E4WARNING
Eco-Epidemiological Intelligence for early Warning and response to mosquito-borne disease risk in Endemic and Emergence settings

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Holistic ONE HEALTH approach to improve our understanding of the interplay between humans, mosquitoes, reservoir species and the environment for a better disease intelligence capable of anticipating and identifying MBDs epidemic risk and outbreaks.
Citizen science
IoT Smart traps

High quality real-time information on vectors for a scalable and flexible "epidemic intelligence"

Citizen science
IoT Smart traps

EO data
seasonal climate
water availability
land use

Human mobility

Estimate and anticipate mosquito prevalence and disease risk

How human activity produce differential disease exposure and contribute to the spreading of invasive mosquitoes and diseases

Ecosystem barriers
to disease spreading

Host and vector dispersal capacities

Movement patterns in complex mosaic landscapes

Disease models in endemic settings

Dengue importation

Dengue forecasting in South Asia and endemic hotspots

Dengue prevalence in endemic areas and global traffic patterns will anticipate connectivity and importation risk
Model water availability dynamics and build hydrometeorological indicators.

EO data to develop vector and host distribution spatial models at different scales (regional, continental) and to enable climate-driven disease risk forecasting.

Introduce novel technologies (ground sensors, mobile phones, Internet) and citizen science, making citizens part of the solution.

Quantify ecosystem barriers/connectivity to MBDs spreading in 4 wetland areas (WNV) and 5 urban areas (DNV).

Explore risk factors, pathways and barriers for disease circulation. Identify strategies to make more resilient ecosystems in mosaic landscapes: urban and natural areas.

**ACTIONABLE RESEARCH**

All research & EW modelling will be integrated in operational frameworks following a QH open innovation model. Push the state-of-the-art of EWS and generate evidence-based and next-level knowledge to inform One Health management.
Innovative mosquito surveillance in urban environments (FARSEER)

- Citizen science (Mosquito Alert)
- E2E trap data mapping
- IoT Smart traps
- Earth Observation data
- Climatological data
- Human activity-spaces
- Human mobility

Go and checkout!

www.mosquitoalert.com
https://map.mosquitoalert.com/spa/en
Innovative mosquito surveillance in urban environments (FARSEER)

- Athens
- Barcelona
- Brasilia
- Hanoi / Ho Chi Minh City

Aedes albopictus
Aedes aegypti

Extending the “smart city” model of Barcelona
Disease models in Endemic settings (DMOSS)

**EARTH OBSERVATION DATA**
Previous 20 years to date:
- Land use
- Population
- Meteorological data

**REPORTED CASES OF DENGUE**
Previous 20 years to date

**EARTH OBSERVATION DATA**
Previous 20 years to date

**PROBABILISTIC WEATHER FORECAST FOR THE NEXT 6 MONTHS**

**AUTOMATIC BIG DATA HARVESTER**

**FORMATTING & STANDARDISATION OF BIG DATA**

**DATABASE**

**MODEL TO FORECAST PARAMETERS RELATED TO WATER AVAILABILITY**

**MODEL TO FORECAST THE NUMBER OF DENGUE CASES**

**WEB-BASED GRAPHICAL USER INTERFACE**
Probabilistic forecast of dengue every month for the next 6 months available in map, graphical and downloadable tabular formats at provincial scale

GEO Health Community of Practice 2023 | 9 June
Wetlands and urban areas connectivity: vectors, reservoirs, pathogens

- self-Mark and Capture (Culex)
- Mark-Release-Recapture (Aedes)
- Biologging of birds in field
- Human-vector interaction
- Human mobility

❖ Vector dispersal capacity
❖ Reservoirs home ranges
❖ Reservoirs behaviour activity
❖ Vector activity
❖ Human-vector interaction
❖ Vector passive dispersal

Aiguamolls de l’Emporda (Spain)
Sichinia-Marathona (Greece)
Bodanrück (Germany)
Bolle di Magadino (Switzerland)

Aedes albopictus
Culex sp.
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