



*Challenges facing
vector-borne disease
control, collaboration,
and the role of the
private sector*



JITMM Meeting 2018

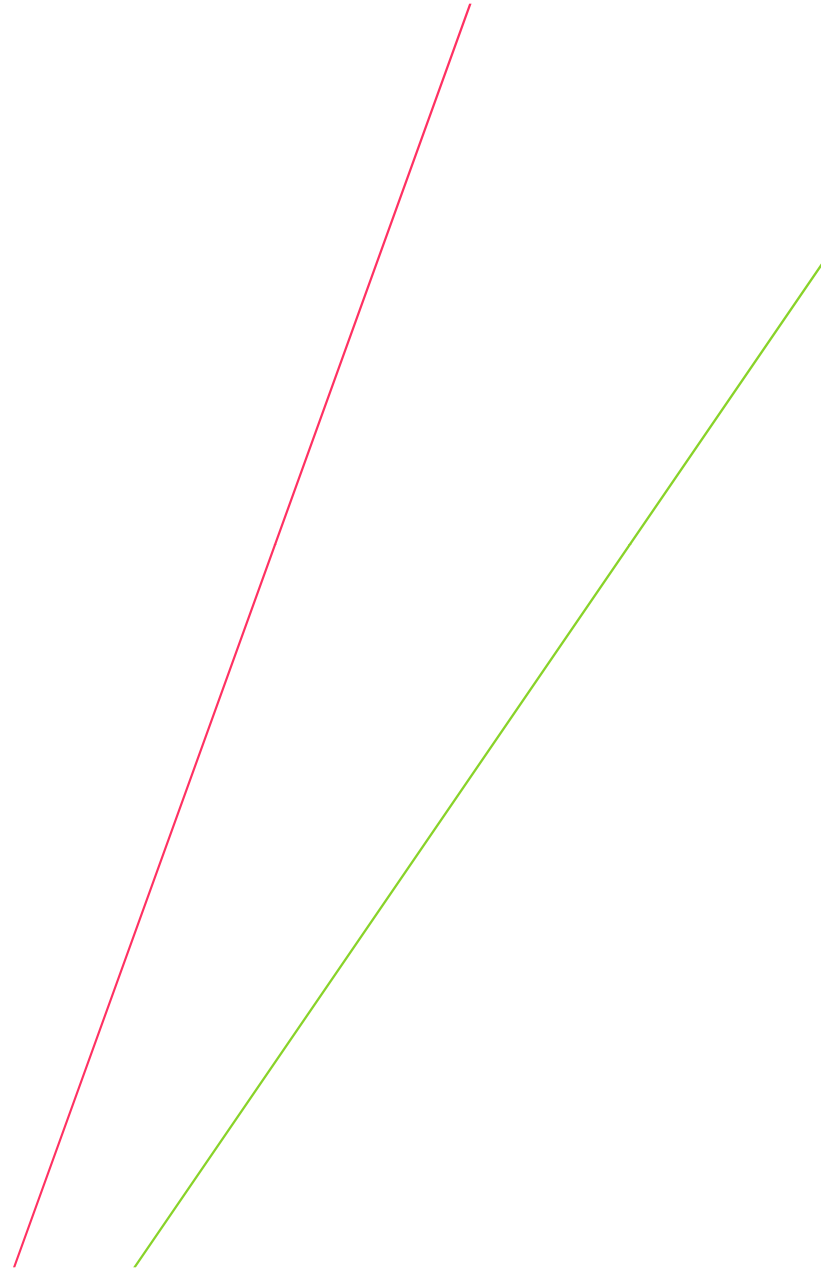
Jason Nash
Market Development Manager





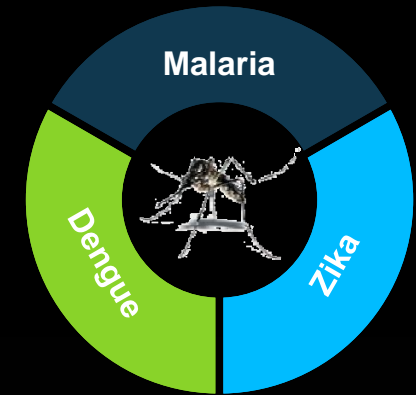
Topics

- // Challenges in vector control
- // Accelerating access to new technologies
- // Collaboration
- // How the private sector can help
- // Some examples



Vector-borne diseases...

A major threat to the health of societies around the world, which exact an immense toll on economies, restricting both rural and urban development.



RISK

80% of the world's population is at risk of one or more vector-borne diseases

BURDEN

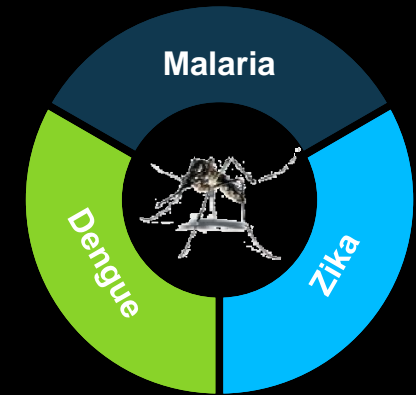
17% of the global burden of communicable diseases is due to vector-borne diseases

MORTALITY


Over 700,000 deaths are caused by vector-borne diseases annually


Vector-borne diseases...

A mixed picture in managing these diseases.

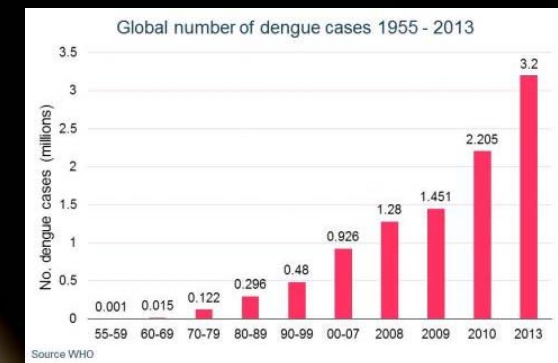


"It is reasonable to expect emergence of some new vector-borne diseases and further intensification of others, particularly those viral diseases transmitted by Aedes mosquitoes that are closely associated with urbanisation" Source: WHO

- // Impressive gains against: 
- // malaria
 - // lymphatic filariasis
 - // chagas

- // Yet major outbreaks of: 
- // dengue
 - // chikungunya
 - // yellow fever
 - // Zika

Dengue cases climbing:



What is being done today is not working!





Challenges faced:

Malaria

- // Several countries striving towards elimination
 - // Managing drug e.g. artemisinin resistance
 - // Limited tools and insecticide resistance
 - // Limited accessibility to at risk populations
 - // Limited operational capacity
 - // Securing ongoing funding





Challenges faced:

Dengue and other arboviral diseases

- // Disease incidence is increasing
- // Vector control is largely reactive
- // Urbanisation and increased travel
- // Limited tools and insecticide resistance
- // Limited operational capacity
- // Variable government commitment (funding)
- // Need for widespread community engagement





Some new vector control technologies are emerging:



Malaria	New insecticides	// For LLINs // For IRS
	New techniques	// Spatial repellents // Treated materials // ATSB // Toxic barriers // Larvicides
	Biologically modified mosquitoes	// HEG's // Wolbachia
	Surveillance & response	// Integrated digital tools // Community participation

Dengue	New insecticides	// For space spraying // For larviciding
	New techniques	// Residual sprays
	Biologically modified mosquitoes	// Wolbachia // RIDL technology
	Surveillance & response	// Integrated digital tools // Community participation



Accelerating access to these new technologies:

Key traits for success

Openness:

- // Accepting of new ideas
- // Looking at, and doing things differently
- // Willingness & acceptance of risk / failure



A short exercise...

FLY



Accelerating access to these new technologies:

Key traits for success

Collaboration:

// Trusting

// Sharing

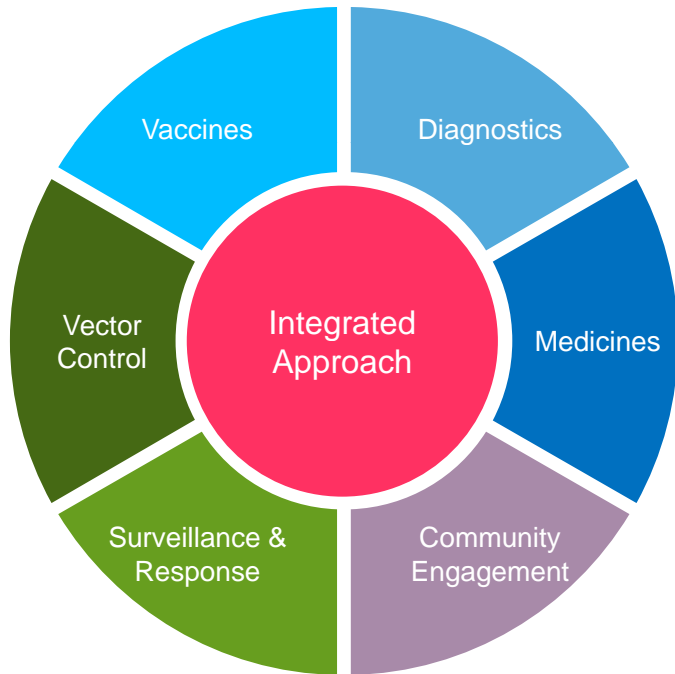
// Co-creating



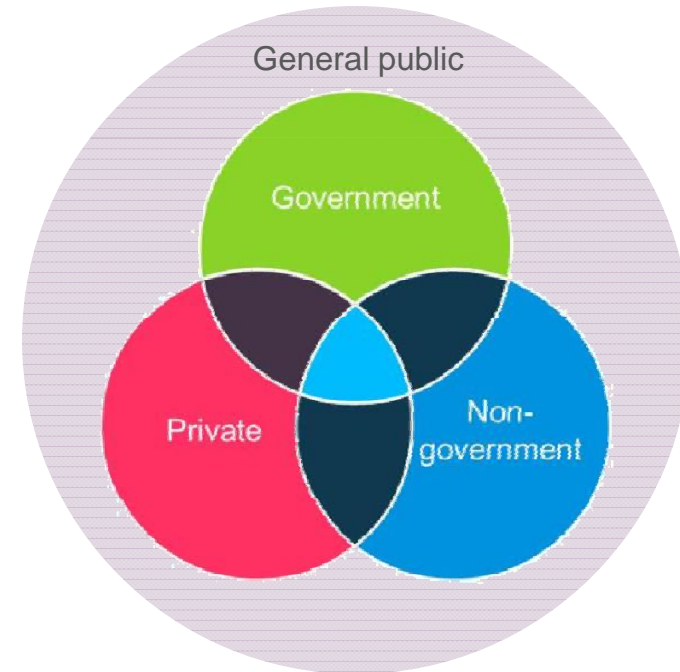


Accelerating access to these new technologies:

New technologies should be adopted as part of an **integrated** approach.



Technology development & adoption can be accelerated through a **collaborative** approach.





Accelerating access to these new technologies:

Why is collaboration so important?:

- // No institution can be successful alone
- // There are limited resources – have to utilise what exists
- // Learn from expertise of others



We share a common goal: reducing the burden of vector-borne diseases



What can the private sector contribute?



Access to new technologies



Different experiences



Additional resources



Extended networks



Some examples



Vector Control Expert Meetings

What are they?

// Annual meetings with collaborators and partners in Asian countries to share information / experiences on vector control.





An Innovation Platform

What is it?

// A private platform for sharing data summaries with selected partners from our insecticide trials.

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Bayer Innovation Platform

Advancing together to find the best solutions

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- Fludora Fusion Trial Data Sharing**
Bayer Vector Control
Fludora Fusion is a new two-way insecticide combination (a neonicotinoid plus a pyrethroid) for use in indoor residual spraying. It is intended to provide improved efficacy under conditions of insecticide resistance.
- Discussion Forum: Insecticide Resistance Management**
Bayer Vector Control
This section is intended as a general discussion forum around relevant topics and challenges facing insecticide resistance management in a local context. [View this forum](#)

Recent updates

Latest blog entries

Welcome!
Dear all, Welcome to the Bayer Innovation Platform. This site has been...
10 Oct 2016 in blog entries

Recent topics

- Results from 10 Month Assessment...
- Benin CREC_11 month data summary...
- Benin CREC_9 month data summary...

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Fludora Fusion Trial Data Sharing

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Bayer Vector Control

Settings | **Moderation**

Project news

- Cote d'Ivoire (LSHTM)
- Ghana
- Zambia
- Senegal
- Tanzania
- Kenya
- Rwanda
- Madagascar
- Ethiopia

Benin - Centre de Recherches Entomologiques de Cotonou (CREC)

- STATUS:** Trial completed - data summary finalised
- Institution:** Centre de Recherches Entomologiques de Cotonou (CREC)
- Principal Investigator:** Professor Martin Akogbeto
- Small-scale field evaluation to compare the efficacy and residual activity of the Fludora Fusion mixture against the individual components applied alone. For Fludora Fusion this means clothianidin applied at 200 mg ai/m² and Deltamethrin at 25 mg ai/m². The insecticides were sprayed on indoor surfaces in Dangbo village district against populations of *Anopheles gambiae* susceptible and resistant to pyrethroids.
- Treatment arms of the trial:** Fludora Fusion at target dose rate, Clothianidin at 200 mg/m² and deltamethrin at 25 mg/m²
- Mosquito strains utilized:** *A. gambiae* Kisumu (pyrethroid susceptible) and local (pyrethroid resistant) *A. gambiae* wild population.
- Resistance status of local wild mosquito population:** Highly resistant to deltamethrin (36% mortality at discriminating dose of 0.05% Deltamethrin). Fully susceptible to bendiocarb and pirimiphos-methyl. Kdr:W frequency of Leu-Phe 99%. Oxidase and GST activity were significantly higher in the study area compared to Kisumu. Evaluation of susceptibility to clothianidin is underway.
- Target surfaces:** Mud, cement and painted cement walls.
- pH of target surfaces:** Cement and painted cement pH 9-10 (mean of 9.3 and 9.2 respectively) and Mud pH 5-8 (mean pH 6.2).

[Click here to open the protocol](#)

Topic:

Details:

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Benin CREC_11 month data summary with Knockdown data

[Actions](#)

Attached is the final data summary (11 months after treatment) for this semi-operational village trial carried out in Dangbo, Benin. This summary includes cone-assay mortality results for wild-type resistant mosquitoes as well as results for Knockdown at each assessment point. The knockdown results provide an interesting discussion point on the impact (or not) of excite-repellent com-



Community engagement tools

What are they?

// Mosquito Learning Lab

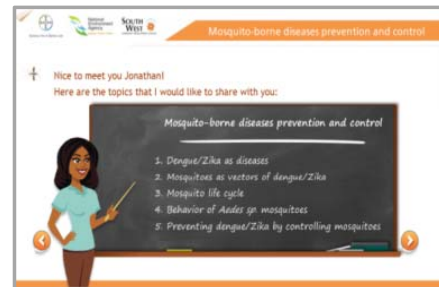


- // An online educational tool
- on how to prevent dengue / Zika

// Mosquito Quest



- // A VR experience
- to identify mosquito breeding sites in a home





Digital vector control platform

What is it?

// A digital platform to collect, analyse, and present relevant data - to enable better informed vector management decisions.

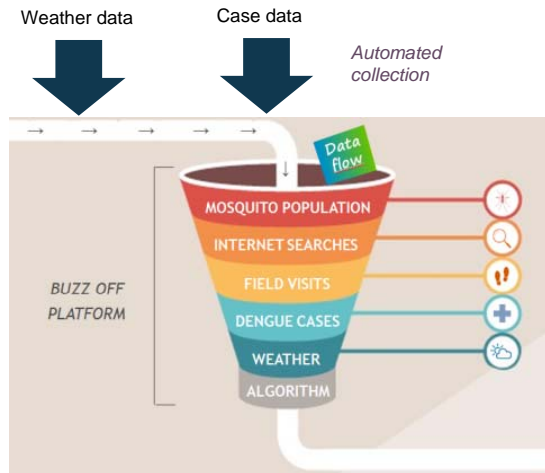
App for data collection



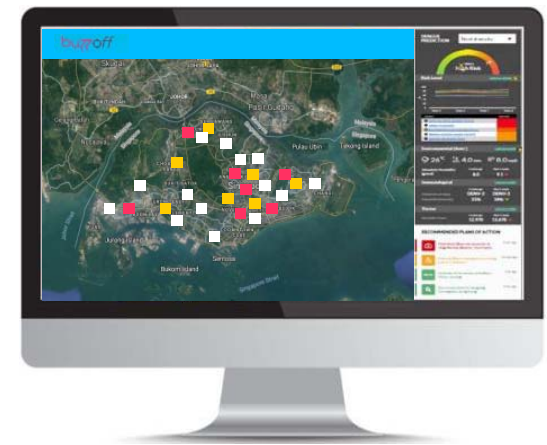
- Mosquito counts
- Type of breeding site
- Type of building or environment

Manually collected data and photos

Data analysis platform



Dashboard & reporting tool





Questions?

