World Mosquito Program™

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Gerente WMP Colombia
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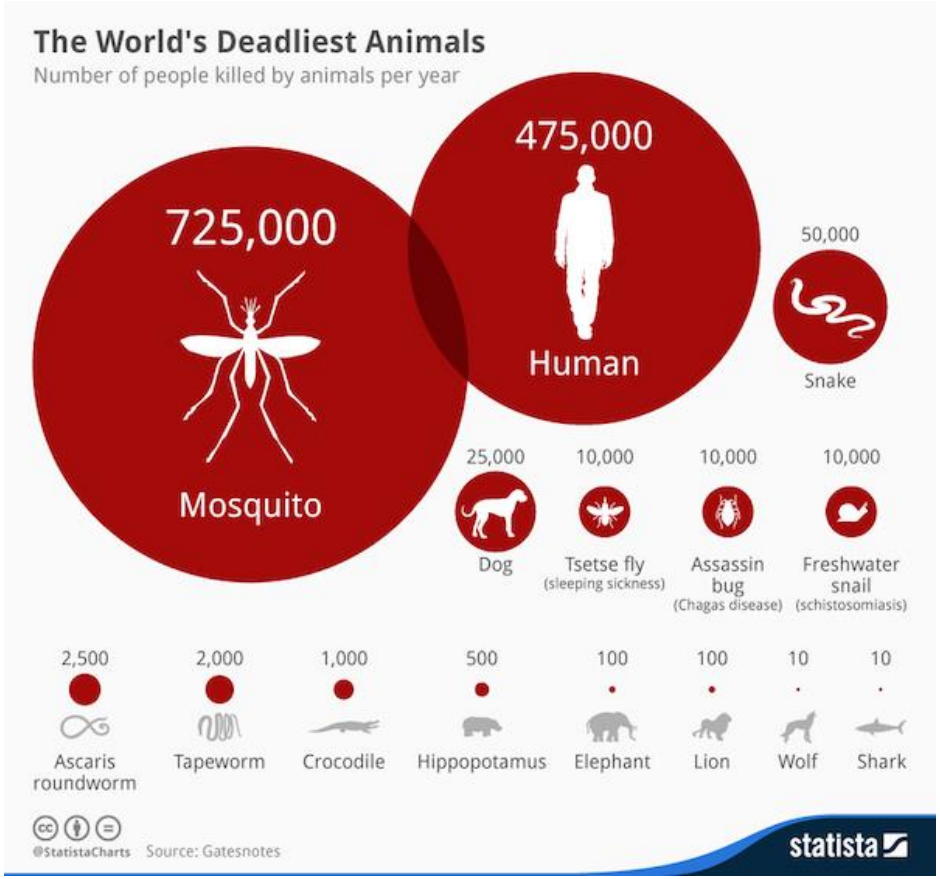
1803


The World's Deadliest Animals
Number of people killed by animals per year
475,000
Human
725,000
Mosquito
50,000
Snake
25,000
Dog
10,000
Tsetse fly
(sleeping sickness)
10,000
Assassin bug
(Chagas disease)
10,000
Freshwater snail
(schistosomiasis)
2,500
Ascaris roundworm
2,000
Tapeworm
1,000
Crocodile
500
Hippopotamus
100
Elephant
100
Lion
10
Wolf
10
Shark
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Source: Gatesnotes
statista

Populations at risk from dengue, zika, chikungunya and yellow fever

Global Burden Of Dengue And Zika

Costo del dengue en Colombia

PLOS | NEGLECTED TROPICAL DISEASES

RESEARCH ARTICLE

A multi-country study of the economic burden of dengue fever: Vietnam, Thailand, and Colombia

Jung-Seok Lee[1,2]*, Vittal Mogasale[2☯], Jacqueline K. Lim[2☯], Mabel Carabali[2☯], Kang-Sung Lee[2☯], Chukiat Sirivichayakul[3☯], Duc Anh Dang[4☯], Diana Cristina Palencia-Florez[5☯], Thi Hien Anh Nguyen[4☯], Arthorn Riewpaiboon[6☯], Pornthep Chanthavanich[3☯], Luis Villar[5☯], Brian A. Maskery[2☯], Andrew Farlow[1☯]

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OPEN ACCESS

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Editor: Benjamin Althouse, Institute for Disease Modeling, UNITED STATES

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Published: October 30, 2017

Data Availability Statement: All relevant data are within the paper and its Supporting Information files.

Abstract

Background

Dengue fever is a major public health concern in many parts of the tropics and subtropics. The first dengue vaccine has already been licensed in six countries. Given the growing interests in the effective use of the vaccine, it is critical to understand the economic burden of dengue fever to guide decision-makers in setting health policy priorities.

Methods/Principal findings

A standardized cost-of-illness study was conducted in three dengue endemic countries: Vietnam, Thailand, and Colombia. In order to capture all costs during the entire period of illness, patients were tested with rapid diagnostic tests on the first day of their clinical visits, and multiple interviews were scheduled until the patients recovered from the current illness. Various cost items were collected such as direct medical and non-medical costs, indirect costs, and non-out-of-pocket costs. In addition, socio-economic factors affecting disease severity were also identified by adopting a logit model. We found that total cost per episode ranges from $141 to $385 for inpatient and from $40 to $158 outpatient, with Colombia having the highest and Thailand having the lowest. The percentage of the private economic bur-

Am. J. Trop. Med. Hyg., 94(5), 2016, pp. 1065–1072
doi:10.4269/ajtmh.15-0280

The Burden of Dengue and the Financial Cost to Colombia, 2010–2012

Raúl Castro Rodríguez,* Gabriel Carrasquilla, Alexandra Porras, Katia Galera-Gelvez, Juan Guillermo Lopez Yescas, and Jorge A. Rueda-Gallardo

Department of Economics, Universidad de los Andes, Bogotá, Colombia; Centro de Estudios e Investigación en Salud (CEIS), Fundación Santa Fe de Bogotá, Bogotá, Colombia; Fundación Santa Fe de Bogotá, Universidad El Bosque, Bogotá, Colombia; Sanofi Pasteur Latin America, Mexico City, Mexico

Abstract. Data on the burden of dengue and its economic costs can help guide health policy decisions. However, little reliable information is available for Colombia. We therefore calculated the burden of the disease, expressed in disability-adjusted life years (DALYs), for two scenarios: endemic years (average number of cases in non-epidemic years 2011 and 2012) and an epidemic year (2010, when the highest number of dengue cases was reported in the study period). We also estimated the total economic cost of the disease (U.S. dollars at the average exchange rate for 2012), including indirect costs to households derived from expenses such as preventing entry of mosquitos into the home and costs to government arising from direct, indirect, and prevention and monitoring activities, as well as the direct medical and non-medical costs. In the epidemic year 2010, 1,198.73 DALYs were lost per million inhabitants versus 83.88 in endemic years. The total financial cost of the disease in Colombia from a societal perspective was US$167.8 million for 2010, US$129.9 million for 2011, and US$131.7 million for 2012. The cost of mosquito prevention borne by households was a major cost driver (accounting for 46% of the overall cost in 2010, 62% in 2011, and 64% in 2012).

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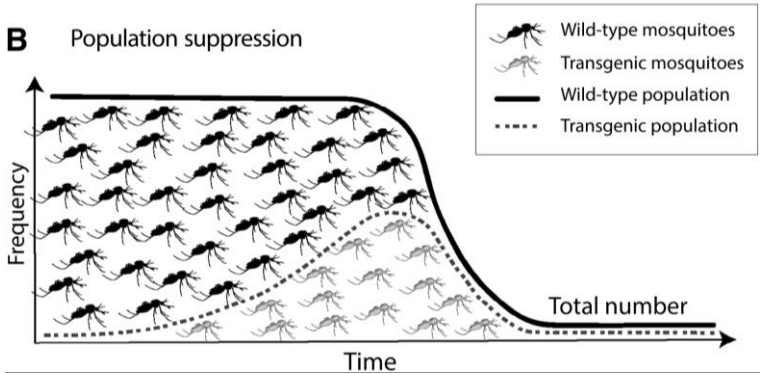
ESTRATEGIAS DE CONTROL : No vacunas, No medicamentos…



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¡Grac

MARZO 2015

Carcinogenicity of tetrachlorvinphos, parathion, malathion, diazinon, and glyphosate

Published Online
March 20, 2015
http://dx.doi.org/10.1016/S1470-2045(15)70134-8

For more on the **IARC Monographs** see http://monographs.iarc.fr

Upcoming meetings
June 2–9, 2015, Volume 113: Some organochlorine insecticides and some chlorphenoxy herbicides
Oct 6–13, 2015, Volume 114: Red meat and processed meat

Monograph Working Group Members
A Blair (USA)—Meeting Chair; L Fritschi (Australia); J McLaughlin; C M Sergi (Canada); G M Calaf (Chile); F Le Curieux (Finland); I Baldi (France); F Forastiere (Italy); H Kromhout (Netherlands); A 't Mannetje (New Zealand); T Rodriguez [unable to attend] (Nicaragua); P Egeghy [unable to attend], G D Jahnke; C W Jameson; M T Martin; M K Ross; I Rusyn; L Zeise (USA)

In March, 2015, 17 experts from 11 countries met at the International Agency for Research on Cancer (IARC; Lyon, France) to assess the carcinogenicity of the organophosphate pesticides tetrachlorvinphos, parathion, malathion, diazinon, and glyphosate (table). These assessments will be published as volume 112 of the IARC Monographs.[1]

The insecticides tetrachlorvinphos and parathion were classified as "possibly carcinogenic to humans" (Group 2B). The evidence from human studies was scarce and considered inadequate. Tetrachlorvinphos induced hepatocellular tumours (benign or malignant) in mice, renal tubule tumours (benign or malignant) in male mice,[2] and spleen haemangioma in male rats. Tetrachlorvinphos is a reactive oxon with affinity for esterases. In experimental animals, tetrachlorvinphos is systemically distributed, metabolised, and eliminated in urine. Although bacterial mutagenesis tests were negative, tetrachlorvinphos induced genotoxicity in some assays (chromosomal damage in rats and in vitro) and increased cell proliferation (hyperplasia in rodents). Tetrachlorvinphos is banned in the European Union. In the USA, it continues to be used on animals, including in pet flea collars.

For parathion, associations with cancers in several tissues were observed in occupational studies, but the evidence in humans remains sparse. In mice, parathion increased bronchioloalveolar adenoma and/or carcinoma in males, and lymphoma in females. In rats, parathion induced adrenal cortical adenoma or carcinoma (combined),[3] malignant pancreatic tumours, and thyroid follicular cell adenoma in males, and mammary gland adenocarcinoma (after subcutaneous injection in females).[4] Parathion is rapidly absorbed and distributed. Parathion metabolism to the bioactive metabolite, paraoxon, is similar across species. Although bacterial mutagenesis tests were negative, parathion induced DNA and chromosomal damage in human cells in vitro. Parathion markedly increased rat mammary gland terminal end bud density.[4] Parathion use has been severely restricted since the 1980s.

The insecticides malathion and diazinon were classified as "probably carcinogenic to humans" (Group 2A). Malathion is used in agriculture, public health, and residential insect control. It continues to be produced in substantial volumes throughout the world. There is limited evidence in humans for the carcinogenicity of malathion. Case-control analyses of occupational exposures reported positive associations with non-Hodgkin lymphoma in the USA,[5] Canada,[6] and Sweden,[7] although no increased risk of non-Hodgkin lymphoma was observed in the large Agricultural Health Study cohort (AHS). Occupational use was associated with an increased risk of prostate cancer in a Canadian case-control study[8] and in the AHS, which reported a significant trend for aggressive cancers after adjustment for other pesticides.[9] In mice, malathion increased hepatocellular adenoma or carcinoma (combined).[10] In rats, it increased thyroid carcinoma in males, hepatocellular adenoma or carcinoma (combined) in females, and mammary gland adenocarcinoma after subcutaneous injection in females.[4] Malathion is rapidly absorbed and distributed. Metabolism to the bioactive metabolite, malaoxon, is similar across species. Malaoxon strongly inhibits esterases; atropine reduced carcinogenesis-related effects in one study.[4] Malathion induced DNA and chromosomal damage in humans, corroborated by studies in animals and in vitro. Bacterial mutagenesis tests were negative. Compelling evidence supported disruption of hormone pathways. Hormonal effects probably mediate rodent thyroid and mammary gland proliferation.

Diazinon has been applied in agriculture and for control of home and garden insects. There was limited evidence for diazinon carcinogenicity

	Activity (current status)	Evidence in humans (cancer sites)	Evidence in animals	Mechanistic evidence	Classification*
Tetrachlorvinphos	Insecticide (restricted in the EU and for most uses in the USA)	Inadequate	Sufficient	..	2B
Parathion	Insecticide (restricted in the USA and EU)	Inadequate	Sufficient	..	2B
Malathion	Insecticide (currently used; high production volume chemical)	Limited (non-Hodgkin lymphoma, prostate)	Sufficient	Genotoxicity, oxidative stress, inflammation, receptor-mediated effects, and cell proliferation or death	2A†
Diazinon	Insecticide (restricted in the USA and EU)	Limited (non-Hodgkin lymphoma, leukaemia, lung)	Limited	Genotoxicity and oxidative stress	2A†
Glyphosate	Herbicide (currently used; highest global production volume herbicide)	Limited (non-Hodgkin lymphoma)	Sufficient	Genotoxicity and oxidative stress	2A†

EU=European Union. *See the International Agency for Research on Cancer (IARC) preamble for explanation of classification system (amended January, 2006). †The 2A classification of diazinon was based on limited evidence of carcinogenicity in humans and experimental animals, and strong mechanistic evidence; for malathion and glyphosate, the mechanistic evidence provided independent support of the 2A classification based on evidence of carcinogenicity in humans and experimental animals.

Table: **IARC classification of some organophosphate pesticides**

M K Ross; I Rusyn; L Zeise (USA)

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Table: **IARC classification of some organophosphate pesticides**

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Es una iniciativa sin fines de lucro que trabaja para **proteger a la comunidad mundial** de enfermedades transmitidas por mosquitos como el dengue, el Zika, el chikungunya y la fiebre amarilla.

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BILL & MELINDA GATES foundation

USAID FROM THE AMERICAN PEOPLE

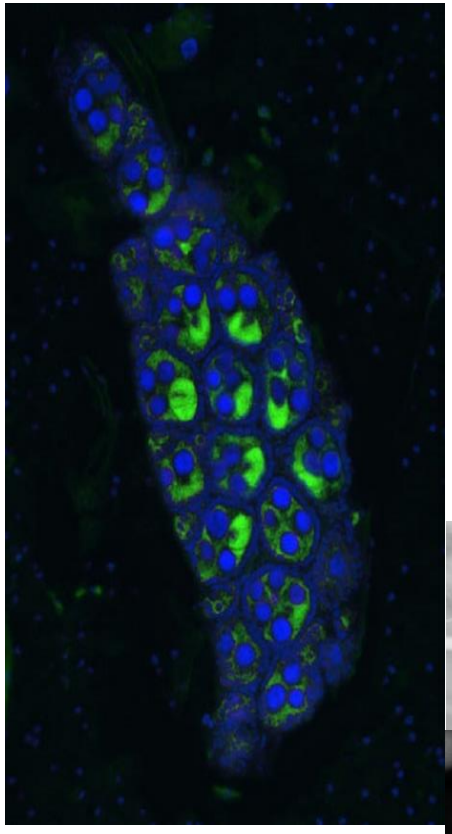
wellcome

Fundación Bill y Melinda Gates, a través de la convocatoria Grandes Desafíos para la Salud Global, quien entrega la mayor parte de los dineros para su financiación

La Agencia de Cooperación Internacional de Estados Unidos **USAID**

Wellcome (Inglaterra)

¿Qué es *Wolbachia* ?



- Bacteria exclusiva de insectos
- Intracelular obligatoria (simbionte)
- Incapaz de sobrevivir por fuera del insecto
- Transmisión materna
- No hay transferencia horizontal de *Wolbachia* a los predadores de mosquitos
- No hay transferencia horizontal de *Wolbachia* al ambiente (suelo, plantas…)
- Presente en 60% especies de insectos
- Está en Colombia
- Produce efectos en el insecto que son útiles para el control de ETVs

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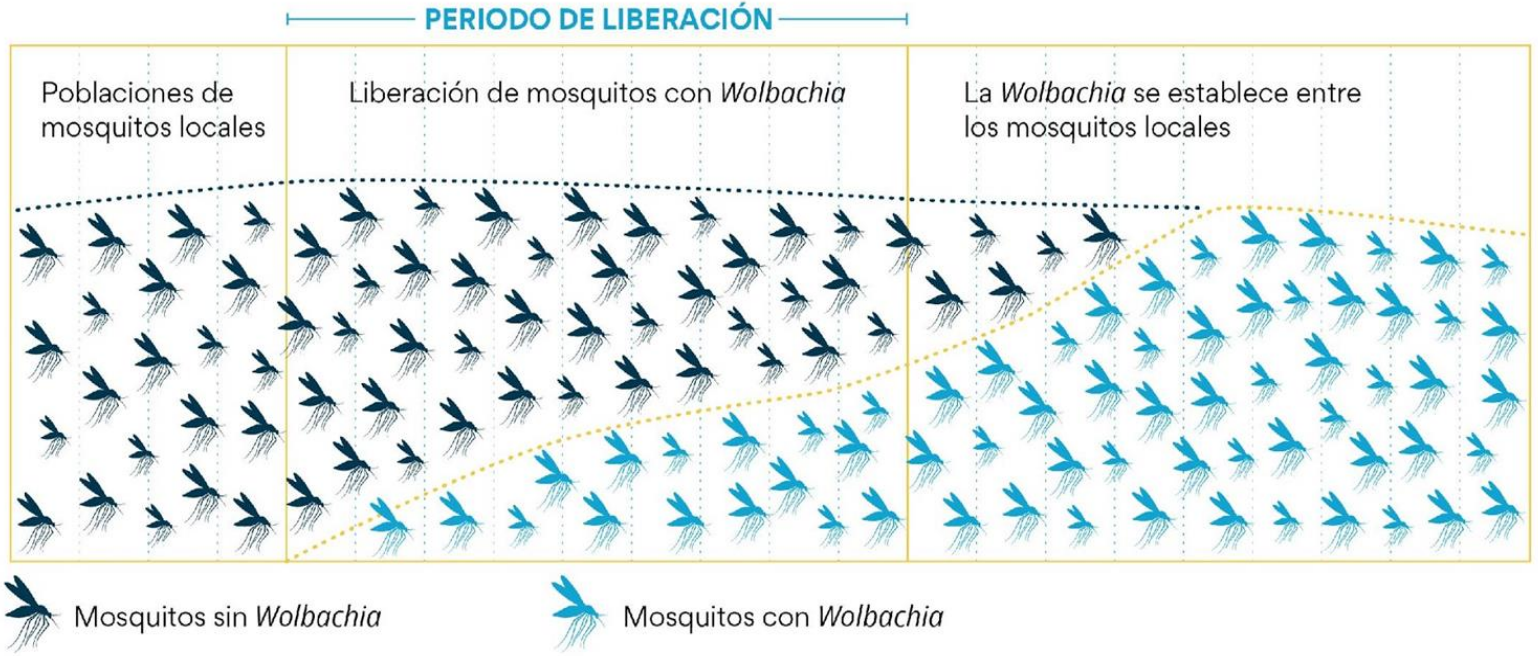
Nuestro método innovador
Video

Establecimiento de la *Wolbachia* en las comunidades de mosquitos locales



CSIRO

www.csiro.au

Risk Analysis on the Australian release of *Aedes aegypti* (L.) (Diptera: Culicidae) containing *Wolbachia*

Murphy, B, Jansen, C, Murray, J & De Barro, P

March 2010

Vietnam Eliminate Dengue Project

Risk Assessment of the Pilot Release of *Aedes aegypti* mosquitoes containing *Wolbachia*

Hanoi September 2011

Evaluation Team

Prof. Truong Quang Hoc, DSc.

Prof. Truong UyenNinh, PhD

Nguyen Van Tuat, PhD

Nguyen Viet Hung, PhD

Nguyen Dinh Cuong, MD. MPH

Cambios en el ecosistema

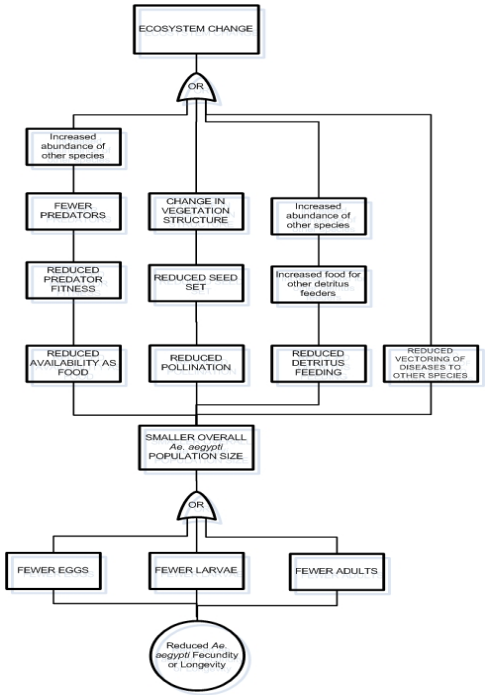


Figure 9. Expert derived fault tree describing the ecological implications of reduced *Ae. aegypti* life span or fecundity.

Table 6. Hazard definitions for 'Ecosystem Change' fault tree.

Name	Type	Description
Change in vegetation Structure	Hazard	The vegetative composition of an area changes because of changes (decline) in plant fecundity.
Ecosystem change	Hazard	The release leads to ecosystem change or removal of ecosystem services.
Fewer adults	Hazard	Fewer *Ae. aegypti* adults present in environment.
Fewer eggs	Hazard	*Wolbachia Ae. aegypti* has lower fecundity than naturally occurring *Ae. aegypti.*
Fewer larvae	Hazard	Fewer *Ae. aegypti* larvae present in environment.
Fewer predators	Hazard	Fewer predators occur in ecosystem because of reduced prey.
Increased abundance of other species (x2)	Hazard	Some species increase in numbers because of a reduction in predation or increased availability of food (e.g. detritus) and reduced competition because of smaller *Ae. aegypti* populations.
Increased food for other detritus feeders	Hazard	Reduced cycling of detritus as a result of lower numbers of *Ae. aegypti* larvae leaves more food for other detritus feeders.
Reduced *Ae. aegypti* fecundity or longevity	Und. Event	*Wolbachia Ae. aegypti* has lower fecundity or shorter life span than naturally occurring *Ae. aegypti.*
Reduced availability as food	Hazard	Reduced numbers of eggs, larvae and adult *Ae. aegypti* reduces their availability to predators.
Reduced detritus feeding	Hazard	Lower numbers of *Ae. aegypti* larvae provide reduced cycling of detritus.
Reduced pollination	Hazard	Plant species receive less pollination by *Ae. aegypti* males as a result of fewer *Ae. aegypti* being present to feed on flowers.
Reduced predator fitness	Hazard	Predators have reduced fitness because of reduced *Ae. aegypti* prey.
Reduced seed set	Hazard	Plant species have lower fecundity because of reduced pollination services.
Reduced vectoring of disease to other species	Hazard	A smaller *Ae. aegypti* population leads to lower transmission of diseases/arboviruses.
Smaller overall *Ae. aegypti* population size	Hazard	Mean density of *Wolbachia Ae. aegypti* is lower than that of naturally occurring *Ae. aegypti.*

Árbol de fallas para la evaluación de seguridad – Impacto ecológico y en la salud humana

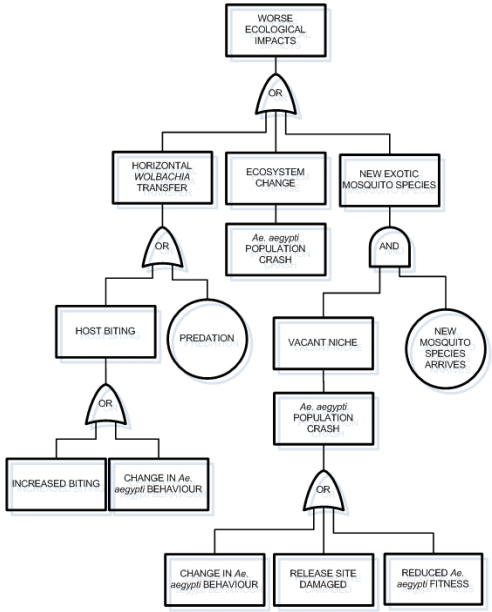


Figure 4. 'Worse ecological impacts 'component of 'Cause More Harm' fault tree.

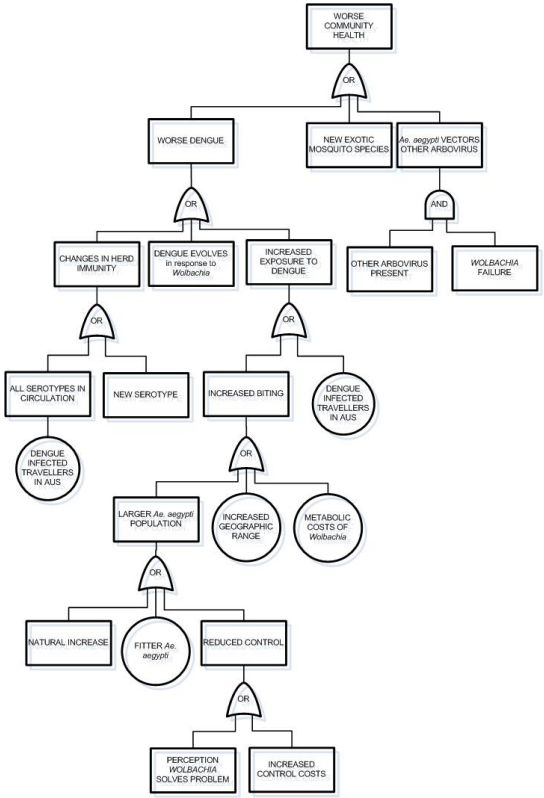


Figure 7. 'Worse community health' component of 'Cause More Harm' fault tree.

www.nature.com/scientificreports

SCIENTIFIC REPORTS

OPEN

The *w*Mel strain of *Wolbachia* Reduces Transmission of Zika virus by *Aedes aegypti*

Received: 28 April 2016
Accepted: 10 June 2016

Matthew T. Aliota[1], Stephen A. Peinado[1], Ivan Dario Velez[2] & Jorge E. Osorio[1]

PLOS | NEGLECTED TROPICAL DISEASES

RESEARCH ARTICLE

The *w*Mel Strain of *Wolbachia* Reduces Transmission of Chikungunya Virus in *Aedes aegypti*

Matthew T. Aliota[1]*, Emma C. Walker[1], Alexander Uribe Yepes[2], Ivan Dario Velez[2], Bruce M. Christensen[1], Jorge E. Osorio[1]

1 Department of Pathobiological Sciences, University of Wisconsin-Madison, Madison, Wisconsin, United States of America, 2 Programa de Estudio y Control de Enfermedades Tropicales (PECET), Universidad de Antioquia, Medellin, Colombia

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OPEN ACCESS

Citation: Aliota MT, Walker EC, Uribe Yepes A, Dario Velez I, Christensen BM, Osorio JE (2016) The *w*Mel Strain of *Wolbachia* Reduces Transmission of Chikungunya Virus in *Aedes aegypti*. PLoS Negl Trop Dis 10(4): e0004677. doi:10.1371/journal.pntd.0004677

Editor: Philip M. Armstrong, The Connecticut Agricultural Experiment Station, UNITED STATES

Received: February 25, 2016

Abstract

Background

New approaches to preventing chikungunya virus (CHIKV) are needed because current methods are limited to controlling mosquito populations, and they have not prevented the invasion of this virus into new locales, nor have they been sufficient to control the virus upon arrival. A promising candidate for arbovirus control and prevention relies on the introduction of the intracellular bacterium *Wolbachia* into *Aedes aegypti* mosquitoes. This primarily has been proposed as a tool to control dengue virus (DENV) transmission; however, evidence suggests *Wolbachia* infections confer protection for *Ae. aegypti* against CHIKV. Although this approach holds much promise for limiting virus transmission, at present our understanding of the ability of CHIKV to infect, disseminate, and be transmitted by *w*Mel-infected *Ae. aegypti* currently being used at *Wolbachia* release sites is limited.

Acciones del MAP

1. Perfil comunitario e investigación de **línea de base**

2. Creación **grupo de referencia**

3. Campañas de **información y comunicación**

4. Actividades de **participación comunitaria**

5. Activación de un sistema de **PQRS**

6. Evaluación del nivel de **aceptación de las liberaciones**

7. **Liberaciones de mosquitos** portadores de *Wolbachia*

8. **Monitoreo del aumento** de la *Wolbachia*

9. Evaluación de **la percepción de la comunidad** después de terminadas las liberaciones

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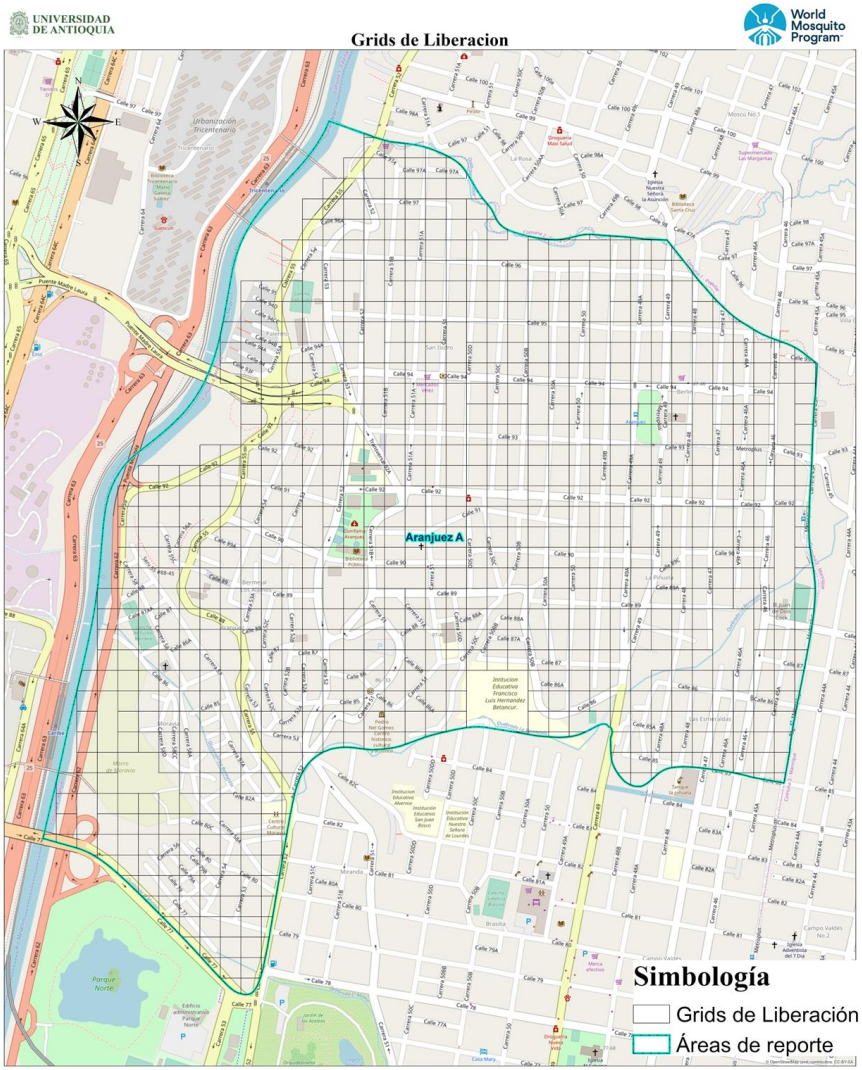
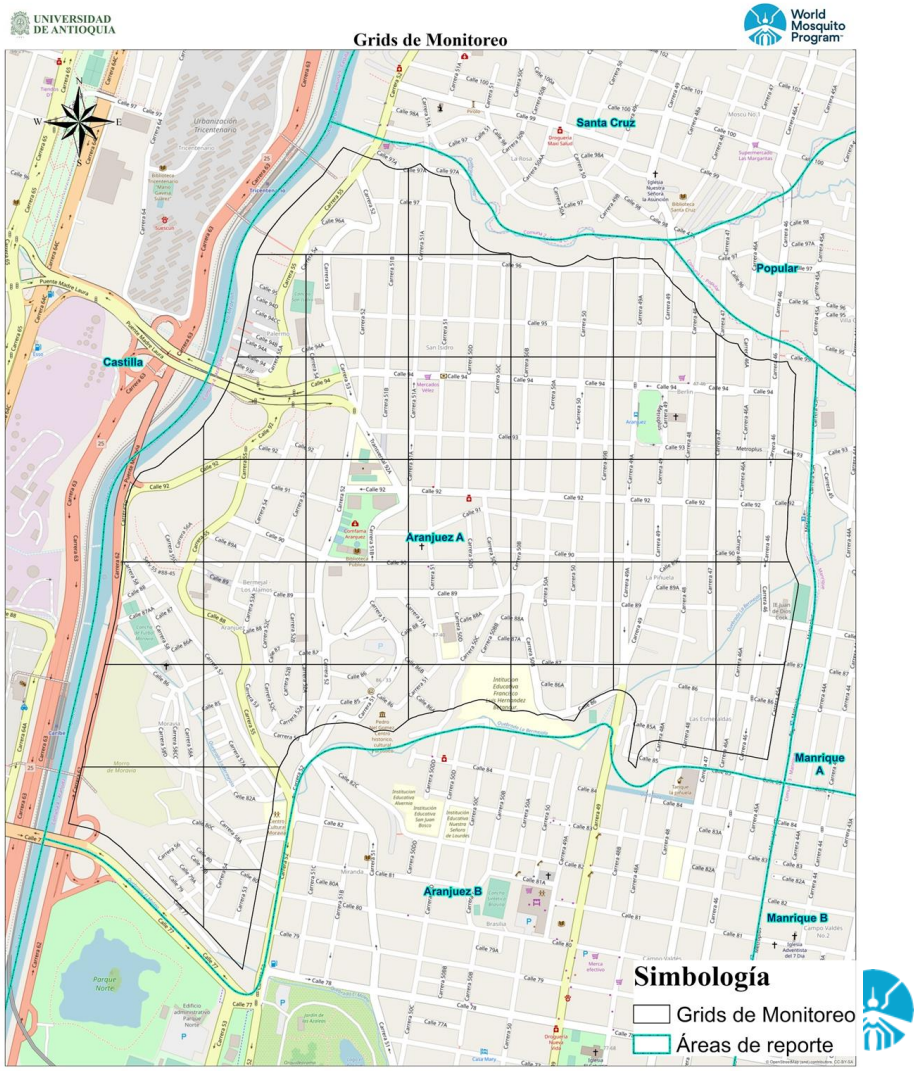
H13N

Preparación para actividades de liberación

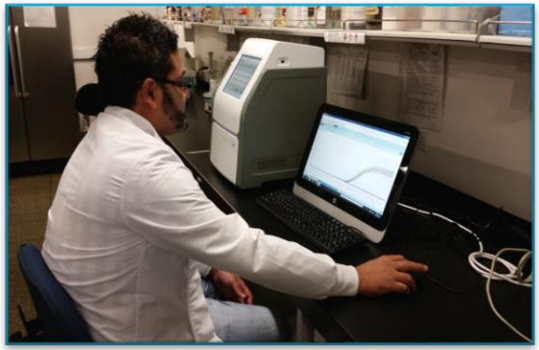


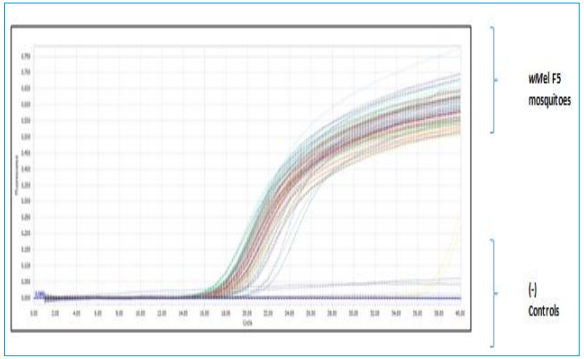
Preparación para el despliegue del sistema de monitoreo



OVITRAMPAS

TRAMPAS BG-SENTINNEL

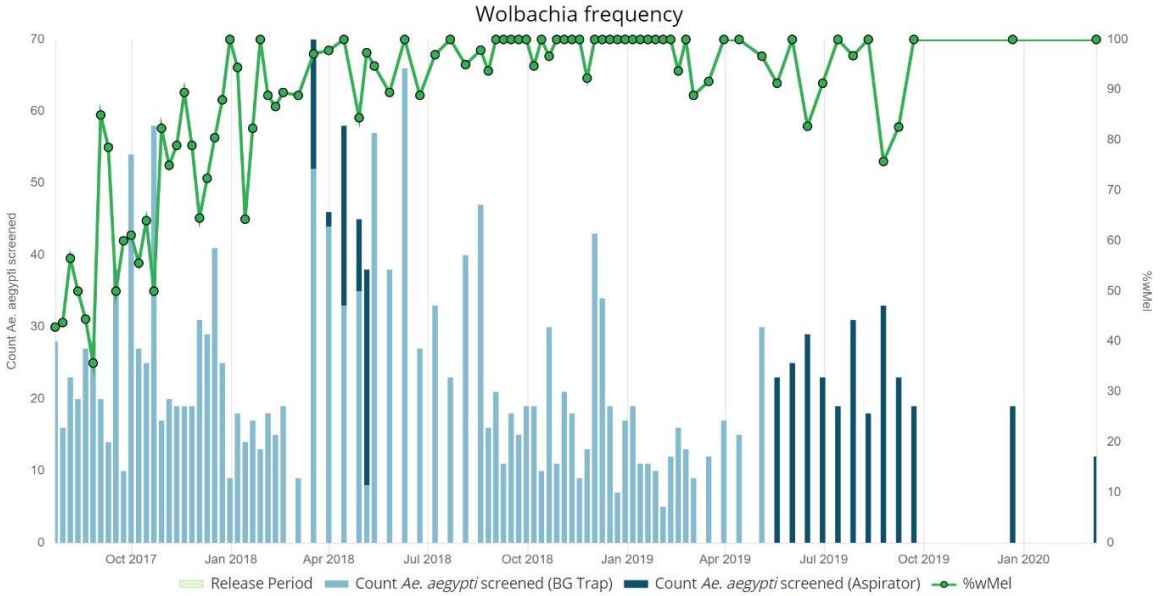


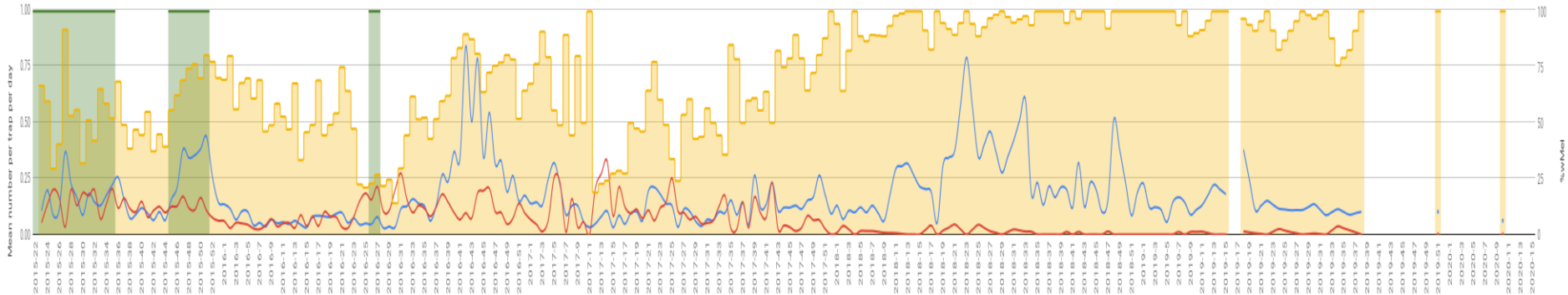


Real time PCR for *Wolbachia* and DENV

Updated 8th Mar., 2020

wMel Infection in Paris





Organización Panamericana de la Salud

Organización Mundial de la Salud
Américas

FIRST MEETING OF THE TECHNICAL ADVISORY GROUP ON PUBLIC HEALTH ENTOMOLOGY

PAN AMERICAN HEALTH ORGANIZATION

SUMMARY

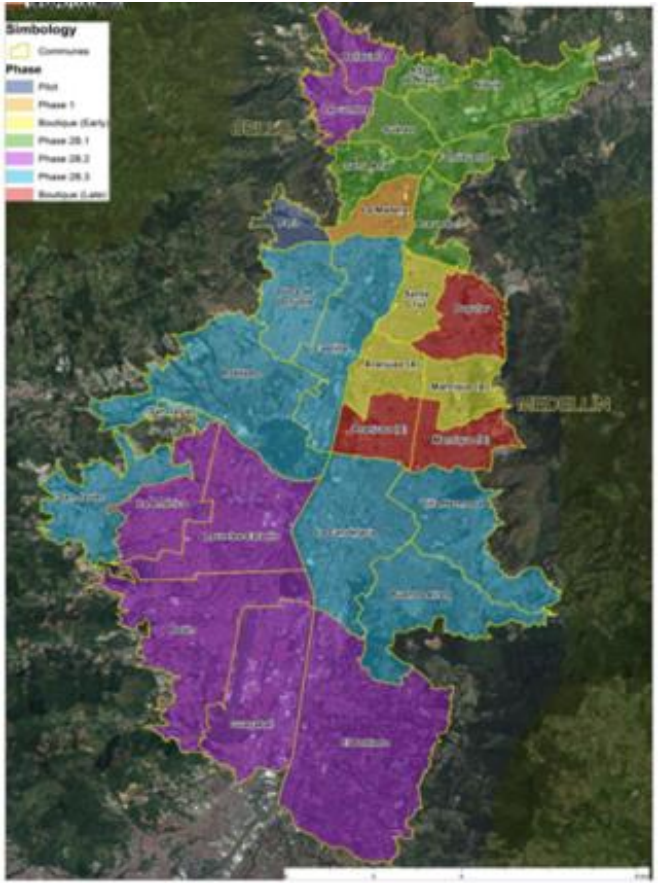
The first meeting of the Technical Advisory Group on Public Health Entomology (TAG PHE), was held from 8 to 10 March 2016 at the PAHO headquarters in Washington, DC. The topics discussed covered two scenarios: 1) vector control and prevention actions in regards to the current public health emergency of international concern (PHEIC) declared by WHO on the epidemic of Zika virus infections in the Americas, and 2) review and analysis of the actions that can be implemented in the medium and long term for the prevention and control of vectors responsible for vector-borne diseases (VBD) in the Americas.

- **Encourage** the rapid, robust and accelerated evaluation of new and supplemental tools for *Aedes* control, such as *Wolbachia* infections and genetically modified insect technology to ensure adequate technical cooperation and funding for this purpose.

MONITORING AND EVALUATION

- **Develop and provide** a protocol for penetration testing of insecticides, and testing of biological efficacy, especially in countries where the situation of insecticide resistance is unknown.
- **Evaluate** the actions of vector control, field operations, work equipment and operational procedures used in prevention and control activities; in terms of impact of actions and cost-effectiveness, and the measured impact on disease transmission and incidence. The method and evaluation of most-productive mosquito larval containers should be included.
- **The countries should support the evaluation of new tools, without losing focus on the emergency and its corresponding response to their level of scale, feasibility, cost effectiveness and acceptability by the community.**

Expansión Bello y Medellín

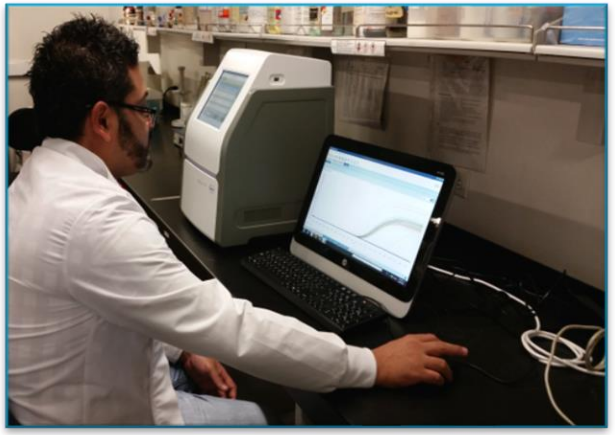


- 2.750 000 **habitantes**
- 100 **km²**
- Población heterogénea: todos los niveles económicos y educativos
- **Equipo de 150 personas**

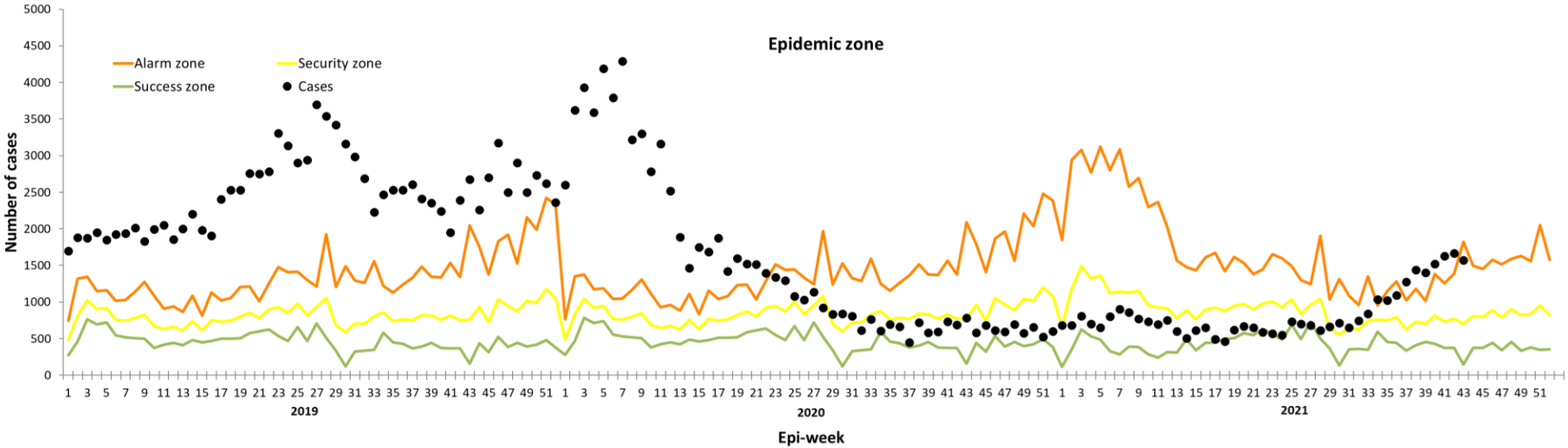
RETOS

- Permisos
- Desarrollo de Modelo Epidemiológico
- Modelo de Aceptación Pública
- Infraestructura
- Cultivo masivo
- Liberaciones
- QA/QC

Construcción de infraestructura



Dengue Endemic Channel, Colombia 2019-2021*
Epi week 42 (17th – 23th October, 2021)



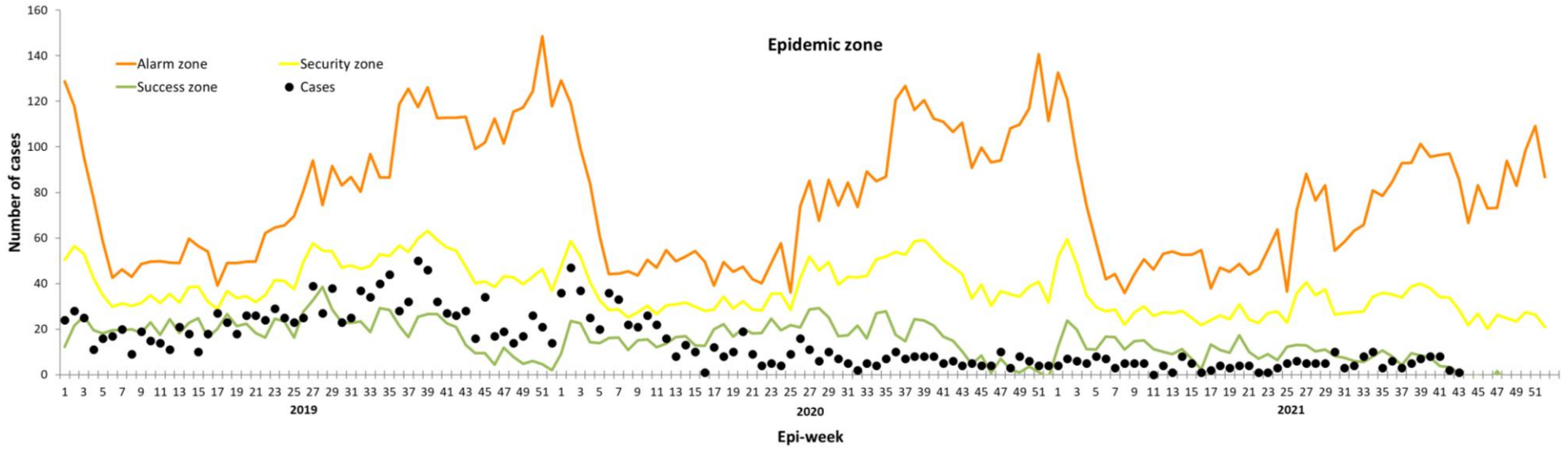
*Calculation based on geometric means of incidence proportions (PI) per 100,000 inhabitants and their confidence intervals (95% CI). Bortman, Marcelo (1999). Epidemic years are excluded.

Source: Sivigila, National Health Institute, Colombia, 2021

Total notified cases = 2019 (127 553), 2020 (80 510), 2021 (35 353, until week 42)

Dengue Endemic Channel, Medellín 2019-2021*

Epi week 43 (24th – 30th October, 2021)



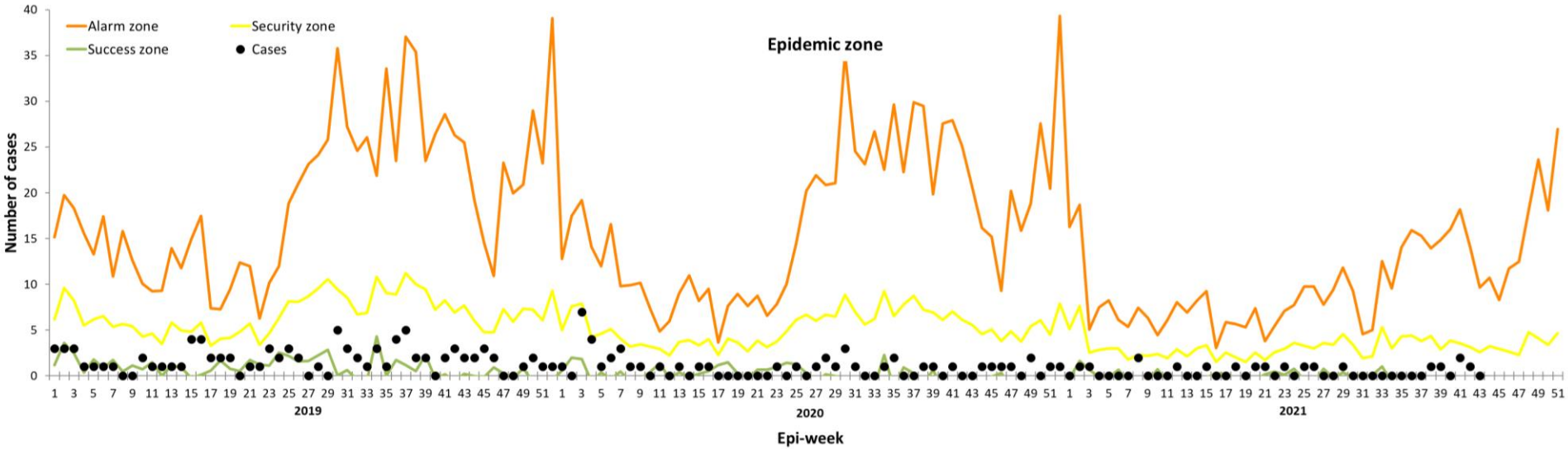
*Calculation based on geometric means of incidence proportions (PI) per 100,000 inhabitants and their confidence intervals (95% CI). Bortman, Marcelo (1999). Epidemic years are excluded.

Source: Medellin local Health Department, 2021

Total notified cases = 2019 (1313), 2020 (631), 2021 (200, until week 43)

Dengue Endemic Channel, Bello 2019-2021*

Epi week 43 (24th – 30th October, 2021)



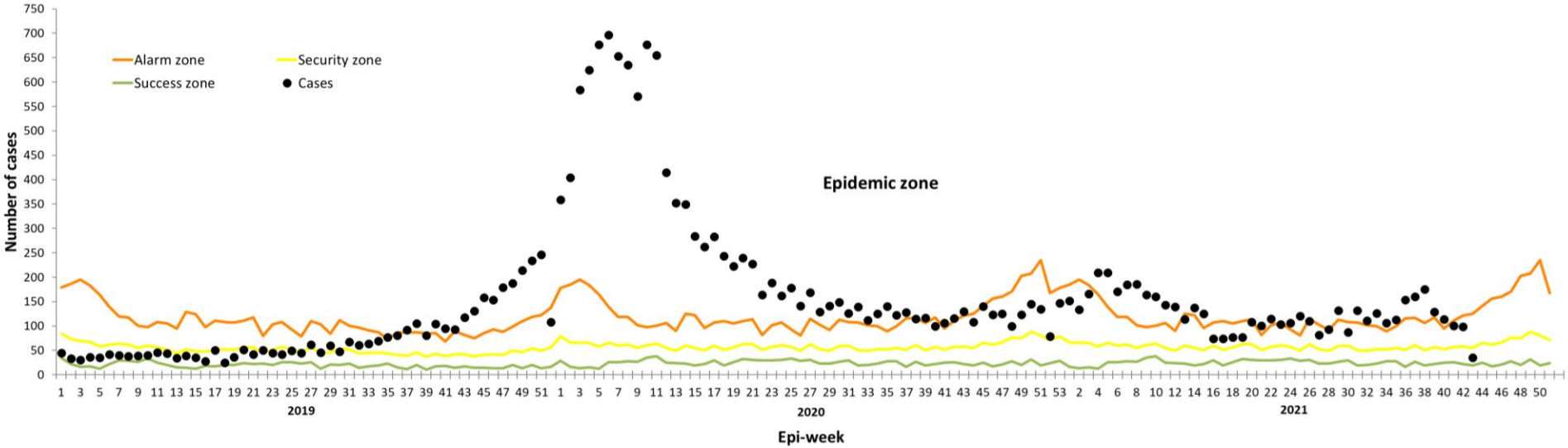
*Calculation based on geometric means of incidence proportions (PI) per 100,000 inhabitants and their confidence intervals (95% CI). Bortman, Marcelo (1999). Epidemic years are excluded.

Source: Bello local Health Department, 2021

Total notified cases = 2019 (93), 2020 (49), 2021 (18, until week 43)

Dengue Endemic Channel, Cali 2019-2021*

Epi week 43 (24th – 30th October, 2021)

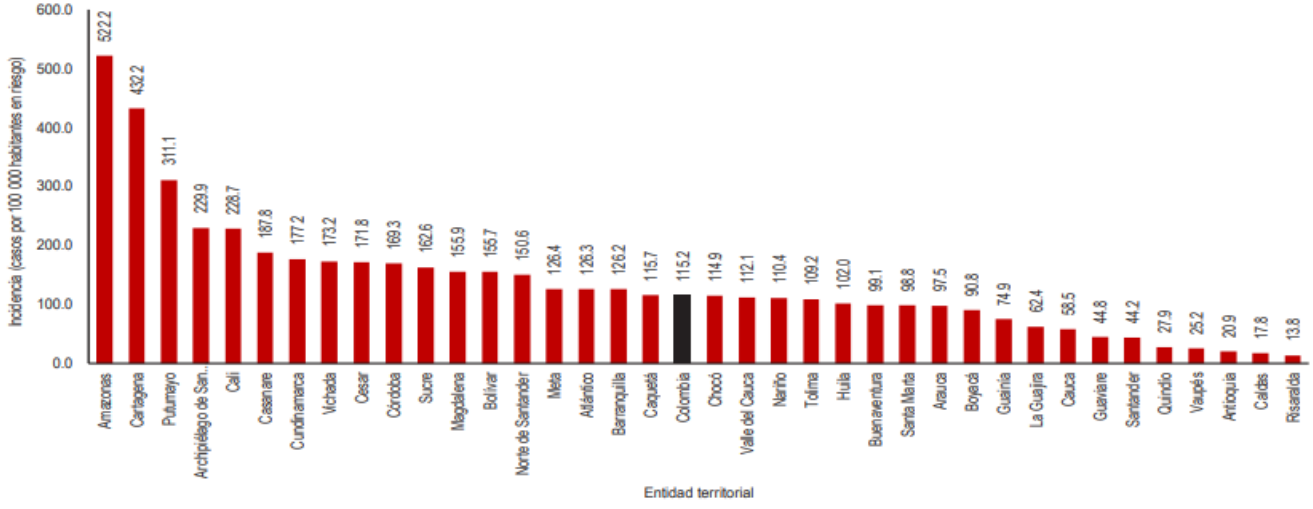


*Calculation based on geometric means of incidence proportions (PI) per 100,000 inhabitants and their confidence intervals (95% CI). Bortman, Marcelo (1999). Epidemic years are excluded.

Source: Cali local Health Department, 2021

Total notified cases = 2019 (3975), 2020 (13 555), 2021 (5408, until week 43)

Incidence rate and number of dengue cases by territorial entity, Epi week 43 (24th – 30th October, 2021)



Entidad territorial	Dengue		Dengue grave		Total	
	n	%	n	%	n	%
Cali	5094	14,6	57	8,8	5151	14,5
Cartagena	3850	11,0	103	15,9	3953	11,1
Norte de Santander	2081	5,9	48	7,4	2129	6,0
Valle del Cauca	2096	6,0	12	1,9	2108	5,9
Atlántico	1788	5,1	35	5,4	1823	5,1
Cesar	1624	4,6	49	7,6	1673	4,7
Córdoba	1590	4,5	22	3,4	1612	4,5
Barranquilla	1566	4,5	41	6,3	1607	4,5
Tolima	1279	3,7	7	1,1	1286	3,6
Meta	1216	3,5	7	1,1	1223	3,4
Antioquia	1123	3,2	19	2,9	1142	3,2
Bolívar	1053	3,0	43	6,6	1096	3,1
Putumayo	1009	2,9	3	0,5	1012	2,8
Huila	970	2,8	24	3,7	994	2,8
Sucre	926	2,6	35	5,4	961	2,7
Cundinamarca	945	2,7	3	0,5	948	2,7
Magdalena	768	2,2	21	3,2	789	2,2
Santander	752	2,1	16	2,5	768	2,2
Casanare	725	2,1	18	2,8	743	2,1
Nariño	596	1,7	5	0,8	601	1,7
Cauca	574	1,6	0	0,0	574	1,6
Santa Marta	511	1,5	21	3,2	532	1,5
La Guajira	403	1,2	28	4,3	431	1,2
Chocó	405	1,2	2	0,3	407	1,1
Caquetá	352	1,0	6	0,9	358	1,0
Buenaventura	306	0,9	3	0,5	309	0,9
Boyacá	262	0,7	0	0,0	262	0,7
Amazonas	236	0,7	3	0,5	239	0,7
Arauca	234	0,7	2	0,3	236	0,7
Quindío	152	0,4	3	0,5	155	0,4
Risaralda	124	0,4	2	0,3	126	0,4
Exterior	104	0,3	7	1,1	111	0,3
Archipiélago de San Andrés	111	0,3	0	0,0	111	0,3
Caldas	73	0,2	0	0,0	73	0,2
Vichada	48	0,1	0	0,0	48	0,1
Guainía	30	0,1	2	0,3	32	0,1
Guaviare	21	0,1	0	0,0	21	0,1
Vaupés	3	0,0	0	0,0	3	0,0
Total	35 000	100	647	100	35647	100

Source: Sivigila, National Health Institute, Colombia, 2021

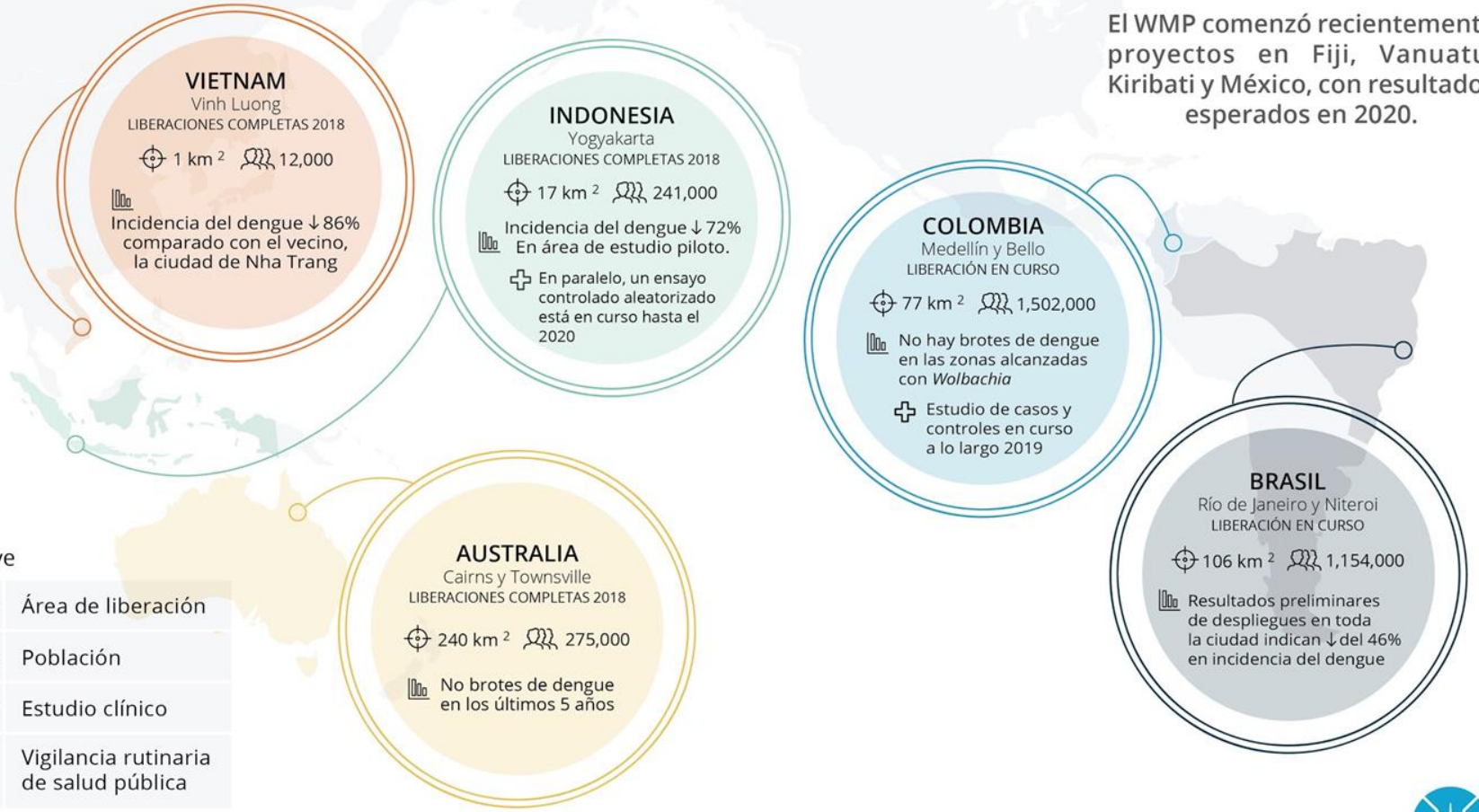
Evidencias internacionales

Evaluación de impacto

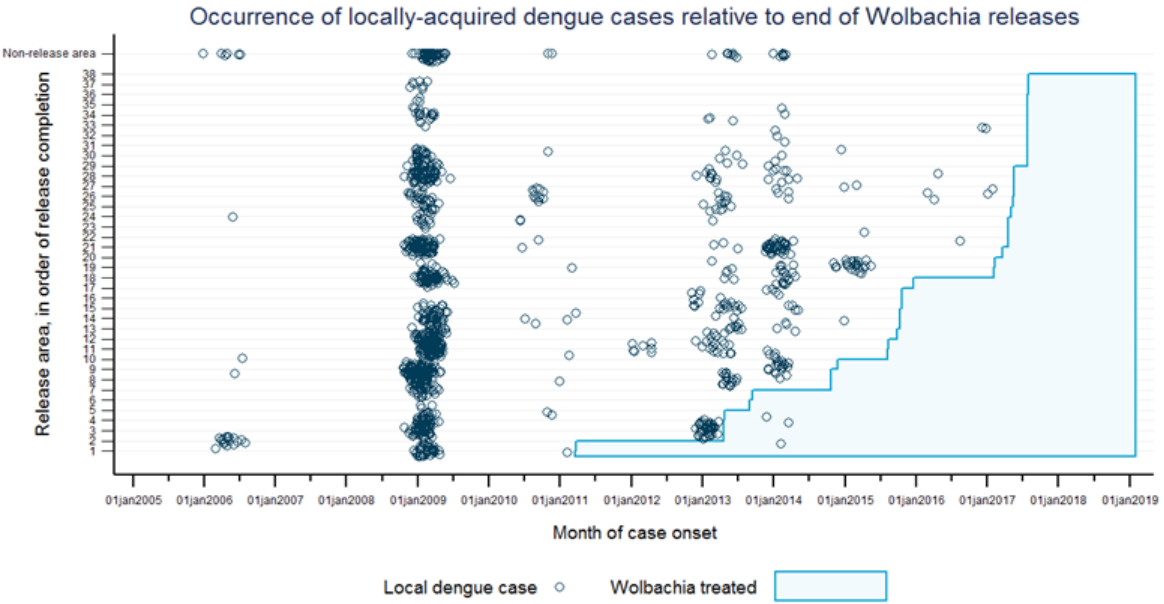
World Mosquito Program™

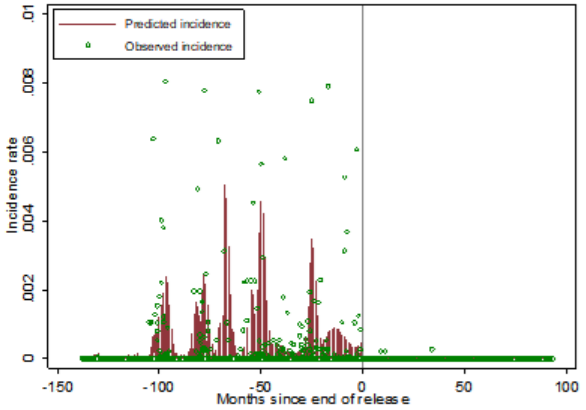
Evaluación de impacto en el mundo

El WMP comenzó recientemente proyectos en Fiji, Vanuatu, Kiribati y México, con resultados esperados en 2020.



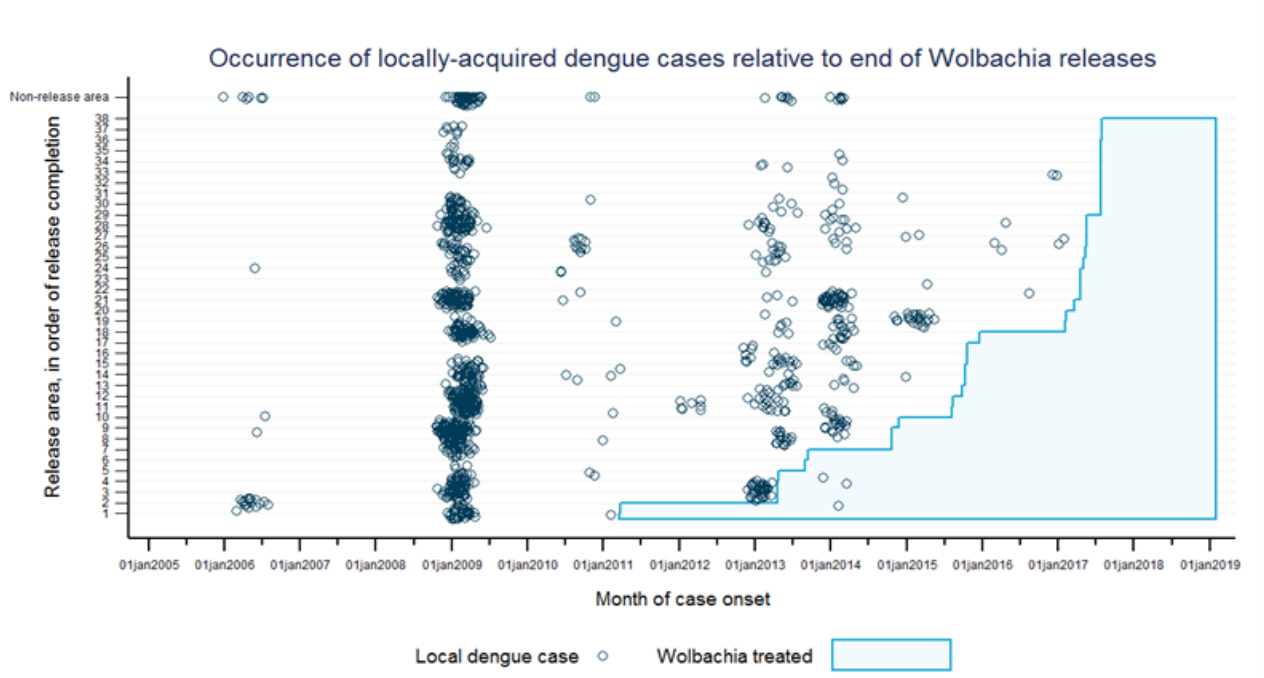
Interrupted time series analysis of dengue case notifications
Example (from Cairns)





IRR = 0.028 (95%CI 0.014–0.053) corresponding to a 97.2% (94.7 – 98.6%) reduction in the incidence of locally-acquired dengue.

Interrupted time series analysis of dengue case notifications. Example (from Cairns)



Contribuimos al logro de los Objetivos de Desarrollo Sostenible

1. Fin de la pobreza

3. Salud y bienestar

17. Alianzas para lograr los objetivos