Consideration of a synthesis tool for malaria analysis

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enrghi2010@irdes.fr

Camille PERCHOUX, Marion BORDERON,
UMR 6012 ESPACE, University of Provence

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Framework of research

ACTU PALU Project

Context	*Stake*	*Methodology*
ANR 2008 – 2010 Coordinated by UMR 151 – LPED – IRD Richard Lalou Contribution of : UMR 6012 ESPACE Multidisciplinary research laboratory	➢ To link the socio-spatial carcteristics ➢ By creating an index of paludal risk ➢ In a urban heterogeneous context	➢Survey ➢ 3000 Households ➢ 50 Districts ➢ Thickdrop diagnostsis

Research context

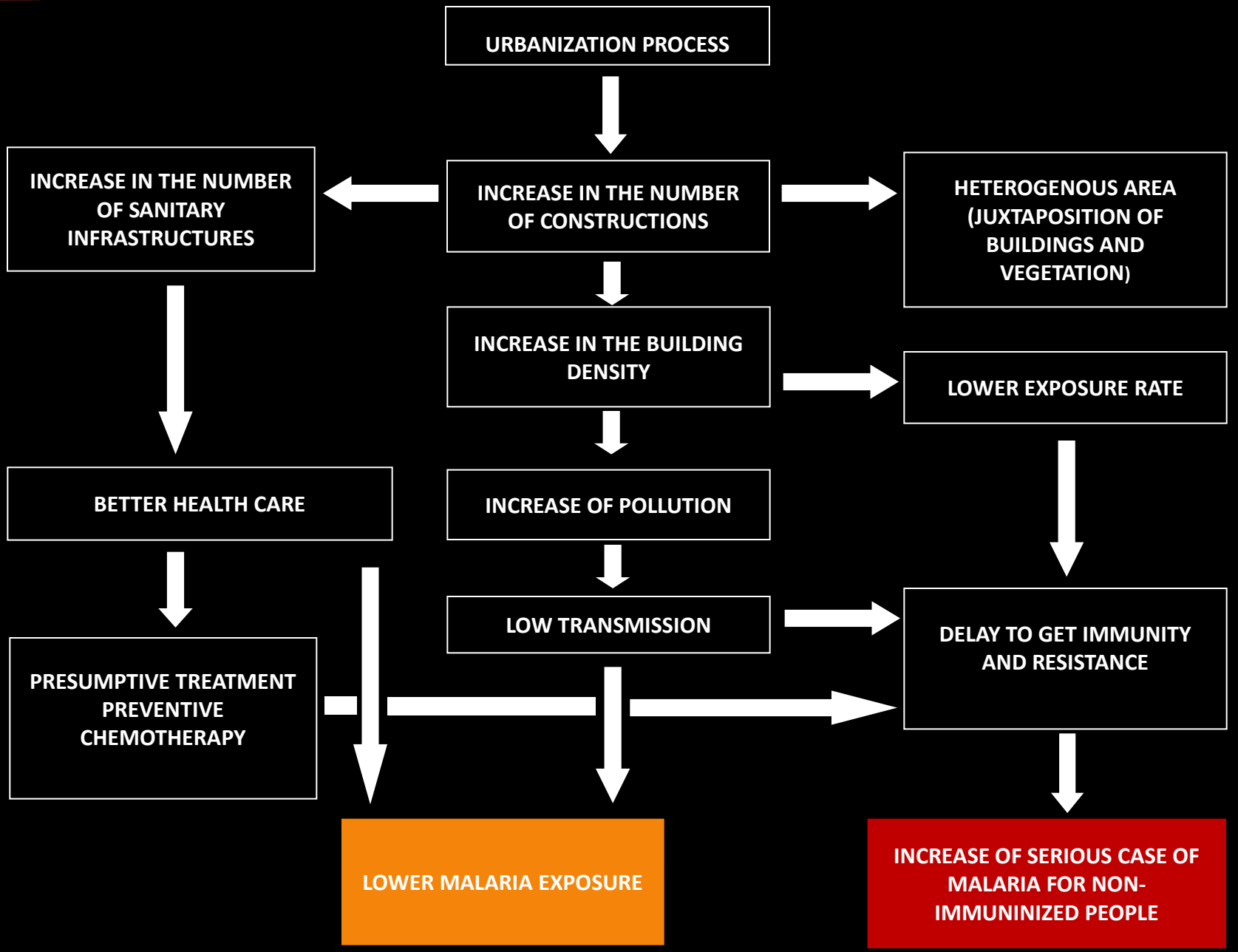
Malaria is the first endemic desease in the world. Establishing a map of the prevalence in a small scale for one specific site is a major goal for the next years.

Nevertheless, some obstacles remain:

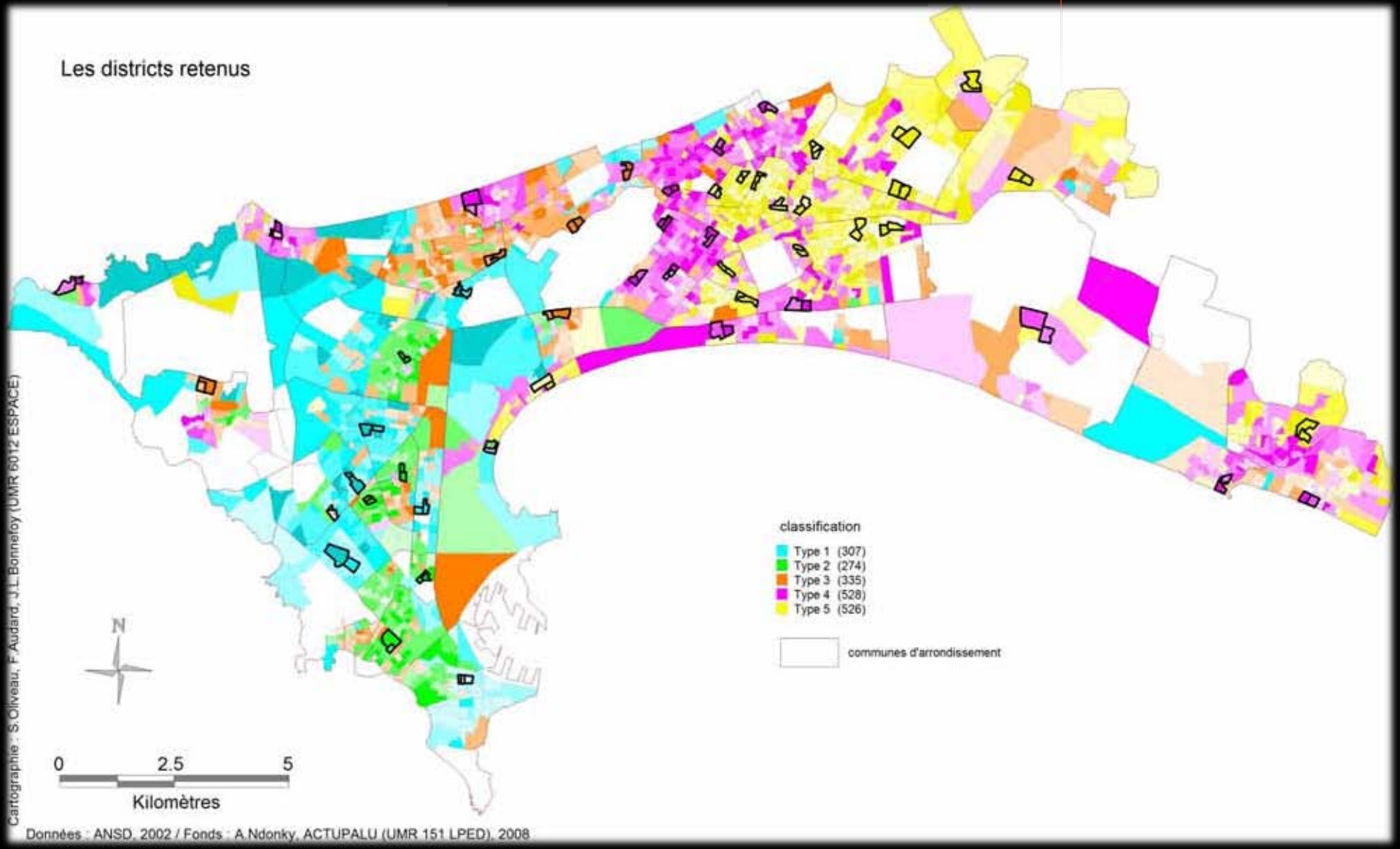
- Difficulty to organize the numerous decisive factors of the disease into a hierarchy.

- In urban area: Impact of population, culture diversity and socio-economical status

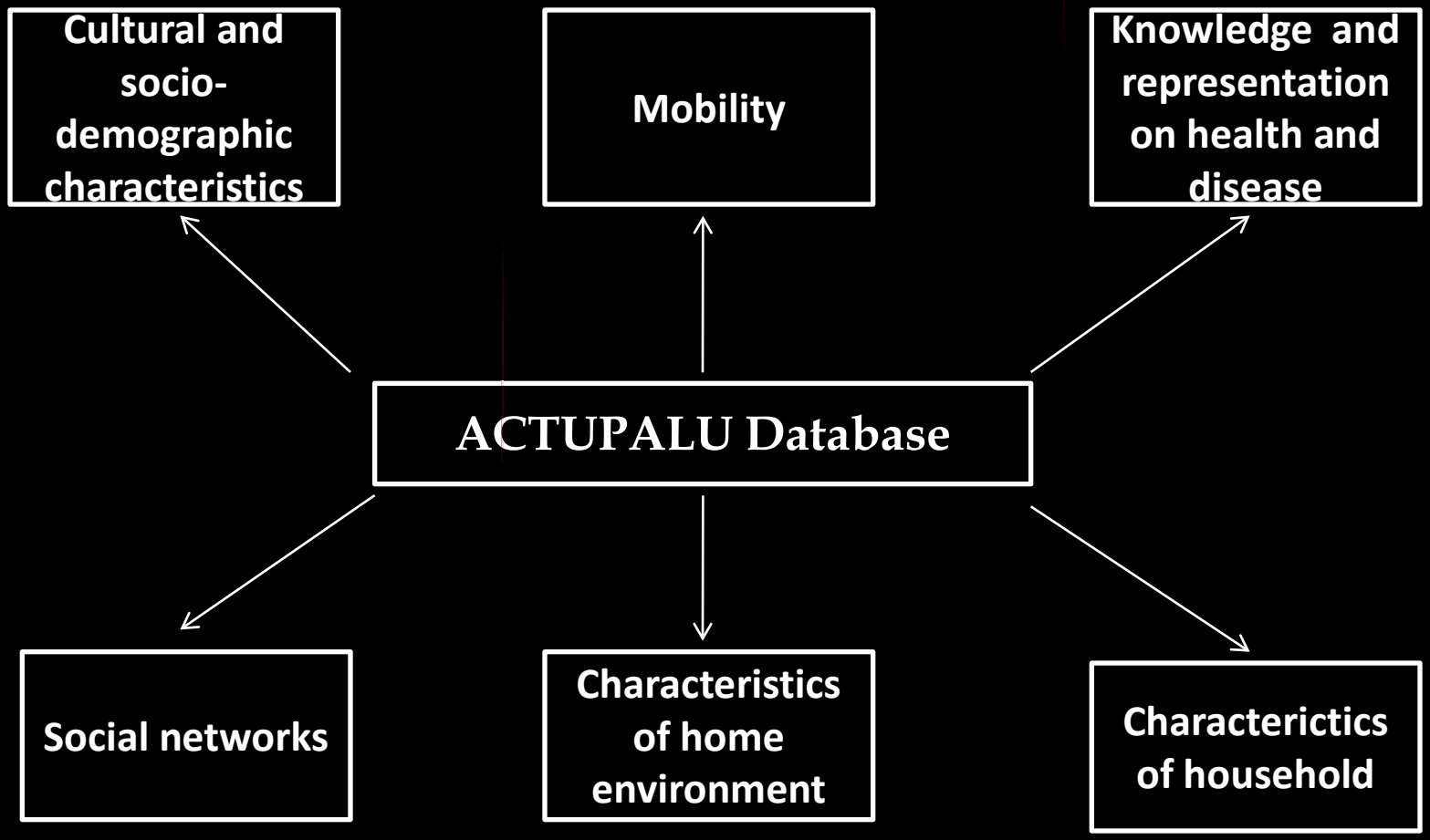
THE PARADOXICAL CONSEQUENCES OF URBAN MALARIA



Field work


Les districts retenus
classification
Type 1 (307)
Type 2 (274)
Type 3 (335)
Type 4 (528)
Type 5 (526)
communes d'arrondissement
N
0
2.5
5
Kilomètres
Cartographie : S.Oliveau, F.Audard, J.L.Bonneloy (UMR 6012 ESPACE)
Données : ANSD, 2002 / Fonds : A.Ndonky, ACTUPALU (UMR 151 LPED), 2008

From social geography…



…To urban ecology

To link the socio-spatial characteristics

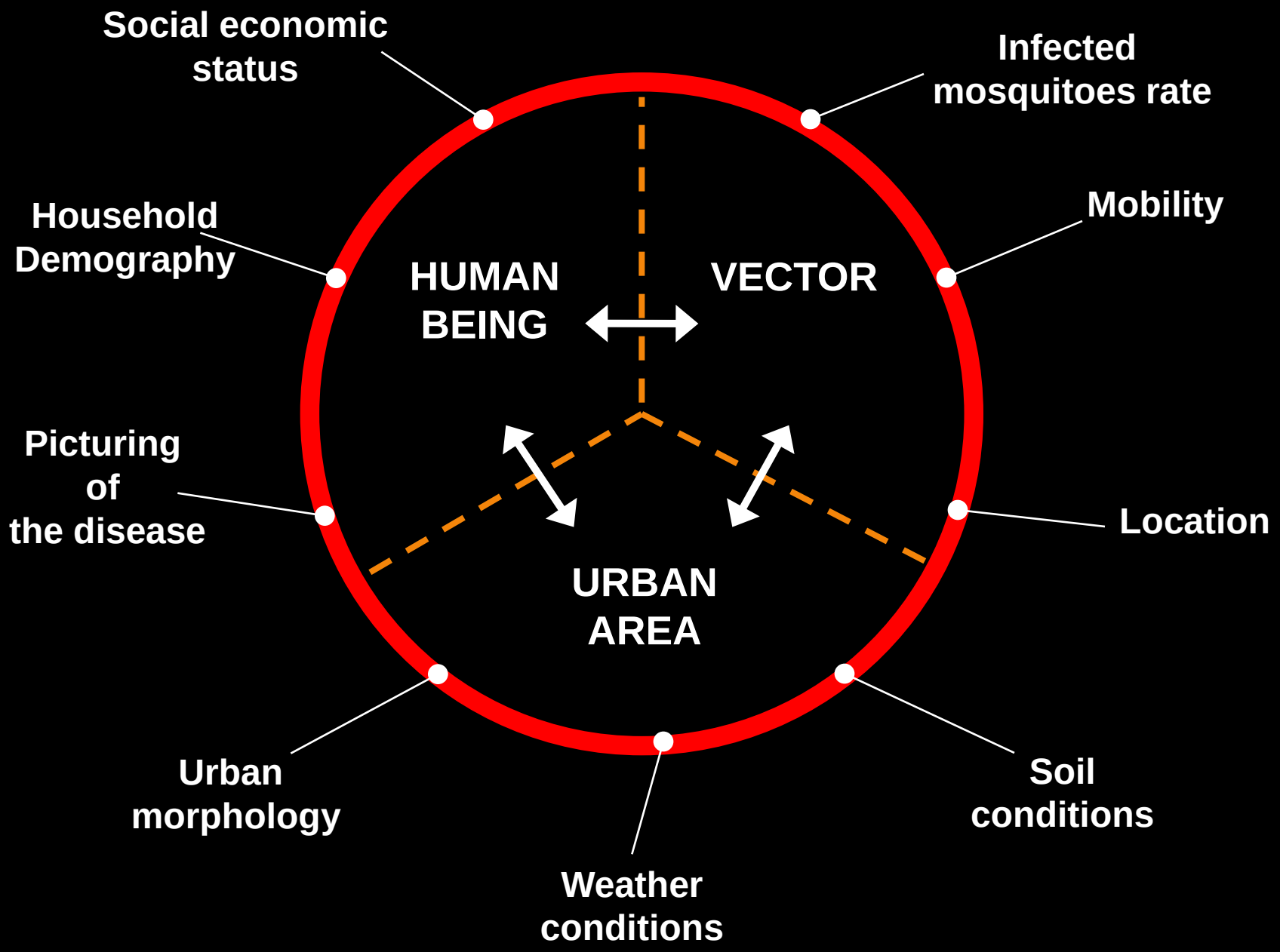
Aim :

To create an index of paludal risk which would tend to include various factors of environmental risk.

Nevertheless problems prove to be numerous :

- Scalar
- Temporal
- More technical (balance of factors according to their respective importance)

Considering the numerous factors



By creating an index of risk (1)

VULNERABILITY

Habitat typology (H)

Prevention (picturing of pathology) (Pr)

Socio-eco-demographic variables (P)

HAZARD

Urban typology (T)

Flood area (F)

Soil occupation (S)

$$I = \frac{a\,\frac{(\alpha H+\beta P+\gamma \mathrm{Pr})}{3} + b\,\frac{(\delta T+\varepsilon F+\epsilon S)}{3}}{2}$$

Variables are selected by stepwise regression

By creating an index of risk (2)

« a » and « b » are independant variables and need to be balanced

Vulnerability *Hazard*

$$I = \frac{a\frac{(\alpha H+\beta P+\gamma \mathrm{Pr})}{3} + b\frac{(\delta T+\varepsilon F+\epsilon S)}{3}}{2}$$

Comment : *Hazard, vulnerability and the risk data are respectively confirmed by entomological and parasitical data.*

Methodological limits

This index doesn’t consider:

- Immunity
- Mobility
- Perceptions about the neighbourhood health structures
- Use of health care services

Conclusion

- Epidemic spread of malaria in urban setting depends of countless factors.

- This kind of research shows the interest of and the difficulty to link social aspects and “geographic” ones.

- Urban environment studies involve a multi-factorial reasoning, close to what the social sciences approach should be.

Research prospects

In order to ripen this index, we could insert the healthcare. This index could deal with some following points :

healthcare quality :

- Meshing of health structures
- Cost
- Quality of treatments

City practices:

- Perceptions about neighbourhood health structures
- Mobility
- Use of health care services during fever crisis

THANKS FOR YOUR ATTENTION

Camille PERCHOUX, Marion BORDERON
University of Provence (Aix-Marseille)
UMR 6012 ESPACE

camille.perchoux@club-internet.fr

http://univ-provence.fr/umrespace