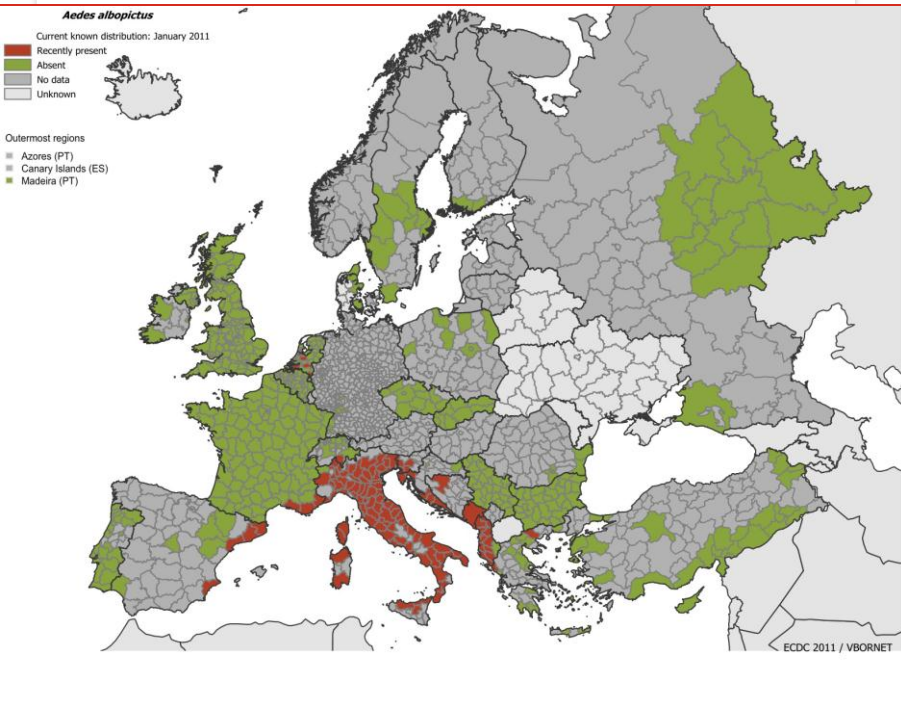


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National Institute for Public Health
and the Environment
Ministry of Health, Welfare and Sport



WP4: Towards an integrated approach in surveillance of vector-borne diseases in Europe

Marieta Braks
on behalf of WP4

Vbornet AGM 2012, Riga



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European Network for Arthropod Vector Surveillance for Human Public Health

<http://www.vbornet.eu/>

Project design

- WP1 - Secretariat, (Belgium)
- WP2 - Science watch and technical support (UK)
- WP3 - Vector surveillance and distribution maps (Belgium)
- WP4 - Strategic consultation group/public health (Netherlands)





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Aim: Integrated approach in surveillance of vector-borne diseases in Europe

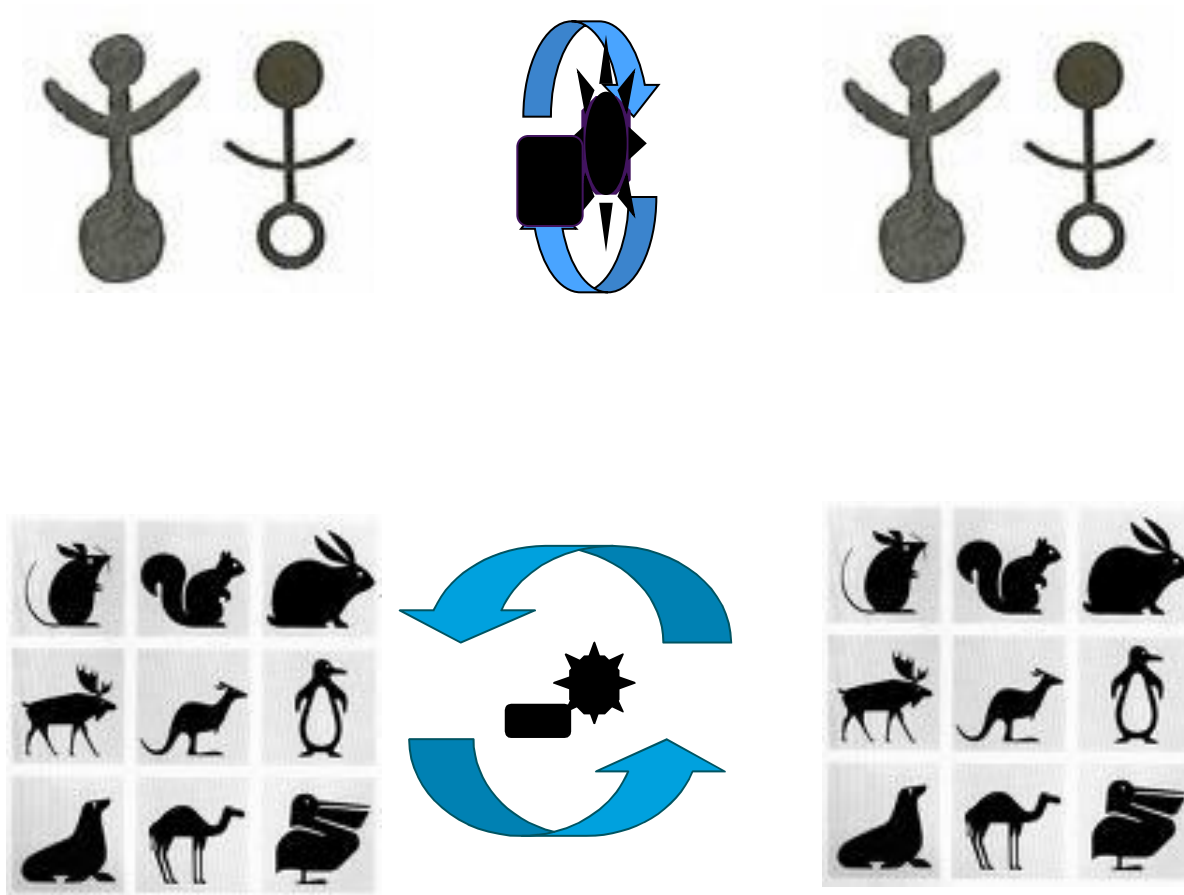
Deliverables

- Database/network of Public Health Experts interest for VBD
- Questionnaire on VBD Surveillance in Europe
- Strategic Paper Surveillance of VBD
- Pan European maps of VBDs
- Interventions -> vector control



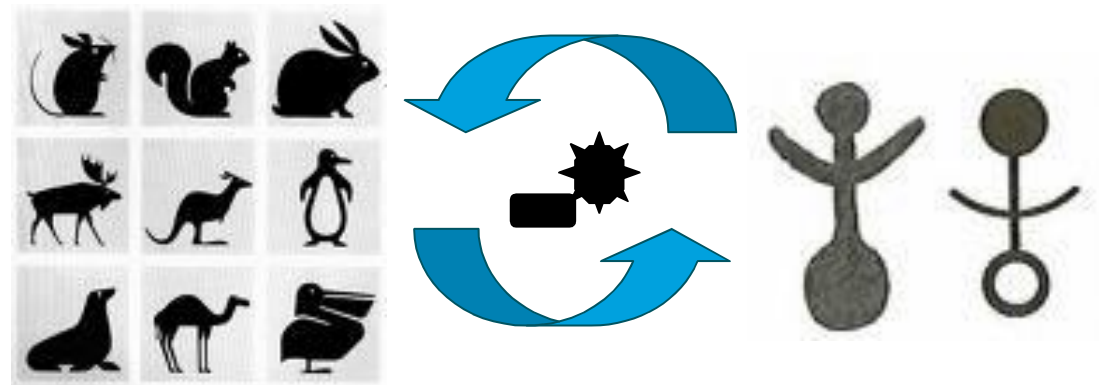


Infectious diseases



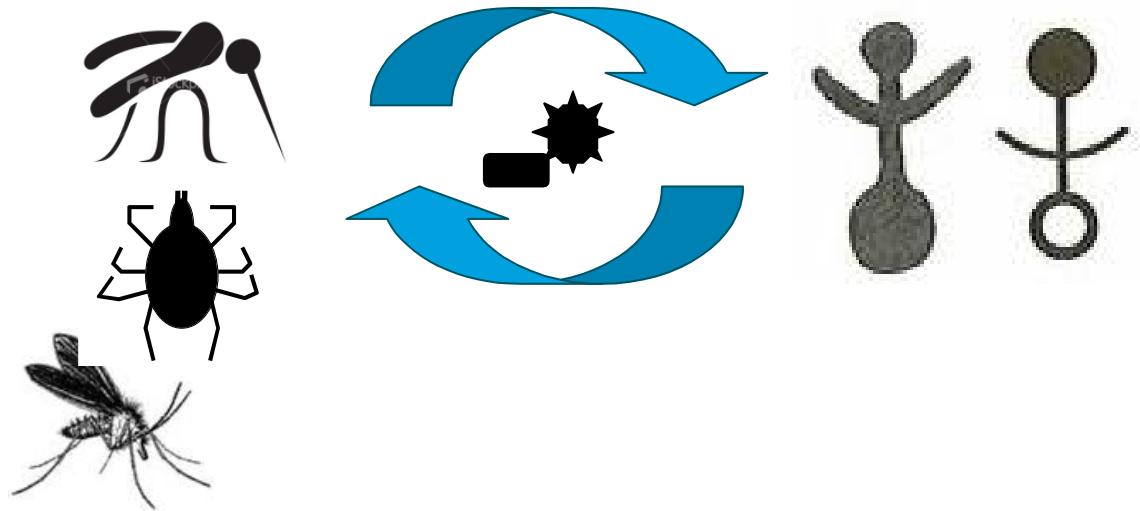


Zoonoses



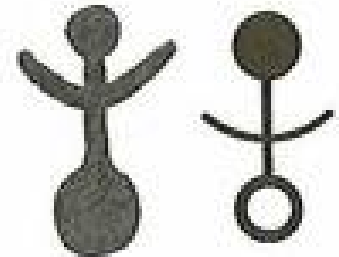
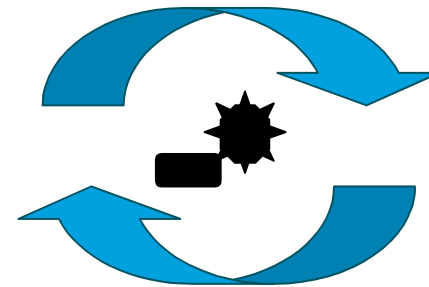
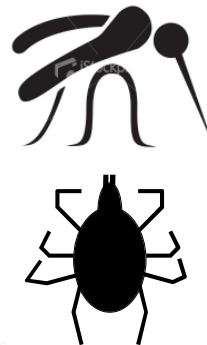
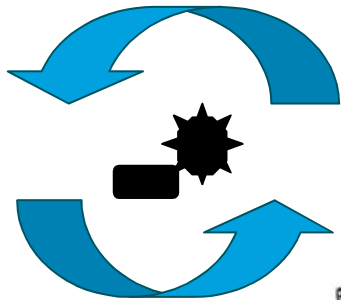


Vector-borne diseases





Vector-borne zoonoses



RESERVOIR

VECTOR



Important Vectorborne disease (VBD)

Mosquito-borne diseases:

Chikungunya

Dengue

West Nile Fever

Rift Valley Fever

Malaria



Tick-borne diseases:

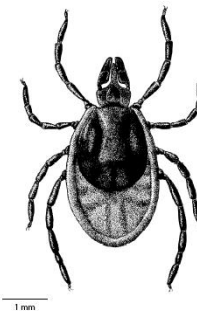
Tick-borne encephalitis

Crimean-Congo haemorrhagic fever

Lyme borreliosis

Tularaemia

Rickettsiosis



Sandfly-borne diseases

Leishmaniasis

Sandfly fevers





Important Vectorborne disease (VBD)

Mosquito-borne diseases:

Chikungunya

Dengue

West Nile Fever

Rift Valley Fever

Malaria



Tick-borne diseases:

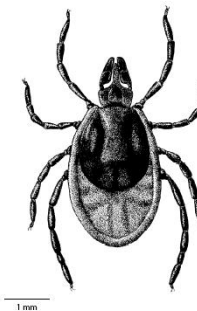
Tick-borne encephalitis

Crimean-Congo haemorrhagic fever

Lyme borreliosis

Tularaemia

Rickettsiosis



Sandfly-borne diseases

Leishmaniasis

Sandfly fevers





WP4 also Other vectors and their pathogens

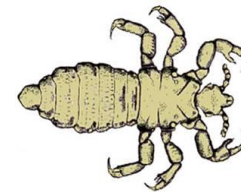
Flea borne diseases

<i>Yersinia pestis</i>	Plague
<i>Rickettsia typhi</i>	Murine typhus
<i>Rickettsia felis</i>	Flea borne spotted fever
<i>Bartonella henselae</i>	Cat scratch disease



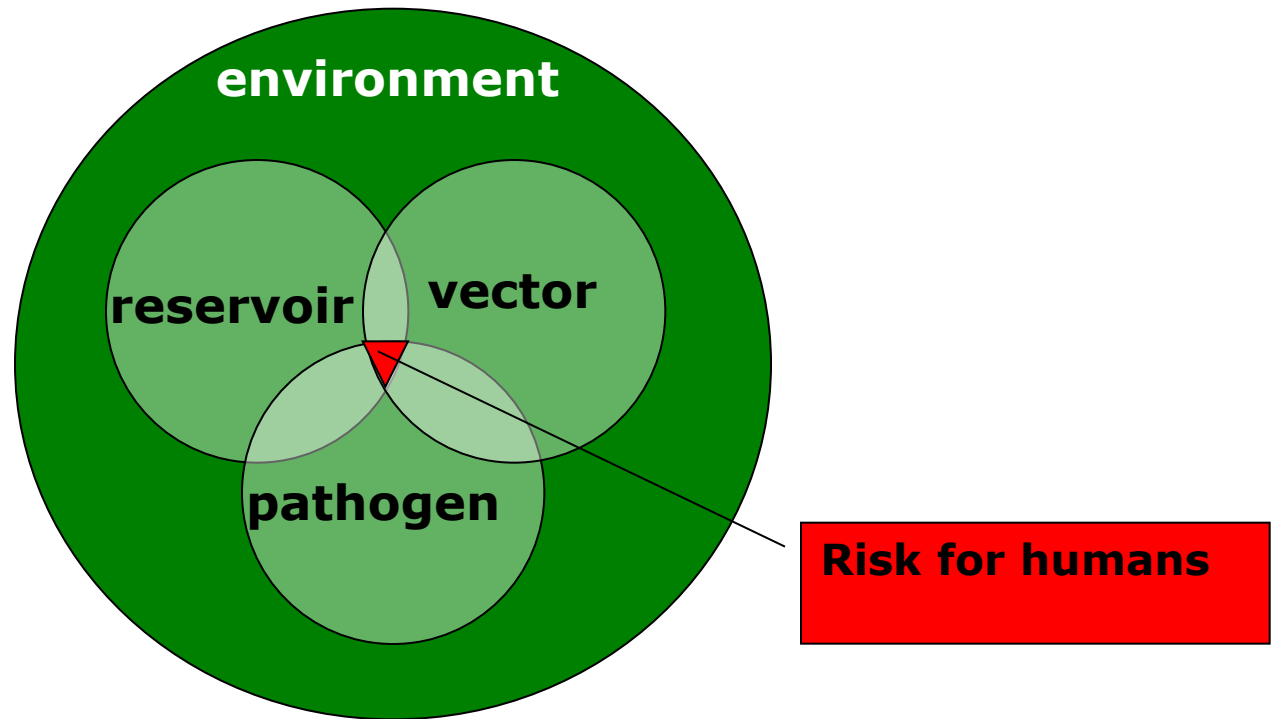
Body lice borne diseases

<i>Rickettsia prowazekii</i>	Epidemic typhus
<i>Bartonella quintana</i>	Trench fever
<i>Borrelia recurrentis</i>	Louse borne relapsing fever





Transmission of vector borne disease





Different types of VBD context

based on the current presence (✓) or absence (-) of disease (endemic human cases), pathogen or vector

Context	Endemic disease	Pathogen	Vector	Examples of diseases holding for the Netherlands
1				
2				
3				
4				
5				

* Endemic infections with human cases.



Different types of VBD context

based on the current presence (√) or absence (-) of disease (endemic human cases), pathogen or vector

Context	Endemic disease	Pathogen	Vector	Examples of diseases holding for the Netherlands	
1	√	√	√	Lyme borreliosis	Disease burden
2	-	√	√	Dirofilariasis	Threat
3	-	-	√	West Nile Fever	
4	-	√	-	Leishmaniasis	
5	-	-	-	Crimean Congo haemorrhagic fever	

* Endemic infections with human cases.



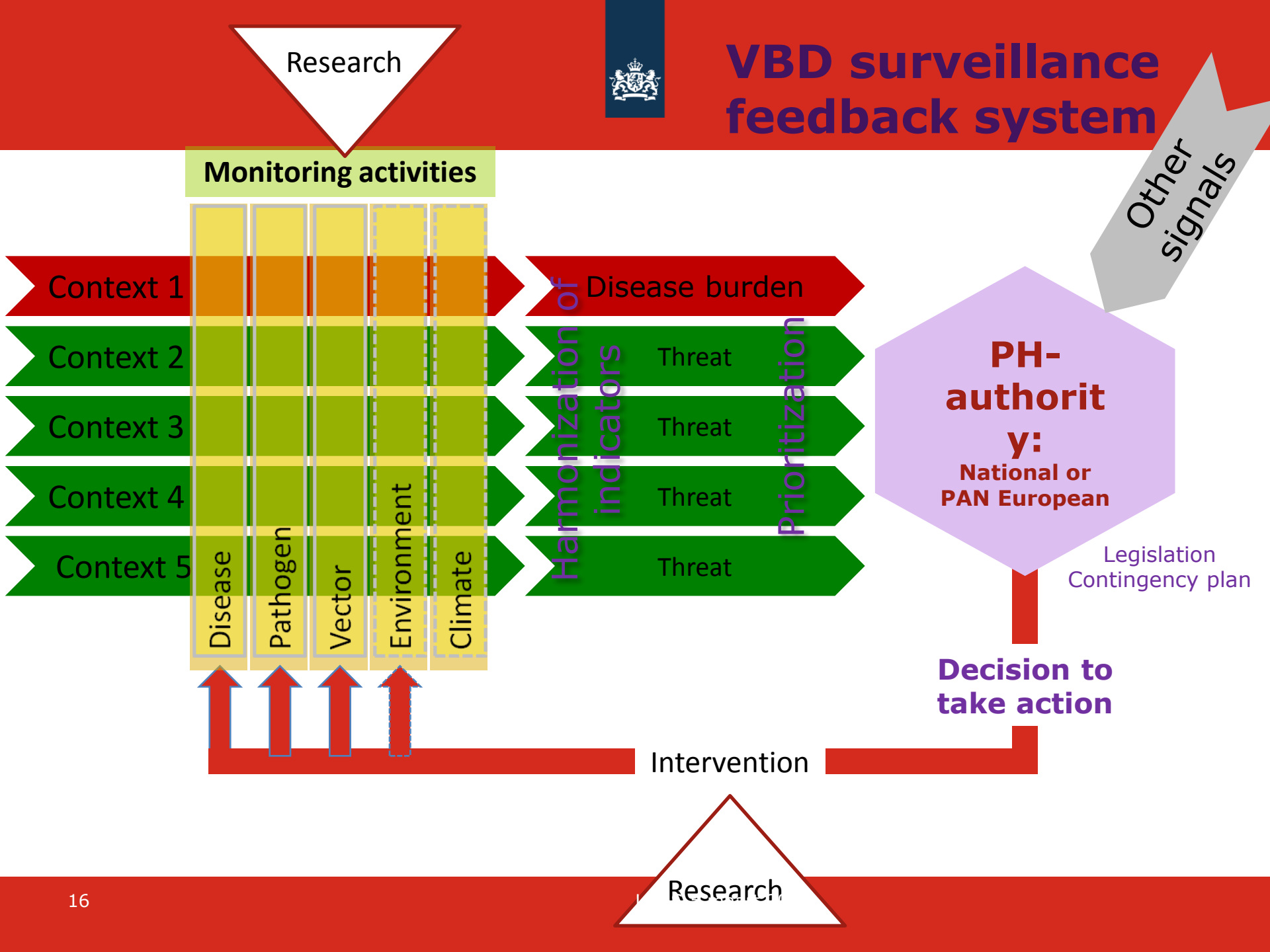
VBD surveillance feedback system

**PH-
authorit
y:
National or
PAN European**

Legislation
Contingency plan



VBD surveillance feedback system



Research

Monitoring activities

Context 1

Context 2

Context 3

Context 4

Context 5

Disease

Pathogen

Vector

Environment

Climate

Disease burden

Threat

Threat

Threat

Threat

Harmonization of indicators

Prioritization

PH-authority:
National or
PAN European

Other signals

Legislation
Contingency plan

Decision to take action

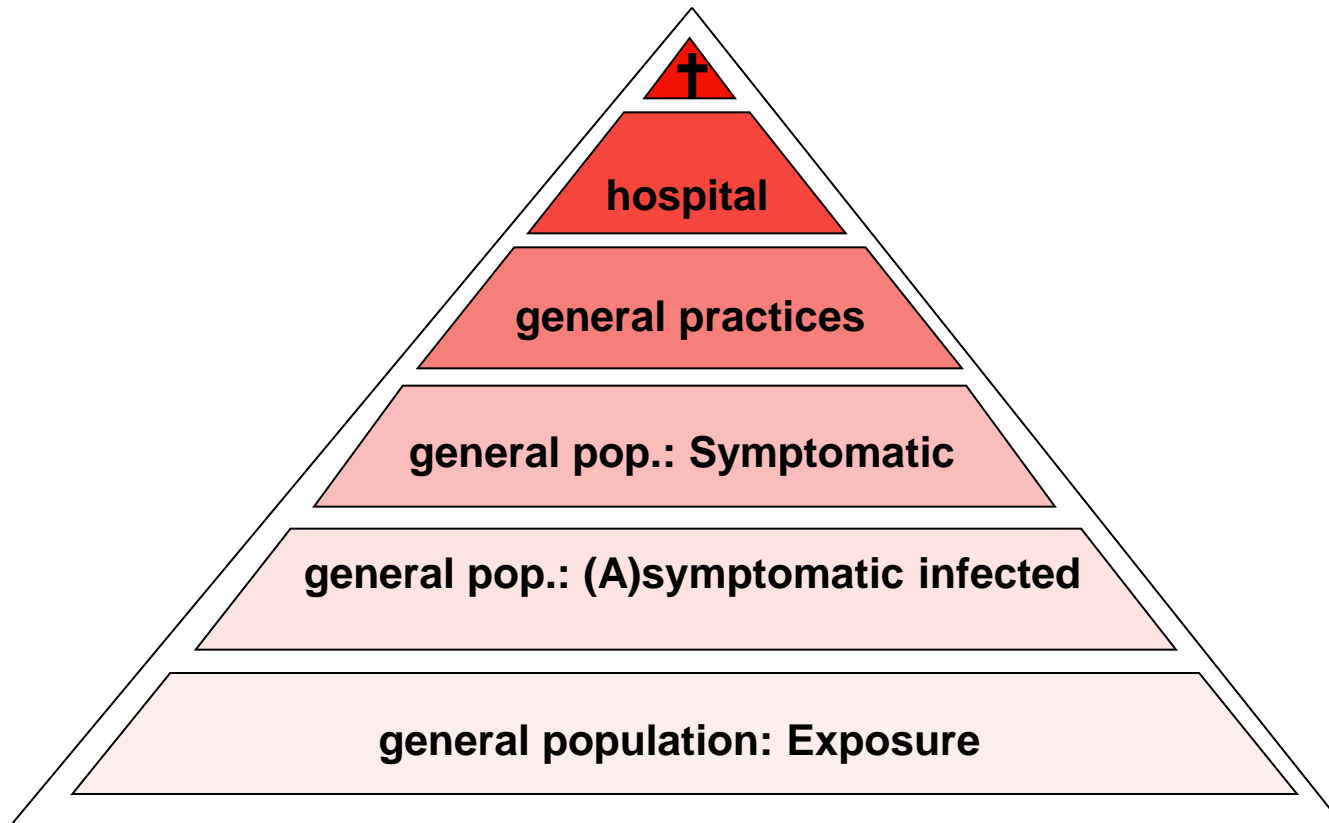
Intervention

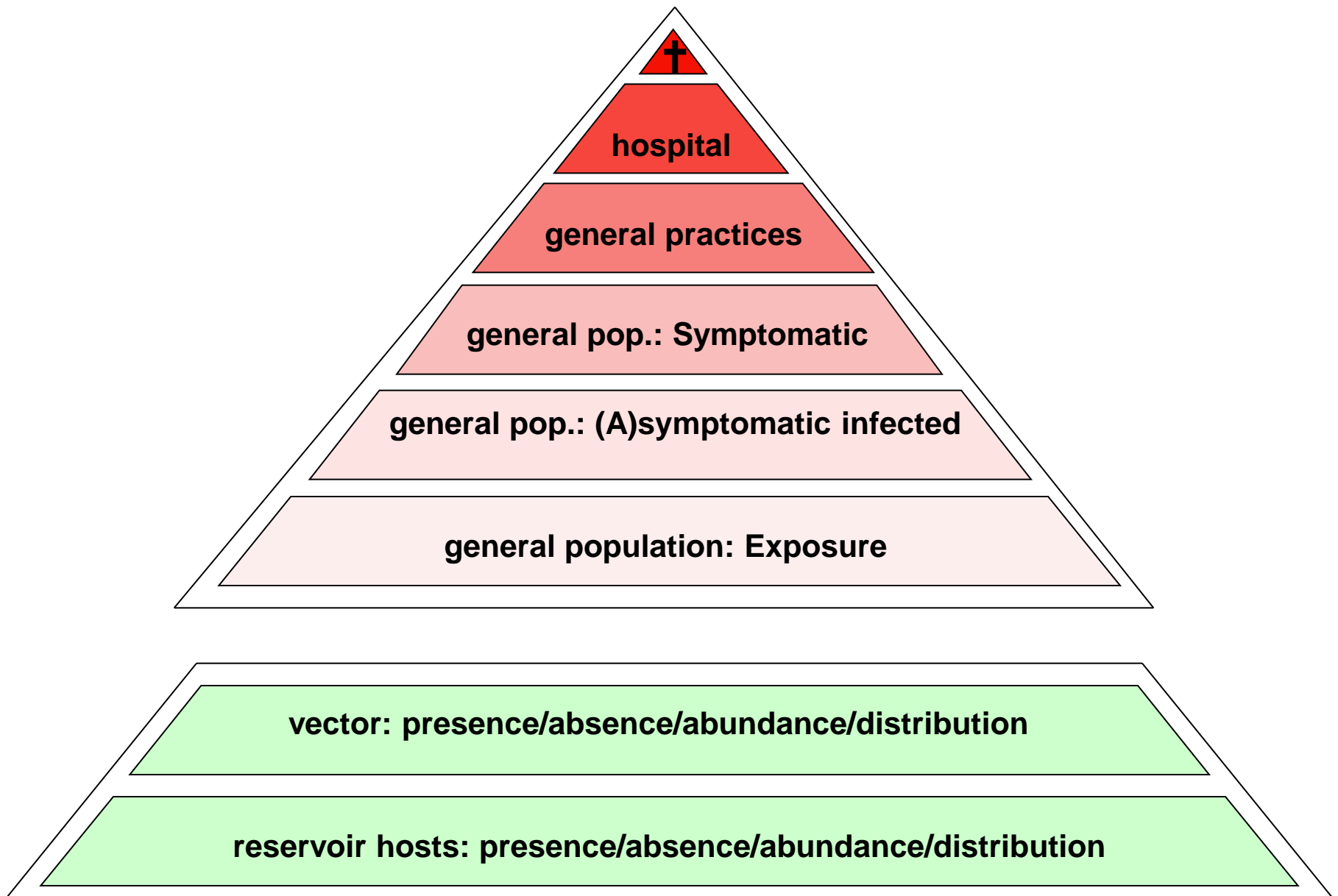
Research



Data collection in disease surveillance

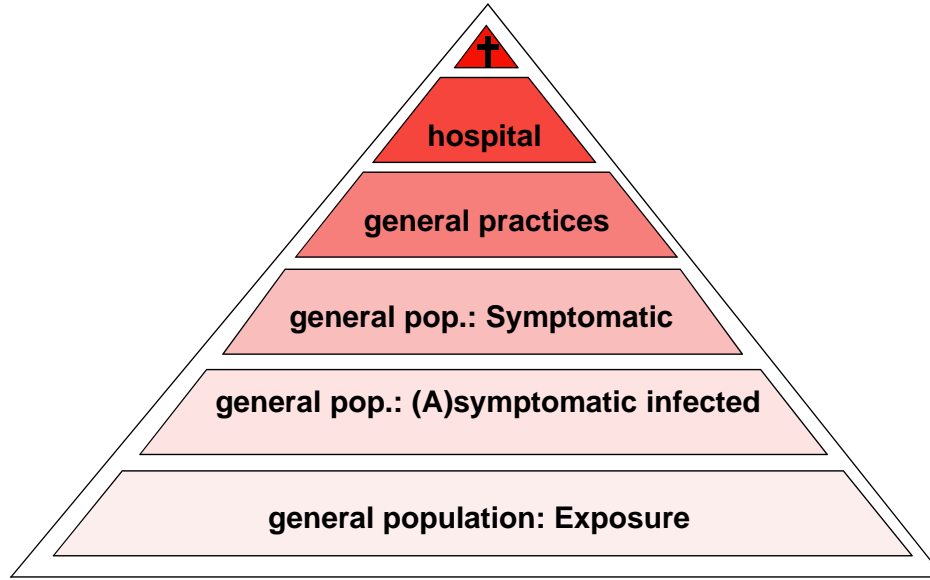
- Pathogen data collection.
- Serological data collection.
- Clinical data collection.
- Syndromic data collection.
- **Risk data collection.**



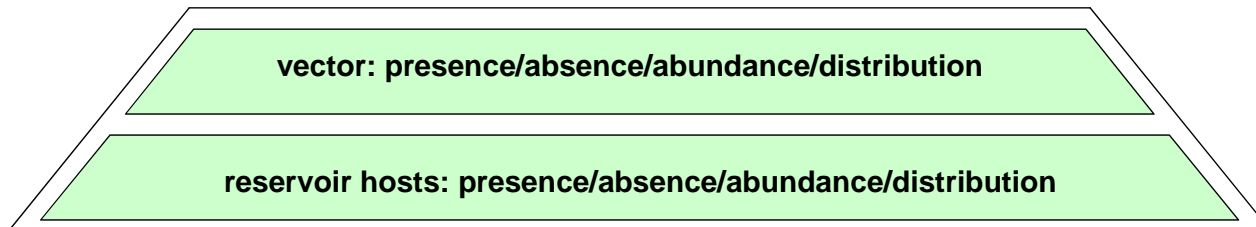


Surveillance

Disease burden



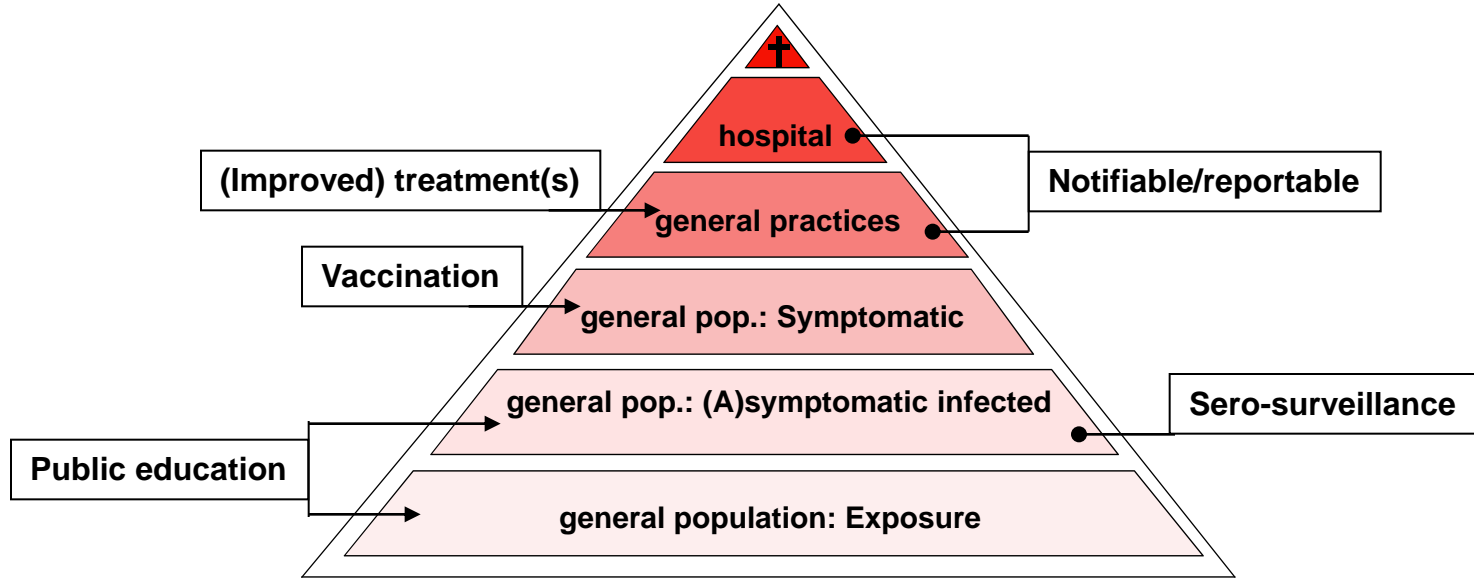
Threat



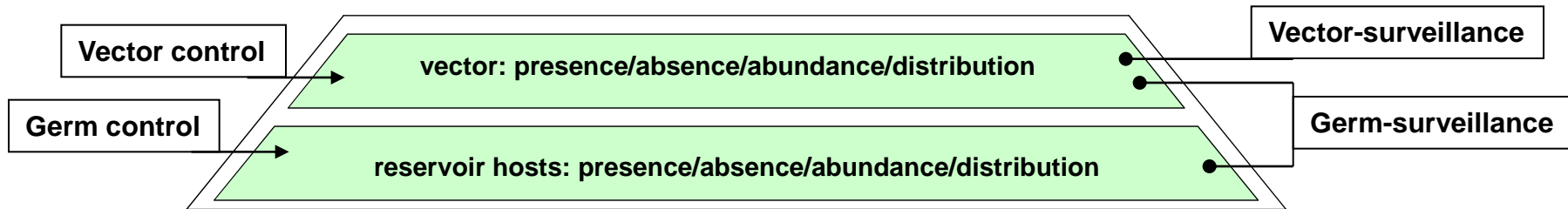
Intervention

Surveillance

Disease burden



Threat





Surveillance and intervention

Essential data per member state?



Essential data per member state

Country x	VBD
	Context
Mosquito-borne diseases:	
Chikungunya	x
Dengue	.
West Nile Fever	.
Rift Valley Fever	.
Tick-borne diseases:	
Tick-borne encephalitis	.
Crimean-Congo haemorrhagic fever	.
Lyme borreliosis	.
Tularaemia	.
Rickettsiosis	.
Sandfly-borne diseases	
Leishmaniasis	.
Sandfly fevers	.

Context	Endemic disease	Pathogen	Vector
1	√	√	√
2	-	√	√
3	-	-	√
4	-	√	-
5	-	-	-

* Endemic infections with human cases.



Issues for ECDCs Pan European approach to VBD's

- VBDs belong to different contexts in different countries
- Priorities for surveillance/interventions depend on the context of VBD
- To determine the context of a VBD, data is needed from each country
- The quality of data depends on the quality/ level of the VBD surveillance feedback system of country
- Quality/Level of VBD surveillance feedback system depends on perceived urgency of local governments

VBORNET aims to assist ECDC and member states in their assessments of VBDs



Deliverables

- Database/network of Public Health Experts interest for VBD
- Questionnaire on VBD Surveillance in Europe
- Strategic Paper Surveillance of VBDs

- Pan European maps of VBDs
- Interventions -> vector control



Deliverables

- Database/network of Public Health Experts interest for VBD
- Questionnaire on VBD Surveillance in Europe
- **Strategic Paper Surveillance of VBDs**

- Pan European maps of VBDs
- Interventions -> vector control

REVIEW

Open Access

Towards an integrated approach in surveillance of vector-borne diseases in Europe

Marieta Braks^{1*}, Joke van der Giessen¹, Mirjam Kretzschmar^{2,6}, Wifrid van Pelt², Ernst-Jan Scholte³, Chantal Reusken⁴, Hervé Zeller⁵, Wim van Bortel⁵ and Hein Sprong^{1*}

Abstract

Vector borne disease (VBD) emergence is a complex and dynamic process. Interactions between multiple disciplines and responsible health and environmental authorities are often needed for an effective early warning, surveillance and control of vectors and the diseases they transmit. To fully appreciate this complexity, integrated knowledge about the human and the vector population is desirable. In the current paper, important parameters and terms of both public health and medical entomology are defined in order to establish a common language that facilitates collaboration between the two disciplines. Special focus is put on the different VBD contexts with respect to the current presence or absence of the disease, the pathogen and the vector in a given location. Depending on the context, whether a VBD is endemic or not, surveillance activities are required to assess disease burden or threat, respectively. Following a decision for action, surveillance activities continue to assess trends.

Keywords: Vector borne disease, surveillance, public health, ECDC



Deliverables

- Database/network of Public Health Experts interest for VBD
- Questionnaire on VBD Surveillance in Europe
- Strategic Paper Surveillance of VBDs

- Pan European maps of VBDs
- Interventions -> vector control



Deliverables

- Database/network of Public Health Experts interest for VBD
- **Questionnaire on VBD Surveillance in Europe**
- Strategic Paper Surveillance of VBD

- Pan European maps of VBDs
- Interventions -> vector control

Questionnaire



Sent to competent bodies of 30 member states and Switzerland by ECDC

Questions

- of 11 VBDs
- surveillance activities wrt human, animal and vector
- nature of surveillance (active/ passive, frequency)
- priority of each VBD

Questionnaire



For each of the 11 Vector Borne Diseases:

	human				animal				vector			
	HS	LS	R	none	HS	LS	R	none	HS	LS	R	none
Surveillance	v	v	v	v	v	v	v	v	v	v	v	v

- *HS = high frequency surveillance (>= monthly),*
- *LS = low frequency surveillance,*
- *R = research,*
- *no&?r = no surveillance system & research unknown*

Questionnaire



For each of the 11 Vector Borne Diseases:

	human				animal				vector			
	HS	LS	R	none	HS	LS	R	none	HS	LS	R	none
Surveillance	v	v	v	v	v	v	v	v	v	v	v	v

- *HS = high frequency surveillance (>= monthly),*
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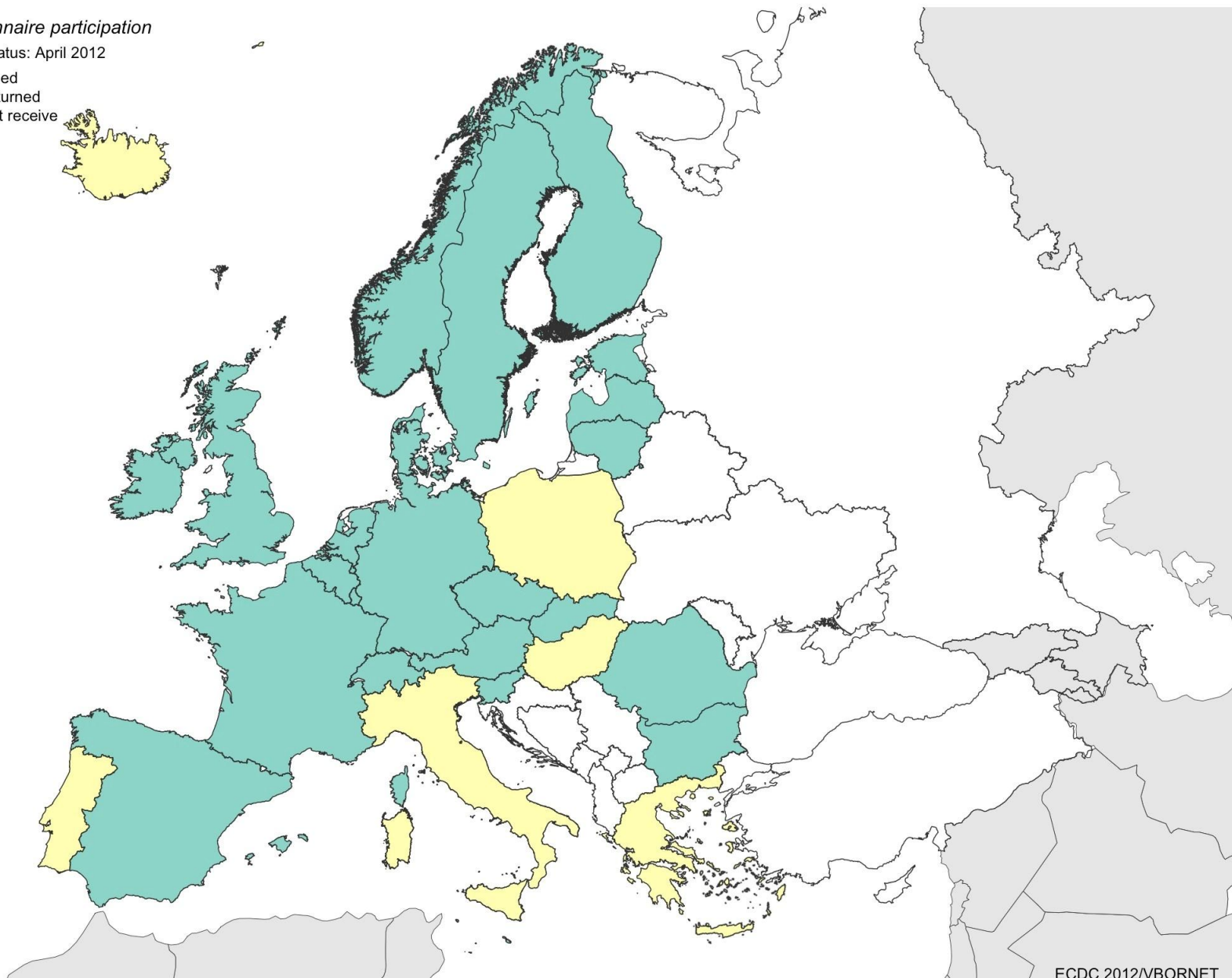
Decision rules

Level	human				animal				vector			
	HS	LS	R	none	HS	LS	R	none	HS	LS	R	none

Questionnaire participation

Current status: April 2012

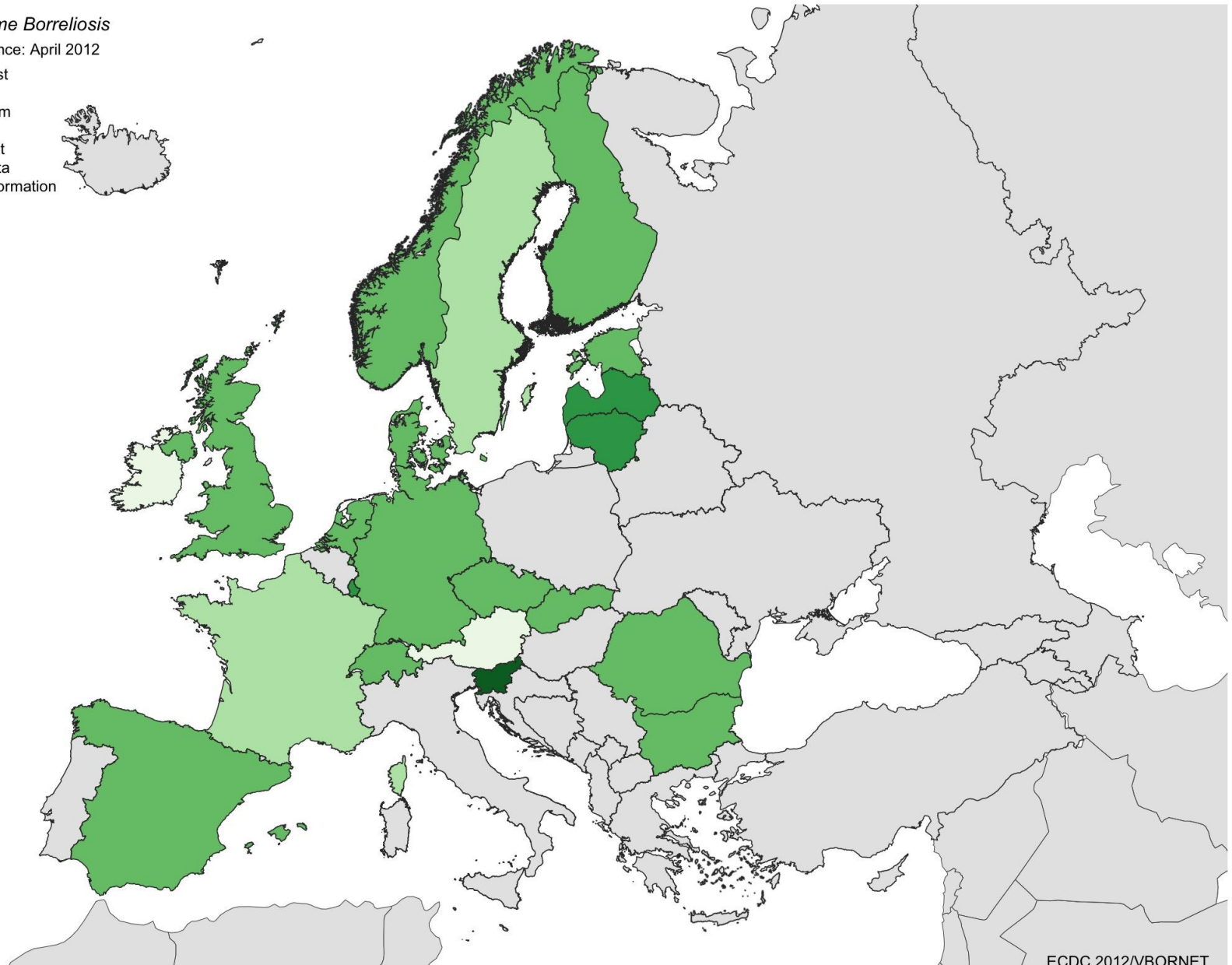
- Returned
- Not returned
- Did not receive



Lyme Borreliosis

Surveillance: April 2012

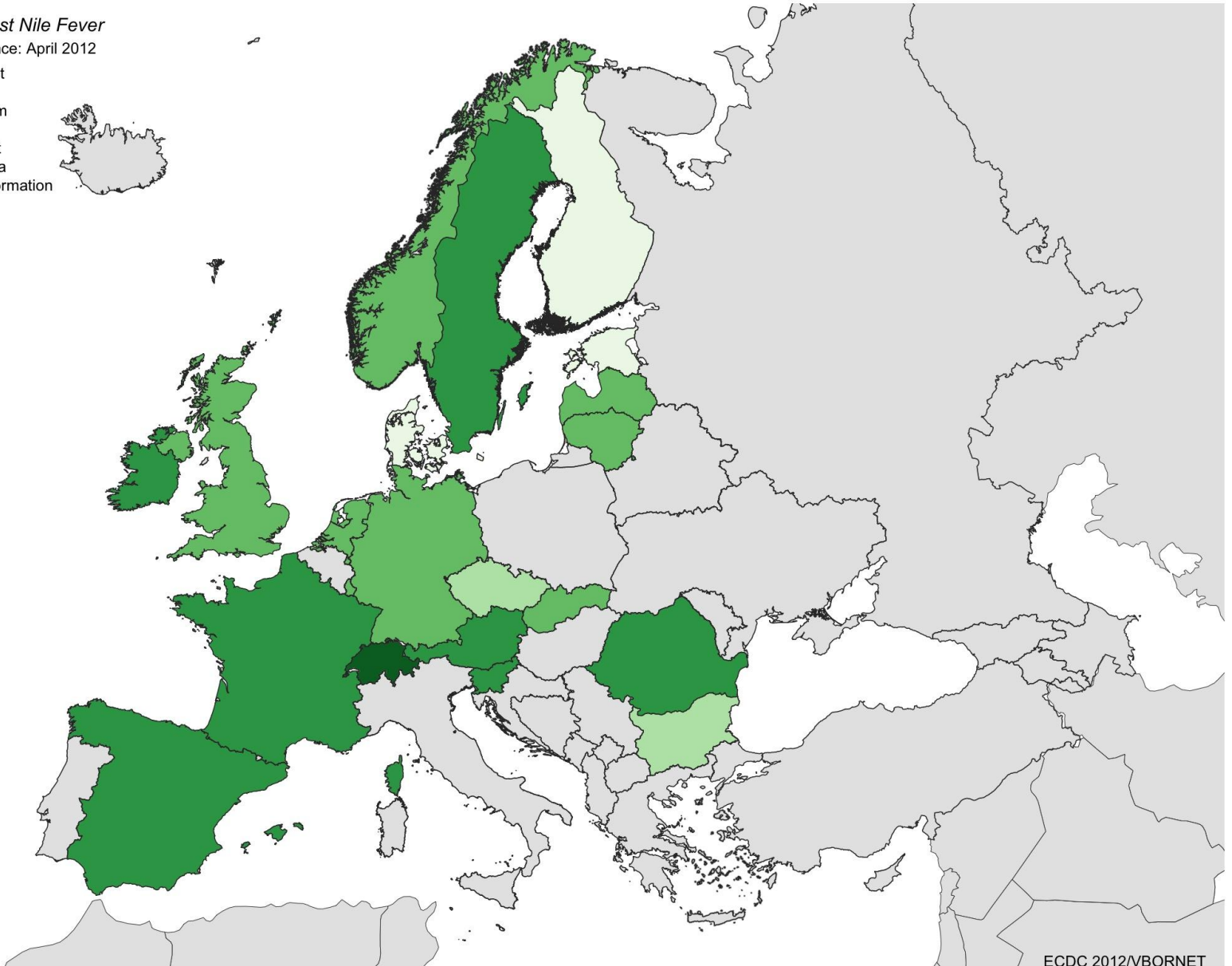
- Highest
- High
- Medium
- Low
- Lowest
- No data
- No information



West Nile Fever

Surveillance: April 2012

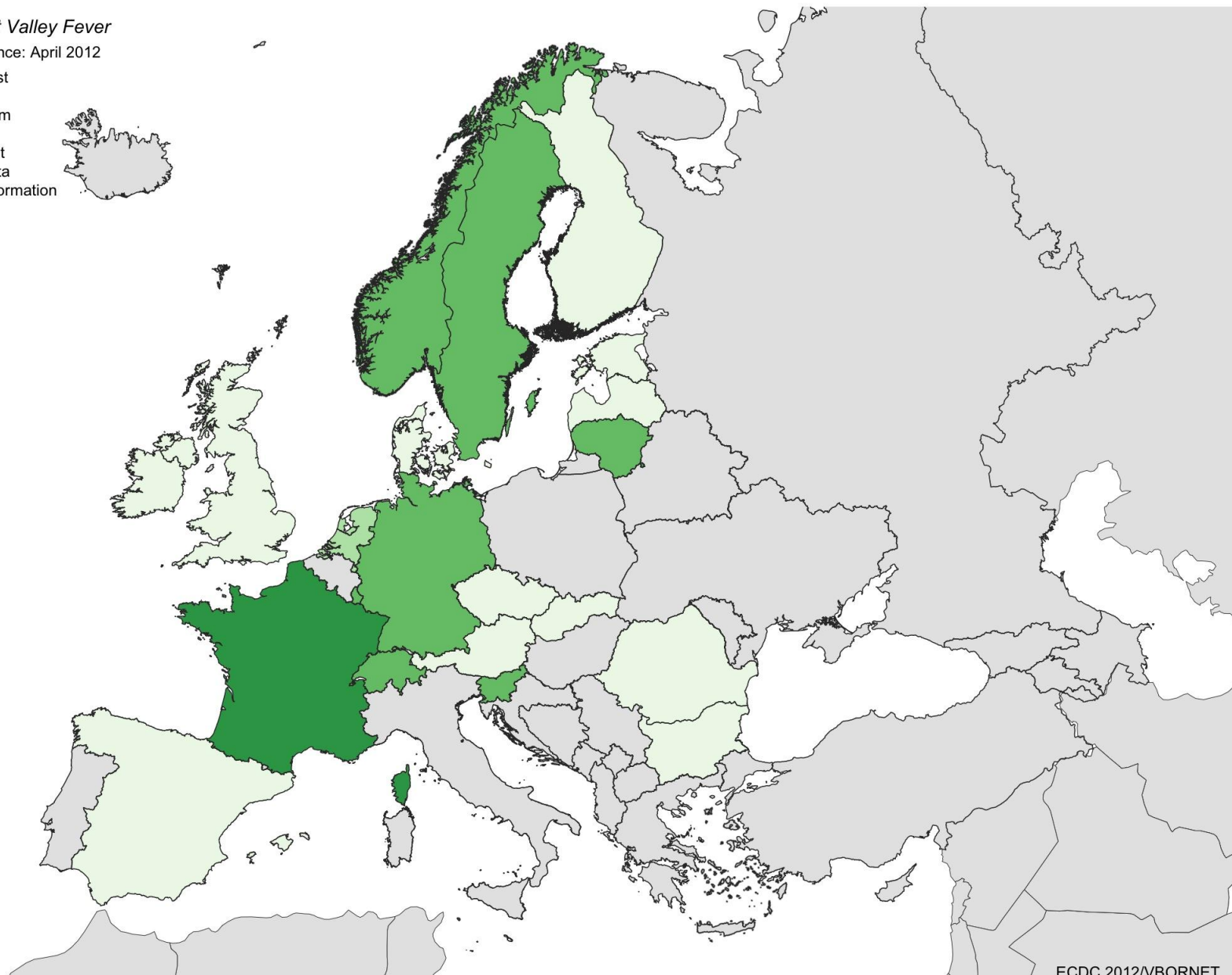
- Highest
- High
- Medium
- Low
- Lowest
- No data
- No information



Rift Valley Fever

Surveillance: April 2012

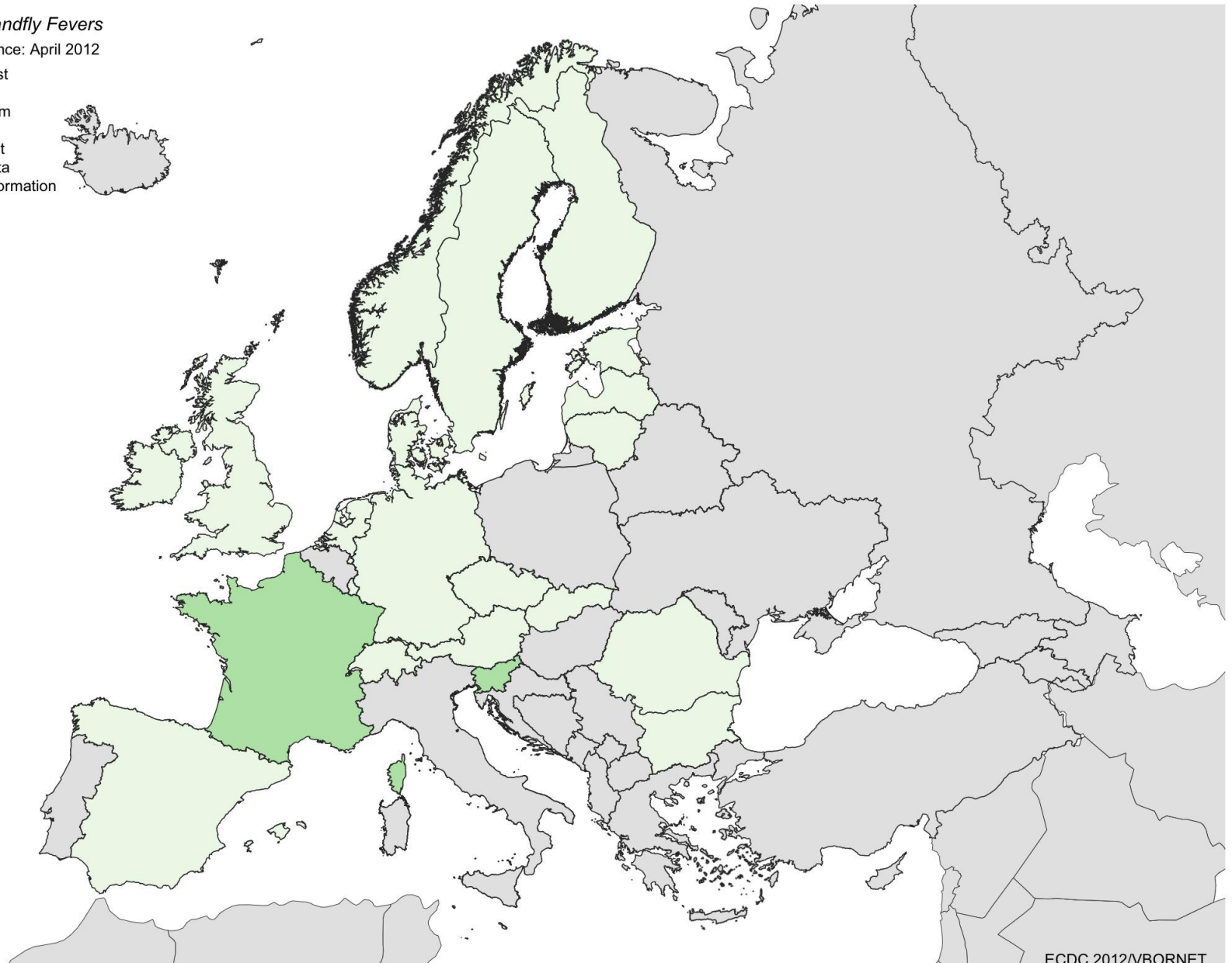
- Highest
- High
- Medium
- Low
- Lowest
- No data
- No information



Sandfly Fevers

Surveillance: April 2012

- Highest
- High
- Medium
- Low
- Lowest
- No data
- No information





Challenges of questionnaire

- 22 out of 30 countries responded
 - 8 out of 30 countries did not respond!
- Different interpretation of definitions, *incidence, surveillance etc*
- Snap shot of reality, needs updates
- Confirmed erroneous answers by some competent bodies

However,

- Helpful for feedback from Vbornet to competent bodies
- Tool to build awareness and network
- Aids ECDC to identify gaps in network and knowledge



Later this week

Deliverables

- Database/network of Public Health Experts interest for VBD
- Strategic Paper Surveillance of VBD
- Questionnaire on VBD Surveillance in Europe

- Pan European maps of VBDs**
- Interventions -> vector control**
(mosquitoes and ticks)



V b o r n Net

Thanks to

- Joke van der Giessen, Mirjam Kretzschmar, Wifrid van Pelt, Ernst-Jan Scholte, Chantal Reusken, Hervé Zeller, Wim van Bortel and Hein Sprong
- Margriet Harms (EPI)
- Herve Zeller, Wim van Bortel
- WP1 - Secretariat, information management and coordination (Belgium, Guy Hendrickx)
- WP2 - Science watch and technical support (UK, Jolyon Medlock)
 - Ad hoc technical support
 - Fact sheets
 - Mosquito monitoring
 - Picture database
- WP3 - Vector surveillance and distribution maps (Belgium Veerle Versteirt)
 - Mosquitoes (France, Francis Schaffner)
 - Ticks (France, Laurence Viacl)
 - Sandflies (Turkey, Bulent Alten)
- WP4 - Strategic consultation group/public health, (Netherlands, Marieta Braks)
 - Focal points Northern (Sweden, Marika Hjertqvist)
 - Focal points Western (Netherlands), Marieta Braks)
 - Focal points Central (Czech Republic, Zdenek Hubalek)
 - Focal points Southern (France, Renaud Lancelot)
 - Focal points Overseas (France, Didier Fontenille)
 - Focal points other vectors (France, Frederic Pages)

