Genetic engineering to control mosquitoes: The Oxitec solution

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The problem of Aedes aegypti

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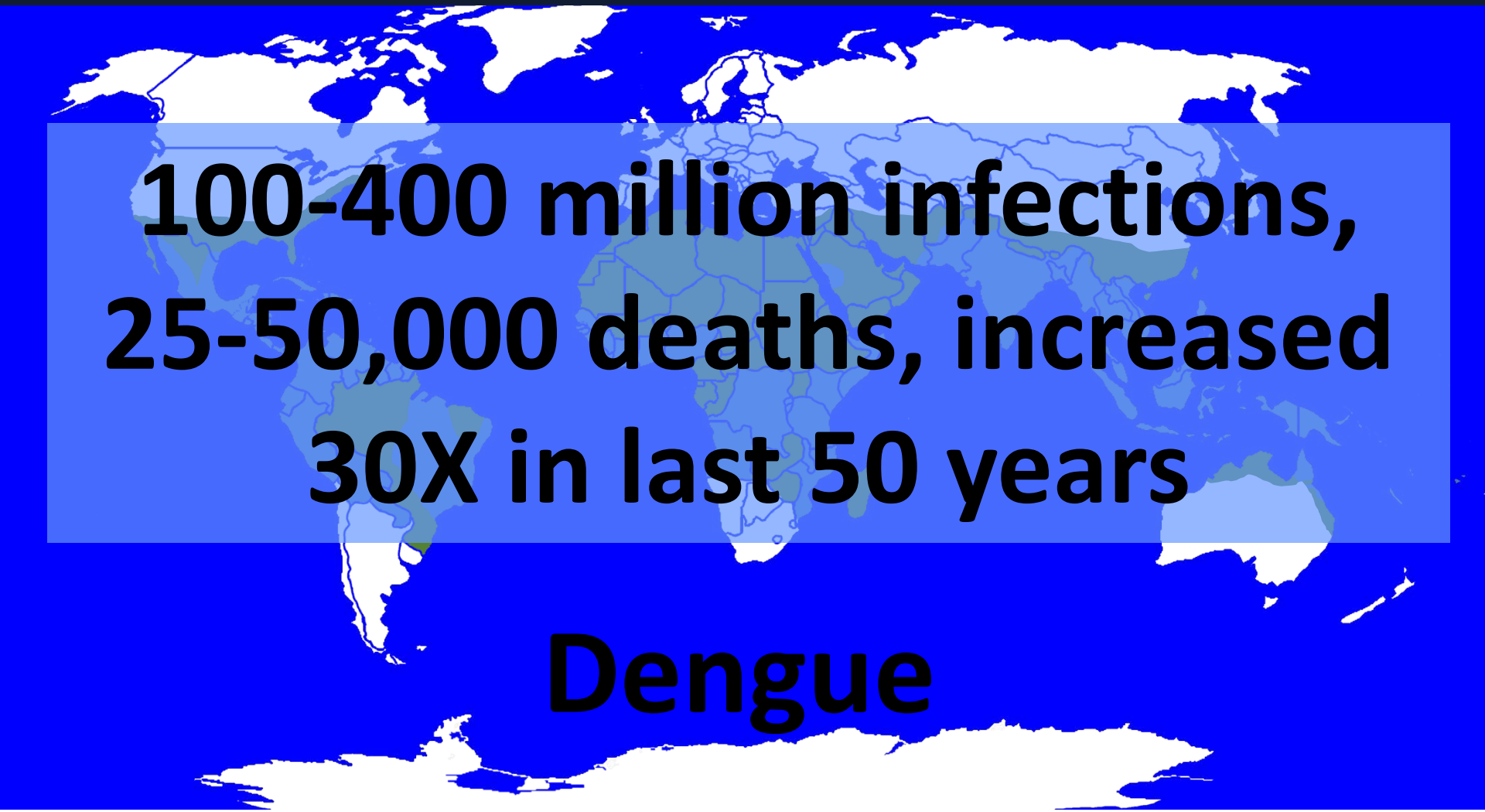


100-400 million infections, 25-50,000 deaths, increased 30X in last 50 years

Dengue

The problem of Aedes aegypti

Over 1.2 million cases in the Americas alone, 200 deaths, spreading fast

Chikungunya

The problem of Aedes aegypti

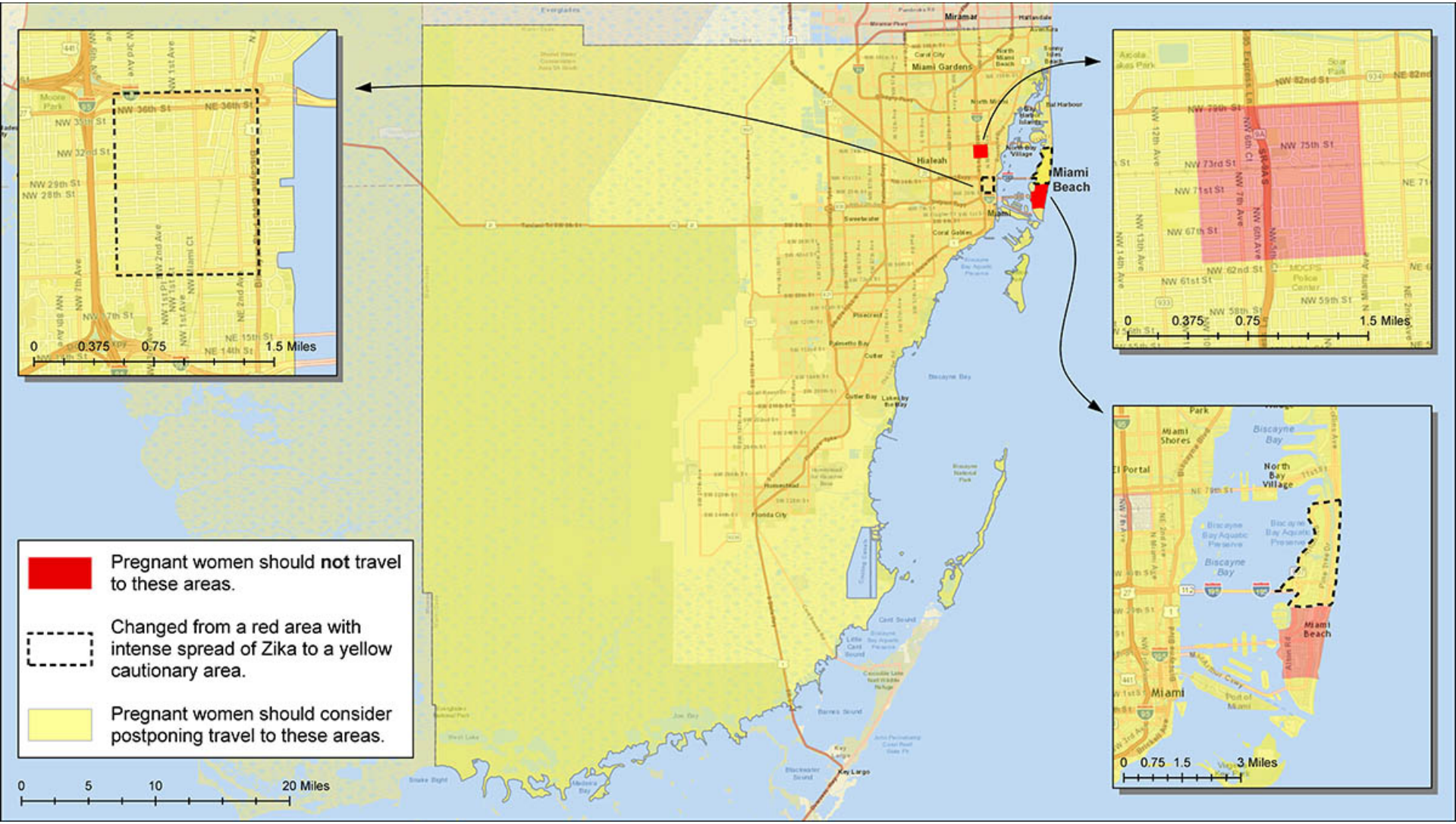
Spreading rapidly, symptoms mild but link to microcephaly during pregnancy

The problem of Aedes aegypti

If you don't remove the vector:

What's next?

Miami – the threat is real



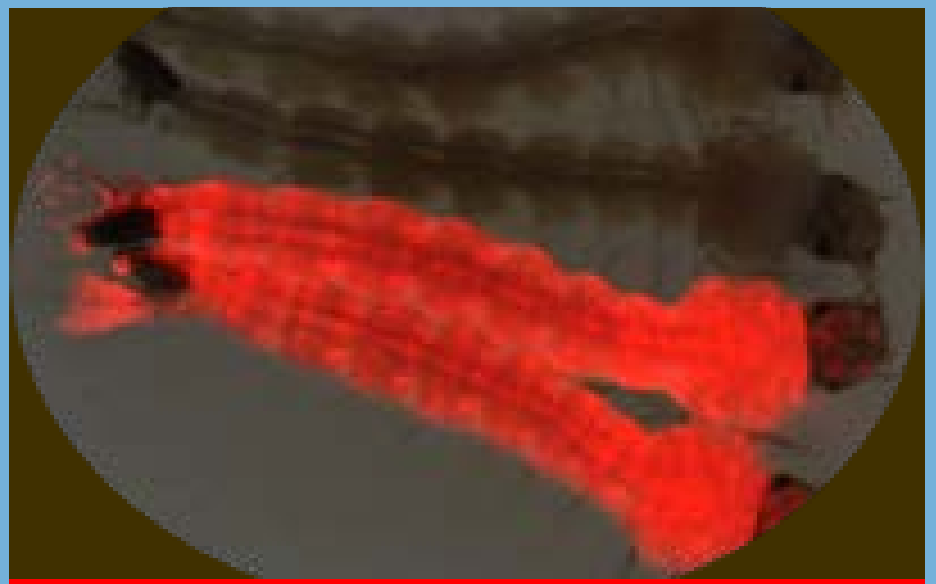
Source: https://www.cdc.gov/zika/intheus/florida-maps.html (Page accessed December 1, 2016; Page last updated November 22, 2016)

Traditional approaches are ineffective

- Against *Aedes aegypti* 30-50% effective at best (FKMCD data)
  - Private property prevents access
  - Insecticide resistance
  - Finding breeding sites

Oxitec OX513A Friendly™ mosquitoes

Self-limiting Gene

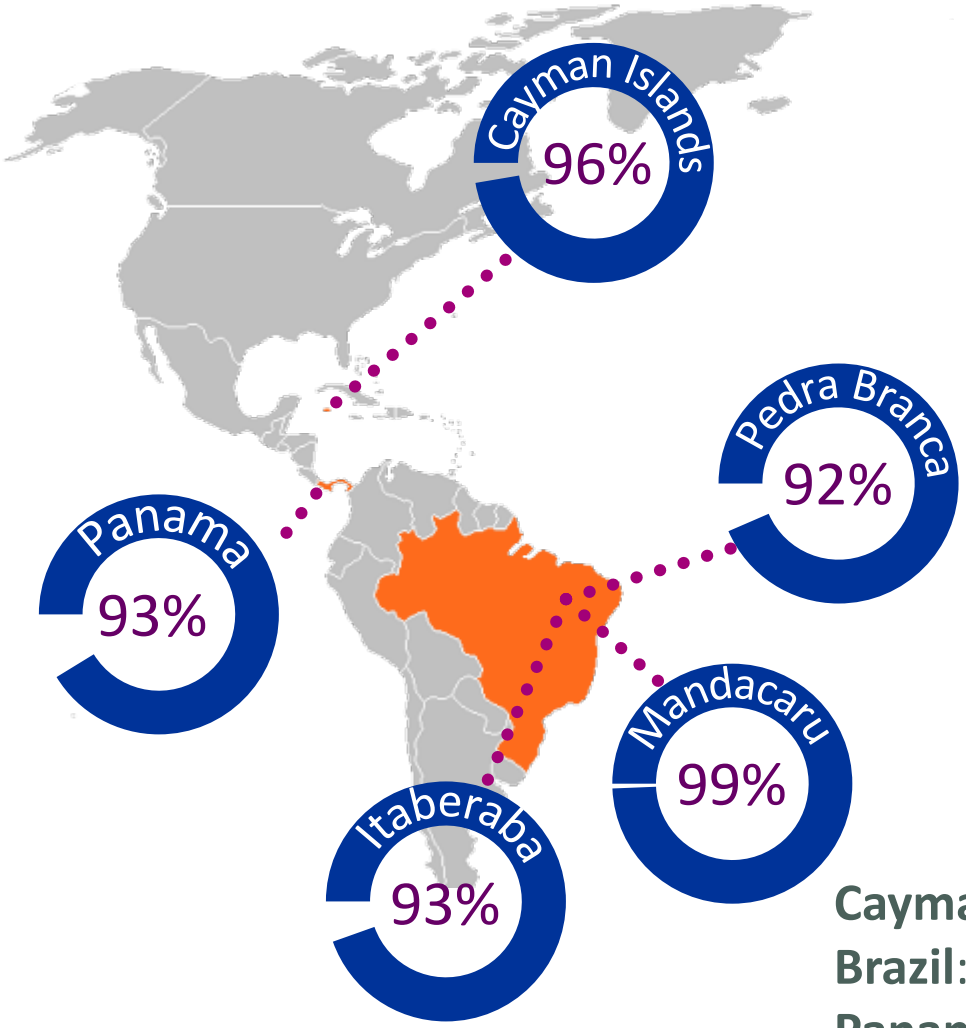


Fluorescent Marker Gene

Oxitec male mosquitoes are produced for release and mate with pest females

Offspring die before they can reproduce and transmit disease

Oxitec OX513A success



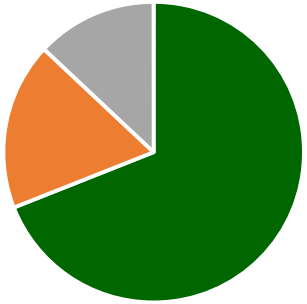
Efficacy field trials show 90+%[1] suppression of *Aedes aegypti*.

Cayman: Mosquito Research and Control Unit
Brazil: University of São Paulo and Moscamed
Panama: The Gorgas Institute

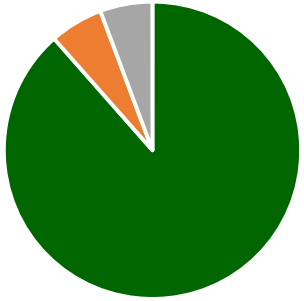
[1] Relative to control sites

Strong public support Worldwide

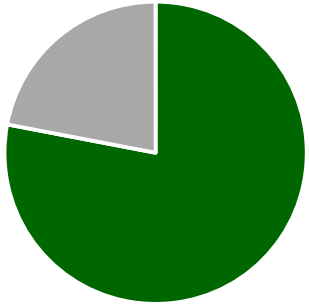
Cayman Islands



Piracicaba, Brazil



USA*



Extensive community engagement

* https://www.purdue.edu/newsroom/releases/2016/Q1/survey-public-supports-use-of-gmo-mosquitoes-to-fight-zika-virus.html

A comprehensive road to success

OXITEC

2002
OX513A created

2009
Caymans trial: 96% suppression

2010
Three trials in Brazil: All >90% suppression

2014
Panama trial showed:
- 93% suppression
- No *Albopictus* niche replacement
- No persistence in the environment

2014-2016

Brazil: CTNBio Approval, ANVISA announcement

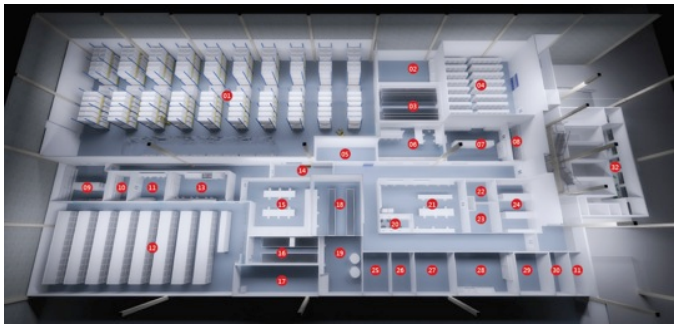
US: FDA Final FONSI & EA

Global: WHO/PAHO/CARPHA recommend pilot deployment under operational conditions

Launches: Piracicaba, Brazil expansion (65,000 people) and Cayman Islands

Beyond a trial: Scaling up production

- Industrialized production
  - Efficient, clean processes
  - Quality controlled outputs
- Capacity:
  - Space >5,000m2
  - 60 million OX513A males/week
  - Up to 3 million people covered maintenance phase
- Detailed design facilitates rapid start in other locations and at any scale
  - Investment
  - New jobs



Now operational in Piracicaba, Brazil

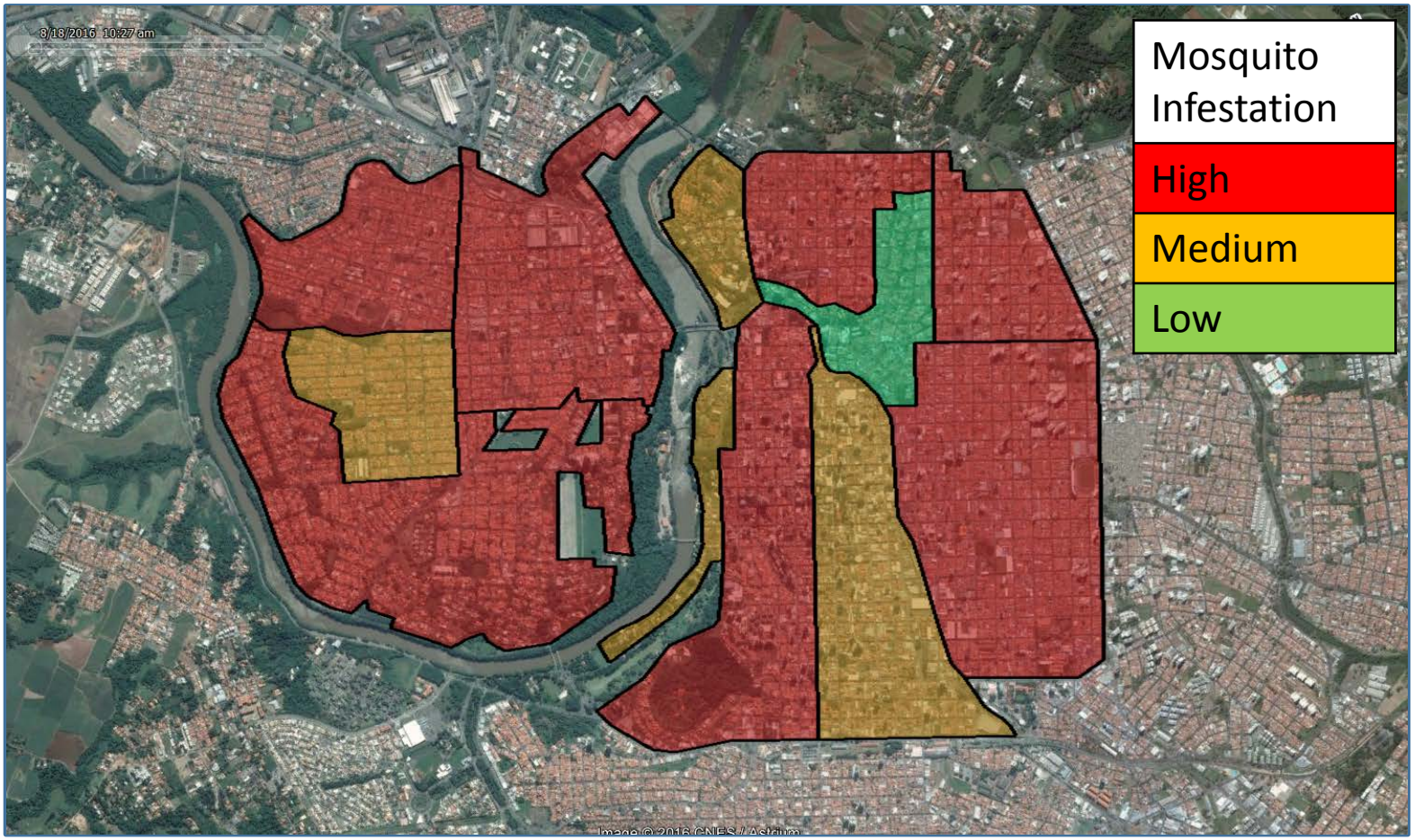
OXITEC

Capacity of new factory is 60 million Oxitec mosquitoes per week. This capacity can cover circa 3 million people

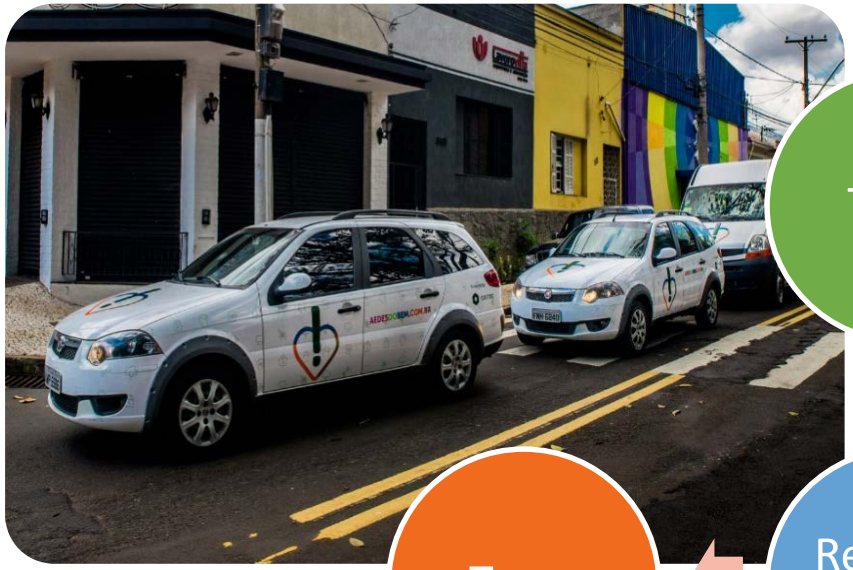
Inside our Brazil factory

Control Programme: Mapping

Define infestation levels by subareas -> Initial Release Rates by subareas



Mosquito distribution simple and efficient



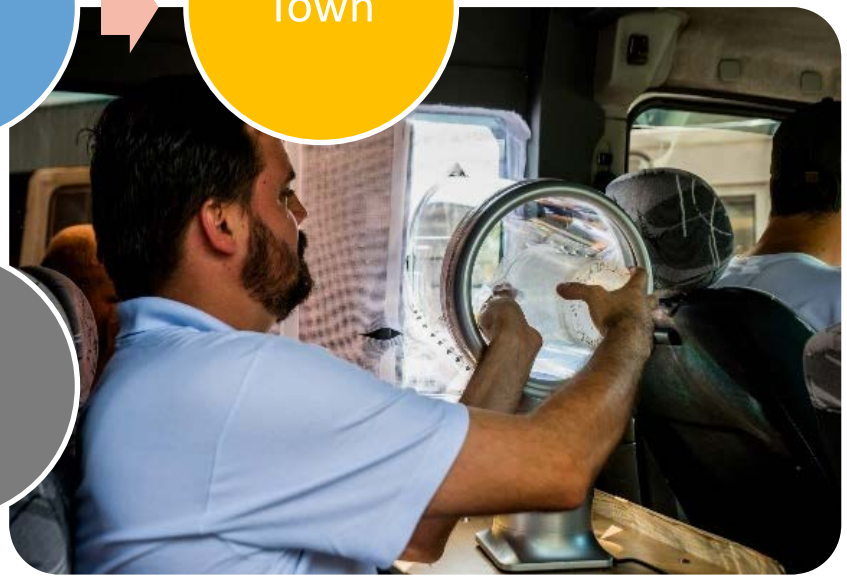
Town

Town

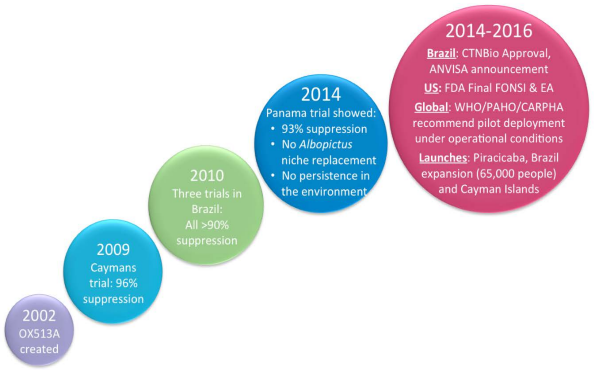
Regional hub

Town

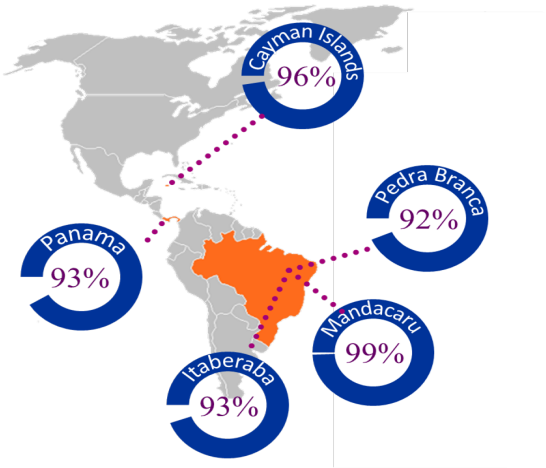
Town



Oxitec has the solution



Years of independent research



Proven safe and effective in other countries

Confirmed scale-up capabilities and programmatic deployment

Oxitec preparing for Worldwide control of *Aedes aegypti* using a genetically engineered mosquitoes

Thank you

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