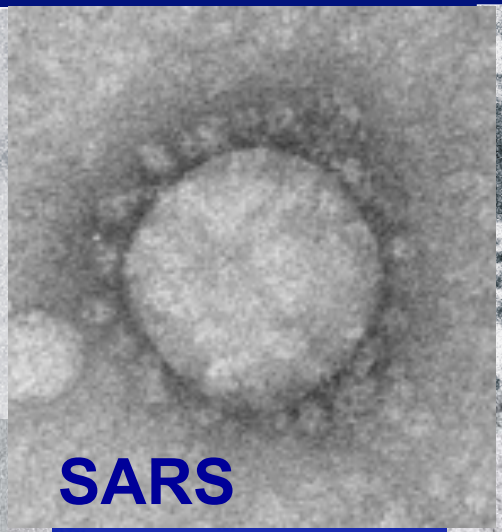
Imported viral diseases to Europe.
- A risk for future outbreaks? -

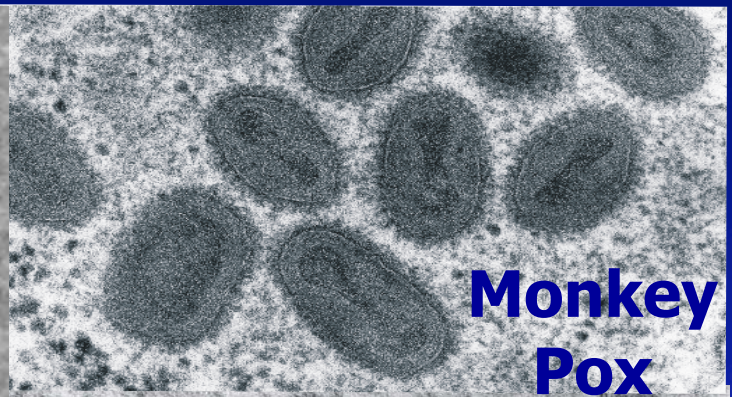
European Network for Diagnostics of "Imported" Viral Diseases (ENIVD).

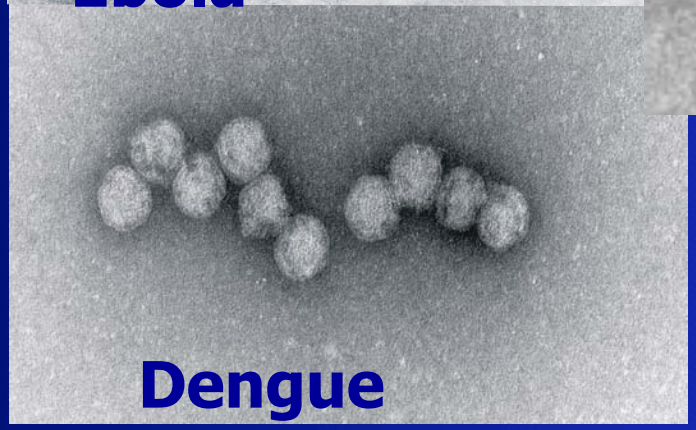
★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★

ROBERT KOCH INSTITUT

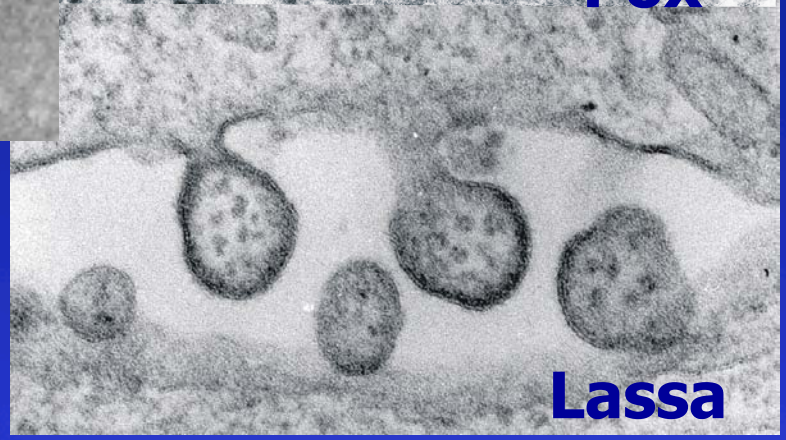
Matthias Niedrig, Berlin, Germany





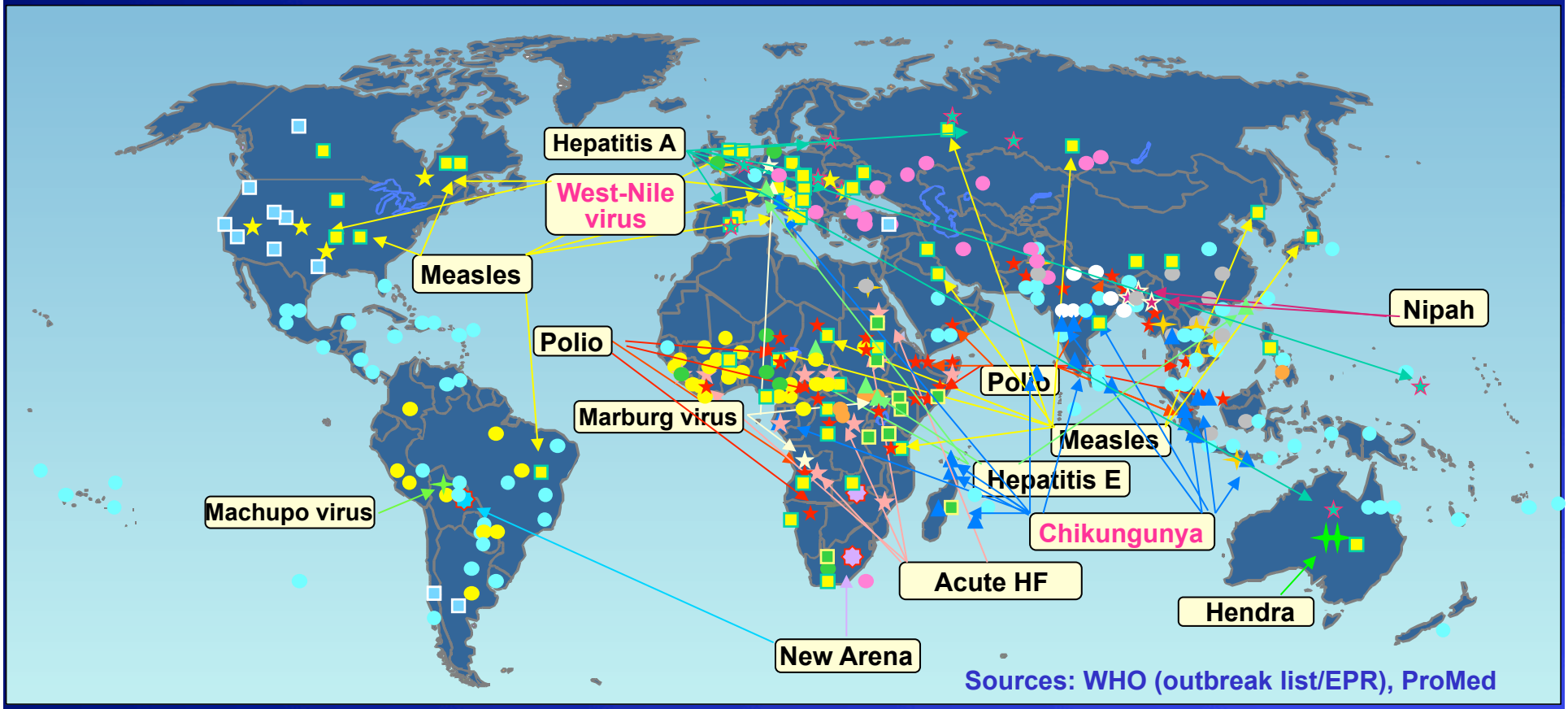


Source: H. Gelderblom, RKI



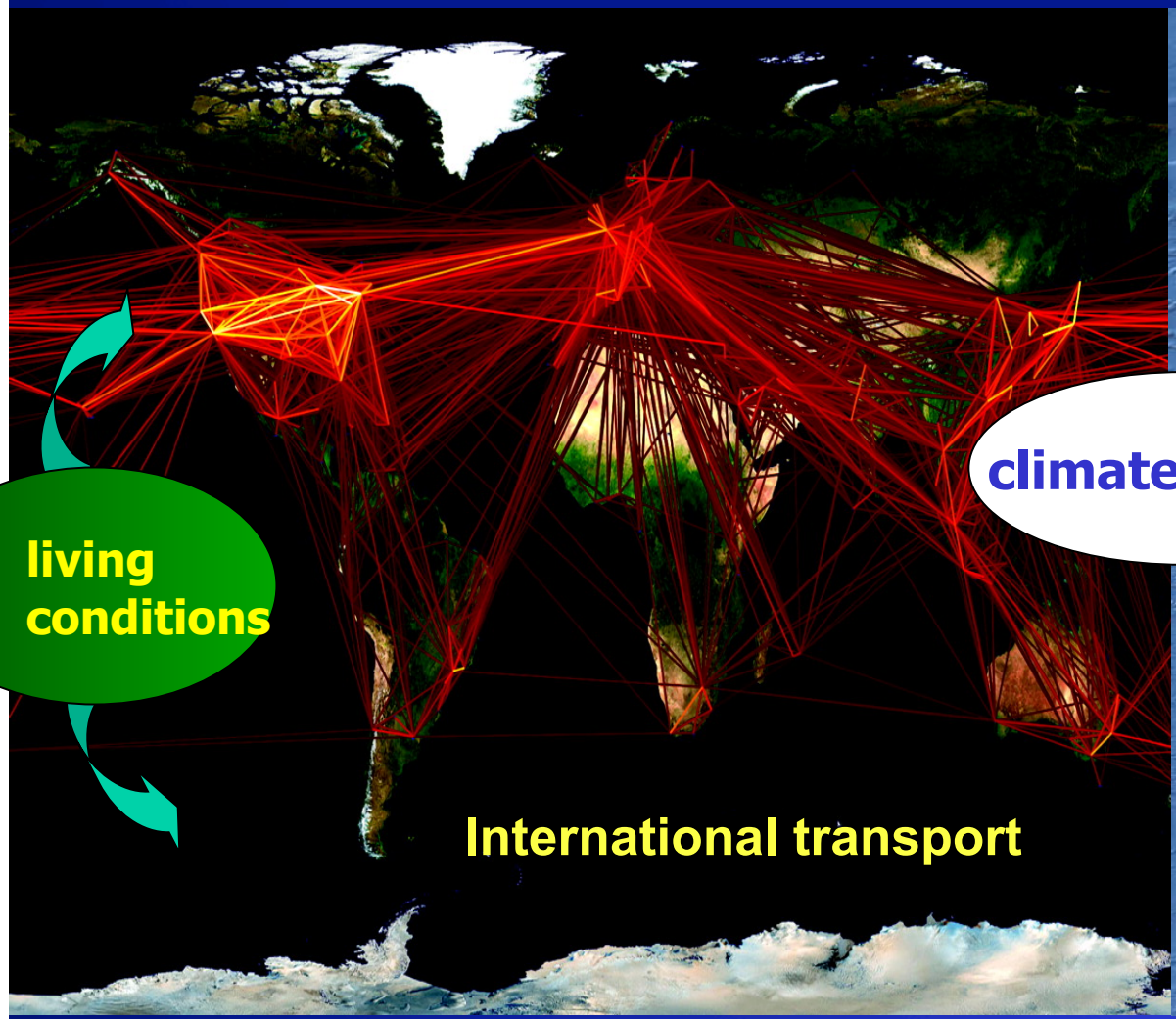
Is Europe prepared for an international infectious disease outbreak?

Viral Threats Worldwide
2005/ 2006 / 2007/ 2008/ 2009



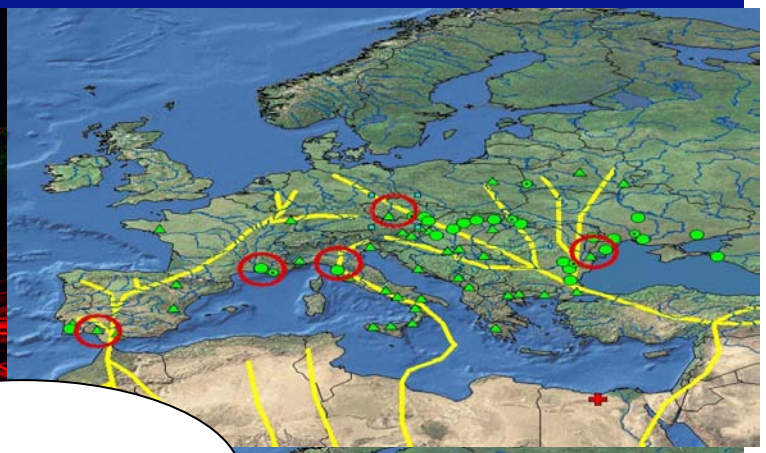
- Dengue/dengue haemorrhagic fever
- Ebola / Reston
- Lassa
- Yellow fever
- Influenza
- Crimean Congo haemorrhagic fever
- Japanese Encephalitis
- Viral Meningitis
- Rift Valley fever
- Hanta

Background: causes

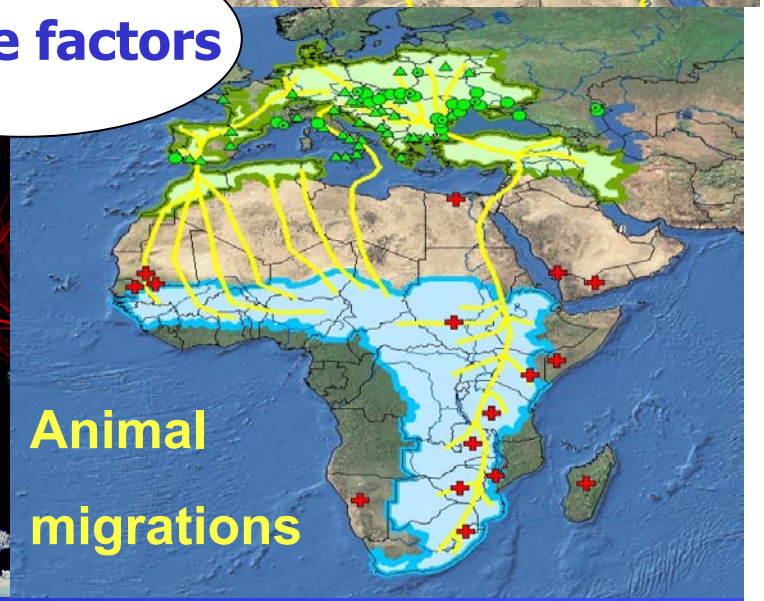


living conditions

International transport



climate factors

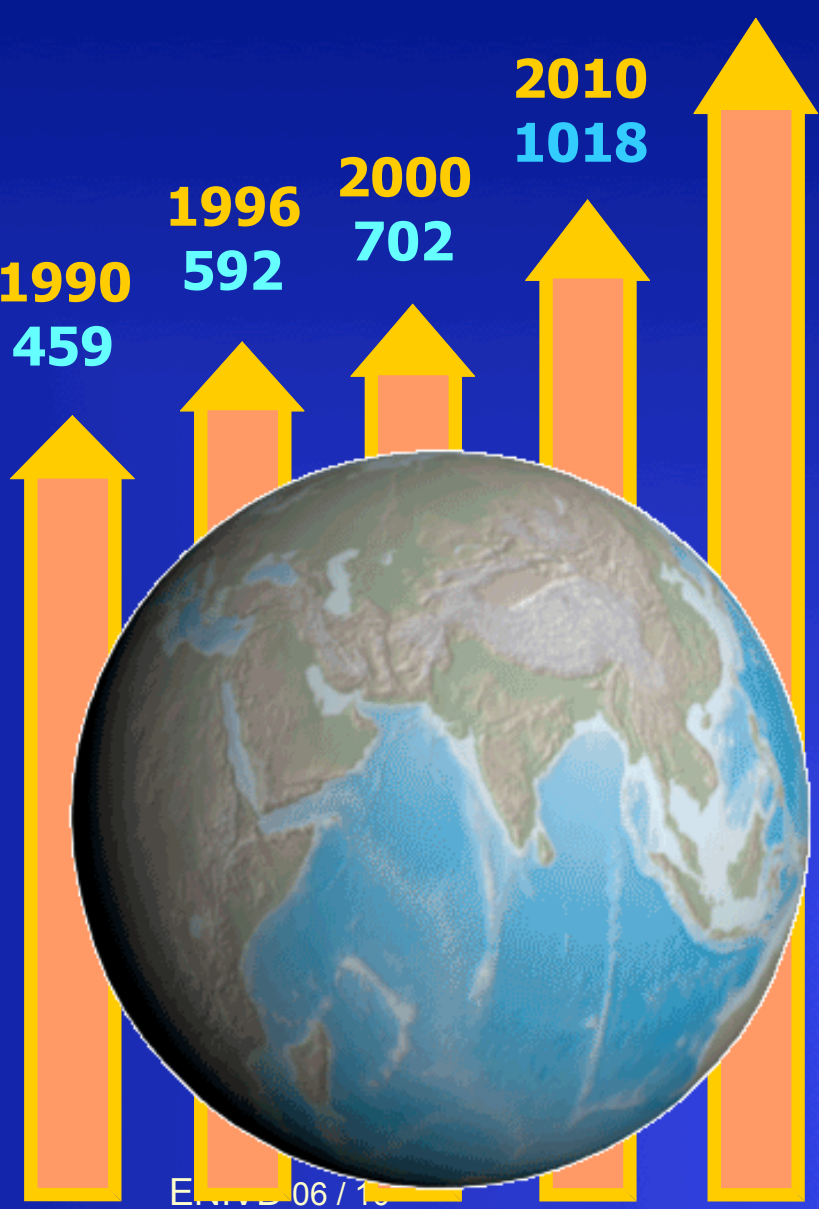


Animal migrations

travellers / infectious pathogens [Dengue, Malaria, ...]

Goods / vectors [rodents, mosquitoes, ...]

Increase of world tourism



number of persons travelling abroad in millions

(after 2006 forecast)

Source: WTO

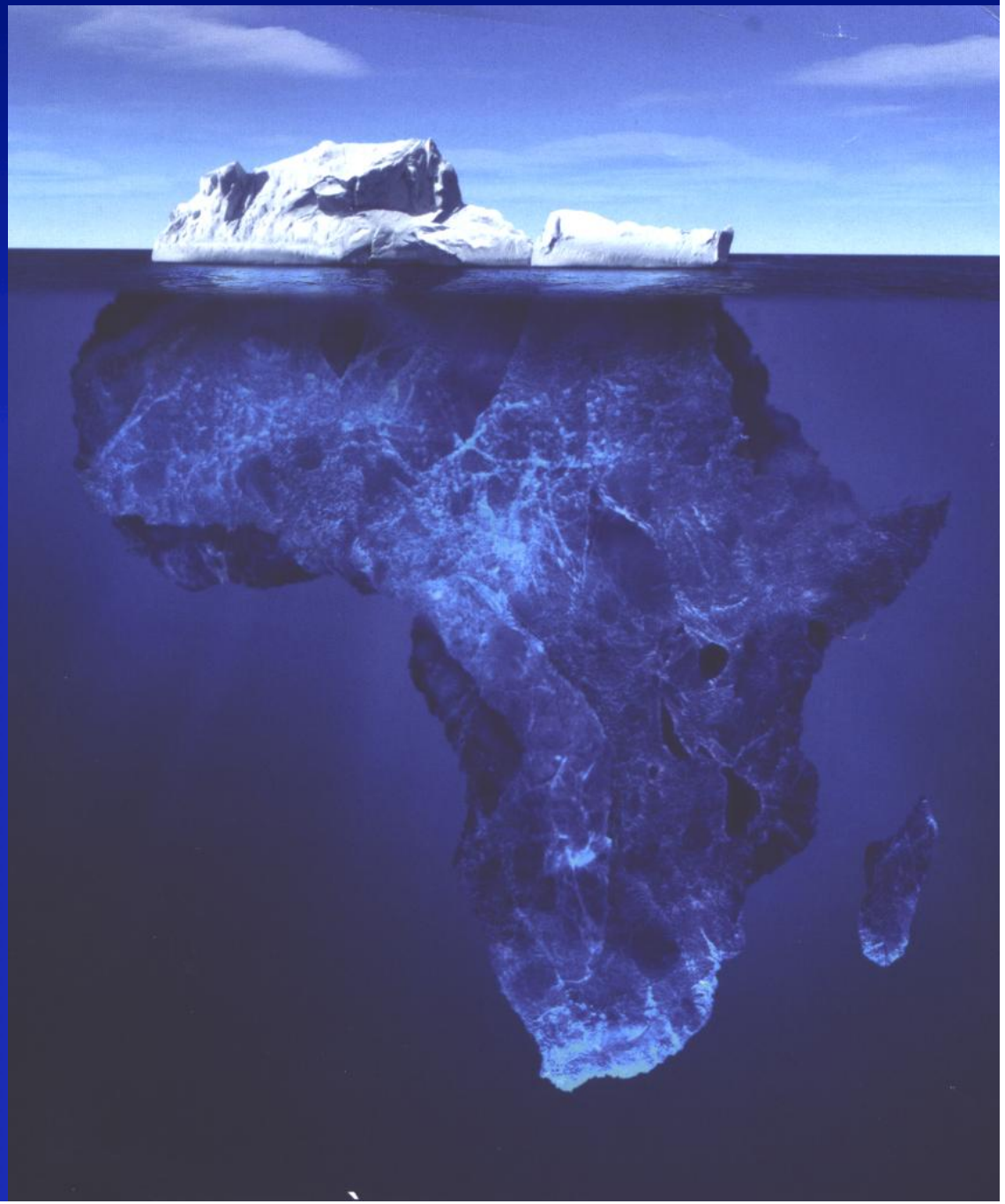
Import of suspected and confirmed Viral HFs and SARS to Europe

time	Imported from	Imported to	Viral pathogen	N° of cases /fatalities	Business / Tourist
Aug 1999	Ivory Coast	Germany	Yellow Fever	1 / 1	Business
Jan 2000	Ivory Coast	Germany	Lassa	1 / 1	Tourist
Feb 2000	Sierra Leone	U K	Lassa	1 / 1	Business
Mar 2000	Nigeria	Germany	Lassa	1 / 1	Repatriation
Jun 2000	Sierra Leone	Netherlands	Lassa	1 / 1	Business
Dec 2000	Kenya	Germany	Suspected VHF[3]	1 / 1	Tourist
Mar 2001	Sierra Leone	Germany	Suspected VHF[2]	1 / 0	Business
Mar 2001	Chile/Argentine	France	Hanta (Andes)	1 / 0	Tourist
Mar 2001	Sierra Leone	Germany	Suspected VHF[2]	1 / 0	Business
Aug 2001	Bulgaria	Germany	CCHF	1 / 0	Tourist
Sep 2001	Rep. of Chad	France	RVF	2 / 0	Business
Nov 2001	The Gambia	Belgium	Yellow Fever	1 / 1	Tourist
Sep 2002	Nepal	Spain	Suspected VHF[1]	1 / 0	Tourist
Oct 2002	Cameroon	Rep. Ireland	Suspected VHF[2]	1 / 0	Business
Feb 2003	Sierra Leone	U K	Lassa	1 / 1	Business
Feb 2003	China, Vietnam	Europe	SARS	33/1	Tourist/Bus.
2004	USA	Germ./France	West Nile virus	4/0	Tourist
July 2004	Portugal	Rep. Ireland	West Nile virus	2 / 0	Tourist
Oct 2004	Tunesia	France	West Nile Virus	1 / 0	Tourist
Nov 2004	Senegal	France	CCHF	1 / 0	Repatriation
2005	Reunion	Europe	Chikungunya	ca. 164/0	Tourist/Bus.
Nov 2006	India	Lithuania	Rabies	1 / 1	Tourist
2007	Morocco	Germany	Rabies	1 / 1	Tourist
Apr 2007	India	Germany	Rabies	1 / 1	Tourist
Jun 2007	India	Italy	Chikungunya	1 / 0	Tourist
Jan 2008	Kenya	Netherlands	Rabies	1 / 1	Tourist
July 2008	Uganda	Netherlands	Marburg	1 / 1	Tourist
Jan 2009	Nigeria	UK	Lassa	1 / 1	Tourist

[1] no final diagnosis, [2] final diagnosis: Malaria, [3] final diagnosis: generalised HSV-1

Recognized imported viral infections -

Tip of an iceberg?



The ratio tells us that 7/8 of the iceberg's mass must be below water.

Reservoirs for transmission of virus infections

domestic animals

Rift Valley Fever
Crimean Congo HF

Rabies virus

Nipah virus

Vectors for transmission of virus infections

wild animals

Bank voles

Hanta virus

Lassa virus

Mastomys spec.

Monkeys

Monkeypox

Reservoir for:

Yellow Fever virus

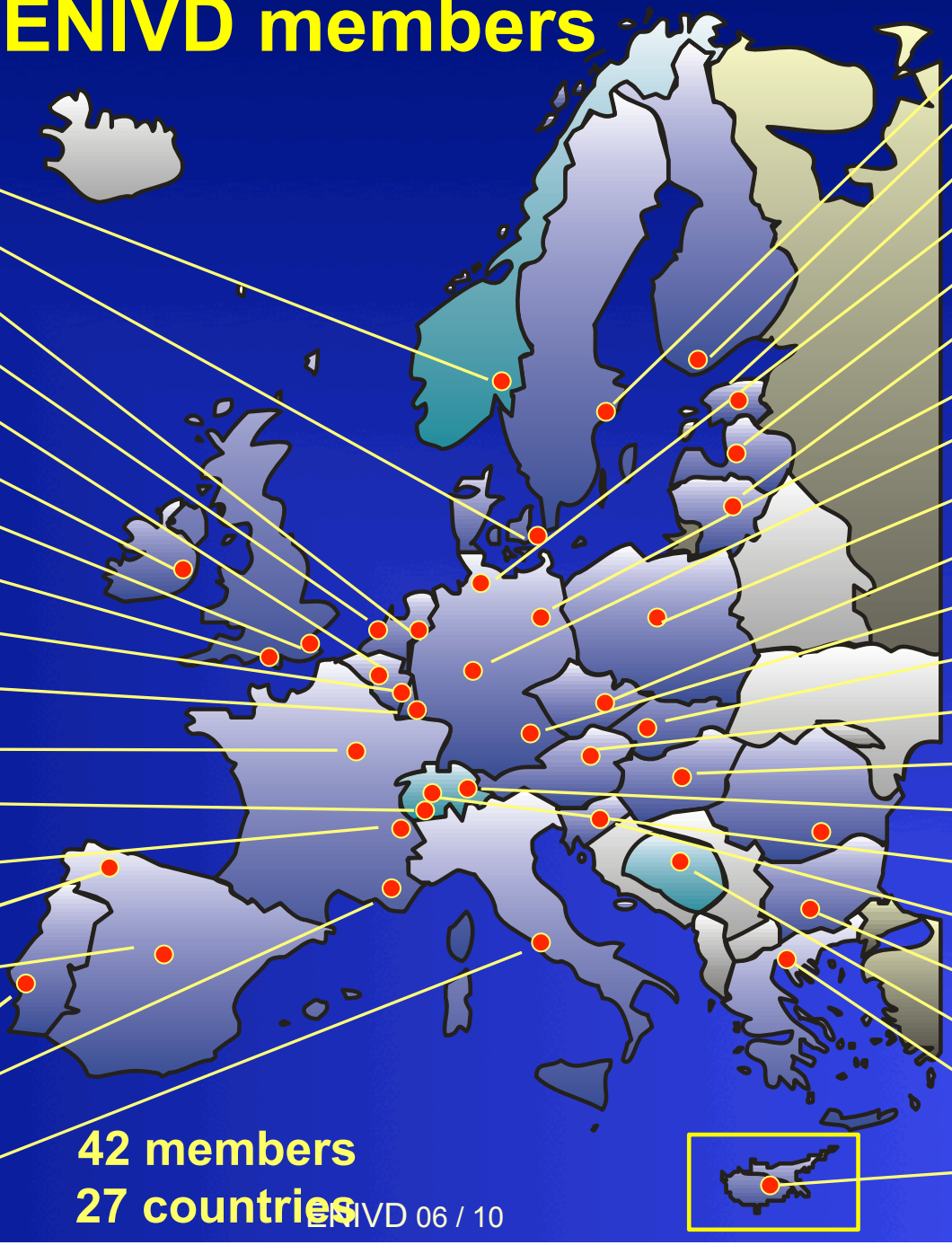
Vectors for transmission of virus infections

Yellow Fever virus
Dengue virus

Phlebovirus

Tick borne encephalitis
Omsk hemorraghic fever virus

ENIVD members



S. Gjeruldsen-Dudman
Oslo
A. Fomsgaard
Copenhagen
M. Koopmans
Bilthoven
A. Osterhaus
Rotterdam
M. v. Esbroeck
Antwerp
J. Connell
Dublin
D. Brown / M.Borchert
London
R. Hewson
Porton Down
P. Heyman
Brussels
M. Opp
Luxembourg
J.-C. Manuguerra,
M. Bouloy
Paris
P. Cherpillod
Geneva
N. Tordo
lyon
J.G. Costa
Orense
A. Tenorio
Madrid
M.J. Alves
Àgua de Moura
H. Toulu
R. Charrel
Marseille
M. Capobianco/
L. Nicoletti / F. Lista
Rome

A. Lundkvist,
A. Mirazimi
Stockholm
A. Vaheri
Helsinki
I. Golovljova
Tallin
S. Günther
Hamburg
T. Kolupajeva
Riga
S. Chaplinskas
Vilnius
M. Niedrig
Berlin
M. Eickmann
Marburg
M. Szkoda/J. Kocik
Warsaw
H. Zelená
Ostravě
G. Dobler
Munich
B. Klempa
Bratislava
S. Aberle
Vienna
I. Visontai
I. Budapest
D. Schultze
St. Gallen
M. Strasser
Spiez
T. Avsic-Zupanc
Ljubljana
I. Christova
Sofia
M. Hukic
Sarajevo
A. Papa
Thessaloniki
L.Kostrikis
Nicosia

42 members
27 countries

ENIVD meetings

	Date	Place	Participants	Countries	Guests
	06/95	Berlin	5	3	
	01/96	Porton Down	6	4	
	07/96	Marburg	8	6	
	05/97	Thessaloniki	17	12	WHO & EC
5	02/98	Paris	20	11	WHO & CDC
	11/98	Berlin	28	16	WHO & EC & PAHO
					EC funding
	06/99	Rotterdam	30	12	WHO
	04/00	Orense / Spain	26	14	WHO & CDC
	11/00	Luxembourg	27	16	EC
10	04/01	Palmela/Portugal	36	17	WHO & Japan
	05/02	Chalkidiki/Greece	35	17	WHO & EC
	05/03	Helsinki	38	21	WHO
	05/04	Ljubljana	38	23	Russia
	06/05	Rome	44	21	WHO, Brazil, Argentina
15	05/06	Warsaw	47	25	ECDC, WHO, Israel, Russia, S. Africa
	05/07	Limassol / Cyprus	49	25	ECDC, WHO, Israel, Russia, Egypt
	05/08	Madrid	49	25	ECDC, WHO, Israel, Russia, Iran, South America
	05/09	Prague	65	31	ECDC, WHO, Israel, Russia, Senegal, Albania, Turkey, Ukraine

18th ENIVD Meeting in Prague May 2009

Tasks of the European Network for diagnostics of"Imported“ Viral Diseases (ENIVD)

1. Build a network of European laboratories working on diagnostics of "imported” and rare viral infections.

2. Identify those viral infections more likely to be imported and co-ordinate the objectives and identify laboratories, capable and willing to perform the rapid diagnostics (< 24h) of an acute case, suspected to be a viral haemorrhagic fever.

Tasks of ENIVD (2)

3. Work out recommendations for standard-isation and quality control in laboratories involved in the diagnostics of such diseases.
4. Identify and operate standard assays according to defined quality control criteria.
5. Optimise limited resources by exchanging reagents, methodologies, and expertise.
6. Encourage regular contact within the network through meetings and exchange of laboratory personnel.

Tasks of ENIVD (3)

7. Open the network for members of other European laboratories.

8. Organise and coordinate international activities with the "Surveillance network group", and other national organisations like CDC, or international organisations like ECDC, WHO or PAHO

DECISION No 2119/98/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 24 September 1998

Setting up a network for the epidemiological surveillance and control of communicable diseases in the Community

Article 1: **... As regards the early warning and response system, this network shall be formed by bringing into permanent communication with one another, through appropriate means, the Commission and the competent public health authorities in each Member State responsible for determining the measures which may be required to protect public health**

Article 3 (f): **guidlines on the protective measures to be taken, in particular at external frontiers of the Member States notably in emergency situations;**

Article 4 (e): **information concerning existing and proposed mechanisms and procedures for the prevention and control of communicable diseases, in particular in emergency situations;**

DECISION No 2119/98/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

Annex

LIST INDICATING CATEGORIES OF COMMUNICABLE DISEASES

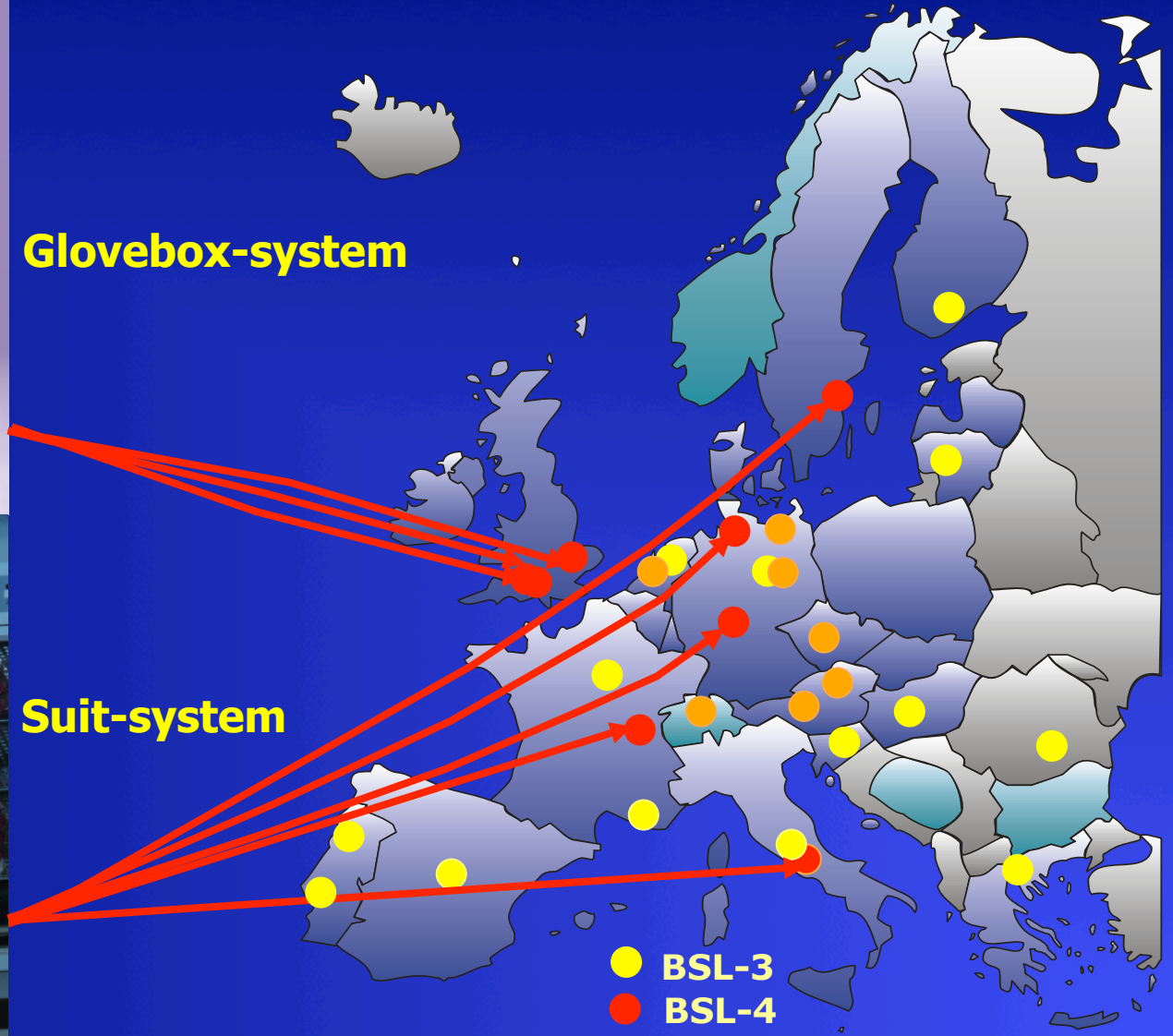
- ✓ **Diseases preventable by vaccination**
- ✓ **Sexually-transmitted diseases**
- ✓ **Viral hepatitis**
- ✓ **Food-borne diseases**
- ✓ **Water-borne diseases and diseases of enviromental origin**
- ✓ **Nosocomial infections**
- ✓ **Other diseases transmissible by non-conventional agents**
- ✓ **Diseases covered by the international health regulations (yellow fever, cholera and plague)**
- ✓ **Other diseases (rabies, typhus, viral haemorrhagic fevers*, malaria and any other yet unclassified serious epidemic diseases, etc.)**

*** VHFs: Crimean Congo HF, Ebola / Marburg virus HF, Lassa fever,**

Biosafety Laboratories

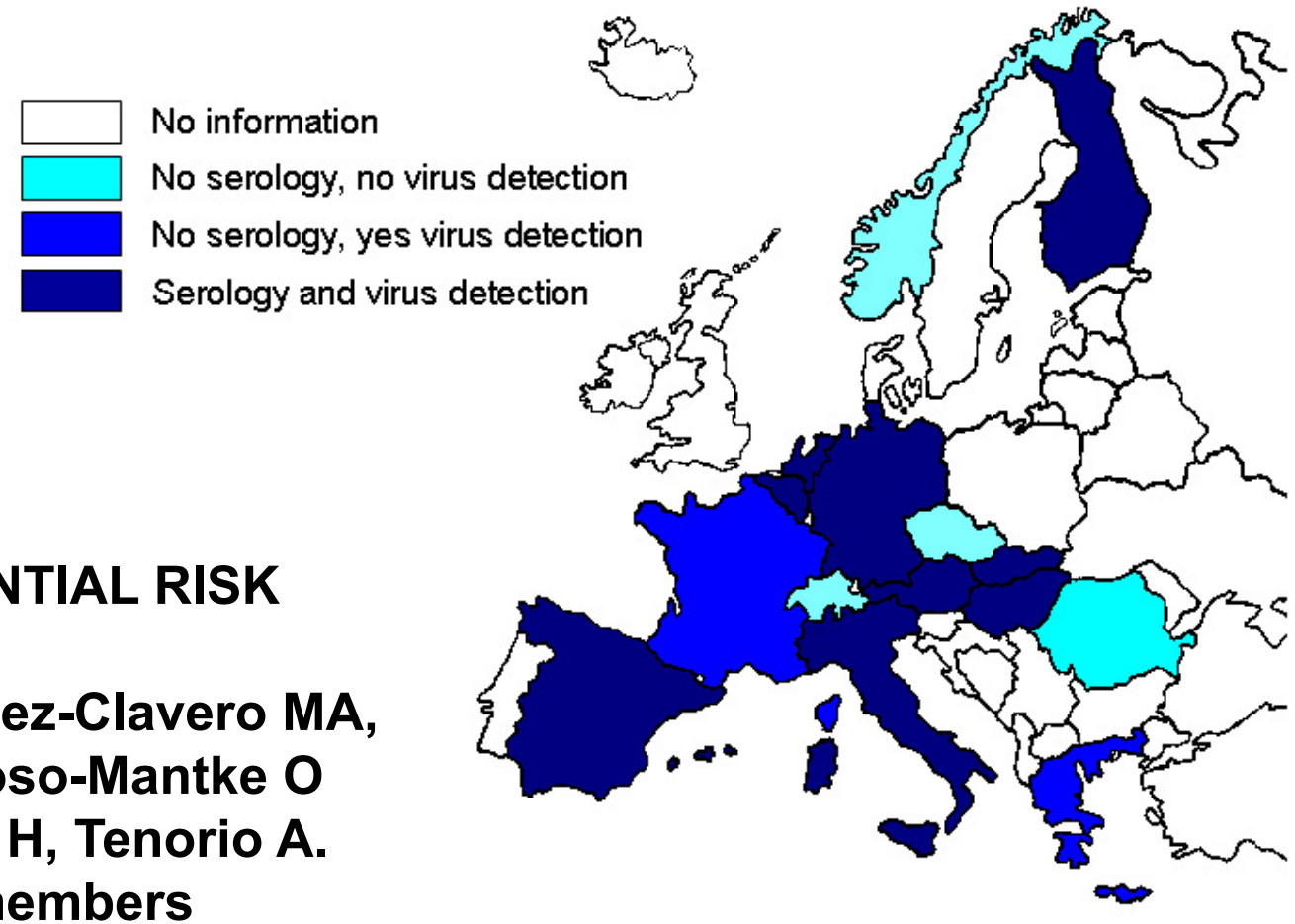
Glovebox-system

Suit-system



Capacity for USUTU virus diagnostic in Europe.

In September 2009, two acute cases of neurological disease in humans were associated to Usutu virus infection in Italy.

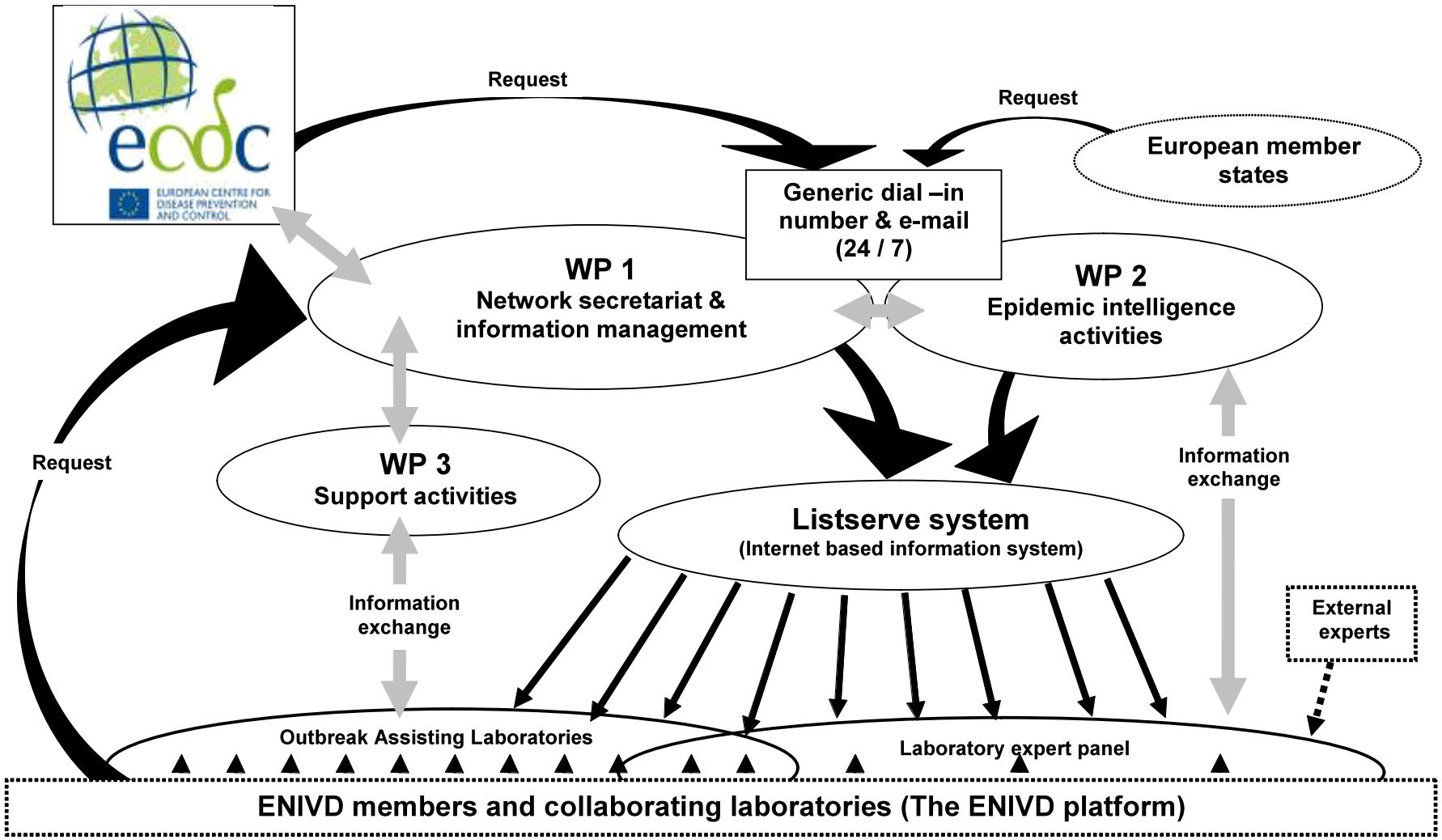


USUTU, A POTENTIAL RISK FOR EUROPE

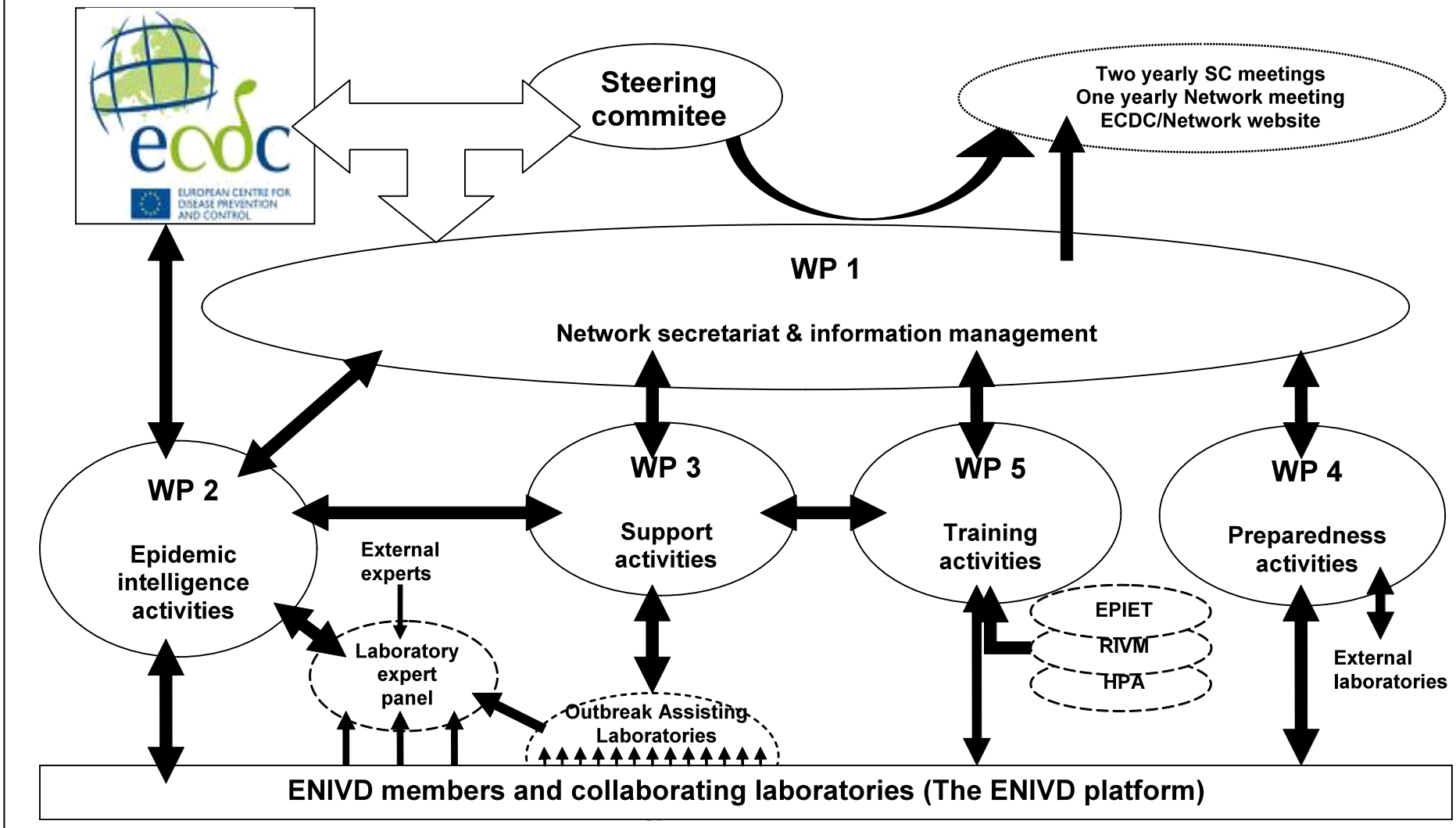
Franco L., Jiménez-Clavero MA, Vázquez A, Donoso-Mantke O Niedrig M, Zeller H, Tenorio A. and the ENIVD members

Distribution of information using *Listserv*

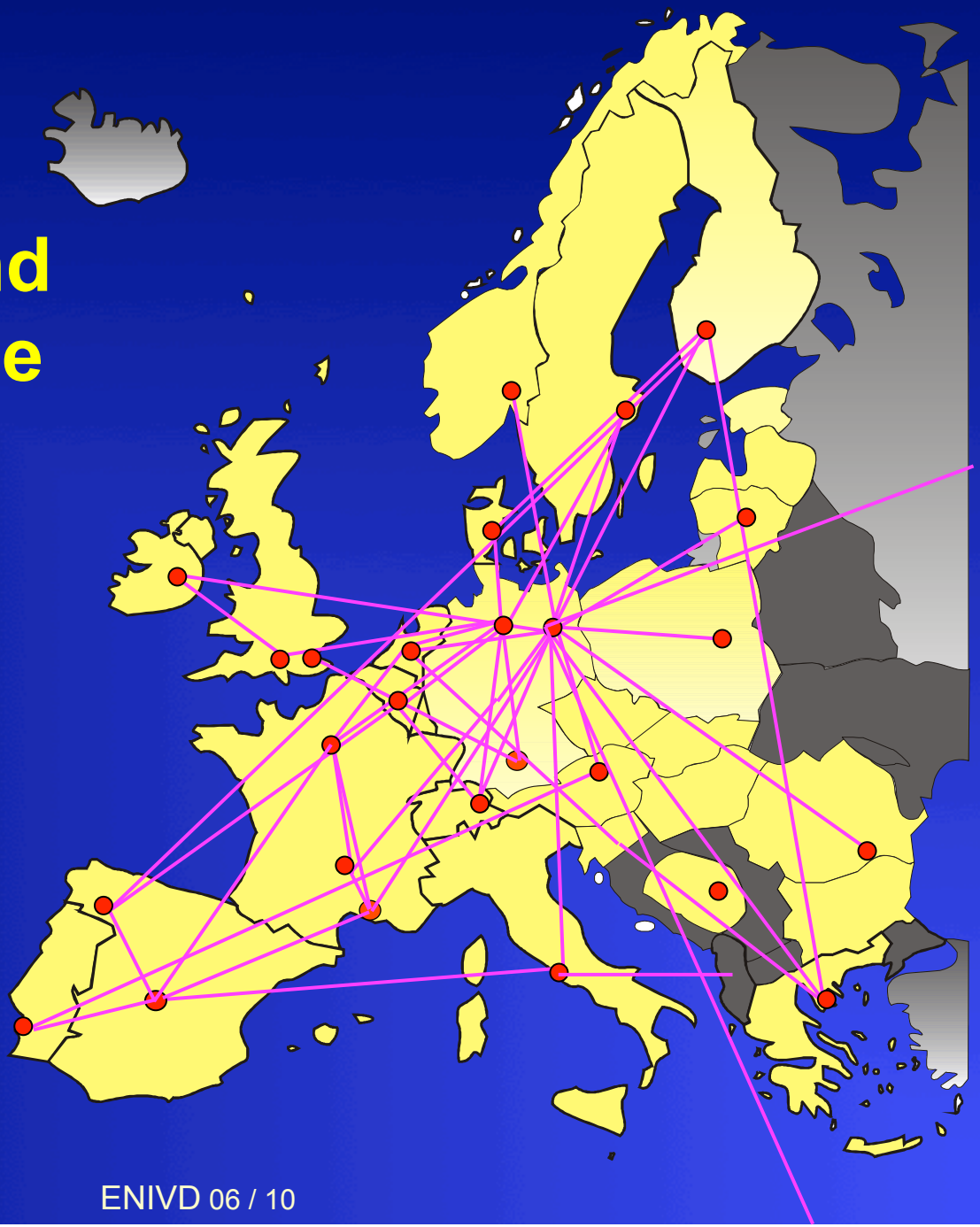
Request & information exchange of the ENIVD-CLRN



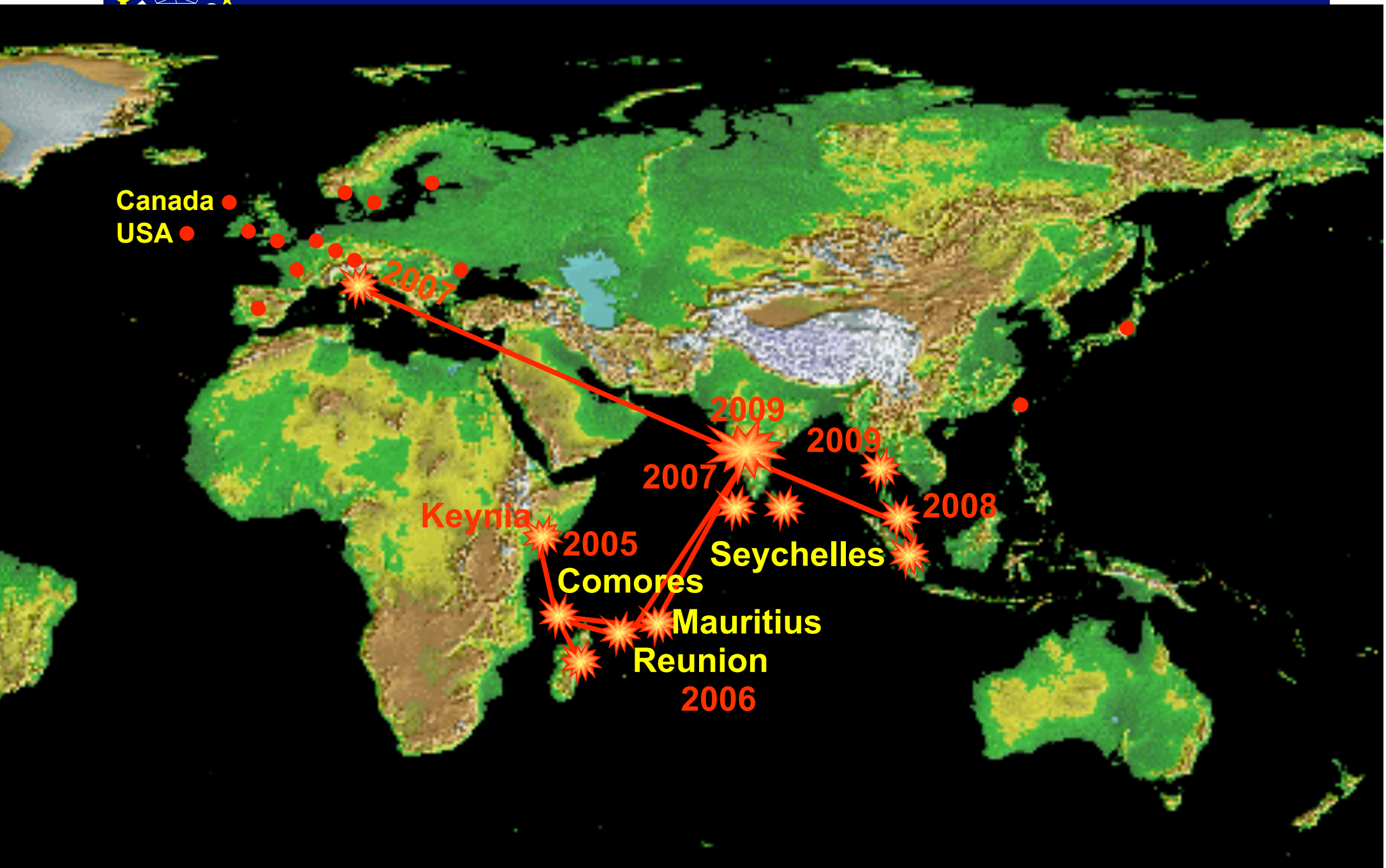
Structure & project management of the ENIVD-CLRN



Co-operations and material exchange between ENIVD members

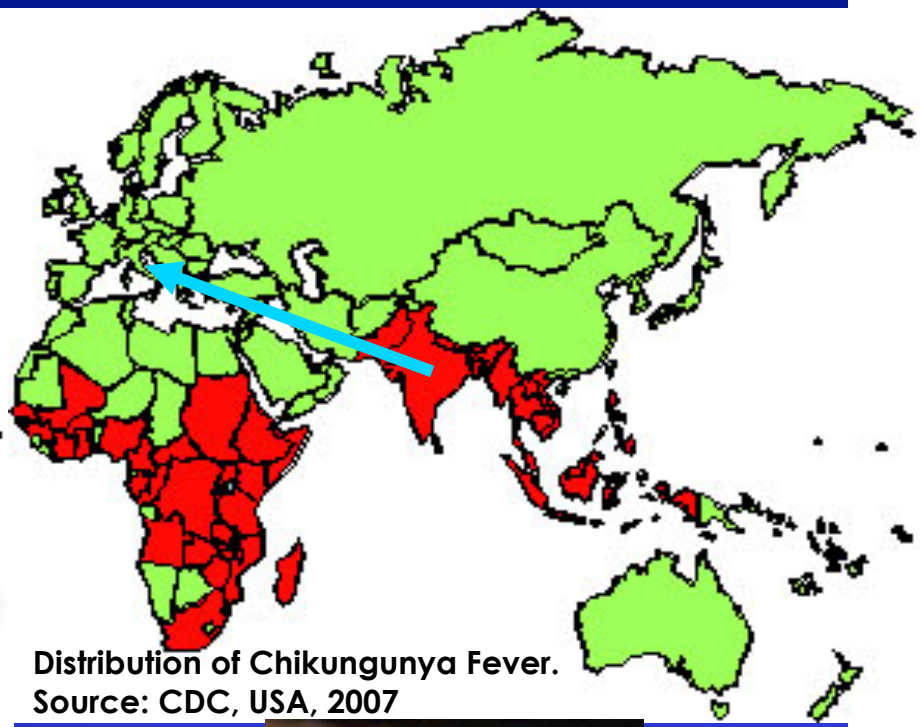


Distribution of CHIK since 2005



Chikungunya Ausbruch in Italien im Juni 2007

source: knowita1.com



Distribution of Chikungunya Fever.
Source: CDC, USA, 2007

- ✓ 15th June – 21st Sep. 292 suspected cases of Chikungunya Fever
- ✓ 125 cases were confirmed by laboratory diagnosis
- ✓ Increase of *Aedes albopictus* in the region in recent years

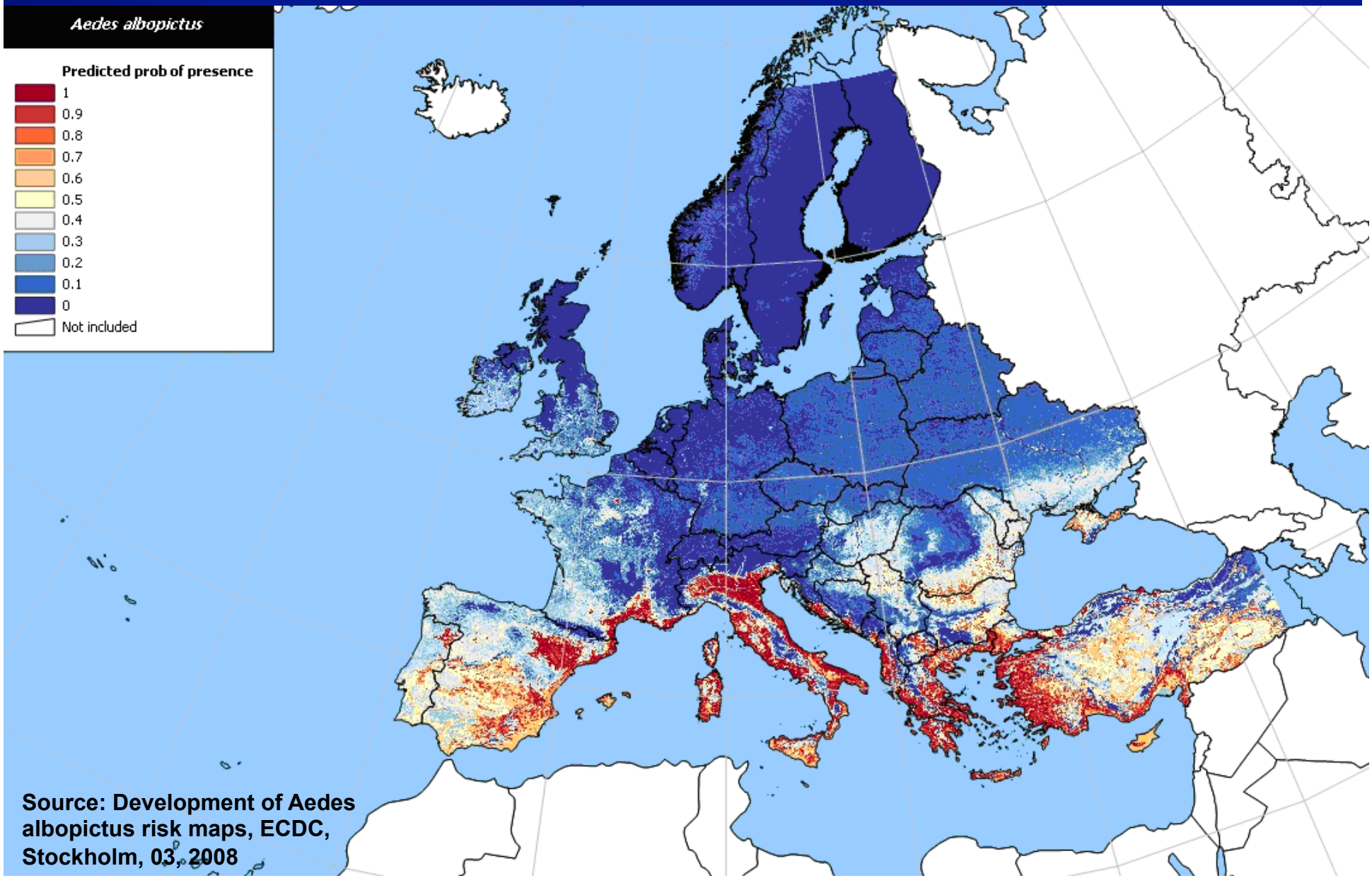
Vectors for transmission of virus infections

Yellow Fever virus
Dengue virus

Phlebovirus

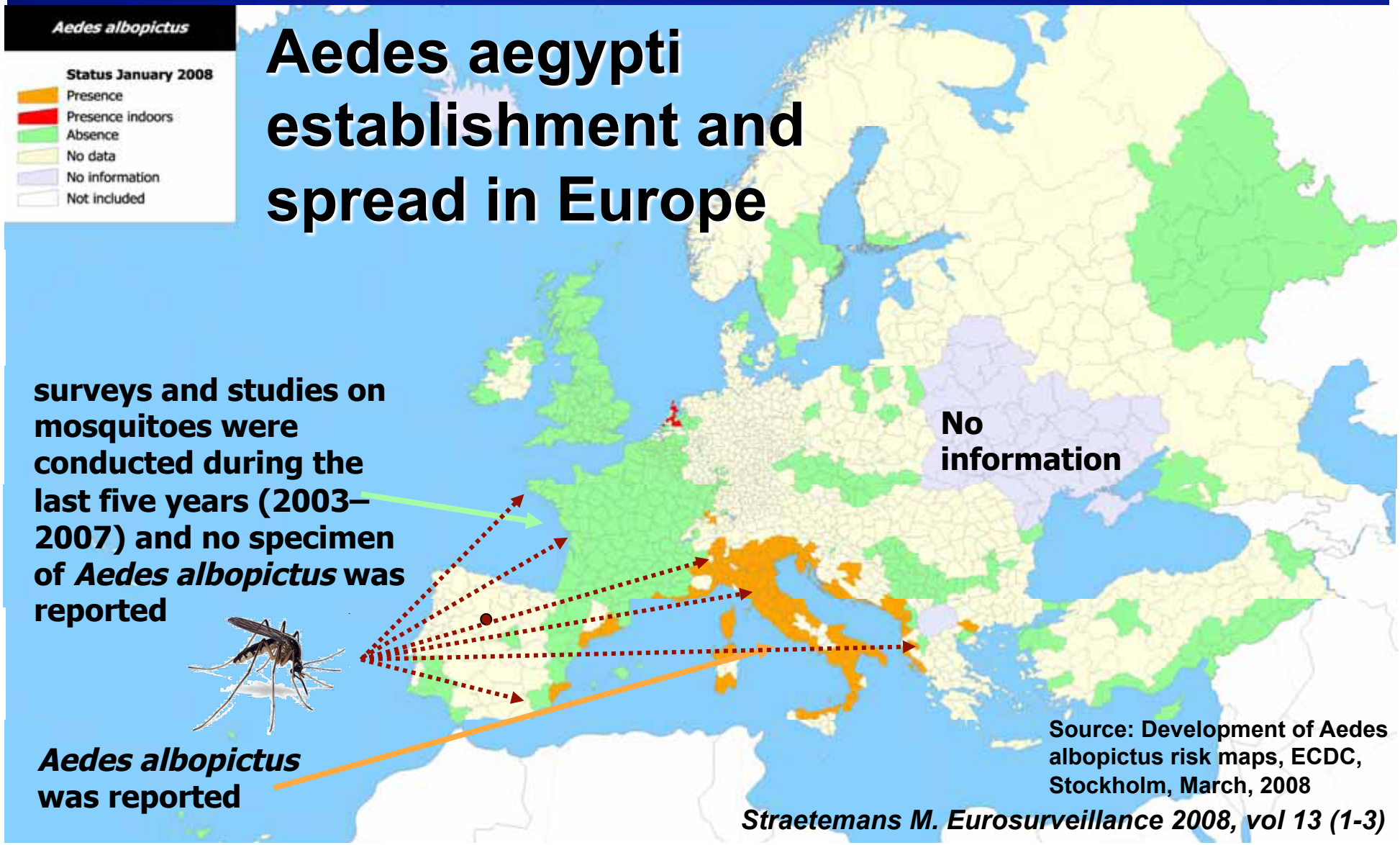
Tick borne encephalitis
Omsk hemorraghic fever virus

East and westward invasion of Aedes albopictus in the Mediterranean basin



Source: Development of Aedes albopictus risk maps, ECDC, Stockholm, 03, 2008

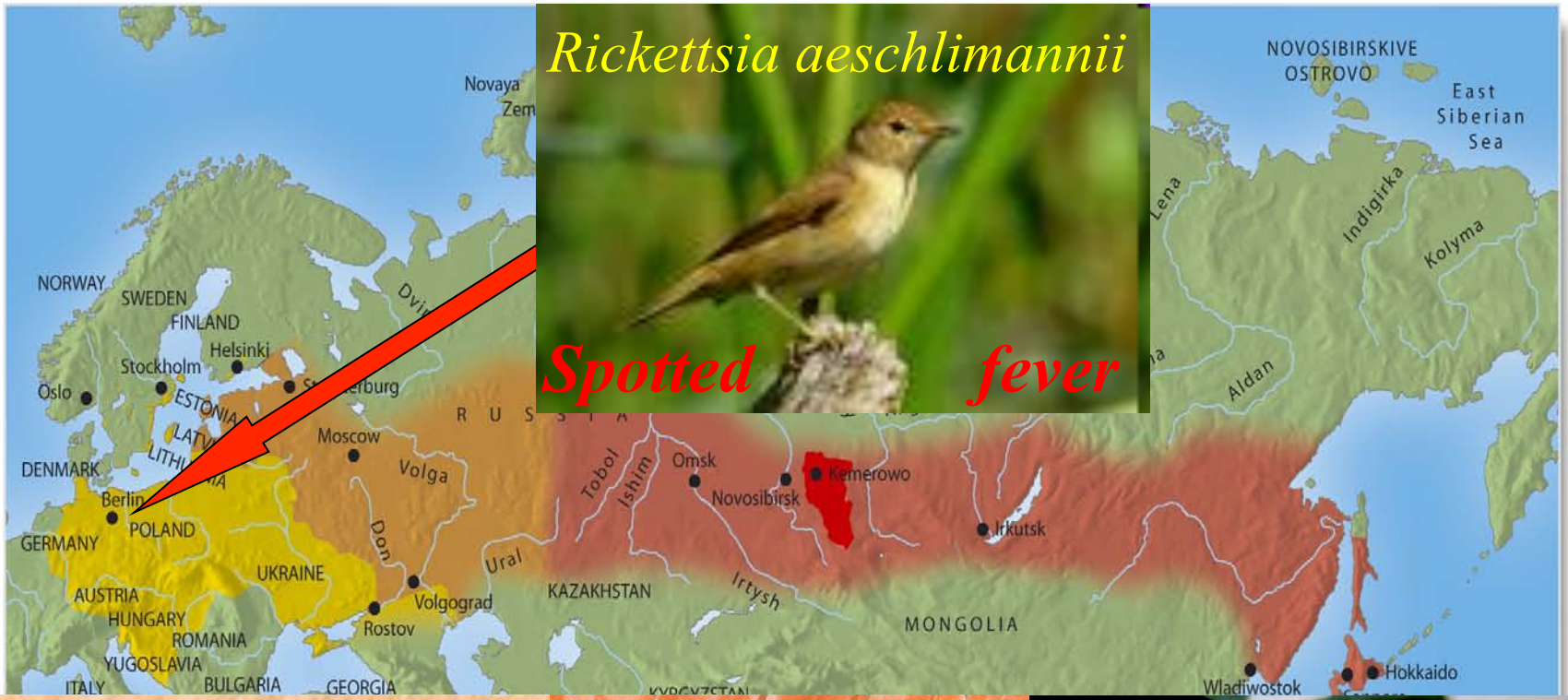
Current distribution of Aedes albopictus in Europe, January 2008

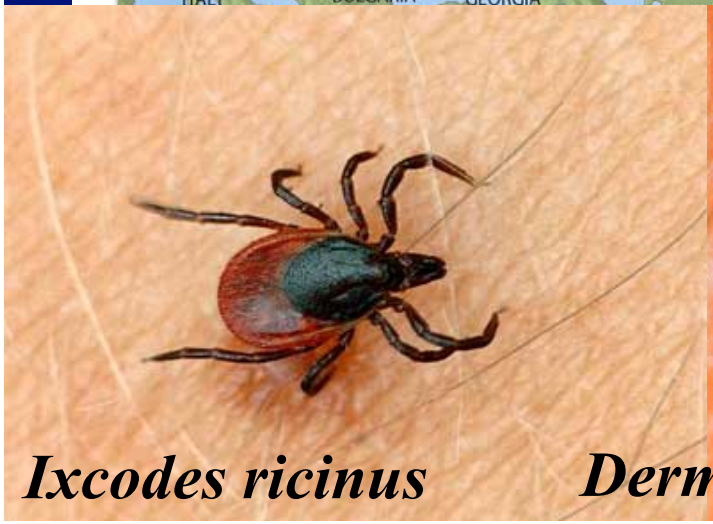


Recent detected „new / emerging“ viruses in Europe

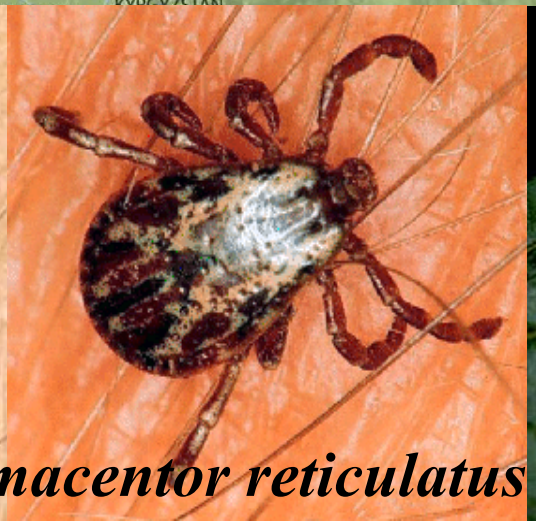
known / expected

Distribution of Tick borne encephalitis





Ixcodes ricinus



Dermacentor reticulatus

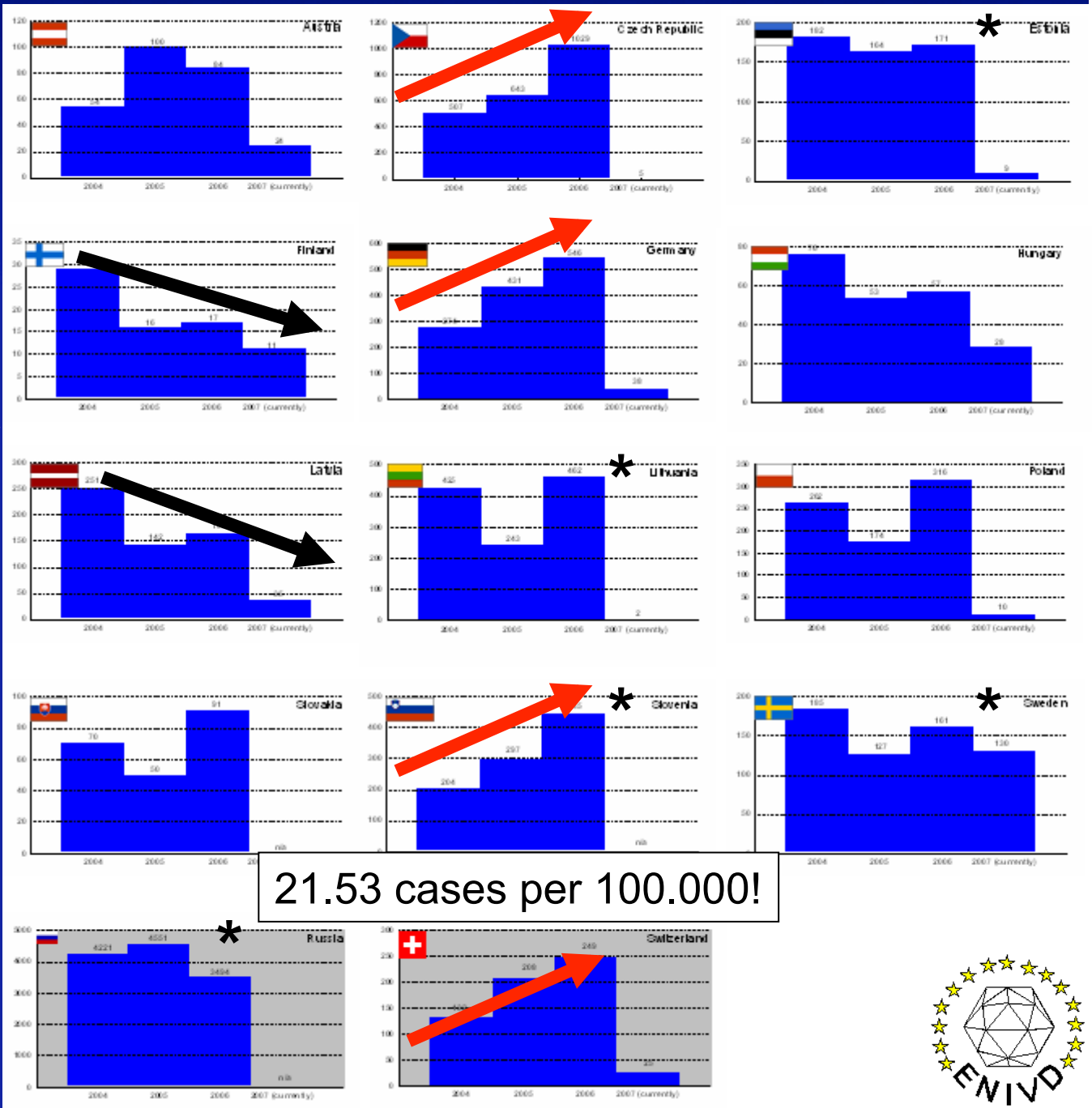
Hyalomma marginatum

Annual case numbers of TBE in European countries, 2004- summer 2007

- ► 2-fold increase
- ► highest incidence

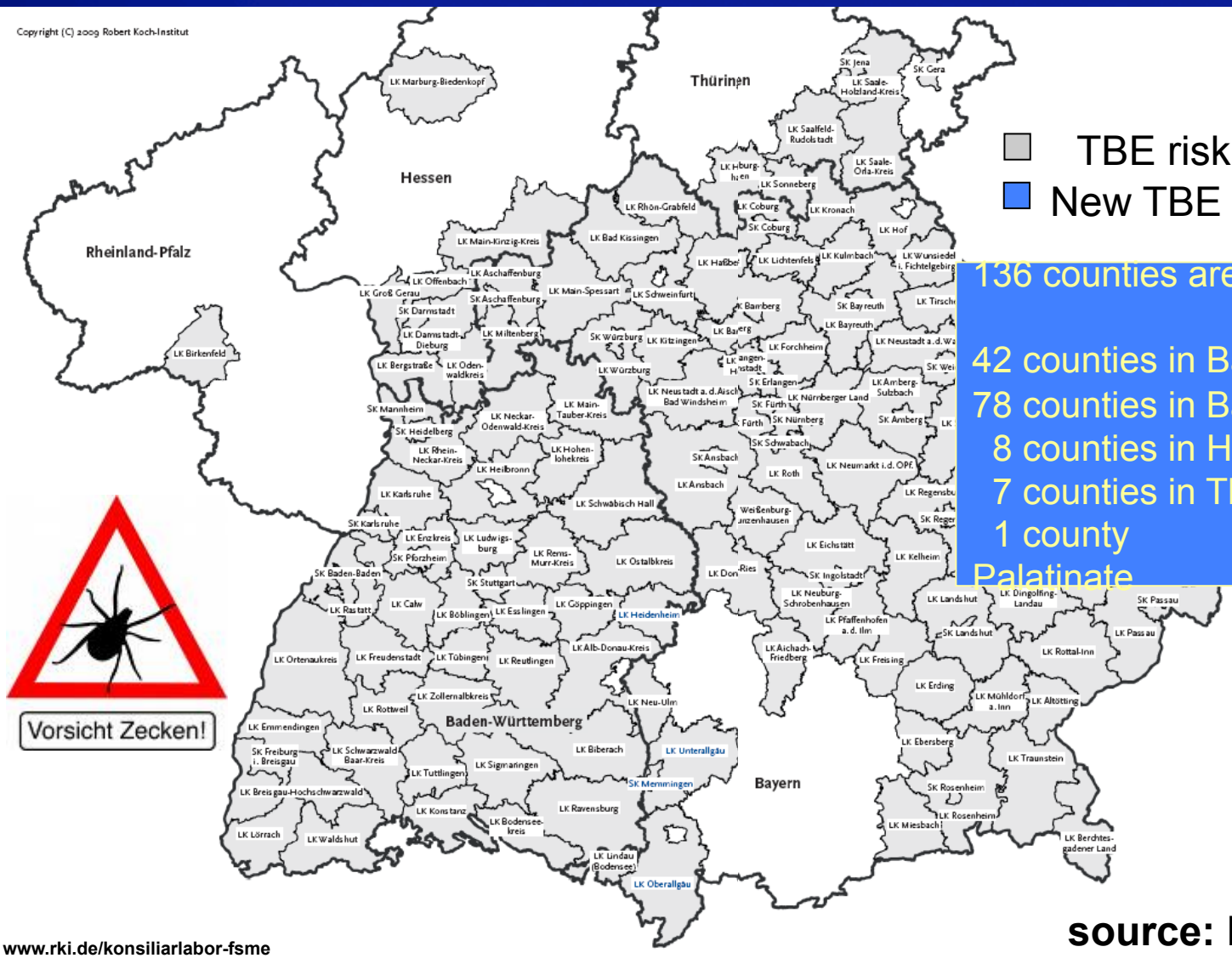
Lithuania 13.14
Estonia 12.35

- ► moderate decrease
- ► marked incidences (1.65-13.14)



21.53 cases per 100.000!

TBE endemic areas in Germany, 2010



TBE risk areas

New TBE risk areas 09

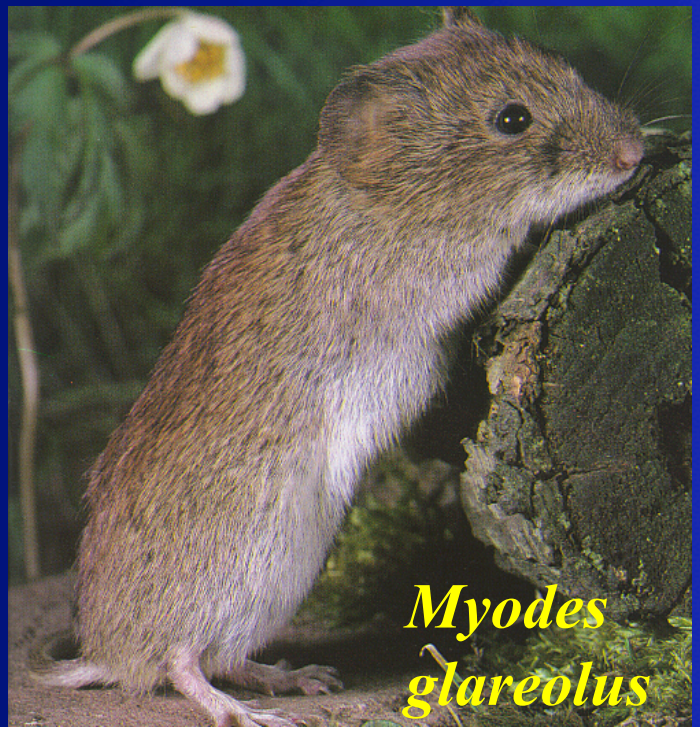
136 counties are defined risk areas:

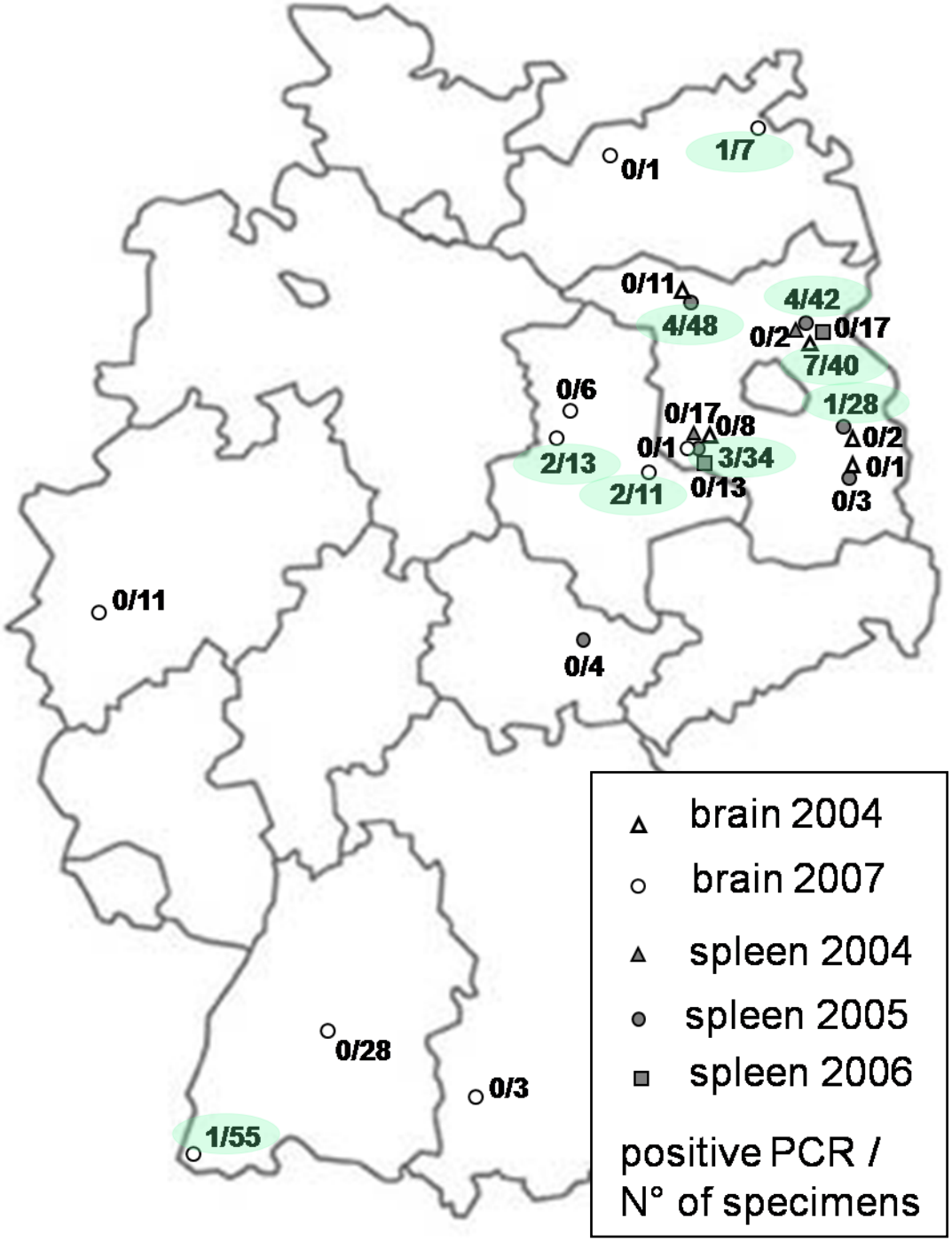
42 counties in Baden-Wuerttemberg
78 counties in Bavaria
8 counties in Hessen
7 counties in Thuringia
1 county in Rhineland-Palatinate

www.rki.de/konsiliarlabor-fsme

source: Epid Bull 17/2010

Map of Germany with sampling sites of positive tested rodent organ samples.



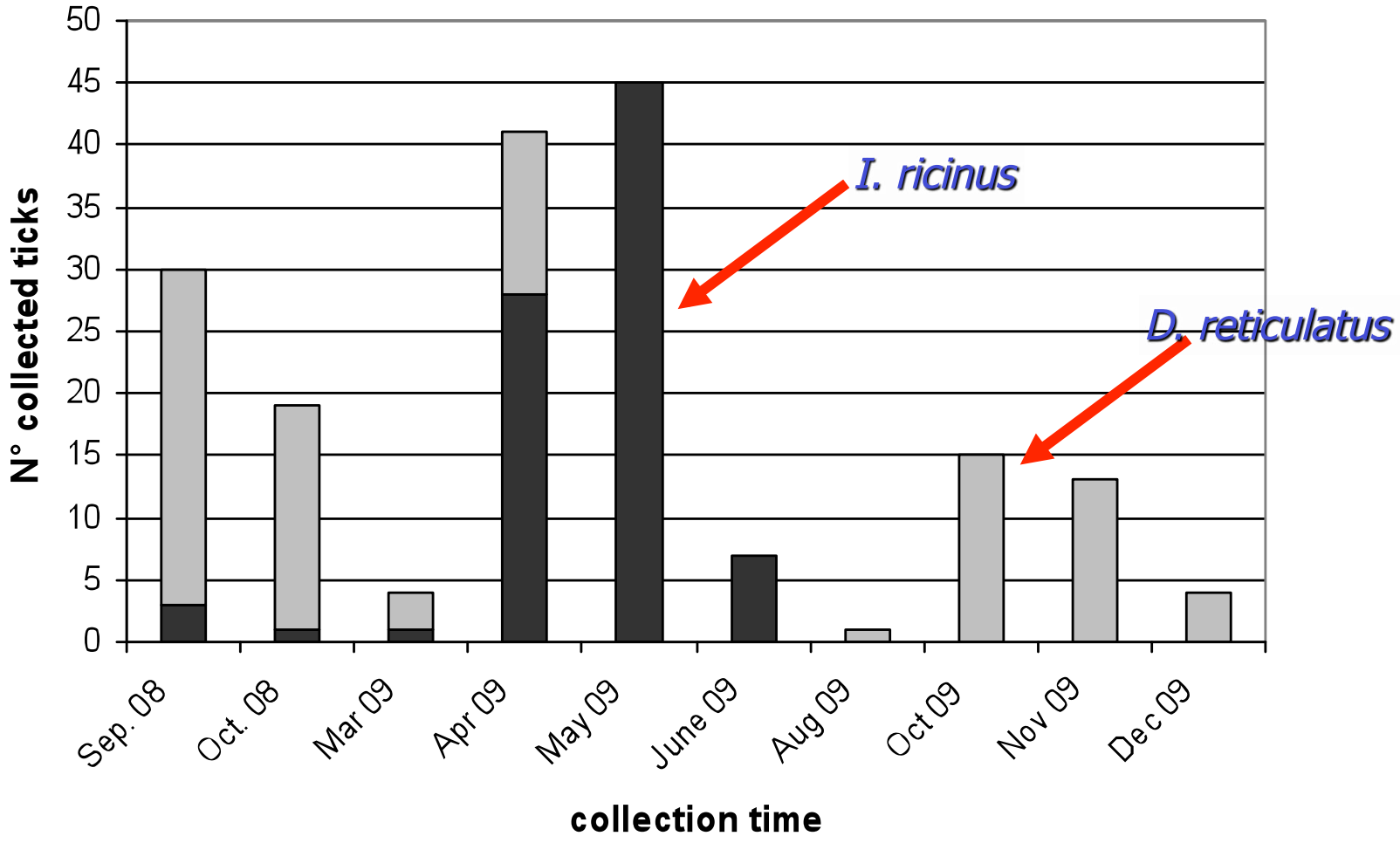


Study on ticks around Berlin

Sampling Area (geographical coordinates)	N° of *D. reticulatus*/ N° of collected ticks (% of *D. reticulatus* ticks) [factor for tick density / 100m^2]*	N° of collected tick stages	N° of pos. ticks / N° of ticks tested (% of pos. ticks)	*Borrelia* % of positive tick stages	N° of pos. ticks / N° of ticks tested (% of pos. ticks)	*Anaplasma* % of positive ticks stages	N° of pos. ticks / N° of ticks tested (% of pos. ticks)	*Rickettsia* % of positive ticks stages	N° of pos. ticks / N° of ticks tested (% of pos. ticks)	*Babesia* % of positive ticks stages
Bucher Forst (N52.64377 E13.48016)	0 / 162 (0) [2.4]	l = 39 n = 112 a = 11	8 / 37 (21.6)	l = 0 n = 22 a = 20	0 / 35 (0)	l = 0 n = 0 a = 0	11 / 32 (34.4)	l = 0 n = 34 a = 50	4 / 43 (9.3)	l = 0 n = 10.8 a = 0
Frohnau (N52.64913 E13.30765)	0 / 96 (0) [2.5]	l = 66 n = 26 a = 4	1 / 30 (3.3)	l = 0 n = 3.8 a = 0	1 / 30 (3.3)	l = 0 n = 3.8 a = 0	9 / 30 (30.0)	l = 0 n = 31 a = 100	1 / 30 (3.3)	l = 0 n = 3.8 a = 0
Wannsee (N52.42118 E13.10468)	4 / 97 (4.1) [2.9]	l = 75 n = 16 a = 6	3 / 39 (7.7)	l = 0 n = 12.5 a = 16.7	8 / 34 (23.5)	l = 0 n = 62 a = 0	14 / 32 (43.8)	l = 53 n = 18 a = 75	3 / 31 (9.7)	l = 12 n = 62.5 a = 0
Teufelssee (N52.42804 E13.62377)	1 /17 (5.9) [0.2]	l = 5 n = 6 a = 6	3 / 17 (17.6)	l = 0 n = 0 a = 75	2 / 17 (11.8)	l = 0 n = 40 a = 0	3 / 17 (17.6)	l = 40 n = 43 a = 25	0 / 17 (0)	l = 0 n = 0 a = 0
Michendorfer Heide (N52.32422 E13.00504)	124 / 216 (58.5) [0.3]	l = 6 n = 56 a = 154	4 / 74 (5.4)	l = 0 n = 25 a = 4.1	2 / 30 (6.6)	l = 0 n = 0 a = 3.3	49 / 92 (53.3)	l = 40 n = 20 a = 25	0 / 32 (0)	l = 0 n = 0 a = 0
Total	191 / 585 (32.5)	l = 191 n = 216 a = 178	19 / 194 (9.8)	l = 0 n = 15.2 a = 23.2	13 / 143 (9.1)	l = 0 n = 20.4 a = 0.6	86 / 200 (43.0)	l = 26 n = 29.2 a = 55	8 / 150 (5.3)	l = 0 n = 15.4 a = 0

Table 1: Overview of the pathogens burden analysed by PCR of ticks collected in different sampling sites in Berlin and Brandenburg. N° = number, l = larvae, n = nymphs, a = adult, * = tick factor was calculated as an average of ticks collected by dragging from three different districts in every sampling site

Number of collected ticks in and around Berlin Sep. 08 – Dec. 09

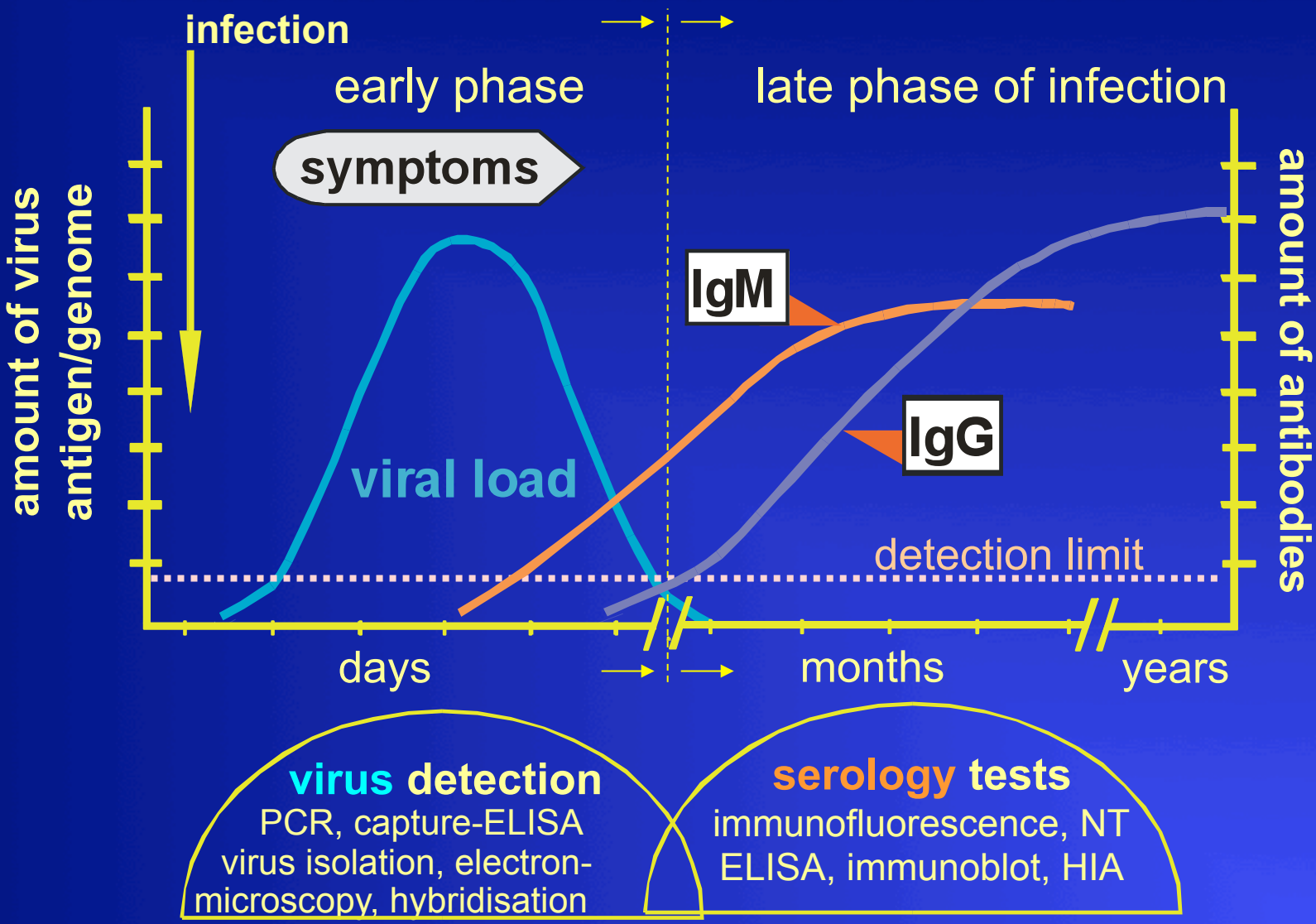


Important things required for diagnostic inve

considering all circumstances

clever physician

Diagnostic of viral infections



Duration for different diagnostic methods

Virus detection	time of diagnosis	sensitivity	specificity
- virus isolation	1 – 7 days	high*	high**
- hybridisation	3 – 4 hours	high[1]	good
- PCR/Pyrosequencing	3 – 4 hours	high[2]	high
- Electronmicroscopy	30 min	low[3]	high
- capture ELISA	3 – 5 hours	good[4]	high
Serology			
- ELISA	3 – 4 hours	high	low
- Immunofluorescence	2 – 4 hours	good	good
- Immunoblot	2 – 4 hours	good	good
- Neutralisation	4 – 7 days	good	high
- HIA	2 – 4 hours	low	good

[1] ca. 10^4 particle/ml, [2] ca. 200 genome equivalent/ml,
[3] ≥ 10^6 particle/ml, [4] ca. 0.01 µg antigen/ml

* depending on cultivation system

** depending on detection System

ROBERT KOCH INSTITUT

SARS new corona virus standard pre-paration

- DATA SHEET -

Standard preparation of SARS new Coronavirus for diagnostic purposes.

Berlin, 23rd April, 2003

Description

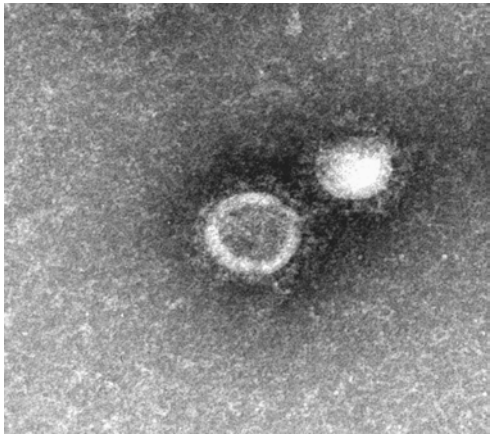
The samples you obtained contain cell culture supernatant of VeroE6 infected with the new Coronavirus causing the „severe acute respiratory syndrome“ (SARS).
The samples were thoroughly analysed for infectivity after inactivation by heat and gamma irradiation. According to the inactivation procedures used, we assure you that we provide you with safe and **non-biohazard** material which can be handled under normal laboratory conditions. The virus preparation was diluted in human plasma before aliquoting and freeze drying.

-- **The sample must be resolved by adding 100 µl bi.dest. water before use.** --

Analysis of the samples

The samples contain a mean of 9.4 x 10^6 genome equivalents per ml (geq/ml) analysed by Christian Drosten, Bernhard-Nocht-Institut, Hamburg, Germany.

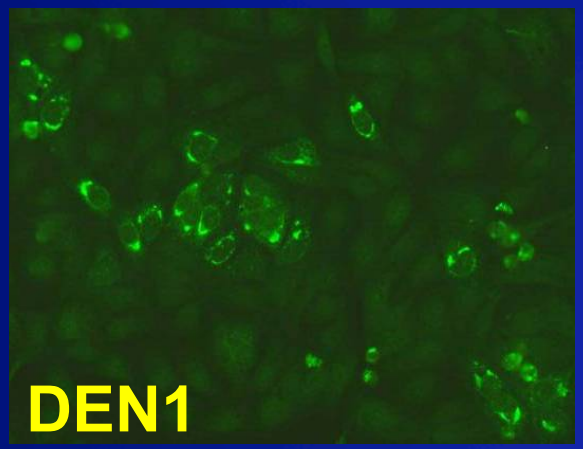
In electron microscopy analysis performed by Hans Gelderblom, Robert Koch-Institut, Berlin, Germany we could demonstrate the presence of Coronavirus particles in the samples (see picture).

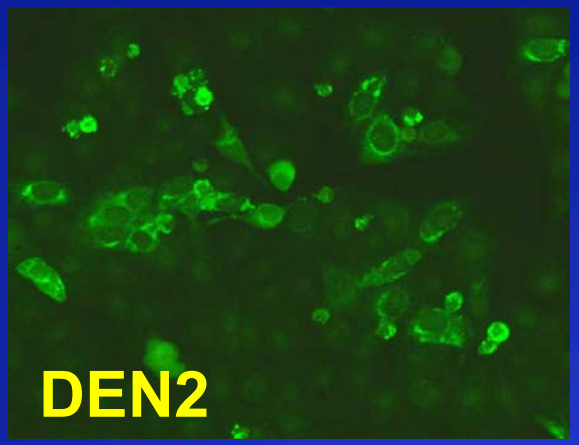


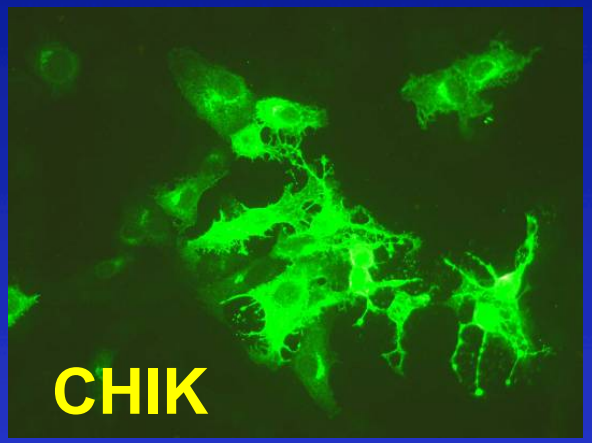
The infectivity of the cell culture supernatant before inactivation is determined by a titre of 10^7/ml.

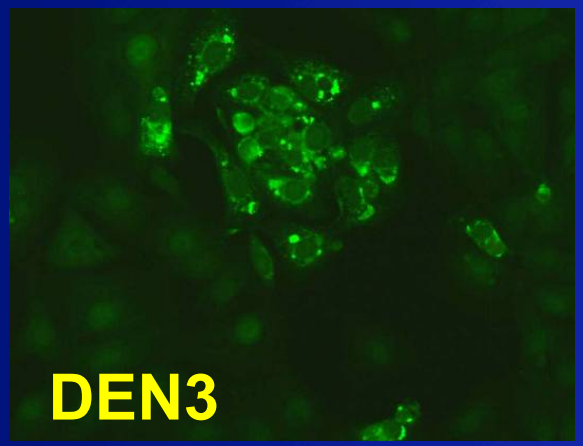
Acknowledgement:

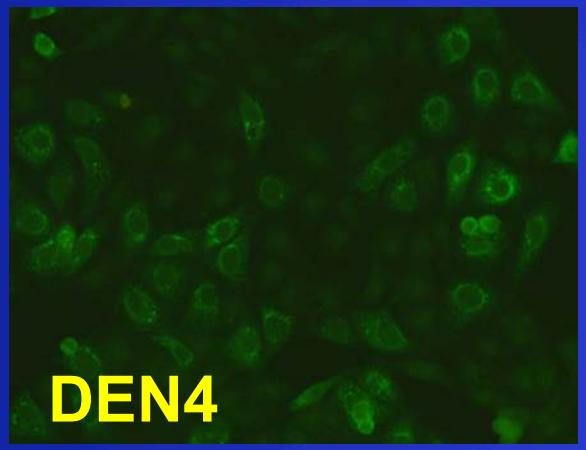
Immunofluoreszens Teste Dengue und Chikungunya



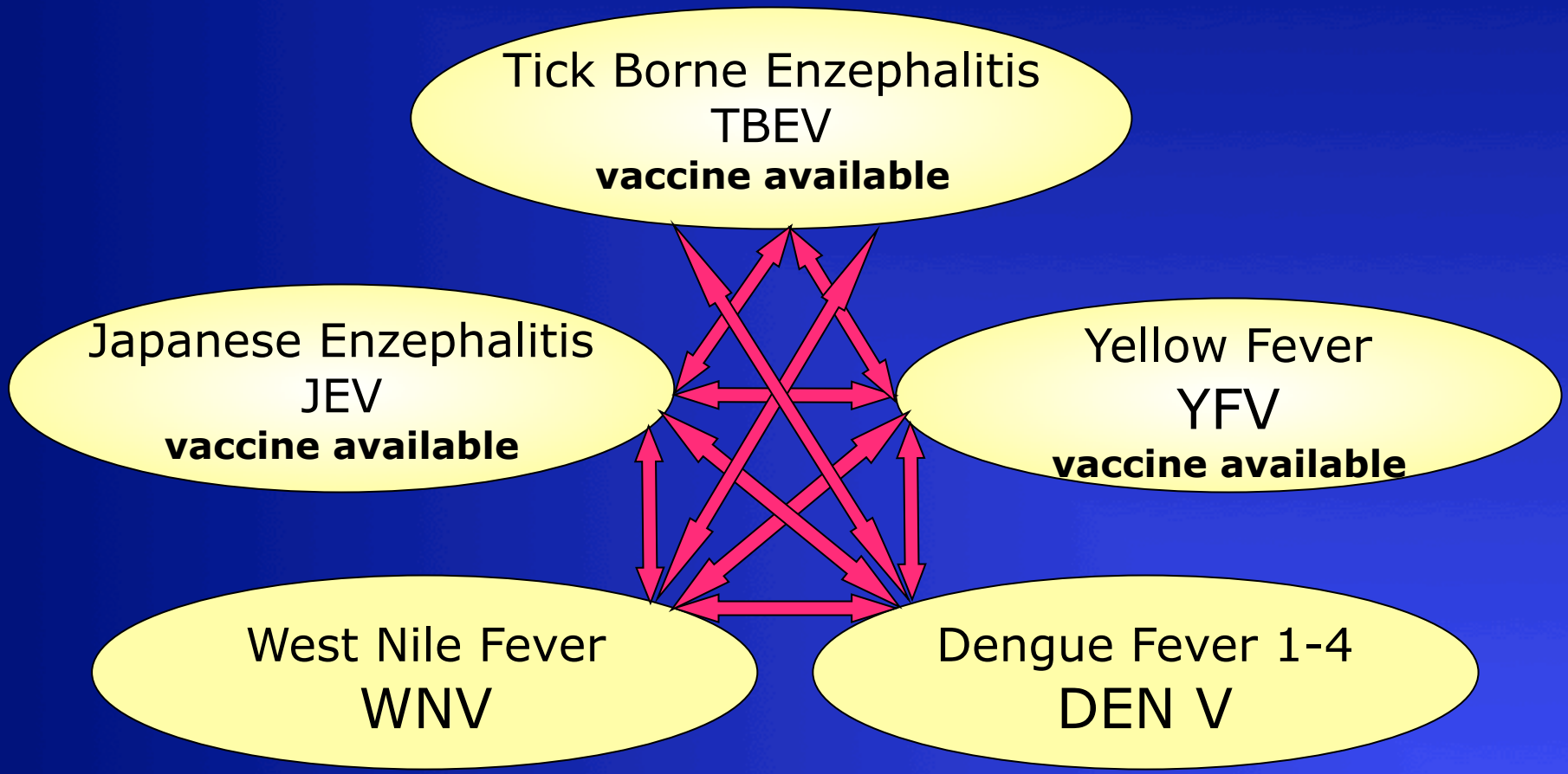








Kreuzreaktivität zwischen verschiedenen Flaviviren bei diagnostischen Testen (IFA, EIA)



Koraka et al., 2002

EQA studies performed by the ENIVD between 1999 and 2009

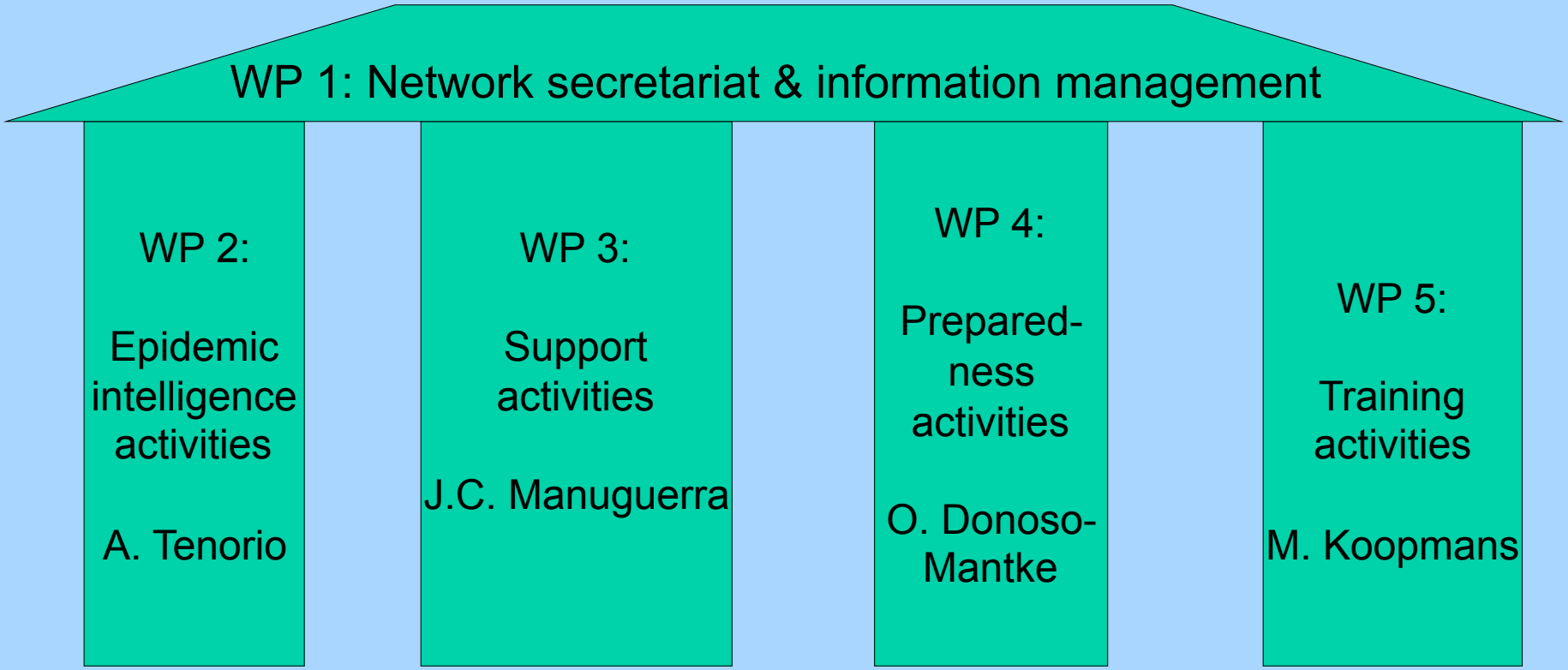
Period of time	Viral agent	Type of methods	No. of participants (labs)	No. of participants (countries)	No. of samples positive/negative	No. of labs with good overall proficiency	Reference
1999/2000*	Hantavirus	Serology	13	10	3/1	11 (85 %)	published
2001/2002	Hantavirus	Serology	18	14	14/6	13 (72 %)	published
1999*	Dengue virus	Serology	13	10	2/2	11 (85 %)	published
2002	Dengue virus	Serology	18	16	18/2	15 (83 %)	published
2002/2003	Dengue virus	PCR	13	12	7/3	5 (38 %)	published
2002/2003	Filovirus	PCR	14	13	7/5**	7 (50 %)	published
2002/2003	Lassa virus	PCR	14	13	8/5**	8 (57 %)	published
2002/2003	Orthopox virus	PCR	23	15	13/5**	10 (43 %)	published
2004	SARS-CoV	PCR	62	37	7/3	54 (87 %)	published
2004	SARS-CoV	Serology	30	19	5/6	13 (43 %)	published
2004/2005	Orthopox virus	PCR	34	18	11/9	85% / 58% ***	published
2005	West Nile Virus	PCR	28	20	6/5	17 (60%)	published
2005	West Nile Virus	Serology	28	20	4/6	20 (71%)	published
2005	Tick borne Enc.	PCR	23	16	9/3	9 (39%)	published
2005	Tick borne Enc.	Serology	42	25	8/5	25 (60%)	published
2007	Chikungunya	PCR	32	30	8/4	21 (66%)	published
2007	Chikungunya	Serology	31	30	8/4	14 (45%)	published
2009	Dengue virus	PCR	37	25	8/4	19 (45%)	submitted

* Pre-evaluation panel tested before running the respective EQA to optimise sample preparation and shipping procedures. ** The same negative samples were included in the three test panels for diagnostic of Filo-, Lassa- or Orthopox virus. *** consist out of two panels: one for sensitivity and specificity including inhibiting factors

External quality assurance study on Dengue PCR diagnostic

Lab. no.	RT-PCR technique	Samples no.	#2	#9	#12	#4	#14	#5	#13	#6	#10	#11	#3	#7	Score*	Correct results (%)
			DEN-1	DEN-1	DEN-1	DEN-1	DEN-1	DEN-3	DEN-3	DEN-2	DEN-4	JE/YF/WNV/ TBEV	CHIKV	Negative		
		Copy no. [ge/mL]	7,0E+04	5,0E+03	7,5E+02	7,0E+01	7,0E+00	3,0E+03	3,0E+02	1,0E+04	1,0E+04	neg.	neg.	neg.		
8	Heminested[a]		++	++	++	++	++	++	++	++	++	-	-	-	22	100
7	TaqMan[b]		++	++	++	++	(-)	++	++	++	++	-	-	-	22	100
13	SYBR-Green[b]		++	++	++	++	(-)	++	++	++	++	-	-	-	22	100
17	TaqMan[c]		++	++	++	++	(-)	++	++	++	++	-	-	-	22	100
12	TaqMan[c]		++	++	++	+	++	+	(-)	++	++	-	-	-	20	91
2a	Nested[d]		++	++	++	(-)	(-)	++	++	++	++	-	-	-	20	91
21	Nested/SYBR-based[e]		++	++	++	++	(-)	++	++	++	++	(+)	-	-	20	91
2b	TaqMan[c]		++	++	++	(-)	(-)	++	(-)	++	++	-	-	-	18	82
4	Nested[N]/TaqMan-based[e]		++	++	++	(-)	(-)	++	(-)	++	++	-	-	-	18	82
28	Nested/TaqMan-based[e]		++	++	++	(-)	(-)	++	(-)	++	++	-	-	-	18	82
15	TaqMan[c]		++	++	(-)	(-)	++	++	(-)	++	++	-	-	-	18	82
9	Nested/TaqMan-based[e]		++	++	++	+	(-)	++	++	++	+	(+)	-	-	18	82
5	TaqMan[f]		++	++	++	++	(-)	(-)	(-)	++	++	-	-	-	18	82
20	TaqMan[f]		++	++	++	++	(-)	(-)	(-)	++	++	-	-	-	18	82
14	Nested[c]		+	+	+	+	(-)	++	++	++	+	-	-	-	17	77
27	Nested[g]		+	++	++	++	(-)	++	(-)	++	++	(+)	-	-	17	77
29	TaqMan[b]		++	++	++	(-)	(-)	++	(-)	++	(-)	-	-	-	16	73
31	TaqMan[c†]		+	+	+	+	+	+	+	+	+	-	-	-	15	68
23b	TaqMan[c]		+	+	(-)	(-)	(-)	++	(-)	++	++	-	-	-	14	64
19a	Nested[d]		++	++	(-)	(-)	(-)	++	(-)	(-)	++	-	-	-	14	64
1	Light Cycler[M]		++	++	(-)	(-)	(-)	+	+	++	(-)	-	-	-	14	64
36	Nested[N]		+	+	+	(-)	(-)	+	+	+	+	-	-	-	13	64
10	TaqMan[c]		+	+	+	(-)	(-)	+	+	+	+	-	-	-	13	59
19b	TaqMan[h]		+	+	+	(-)	+	+	+	+	(-)	-	-	-	13	59
25	Nested/TaqMan-based[e]		++	+	(-)	(-)	(-)	++	(-)	++	(-)	-	-	-	13	59
22	TaqMan[c]		++	++	(-)	(-)	(-)	(-)	(-)	(-)	++	-	-	-	12	55
30	Nested[g]		(-)	++	(-)	++	++	(-)	(-)	+	(-)	-	(+)	-	11	50
37	TaqMan[h]		+	+	(-)	(-)	(-)	+	+	+	(-)	-	-	-	11	50
3	SYBR-Green[c]		+	(-)	(-)	(-)	(-)	+	(-)	+	+	-	-	-	10	45
16	Nested/Light Cycler-base		++	+	(-)	++	+	+	+	+	+	(+)	(+)	(+)	10	45
18	TaqMan[h]		+	+	(-)	(-)	(-)	(-)	(-)	+	+	-	-	-	10	45
24	RT-PCR[g]		+	+	(-)	(-)	(-)	(-)	(-)	+	+	-	-	-	10	45
6	Light Cycler[i†]		+	+	(-)	(-)	(-)	+	(-)	+	(-)	-	-	-	10	45
11	Nested [j]		++	++	(-)	(-)	(-)	+	(-)	+	(-)	(+)	-	-	10	45
34	TaqMan[k]		+	+	(-)	(-)	(-)	(-)	(-)	(-)	+	-	-	-	9	41
35a	Nested[d]		++	++	(-)	(-)	(-)	(-)	(-)	(-)	(-)	-	-	-	10	45
23a	SYBR-Green[c]		+	(-)	(-)	(-)	(-)	(-)	(-)	+	(-)	-	-	-	8	36
32	Heminested[a]		++	(-)	(-)	(-)	(-)	(-)	(-)	(-)	(-)	-	-	-	8	36
33	TaqMan[h]		+	+	+	(-)	(-)	(-)	(-)	+	+	-	-	-	8	36
26	Nested[g]		(-)	(-)	(-)	(-)	(-)	(-)	(-)	(-)	(-)	-	-	-	6	27
35b	Nested[L]		(-)	(-)	(-)	(-)	(-)	(-)	(-)	(-)	+	-	-	(+)	5	22
		Correct positive/negative results (%)	93	88	51	34	17	68	36.5	83	71	88	95	95		

ECDC public tender OJ/2008/04/14 – PROC/2008/007: "European network of laboratories for outbreak assistance and support"



September 2008: Kick-off meeting in Stockholm → Service level agreement

Partners of the ENIVD-CLRN

WHO

PAHO

EuroTravNet

The European Travel Medicine Network
of the International Society of Travel Medicine
www.eurotravnet.eu

http://www.euronetp4.eu

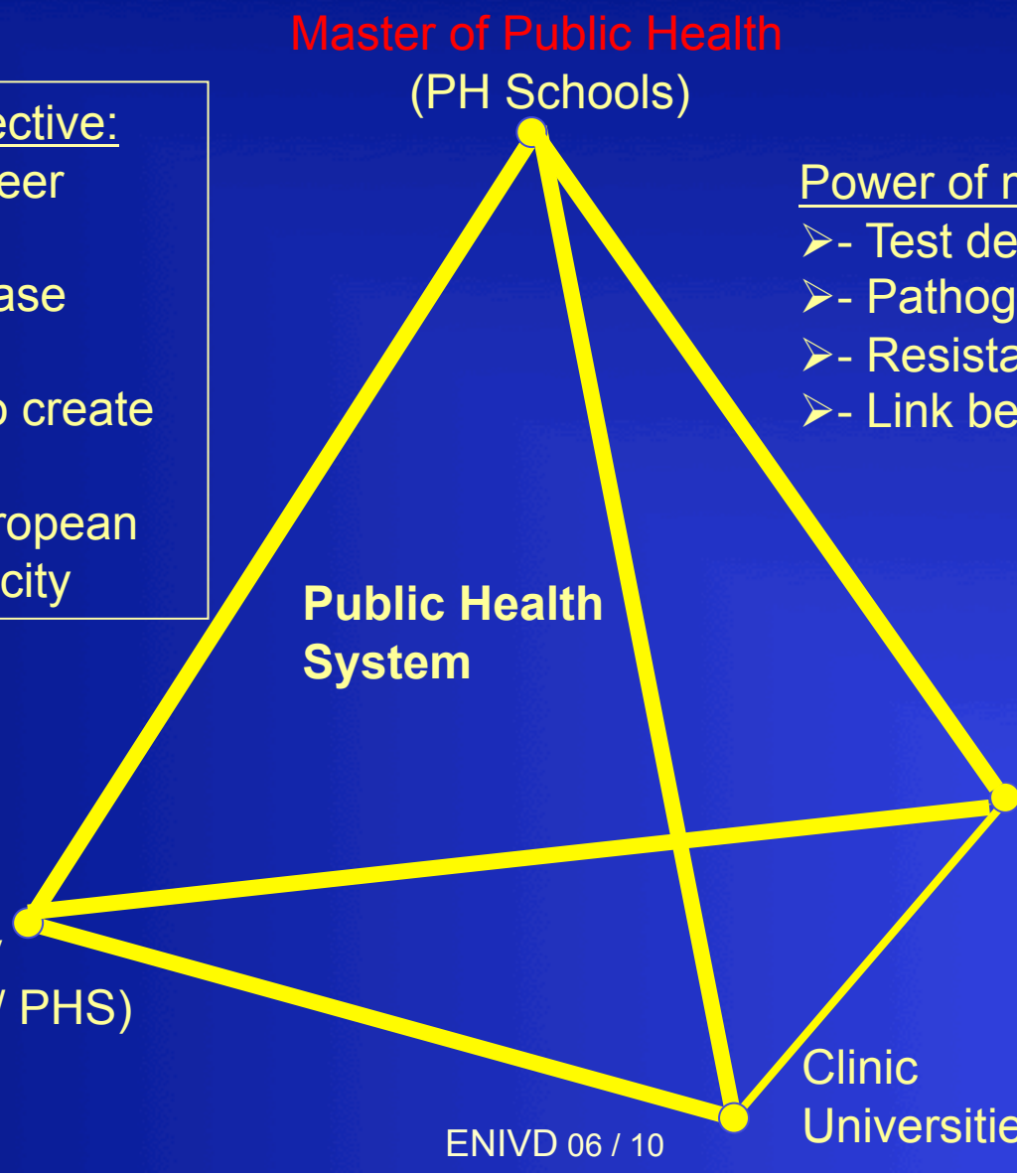
http://www.tropnet.net/

Red Iberoamericana en Virosis Emergentes
http://rivecyted.fcien.edu.uy/index.htm

Why a special training for microbiologists?

Long term perspective:

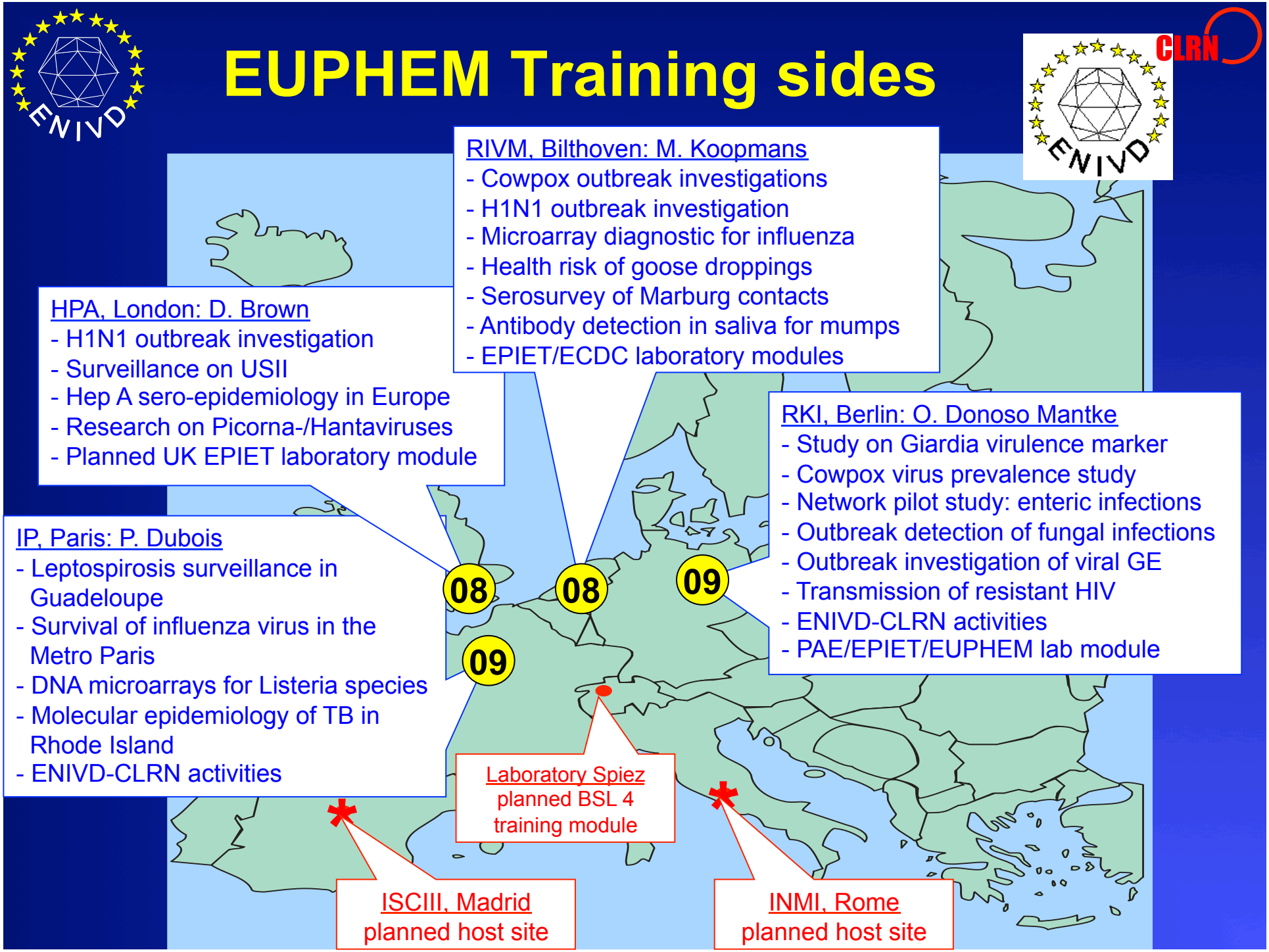
- To increase career perspectives
- Infectious disease specialists
- Joint training to create partnerships
- Strengthen European response capacity



Power of microbiologists:

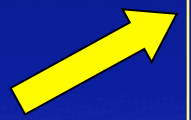
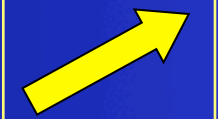
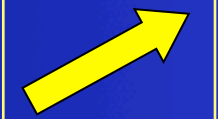
- - Test development / validation
- - Pathogenesis study
- - Resistance study
- - Link between all

EUPHEM Training sides



What is coming next?

Future prospects & whats to do?

Zoonotic & vector borne viral diseases		Closer & better collaboration with vetenarians & entomologists
Human-only viruses		Proceed with erradication measures. Check for vaccination schedule in travelers.
Sexually transmitted viruses		Better education of risks and protection measures for travelers
Food- & water-borne virus		
Repiratory viruses		

Topics of common interest of VBORNET & ENIVD for Public Health

- distribution of vectors
- presence of viral pathogens in the vectors
- studies on vector competence
- surveillance studies for vector borne human viral pathogens
- development of test algorithm (diagnostic tools) for vector borne viral pathogens

Organisation of the Network

Thanks for your attention!

Whats coming next we do not know?

ROBERT KOCH INSTITUT

The network is presently organised by M. Niedrig and his team from the Robert Koch-Institut in Berlin

The ENIVD-CLRN project is funded by the ECDC

www.enivd.org

Thanks for your attention!