Institut Pasteur
de Nouvelle Calédonie

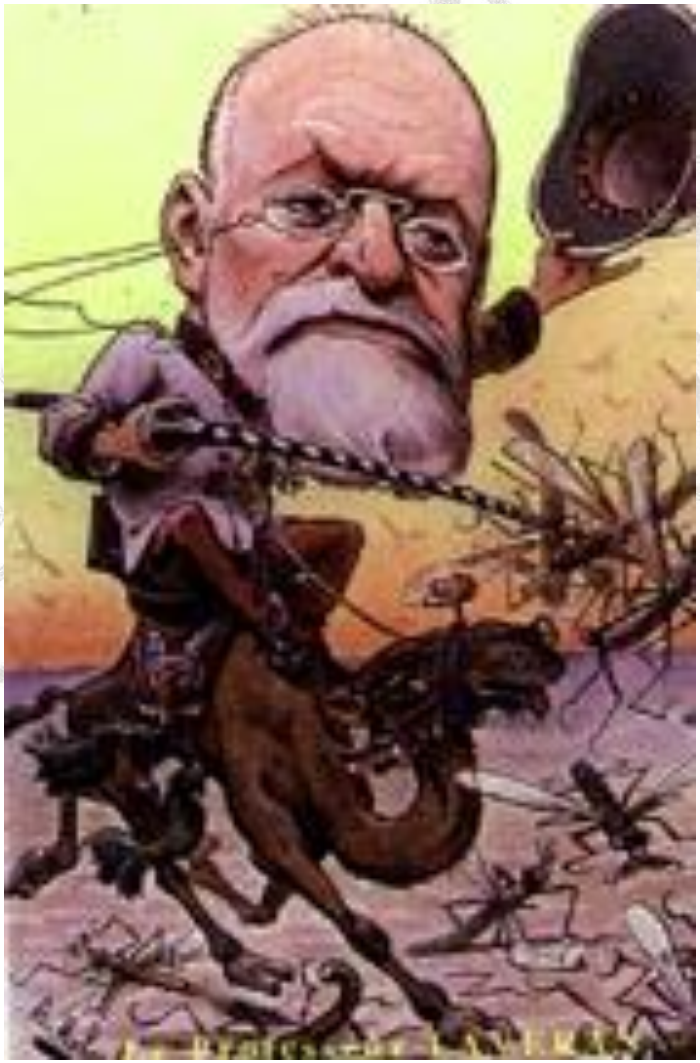
Vector control
Past, present and future

Laurent Guillaumot (IPNC)

History.

- End of XIXth century:
  - Discovery of the vector role of mosquitoes (Manson, Ross).
  - Discovery of the role of *Aedes aegypti* i nthe transmission of Yellow Fever (Carlos Finlay, 1881).
- To stop transmission, the goal is to reduce vector density under a certain threshold.

The heroic times



A. Laveran - 1880

First success

- William Gorgas in Cuba and Panama:
  - In Cuba
  - In Panama
- Discovery of the insecticide properties of DDT(1936).
  - Success against lice and typhus
  - Success against YF
  - Success against *Anopheles* and malaria

Vector surveillance and control of Yellow Fever Brazil - 1924.

Now … try to imagine!

- Few motor vehicles, no airplanes
- Cities: small scale
- No plastics
- Few disposable containers
- Few tires
- Yellow Fever: a terrifying disease
- High herd immunity
- Authoritarian authorities ...

Summary: the golden days

Source reduction was very effective, but ….

- Conditions were very different
- Target disease was very different
- Organization of operations was very different
- Public attitudes were very different

- Source reduction with homeowner within a 100m radius
- Neighbours information, flyer distribution
- No systematic spraying outside known transmission zone

- Space sprayings with malathion or deltamethrin.

Practical factors we cannot ignore

- Large cities
- Dense populations
- Difficult access
- Insecticide resistance

Mid term possibilities

- Public education
- Focal treatments
- IGR autodissemination
- Treated materials
  - Mosquito nets
  - Curtains
  - Screens
- Biodegradable Ovitraps
  - Treated with long lasting pyrethroids
  - Destroy the adult females looking for a breeding site
  - No need for retrieval

Long term alternative strategies

- Sterile Insect Technologies
  - Chemically sterilized
  - Irradiated males (*Ae. albopictus*)
  - Genetically modified strains (RIDL)
- Wolbachia infected insects
  - Cytoplasmic incompatibility (*Ae. polynesiensis*)
  - Novel wolbachia infections (*Ae. aegypti*)

Long term alternative strategies (2)

- Vaccines
- Push-pull strategies
  - Repellents indoors
  - Traps outdoors
- More public education
- Other ideas?

THANK YOU FOR YOUR ATTENTION

Many thanks to Prof. Paul Reiter for his help, and access to slides 6,7and 9