Following of mosquito species in 24 schools

Sebastien BOYER

ECOMORE II

AFD

Institut Pasteur

international network Institut Pasteur

Institut Pasteur du Cambodge

WP CAMBODIA

Process of initiation of the project

- Primary objective of the project

Do the Integrated Vector Management decrease the population of Aedes aegypti?

- Related Questions

Is the density of Aedes aegypti the same in the 2 clusters before treatment?

What is the composition of mosquito species ?

What are the breeding sites in/around schools ?

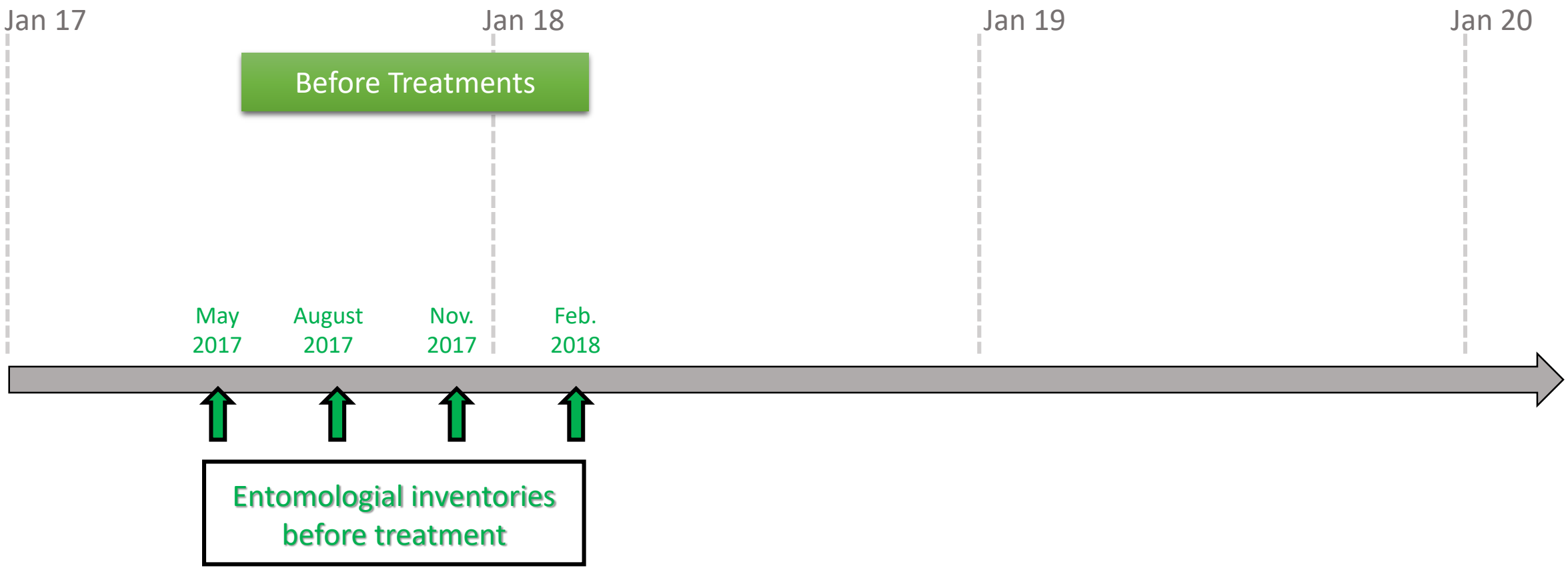
Are Aedes aegypti resistant to insecticides ?

- Experts who have participated in the design of the study

IPC (Sebastien Boyer, Didier Fontenille, Patrice Piola, Sowath Ly) & CNM (Rekol Huy , Rithea Leang)

To set up an integrated vector control strategy in schools

- Methodology to meet the goal



To set up an integrated vector control strategy in schools

- Methodology to meet the goal

BG-sentinel trap with lure

CDC light trap

To set up an integrated vector control strategy in schools

- Methodology to meet the goal

To set up an integrated vector control strategy in schools

- Methodology to meet the goal

Discussion with children and tell them our objective of study

To set up an integrated vector control strategy in schools

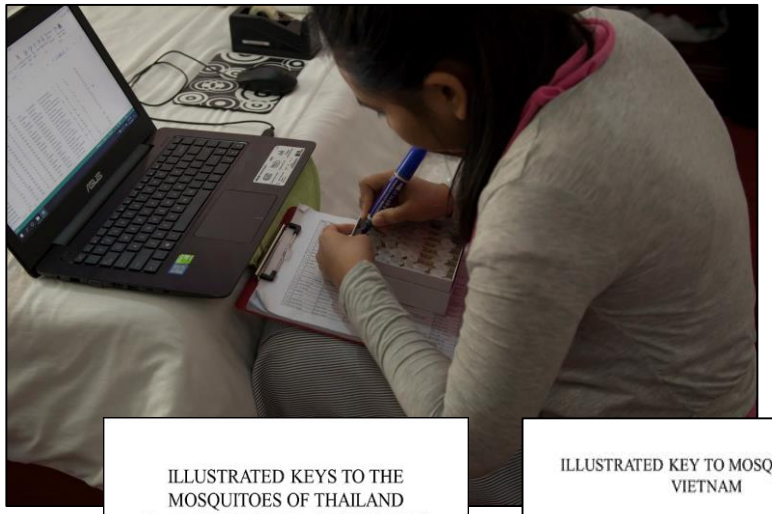
- Methodology to meet the goal

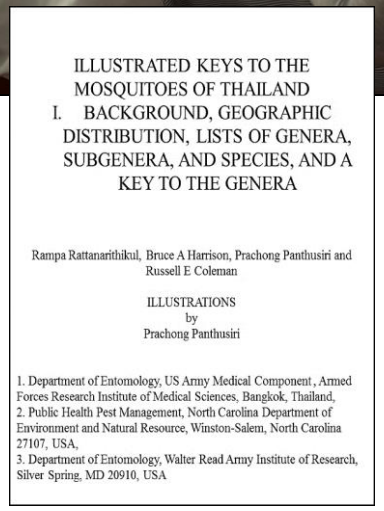


Installation of traps (CDC Light Traps and BG sentinel for 24 hours)

To set up an integrated vector control strategy in schools

- Methodology to meet the goal





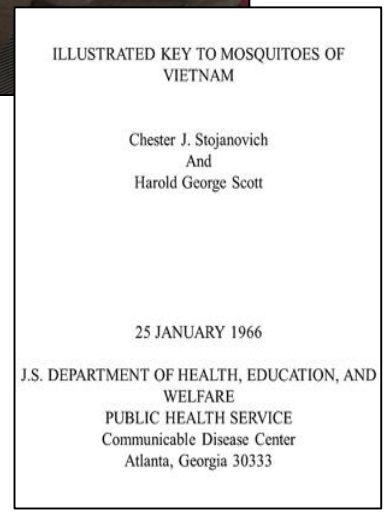
ILLUSTRATED KEYS TO THE MOSQUITOES OF THAILAND

I. BACKGROUND, GEOGRAPHIC DISTRIBUTION, LISTS OF GENERA, SUBGENERA, AND SPECIES, AND A KEY TO THE GENERA

Rampa Rattanarithikul, Bruce A Harrison, Prachong Panthusiri and Russell E Coleman

ILLUSTRATIONS
by
Prachong Panthusiri

1. Department of Entomology, US Army Medical Component, Armed Forces Research Institute of Medical Sciences, Bangkok, Thailand,
2. Public Health Pest Management, North Carolina Department of Environment and Natural Resource, Winston-Salem, North Carolina 27107, USA,
3. Department of Entomology, Walter Read Army Institute of Research, Silver Spring, MD 20910, USA



ILLUSTRATED KEY TO MOSQUITOES OF VIETNAM

Chester J. Stojanovich
And
Harold George Scott

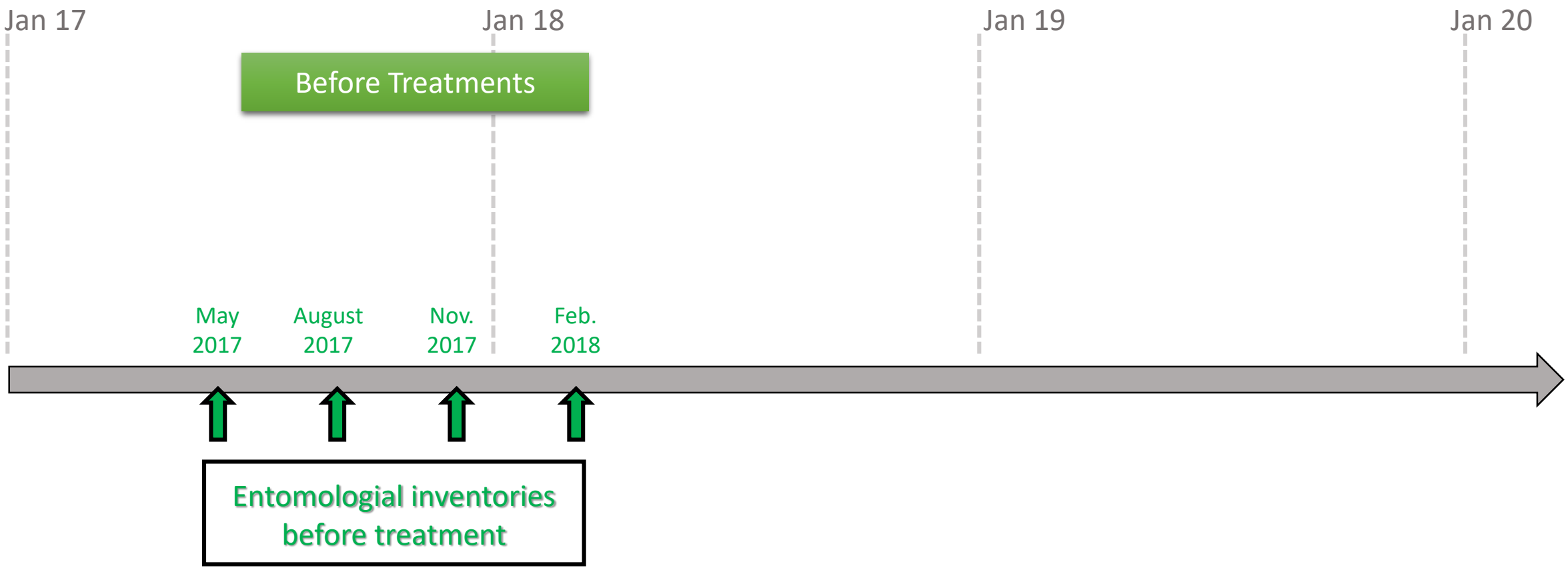
25 JANUARY 1966

J.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
Communicable Disease Center
Atlanta, Georgia 30333

- Collect mosquitoes from all trap and identified by using Thailand and Vietnam key
- Sample storage: bring back from field and store -20 ˚c

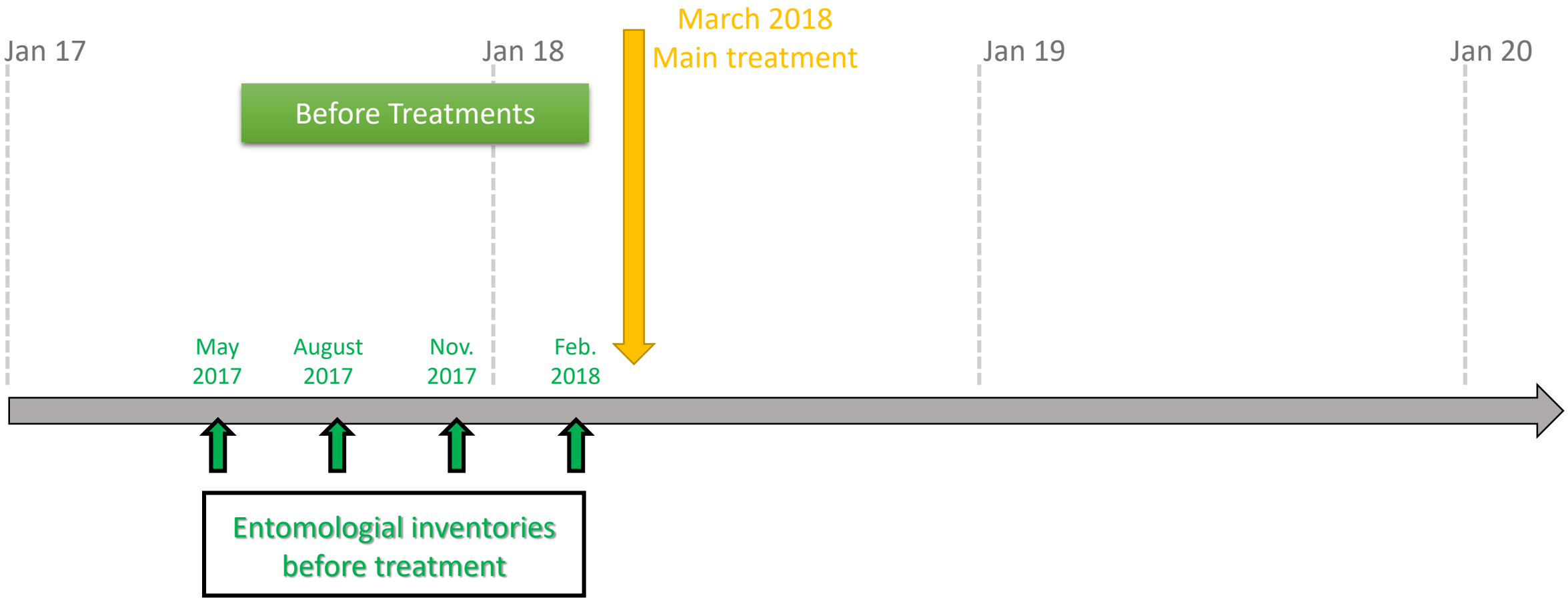
To set up an integrated vector control strategy in schools

- Methodology to meet the goal



To set up an integrated vector control strategy in schools

- Methodology to meet the goal



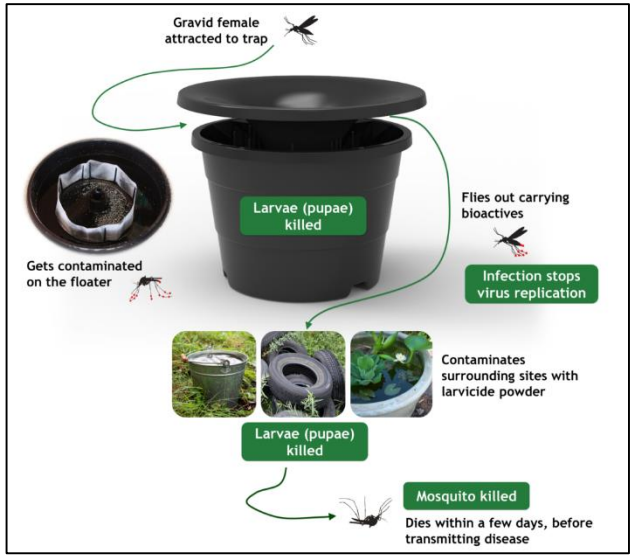
To set up an integrated vector control strategy in schools

- Methodology to meet the goal

Integrated Vector Management

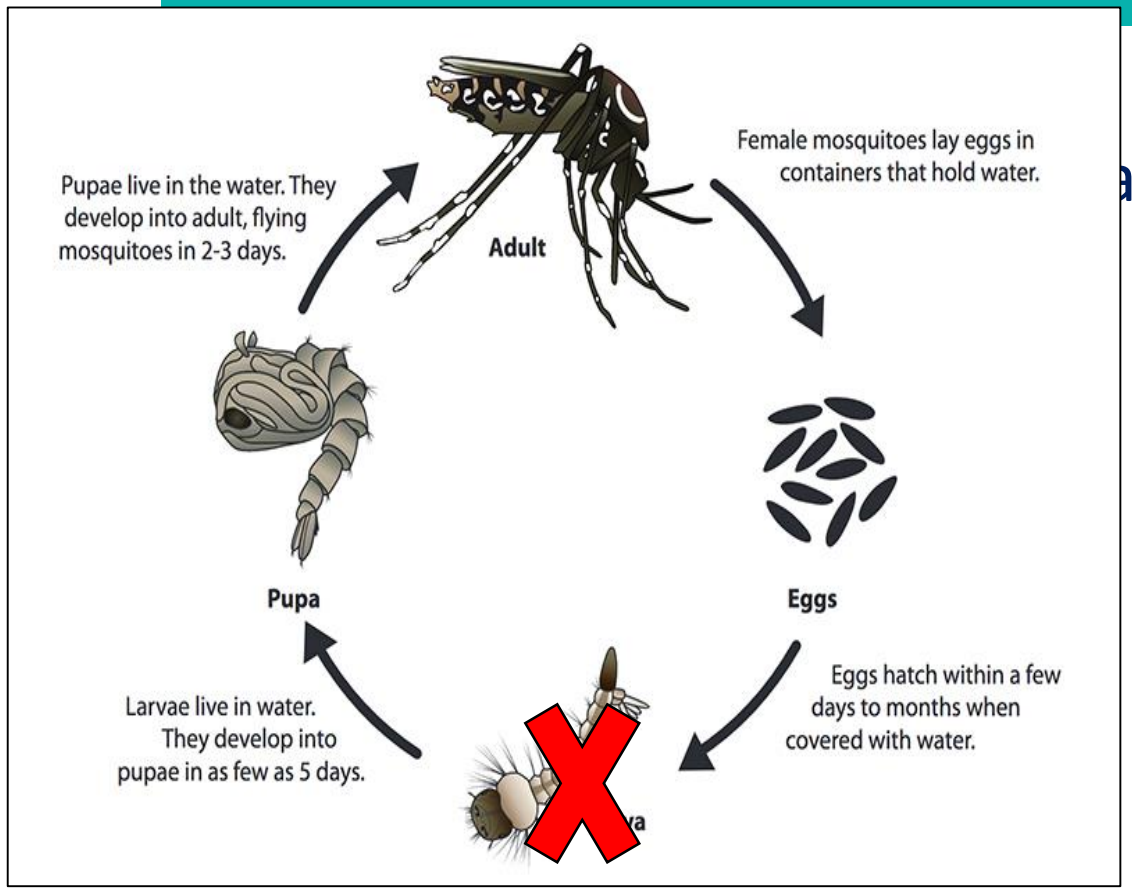
Bti

- Use of a larvicide : Bacillus thuringiensis var. israelensis (Bti) in big containers
- Physical destruction of breeding sites
- Use of dessimination insecticide : Pyriproxyfen in2Care
- COMBI = Communication for Behaviour Impact with children



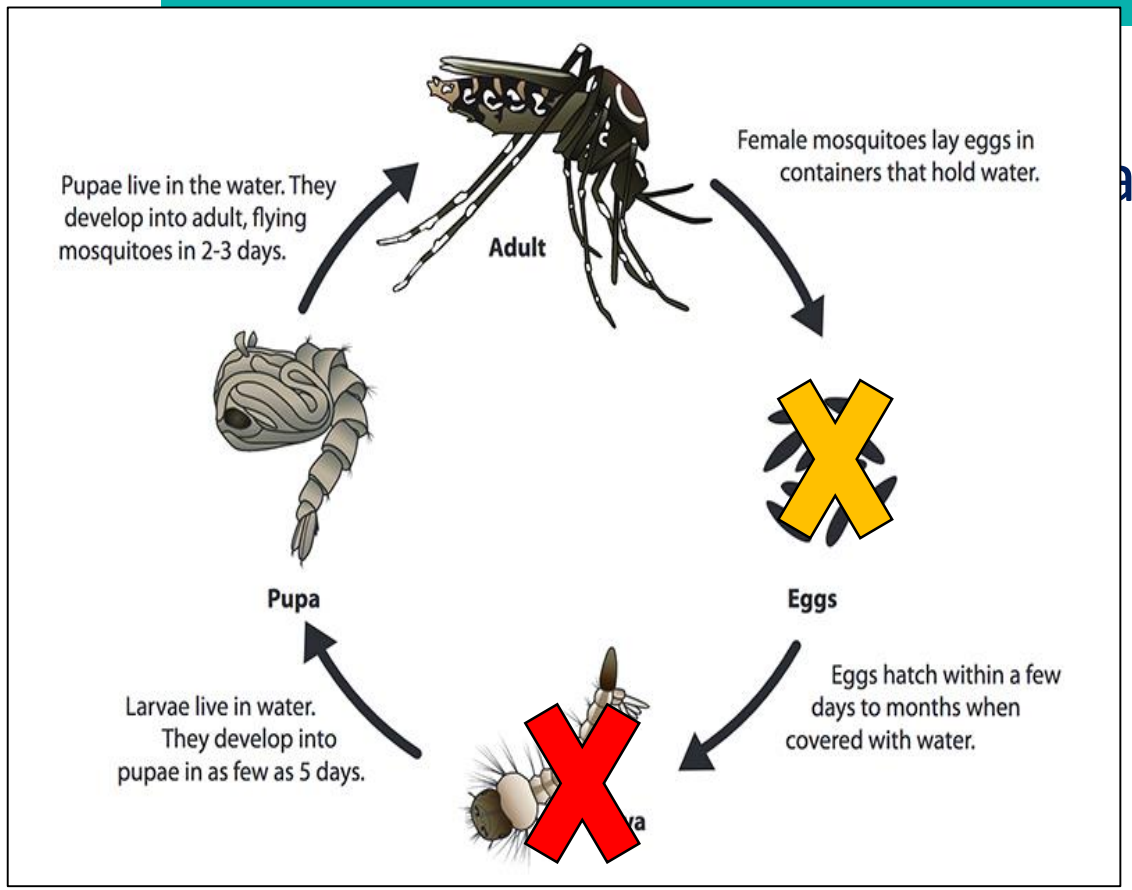
Pyriproxyfen in2care

To set up an integrated vector control strategy in schools



Use of *Bti*

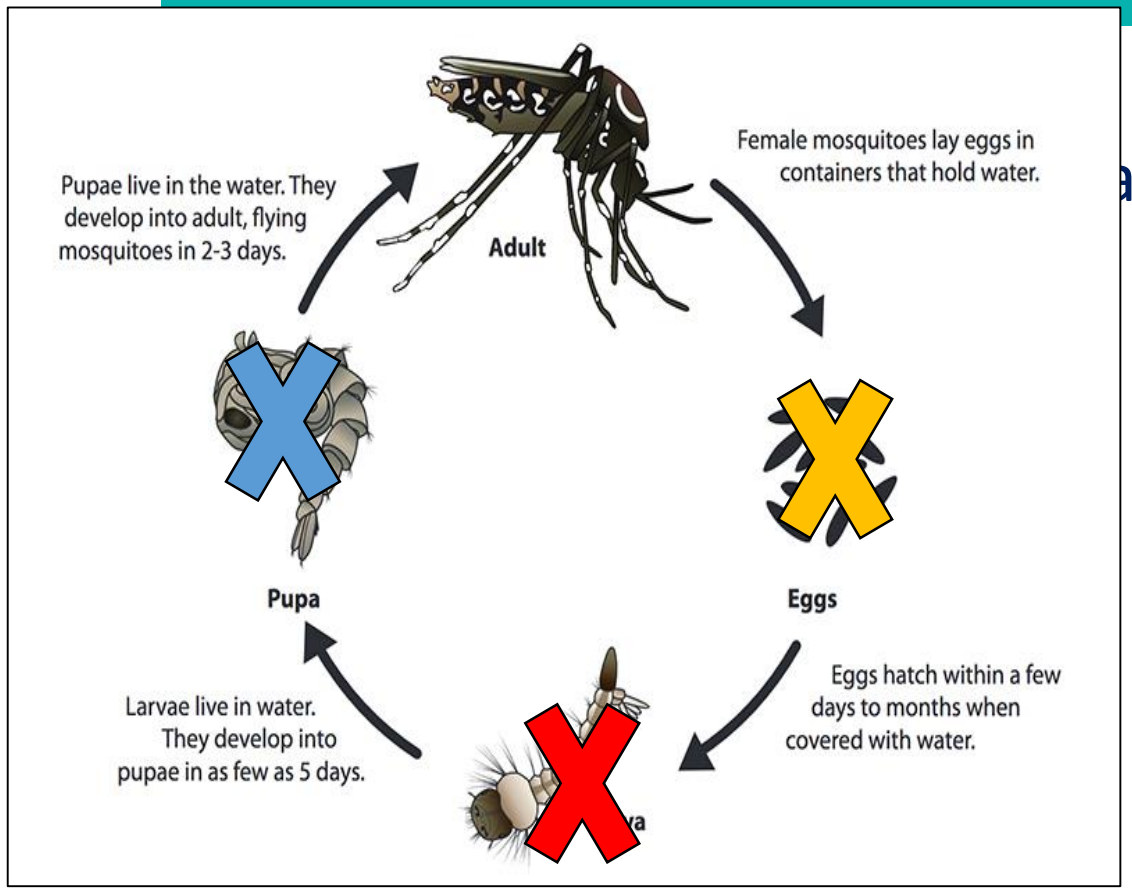
To set up an integrated vector control strategy in schools



Use of *Bti*

Physical destruction

To set up an integrated vector control strategy in schools



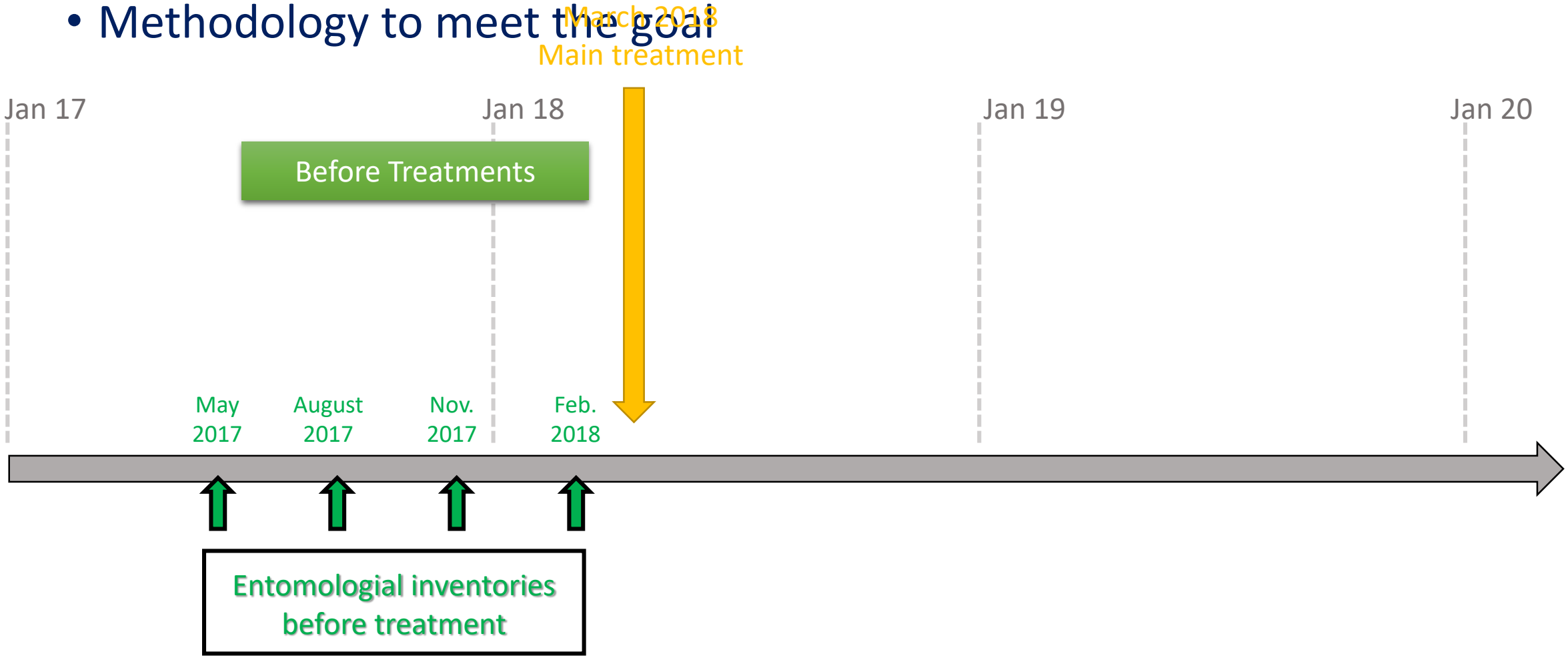
Use of *Bti*

Physical destruction

Dissemination PP

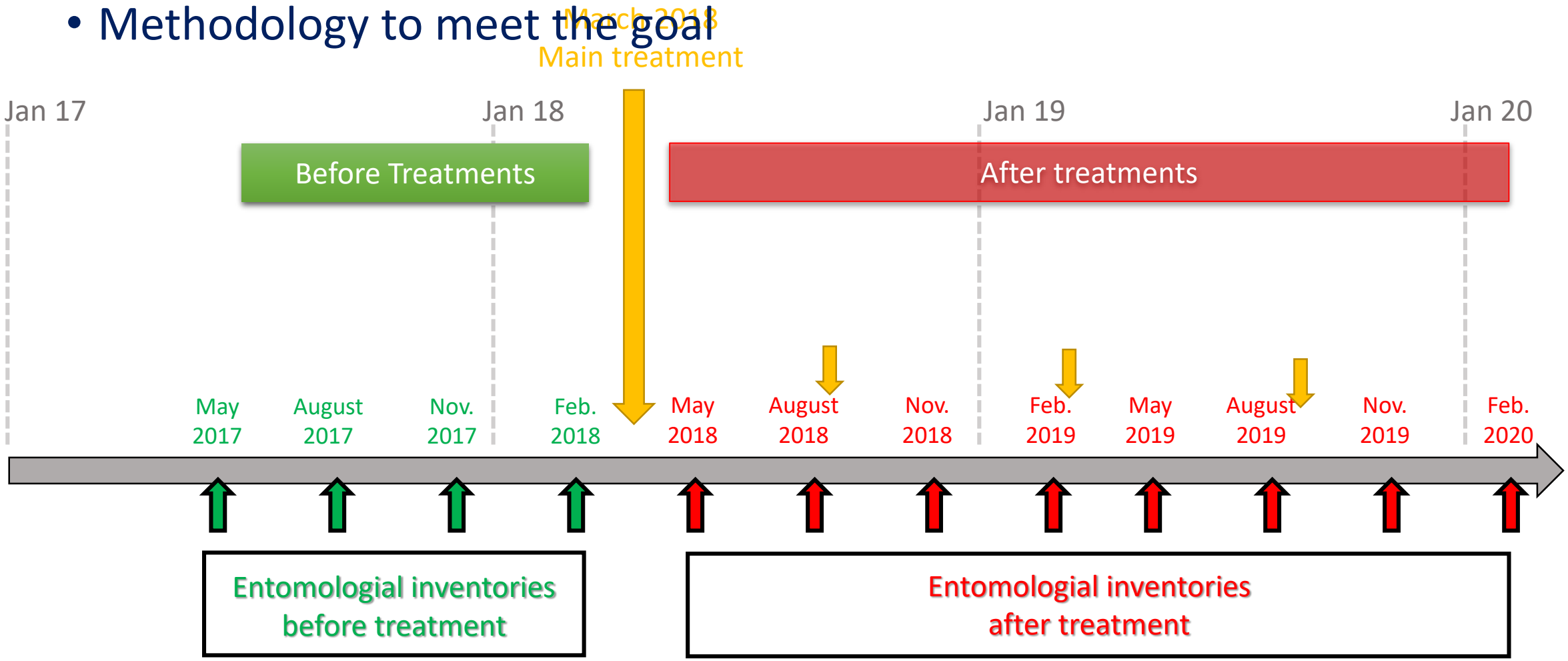
To set up an integrated vector control strategy in schools

- Methodology to meet the goal



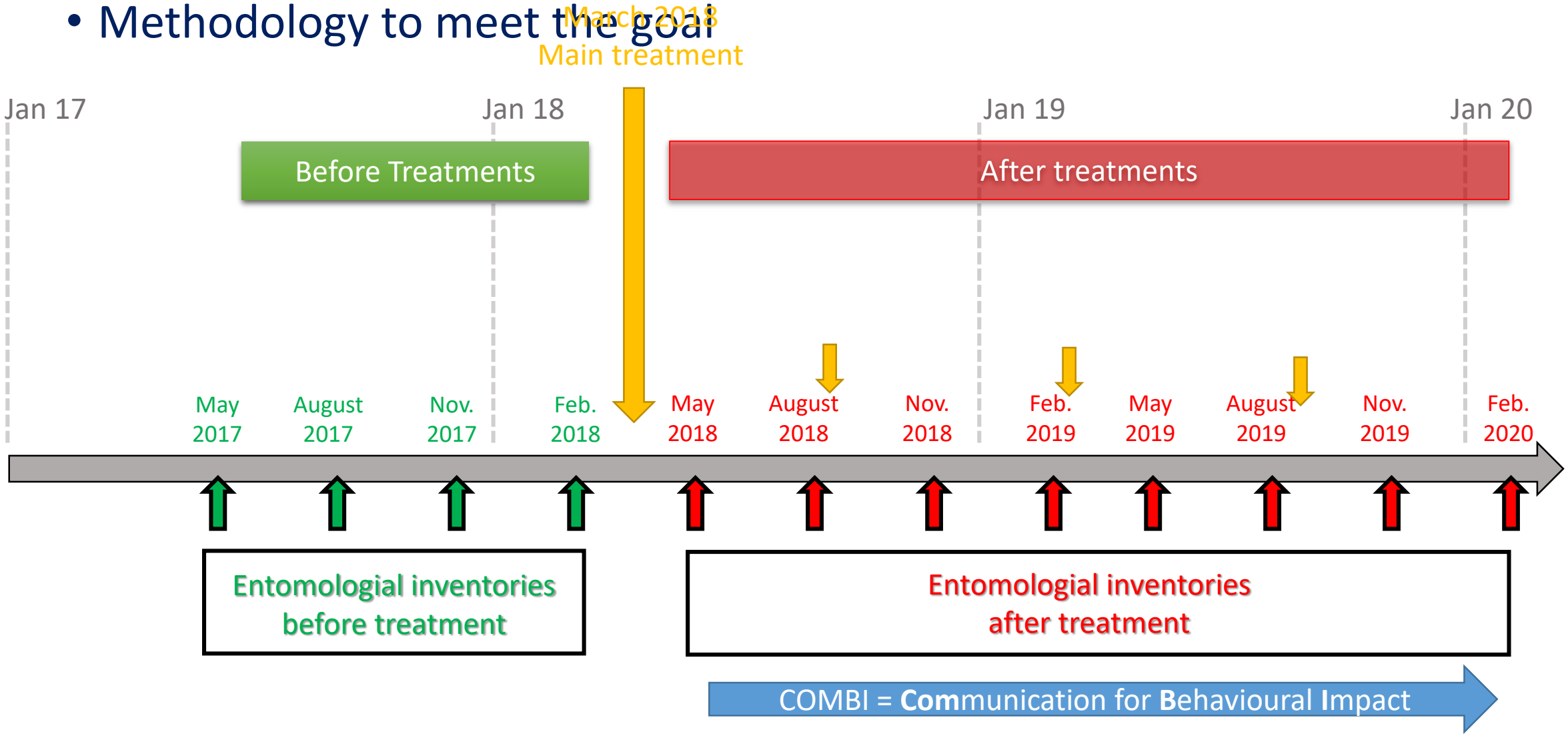
To set up an integrated vector control strategy in schools

- Methodology to meet the goal

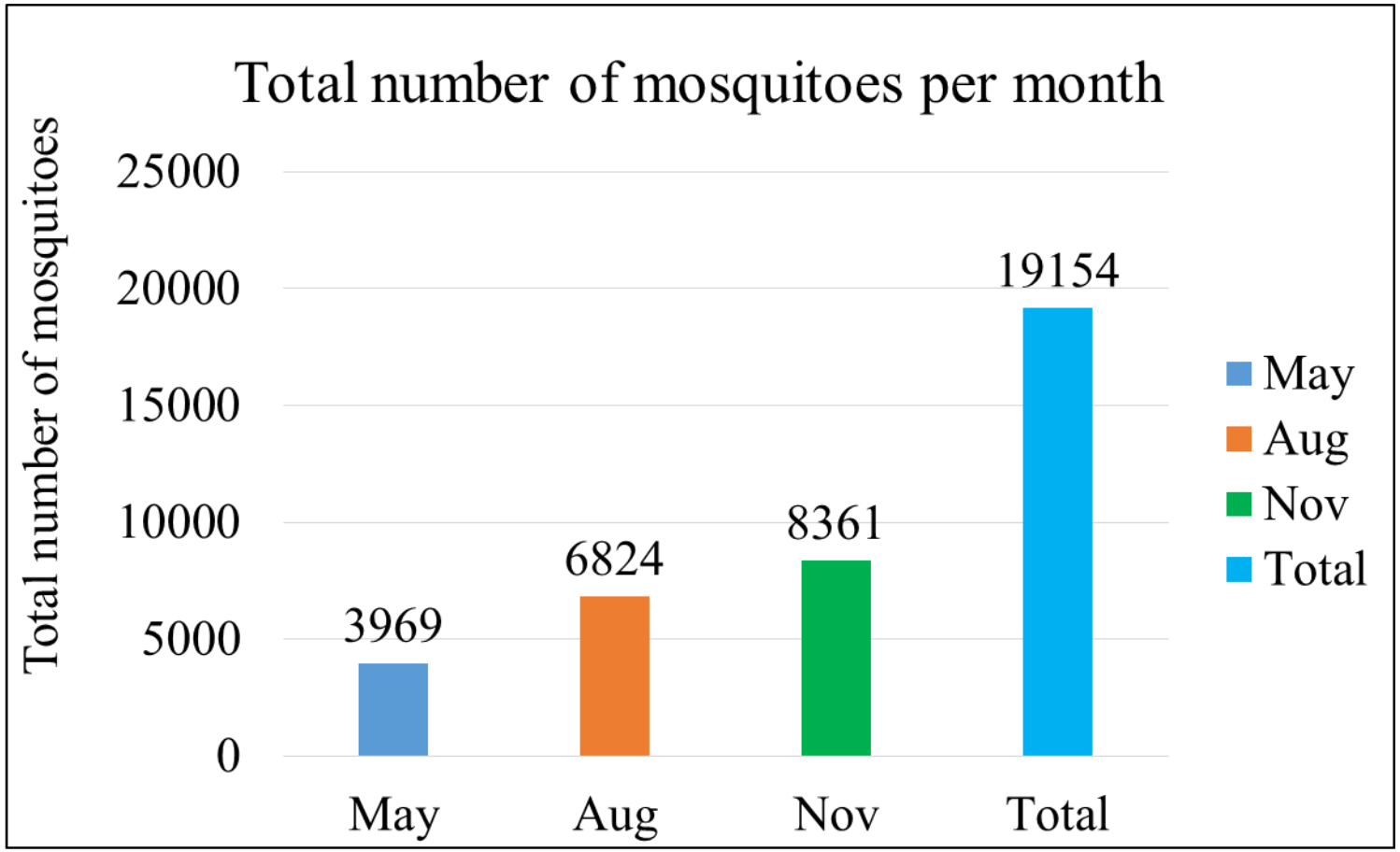


To set up an integrated vector control strategy in schools

- Methodology to meet the goal



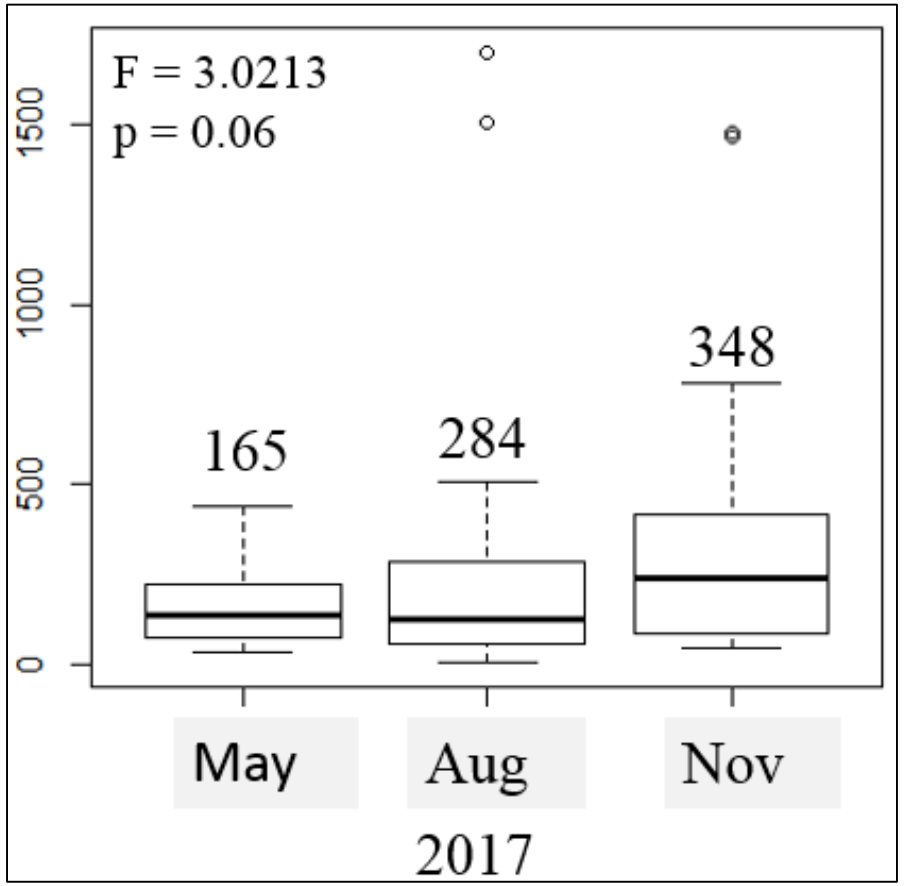
Preliminary Results



Number of mosquitoes were collected from 131 traps in May, August and November

Preliminary Results

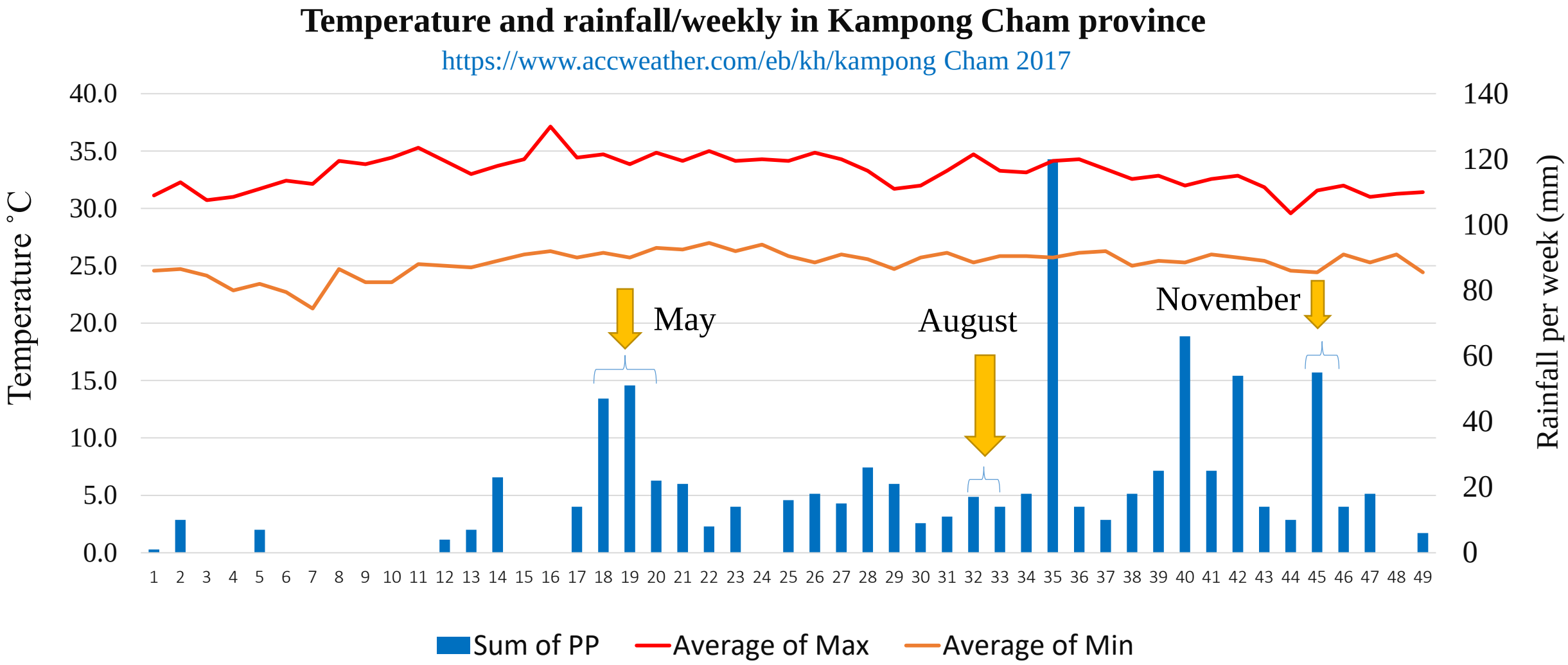
Average mosquitoes / school / 24h each month



Month	Min	Max
May	32	441
August	7	1698
November	47	1476

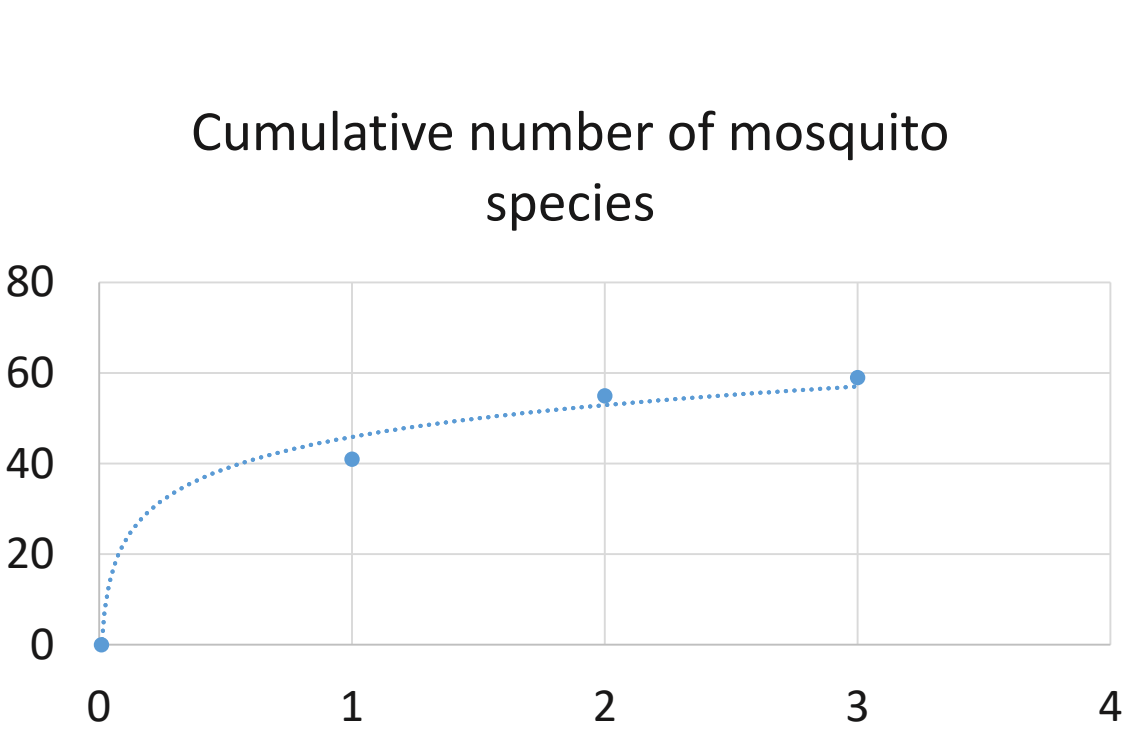
Min and Max number of mosquitoes in each month

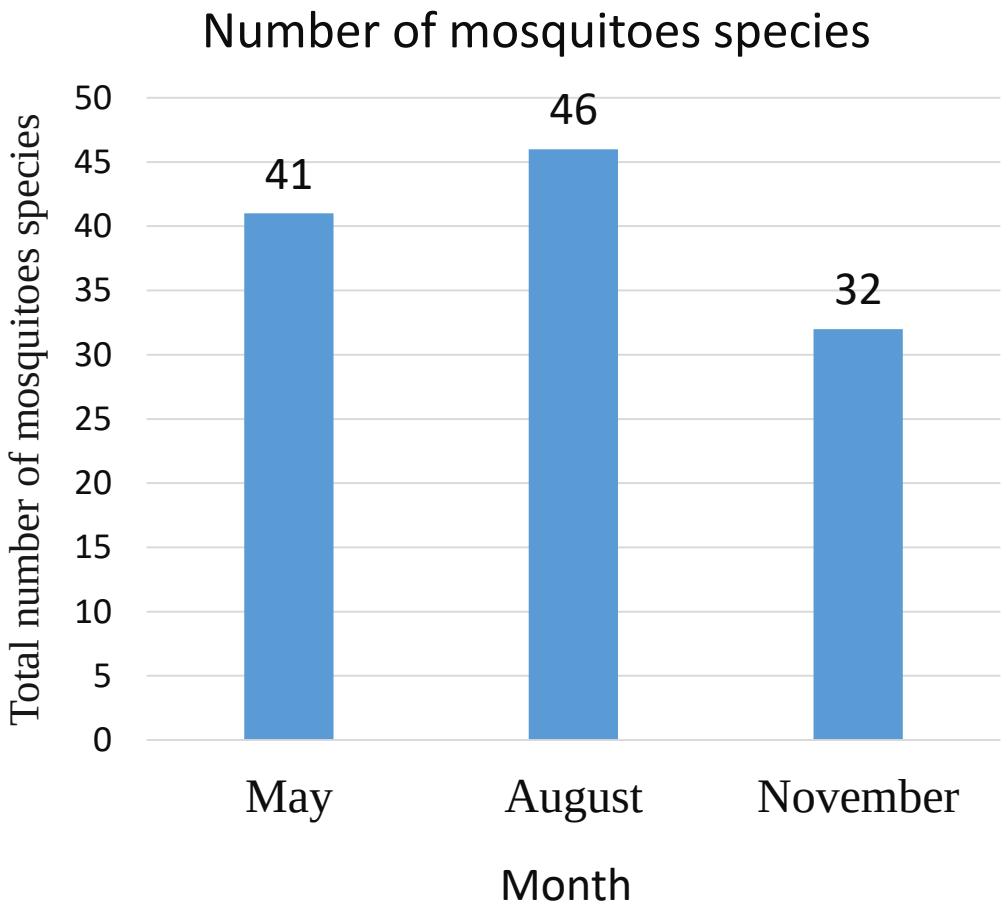
Preliminary Results



Correlation between number of mosquitoes and rainfall

Preliminary Results





- A Total of 59 mosquitoes species belonging to 11 genera

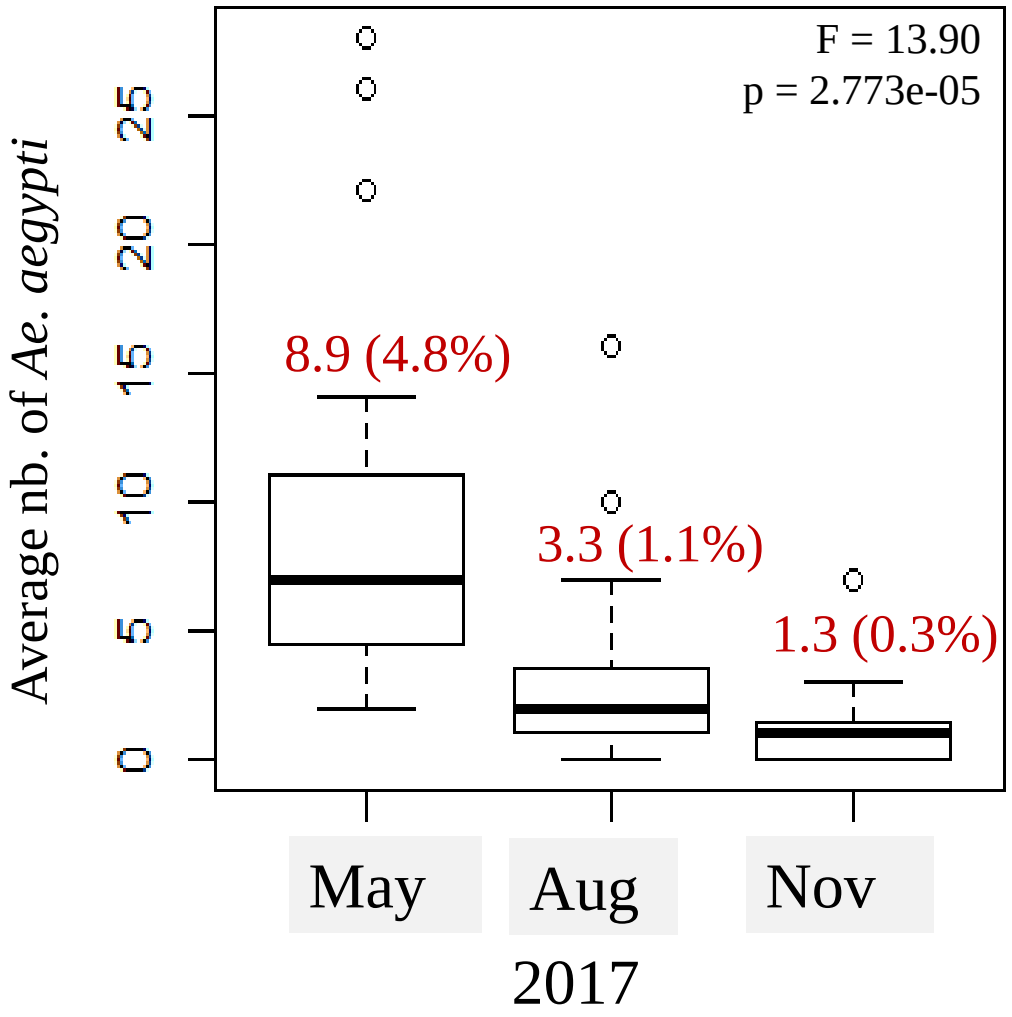
Preliminary Results

	Average mosquito per school		
Main species	**May**	**August**	**November**
Culex vishnui.g	20 (12%)	23 (8%)	42 (12%)
Culex quinquefasciatus	31 (19%)	24 (8%)	15 (4%)
Anopheles indefinitus	8 (5%)	13 (5%)	5 (1%)
Culex tritaeniorhynchus	40 (24%)	174 (61%)	278 (80%)
Total	99 (60%)	234 (82%)	340 (98%)

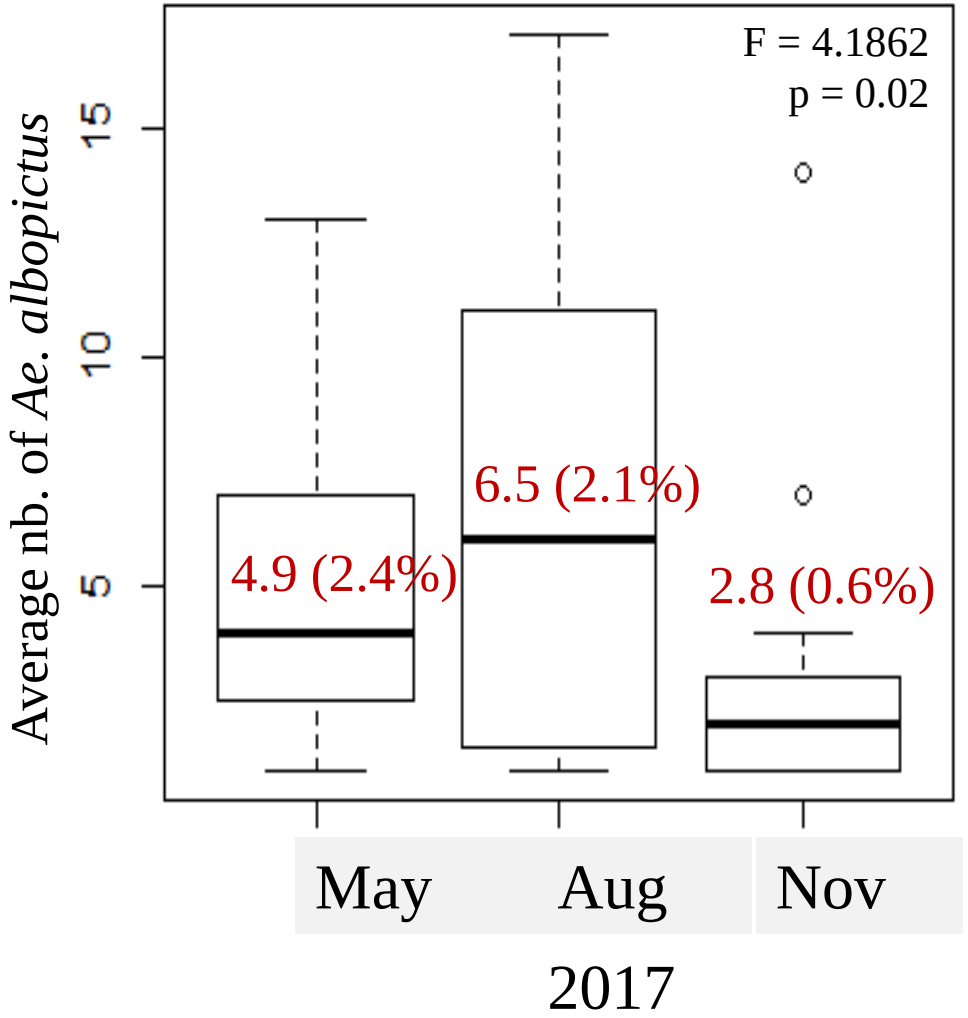
Cx quinquefasciatus, Cx tritaeniorhynchus and Cx vishnui.g are JEV vectors

Preliminary Results

Aedes aegypti

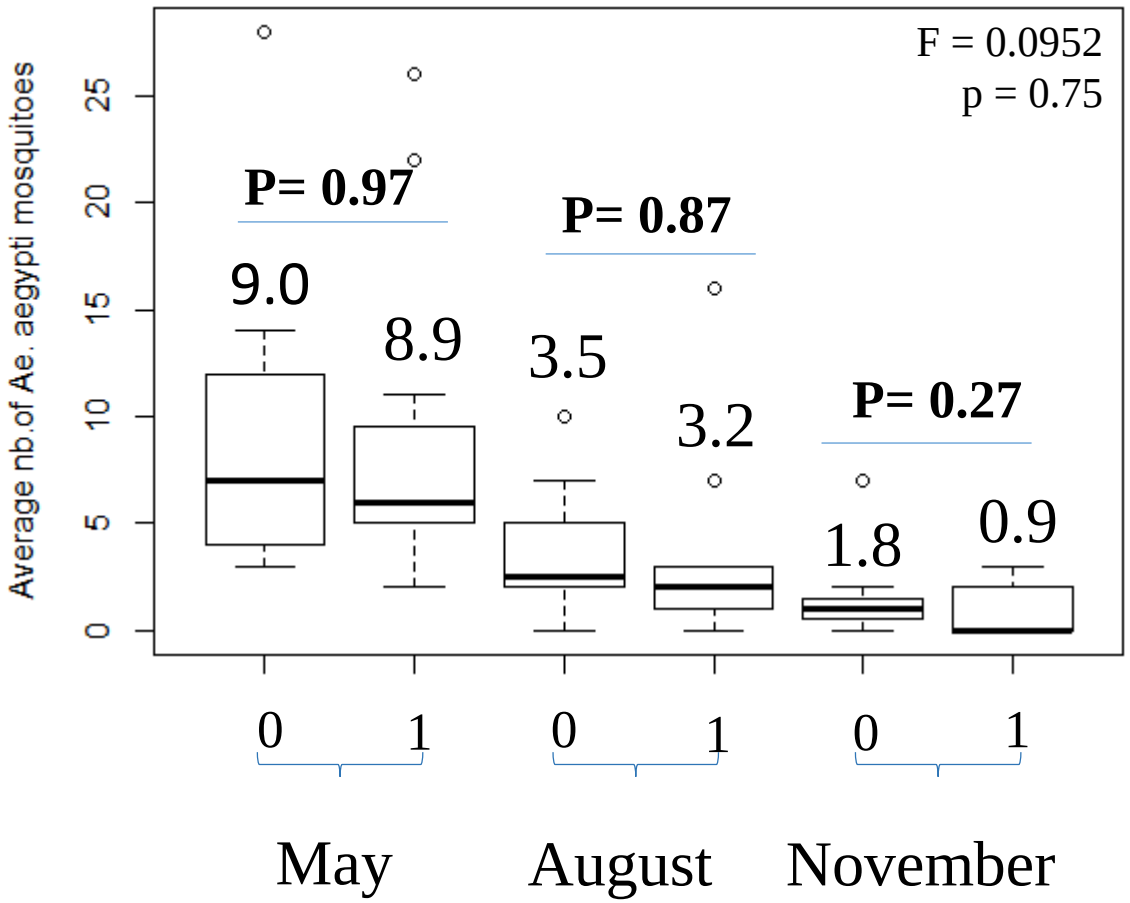


Aedes albopictus

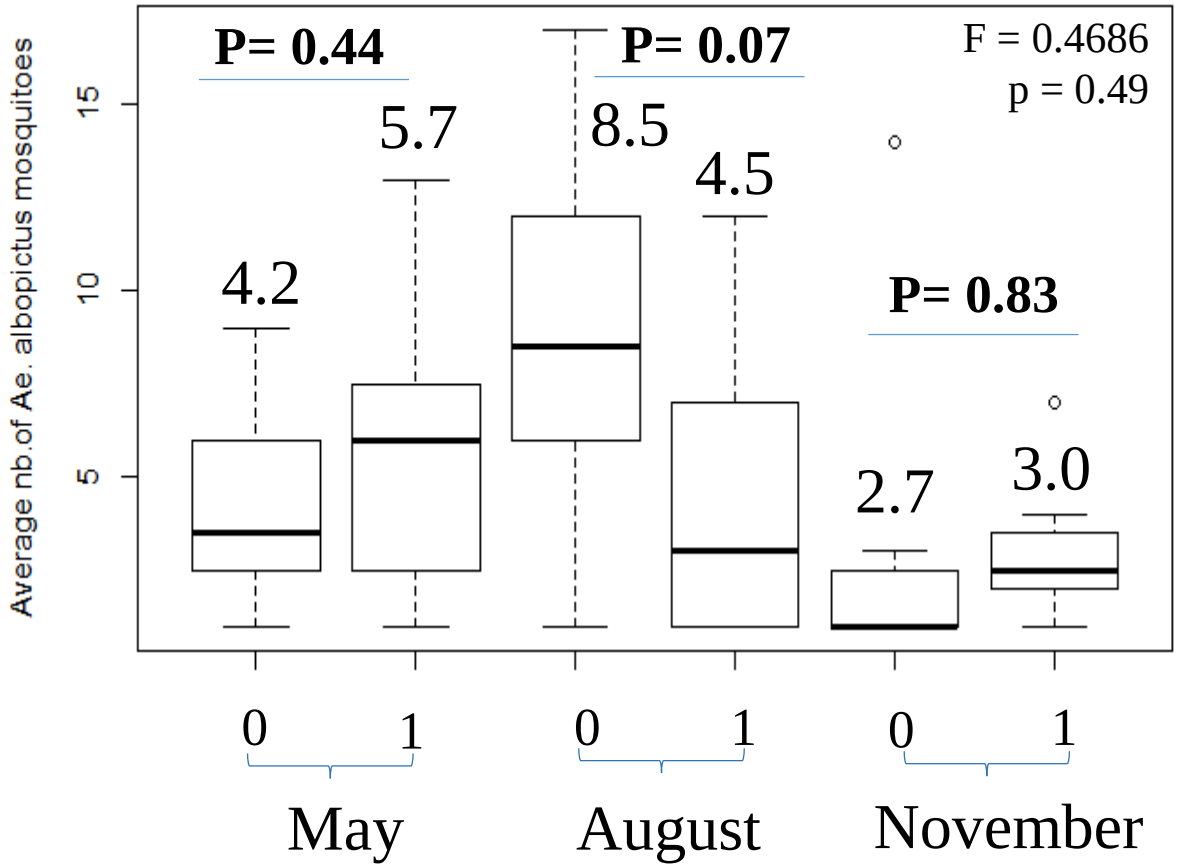


Preliminary Results

Aedes aegypti



Aedes albopictus



Next step

• February 2018	4th monitoring of schools
• February 2018	Questionnaries for children on mosquitoes
• March 2018	Inventory and destruction of breeding sites
	Disposal of in2Care traps
	Use of *Bti* in schools and surroundings
	COMBI with distribution of posters and explanations

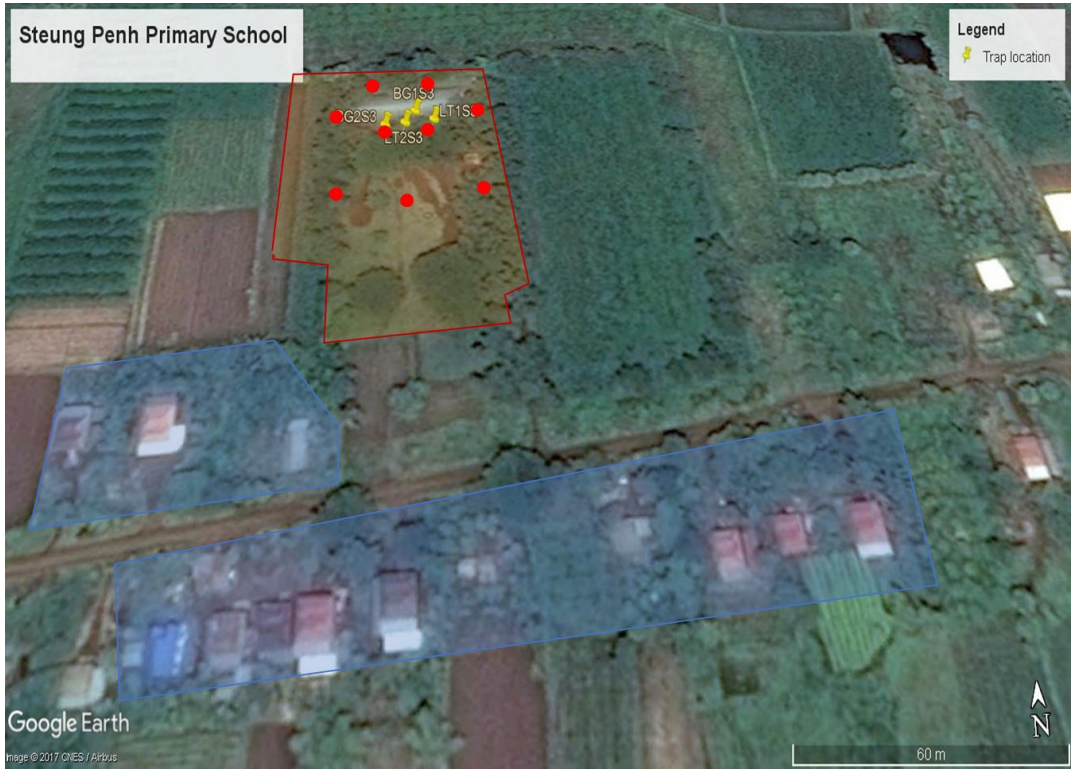
Next step

7090 m² -> 8 traps

Bti treatment areas

8292 m² -> 9 traps

Bti treatment areas



Next step

9229 m² -> 10 traps

Bti treatment area

7466 m² -> 8 traps

Bti treatment area

Monitoring of realization

Milestonename / Short description	
Senior entomologist PhD deployment	
Study sites identification & selection	
Achievement of field visits to present the project to community and health authorities	
Design of the Cluster Randomized Trial Study	
Initial inventory of breeding sites in schools and destruction with participation of scholar	
Result of insecticide sensitivity and selection of products for the control of vectors	
Implementation of adult mosquitoes control	
Installation of auto-dissemination system around schools	
Kits for COMBI ready to be distributed	
Achievement of training of VHV involved in the active surveillance in villages	
Initial supply of saliva tests	
Data of passive surveillance collated for statistical analysis	
Issue of recommendations for health authorities	

Acknowledgements

- School directors and teachers
- Medical Entomology team : Sony, Kalyan, Moeun, Kimhuor

Institut Pasteur

international network Institut Pasteur

Institut Pasteur du Cambodge

AFD

Next step

- in2Care traps

TRAPS TO USE									
Primary schools	**Area**	**in2care**	**PLoS Med**	**Nb of classroom**	**1 tous les 800m²**	**1 tous les 1000m²**	**4 traps/school**	**5 traps / school**	**6 traps/ school**
Angkor Chey	7090	18	2	11	9	8	4	5	6
Steung Penh	8292	21	2	6	11	9	4	5	6
Prek kak	9229	24	2	13	12	10	4	5	6
Ro-ang Leu	7466	19	2	7	10	8	4	5	6
Wat thmei	5051	13	1	14	7	6	4	5	6
Sre Peal	9768	25	2	10	13	10	4	5	6
Sre Paing	4951	13	1	10	7	5	4	5	6
Chamkar Andaung	4467	12	1	10	6	5	4	5	6
O Ta Thok	2466	7	1	6	4	3	4	5	6
Svay Prey	4280	11	1	6	6	5	4	5	6
Svay Areak	1857	5	1	6	3	2	4	5	6
Khvet Thom	12251	31	2	12	16	13	4	5	6
NB TOTAL OF TRAPS		**199**	**18**	**111**	**104**	**84**	**48**	**60**	**72**
SURFACE AV. FOR 1 TRAP (m²)		**388**	**4288**	**696**	**742**	**919**	**1608**	**1287**	**1072**

COST	**in2care**	**PLoS Med**	**Nb of classroom**	**1 tous les 800m²**	**1 tous les 1000m²**	**4 traps/school**	**5 traps / school**	**6 traps/ school**
Cost of traps (4.5€)	895.5	81	499.5	468	378	216	217	218
Cost of refill every 3 month (7)	2388	189	1165.5	1248	1008	576	720	864
Cost of refill every 1.5 month (15)	4776	405	2497.5	2496	2016	1152	1440	1728
Total cost (ev. 3 month)	**3283.5**	**270**	**1665**	**1716**	**1386**	**792**	**937**	**1082**
Total cost (ev. 1.5 month)	**5671.5**	**486**	**2997**	**2964**	**2394**	**1368**	**1657**	**1946**