ESTACIONES DISEMINADORAS DE PIRIPROXFEN

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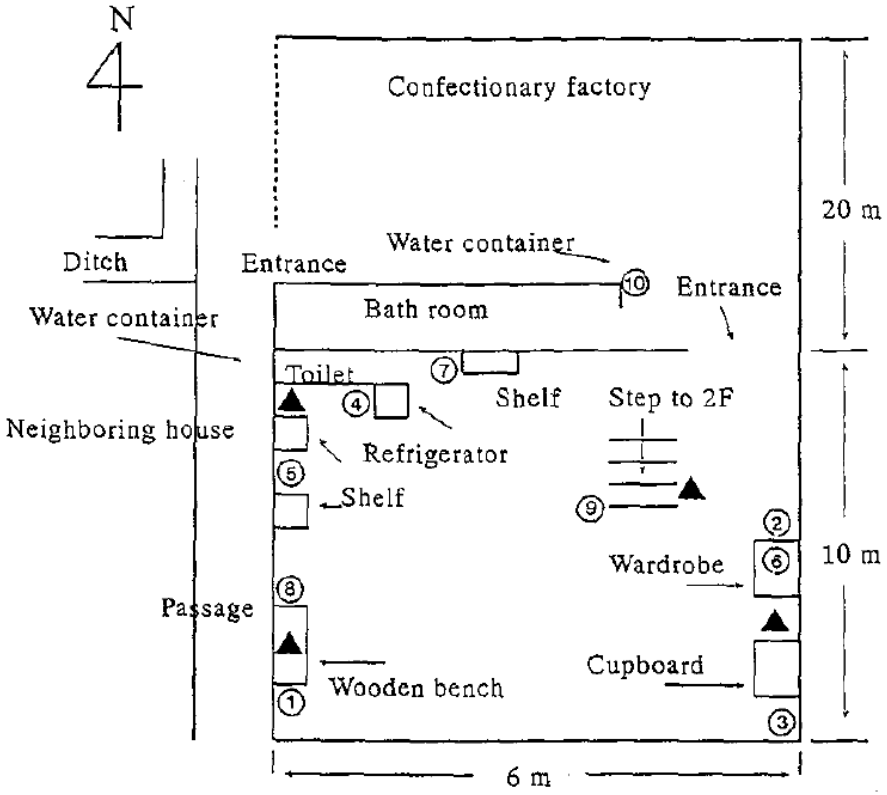
Mosquito-disseminated PPF

Trop. Med., 36 (4), 243–248, December, 1994

Utilization of Bloodfed Females of *Aedes aegypti* as a Vehicle for the Transfer of the Insect Growth Regulator, Pyriproxyfen, to Larval Habitats

Takaaki ITOH

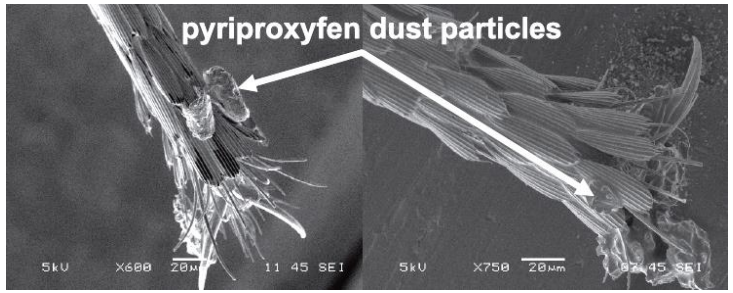


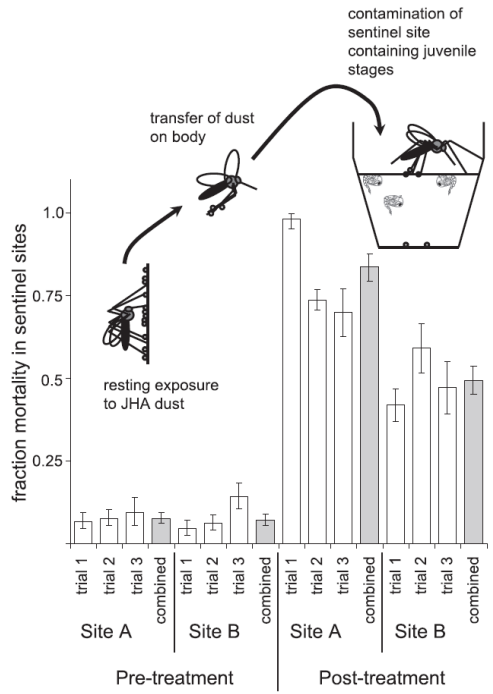
July 14, 2009 | vol. 106 | no. 28

PNAS

Using adult mosquitoes to transfer insecticides to *Aedes aegypti* larval habitats

Gregor J. Devine[a,1], Elvira Zamora Perea[b], Gerry F. Killeen[c,d], Jeffrey D. Stancil[e,2], Suzanne J. Clark[a], and Amy C. Morrison[f]





Question 1

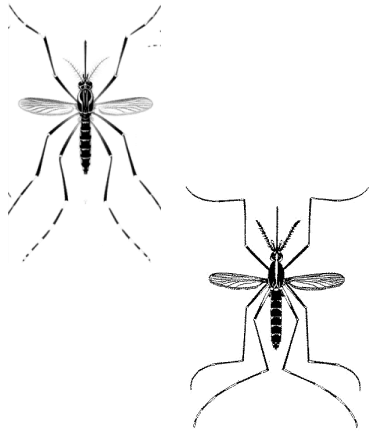
Would it actually work at spatial scales relevant to vector control?

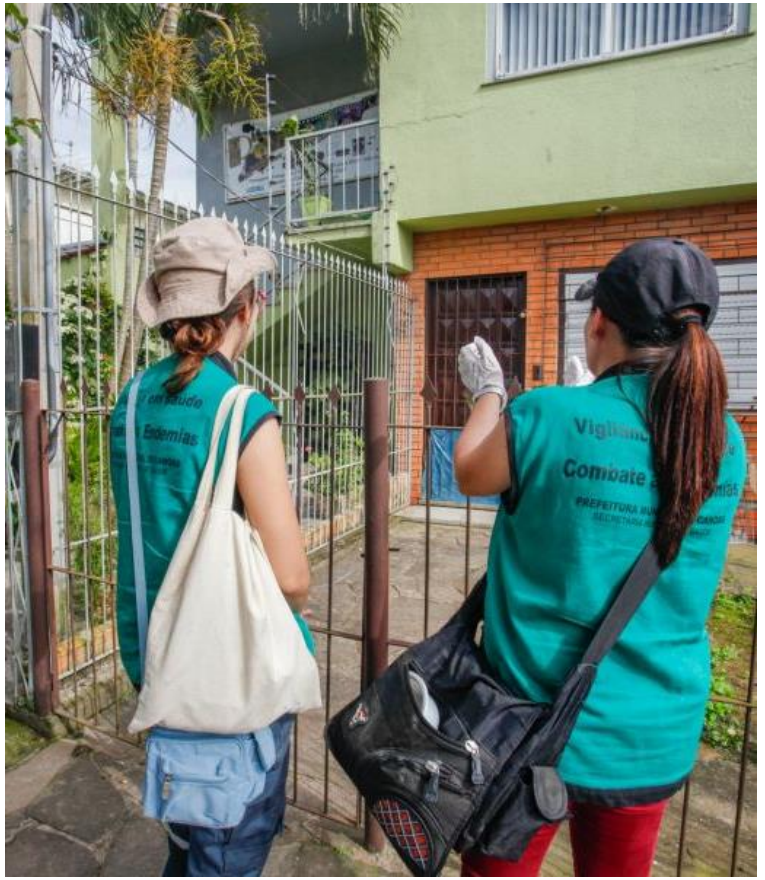
In particular, we first asked,

- **How far** do mosquitoes carry PPF?
- What **breeding-site coverage** can we achieve?
- What effect will this have on **juvenile mortality**?
- What effect will this have on **adult emergence**?

Trial 1

- **The problem** (or at least a key issue)
  - **Cryptic** and **inaccessible** breeding sites
  - Surveillance and **control**





Mosquito-disseminated PPF

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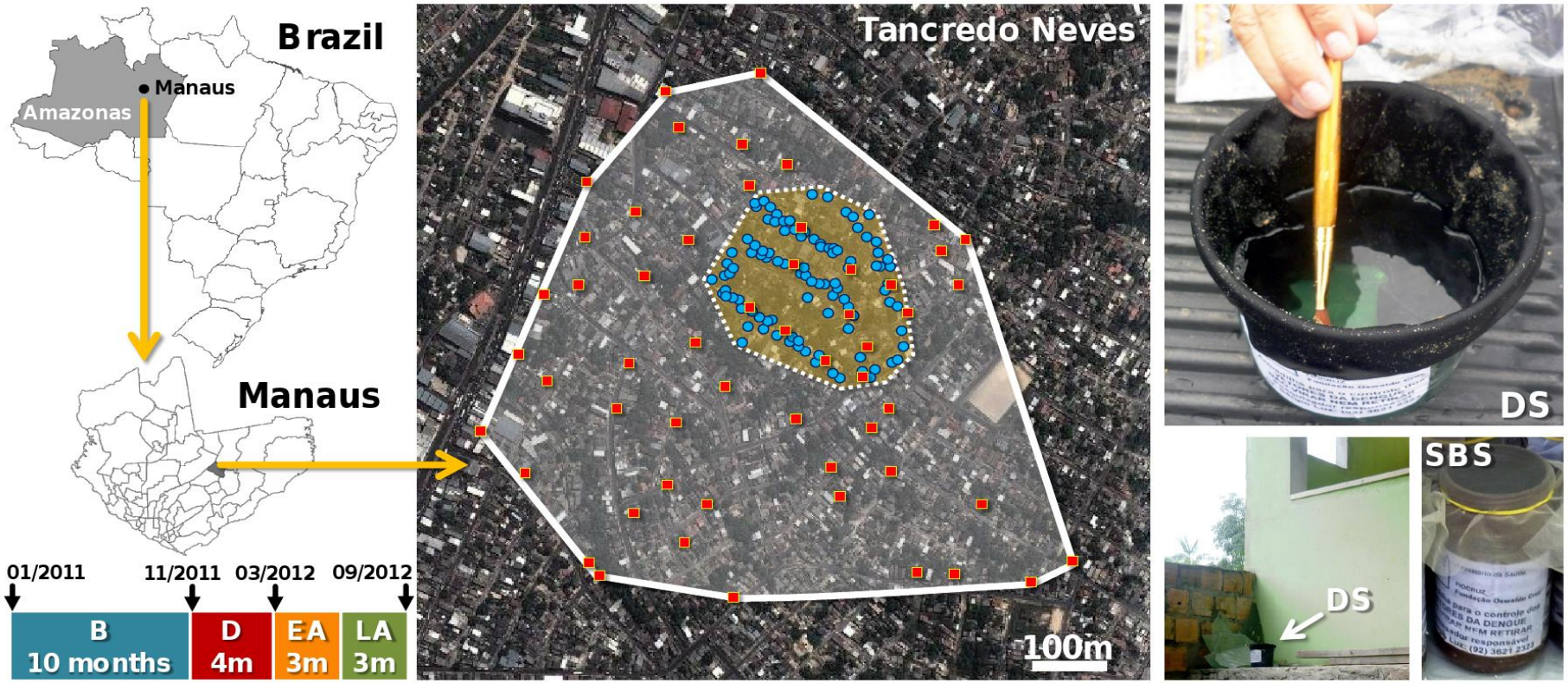
Mosquito-disseminated PPF

Mosquito-Disseminated Pyriproxyfen Yields High Breeding-Site Coverage and Boosts Juvenile Mosquito Mortality at the Neighborhood Scale

PLOS | NEGLECTED TROPICAL DISEASES
April 7, 2015 9(4): e0003702.

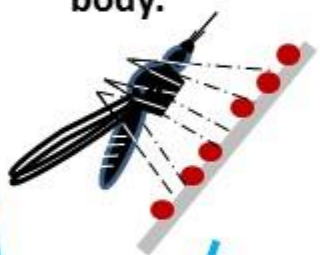
Fernando Abad-Franch[1]*, Elvira Zamora-Perea[1], Gonçalo Ferraz[2,3], Samael D. Padilla-Torres[1], Sérgio L. B. Luz[1]

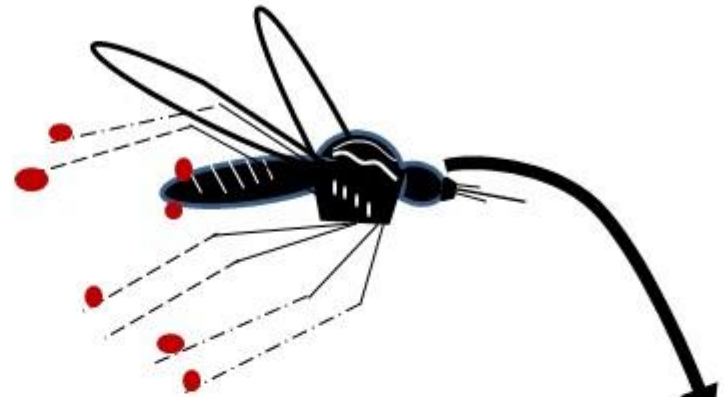


Using adult mosquitoes to transfer insecticides

FIOCRUZ

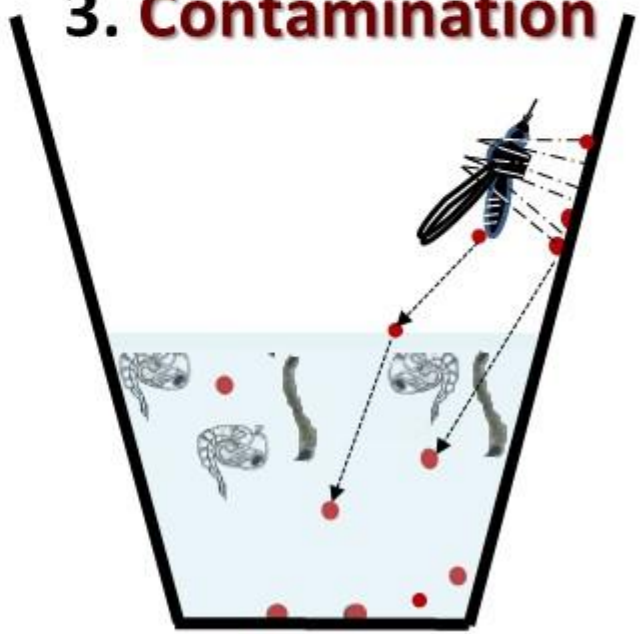
1. When an adult mosquito lands on the surface of the insecticide particles adhere to the legs and the insect's body.





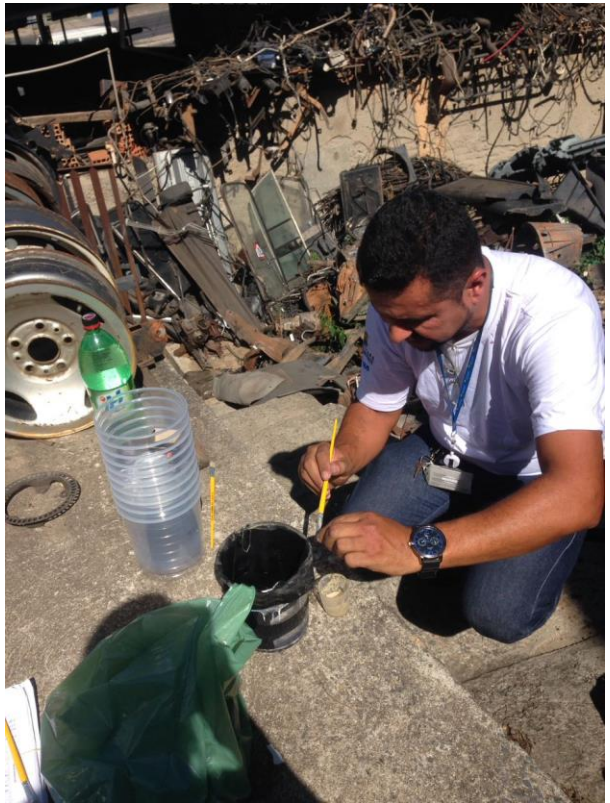
2. Search for breeding
DISSEMINATION

3. Contamination



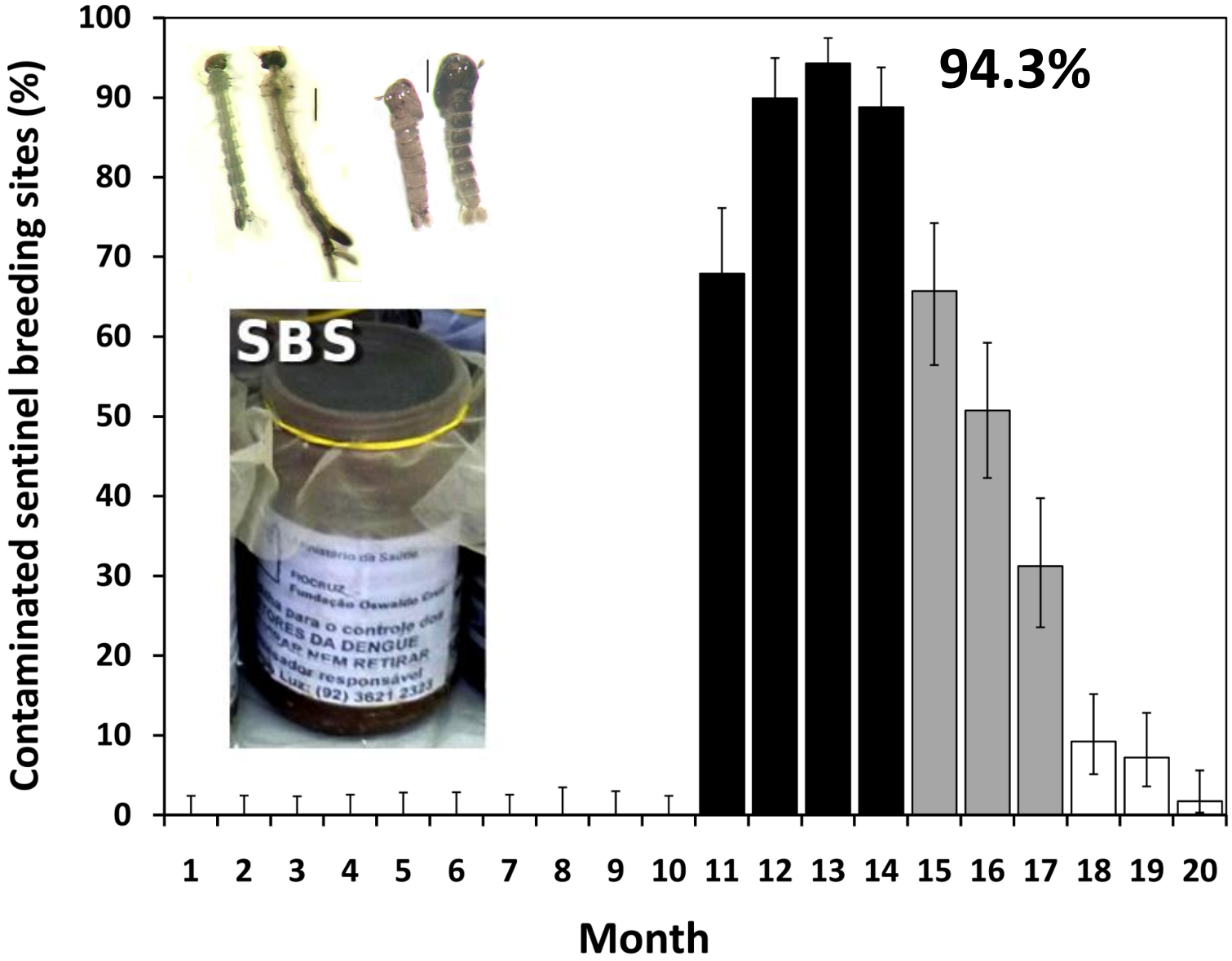
Auto-dissemination Unit
with water to attract the mosquitos females (*Aedes*, Culex...)

Mosquito-disseminated PPF

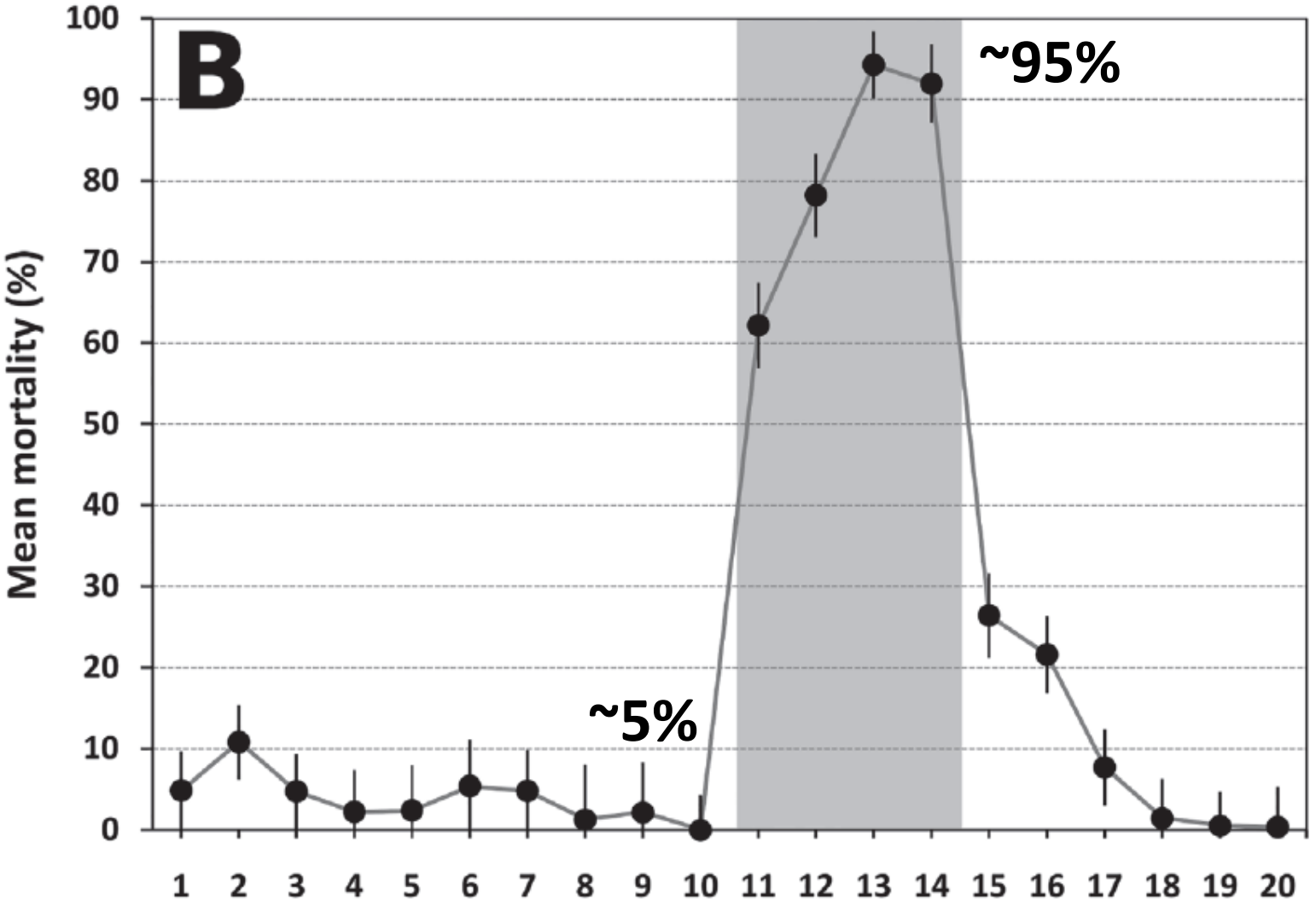



SumiLarv®
Pyriproxyfen 0.5%
~5g
SONY

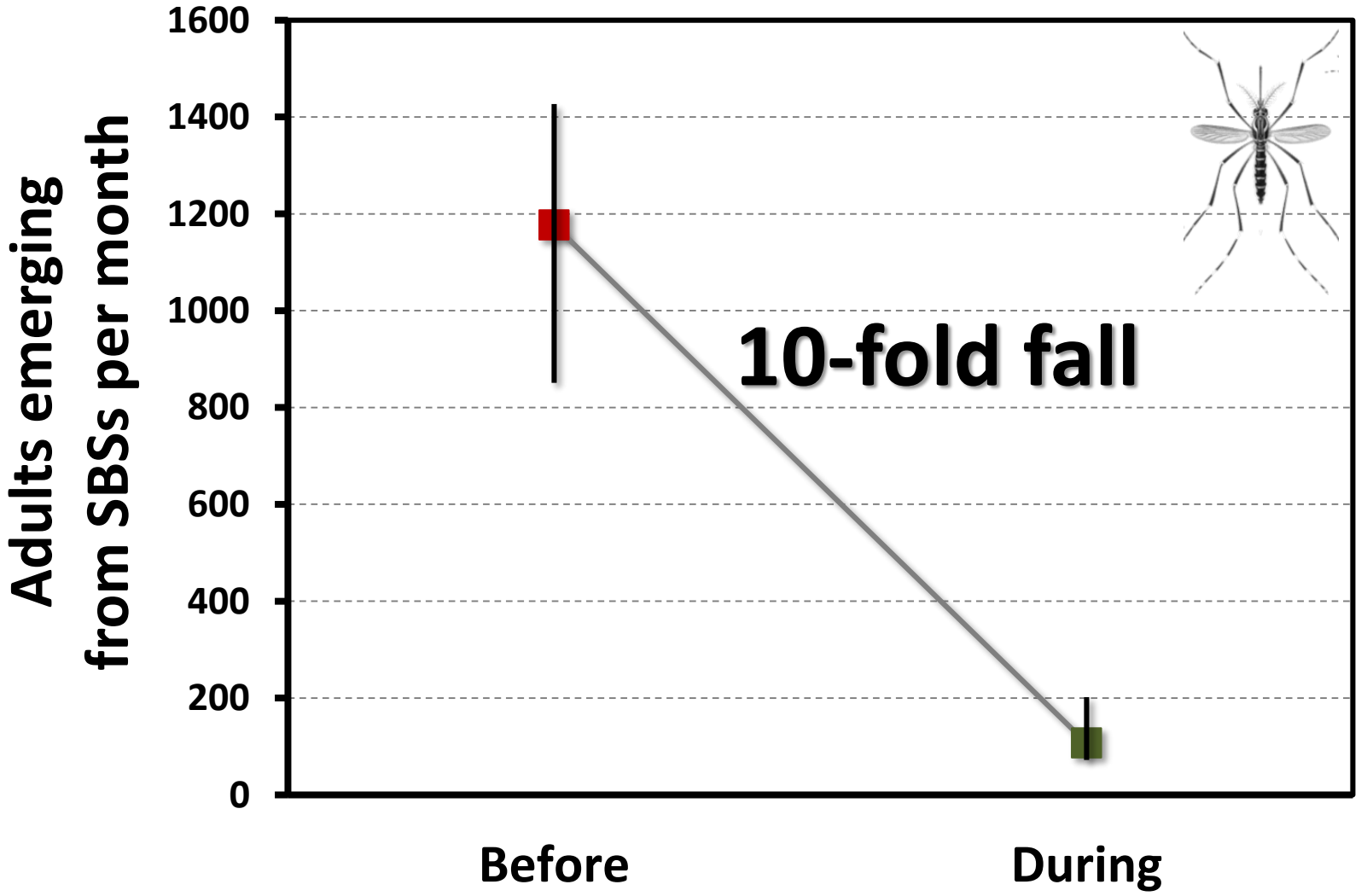
Breeding site-level coverage



Juvenile *Aedes aegypti* mortality

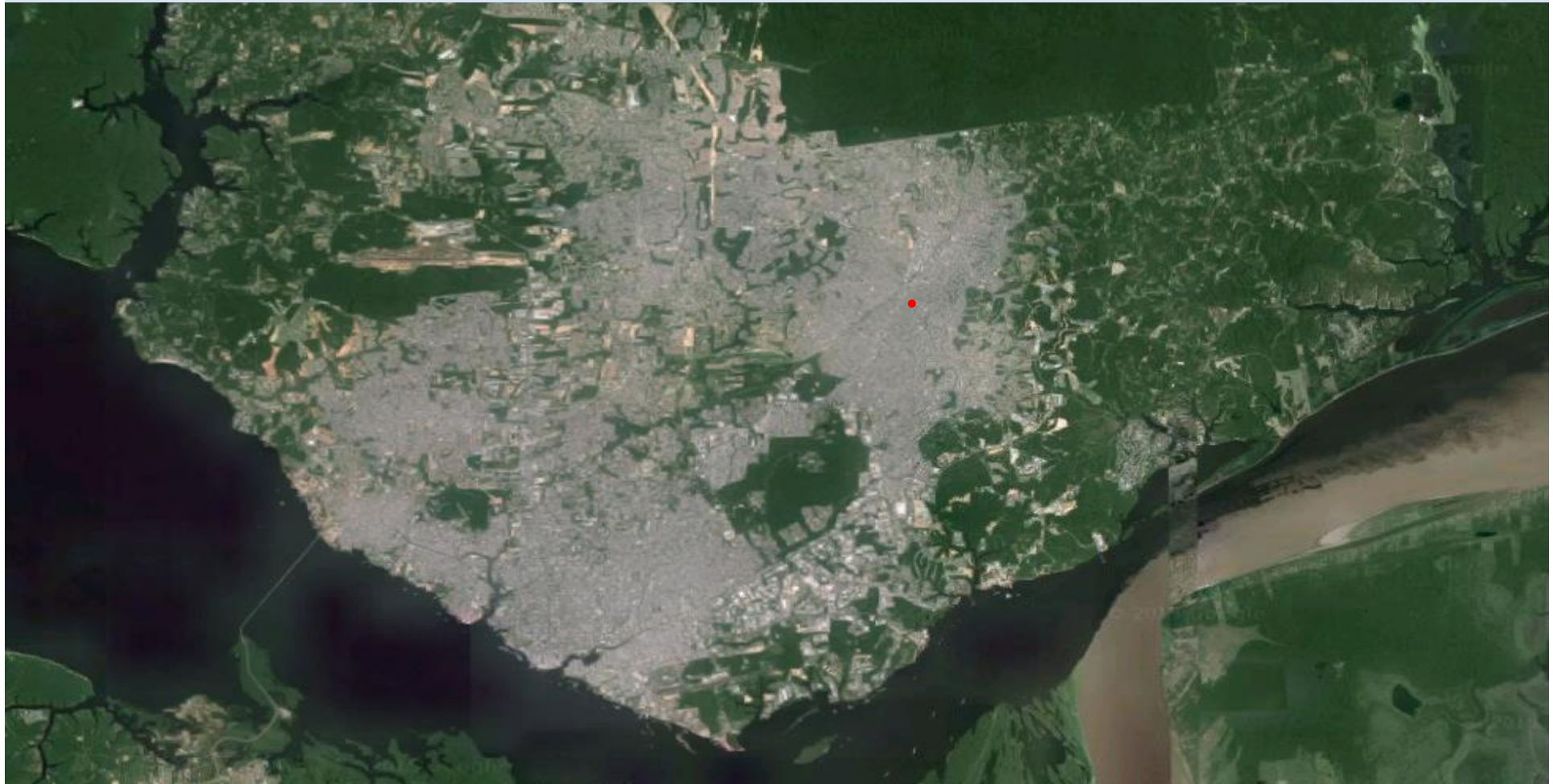


Adult mosquito emergence



Nice, but…

Our study site was a small island…
in an ocean of mosquitoes



Question 2

Would it actually work in a whole city?

In particular, we wanted to ask,

- What are the effects on **house infestation**?
- What are the effects on **mosquito catches**?
- What are the effects on **juvenile mortality**?
- What are the effects on **adult emergence**?

Trial 2

Question 2

Would it actually work in a whole city?

What is the strategy?

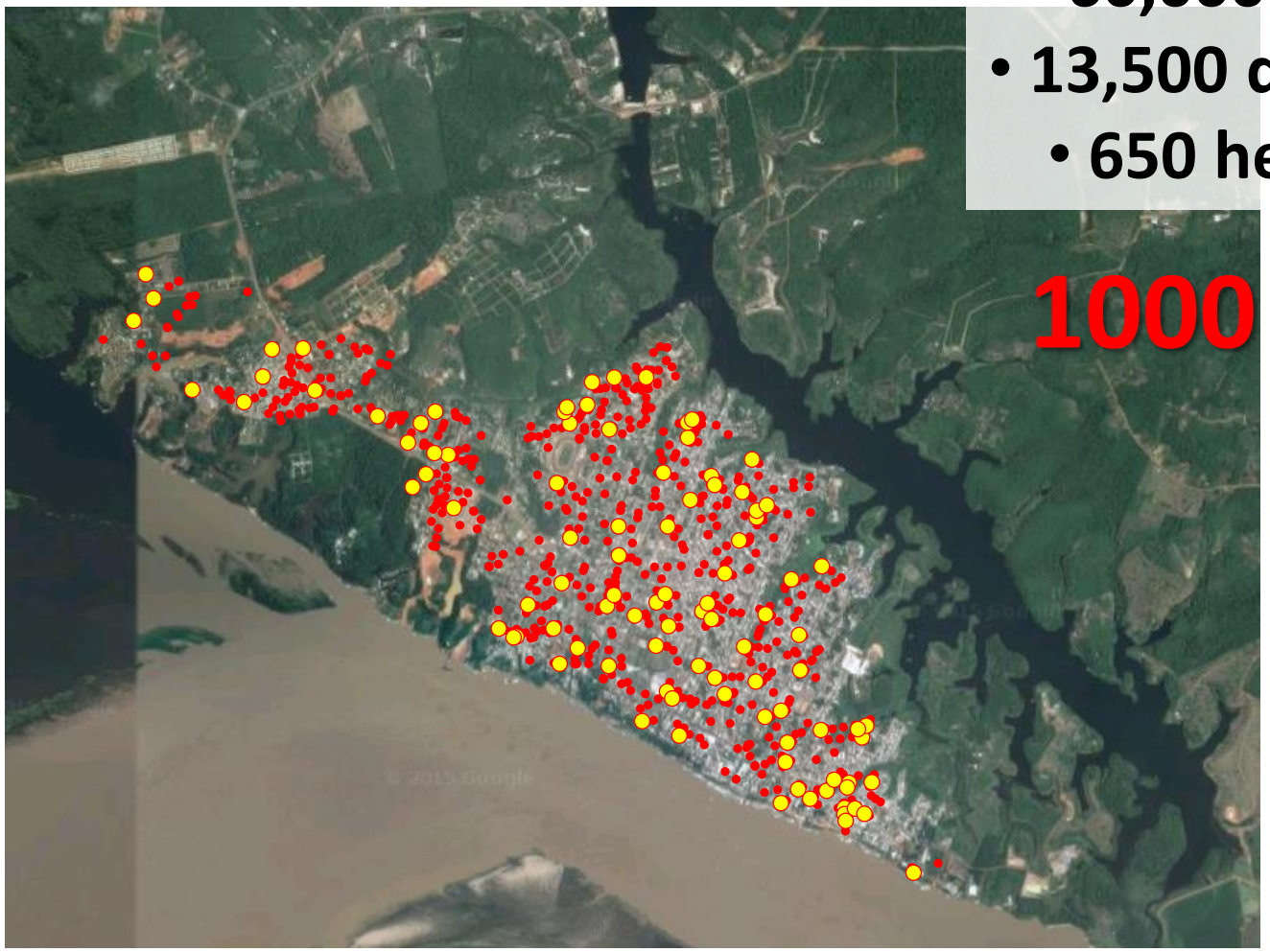
Training

Training

MANACAPURU

- 60,000 people
- 13,500 dwellings
- 650 hectares

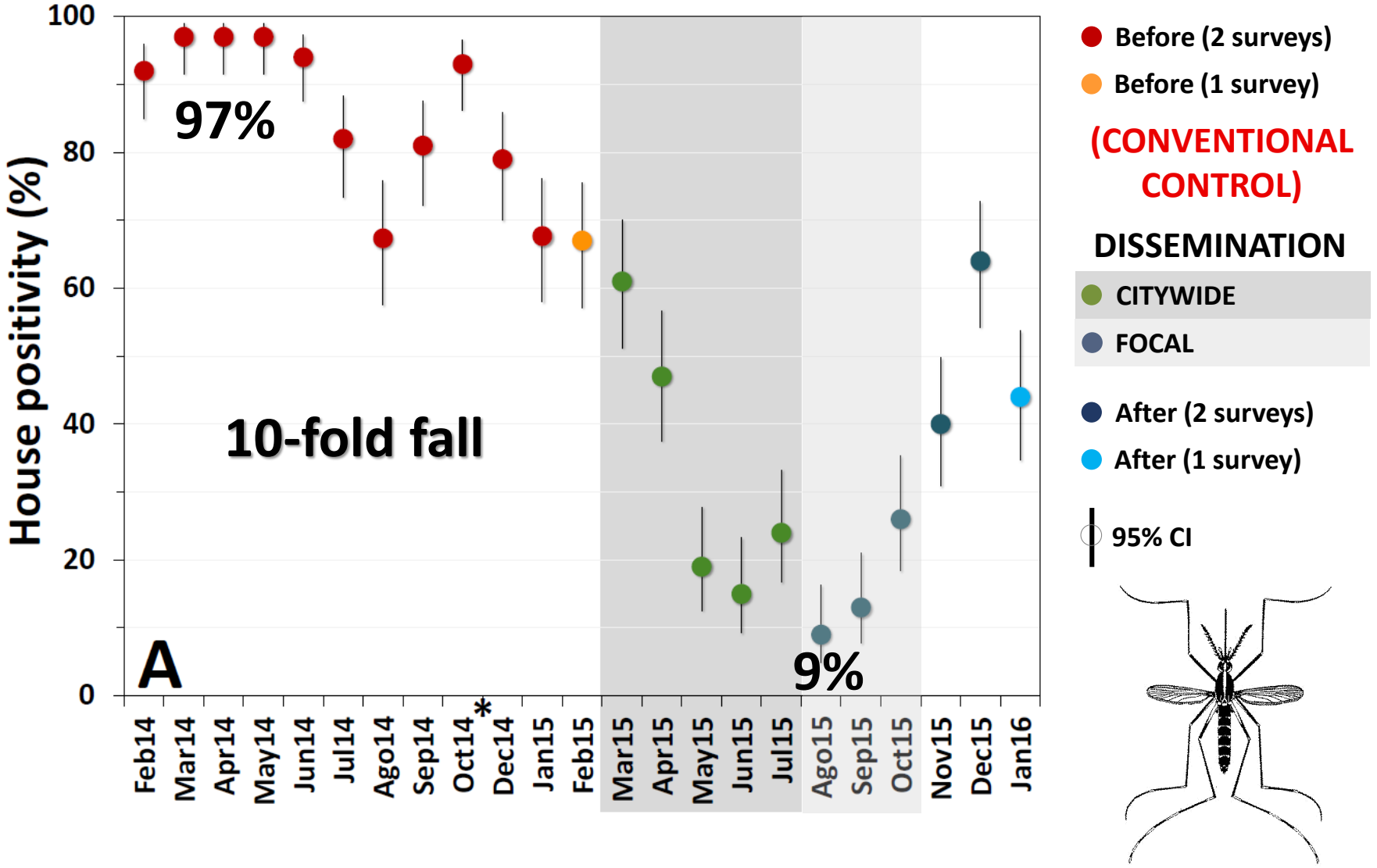
1000 DSs



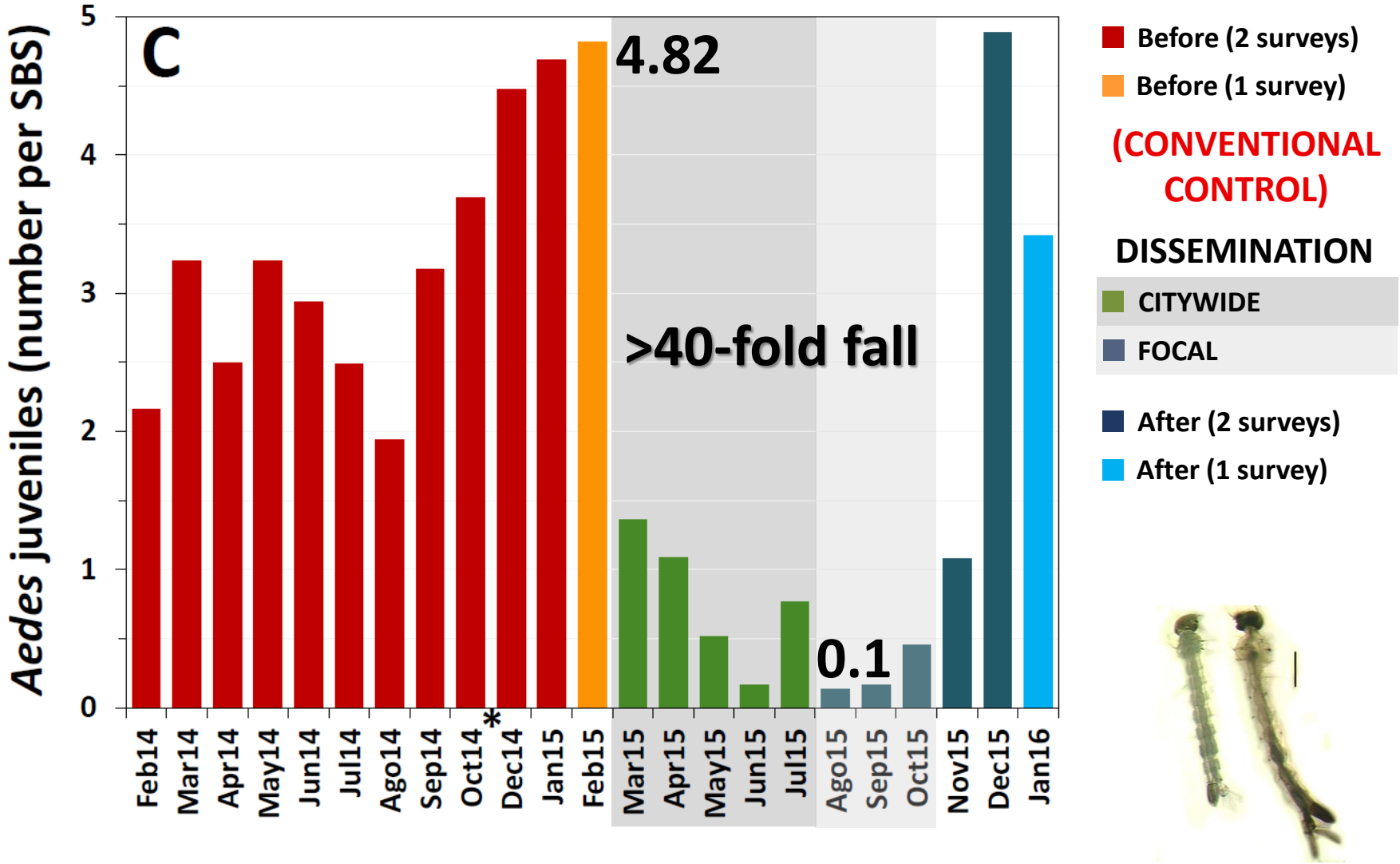
CONVENTIONAL CONTROL	CITYWIDE	FOCAL	AFTER
12m	5m	3m	3m

~1 km

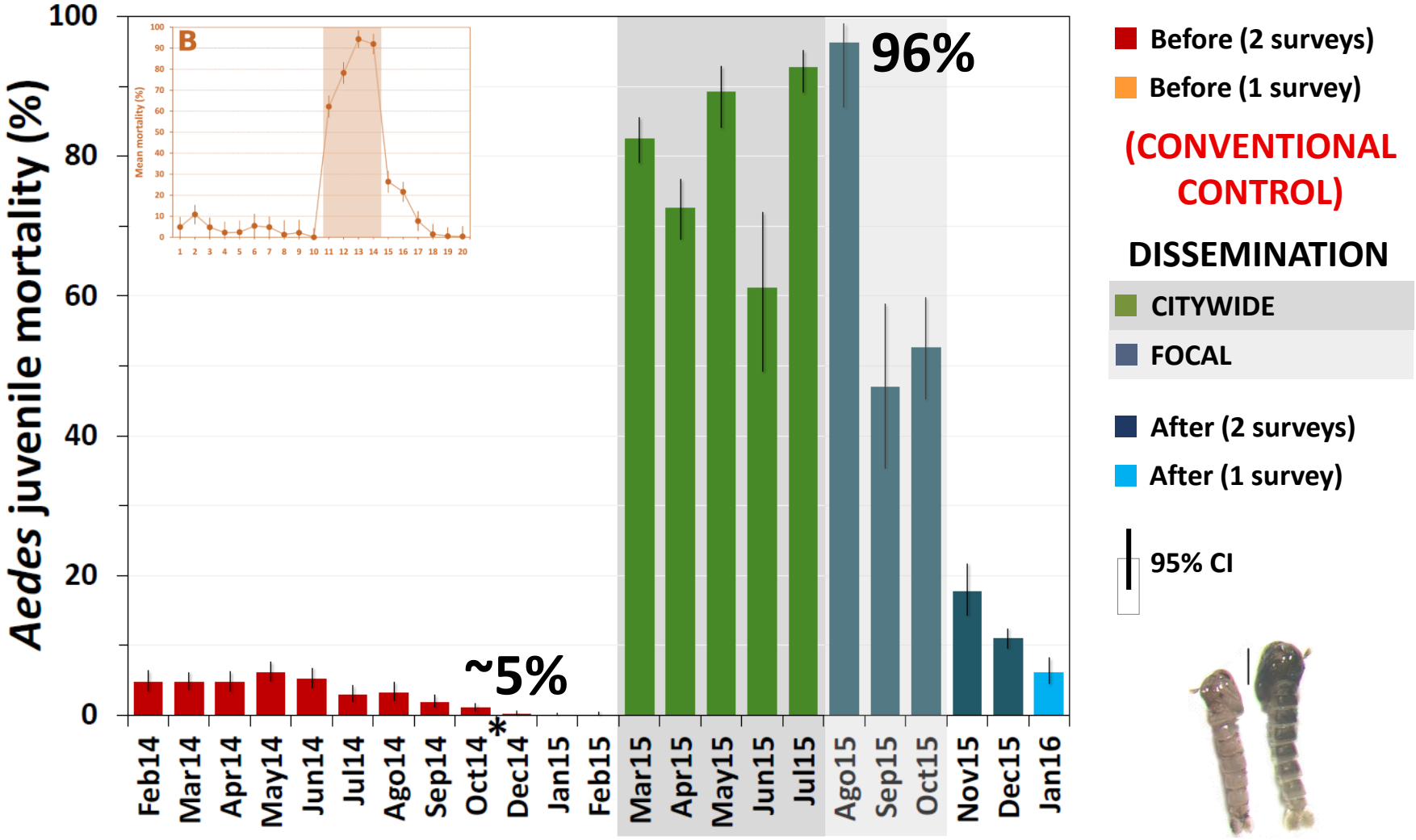
House infestation (*Aedes* spp.)



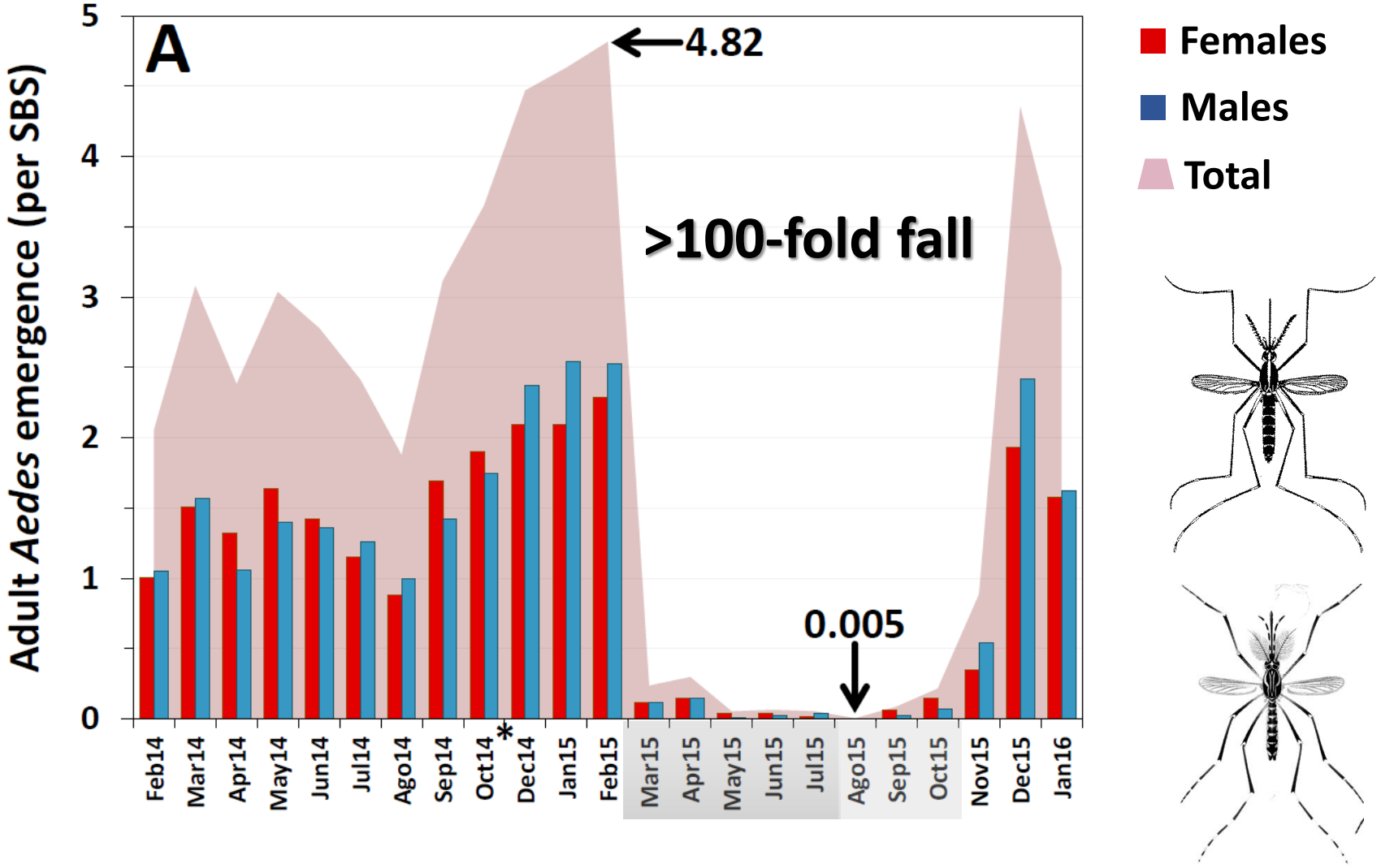
Aedes juvenile catch (# per SBS)



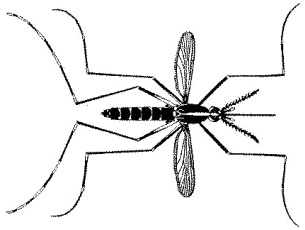
Aedes juvenile mortality in SBSs



Adult *Aedes* emergence (# per SBS)



Females
Aedes albopictus

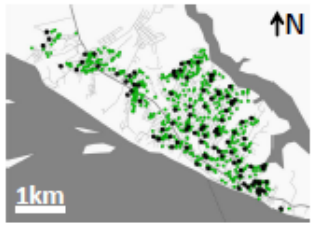


Females per house

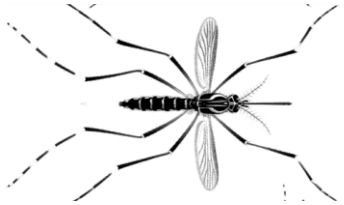
0 1 50

Phase

- BEFORE
- (CONVENTIONAL CONTROL)
- CITYWIDE DISSEMINATION
- FOCAL DISSEMINATION
- AFTER



Females
Aedes aegypti

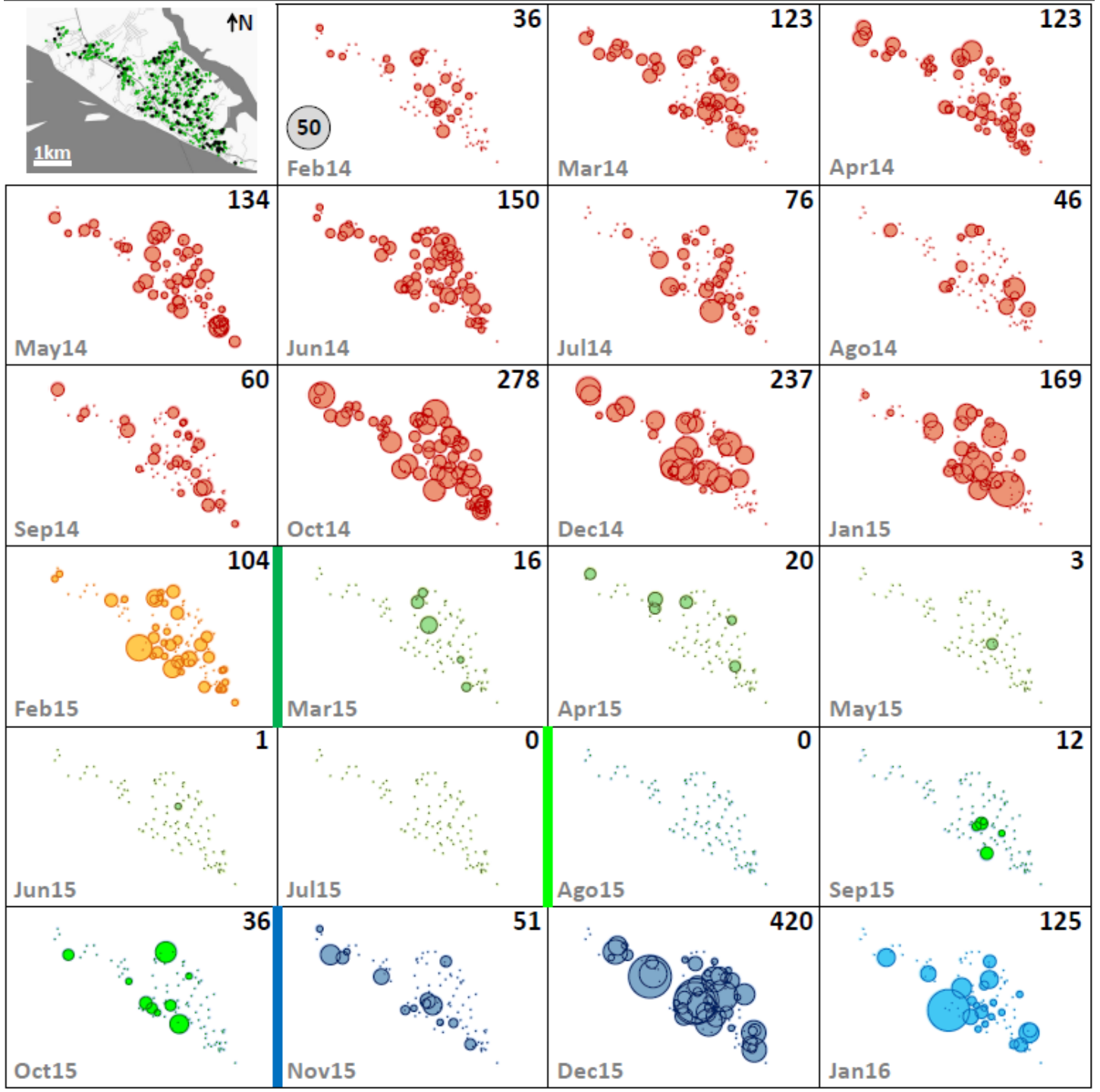


Females per house

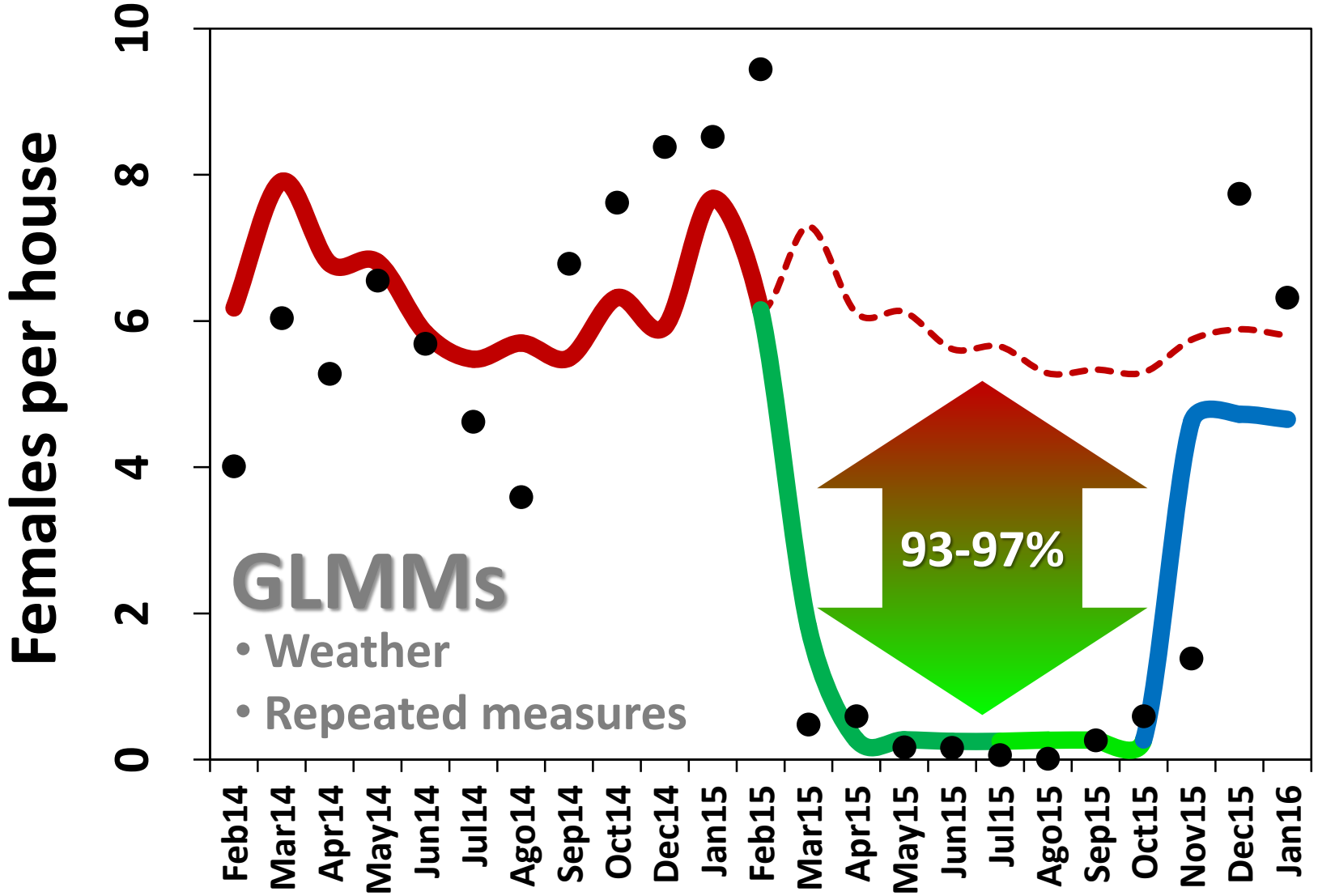
0 1 50

Phase

- BEFORE
- **(CONVENTIONAL CONTROL)**
- CITYWIDE DISSEMINATION
- FOCAL DISSEMINATION
- AFTER



Aedes females – emergence



Mosquito-disseminated PPF

PLOS | MEDICINE

PLoS Med 14(1): e1002213

RESEARCH ARTICLE

Mosquito-Disseminated Insecticide for Citywide Vector Control and Its Potential to Block Arbovirus Epidemics: Entomological Observations and Modeling Results from Amazonian Brazil

Published: January 17, 2017

Fernando Abad-Franch[1,2]*, Elvira Zamora-Perea[2], Sérgio L. B. Luz[2]

PLOS | MEDICINE

PLoS Med 14(1): e1002219

PERSPECTIVE

Novel Vector Control Approaches: The Future for Prevention of Zika Virus Transmission?

Lorenz von Seidlein[1]*, Alexander S. Kekulé[2], Daniel Strickman[3]

Aedes spp. control with mosquito-disseminated pyriproxyfen

- Mosquitoes ***carry*** PPF **at least** to **400m**
- Breeding-site ***coverage*** is **over 94%**
- Mosquito ***catch*** **falls over 40-fold**
- Juvenile ***mortality*** **reaches 90 – 95%**
- Adult ***emergence*** **falls over 100-fold**
- ***Female emergence*** **falls** to **<0.005/person-month**

In theory, this will block epidemic transmission

Urban mosquito control with mosquito-disseminated pyriproxyfen

…more questions…

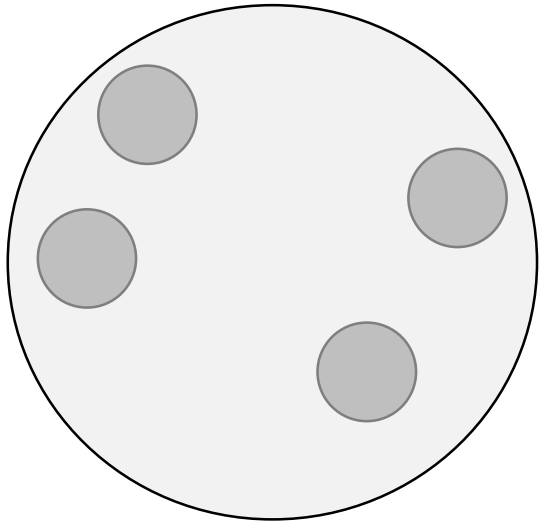
Will it *really* block transmission?

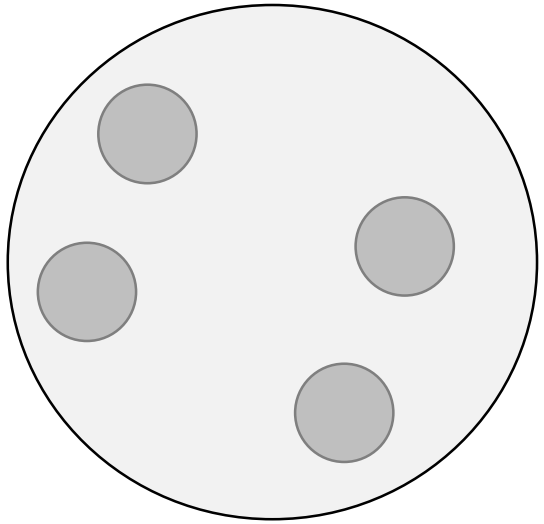
How can we *scale* it *up*?

How can we *improve* it?

PROJECT… waiting for financing

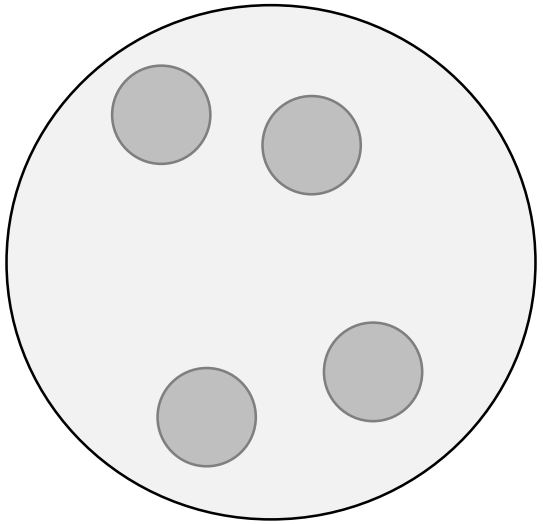
Area 1

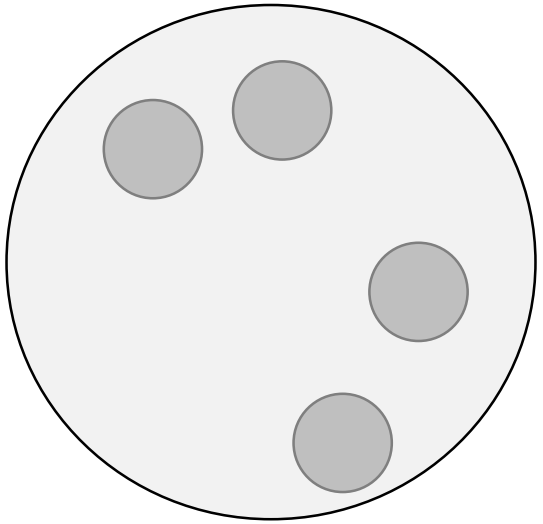




Matched-pair Cluster Randomized Controlled Trial

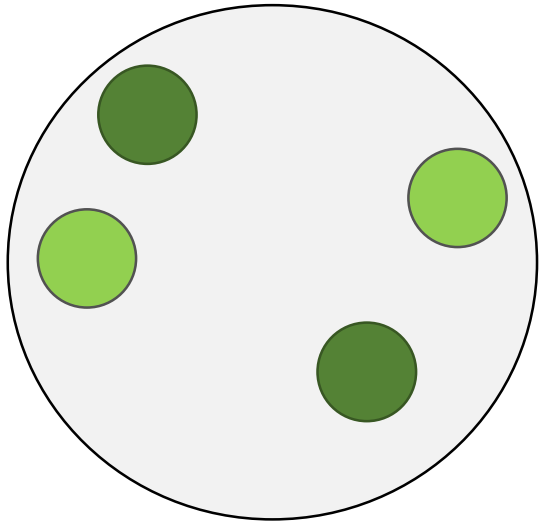
Area 2

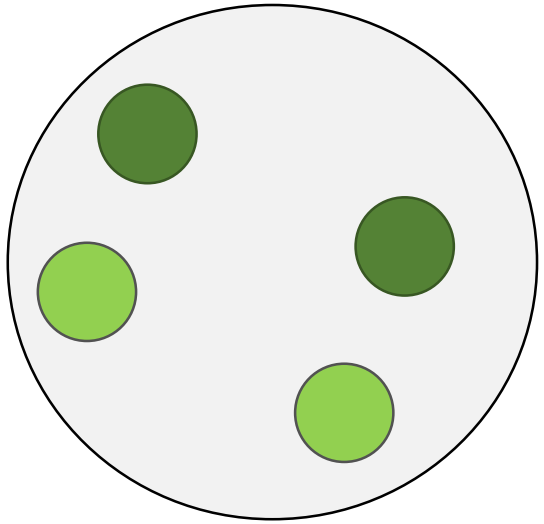




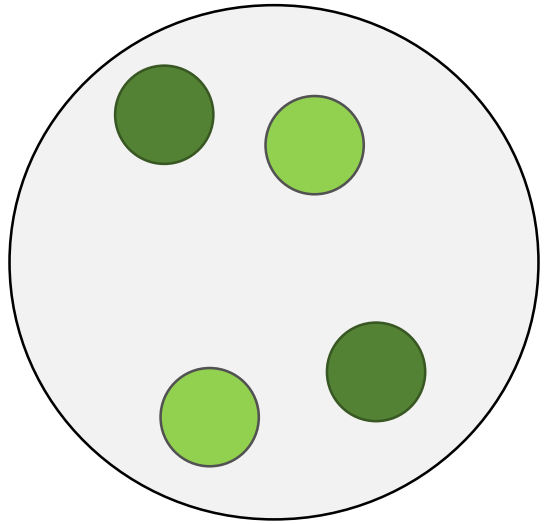
PROJECT… waiting for financing

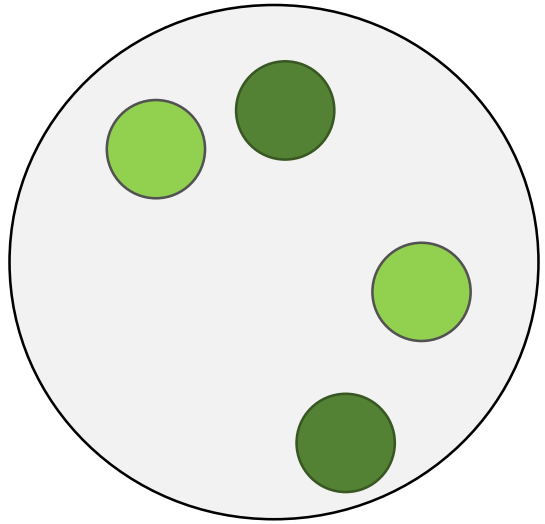
Area 1

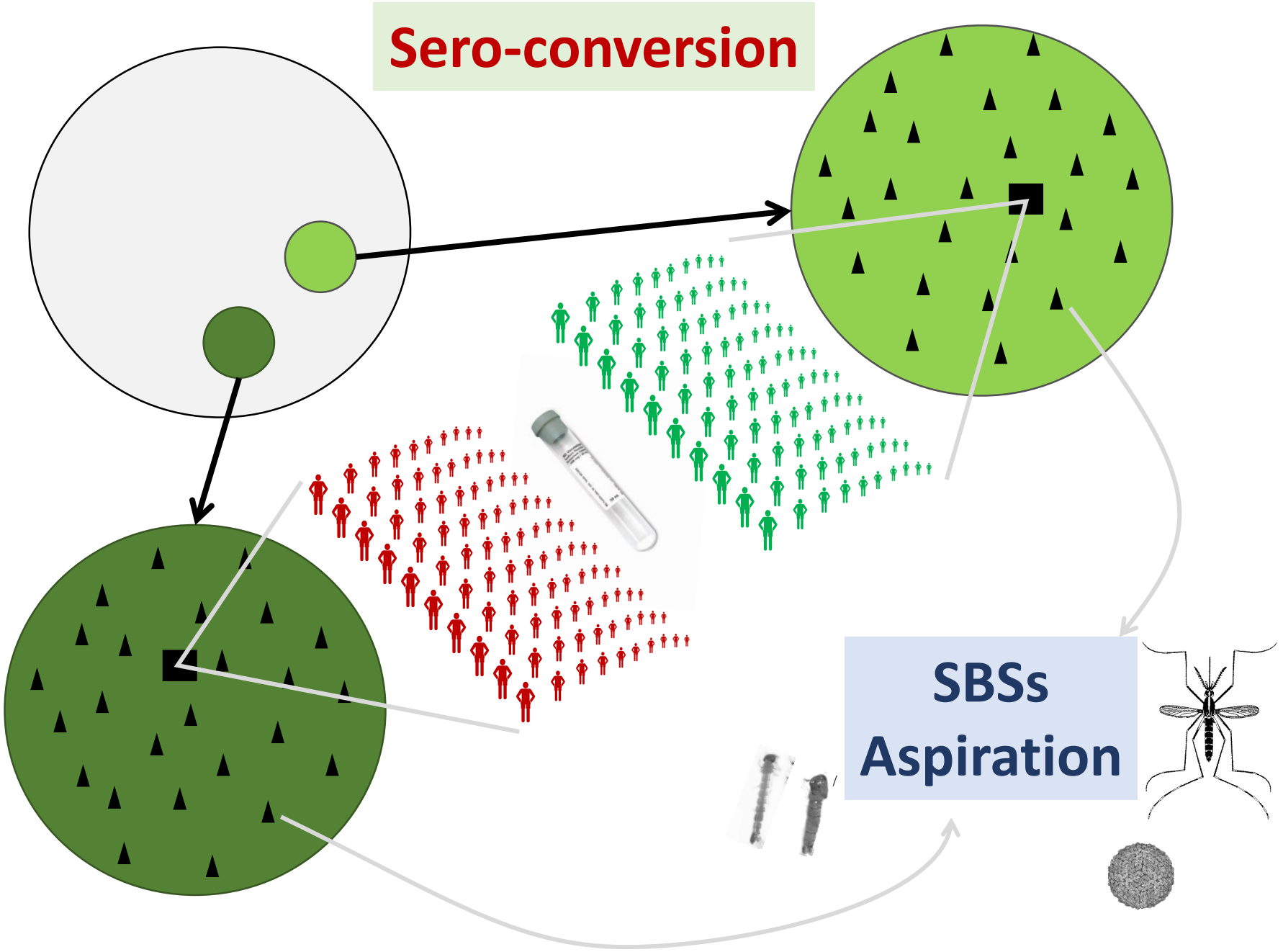




Area 2






Sero-conversion
SBSs
Aspiration

Meanwhile.... waiting for financing...

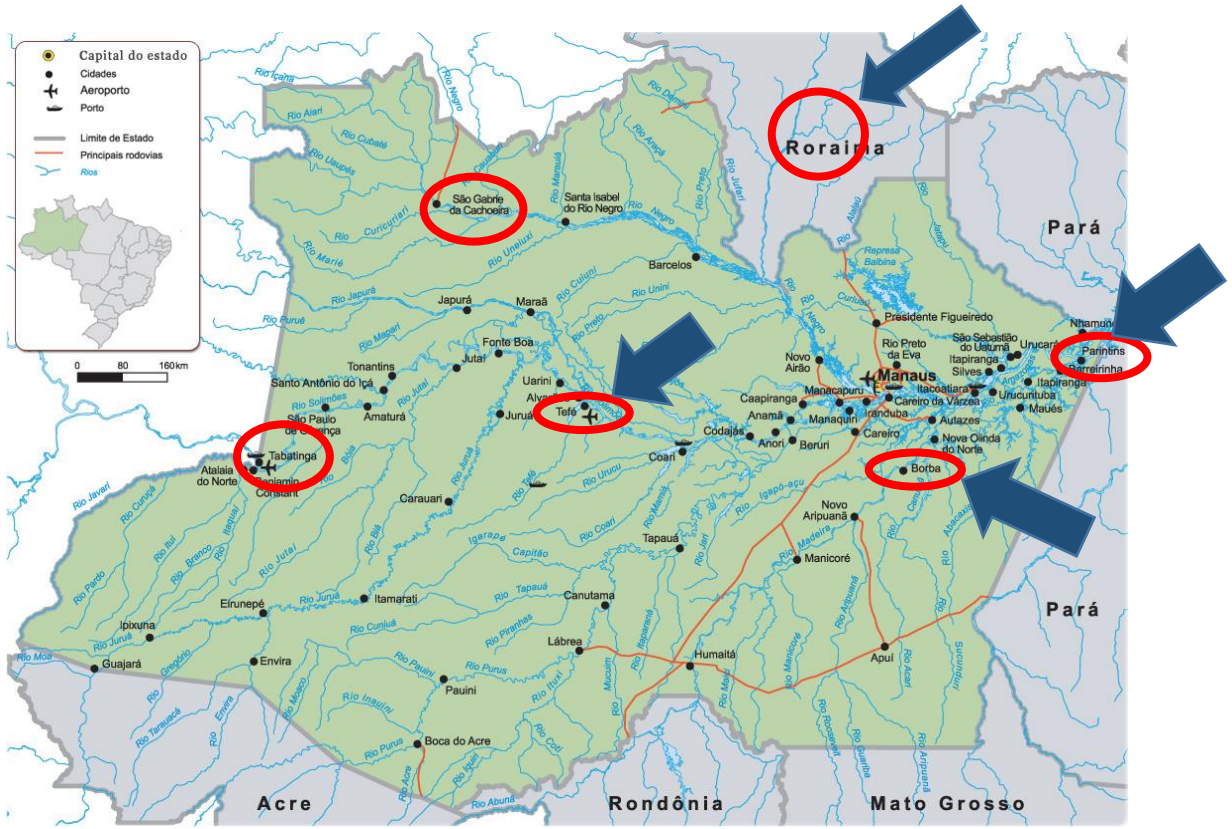
Ministery of Health – DECIT & PNCD
Aedes spp. control with
mosquito-disseminated pyriproxyfen

- **Identify and know the problems or "intercurrences" implementation of the strategy in practice**
  (on the real scale of control programs and with the mean and resources available on this scale)

- **In different city scenarios and their ecological landscapes**
  (for example: northeast, southeast, etc)

- **Understand how to improve operational procedures in different realities.**

In different city scenarios and their ecological landscapes

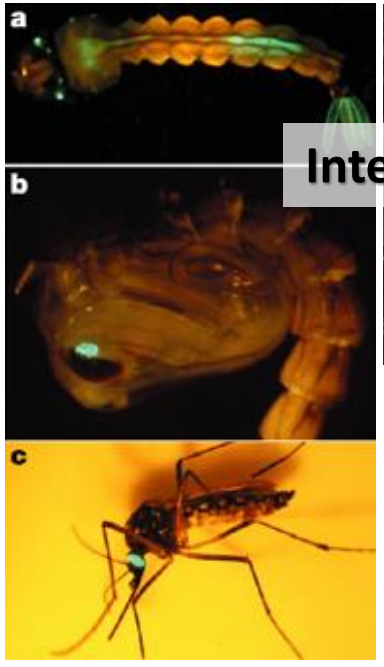


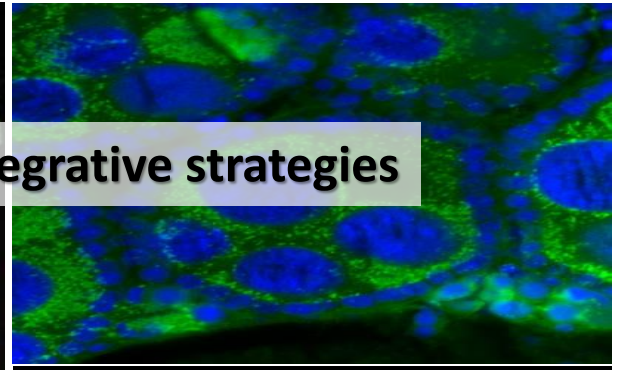
MS DECIT

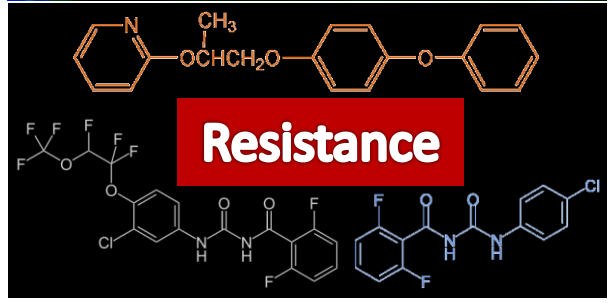
MS DEVIT (PNCD)

Understand how to improve operational procedures in different realities.

Impact on infection and disease



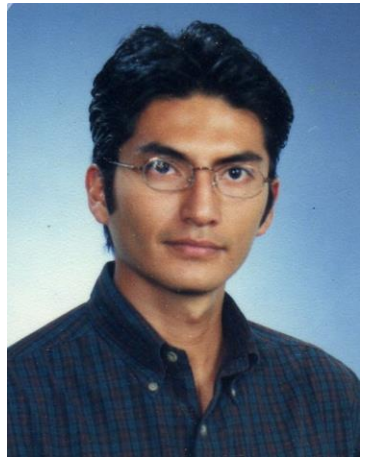




Urban mosquito control with mosquito-disseminated pyriproxyfen


Sérgio Luz


Elvira Zamora


Samael Padilla

Gonçalo Ferraz


Fernando Abad

Thanks

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