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# Effectiveness perifocal deltamethrin spray versus insecticide treated curtains for Aedes control

**Submission date**
23/07/2012

**Recruitment status**
No longer recruiting

**Registration date**
07/09/2012

**Overall study status**
Completed

**Last Edited**
18/01/2019

**Condition category**
Infections and Infestations

[_] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

## Plain English summary of protocol

Background and study aims
Dengue is a common viral infection spread by mosquitoes. It is widespread in tropical and sub-tropical regions, mainly affecting urban areas but extending into more populated rural areas. The mosquitoes breed in water storage containers and other deposits containing relatively clean water. Attempts at eradicating the mosquitoes failed during the 1960s in Latin America and today more than 50% of houses are infested with mosquitoes in many endemic areas. This research is studying new methods to control dengue mosquitoes. We are studying the acceptance, effectiveness and cost-effectiveness of insecticide-treated curtains and of spraying the insecticide deltamethrin in and around the house.

Who can participate?
Houseblocks are selected at random in the city of Santiago de Cuba among those with the highest infestation rates in 2009-2010, and all families living in these areas are invited to participate

What does the study involve?
Groups of houses are randomly allocated to one of three groups. Group 1 receive the routine mosquito control activities of the Ministry of Health programme. Group 2 receive insecticide-treated curtains (maximum of three per house) on top of the routine mosquito control activities of the Ministry of Health programme. Group 3 receive every four months a spraying of deltamethrin in and around their houses on top of the routine mosquito control activities of the Ministry of Health programme.

What are the possible benefits and risks of participating?
Participants receive the mosquito control methods for free. As they have shown already good results in other studies, the mosquitoes in the house will decrease if the tool is correctly used. The curtains that will be distributed didn't show any side effects in other studies, except for a brief feeling of itching and sneezing in 7% of the people, lasting for at most 1 day. The spraying

is a procedure that has already been used in Santiago de Cuba by the Ministry of Health. In this study it's another insecticide, widely used in Africa and Latin-America, but up to now not yet used in this area in this form.

Where is the study run from?
Institute of Tropical Medicine (Belgium)

When is the study starting and how long is it expected to run for?
May 2011 to December 2013

Who is funding the study?
1. Directorate-General for Development Cooperation (Belgium)
2. Institute of Tropical Medicine (Belgium)
3. Ministry of Health (Cuba)

Who is the main contact?
Prof. Patrick Van der Stuyft

# Contact information

### Type(s)
Scientific

### Contact name
Prof Patrick Van der Stuyft

### Contact details
Institute of Tropical Medicine
General Epidemiology and Disease Control
Public Health Department
Nationalestraat 155
Anwterp
Belgium
2000

# Additional identifiers

### Protocol serial number
B300201111923

# Study information

### Scientific Title
Effectiveness and cost-effectiveness of perifocal residual deltamethrin spraying and of long lasting deltamethrin treated curtains distribution for Aedes control

### Study objectives

1. Evaluate the uptake and acceptability of tools in both intervention arms (ITC and PFS)
2. Evaluate the effectiveness of both tools, on top of the routine, in the control of Aedes aegypti (in comparison to the effect of the routine programme alone)
3. Compare the cost-effectiveness of both tools with the routine Aedes control strategy

## Ethics approval required
Old ethics approval format

## Ethics approval(s)
Ethical Committee, University Hospital Antwerp, 14/11/2011 ref: 11/34/227

## Study design
Interventional cluster-randomized controlled trial single-center study

## Primary study design
Interventional

## Study type(s)
Prevention

## Health condition(s) or problem(s) studied
Effect of intervention on Aedes aegypti infestation level (vector of dengue fever)

## Interventions
Control group: routine aedes control programme (entomological surveillance, source reduction, larviciding and selectiveadulticiding, health education)

Insecticide treated curtains: made from long-lasting, insecticide-treated (pyrethroid deltamethrin is applied during manufacture) polyester netting that requires no re-impregnation (PermaNet®; Vestergaard-Frandsen company). PermaNet materials are special UV protected and retain their insecticidal properties and efficacy for about 2 years (information from producer). The material has been approved by WHOPES for use as bednets.

Deltamethrin perifocal spraying (PFS): K-Othrine 25 WG, supplied by Bayer Environmental Sciences co. (25% deltamethrin formulation) will be sprayed every 4 months (3 times/year). It is a granular formulation that need to be solved into water (20 gram in 8 Liter of water, sufficient to treat 200 $m^2$ and attaining 25 mg a.i./$m^2$). It has a long lasting residual activity. Where deposits remain undisturbed, residual activity depends upon the nature of the surface. Sustained residual activity beyond 12 weeks post-application is observed on non-porous surfaces. Deltamethrin is photostable and the particulate suspension enhances availability to insects.

The insecticide will be sprayed on the outside of the ground-level water tanks and the walls behind them; and on the adult Aedes resting sites (for example under beds, in and under closets) in the intradomestic area.

## Intervention Type
Other

## Phase
Not Applicable

### Primary outcome(s)
1. Effectiveness: Breteau Index (number of containers positive for immature aedes stages per 100 inspected houses)
2. House index (number of houses positive for at least one container with aedes immature stages per 100 houses inspected)
3. Pupae per person index (number of pupae per inhabitant), (adult mosquito infestation), confirmed Dengue cases (if any)

### Key secondary outcome(s))
1. Uptake and use of ITC
2. Acceptance of PFS and ITC (and identification of underlying lay dimensions of acceptability)
3. Change in intra-and extradomiciliary risks for Aedes infestation
4. Cost- effectiveness of ITC and of PFS
5. Residual insecticidal activity of deltamethrin applied in ITC and in PFS

### Completion date
31/12/2013

## Eligibility

### Key inclusion criteria
All households of houseblocks, chosen at random in urban Santiago de Cuba

### Participant type(s)
All

### Healthy volunteers allowed
No

### Age group
All

### Sex
All

### Key exclusion criteria
1. Houseblocks without community approval
2. Houses without household approval

### Date of first enrolment
01/05/2011

### Date of final enrolment
31/12/2013

## Locations

### Countries of recruitment
Belgium

Cuba

**Study participating centre**
**Institute of Tropical Medicine**
Anwterp
Belgium
2000

# Sponsor information

**Organisation**
Institute of Tropical Medicine (Belgium)

**ROR**
https://ror.org/03xq4x896

# Funder(s)

**Funder type**
Government

**Funder Name**
Directorate-General for Development Cooperation (Belgium) ref: 95900

**Funder Name**
Institute of Tropical Medicine (Belgium)

**Funder Name**
Ministerio de Salud Pública [MINSAP] (Cuba)

# Results and Publications

**Individual participant data (IPD) sharing plan**

**IPD sharing plan summary**

Not provided at time of registration

## Study outputs

| Output type | Details | Date created | Date added | Peer reviewed? | Patient-facing? |
|---|---|---|---|---|---|
| Results article | results | 01/05/2016 | 18/01/2019 | Yes | No |
| Results article | results | 08/11/2017 | 18/01/2019 | Yes | No |
| Results article | results | 02/01/2018 | 18/01/2019 | Yes | No |
| Participant information sheet | Participant information sheet | 11/11/2025 | 11/11/2025 | No | Yes |