

Community-based vector control programs



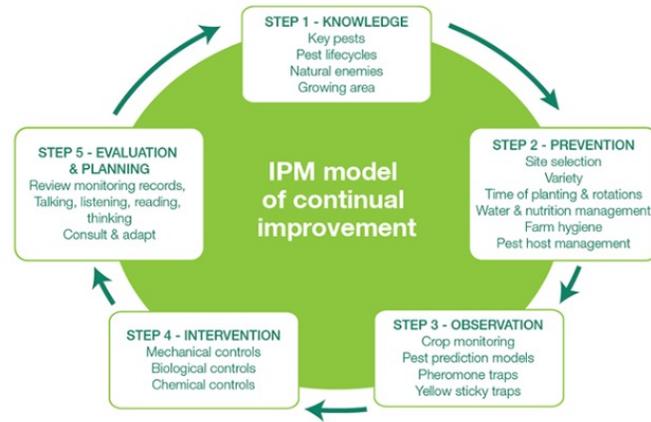
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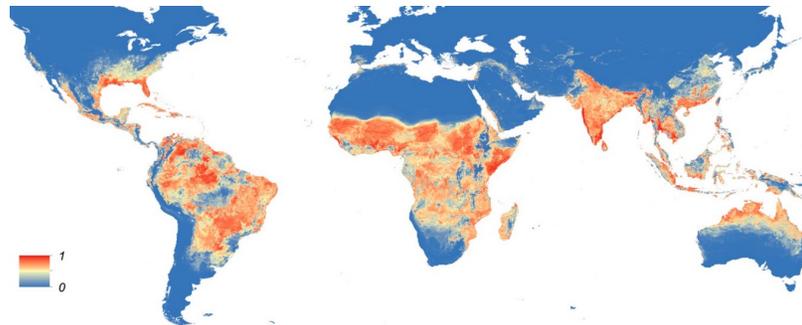
ENTOMOLOGY
TEXAS A&M UNIVERSITY

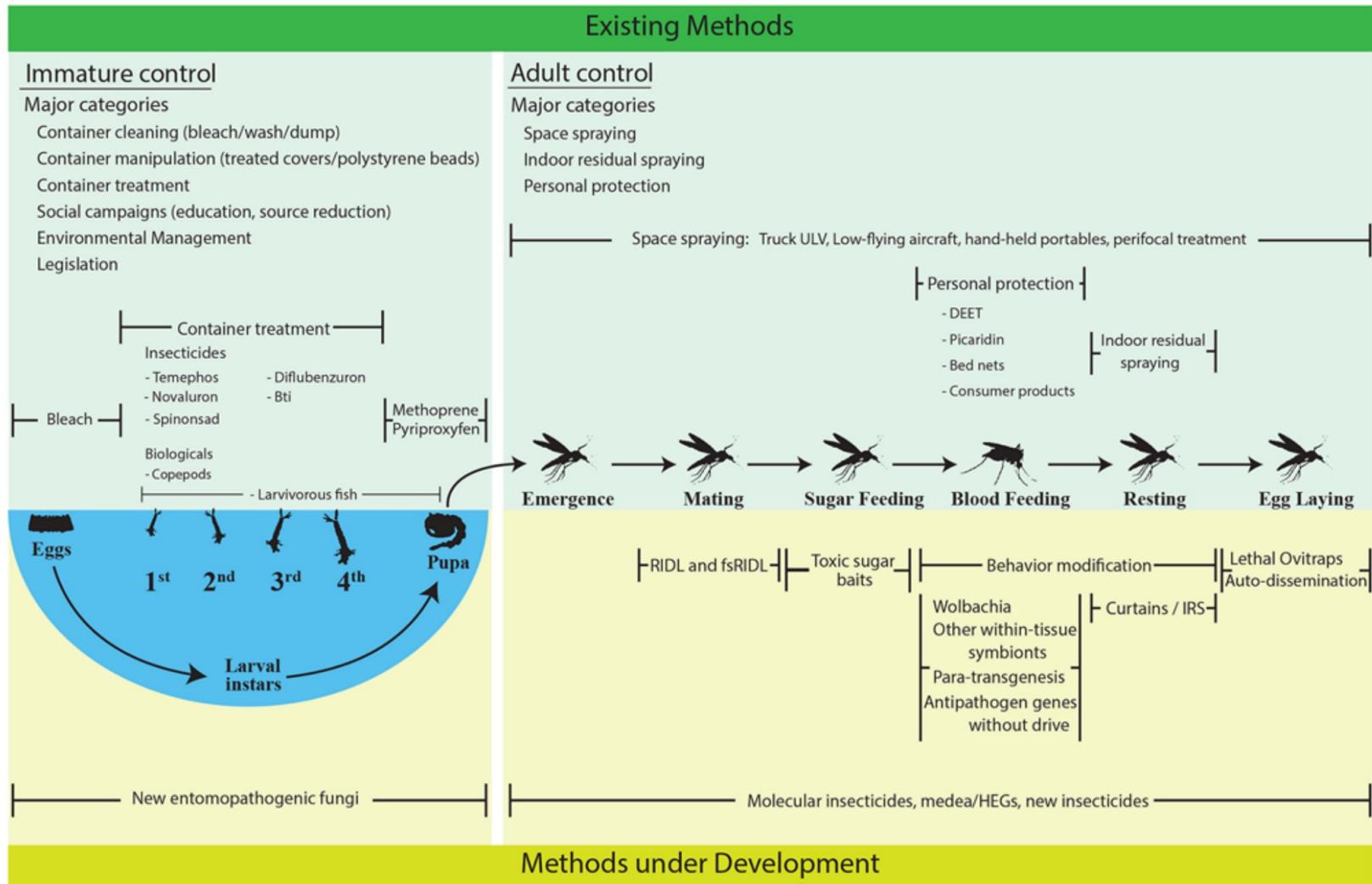
TEXAS A&M
AGRI LIFE
RESEARCH

Integrated Pest/Vector/Mosquito Management



Phillips et al. 2017 Nature Reviews





How to determine if an intervention works?

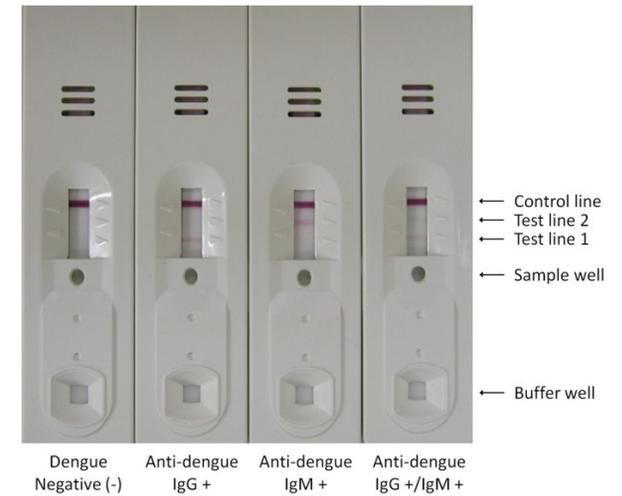


WHO

Epidemiological outcome variable

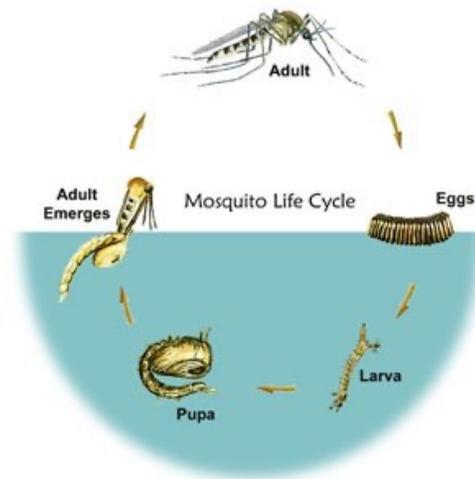
- Asymptomatic
 - Seroconversion over time (force of infection)
- Symptomatic
 - Clinical disease

- Animal surrogates



Entomological Outcome Variable

- Adults mosquitoes
 - Mosquito traps
 - Aspirator collections
- Immature (*Stegomyia* indices)
 - House index
 - Container index
 - Breteau Index

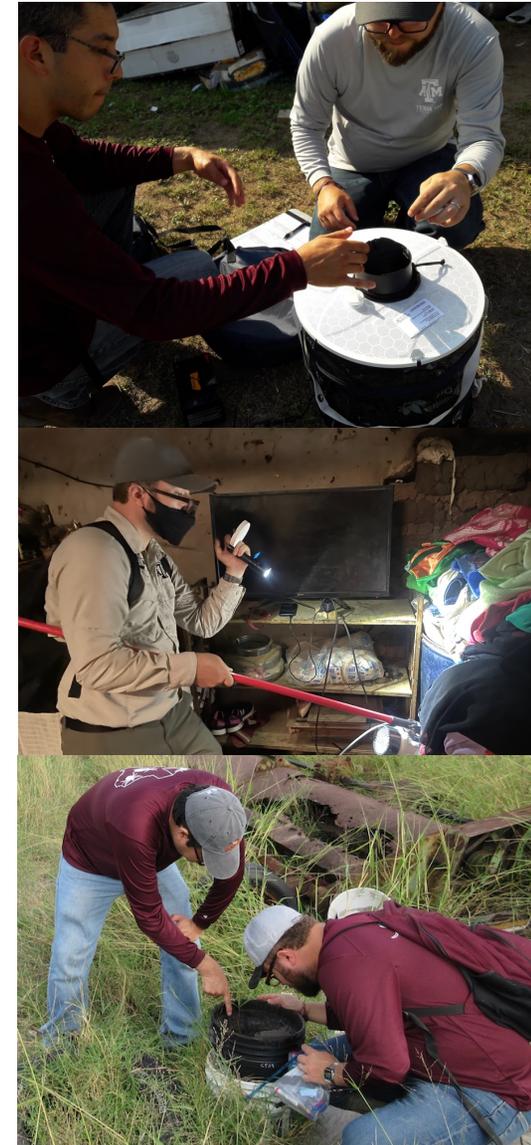


- Percent control = $100 - ((T / U) \times 100)$

$$Treated = \frac{\text{Post-treatment mean}}{\text{Pre-treatment mean}}$$

$$Untreated = \frac{\text{Post-untreated mean}}{\text{Pre-untreated mean}}$$

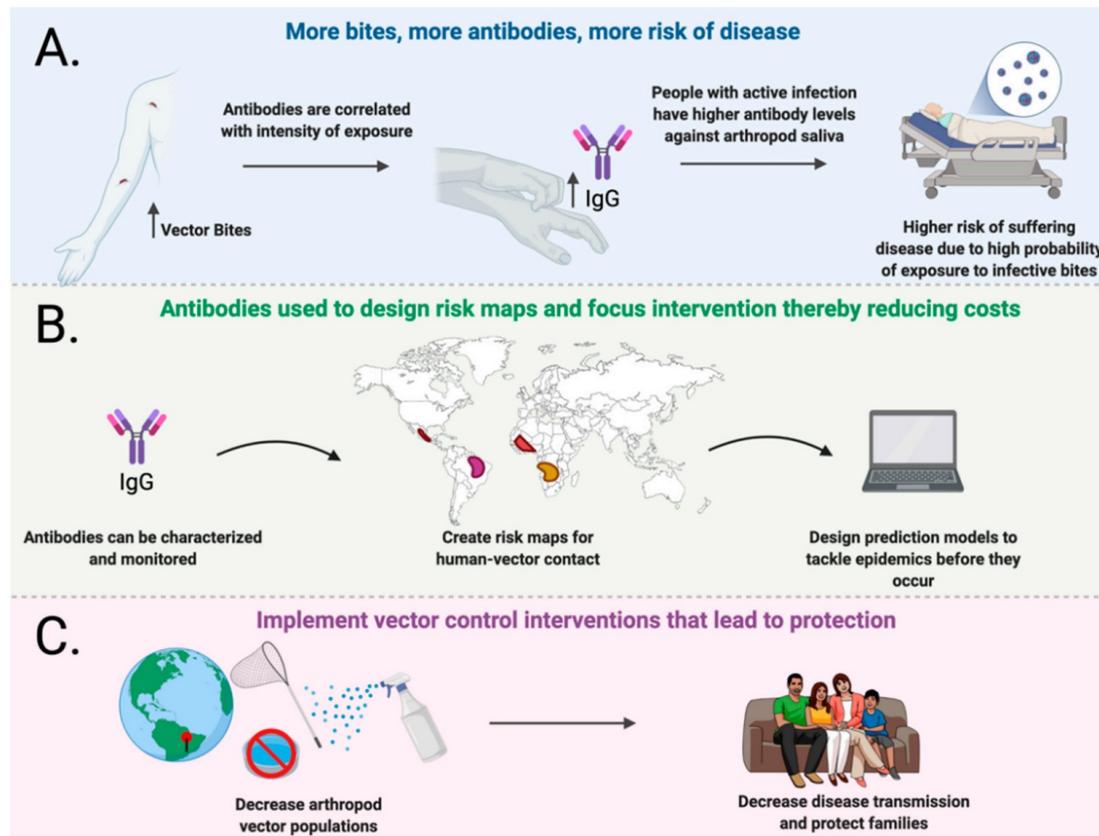
Mulla's or Henderson's Formula



Merging Entomological and Epidemiological outcome variables: the Bite Mark Assay



Berlin
Londono-Renteria



Olajiga et al. 2021 *Vaccines*



Nicole Scavo

Little disease but lots of bites: social, urbanistic, and entomological risk factors of human exposure to *Aedes aegypti* in South Texas, U.S.

Nicole A. Scavo^{1,2*}, Jose G. Juarez¹, Luis Fernando Chaves³, Nadia A. Fernández-Santos^{1,4}, Ester Carbajal¹, Joshuah Perkin⁵, Berlin Londono-Renteria⁶, Gabriel L. Hamer^{1*}

PLOS Neglected Tropical Diseases | <https://doi.org/10.1371/journal.pntd.0011953> October 21, 2024

• Risk factors of exposure to bites

- Mosquito collection
 - Weekly BGS2 surveillance (2021)
- Surveys
 - Housing and property variables
 - Human movement variables

• Autodissemination Station Intervention

- 275 units in 4 intervention communities
- Outcome variables
 1. *Ae. aegypti* adult abundance
 2. Larval Bioassays
 3. Bitemark Assay (ELISA)
 - optical density of N34kDa



Autodissemination Station Intervention - Pyriproxyfen

Methods

Community selection and BG2 surveillance (Aug 2021)



Low-income

8

ADS intervention
(September 21 – March 22)

Ctr:4

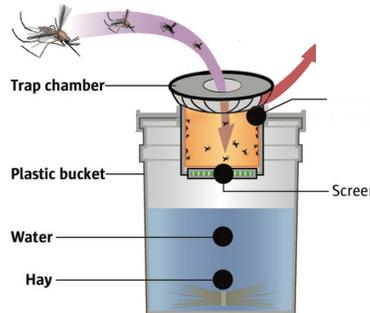


Int:4

80% target
community coverage

Recruitment

77% avg



RESEARCH ARTICLE

Systematic review of *Aedes aegypti* control trials suggests publication bias related to author disclosure of conflicts of interest

Abdisalam A. Abdi¹, Jose G. Juarez^{2,3}, Trevor Harris^{4*}, Tereza Magalhaes¹, Gabriel L. Hamer^{1*}

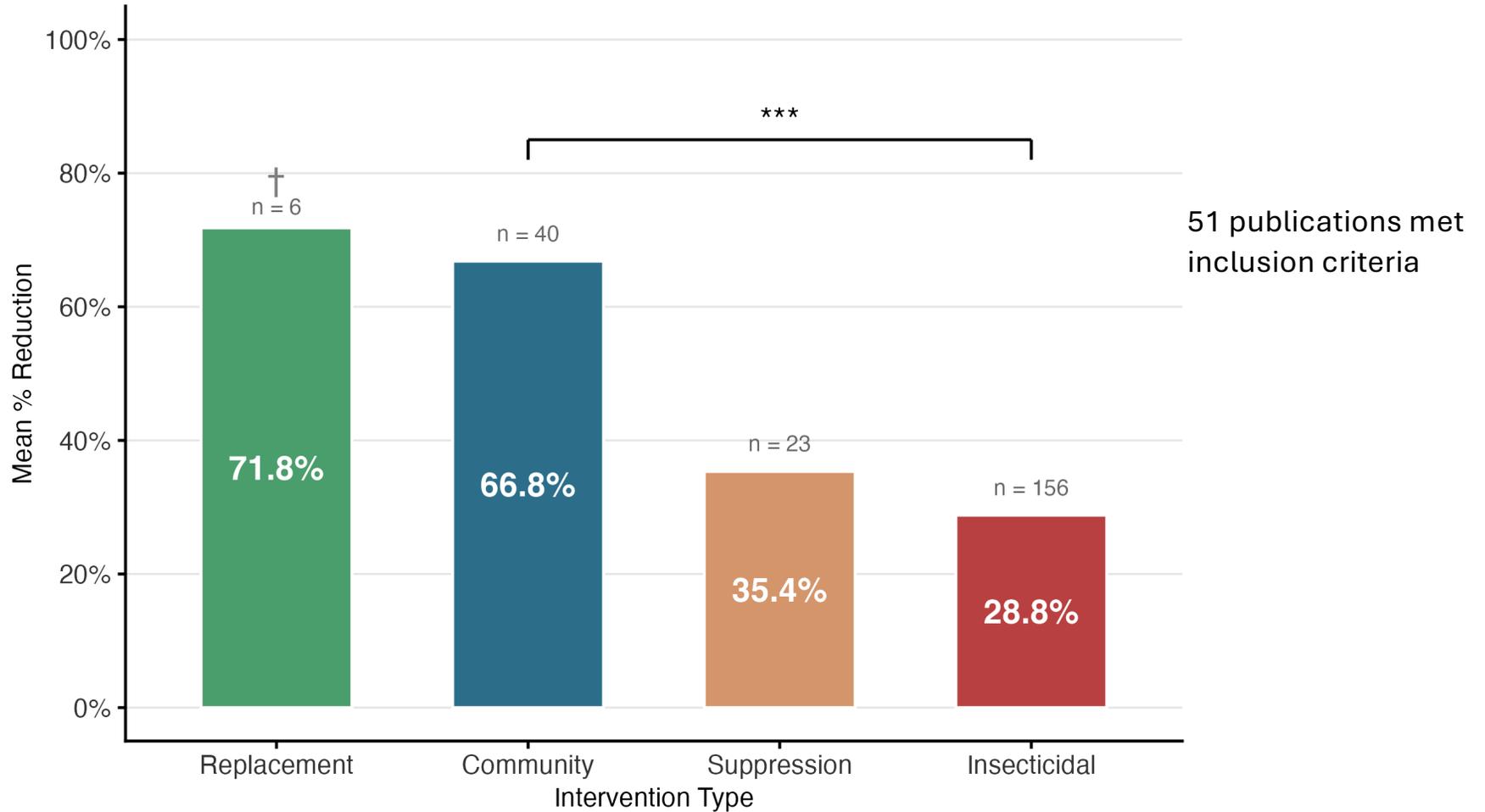


Abdisalam Abdi

PLOS Neglected Tropical Diseases | <https://doi.org/10.1371/journal.pntd.0013914> January 14, 2026

- WHO estimated that \$47 billion is used for primary tools to suppress *Ae. aegypti* vector populations
- Many studies evaluate different control approaches to suppress *Ae. aegypti* populations
- Not all studies conducted are published (Publication Bias)
 - Negative results
 - Conducted by for-profit companies (conflict of interest)
 - Involvement of intellectual property (conflict of interest)

Mean *Aedes aegypti* population reduction by intervention type



*** $p < 0.001$ vs. Insecticidal (median quantile regression, $\beta = 0.308$).
† Replacement $n = 6$; interpret with caution ($p = 0.174$).

Abdi et al. 2026



DengueChat: A Social and Software Platform for Community-based Arbovirus Vector Control

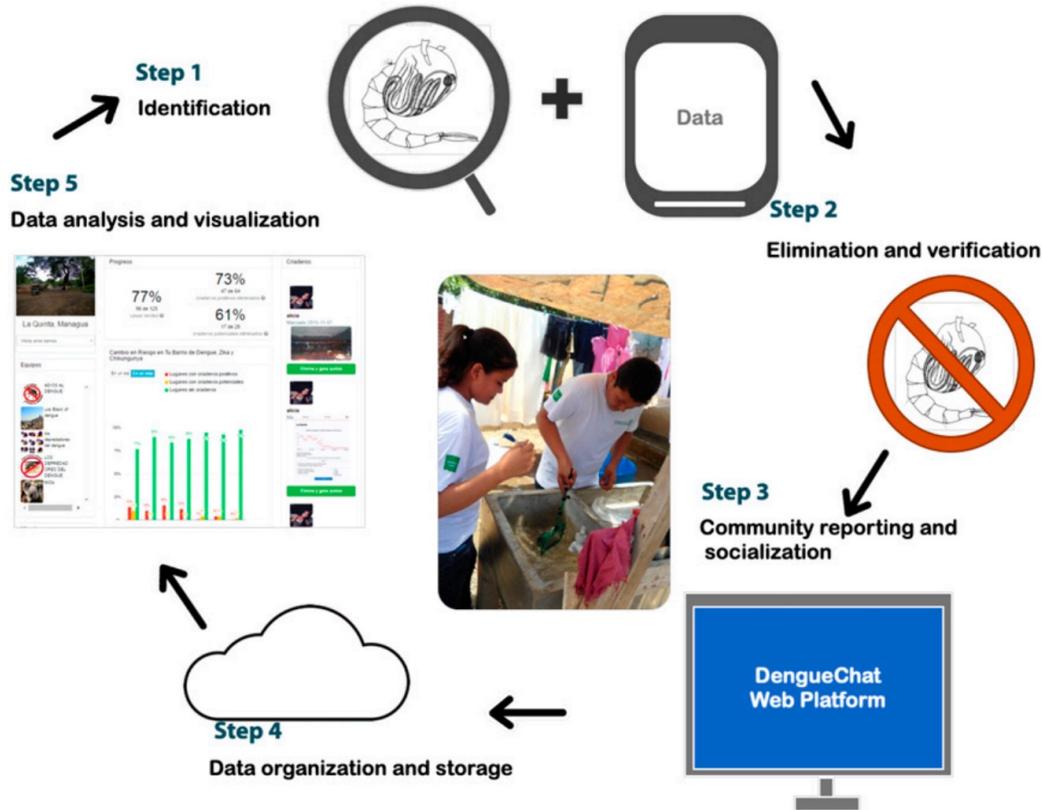
James Holston,¹ Harold Suazo-Laguna,² Eva Harris,^{2,3} and Josefina Coloma^{2,3*}

¹*Department of Anthropology and Social Apps Lab, University of California, Berkeley, California;* ²*Sustainable Sciences Institute, Managua, Nicaragua;* ³*Division of Infectious Diseases and Vaccinology, School of Public Health, University of California, Berkeley, California*

- Paradigm shift from one that largely promotes vertical chemical-based control and vaccine development to one that also concentrates on eliminating the mosquito through actions by the communities
- DengueChat (denguechat.org)
 - A new social and software platform to advance community interventions in arbovirus vector control
 - Promotes resident participation in evidence collection, reporting, and analysis, and it incorporates pedagogic information, key messaging, and game concepts to motivate communities to implement vector reduction strategies.



Brigadas de Salud y Vida
(Brigades of Health and Life)
Citizen entomologists



- Allows individuals and organizations to interact through blog posts
- Win points earned for vector elimination and container management
- Obtain reports of the efficacy of their work to reduce mosquito infestation

FIGURE 2. DengueChat Workflow. Step 1: Brigadistas identify *Aedes* breeding sites and collect house-level data using smartphones or paper registries. Step 2: Residents eliminate breeding sites that brigadistas verify during house visits. Step 3: Entomological and other data are uploaded to the website and brigadistas use the social platform to chat about their findings. Step 4: DengueChat cloud computing sorts, stores, and processes the community-collected data. Step 5: DengueChat displays the data in color-coded graphs representing neighborhood risk (% of households positive, negative, or potential for *Ae. aegypti*). This figure appears in color at www.ajtmh.org.

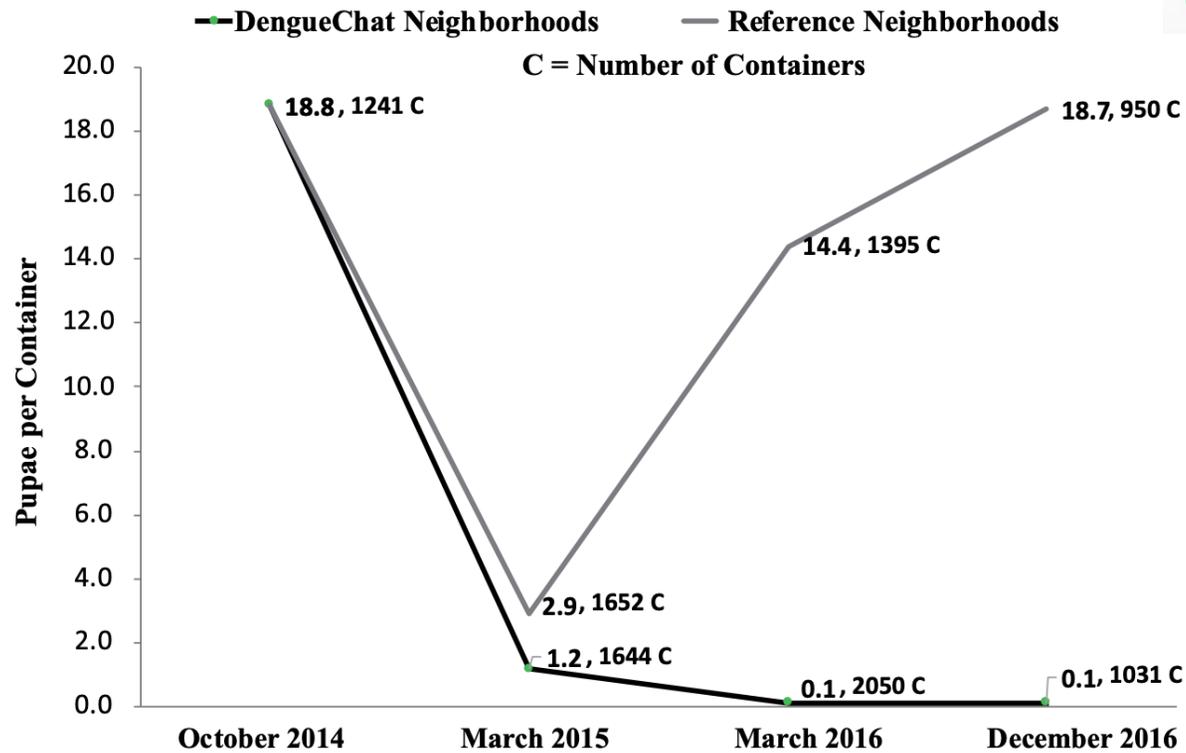


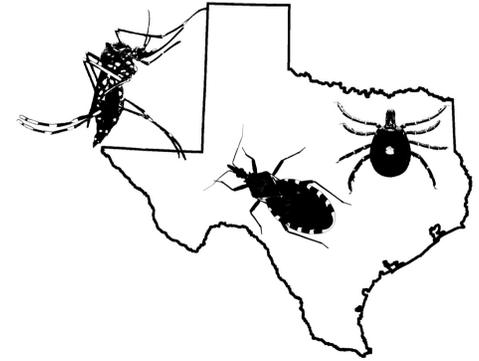
FIGURE 6. Pupae per container counts at baseline and during each of the external entomological measurements. Although the study ended in March 2016, a final measurement performed in December 2016 showed that communities maintained their low entomological levels on their own compared with control neighborhoods, where pupal and Breteau indices (not shown) returned to baseline levels during the wet season.



RESEARCH & EXTENSION CENTER
Weslaco



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DEL VALLE
GRUPO EDUCATIVO

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