Vbornet WP34
Other Vector borne diseases

M. Braks.on behalf of F.Pagès,

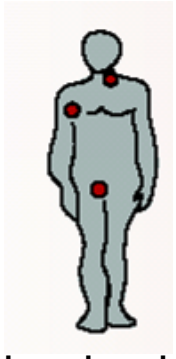
URMITE, Marseille

Fleas, body lices, pathogens and potential diseases in Europe

- Fleas :
  - *Yersinia pestis* — Plague
  - *Rickettsia typhi* — Murine typhus
  - *Rickettsia felis* — Flea borne spotted fever
  - *Bartonelle henselae* — Cat scratch disease
- Body lice :
  - *Rickettsia prowazekii* — Epidemic typhus
  - *Bartonella quintana* — Trench fever
  - *Borrelia recurrentis* — Louse borne relapsing fever
  - *Acinetobacter baumannii*

Plague import scenarios:

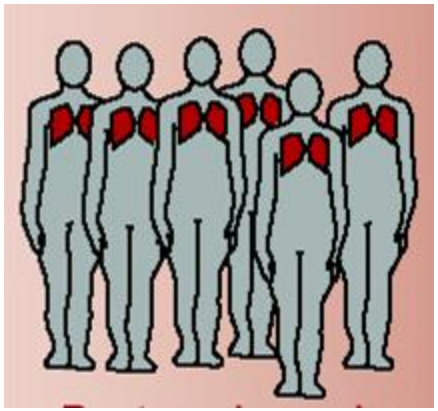
Pulmonary plague

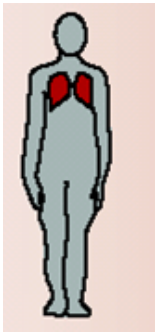


Bubonic plague

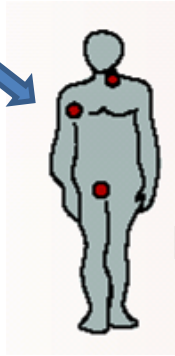
Infected rodents or fleas

Infection of local rodent and fleas



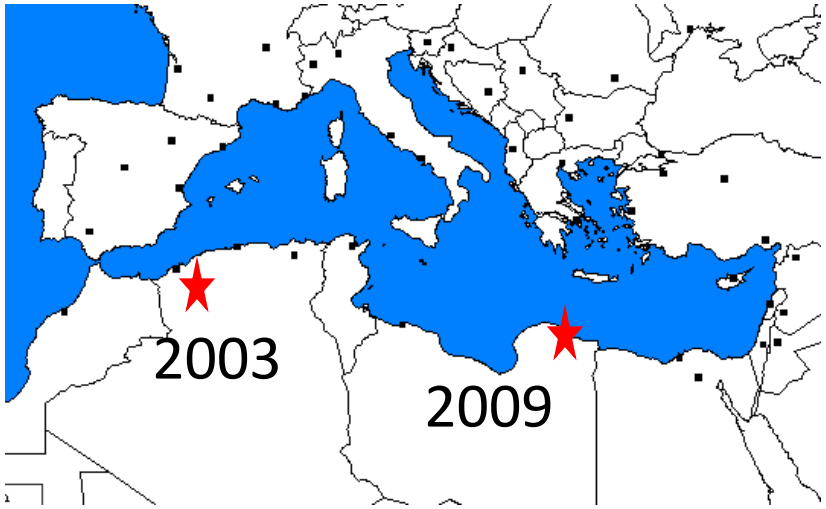


Pulmonary plague



Bubonic plague

Plague at the Mediterranean border:



Bubonic plague near Oran, Algeria

Bubonic plague in Tobrouk, Lybia

Few studies on rats populations

Few studies on their fleas infestations

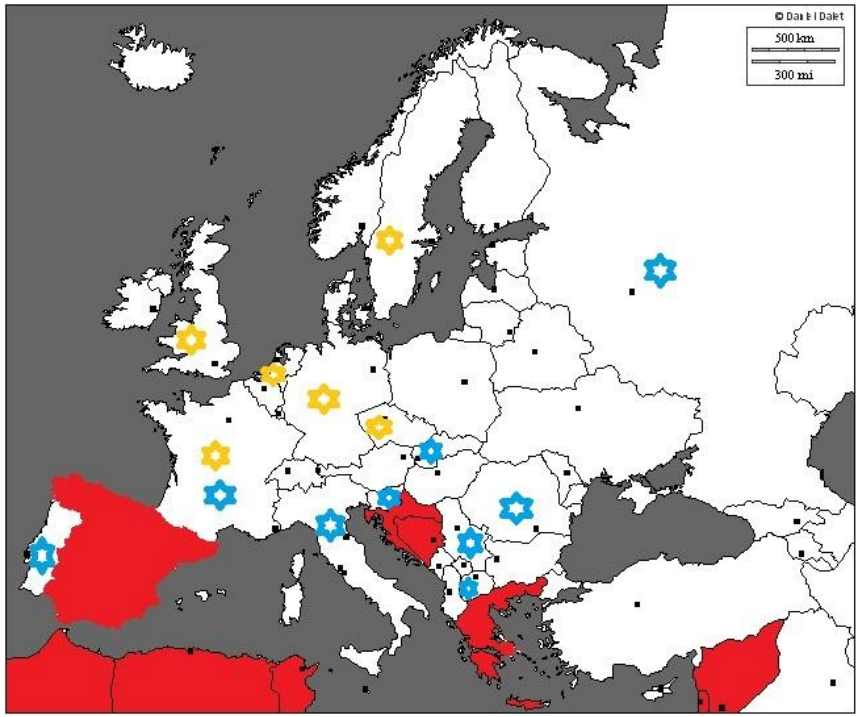
Marseille: 21% infected by Xenopsylla *cheopis*

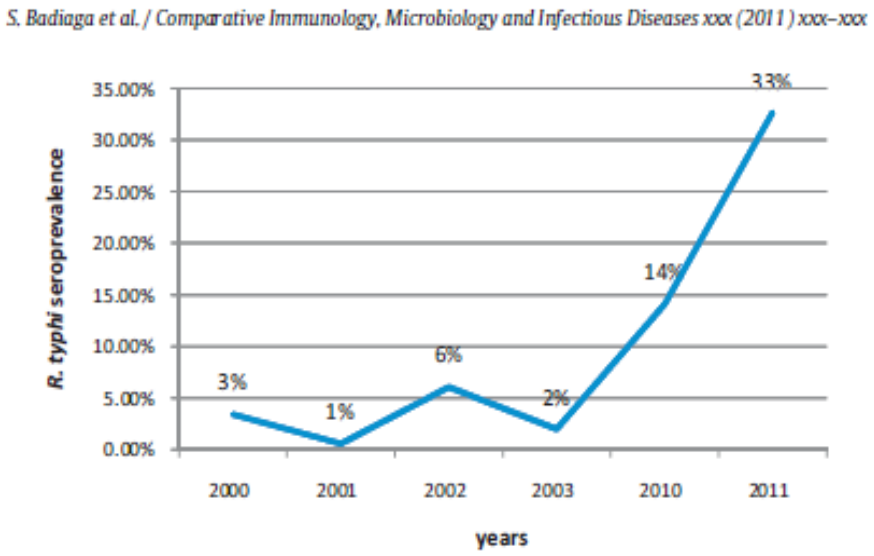
Cyprus: 40% infected by *X. cheopis*

Egypt: 60% infected by *X. cheopis*

Many exchanges between Mediterranean harbours

Murine typhus in Europe





Evolution of *R. typhi* seroprevalence rate in homeless individuals from 2000 to 2011 in Marseille

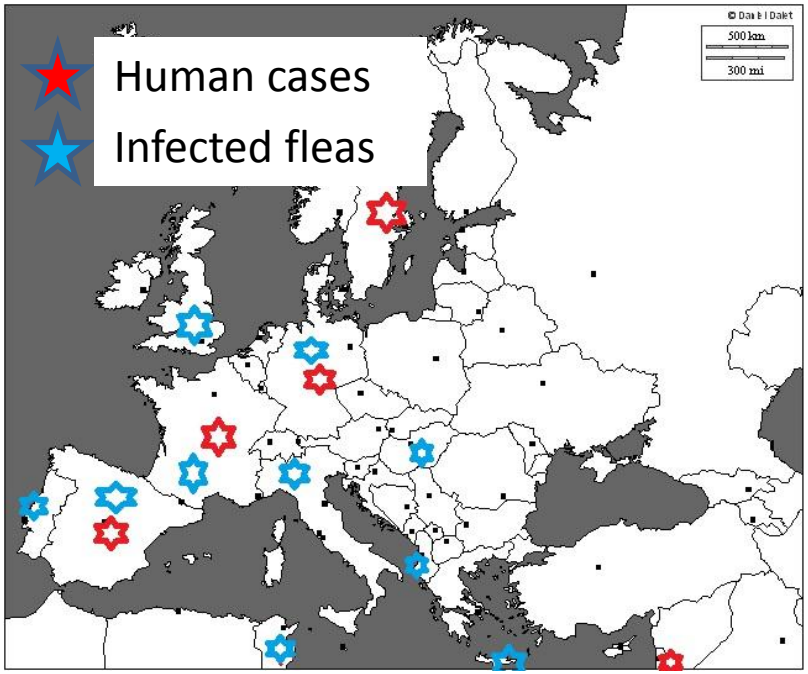
Endemic country

Sporadic autochtonous cases

Imported cases

Rat flea *Xenospylla cheopis*
Cat flea *Ctenocephalides felis*

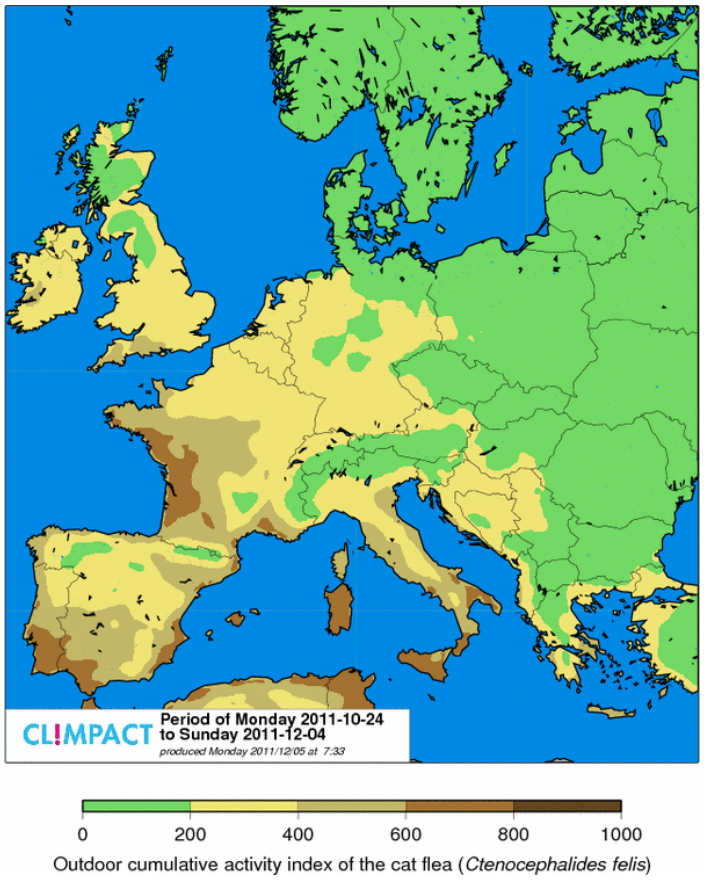
Flea borne spotted fever in Europe



Ctenocephalides felis :

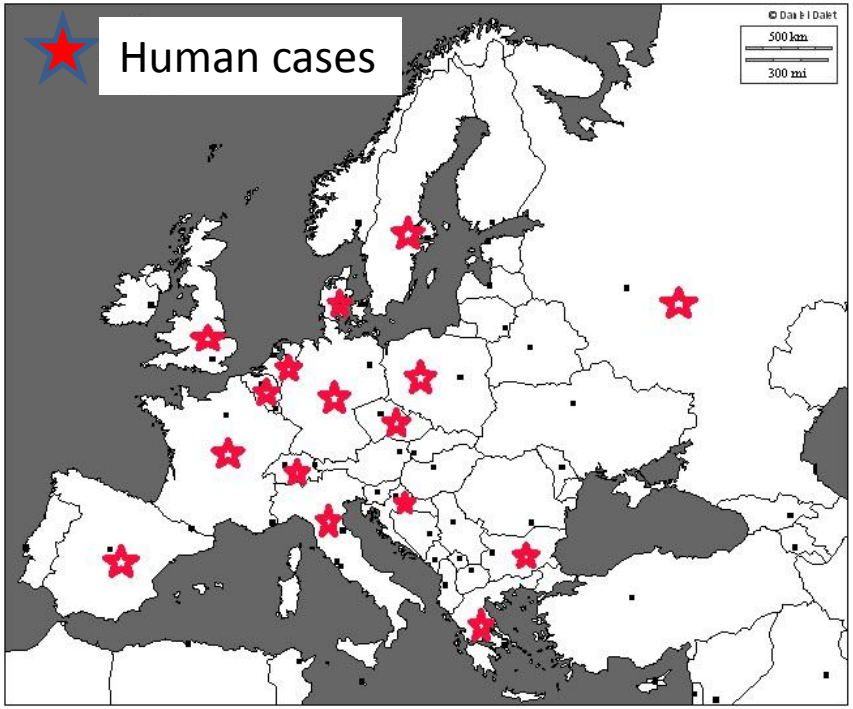
- Worldwide distribution
- Most of mammals
- Wild and domestics
- Urban and rural

Human flea, *Pulex irritans,*
Rat flea*, Xenospylla cheopis,*
Hedgehog flea, *Archeopsylla erinaceï*



Cumulative activity of fleas over the past 12 weeks (ranked from 0 to 1000). The model illustrates what happens in the outer environment (in gardens, bushes, parks, etc.) but does not take into account arthropod activity onto animals (in their coat) nor indoors (heated accommodation in winter).

Cat scratch disease in Europe



Bartonella henselae:

- Causes lymphadenopathy
- Worldwide distribution
- Homeless
- HIV and AIDS
- Urban and rural
- General population

Emerging disease ?

Ctenocephalides felis :

- Worldwide distribution
- Most of mammals
- Wild and domestics
- Urban and rural
- Worldwide infected

Ctenocephalides canis, Ixodes ricinus

Body lice

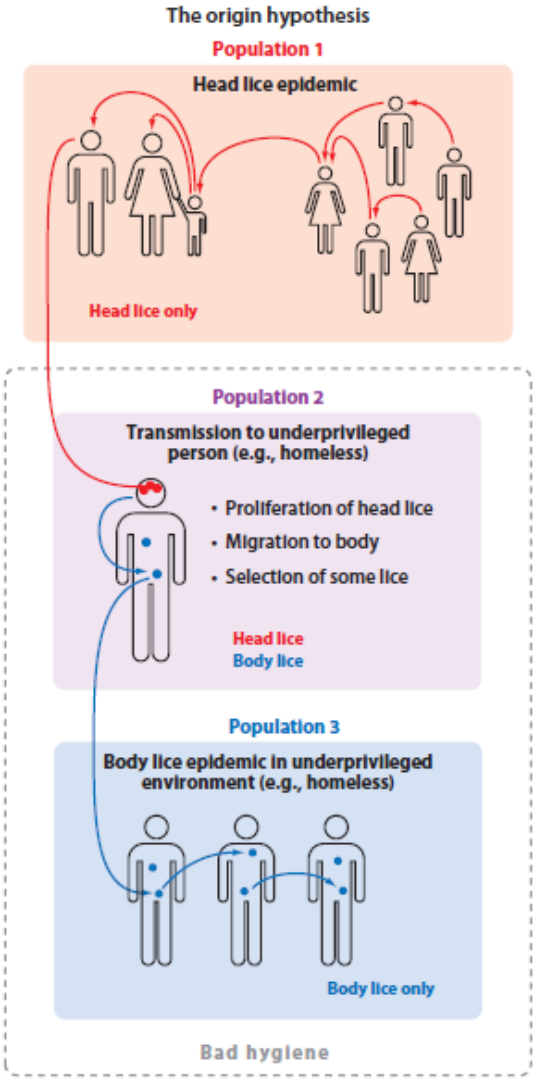
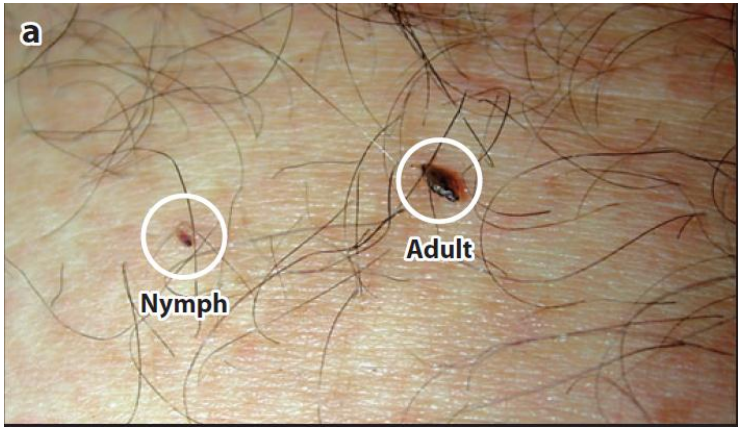


Figure 1

The hypothetical origin of body louse outbreak. Head lice outbreak in deprived populations leads to infestation of clothes and selection of "large blood feeder variant" at the origin of body louse outbreak. From Reference 64. Copyright © 2010 Li et al.

Body louse prevalence reflects the socioeconomic level of the society as it is increasingly described in the poorest population of developed industrialized countries



- Poverty
- Poor hygiene
- Poor living conditions
- Cold weather
- Concentration : "nursing home", jail, asylum

Homeless, migrants, others vulnerable populations

➔ Homeless bodylice infestation: few data available

France: 20%
Russia: 10-20%
Netherlands:
Sweden:

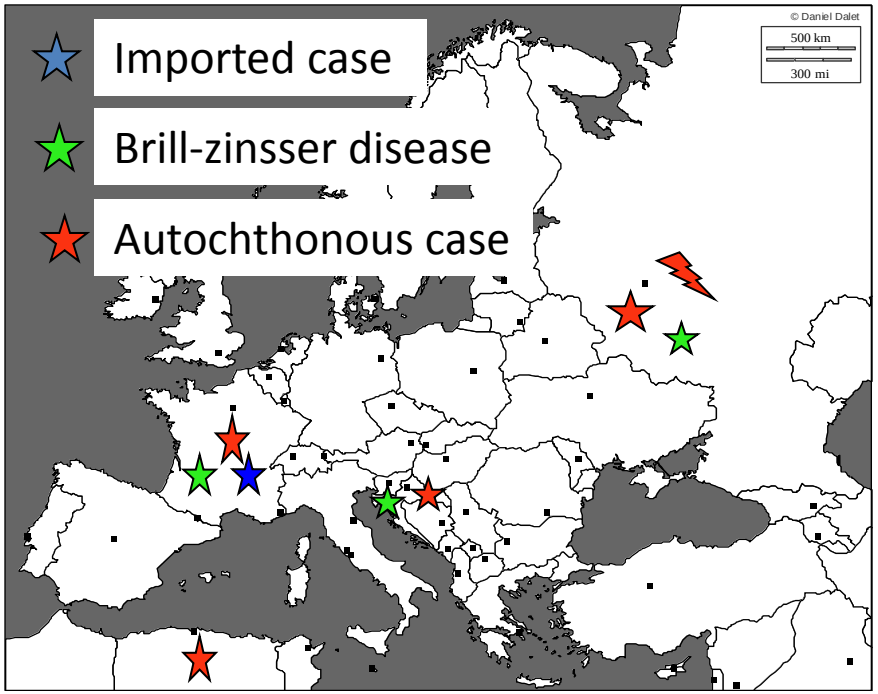
➔Migrants : none

Israel: 30% of Ethiopian and Sudanese migrants

➔Asylum, nursing home : ectoparasites outbreak (scabies) have already been described in Europe.

➔ Impact of economic crisis ??

Epidemic typhus



Algeria:

2% of fever due to *R.prowazekii*
2 recent autochthonous cases

Russia:

an outbreak in 1997, sporadic cases around brill-zinssner cases

France:

imported case or Brill-Zinssner in migrants from north Africa

1 autochthonous case in an homeless

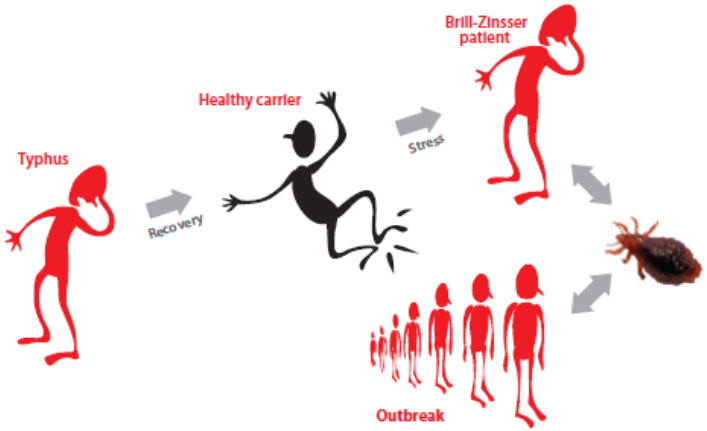
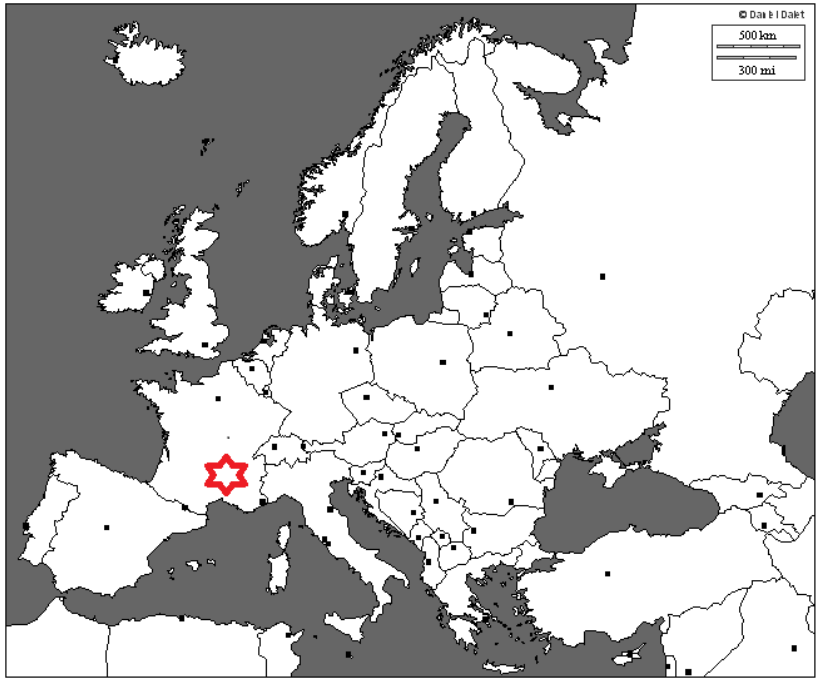


Figure 3
Hypothetical reemergence of epidemic typhus through a bacteremic Brill-Zinsser patient. The *Rickettsia prowazekii*–infected louse appears reddish brown. (Source Dr. Hervé Tissot Dupont).

Louse borne relapsing fever

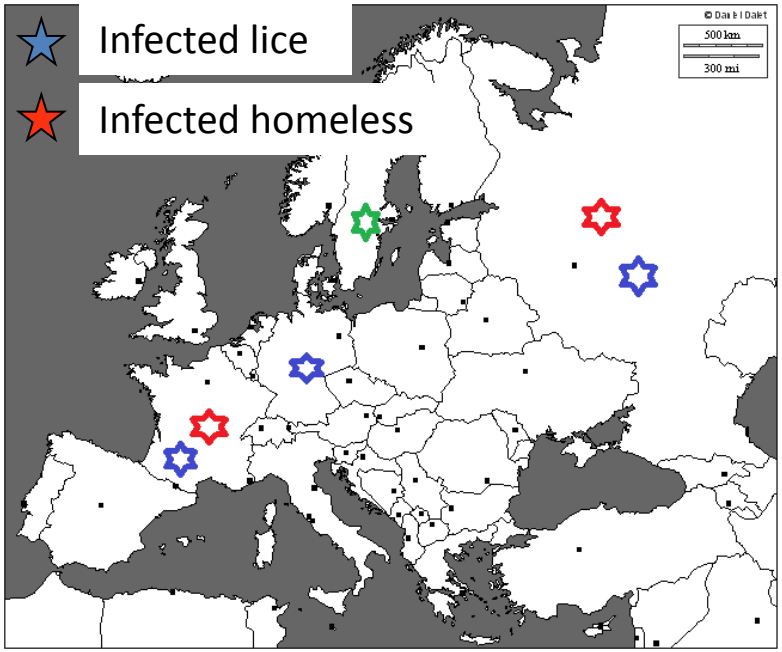


No infected lice found in Europe

Serologic evidence only in French homeless in Marseille

Possible unnoticed outbreak in this population 2002

Trench fever



Sweden : absence of infection in lice or homeless

Infection of body lice by *Bartonella quintana*

Russia:	1998	12,3%
France:	1993	20%
Sweden:	2006	0%

Infection of homeless by *B. quintana*

France:

Marseille
1,8% to 5,3% of seroprevalence in homeless from 1993 to 2000
14% of fever in homeless attending emergency care in 1993

Paris: 54 % [41 -68] of seroprevalence in homeless with skin diseases

Missing data

- Lack of published data in most of European countries
- Necessity to improve the knowledge, to collect unpublished data
- A questionnaire has been sent to two academic society
  - ESCAR (ESCMID* Study Group for Coxiella, Anaplasma, Rickettsia and Bartonella).
  - ISoP (International Society of Phthirapterist)
  - But no more information has been reported via this way

* European Society of Clinical Microbiology and Infectious Diseases

Focus points

- Plague risk: no studies on rodents infestation and their fleas in most of harbours
- All louse borne pathogens have been always circulating in Europe in homeless populations
- No data on other unprivileged person than homeless like migrants or “poor workers” that have already been associated with higher infectious disease risks (e.g. tuberculosis, HIV, malaria, *etc*.)