



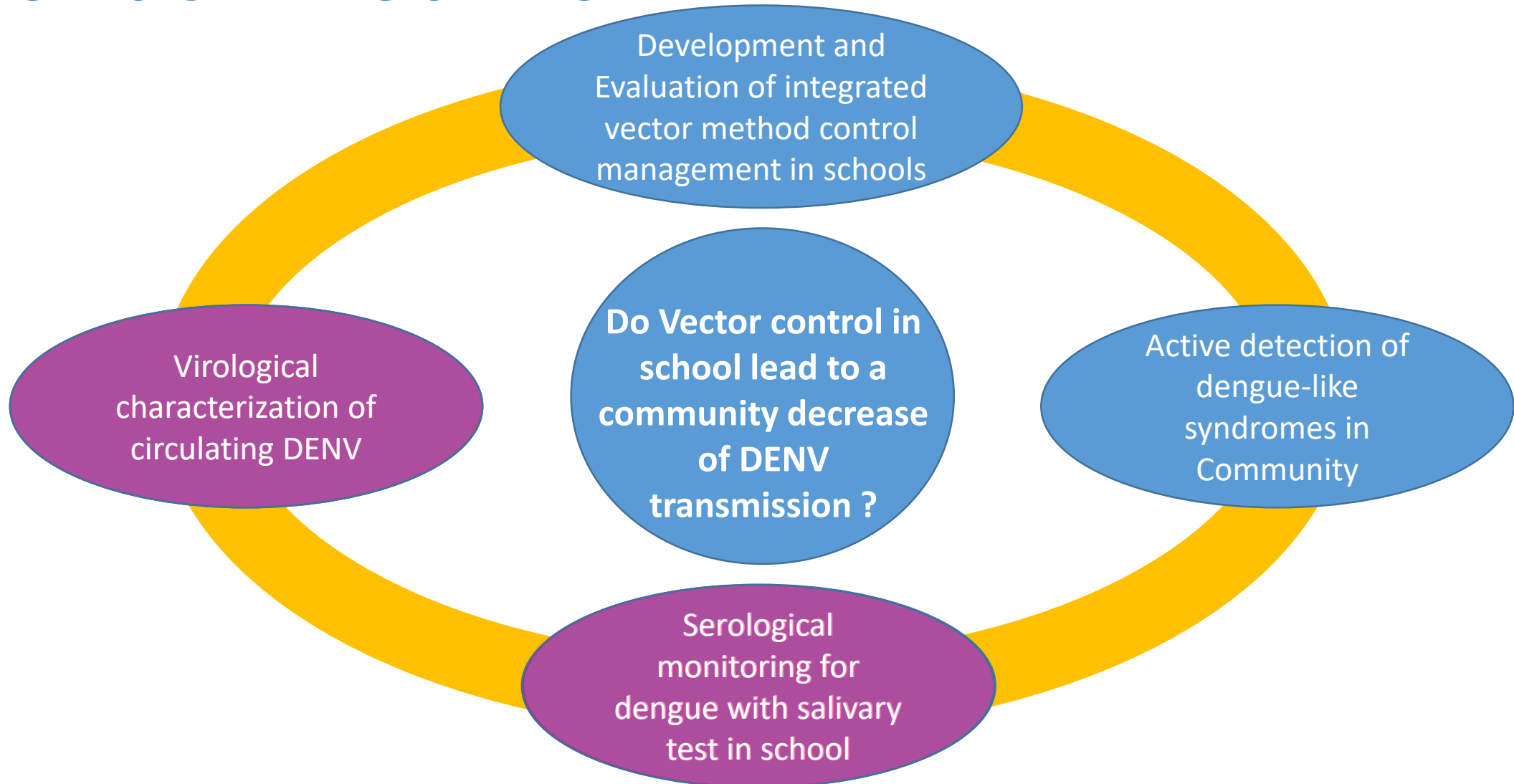
ECOMORE 2 project – Laboratory diagnosis

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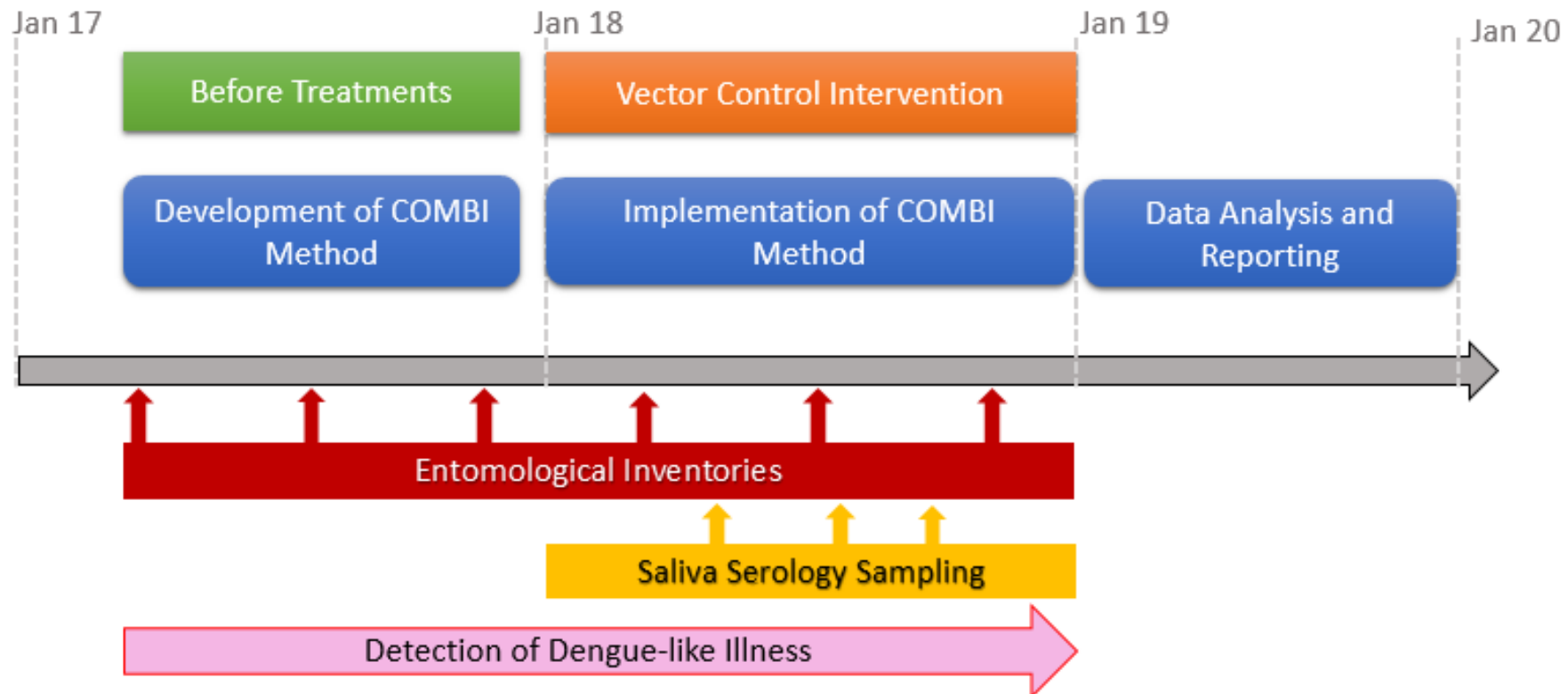
1st National Stakeholder Meeting
Phnom Penh – 23 March 2018



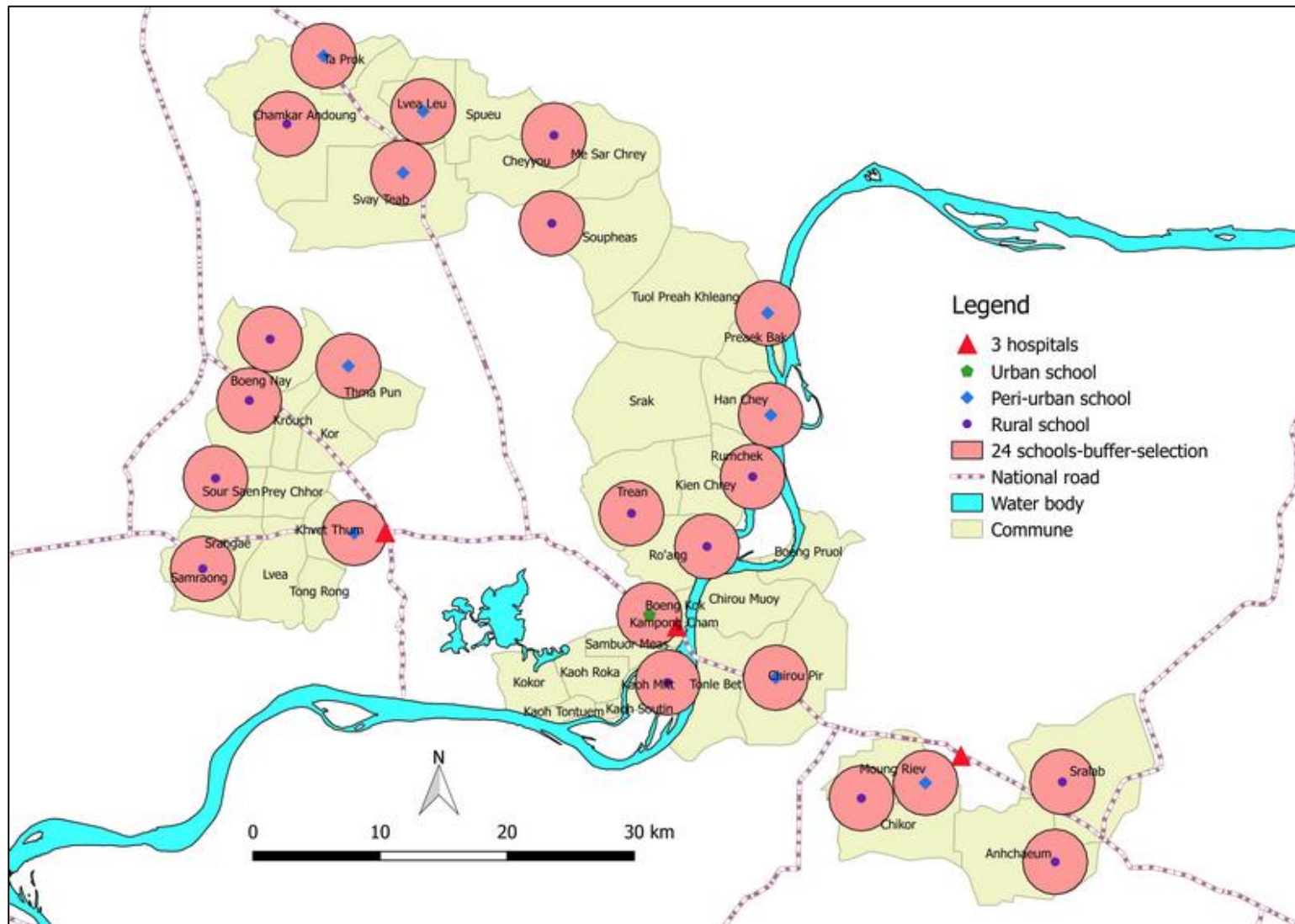
Epidemiological approach : cluster randomized trial



Project Timeline



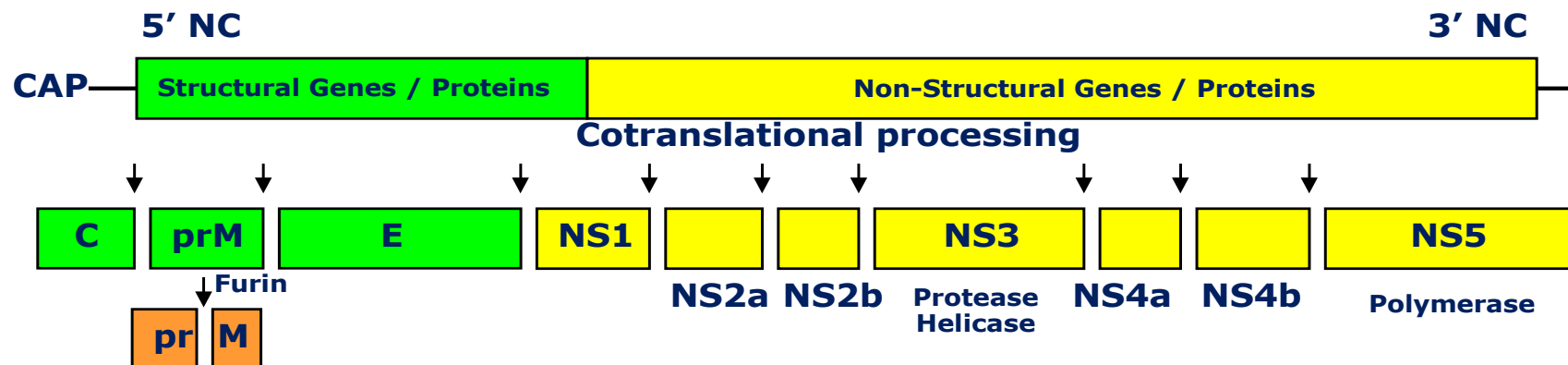
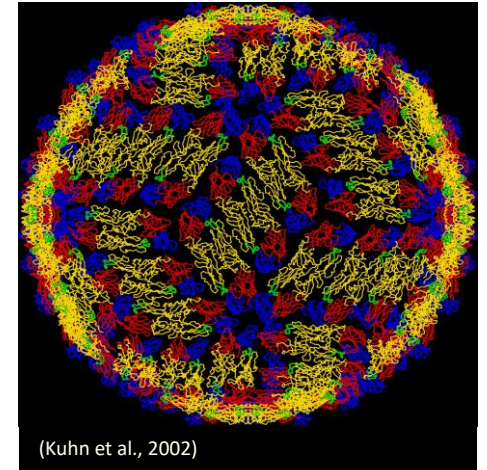
Random selection of 24 clusters in 5 districts (Ly Sowath et al.)



One cluster: one school and several surrounding villages related to that school

Dengue virus

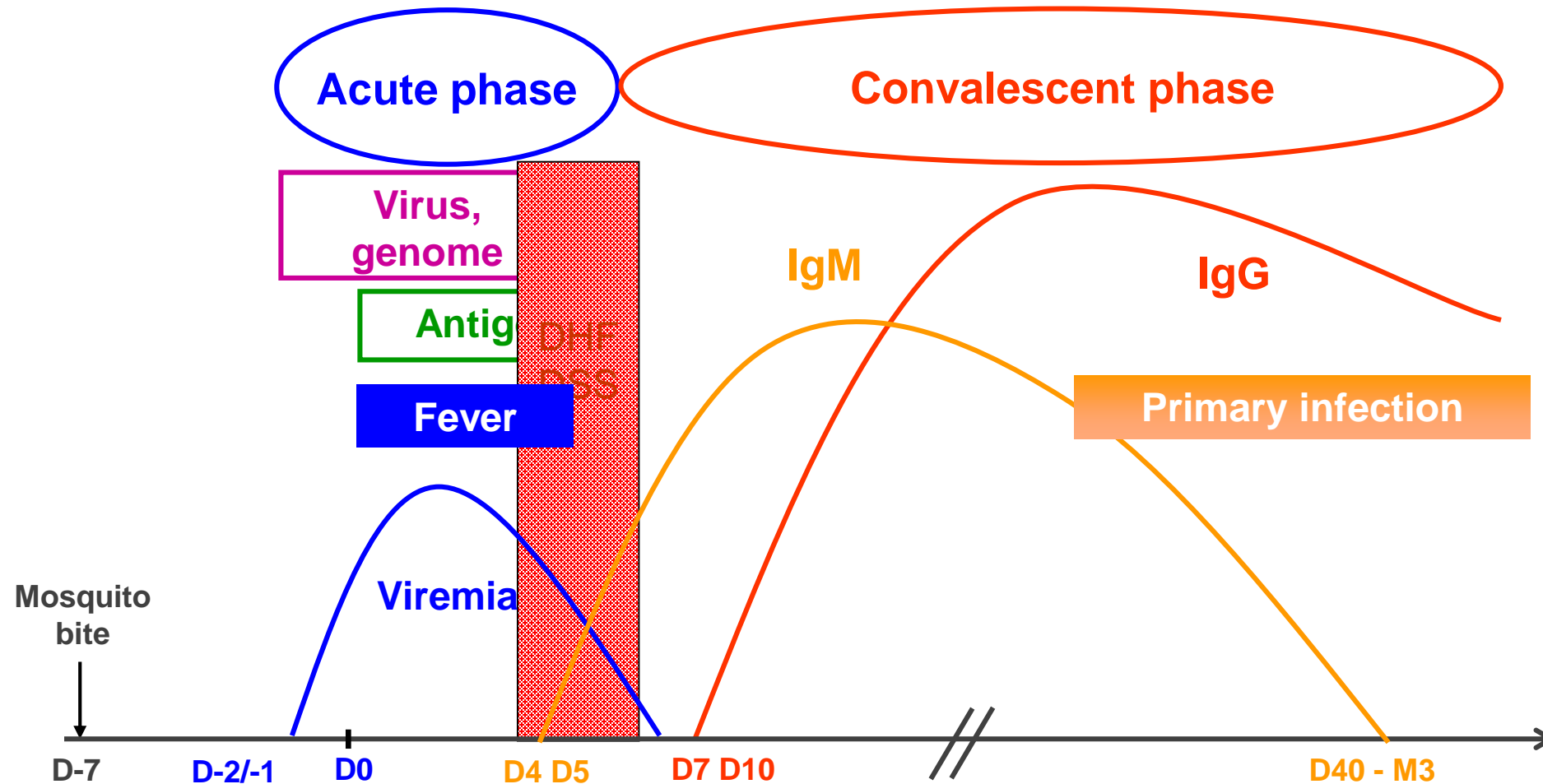
- Arbovirus: virus transmitted by a vector = mosquito
- Family *Flaviviridae*
- Genus *flavivirus*
- 4 serotypes: DENV-1, -2, -3 and -4
- No cross-immunity between serotypes
- Vectors: *Aedes aegypti*, *Ae. albopictus* +/-



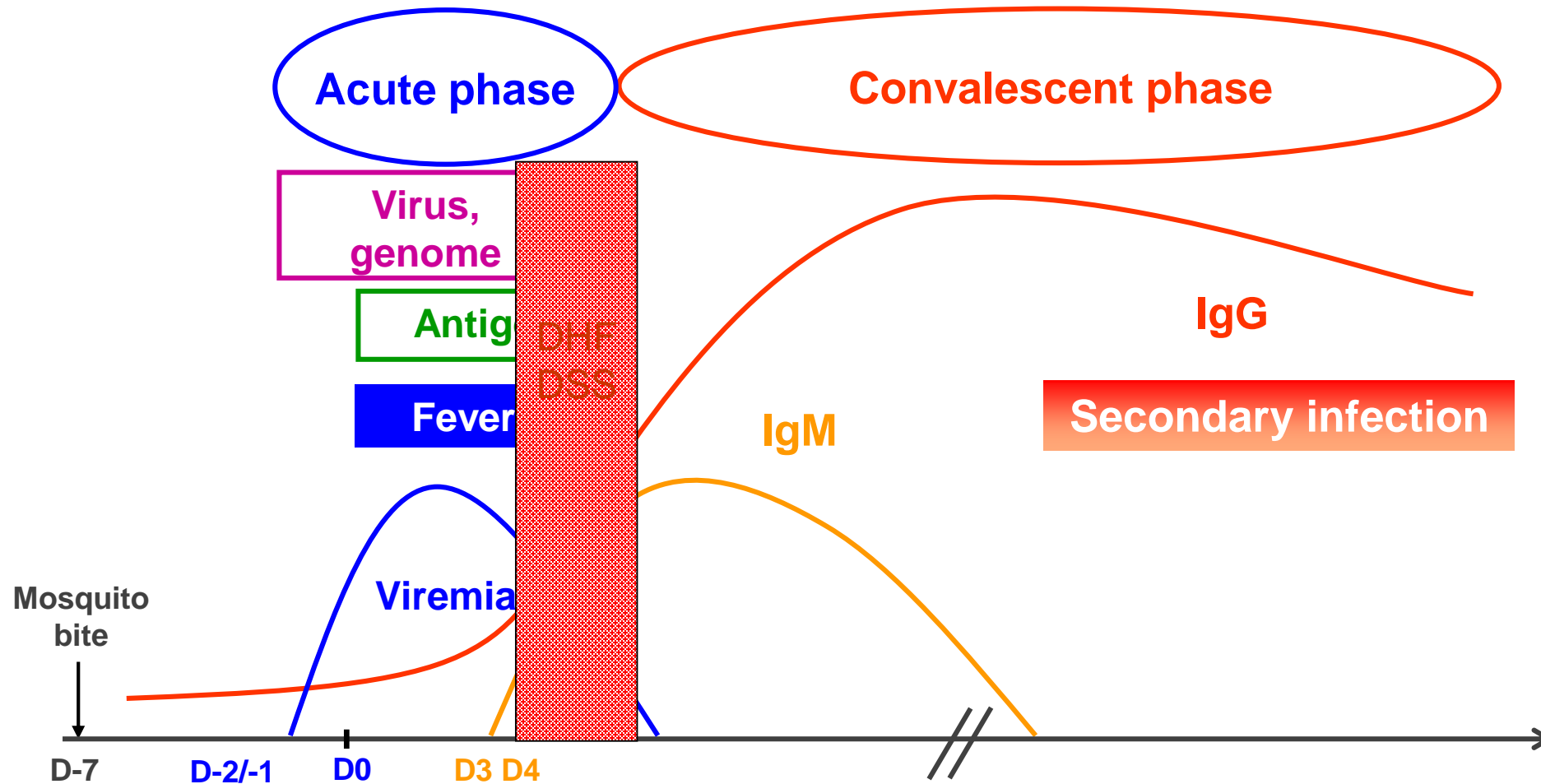
Laboratory diagnosis of dengue

- **Direct diagnosis → early diagnosis, confirmed-diagnosis**
 - Virus isolation and identification by cell culture (mosquito cell lines: AP61, C6/36)
 - Detection of viral RNA by molecular biology (RT-PCR, qRT-PCR)
 - Detection viral protein secreted by DENV (NS1)*
 - **Serum, plasma, whole blood**
- **Indirect diagnosis → detection of immune response during or after acute phase (serum, saliva, urine)**
 - IgM using MAC-ELISA (qualitative)*
 - IgA using AAC-ELISA (qualitative)*
 - IgG using indirect or capture ELISA (qualitative)*
 - Total antibodies by HIA (quantitative)
 - **Cross reactivity with other flavivirus (YFV, SLEV, JEV, WNV, ZIKV)**
- * *Commercial assays available*

Primary dengue infection



Secondary dengue infection

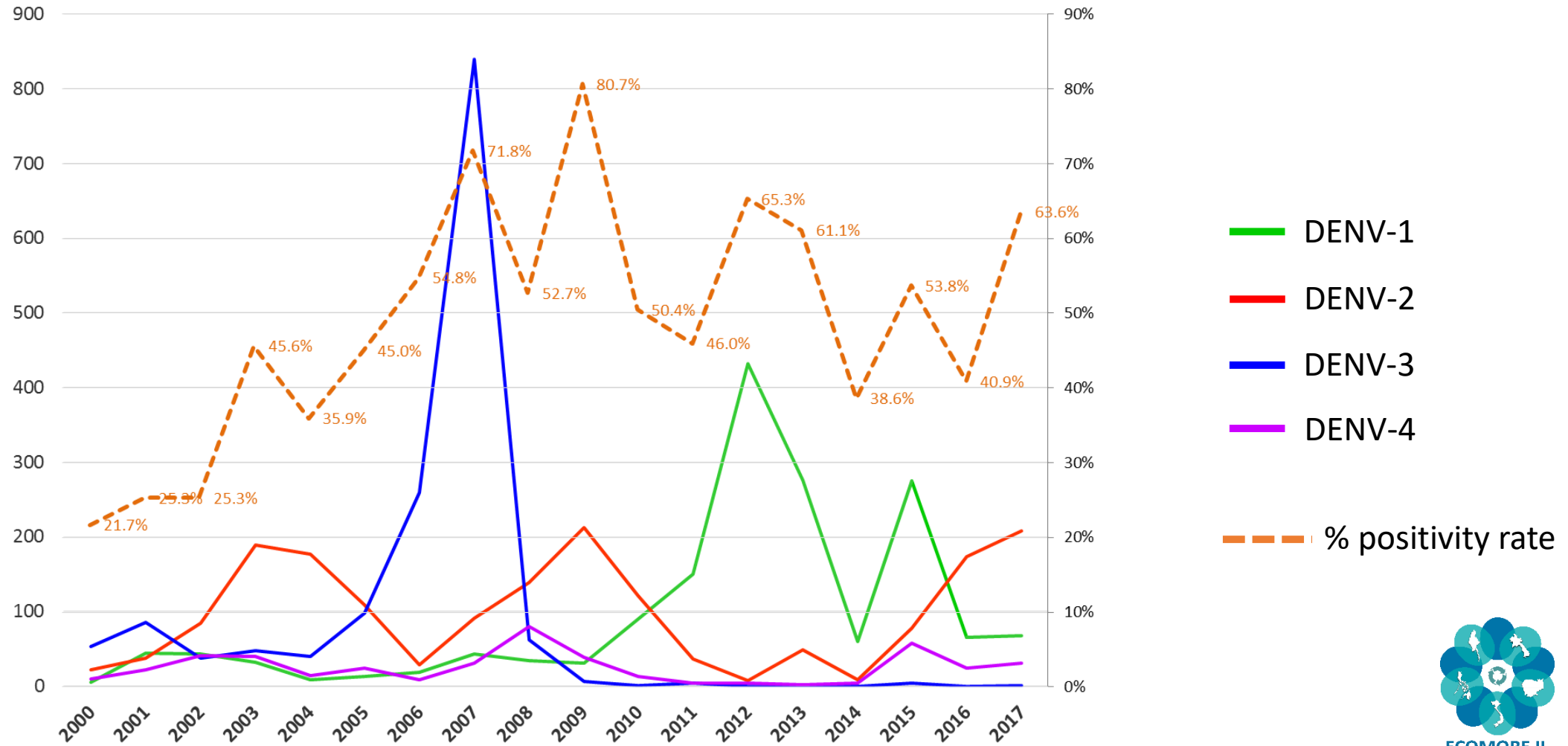


Dengue in Cambodia

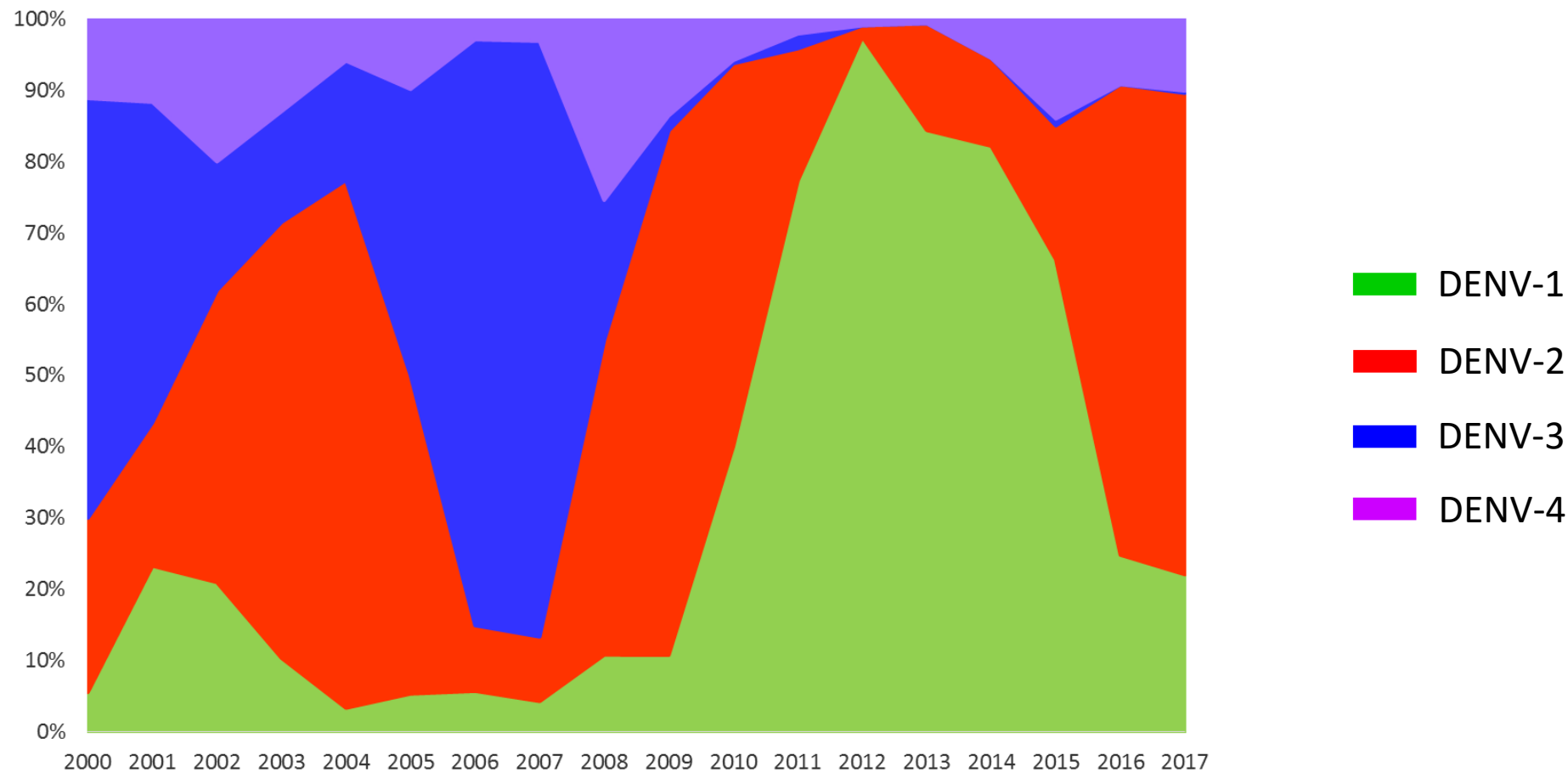
- National Dengue Control Programme (NDCP) – CNM (EPH-IPC)
 - Syndromic surveillance in 25 provinces
- Laboratory surveillance (Virology Unit, IPC)
 - 6 provincial hospitals
 - National Pediatric Hospital, Phnom Penh
 - Health centers
 - Diagnostic tools at IPC:
 - ➔ Dengue (1998), Chikungunya (2000) and Zika (2016)
- Dengue is hyperendemic, urban and rural
 - Rainy season: June to November
 - Peak of detection: End of July and mid-August
 - Intensity of circulation is depending of: serotype, herd immunity, climate etc.

Dengue serotype distribution in Cambodia, 2000-2017

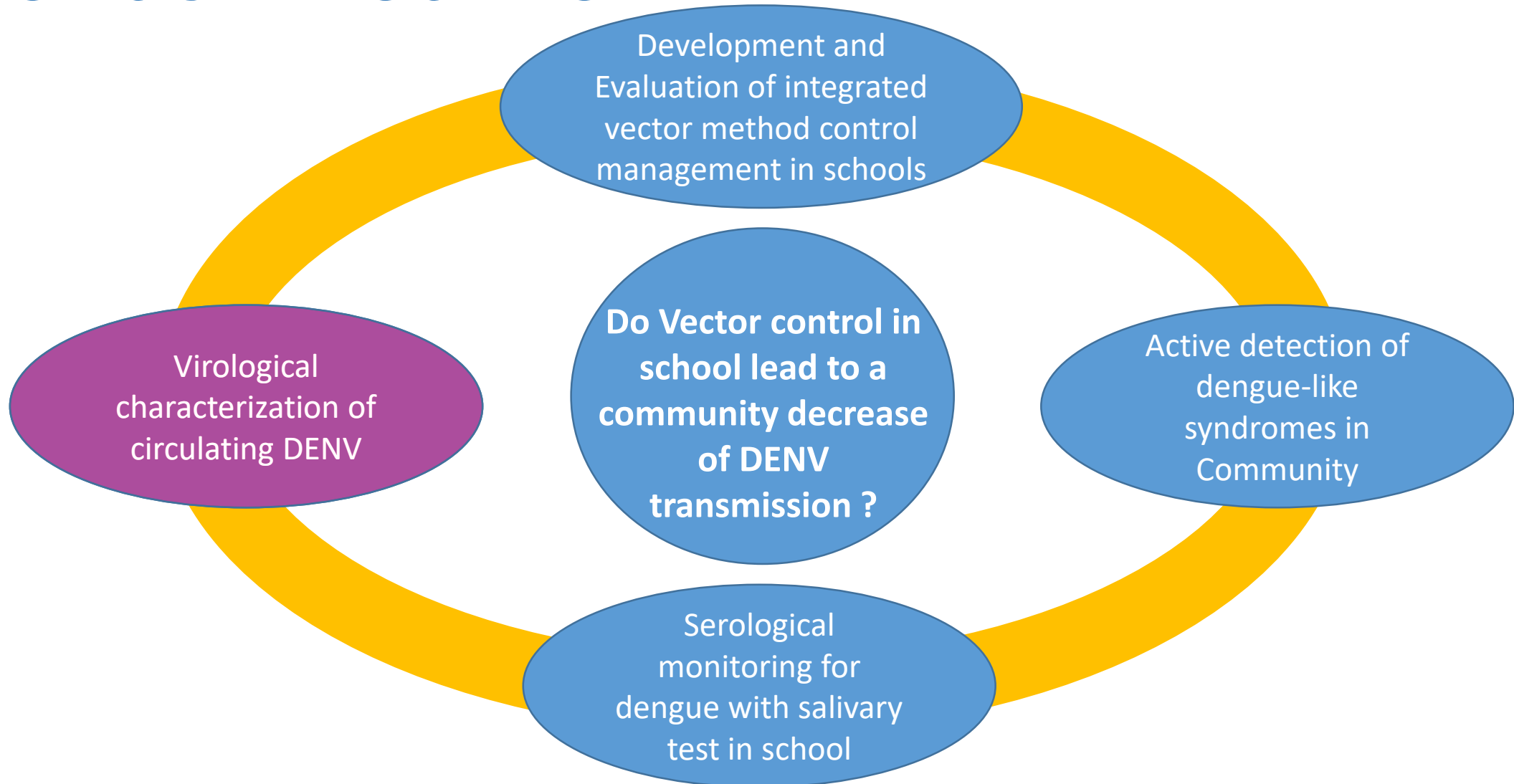
IPC laboratory surveillance



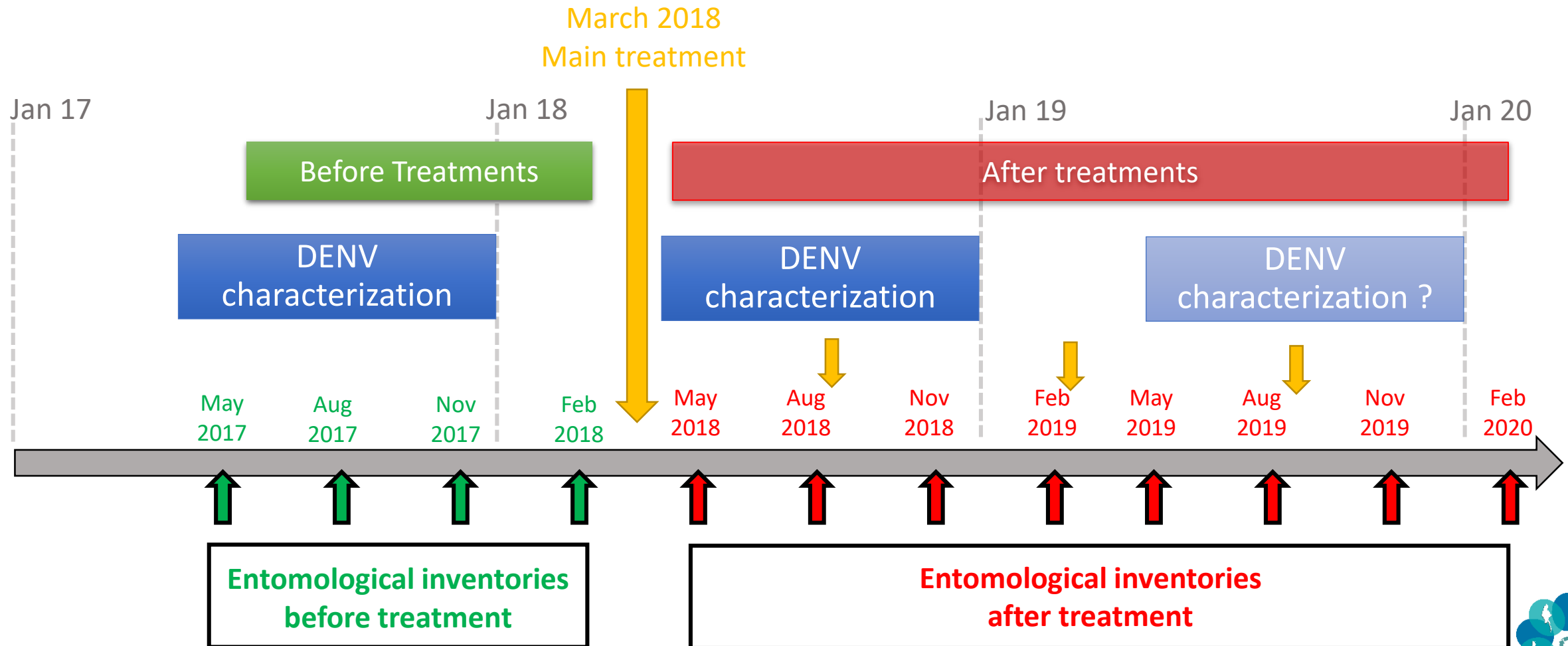
Dengue serotype relative proportion of annually detected DENV serotypes, 2000-2017 – IPC laboratory surveillance



Epidemiological approach : cluster randomized trial

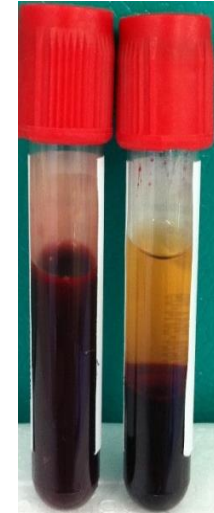


Virological characterization of circulating DENV

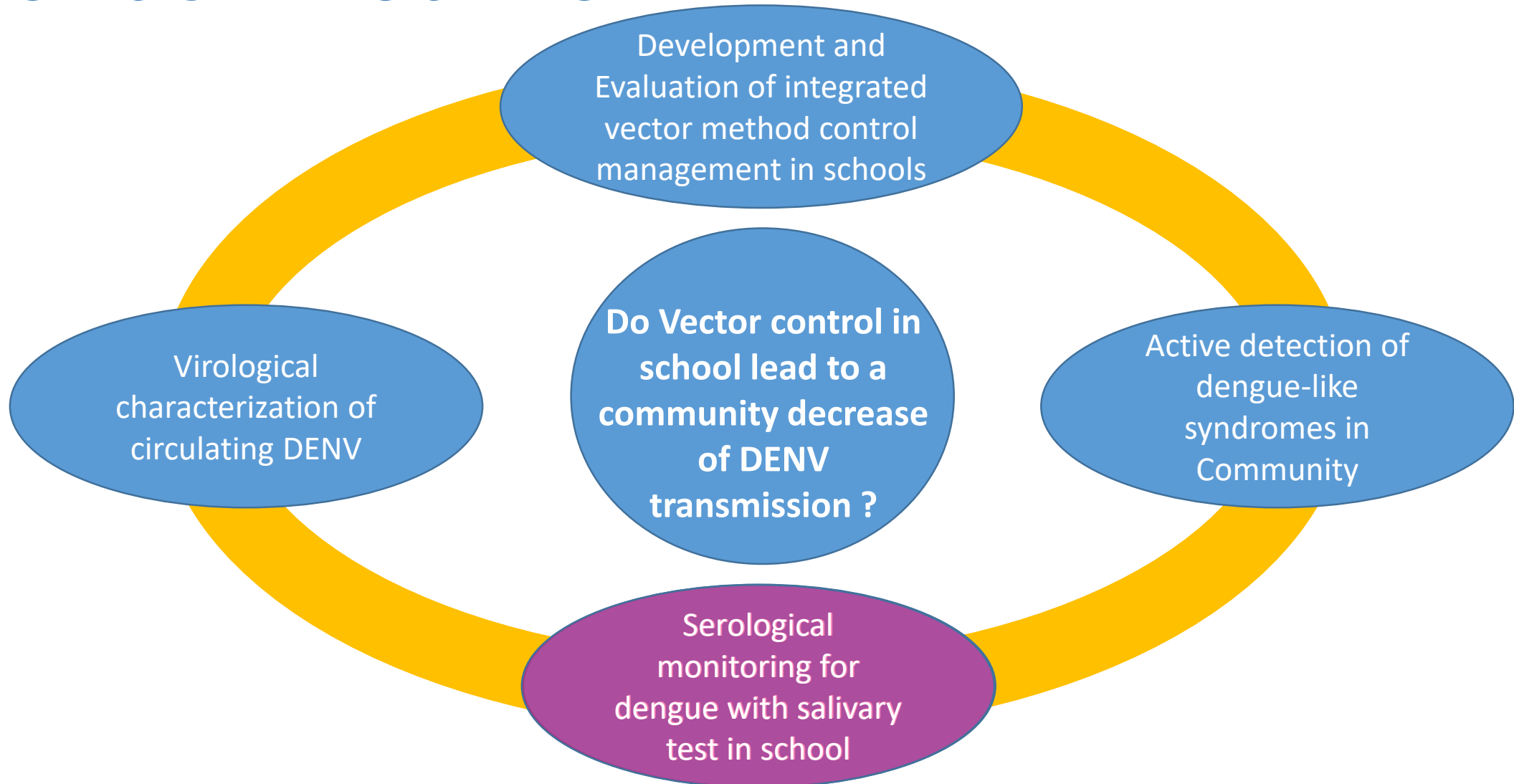


Virological characterization of circulating DENV

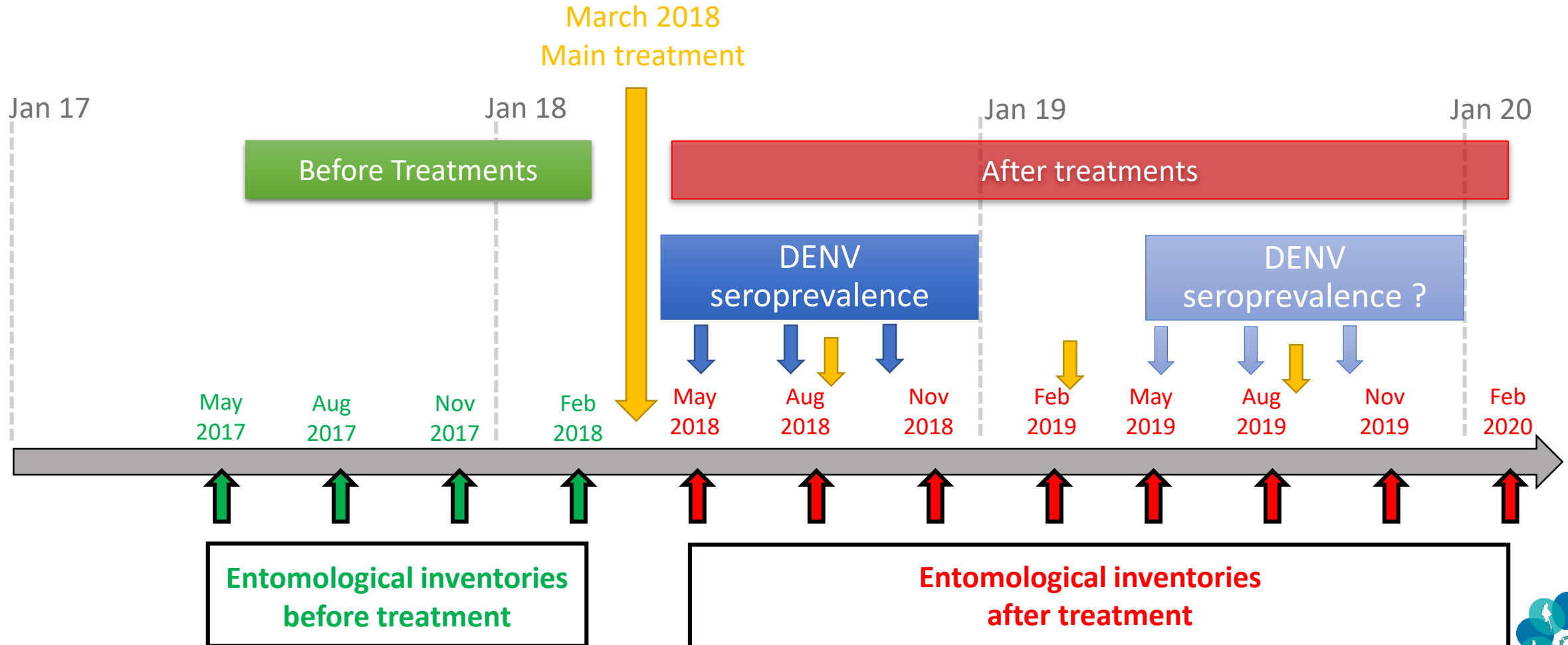
- Active community-based surveillance of dengue-like illness
- Detection of fever cases → screen for dengue-like illness
- Collection of blood samples
 - Twice within 14 days
 - By 2 nurses from closest health center (HC) to each study cluster
 - Samples stored at HC, collected by local project monitor and send to IPC twice a week
 - 1st sample: genome and antibody detection
 - 2nd sample: antibody detection (seroconversion)



Epidemiological approach : cluster randomized trial



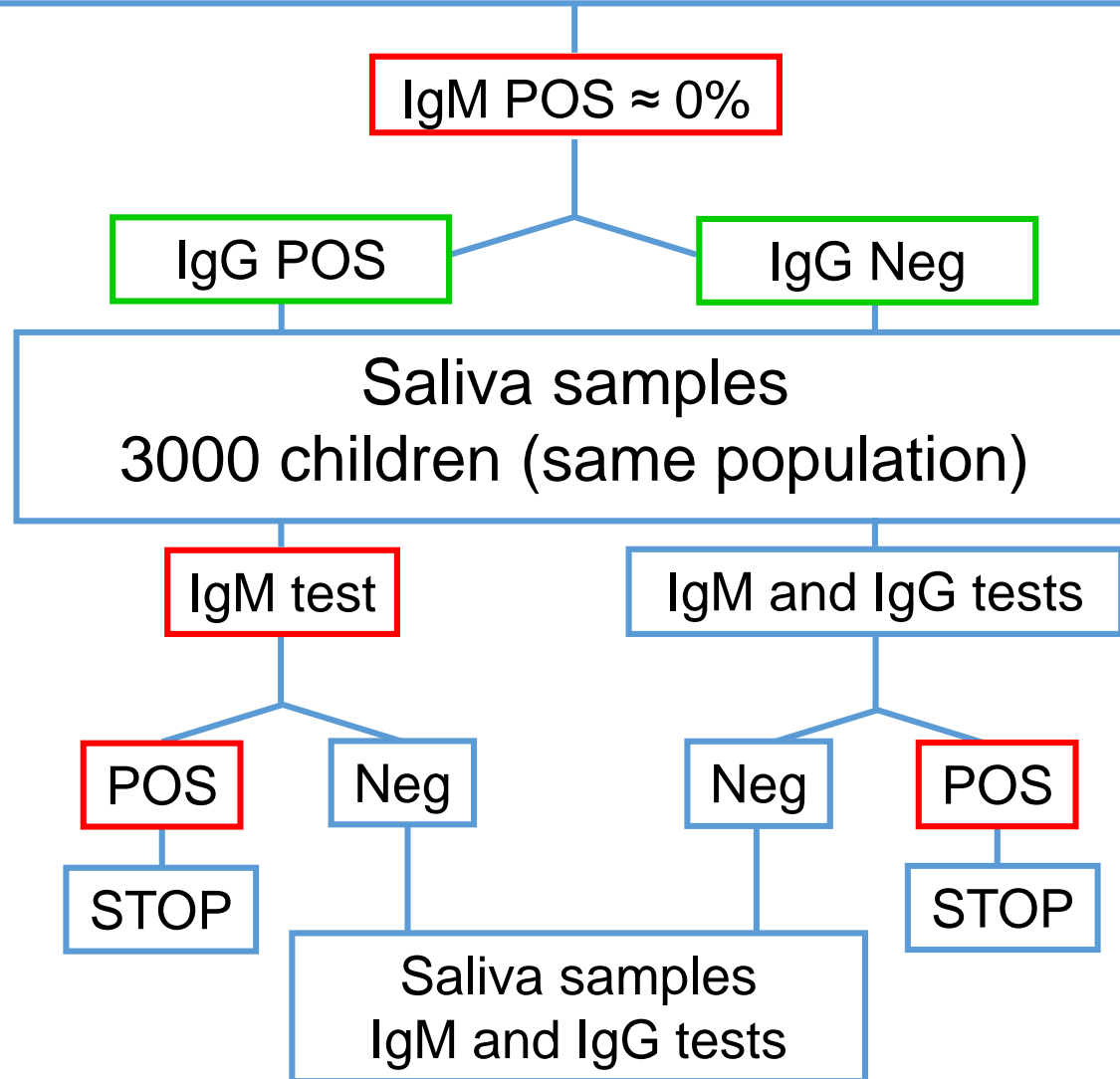
Serological monitoring of dengue with salivary test



Survey 1
Baseline – May

Saliva samples - 3000 children, 5-15 y/o
(1500 non-treated area vs 1500 treated area)
Indirect IgG ELISA / MAC-ELISA assays

Survey 2 – July



Survey 3 – October





THANK YOU



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