The Exact Map of Aedes
Brazil | 2016 - Congenital Zika Virus Syndrome - A new epidemic

~2000 children affected

Brazil | 2016 - Aedes borne epidemics

- 1.4 mi Dengue Fever Cases
- 174 k Zika Virus Cases
- 169 k Chikungunya Fever Cases
- U$ 1 bi government expenditures in healthcare

• +100 countries exposed to the Aedes vector borne diseases
• 3 bi human beings endangered

Source: KRAEMER, SINKA, DUDA et al. The global distribution of the arbovirus vectors Aedes aegypti and Ae. Albopictus. 2105
The outline of the problem

- Of the many diseases transmitted by Aedes sp., only Yellow Fever has an efficient vaccine.
- Therefore, the only way to fight the many diseases transmitted by this genus of insect is to fight the insect itself, especially breeding sites.

Sources: WHO. Dengue Guidelines for diagnosis treatment prevention and control. 2009
The outline of the problem

- The combat efforts should be based on a field intelligence that could allow the efficient application of resources and the measurement of the results.

Sources: WHO. Dengue Guidelines for diagnosis treatment prevention and control. 2009
89% acknowledge the inefficacy of current surveillance methods

Source: interviews with 36 public sector managers in Brazil and Argentina

86% do not know how to control the vector inside their installations

Source: interviews with 8 private managers in Brazil
The proposed solution

- The creation of a map that shows in a timely manner the populational concentration of Aedes sp.
- The use of this information by public officers to plan and evaluate their actions.
- The dissemination of this information to the general public to engage the population.
How is this map created?

It follows a basic principle:
The more the eggs

The more the mosquitoes
How is this map created?

Georeferenced ovitraps are distributed on the area to be surveilled.
How is this map created?

The female mosquito deposits its eggs on wooden paddles inside the traps.
How is this map created?

The wooden paddles are collected weekly and photographed.
How is this map created?

The pictures are uploaded to a server and computer vision algorithms perform the egg counting process.
How is this map created?

Heat maps and reports are generated
<table>
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<th>Accuracy of data</th>
<th>Response speed</th>
<th>Control efficiency</th>
<th>Cost</th>
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- **Accuracy of data**
  - Mosquito Traps: ✓
  - Ovitraps manual egg count: ✗
  - Automated focal visit: ✗

- **Response speed**
  - Mosquito Traps: ✓
  - Ovitraps manual egg count: ✗
  - Automated focal visit: ✓

- **Control efficiency**
  - Mosquito Traps: ✓
  - Ovitraps manual egg count: ✗
  - Automated focal visit: ✗

- **Cost**
  - Mosquito Traps: ✓
  - Ovitraps manual egg count: ✗
  - Automated focal visit: ✓
- Serra’s Slum
- Pampulha’s Airport
- Mariana City
- Sabará City
- Betim City

85,000

Protected Lives
5 step process

1. Manufacture of ovitraps
2. BTI Solution Aedes attractor
3. Implantation of ovitraps
4. Paddle photography
5. Egg count
The making of the ovitraps
Our first manual ovitrap prototype

Our manual ovitrap prototype that works

Our industrial prototype (recommended for wet weather)

Our industrial prototype with lid (recommended for dry weather)
Aedes sp Attractive Solution

Biological larvicide 
*Bacillus thuringiensis israelensis* - BTI

**BTI water dilution**

Water dilution of Panicum maximum infusion

Attractive solution of the Aedes females (Panicum maximum grass infusion diluted in water plus BTI)
Implantation of ovitraps
Return from deployment
Manual photography of the paddles
Current photography of the paddles
Ovitrampas

Endereço: [Enter address]
Latitude: -20.378502
Longitude: -43.428490

Descrição:

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Onde o bicho tá pegando?

**Vermelho**
Dúvidas! O bicho tá pegando!
- Faça a faxina contra a dengue dia sim, dia não;
- Use repelentes e roupas compridas;
- Avise seus vizinhos;
- Procure o mobilizador comunitário.

**Amarelo**
Atenção! O mosquito está voltando!
- Faça a faxina contra a dengue dia sim, dia não;
- Use repelentes e roupas compridas;
- Avise seus vizinhos.

**Verde**
Parabéns! Obrigado pelos seus esforços!
- Mantenha-se vigilante;
- Faça a faxina contra a dengue uma vez por semana.

#TodosContraoMosquito
Thank you!

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