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Malaria risk mapping in cross-border area between French Guiana and Brazil

Supporting malaria elimination plans

Emmanuel Roux^{1,2}, Yi Moua^{1,2} and Margarete do Socorro Mendonça Gomes³



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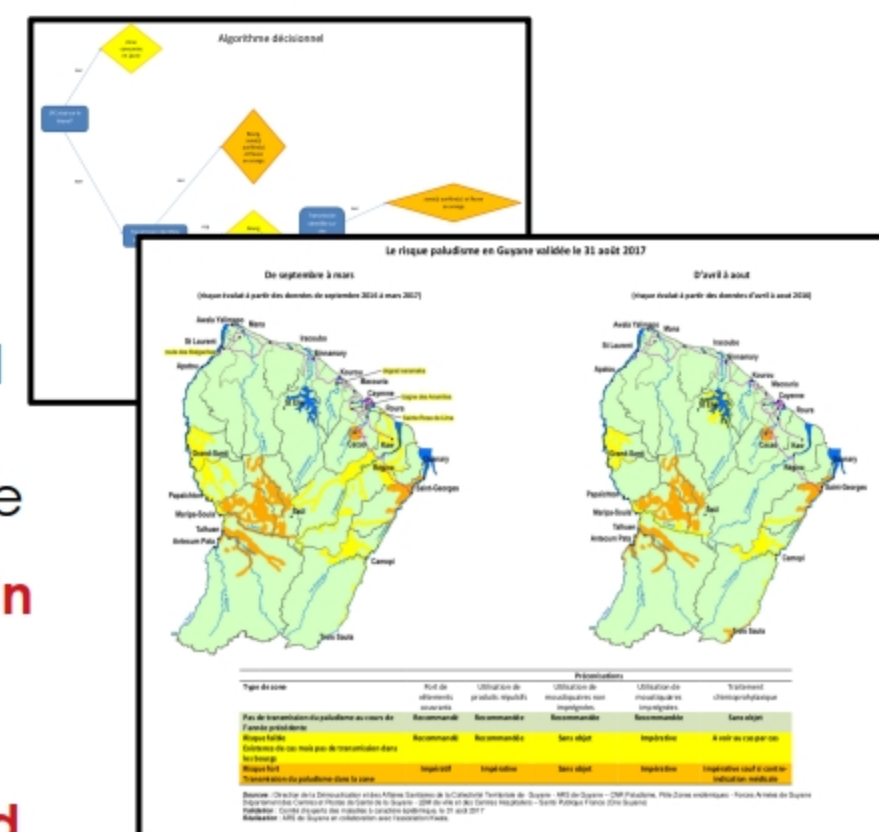
1. **ESPACE-DEV (IRD)**, Univ. de Montpellier, Univ. de la Réunion, Univ. de la Guyane, Univ. des Antilles, Univ. de Perpignan, France
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Background

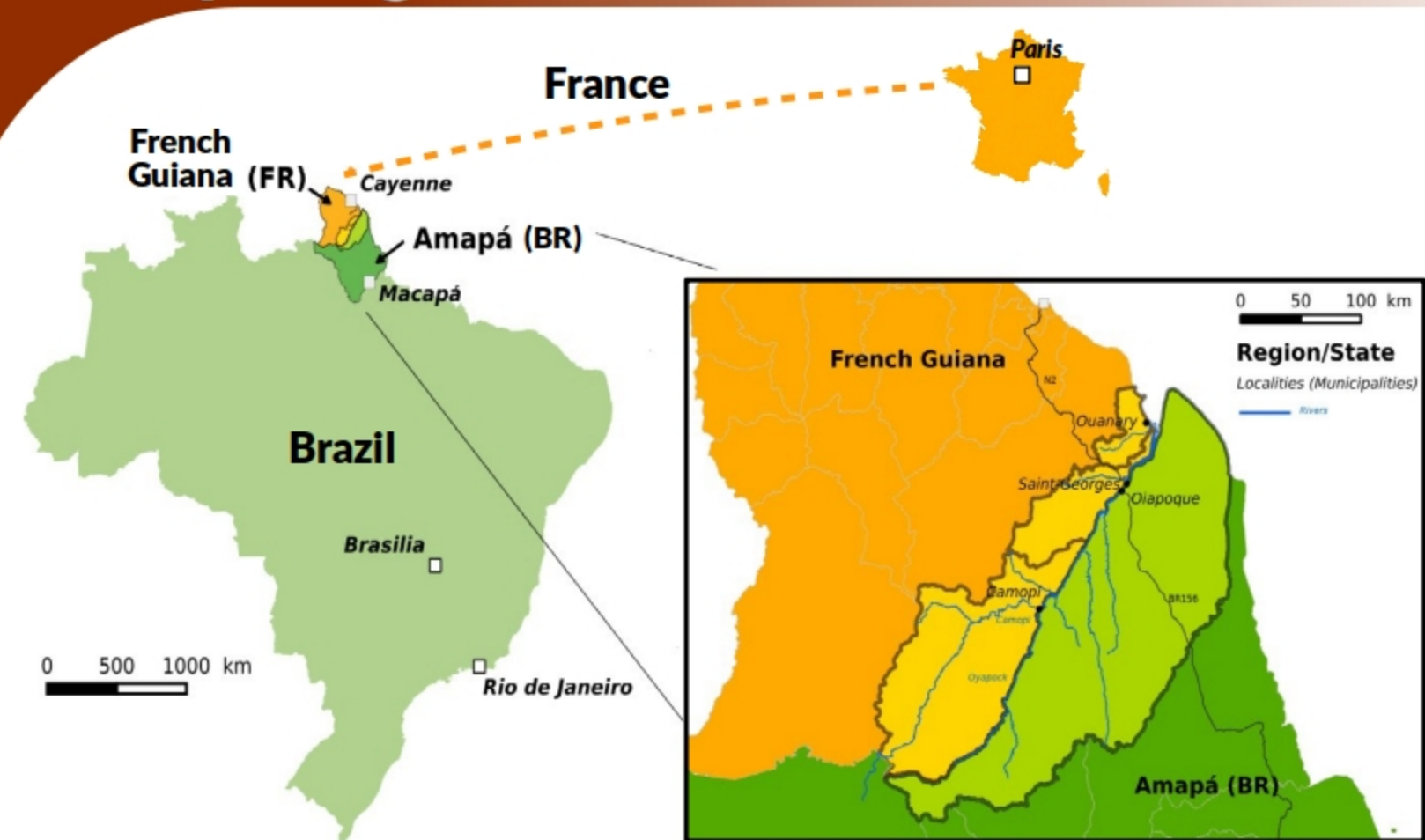
- Brazil and French Guiana reaffirmed the **objective of malaria elimination** (new elimination plan in Brazil, planning elimination of *P. falciparum* and *P. vivax* up to 2030 and 2035, respectively MOH, 2022)
- Modelling/learning approaches based on past reported cases are promising Schincariol et al., 2020
- In cross-border areas, the **high spatial resolution and dynamic risk mapping based (notably) on remote sensing data** would help **targeting control and elimination actions** in space and time independently of the international limits
- Risk mapping and knowledge formalization are used in Public Health

- "Cross-border malaria [is] a major obstacle for malaria elimination" Wangdi et al., 2015
- Pre-elimination phase means **very few cases** and potentially high impacts of control actions (**non-stationarity**) making such approaches inoperative
- Remotely sensed risk mapping is **not/rarely used in Public Health practice**
- knowledge and processing chains **should be formalized and standardized**, and **use of qualified data and indicators should be enhanced**, to ensure greater objectivity and reproducibility



ARS-Guyane, Kwata, 2017

Study Region



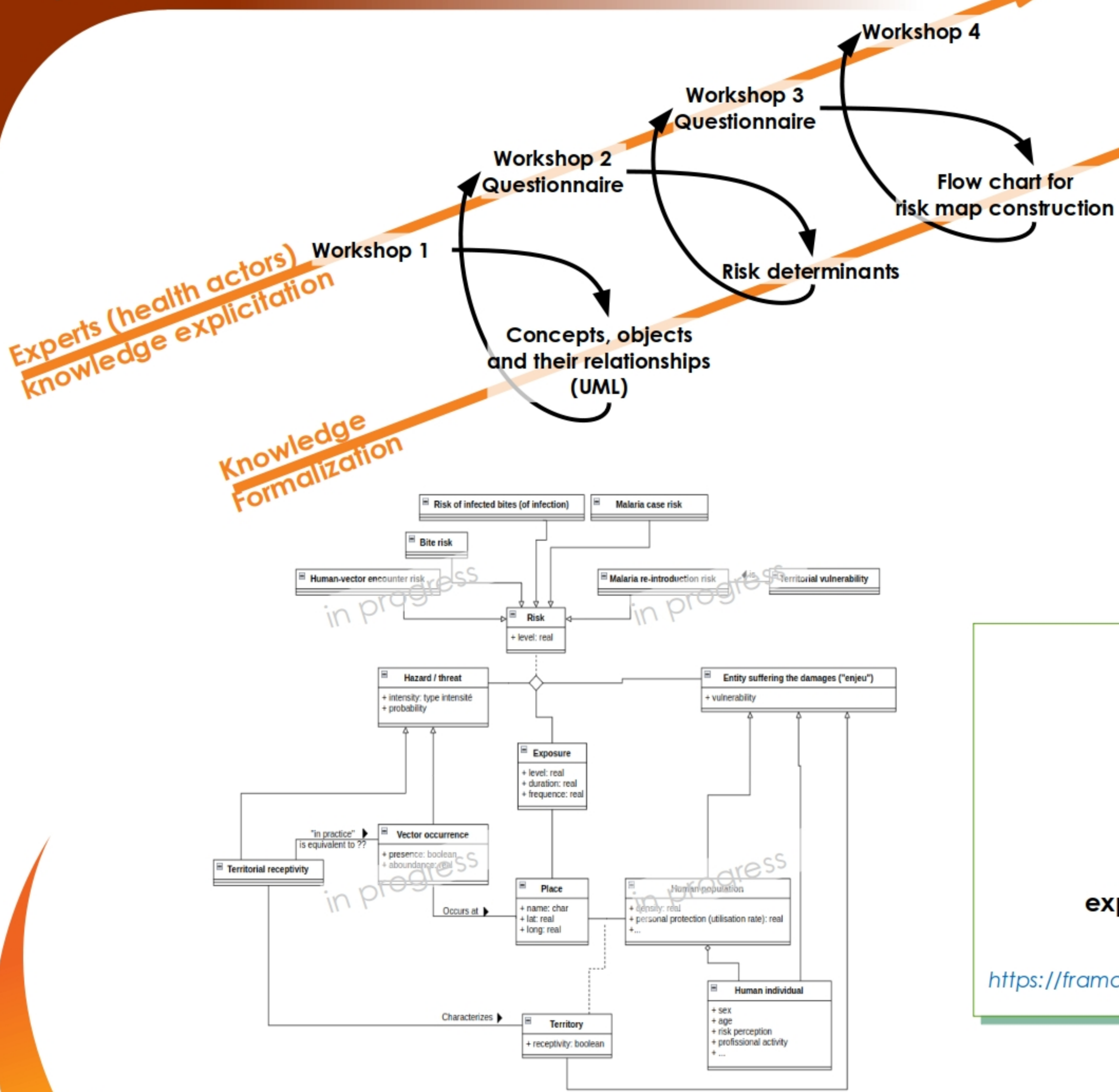
Objectives

- Mapping of malaria risks for an actual use in public health and based on remotely sensed (RS) data, for supporting:
- Targeting of control/elimination actions
 - Prevention/prevision of malaria reintroduction
- (NB: the idea is to support, in partnership! not substitute to current Public health approach!)

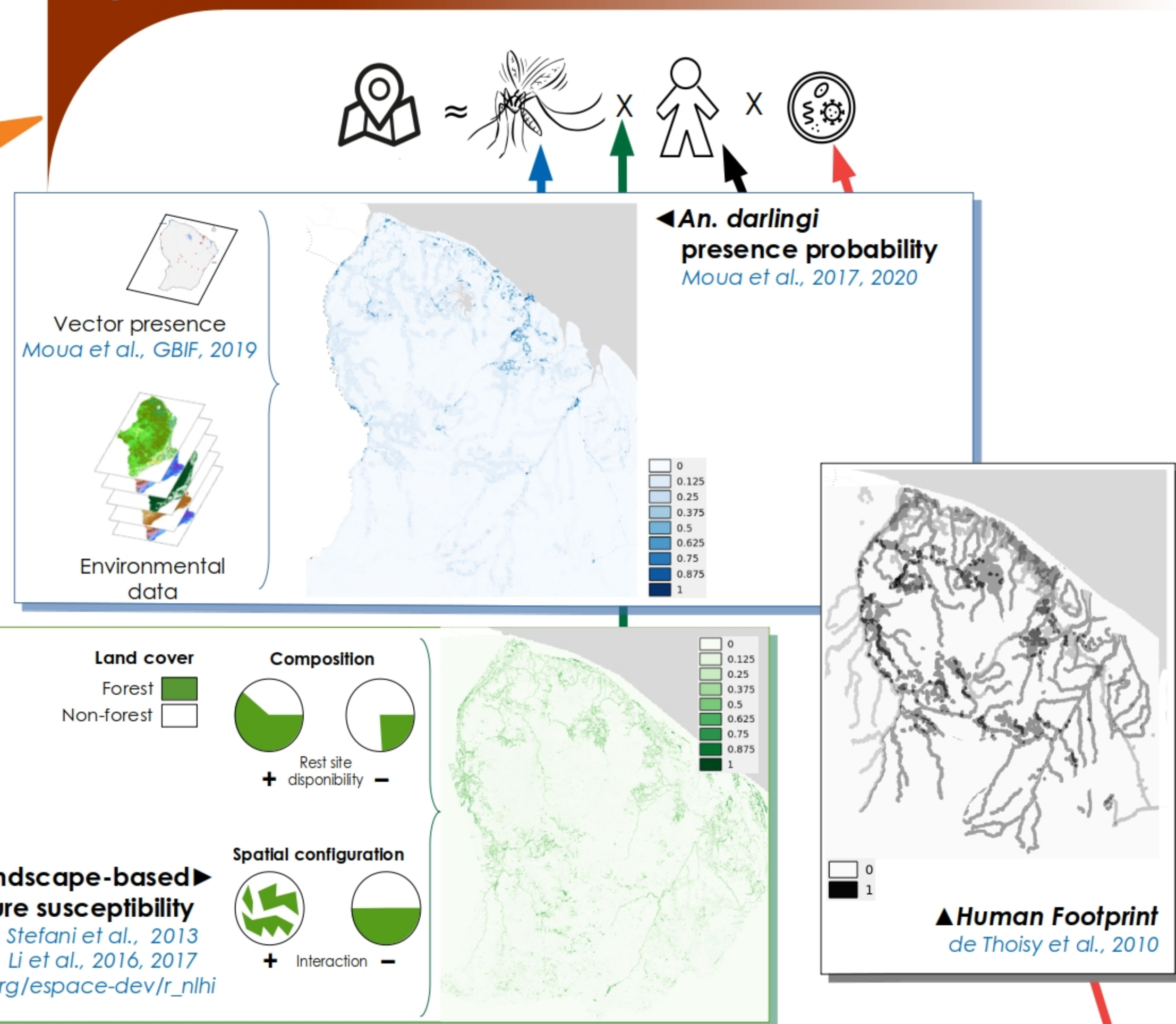
Method

- 1) Elaboration of conceptual models of risks
 - Co-constructed by 1) researchers in RS and data/model sciences and 2) public health actors
 - Adopting international standards (WHO recommendations on risk stratification: vocabulary; strata definition)
- 2) Implementation of the models based on objective, qualified and up to date data and indicators

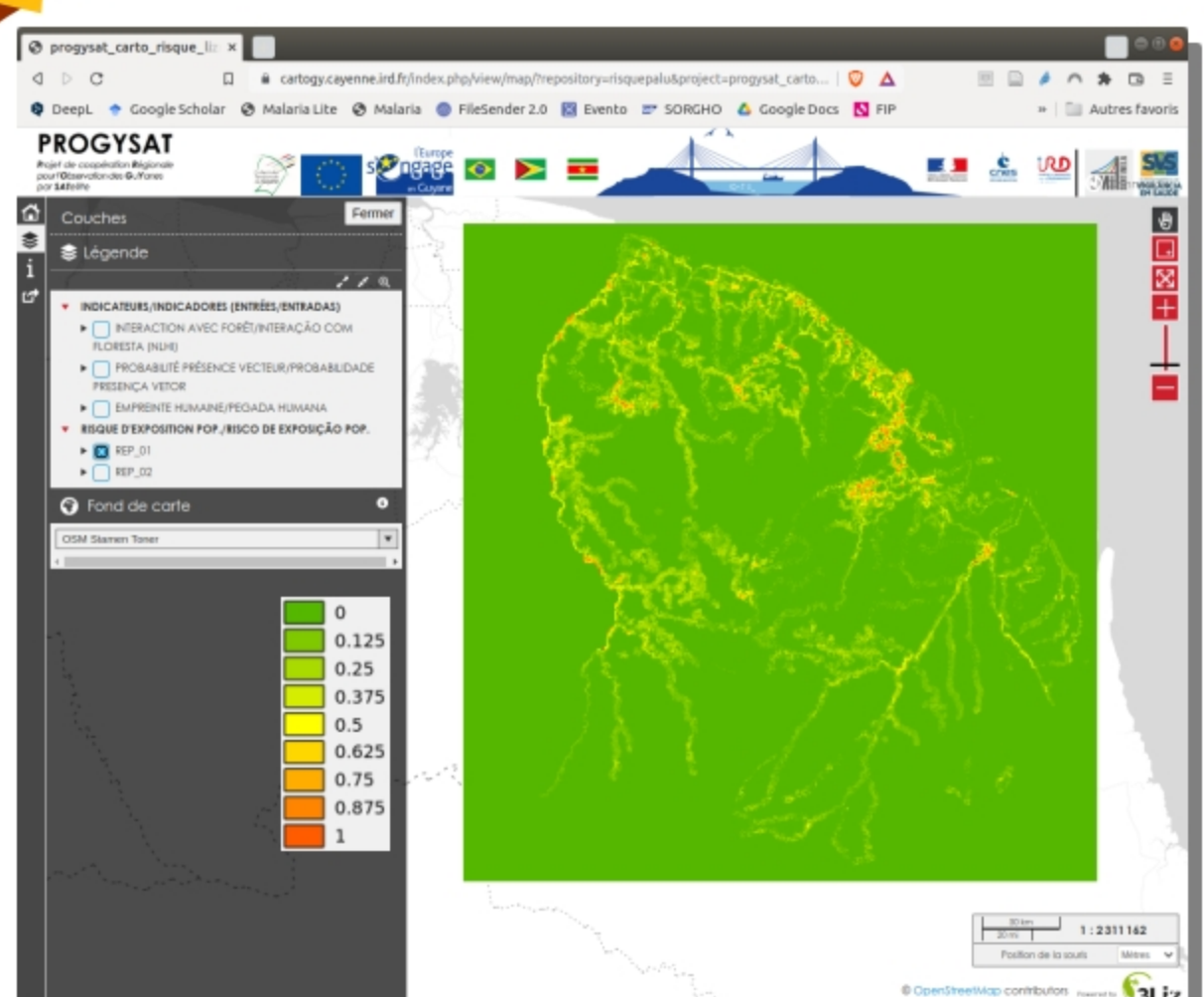
1) Risk model co-construction



2) Indicator production

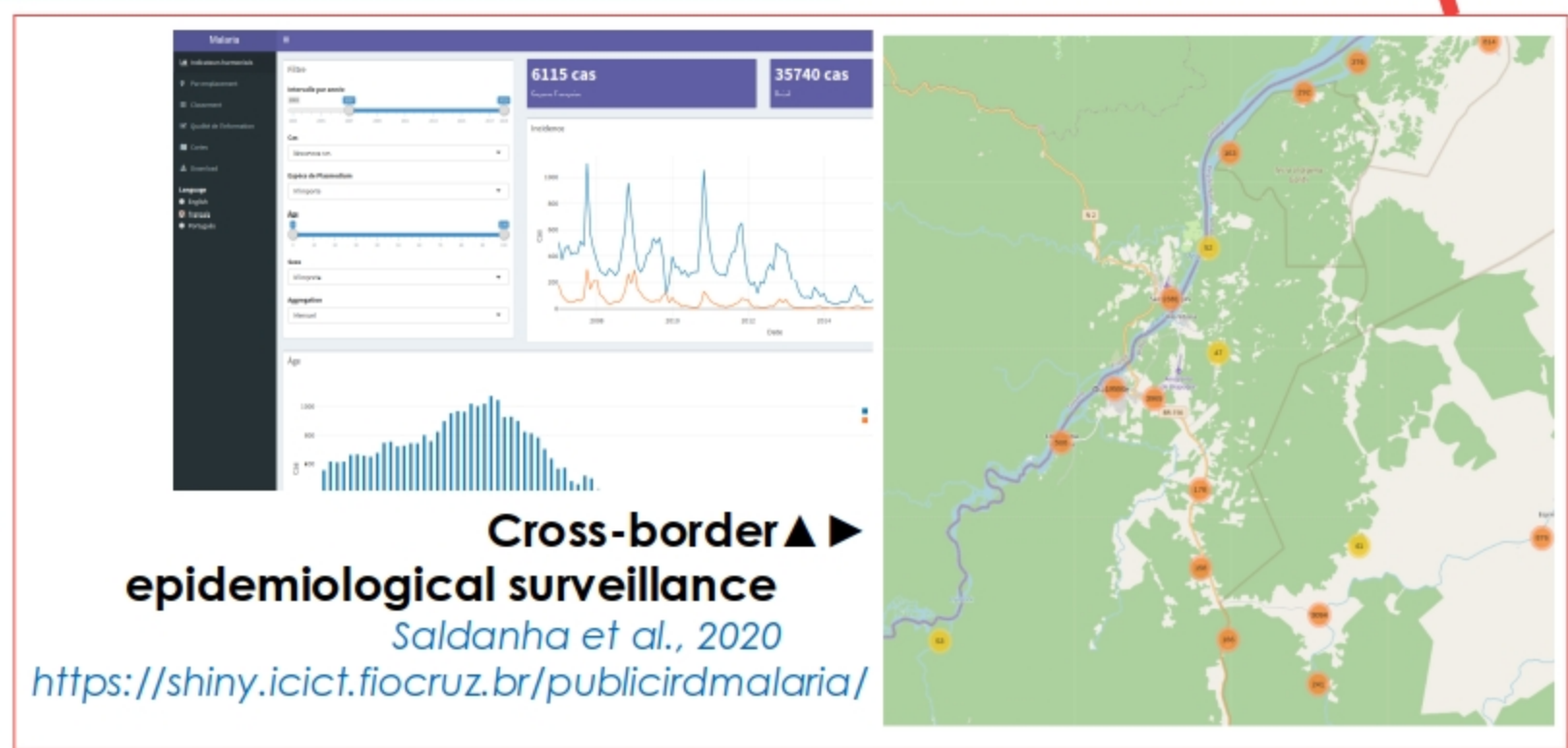


Preliminary results & Perspectives



- Specification of the indicator aggregation method based on the formalized knowledge
 - aggregation operator: + or x or + and x
 - Indicator weights
- Result evaluation (Workshop 4; capacity of predict case occurrence, based on historical data)
- Result dissemination & promotion intended to researchers, public health actors and general public

◀ Risk (in population) of exposure to the main malaria vector (*An. Darlingi*) (Prototype/Proof of concept)
https://cartoguy.cayenne.ird.fr/index.php/view/map/?repository=risquepalu&project=progysat_carto_risque_lizmap



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- LMI Sentinel



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