VBORNET Newsletter 1, December 2009

CONTENTS

1. VBORNET STATUS

Following the kick-off meeting in September 2009, VBORNET started its activities. (http://ecdc.europa.eu/en/activities/diseaseprogrammes/Pages/VBORNET.aspx). Currently the main focus is on preparing the various data query operations:

- A temporary webpage has been opened as part of the EDEN-DMT website to facilitate the download of VBORNET products: http://edendatasite.com.
- An interactive tool has been developed to enable VBD experts to contribute data on the distribution of vectors in Europe at three administrative levels: NUTS 1-2-3. The tool has been beta-tested and is now with ECDC for final validation. As soon as validated the tool will be actively disseminated to our database of VBD specialists in Europe and will be made available on the VBORNET webpage.
- A provisional list of VBD experts in Europe is currently being finalized based on our existing networks: EDEN, V-borne, TigerMaps etc.
- A questionnaire on VBD related national PH activities has been developed to disseminate to Public Health representative of each country. Currently the questionnaire is with ECDC for validation. Once validated the questionnaire will be disseminated through the official PH representative network of ECDC.
- A meeting was held in Stockholm with our and ECDC ICT specialists to prepare for a long-term ICT infrastructure to host VBORNET databases and outputs.

When the products will be validated, we will start our information campaign. We then will:

- Send the VBORNET Distribution Tool to all experts which are in our data base.
- Post the VBORNET Distribution Tool on the webpage for public download.
- Open the expert data base to all experts willing to contribute.

We are already looking forward to your contributions!

The VBORNET Consortium

2. SCIENTIFIC ADVANCES: MOSQUITOES

2.1 Invasive Mosquito species in Europe

The invasive mosquito *Aedes japonicus* in Central Europe

Francis Schaffner, Christian Kaufmann, Daniel Hegglin and Alexander Mathis
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Medical and Veterinary Entomology, 2009, 23, 448–451

Complaints about a biting pest led to the recognition of invasive *Aedes (Finlaya) japonicus japonicus* (Theobald) (Diptera: Culicidae) in Central Europe. Larval collections from cemetery vases revealed a colonized area of approximately 1400 km^2 in northern Switzerland spreading into bordering Germany, suggesting that the mosquito has been established in this region for several years. Within this range, larvae of *Ae. japonicus* were recovered from more containers than the most common resident culicid species *Culex pipiens*. Possible introduction sites (used tyre yards and international airports) revealed few or no larvae, and the mode of introduction remains unclear. Given the vector potential of this species for arboviruses, implementation of surveillance and control measures should be considered.

Link to the article: http://www3.interscience.wiley.com/cgi-bin/fulltext/122686850/PDFSTART
Key words: Dengue Fever, Chikungunya Fever, Mosquito borne diseases

VBORNET comment: 2009-11-13
This paper is related to the ProMED-mail post [Archive Number 20090830.3044; Published Date 30-AUG-2009; Subject PRO/AH> Mosquito, imported – Switzerland]. It gives the first finding of proliferation and spread of an invasive mosquito in Central Europe (northern to the Alps). *Aedes japonicus* is known as an invasive species (ISGG, 2009) and as a competent laboratory vector of several arboviruses (Williges et al. 2008) including West Nile virus for which it is suspected to play a role as bridge vector. In Europe, a few larvae of this species were identified in France in 2000 on a storage yard of imported used tyres (Schaffner et al., 2003), but this introduction was eliminated (unpublished data). Since 2002, this species has repeatedly been observed within a restricted area of two neighbouring used tyre yards in Belgium (Versteirt et al., 2009), but interestingly, the species has not spread there. If there was evidence of introduction by used tire trade in these countries, no obvious source of introduction could be identified in Switzerland. The field study did not reveal any indication that *Ae. albopictus* has established in Switzerland north of the Alps and the earlier record of this species (Wyman et al., 2008) was due to a misidentification of a single specimen from a photograph. Authors propose to survey the species by investigating cemeteries, determining a vase index (percentage of colonized vases). They propose to implement further studies which should monitor the rapidity of its spread as well as determine the bionomics of this species, in order to assess its vector potential for native and exotic pathogens in the local environment. This is particularly of relevance as *Ae. japonicus* is breeding in urbanized environments. They assume that invasive as well as vector potential render this species a potential threat for animal and human health, and justify the implementation of preventive surveillance and control measures.

Introduction and establishment of the exotic mosquito species *Aedes japonicus japonicus* (Diptera: Culicidae) in Belgium

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Journal of Medical Entomology, 2009, 46 (6): 1464-1467

The establishment of the potential vector species *Aedes (Finlaya) japonicus japonicus* (Theobald) (Diptera: Culicidae) in southern Belgium is reported. The species was most likely introduced through the international trade in used tires. It was first collected in 2002 on the premises of a second-hand tire company and was sampled using different sampling methods in the two consecutive years (2003-2004). It was only in 2007 and 2008, during a national mosquito survey (MODIRISK), that its presence as adults and larvae at the above-mentioned site and at another tire company in the area was confirmed based on morphological and molecular identification. This discovery is the first record for Belgium of an exotic mosquito species that established successfully and raises the question on the need for monitoring and control. Considering the accompanying species found during the surveys, we also report here the first observation of *Culex (Maillotia) hortensis hortensis* (Ficalbi) in Belgium.

Link to the article:
http://esa.publisher.ingentaconnect.com/content/esa/jme/2009/00000046/00000006/art00032
Key words: Dengue Fever, Chikungunya Fever, Mosquito borne diseases

VBORNET comment: 2009-11-17
This paper reports the establishment of *Aedes japonicus* in Belgium. As for France (Schaffner et al., 2003), there is evidence of introduction by used tire trade. Even if the species is now established since several years, it has not spread, which is, interestingly, very different to the situation in Switzerland (Schaffner et al., 2009). Its establishment in Belgium suggests a better adaptation to local climate than *Aedes albopictus* which was unsuccessful to establish (Schaffner et al., 2004). No control measures have been implemented so far, despite repeated information and alerts to regional and national health authorities. Authors pinpoint the need for monitoring and control measures at least to keep down its population and to limit its spread. They consider appropriate to aim the elimination of the species from the area where it was found before its spread to other parts of the country, and they suggest to make the used tire storage free of the species, to avoid the export of eggs in tires to other regions and countries.

First report of a North American invasive mosquito species *Ochlerotatus atropalpus* (Coquillett) in the Netherlands, 2009

E J Scholte[1], W Den Hartog[1], M Braks[2], C Reusken[2], M Dik[1], A Hessels[1]
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Eurosurveillance, 2009, 14 (45): pii=19400

In late August and early September 2009, numerous larvae, pupae, and actively flying adult specimens of *Ochlerotatus atropalpus* were discovered in the Province of Brabant, southern Netherlands, during surveillance activities for *Aedes albopictus* at two trading companies that import used tires. No *Ae. albopictus* were found. Both companies mainly import used tires from countries in Europe, but also from North America. *Oc. atropalpus* is endemic to North America and has so far only been found outside of its endemic range in Europe, namely France and Italy, where it was subsequently eradicated. A preliminary modelling study shows that the weather conditions in the Netherlands are unlikely to prevent establishment of *Oc. atropalpus*. This species has so far only been shown to serve as a vector for virus transmission under laboratory conditions. Studies on potential human and veterinary health risks, as well as possible control strategies are currently ongoing.

Link to the article: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19400
Key words: Mosquito borne diseases

VBORNET comment: 2009-11-17
A national survey of *Aedes albopictus* is implemented in the Netherlands. If it failed to discover *Aedes albopictus* on imported used tyre storages (the species is regularly found in green houses, breading lucky bamboos (ref)), it allowed to flush out *Ochlerotatus atropalpus.* Possibly the species has been introduced several years ago most probably by eggs transported through the import of used tyres. This species originating from USA has formerly been introduced to Italy (Romi et al., 1997) and France (Adege-EID Méditerranée, 2003, 2006), from where it has been successfully eliminated (Romi et al., 1999; Schaffner, pers. comm.). In the Netherlands, the species has established but seems not having spread to the immediate surroundings. The results of a preliminary modeling shows that climatological conditions in the Netherlands are not a limiting factor for establishment of *Oc. atropalpus* and that it could become established in large areas of Europe. The Dutch Ministry of Public Health, Welfare, and Sports considers this invasive mosquito species to be an 'unwanted organism' for the Netherlands, based on its putative role in the spread of infectious diseases important for public health. Control strategies are currently being investigated, including adequate treatment of used tires upon arrival and/or roofed storage of tires. Once again, this finding underlines the importance of preventive mosquito surveillance systems.

First record of *Aedes (Stegomyia) albopictus* (Skuse) (Diptera: Culicidae) in Malta

Paul Gatt[1], John C. Deeming[2] & Francis Schaffner[31] Research Associate, International
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European Mosquito Bulletin, 2009, (27):56-64

Aedes albopictus (Skuse, 1894) is newly added to the mosquito fauna of Malta, which now numbers ten species. Its biology and distribution are briefly described and its establishment and possible modes of introduction to the island are discussed. The need for further field work and surveillance is highlighted.

Link to the article: http://e-m-b.org/sites/e-m-b.org/files/EMB(27)56-64.pdf
Key words: Tiger mosquito, Chikungunya Fever, Mosquito borne diseases

A second record of *Aedes (Stegomyia) albopictus* (Diptera: Culicidae) in Malta

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European Mosquito Bulletin, 2009, (27):65-67

The presence of *Aedes albopictus* (Skuse, 1894) was recently confirmed in Malta (Gatt *et al.*, 2009). Three more adult female mosquitoes were caught indoors by the author from another locality (Marsascala) located in east Malta, and identified from morphological features. This is the second time

this species has been recorded for the Maltese archipelago and represents an addition to the nine previously recorded Culicidae mosquito species from the Maltese Islands. Since the species is a known vector for several serious diseases including dengue fever, its occurrence in the Maltese islands needs to be noted by the Health Authorities and measures to contain its spread and/or prevent its establishment, undertaken.

Link to the article: http://e-m-b.org/sites/e-m-b.org/files/EMB(27)65-67.pdf
Key words: Tiger mosquito, Chikungunya Fever, Mosquito borne diseases

VBORNET comment: 2009-11-17
Both papers give the first records of *Aedes albopictus* in Malta. A few specimens have been discovered by chance by local entomologists. One of them (P. Gatt), was aware about the risk of introduction of this mosquito, since an expert mission from ECDC was assessing the risk for vector-borne disease in Malta, April 2009, considering as 'high' the risk of introduction. However, field work implemented during that mission failed to record the species (ECDC mission report, 2009). If introduction to Malta is not surprising due to the large volume of sea traffic between Malta and Italy, the time of this introduction, its origin and the risk of establishment of this species in Malta is still questionable. Findings are located north-east and south-east of Malta, and distant by about 22 Km, and not located close to ports. Climate in the Maltese Islands is relatively warm and mild even during the rainy season. The hot summers are dry but the presence of water in reservoirs may allow the species to bread also during that period. Both papers pinpoint the threat the represents this species and suggest fieldwork in order to determine whether *Ae. albopictus* is more widely distributed, and to apply control measures in order to try to contain its spread or prevent its establishment.

1.2 Risk assessment in Europe

Pan-European Chikungunya surveillance: designing risk stratified surveillance zones

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International Journal of Health Geographics 2009, 8:61 doi: 10.1186/1476-072X-8-61

The first documented transmission of Chikungunya within Europe took place in Italy during the summer of 2007. Chikungunya, a viral infection affecting millions of people across Africa and Asia, can be debilitating and no prophylactic treatment exists. Although imported cases are reported frequently across Europe, 2007 was the first confirmed European outbreak and available evidence suggests that *Aedes albopictus* was the vector responsible and the index case was a visitor from India. This paper proposed pan-European surveillance zones for Chikungunya, based on the climatic conditions necessary for vector activity and viral transmission. Pan-European surveillance provides the best hope for an early-warning of outbreaks, because national boundaries do not play a role in defining the risk of this new vector borne disease threat. A review of climates, where Chikungunya has been active, was used to inform the delineation of three pan-European surveillance zones. These vary in size each month across the June-September period of greatest risk. The zones stretch across southern Europe from Portugal to Turkey. Although the focus of this study was to define the geography of potential surveillance zones based on the climatic limits on the vector and virus, a preliminary examination of inward bound airline passengers was also undertaken. This indicated that France and Italy are likely to be at greater risk due to the number of visitors they receive from Chikungunya active regions, principally viraemic visitors from India. Therefore this study represents a first attempt at creating risk stratified surveillance zones, which we believe could be usefully refined with the use of higher resolution climate data and more complete air travel data.

Link to the article: http://www.ij-healthgeographics.com/content/pdf/1476-072x-8-61.pdf
Keyword: Chikungunya Fever

VBORNET comment:
This paper proposes the mapping of zones to be surveyed in relation to the risk of chikungunya virus transmission in Europe, defining 3 risk levels in space and time. The assessment of risk is based on various climatic conditions necessary for both vector activity (i.e. *Aedes albopictus*) and viral transmission. Additionally, the degree of risk was also examined in relation to the degree of air-passenger traffic. This interesting study is a first attempt at creating risk stratified surveillance zones that include both vector and virus, however it has numerous limitations, many of which have been discussed by the authors. Most importantly these are:

- The maps are based on climatic factors that support the development of Aedes albopictus populations (based on formerly published data), but they do not take into account whether the species is currently present or not (i.e. introduced and established);
- Climatic conditions (i.e. temperature) favourable to viral transmission is based on monthly mean temperature extrapolated from known outbreak locations;
- Potentially viraemic air-passengers (pvp) are difficult to estimate due to a general under-reporting of cases but it can also be overestimated for example in La Reunion where the large number (78% of all pvp) is related to the 2006 outbreak, but there has been very little transmission since, and approximately 40% of the population has been immunised;
- If seasonal synchronicity induces more risk with regard to travellers coming from Asia (i.e. India and Thailand), it is not the case for La Reunion.

This interesting approach could be improved taking into account more precise parameters, i.e. areas with established populations of competent vectors, indirect passengers travelling, laboratory-acquired data for virus extrinsic cycle duration, vector capacity and/or R0 parameters.

1.2.2 Recently introduced *Aedes albopictus* in Corsica is competent to Chikungunya virus and in a lesser extent to dengue virus

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Tropical medicine & international health 2009, 14 (9): 1105-1109

Aedes albopictus has been established in Europe for some decades rendering temperate countries vulnerable to tropical diseases. The Italian chikungunya (CHIK) outbreak in the summer of 2007 demonstrated that indigenous transmission of CHIK was possible in Europe. To estimate the risk of a CHIK outbreak in Corsica, we assessed the vector competence of *Ae. albopictus* established in the island since 2006 towards a CHIK variant (E1-A226V). A dengue serotype 2 virus was also tested. Experimental infections showed that *Ae. albopictus* was highly competent to CHIK virus (disseminated infection rates ranging from 75% to 100%) and to a lesser extent, to dengue virus (12.5-68.8%). Moreover, *Ae. albopictus* ensured a high level of viral replication and was able to transmit the virus as early as 2 days after ingestion of infected blood with around 1 000 viral RNA available in salivary glands. The risk for a local transmission of CHIK is thus likely in Corsica, if other parameters determining the vector capacity of *Ae. albopictus* are suitable.

Link to the article: http://www3.interscience.wiley.com/journal/122574044/issue
Keyword: Chikungunya Fever

VBORNET comment: 2009-11-27
This paper completes the assessment of the vector competence of the *Ae. albopictus* populations spreading in Europe. The studied populations show high competence for CHIK virus infection for a variant that has been shown to be more easily transmitted by this species than the previous circulating virus strains (Schuffenecker et al., 2006, Vazeille et al., 2007). Results are not surprising as vector competence is genetically controlled (Hardy et al., 1983), even if it allows a certain variability of competence between populations. Populations of Corsica were more efficient than population from Alpes-Maritimes and much more than other indigenous mosquito species formerly tested (Vazeille et al., 2007). The virus title in salivary glands is high enough to ensure efficient release of infectious particles with saliva during a blood meal, as early as 2 days after viraemic blood ingestion. *Aedes albopictus* shows definitely a high potential of transmitting CHIK virus in Europe if entering in contact with viraemic hosts coming back from endemic areas. However, transmission will occur on the field only if other parameters of its biology such as density, longevity, host preferences, and duration of gonotrophic cycle are suitable.

1.3 Malaria in Europe

1.3.1 Malaria, "autochthonous" - Italy

ProMED-mail; Archive Number 20091107.3849; Published Date 07-NOV-2009
MALARIA, AUTOCHTHONOUS - ITALY: (LATINA), REQUEST FOR INFORMATION
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Date: Thu 5 Nov 2009 Source: Corriera Della Sera [edited]
<http://roma.corriere.it/roma/notizie/cronaca/09_novembre_3/malaria_marangon-1601951442853.shtml>

Dr Fabrizio Soscia, chief of the department of infectious diseases at the Civil Hospital of Latina, reassured the community after the discovery of a case of malaria contracted by a tourist in Rome after a short stay near Lake Fondi (Latina).

The Roman visitor, who stayed in the area between Monte San Biagio and Fondi, is well after being treated at the Spallanzani Hospital in Rome. The patient had not been abroad, and, therefore, the Ministry of Health has initiated a surveillance of the anopheline mosquitoes in the area.
WHO declared Italy free from malaria in 1970, and this is the 1st case of malaria in which the person was infected in Italy since then.

Link to the article:
http://www.promedmail.org/pls/otn/f?p=2400:1001:347398117118399::NO::F2400_P1001_BACK_PAGE,F2400_P1001_PUB_MAIL_ID:1010,79963
Key words: Malaria

VBORNET comment: 2009-11-17
A few autochthonous (locally acquired) malaria cases have occurred in declared malaria-free countries of Europe during the last 20 years: Bulgaria (18 cases in 1995-1996; Kurdova et al., 2001), France (1 confirmed and 2 possible cases in 2006; Armengaud et al., 2006; Doudier et al., 2007), Germany (2 cases in 1997; Krueger et al., 2001), Greece (4 cases in 1994 and 1995, 2 in 1998, 2 in 2000; Kampen et al., 2002), Spain 2001 (one case in 2001; Cuadros et al., 2002). One other vector-transmitted autochthonous cases has been reported from Italy in 1997, a woman being infected through the bite of *Anopheles labranchiae* that has acquired *P. vivax* from an Indian woman who carried gametocytes (Baldari et al. Lancet 1998; 351: 1246-7; Romi et al., Euro Surveill. 1999, 4 (7): 01 July 1999).
Malaria is still endemic in Turkey and epidemics still occur in far eastern countries (Russian Federation and other former USSR countries). Beside these cases transmitted by indigenous infected mosquitoes, also imported infected mosquitoes may provoke cases of so-called airport malaria or baggage malaria. Between 1977 and 1999, 75 cases of malaria associated with airport were recorded in Western Europe (Mouchet, 2000).
The movements of tourists, immigrants, soldiers and seasonal workers increase the numbers of malaria cases imported into Europe, not just from the neighbouring territories, but also from tropical regions. This creates new reservoirs of *Plasmodium* strains in areas with people which are totally lacking in any immunity to malaria infection and with competent local anopheline vectors. Among these, *An. atroparvus*, *An. labranchiae* and *An. sacharovi* are the three historically most important vectors in Europe; they are competent for *P. vivax* transmission and in a lesser extend for *P. falciparum* (Marchant et al., 1998). However, transmission needs favourable climatic conditions, as *Plasmodium* extrinsic cycle requests 8 to 35 days, depending to *Plasmodium* species and temperature (Heymann, 2004).
Considering the reported Italian case, the local transmission remains to be proved.

3. VECTOR BORNE DISEASE EVENTS

EDEN Emerging Vector-borne Diseases in a Changing European Environment: FP6 Project International Conference

Date - 2010-05-10/12 – Montpellier, France

The EDEN project (http://www.eden-fp6project.net/) has been operating in 24 countries with 49 partner institutions and 80 scientific teams since 2004 and will do so until 2010. This represents more than 200 research years of work on how environmental changes affect the emergence of vector-borne diseases in Europe.
EDEN is organising an International Conference in Montpellier, 10-12 May 2010, to present its most exciting scientific results to the international community, and to stimulate debates with prominent world scientists in this critical area.
To ensure a wider debate the conference is not restricted to contributions from EDEN partners only but is open to any interested scientist or research team working on similar topics in Europe or at its fringes.

The conference will cover the following groups of vectors and vector-borne diseases:
- Mosquitoes and mosquito-borne diseases, including arboviral diseases (e.g. West Nile, Rift Valley fever), and Malaria,
- Ticks and Tick-borne diseases,
- Rodents and Rodent-borne diseases,
- Sandflies and Sandfly-borne diseases.

The content of posters and oral communications presented during the conference should focus on:
- The identification of high-risk ecosystems for the emergence of vector-borne diseases,

- Biological, ecological and epidemiological processes involved in the emergence of vector-borne diseases, and their modelling,
- Applications for improved vector or disease monitoring, and disease information systems.

Submissions of proposed talks, and posters are welcome up to 1st December 2009.

Link to the website: http://international-conference2010.eden-fp6project.net/
Contact name: edenconf2010@cirad.fr

14th International Congress on Infectious Diseases (ICID)

Date - 2010-03-09/12 – Miami, Florida (USA)

The 14th ICID will be held in conjunction with the 4th Regional Conference of the International Society of Travel Medicine (ISTM) and the 2nd Congreso Latinoamericano de Medicina del Viajero (SLAMVI).

Official Language
The official language of the Congress is English. Some Spanish/Portuguese language sessions will be available on Tuesday, March 9, 2010 during the SLAMVI / ISTM program.

The abstract deadline was extended until November 30, 2009.

14th ICID Congress Office Registration
B.P.SERVIMED, S.A. DE C.V.
Barranca del Muerto No. 520, Col. Alpes
01010 Mexico D.F.
Phone: +52 (55) 9171 9570
Fax: +52 (55) 5660 1903
E-mail: icid2010@servimed.com.mx

Link to the website: http://www.isid.org/14th_icid/index.shtml
Contact name: icid2010@servimed.com.mx

17th European Society for Vector Ecology Conference 2010

Date: 2010-09-13/17 – Wrocław, Poland

The Society for Vector Ecology (SOVE) serves the interests of public health vector ecologists and aims to promote the exchange of research and pertinent information in the area of vector ecology and vector-borne diseases in its broader sense.

The Society was established in 1968 in California. Soon after its establishment SOVE attracted vector ecologists from all over North America as well as Europe, and now include members also from many Asian, African and South American countries. Our World-wide Society organizes the main USA annual meetings, the international SOVE meetings once every four years, and under special provision also bi-annual meetings of the European Branch of SOVE.

The SOVE meetings are open to attract scientists and other professionals working on vectors and vector-borne pathogens from all over the World, and their ecology, biology, taxonomy, control and related aspects.

The 17th European Society for Vector Ecology Conference will be organized in Wrocław (Poland), September 13-17, 2010. Our goal is to provide ample opportunities to present exciting results, discuss hot topics, make new friends, meet with old friends, and to enjoy learning more about this exciting field of research.

The conference will cover the following issues:

Emerging and re-emerging vector borne diseases.
Mosquitoes: bionomic, taxonomy, ecology, nuisance and behavioral aspects for their control.
Ticks: ecology of tick-borne pathogens.
Black flies: bionomy, taxonomy, nuisance and species distributions.
Integrated control of vectors.
Remote sensing for arthropod habitats.

Ecological aspects of host-vector-pathogen relationships.
Sand flies: ecology, taxonomy and effect of global climate change.

Submissions of proposed talks, and posters are welcome up to 30th June 2010.

Link to the website: http://esove.microb.uni.wroc.pl
Contact name: esove@microb.uni.wroc.pl