Medical entomology network
MediLabSecure

Presentation of the working group dedicated to medical and veterinary entomology (WP4)
> What is medical entomology?

> Which objectives and activities for this working group?

> Who are we?
Presentation of the laboratory members

> What’s next?
Setting up of the training modules
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Medical & Veterinary Entomology

The branch of entomology dealing with arthropods, which affect the health and well-being of man and vertebrate animals.

Schematic representation of the various health disciplines involved in vector borne disease (source: Vbornet)

Perhaps the most basic concept in Med Vet Entomol
Surveillance vs. Monitoring

**Monitoring**: procedures implemented for temporary and continuous observations (e.g. mosquito species population dynamics) and is not followed by any additional activities

**Surveillance**: procedures developed in response to a risk and carried out to support subsequent actions (e.g. vector control)
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MediLabSecure objectives

General objective

Enhancing and strengthening the preparedness to common health threats and biosafety risks by the creation of a network of laboratories (human virology, animal virology, medical entomology).

Specific objectives

> Create a framework for collaboration to improve surveillance and monitoring of emerging vector borne viral diseases (arboviruses) and respiratory viruses
> Provide training for public health experts
> Improve integrated surveillance (animal, human, entomological)
> Provide tools for awareness, risk assessment, monitoring and control of the different emerging viruses (transmission, spread, human impact...)

The Mediterranean and Black Sea regions

Participating countries
Medical entomology working group (WP4)

Purpose:
To build a network of laboratory specialists in medical entomology, and more precisely, in mosquito vectors of arboviruses

<table>
<thead>
<tr>
<th>WP2</th>
<th>WP3</th>
<th>WP4</th>
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<tbody>
<tr>
<td>Animal virology</td>
<td>Human virology and biosafety</td>
<td>Medical entomology</td>
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<tr>
<td>respiratory virus</td>
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<tr>
<td>arbovirus</td>
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Target mosquito

Arbovirus

Diseases
- Dengue
- Chikungunya
- Rift valley Fever

Vector
- Aedes
- Culex

West Nile Fever
Activities / Timeline

1. Identification of laboratories
2. Inventory and assessments
3. Training modules
4. Public health impact of vectors
1) Identification of laboratories (2014)

- Contact database / Communication tools
- On-line questionnaire
- Committee selection
  Experts in human and animal health and medical entomology
- Establishment of the medical entomology network (MLS Entomo)
MLS / Network members (labs)
Working group medical entomology (WP4)
2) Inventory and assessments (needs and gaps) (2014 / 2015)

> Estimation of needs and gaps of the different partners (with special consideration for efficacy of national surveillance systems devoted to mosquito vectors)

> Inventory of present mosquito species (with special focus on invasive species)

Deliverable:

> **Expertise mapping**: Identification of countries with expertise on medical entomology (M12)

> Comprehensive **checklist of mosquito species** per beneficiary country (M24)
Training inventory on medical entomology

4 countries with specific medical entomology courses: Algeria, Egypt, Turkey, Serbia

Serbia / Faculty of Agriculture, University of Novi Sad
> Insect Systematics and Medical Entomology (2 months)
> Urban Entomology (1 month)
> Introduction to identification of blackflies (2 days)
> Introduction to identification of mosquitoes (2 days)

Turkey / Hacettepe University, HU-ESRL-VERG Laboratories
> Genetic and phenotypic comparison of sand fly and mosquito populations using geometric morphometrics and barcoding methods with relevant softwares (12 days)

Egypt / Ain Shams University
> Medical and Veterinary Entomology (1 semester)
> Vector Biology and Control (5 days)

Algeria / Saad Dahlab University
> Medical entomology (2 years)
3) Capacity building

(2015 / 2016)

Training modules

Deliverable:
> Five days training modules in 3 geographical zones (one module per zone), using training manual (M31)

Training tools

Deliverable:
> Electronic determination keys of mosquito species (on line) (M36)
4) Public health impact of vectors (2016 / 2017)

> Risk assessment related to the vector presence

> Help with appropriate preparedness and emergency response (isolated cases vs. large outbreak)

**Deliverable:**

> Regional *workshop* (M38)

> *Road map* for harmonization of surveillance systems of mosquito vectors (M48)

> Final report on the activities related to Public health impact of vectors, including an inventory of major vectors and potential vectors, needs and gaps (M48)
What is medical entomology?

Which objectives and activities for this working group?

Who are we?
Overview of the laboratory members

What’s next?
Setting up of the training modules
Presentation of the medical entomology lab network members

> Analysis of the 1st questionnaire “Medical and Veterinary Entomology laboratory capacities”

> Based on the results of the 19 selected laboratories (Medical Entomology network)
Methods

Identification of laboratories → On-line questionnaire → Committee selection → Establishment of the medical entomology network (MLS Entomo)

> 36 lab candidates → > 19 selected labs

40 questions laboratories capacities

General information
Activities and services
Influence of the laboratory
Equipment and logistics
Organization and training

Studied data:
1. Dominant diseases studied
2. Dominant vector studied
3. Collection / Identification
4. Equipment
5. Vector control
MLS / Network members
Working group medical entomology (WP4)

Bosnia & Herz. / Lab. Diagnostic Veterinary Institute of the Rep. of Srpska
Montenegro / Lab for applied zoology Biotechnical faculty
FYROM / Lab for virology and molecular diag Institue of Public Health
Albania / Entomology lab Institute of Public Health
Morocco / Lab. des Maladies Vectorielles Institut Pasteur Medical entomology lab Institut National d’Hygiène
Algeria / Eco-épidémiologie parasitaire et génétique des populations Institut Pasteur
Tunisia / Medical entomology lab Institut Pasteur
Kosovo / Institute of Vet. medicine Fac of Univ. of Prishtina, Fac of Agri and Vet.
Serbia / Lab for med and vet entomology Fac of Agriculture, Univ. Novi Sad
Moldova / Lab of systematics and molecular phylogeny Institute of zoology
Ukraine /
Turkey / HU-ESRL-VERG (Vector ecology research group) Hacettepe Univ.
Georgia / The R. Lugar Center for Public Health Research National Center for Disease Control and Public Health
Armenia / Reference lab center National Center for Disease Control
Lebanon / Lab of immunology National Center for Disease Control and Public Health
Jordan / Parasitic and Zoonotic Diseases Department Ministry of Health
Palestine / Vector Control Unit Ministry of Health
Egypt / Entomology department and the Research and Training Center on Vector of Diseases Ain Shams Univ
Libya / Lab of parasitology and vector born diseases National Center for Disease Control
Main activities

What are the main activities of our 19 labs?

- Medical Entomology: 16
- Veterinary Entomology: 7
- Bacteriology: 4
- Virology: 11
- Parasitology: 13
- Epidemiology: 10
- Public Health: 11
- Animal Health: 4
- Others: 5
Research activities

What kind of research activities?

- Taxonomy / Systematic: 8
- Morphology / Identification: 16
- Ecology: 13
- Distribution: 16
- Physiology: 4
- Genetic: 7
- Vector control: 10
- Insecticide: 8
- Transmission of pathogens: 13
- Other: 2
What is our matter of competences?

- Mosquito Culicinae: 18
- Mosquito Anophelinae: 15
- Tick Argasidae: 8
- Tick Ixodidae: 12
- Phlebotomine / Sandflies: 14
- Culicoides: 4
- Rodent: 7
- Other: 7
Diseases

What diseases are we involved in?

- West Nile Fever: 15
- Dengue: 7
- Chikungunya: 5
- Rift Valley Fever: 6
- Crimean Congo Hemorrhagic Fever: 6
- Leishmaniasis: 8
- Malaria: 6
- Rickettsiosis: 4
- Other (Borrelia, Leprosy, plague...): 12

Targeted diseases of the MLS lab. network:

- CCHF: 15%
- DEN: 18%
- RVF: 15%
- CHIK: 13%
- WNF: 39%
Dominant disease studied

> **West Nile Fever** (15/19 countries)
Collection

Which laboratories are collecting mosquitoes in the field?

- Yes: 17 (89%)
- No: 2 (11%)
Identification

Which laboratories are identifying mosquitoes?

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<thead>
<tr>
<th>Method</th>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>Classical morphology</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>Morphometry</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Molecular (e.g. PCR)</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Biochemical (e.g. isoenzymology)</td>
<td>1</td>
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</table>
Vector control

In which countries is there a vector control program?
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Setting up of the training program

Objective
To develop capacity building in medical entomology and vector surveillance for laboratory staff of the MediLabSecure network.

Activities

> Five days training modules in three different areas, according to geography, climate and vector circulation
> Tailored training modules
> 2 persons (technician, scientific) of the selected laboratory staff (MediLabSecure network members)
Training program: which area?

**Zone 1 (7 countries):**
Albania
Bosnia and Herzegovina
Kosovo
Montenegro
Moldova
Serbia
The Former Yugoslav Republic of Macedonia

**Zone 2 (7 countries):**
Armenia
Georgia
Jordan
Lebanon
Palestine
Turkey
(Ukraine)

**Zone 3 (5 countries):**
Algeria
Egypt
Libya
Morocco
Tunisia
Training program: when?

- **2015**
  - June 2015: Zone 1
  - Sept 2015: Zone 2

- **2016**
  - Spring 2016: Zone 3
Training program: where?

Zone 1: Serbia, Novi Sad
Zone 2: Turkey, Ankara
Zone 3: ???
Thank you