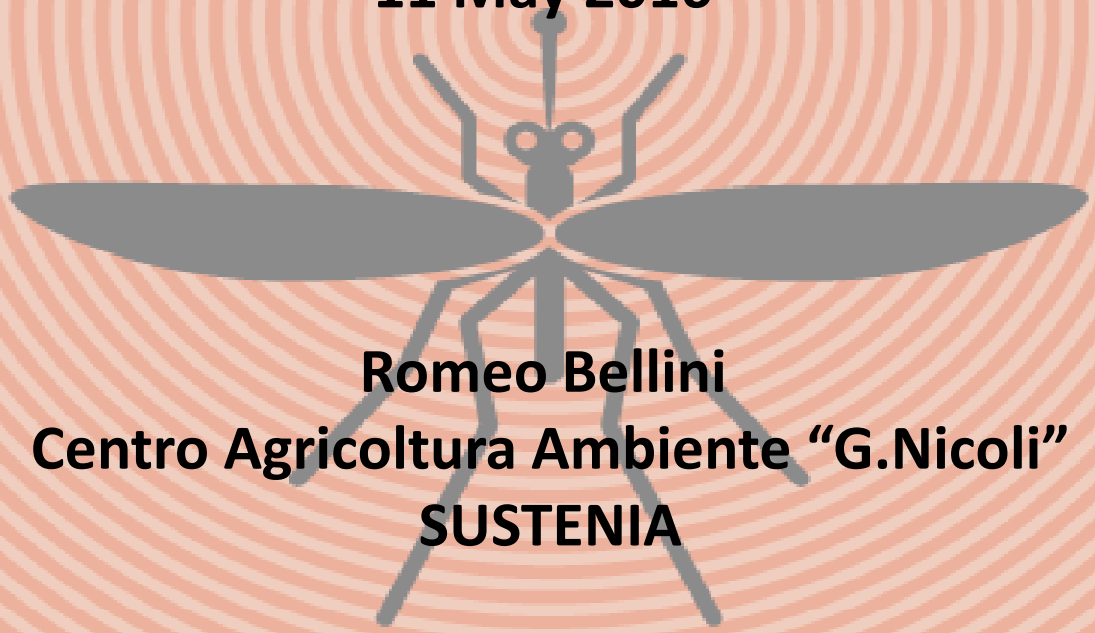
Zika

WHAT THE RISK LEVEL IN EUROPE ?

11 May 2016



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SUSTENIA

LOVCEN meeting, Podgorica, May 10-13, 2016

Aedes albopictus

- **exotic species**
- **first detection in Europe:** 1978, Albania
- **larval habitat**: artificial containers, three holes
- **ethology**: female actives daily, very aggressive
- **hosts**: opportunistic
- **overwintering**: diapausing eggs

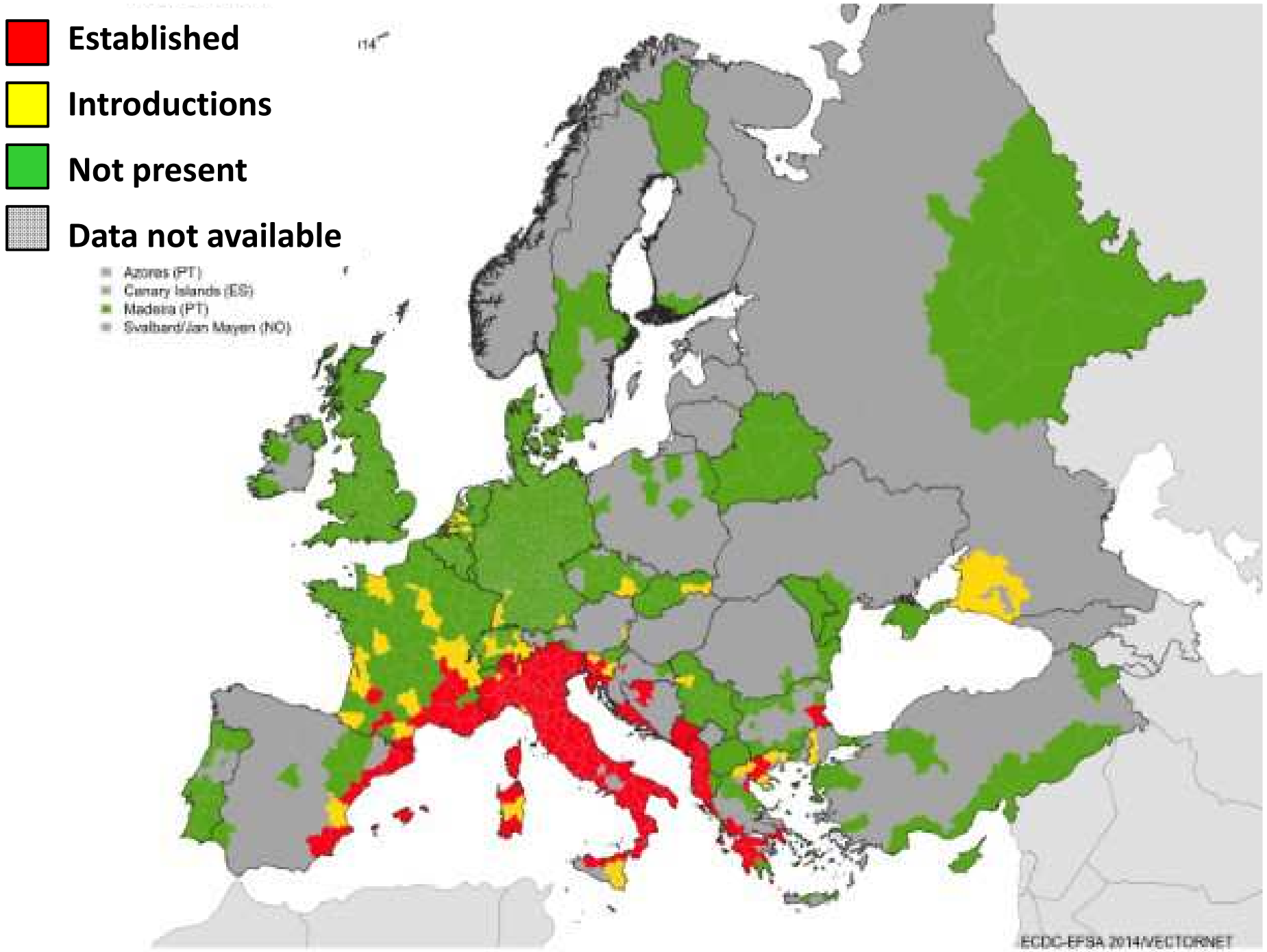
VECTOR COMPETENCE *AEDES ALBOPICTUS (1)*

	infection	transmission	
FLAVIVIRIDAE			
Dengue 1,2,3,4	+++	+++	Mitchell et al., 1987
	+++	+++	in Mitchell, 1991
Yellow fever	++	++	in Mitchell, 1991
St. Louis E.	+	+	Savage et al., 1994
West Nile	+(?)	+(?)	in Shroyer, 1986
	+++	+++	Turell et al., 2001
	+++	+++	Sardelis et al., 2002
Usutu	+	+	Bellini et al., in process
Zika	+++	+++	Wong et al., 2013
	++	+	Chouin-Carneiro et al., 2016
	+	+	Di Luca et al., 2016
TOGAVIRIDAE			
Eastern Equine E.	+++	++	Turell et al., 1994
Western Equine E.	+++	+++	in Mitchell, 1991
Venez. Equine E.	+++	++	Turell e Beaman, 1992
Ross River	++	++	Mitchell et al., 1987
Mayaro	++	++	in Mitchell, 1991
Chikungunya	++	++	Mangiafico, 1971

VECTOR COMPETENCE *AEDES ALBOPICTUS (2)*

	infection	transmission	
BUNYAVIRIDAE			
LaCrosse	+++	++	in Mitchell,1991
Jamest. Canyon	+++	+	in Mitchell, 1991
Keystone	+++	-	in Mitchell, 1991
Oropouche	+	-	in Mitchell, 1991
Potosi	+	+	in Mitchell, 1991
Rift Valley Fever	++	+	in Mitchell, 1991
Tahyna	+	(?)	Portolani et al., 2001
Trivittatus	+	-	in Mitchell, 1991
REOVIRIDAE			
Orungo	+(?)	+(?)	in Shroyer, 1986

+++high; ++ moderate; + low; - negative; (?) not determined


Established
Introductions
Not present
Data not available
Azores (PT)
Canary Islands (ES)
Madeira (PT)
Svalbard/Jan Mayen (NO)
ECDC-EFSA 2014/VECTORNET

ZIKV has been isolated from several mosquito species in Africa: *Aedes africanus*, *Ae. apicocoargenteus*, *Ae. furcifer*, *Ae. luteocephalus*, *Ae. taylori*, *Ae. vittatus* e *Ae. aegypti* (Faye et al. 2014)

In Gabon an epidemic of Chikungunya & Dengue started from 2007, with *Ae. albopictus* indicated as the primary vector.

A retrospective study on human sera and mosquito pools collected during the epidemic (2007-2010), showed 5 sera and 2 *Ae.albopictus* pools positive for ZIKV.

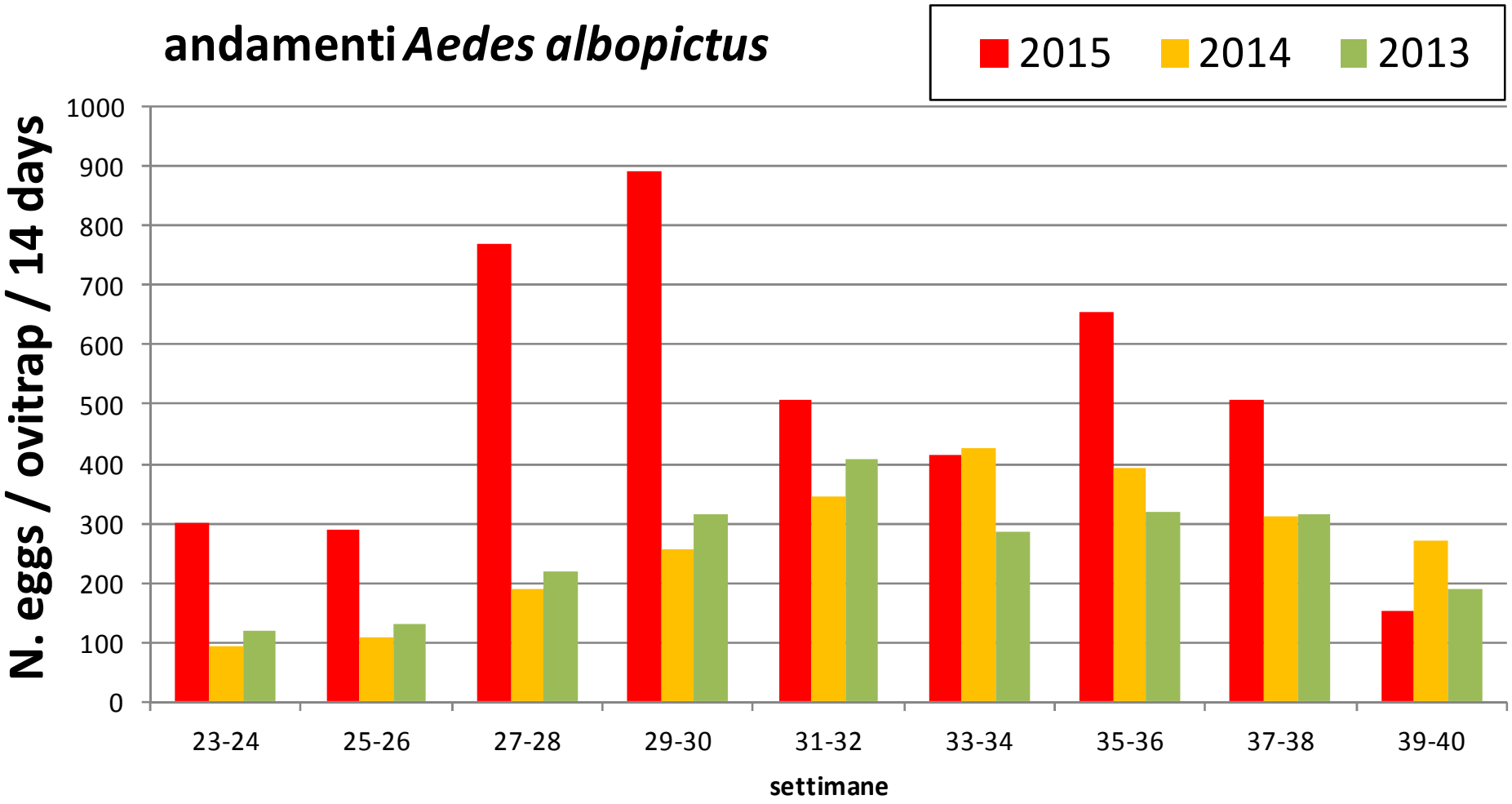
The IR observed for ZIKV was similar to the IR observed for Dengue.

The ZIK circulation was undected because of the Dengue & Chik circulation (Grard et al. 2014).

A ZIKV large epidemic was registered in French Polynesia and New Caledoniafrom October 2013.

The vectors were *Ae. aegypti* and *Ae. polynesiensis* (ECDC 2014)

Population dynamic *Aedes albopictus* in Emilia-Romagna



Epidemiological risk assessment on the N of *Aedes albopictus* eggs in Emilia-Romagna

Mean N eggs/14 dd	CHIK A226V	CHIK	Dengue	Zika
< 100	$R_0<1$	$R_0<1$	$R_0<1$	$R_0<1$
101-250	$1<R_0<2$	$R_0<1$	$R_0<1$	$1<R_0<2$
251-400	$2<R_0<3$	$R_0<1$	$R_0<1$	$1<R_0<2$
401-700	$3<R_0<5$	$1<R_0<2$	$1<R_0<2$	$2<R_0<3$
701-1000	$5<R_0<7$	$1<R_0<2$	$1<R_0<2$	$3<R_0<5$
1001-1500	$7<R_0<10$	$2<R_0<3$	$2<R_0<3$	$3<R_0<5$
> 1501	$R_0>10$	$3<R_0<5$	$3<R_0<5$	$5<R_0<7$

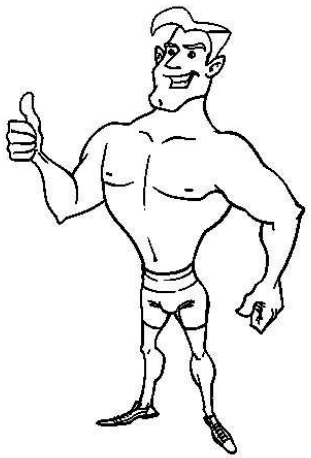
ASYMPTOMATICS ?

- Dengue: 20–97% infections are asymptomatic
- Chikungunya: 25% infections are asymptomatic
- Zika: 80% infections are asymptomatic

IT IS RETAINED THAT ASYPTOMATIC CASES ARE IN GENERAL LOW INFECTIVE FOR MOSQUITOES (TO BE BETTER INVESTIGATED FOR ZIKA)

Possible risk of ZIKV introduction

asymptomatic infected traveller



Vertical transmission ?

WHY THE EPIDEMIC IN THE AMERICAS ?

It has been observed that anti-flavivirus antibodies (e.g. dengue) may increase ZIKV replication in the lab.

Philip K. Russell, 2016