



SERVIZIO SANITARIO REGIONALE
EMILIA-ROMAGNA
Azienda Unità Sanitaria Locale di Cesena

15 giugno 2010

*The impact of globalisation and
climate change on the development
of mosquitoes and mosquito-borne
diseases in Europe*



Act locally



**Think
globally**



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MOSQUITO IN THE WORLD

There are about 3,500 species of mosquitoes. In some species of mosquito, the females feed on humans, and are therefore **vectors** for a number of infectious diseases affecting millions of people.



MOSQUITO IN THE EUROPE

There are about 98 species



SPECIES OF "URBAN" MOSQUITO

Culex p. pipiens

Culex p. molestus

Culiseta annulata

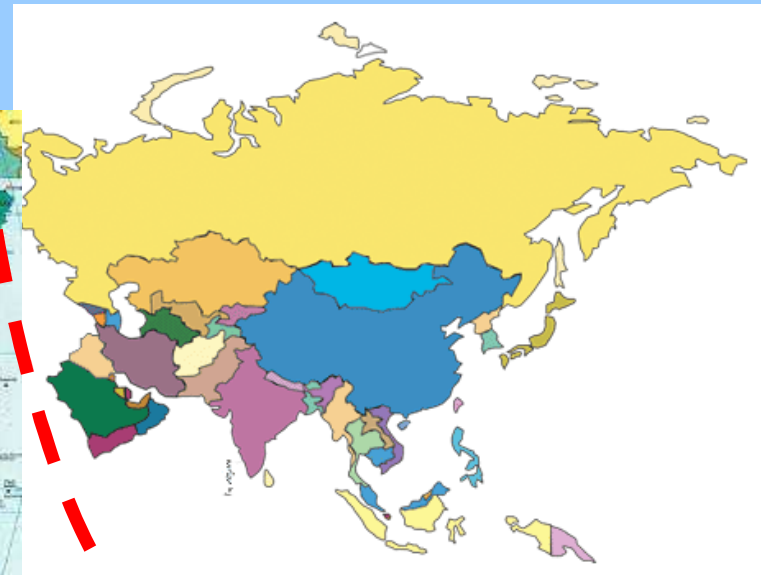
Ae. albopictus



An. plumbeus

Ae. geniculatus







Mosquito as vector of disease in Europe

West Nile:

Romania 1996/1997

Russian Federation 1999

France 2000

Italy 2002/2008/2009

Dengue:

Greece 1927/1928

Dirofilaria:

Italy

France

Spain

Greece

Chikungunya:

Le Reunion 2006

Italy 2007

Mosquito in Italy



ANOPHELINAE:

1) Anopheles (16 species)

CULICINAE:

1) Aedes (9 species)

2) Culex (12 species)

3) Culiseta (6 species)

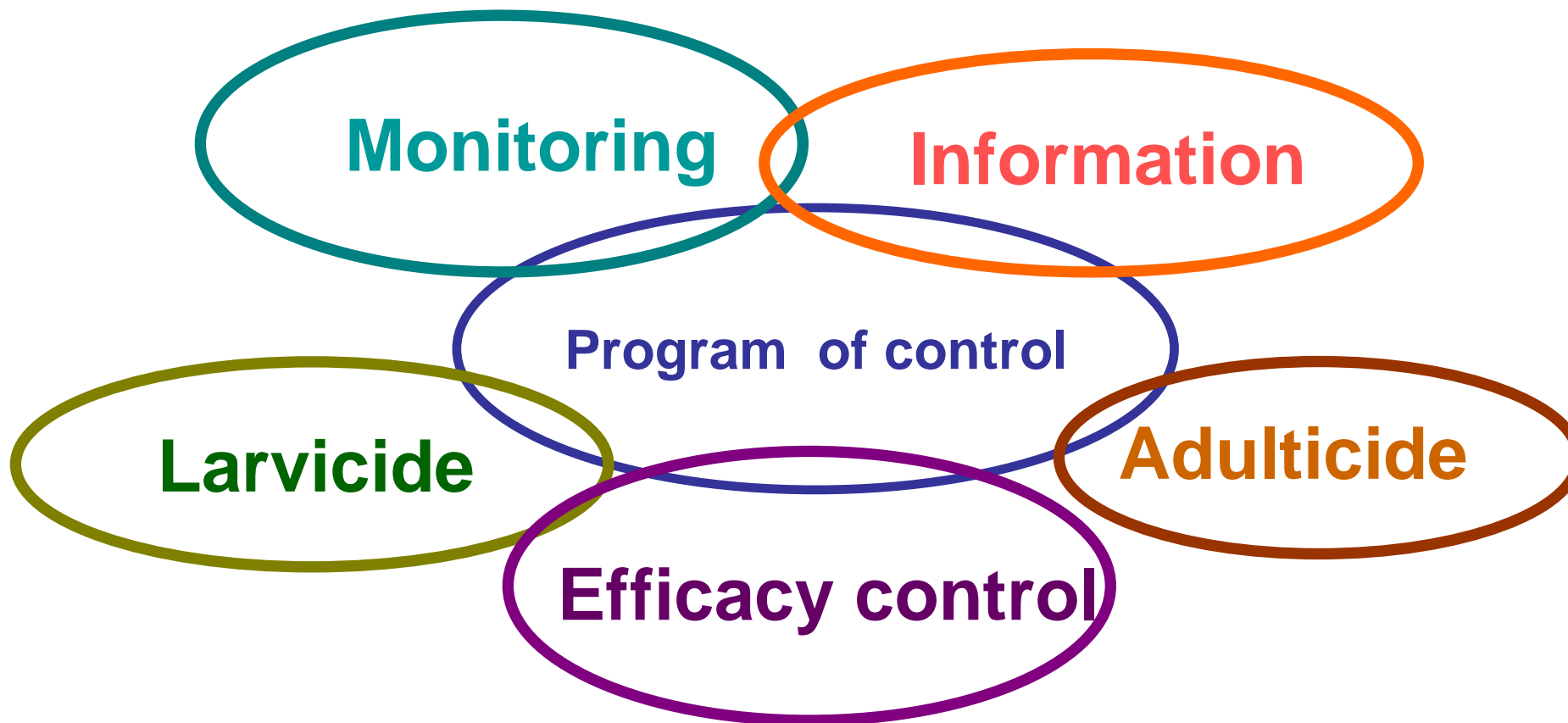
4) Ochlerotatus (17 species)

5) Orthopodomyia (1 specie)

6) Coquillettidia (2 species)

7) Uranotaenia (1 specie)

About 70 species





MOSQUITO CONTROL AND MANAGEMENT

1. **Sanitation, environmental modification measures and biological control** to reduce the development of vectors;
2. **Larviciding** with chemical or biochemical insecticides, for a rapid reduction of the mosquito proliferation
3. **Residual adulticiding** to reduce the longevity of vectors and to stop the cycles of transmission
4. **Passive protection** measures to reduce host –vector contacts



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main control measures



Public Health Department

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Mosquito in Piedmont



- Piedmont has the widest rice-growing area in Europe, with more than 120,000 ha
- The current rice growing practice provides in the first part of the season a sequence of flooding cycles that fits strictly with the development of *Ochlerotatus caspius* population
- It causes the development of a great nuisance for both humans and animals with heavy impacts on local economy
- So the Piedmont Abatement Plan has its main target in *Oc. caspius*

Mosquito control guidelines

Control by growers:

- indirect control → different water management with less flooding cycles
- direct control → larvicide intervention during usual practices

Control by Abatement Plan:

- aerial treatment
- fish



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Control in the city





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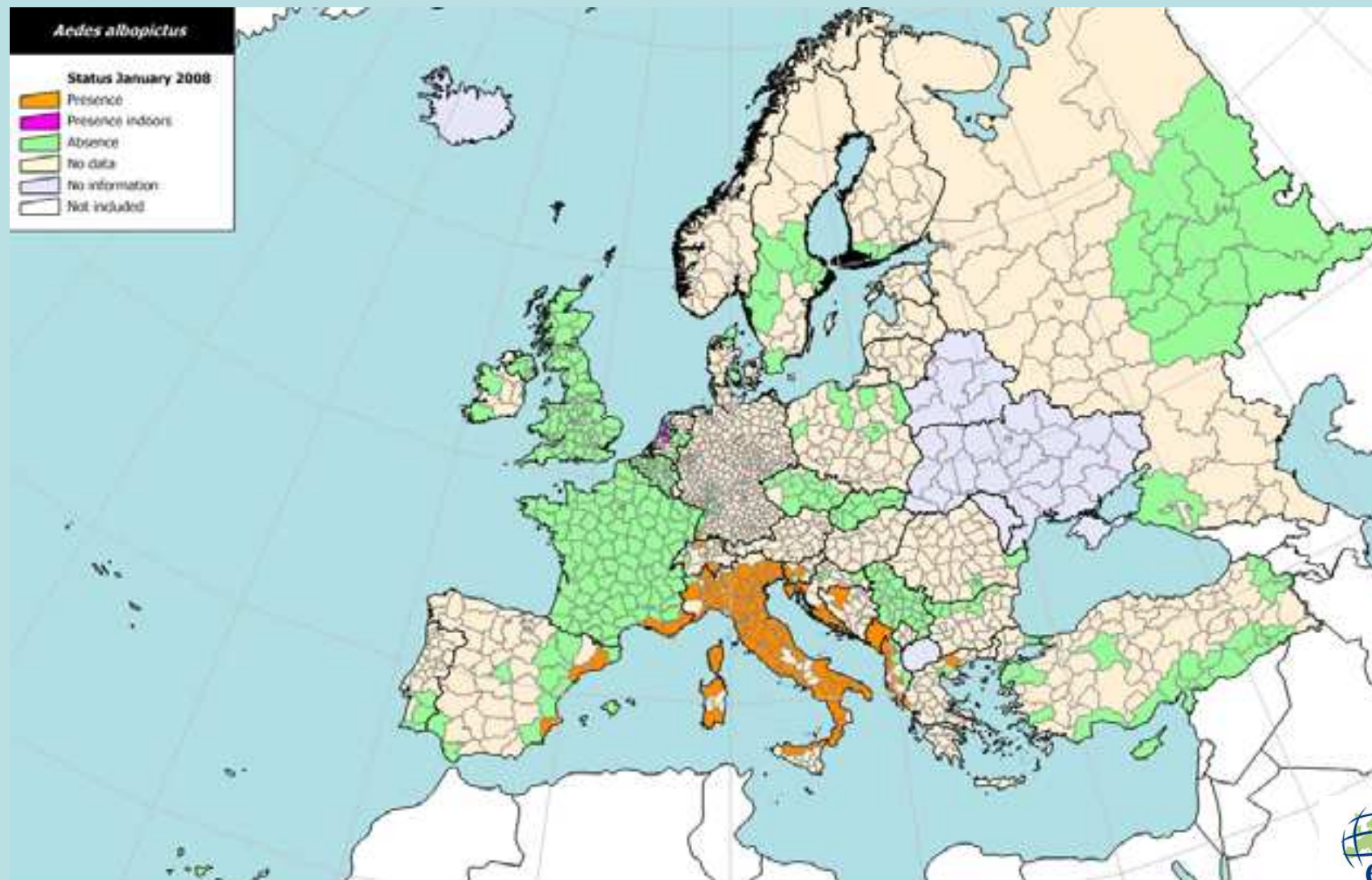
Aedes albopictus



In Europe

In Italy

Current distribution of *Aedes albopictus* in Europe



Albania

Introduction

First report of nuisance: 1975

Discovery: August 1979

Pathway: imports from China

Greece

Introduction

First report of nuisance: people on Corfu reported mosquito nuisance in 2000–2001

Discovery: 2003, Corfu and Igoumenidsa

Pathway: ferry traffic from Albania and/or Italy

Spain

Introduction

First report of nuisance: 2003, near Barcelona.

Discovery: 2004.

Pathway: probably by road from Italy



Croatia

Introduction

First report of nuisance: 2005.
Discovery: 2004, Zagreb.
Pathway: road traffic and ferry traffic from Italy, possibly also via used tyres imported from Italy.

Bosnia and Herzegovina

Introduction

First report of nuisance: no updated information available
Discovery: autumn 2005
Pathway: probably road traffic from Italy

Slovenia

Introduction

First report of nuisance: 2005
Discovery/Observation: 2007
Pathway: probably road traffic from Italy



***A.albopictus* in Italy**

The first *Aedes albopictus* cases ever reported in Italy date back to the early 1990's, when this vector was first introduced in Italy through the trading of second-hand tyres. After its introduction the species rapidly spread throughout the territory thus showing a high adjustability degree to the environmental conditions of our country





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Emilia-Romagna region
Km² 22.124
Population: 3.983.346



Confirmed cases by residence locality, in epidemic clusters



Last Update 16/01/2008

Chikungunya outbreak in Emilia-Romagna Summer 2007

Number of cases by lab results

(July 4th, 2007 – September 28th, 2007)

Index case lab confirmed: 1

Lab confirmed: 217

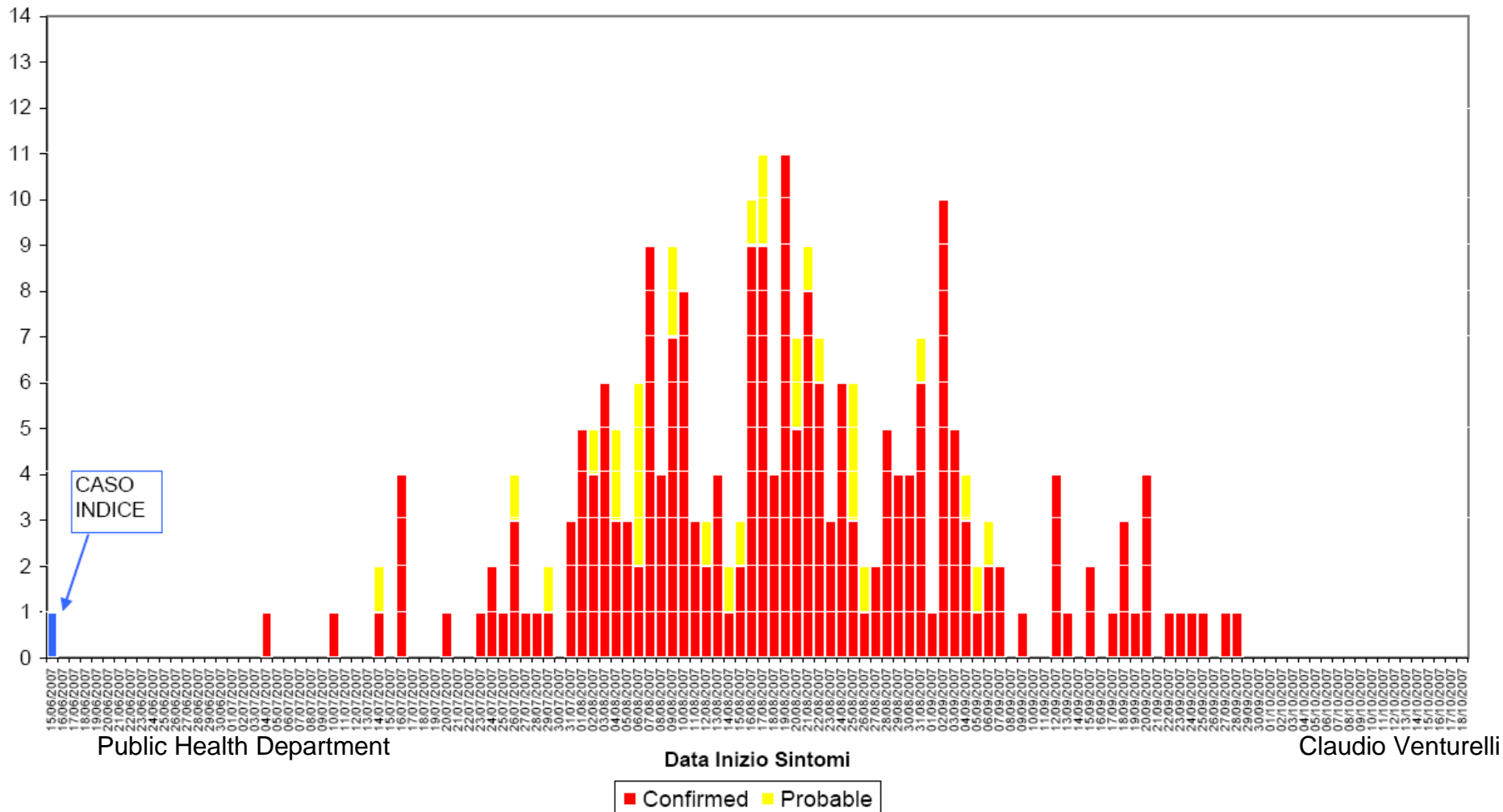
Probable, drawing denied: 30

Lab negative: 89

A total of 247 probable/confirmed cases, from four provinces (Ravenna, Forlì-Cesena, Rimini, Bologna)

Epidemic curve of the overall cases of Chikungunya

(217 CONFERMATI - 30 PROBABILI) Aggiornamento 16/01/2008, ore 12.00



Public Health Department

Data Inizio Sintomi

Claudio Venturelli

Confirmed Probable



A.albopictus in Emilia-Romagna



Health
surveillance

Entomological
surveillance



Health surveillance

- *“Ordinary”* Surveillance
- *“Active”* Surveillance



Health surveillance “Ordinary”

1. **Early case detection.** To identify both imported cases and any related indigenous cases with a view to enforcing virus control measures in the area where the vector is present.
2. **Characterization of each case,** by making a distinction between imported cases and indigenous cases, based on the epidemiological investigation
3. **Quantify the number of cases** recorded on the regional territory, describe the epidemiological trend and monitor the process quality, through specific indicators



Health surveillance “Active”

By active surveillance we mean the setting up of regular contact systems by the competent Local Health Unit addressed to Family paediatricians,



Regional plan objectives

1. Early detection of suspected cases and immediate implementation of control measures aimed at preventing any virus transmission from an individual to mosquitoes and from mosquitoes to another individual
2. Asian Tiger Mosquito control and entomological surveillance, by reducing the mosquito population density as much as possible

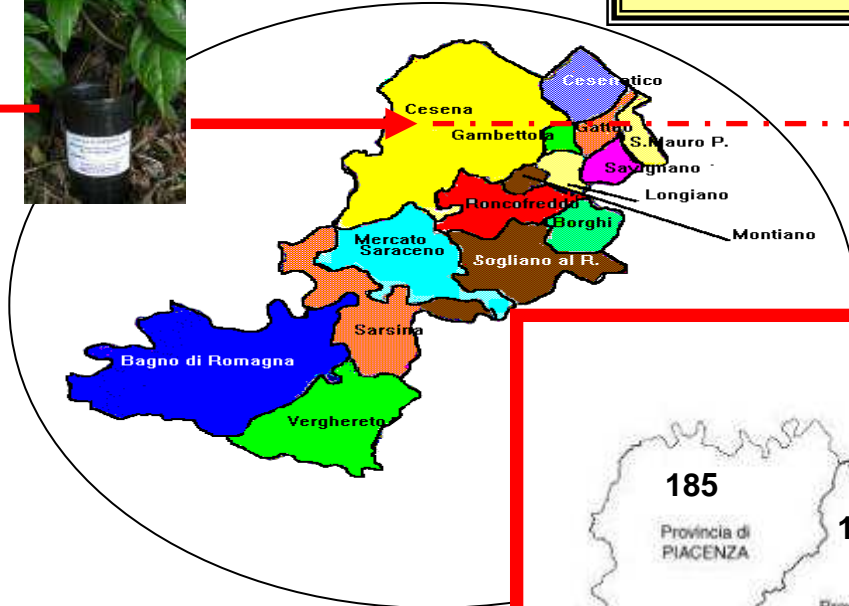


Asian Tiger Mosquito control and entomological surveillance

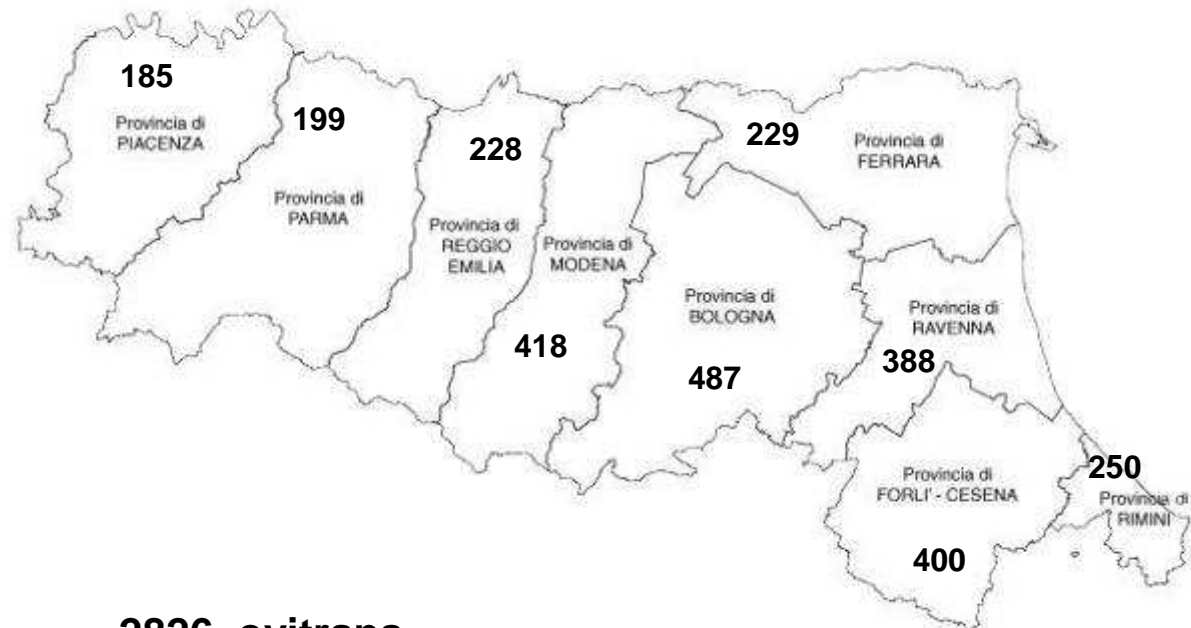
- Control measures against the proliferation of *Ae. albopictus*
- Regional surveillance system of Tiger Mosquito infestation

Acting locally

Entomological Surveillance



Overall plan





Control measures against the proliferation of *Ae. albopictus*

- a) Ordinary measures in areas where vector is active
- b) Protocol for control measures in areas where outbreaks occurred in 2007
- c) Protocol for control measures where there are certain or suspected cases
- d) Extraordinary measures for situations of great outbreak

Ordinary measures in areas where vector is active



1. Periodical distribution of larvicide in public road drains
2. Information and involvement of citizens on the management of their own gardens



Public Health Department

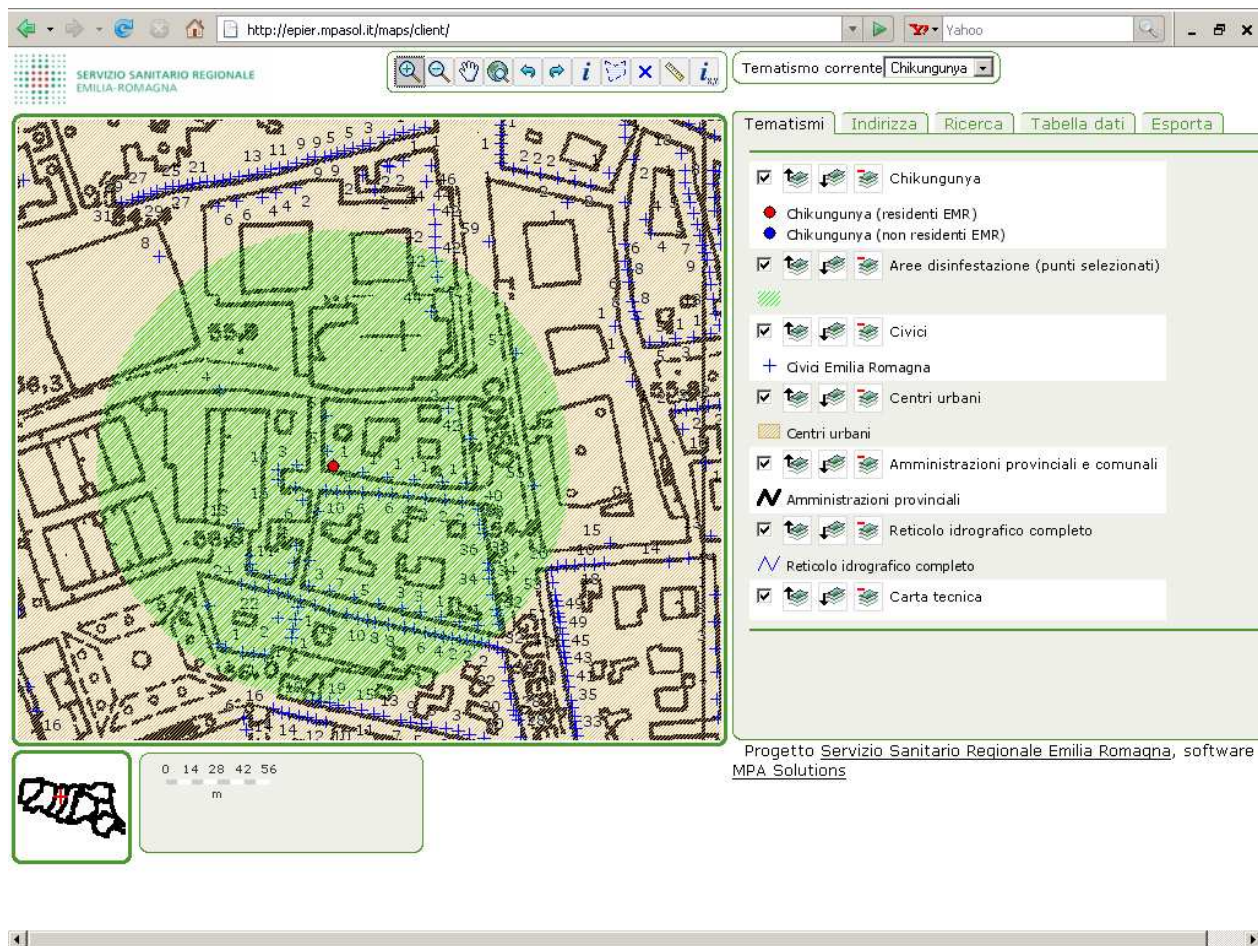


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Protocol for control measures: confirmed or suspected cases

- Use of larvicide (Insect growth regulators or *Bti*) in every manholes
- Door-to door interventions to get rid of breeding sites
- Use of fast acting insecticides applied using truck mounted atomizer or backpack mist blower
- These measures adopted:
 - in a radius of 100 m around every single suspected case
 - in a radius of 300 m around every cluster of cases







Extraordinary measures for situations of great outbreak

- Extraordinary measures in all the Regione, defined on indications by Crisis Unit
- Adoption of the previous slide protocol to greater areas
- Evaluation of the possibility to work in waiver of European directive “biocides”

Conclusion

- The november 2007 epidemic can be considered completely ended
- The surveillance system carried into effect can be supported by the National Health Service
- Health surveillance and vector control actions should be kept working in time
- High attention has always to be focused on this topic and on all vector borne diseases



Conclusion

Giovedì 15

Novembre 2007

RAVENNA **15**
LA VOCE

Il direttore Ausl, Carradori: "Interventi efficaci". Dottori a scuola di malattie tropicali

Chikungunya: il caso è chiuso. Per ora

L'ultimo contagio a settembre. Timori per la prossima estate



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The “Emilia-Romagna Team for *Aedes albopictus*
survey and control”

for the precious collaboration