GEOSIMULATION OF DENGUE VECTOR DYNAMICS IN URBAN AREAS

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Dengue

Estimated 50 to 100 million infections per year

Virus transmitted by mosquito: *Aedes aegypti*  *Aedes albopictus*

40% of people worldwide at risk (WHO)
Dengue

Delhi’s confirmed cases (ELISA) in 2008-2009-2010 (34 sentinel hospitals)

- **Cas 2008**: 1,216 cases
- **Cas 2009**: 1,154 cases
- **Cas 2010**: 6,259 cases

<< 50-80% asymptomatic
<< actions taken to late >>
Inability to control the mosquitos in a city >>

Geosimulation

From the real world (impractical experiments)

To representative world (virtual experiments)
Geosimulation

Agents in geo-referenced environment

Modeling accurate knowledge of actors’ behaviors and its relationships.
Dengue vector population dynamic model

FIRST STAGE OF MODEL DEVELOPMENT

- mosquito individual behaviors
- mosquito’s life cycle from egg to adult
- realistic virtual environments with landuse classification related to mosquito’s behaviors, urbanization and socio-economic characteristics
Population observation

- Adults
- Pupae
- Larvae
- Eggs

Population Size

Individual monitoring

- Time t
- Space x, y

Taking blood

Look for a human

Threshold phenomenon? When? Where? To what extent?

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Conclusion

- The model remains to be calibrated and validated by a multidisciplinary dialogue

😊 Provide robust statistical data
😊 Observation of an emergent phenomenon
😊 Aid formulation of intervention guidelines for a public health authority

因地制 需要集成准确参数和知识的几个学科

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Question?
THANK YOU!

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This research was founded by the EU project DENVREE: Dengue Research Framework for Resisting Epidemics in Europe (grant agreement: 282 378), funded by the European Commission’s Seventh Framework Research Programme and by the French project ADEESS: Analyse de l’Emergence de la Dengue Et Simulation Spatiale, funded by the Agence Nationale de la Recherche, ANR 10 CEPL 004-01.