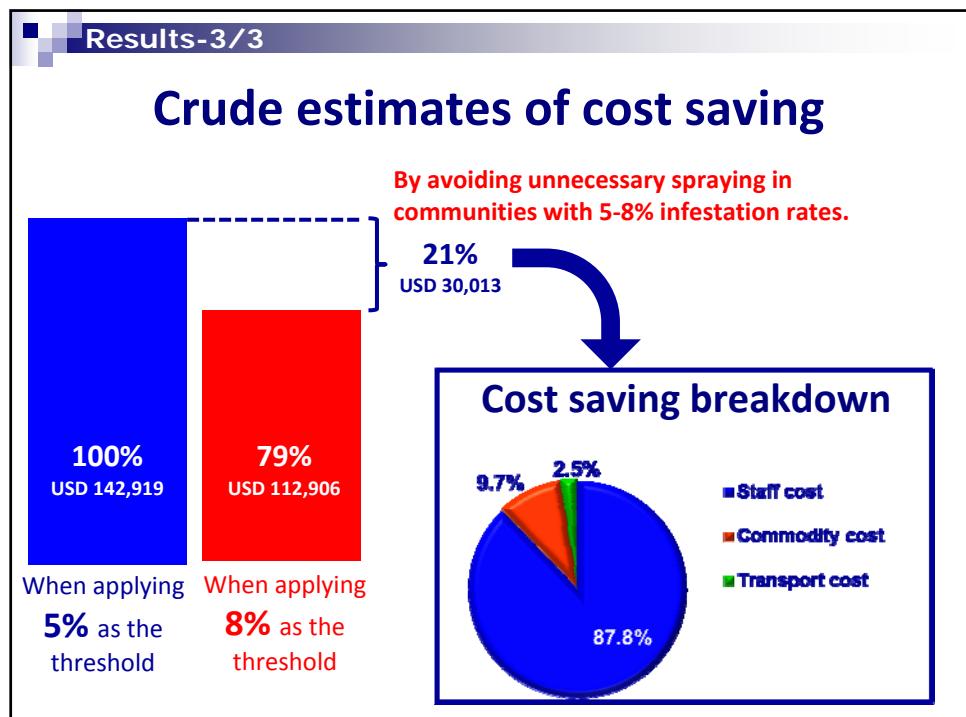
Results-2/3

Relationship between *T. dimidiata* domestic infestation rate threshold 8% and sero-prevalence

		Sero-prevalence among children 6 mo-15 yr of age		Total
		= 0%	> 0%	
<i>T. dimidiata</i> domestic infestation rate	0-8%	29 (49.2%)	0 (0%)	29 (49.2%)
	> 8%	13 (22.0%)	17 (28.8%)	30 (50.8%)
Total		42 (71.2%)	17 (28.8%)	59 (100%)

^a Number of communities
^b Chi-square test: $P < 0.001$

Universal spraying should be done, only when infestation rate is found to be greater than 8% in routine surveillance.



Conclusion & Recommendations

Conclusion and Recommendations

- An infestation rate of **8% could serve as the threshold** below which transmission would become unlikely.
- Application of an 8% threshold could **reduce 21% of spraying-related costs**, by avoiding unnecessary spraying in communities with 5-8% infestation rate.
- Though there is need for further studies to increase precision of 8%, 8% could be **applied in resource-constraint situations**.



**Many thanks for
your attention!**

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