

SANTÉ ET CHANGEMENTS
CLIMATIQUES

SOIGNER UNE HUMANITÉ À

+ 2°

CONFÉRENCE MONDIALE
15/16
AVRIL 2019, CANNES

[HTTPS://WORLDCONFERENCE.CROIX-ROUGE.FR](https://worldconference.croix-rouge.fr)

REDx

PRÉSENTATION DE
PROJETS
INNOVANTS ET
D'INITIATIVES
LOCALES



GUILAUME BINEZ/ANP

ORGANISÉE PAR



croix-rouge française
PARTOUT OÙ VOUS AVEZ BESOIN DE NOUS

AVEC LE SOUTIEN DE :



AVEC LA PARTICIPATION DE :

REDx : PRÉSENTATION DE PROJETS INNOVANTS ET D'INITIATIVES LOCALES

Développement de techniques innovantes de modélisation mathématiques pour anticiper les risques de maladies infectieuses

Dr Simon CAUCHEMEZ,

Responsable de l'unité de Modélisations mathématiques des maladies infectieuses, Institut Pasteur

AVEC LE SOUTIEN DE :



AVEC LA PARTICIPATION DE :



Le Monde

croix-rouge française

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Using mathematical models to understand and anticipate the spread of vector born diseases

Simon Cauchemez
Mathematical Modelling of Infectious Diseases
Unit, Institut Pasteur

Health Climate Change World Conference Red Cross

#HCCWCRC, Cannes | 15 April, 2019

The burden of vector-borne diseases

Mosquitoes are important vectors of viral spread

Aedes aegypti

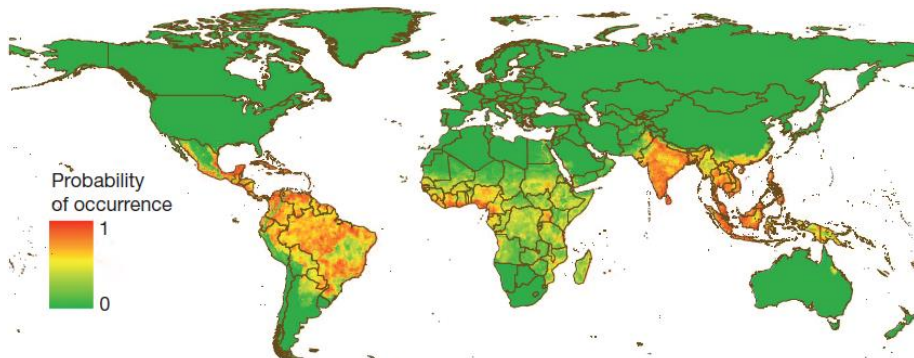
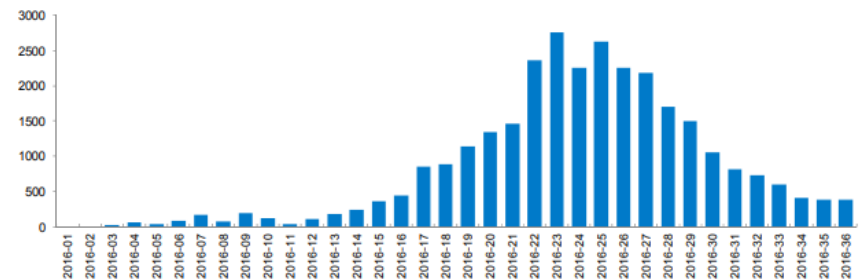


Aedes albopictus



Dengue virus

- Can lead to severe disease and death.
- Almost 400 million infections per year.
- Endemic in subtropical and tropical regions.



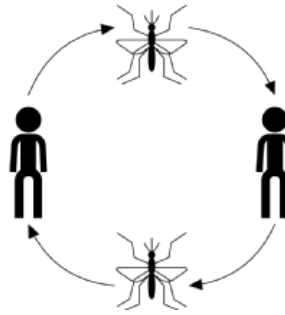
Understand epidemic drivers and dynamics to anticipate their trajectory and support planning

But it's a complex problem...

Vector biology



Transmission cycle

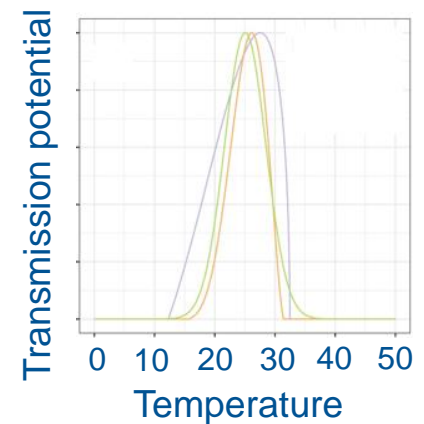
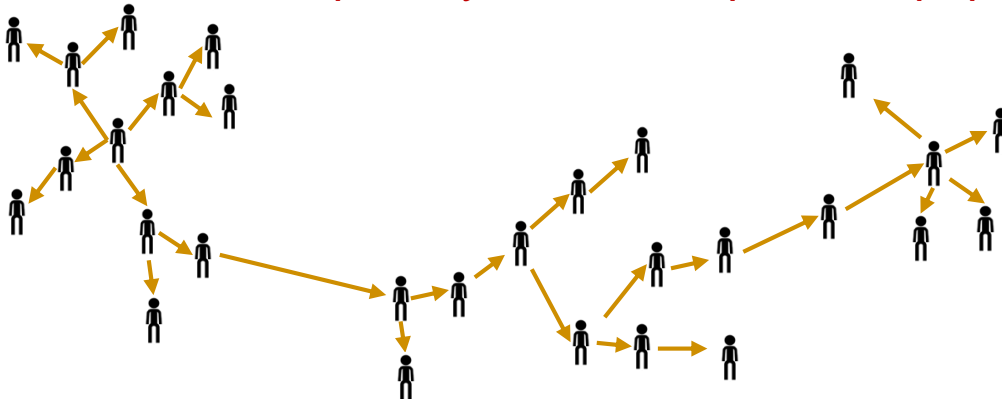


Mathematical Models

Extrinsic factors

- Climate
- Urbanisation
- Economic development
- Immunity...

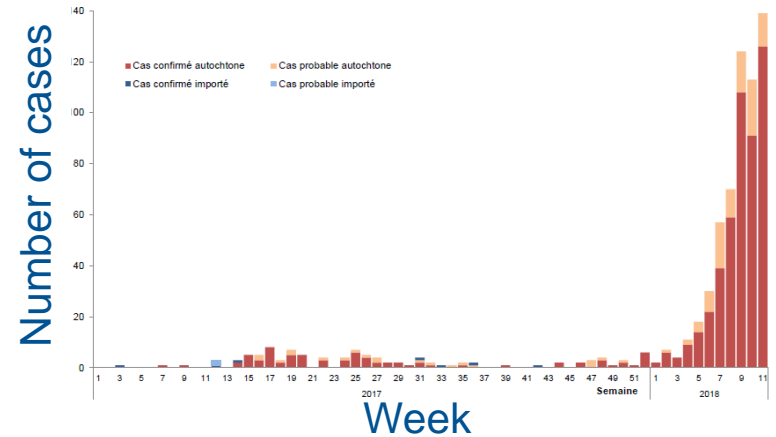
Complex dynamics of spread in populations



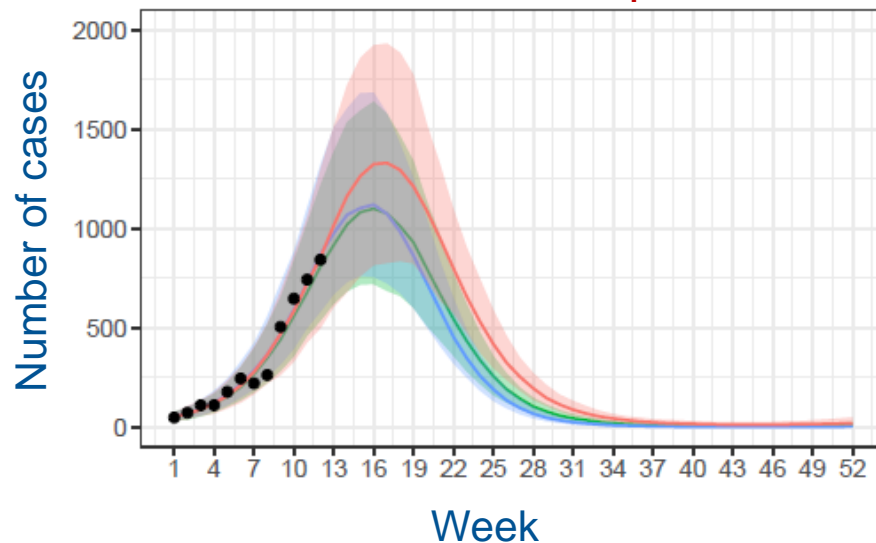
Short-term planning: Supporting policy makers during epidemics

- Epidemic of dengue in Reunion Island in 2018.
- Questions:
 - Will it persist during the austral winter?
 - What will happen in 2019?

Dengue in Reunion Island, March 2018



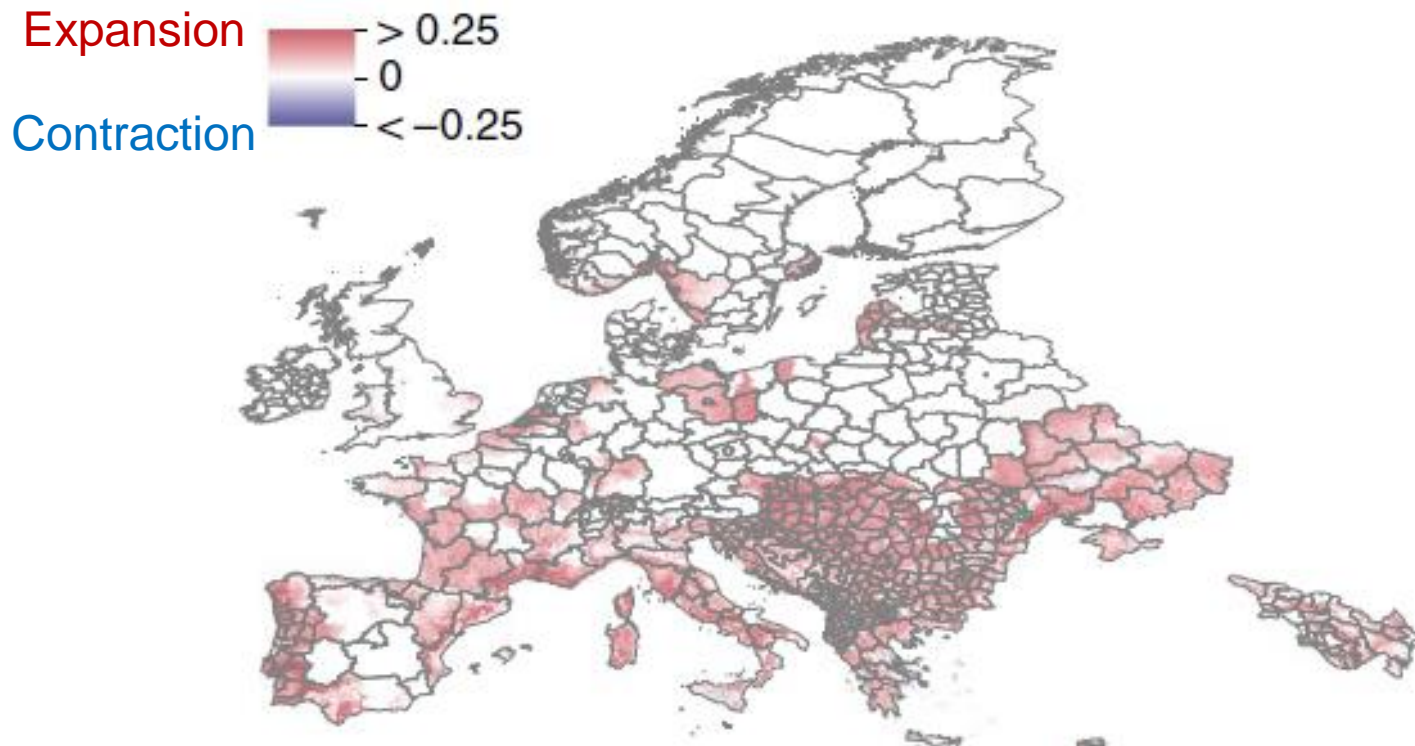
Predictions made on April 4th 2019



Used by the French government
and local administrations to
inform planning

Long-term planning: How are mosquito species expected to expand in the next decades?

Expected expansion of *Ae. Albopictus* between 2020 and 2050 under the medium climate scenario RCP 6.0



[Kraemer et al, Nature Microbiology, 2019]

Thank you!