Methods for Mapping and Assessing Human Exposure to Lyme Disease:

A case study in a suburban forest of France

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PRESENTATION OUTLINE

1. What is Lyme disease (LD) ?
2. Some issues for the assessment of LD risk
3. Methods for assessing human exposure to LD
4. Conclusions and perspectives
1. What Is Lyme Disease?

- Most common vector-borne disease in the Europe and the U.S.
- Transmitted by the bite of an infected tick.
- A disease that can cause skin, joint, heart and nervous system problems.
- Lyme disease can affect people of all ages.
- Named after the town of Lyme, Connecticut, where it was first described in 1977.
1. What Is Lyme Disease?

The key components of the pathogenic system

Source: Talaro, 2005
2. Some Issues for the Assessment of Lyme Disease Risk

A public health issue in suburban areas

- Encroachment of human settlement into the forest areas
- A large number of people who visit urban forests

Increase of human-tick contact

Disease emerged when humans moved into tick environment
2. Some issues for the assessment of Lyme disease risk
2. Some Issues for the Assessment of Lyme Disease Risk

A major indicator: human-tick contact

Field data collection framework

Vector distribution + Human dimension + Spatial design

Spatio-temporal analysis of human-tick contact

A case study in the Forest of Sénart (near from Paris)
3. Methods for Assessing Human Exposure to Lyme Disease

- Workpackage -

Ticks collection methodology (drap sampling)

- 9 forest stands

Statistical Analysis

- densities of ticks (per ha)
- densities of infected ticks
- infection prevalence

Examples of ticks habitat

Ticks are abundant in moist fern habitat

Acknowledgement:
Institut Pasteur (Paris), CNR of Borrelia
3. Methods for Assessing Human Exposure to Lyme Disease

Data collection on visitors and their activities inside the forest

Forest users

Personal interviews

Collected data

Courtesy of Hedi Haddad
The « routes » the visitors follow in the forest of Sénart

**3. Methods for Assessing Human Exposure to Lyme Disease**

**Attendance intensity per section**

Sample of 187 persons

- Type of planting
- Forest stations
- Recreation areas
3. Methods for Assessing Human Exposure to Lyme Disease

**Accessibility into the understory**

- **Good accessibility**
  - Images of a forest path with good accessibility.

- **Risk of human exposure**
  - Images of a forest path with risk indicators.

- **Attractors**
  - Images of children picking flowers in a forest.

- **No accessibility**
  - Images of a forest path with no accessibility.

- **Daffodils, Lily of the valley, mushrooms, etc.**
  - Images of children picking flowers in a forest.
4. Conclusions and Perspectives

Outcome benefit: to develop a multi-agent geosimulation tool allowing forest officers to assess different intervention scenarios

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You can prevent Lyme Disease by keeping ticks off your body!

But we geographers can minimize Lyme Disease risk using the landscape and design!

Source: EUCALB, 2006