



Threat assessment

Autochthonous case of chikungunya fever in South Eastern France

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Source and date of request

Internal decision following EWRS message, France, on 24 September 2010

Public health issue

First two reported autochthonous cases of chikungunya in metropolitan France

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Disease background information

Chikungunya is a viral disease caused by an *alphavirus* from the *Togaviridae* family. Chikungunya is transmitted by the bite of *Aedes* mosquitoes, primarily *Aedes aegypti* and *Aedes albopictus*, which are active during the day. The incubation period ranges from 1 to 12 days, with an average of 3 to 7 days. The typical clinical sign of the disease is fever and arthralgia, which may persist for weeks or months. Asymptomatic infections are reported in 10 to 15% of the cases. In humans, the viral load in the blood can be very high at the beginning of the illness and lasts 5–6 days (up to 10 days) allowing further mosquitoes to feed and disseminate the virus. Once a person has recovered from chikungunya infection, they are likely to be immune from repeat infections [1].

The largest most recent outbreak occurred in the Indian Ocean islands in 2005-2006, from where it spread to India and parts of Southeast Asia. In 2007, an outbreak occurred in

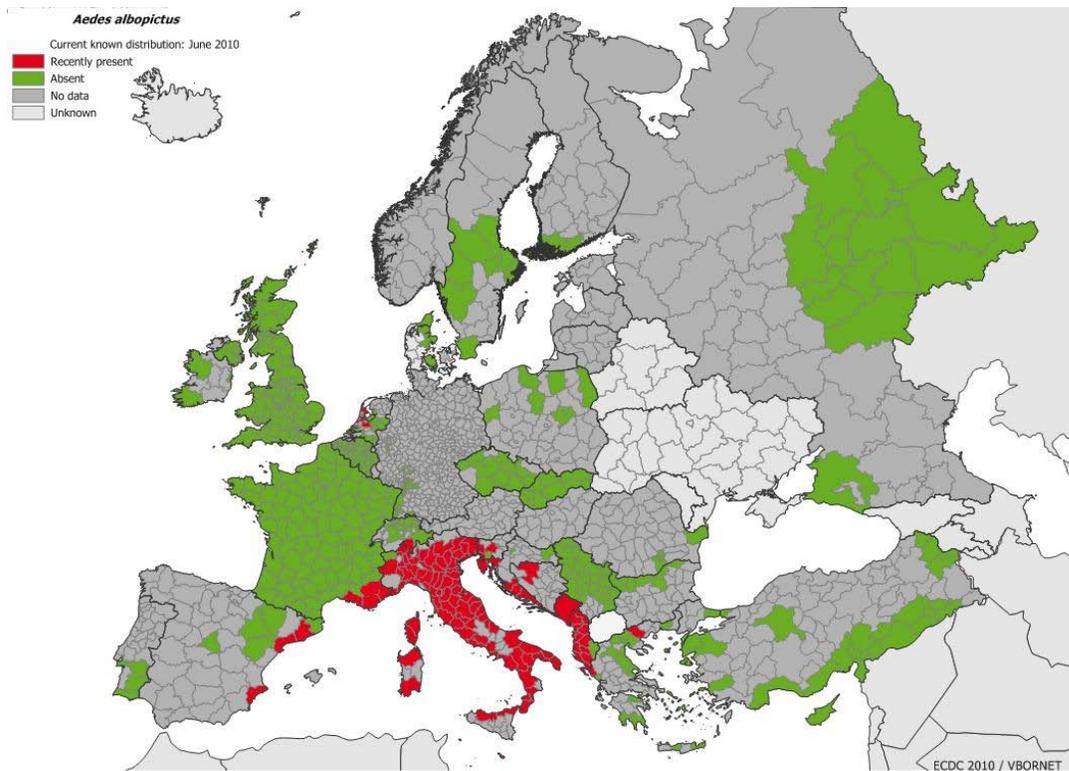
Italy, the first in a non-tropical region where a competent vector for chikungunya virus was present [1].

Chikungunya virus can be identified using RT-PCR or viral isolation during the first week of illness. Serological diagnosis can be performed by detection of specific IgM antibodies in serum specimen from day 4–5 after the onset of illness, or a four-fold rise of specific chikungunya IgG antibody titre on a pair of sera (acute and convalescent specimens). Specific IgM can persist for many months, in particular in patients with long-lasting arthralgia. Serological cross-reactions between closely related alphaviruses have been reported [1-2].

Despite being considered as a non-fatal disease, some deaths have been partly attributed to the virus, and abnormally high death rates have been observed during the 2006 outbreak in Réunion Island. Mother-to-child transmission has also been reported in women who developed the disease within the final week prior to delivery [1, 3].

Since the 1970s, the vector *Aedes albopictus* has become increasingly established in EU countries, mainly through global trade of tyres, including Italy, France, Slovenia, Spain, Greece and the Netherlands (though only in greenhouses and used tyres) [4-5]. This mosquito species is also established in neighbouring countries (see map) [6-7]. *Ae. albopictus* surveillance is implemented in the South-East of France, in the districts where *Aedes albopictus* is present: Alpes-Maritimes, Alpes-de-Haute-Provence, Corse-du-Sud, Haute-Corse, Var and Bouches-du-Rhône.

Distribution of *Aedes albopictus* in Europe, July 2010



Comment to the map: In most parts of Europe it is not known whether *Ae. albopictus* is present or not (grey areas). In some regions it has been found recently (red), and in some it is known to be absent (green).

Cases of chikungunya in travellers returning from epidemic countries are frequently reported. In metropolitan France, the laboratory network surveillance system detected 86 imported cases in total in 2008-2009 [8].

Event background information

On 24 September, the French Ministry of Health reported the first case of chikungunya fever acquired through autochthonous transmission in metropolitan France and on 27 September the French authorities confirmed a second autochthonous case. The cases were detected through enhanced surveillance, which is implemented from May to November in the South-East of France where *Aedes albopictus* mosquito populations have established progressively since 2004 [9].

The cases, two 12-year old girls, resident in Fréjus (district of Var), both developed symptoms on 18 September, including fever, arthralgia, myalgia, rash and headache. The two girls are living in the same neighbourhood and frequenting the same local school. The RT-PCR was positive for chikungunya on 21 September for the first case and on 25 September for the second case. The cases had no recent history of travel in an endemic/epidemic area or blood transfusion [9].

Chikungunya is a notifiable disease in France since July 2006 [8], and enhanced seasonal surveillance of chikungunya and dengue is implemented since 1st January 2006. Since May 2010, two imported cases have been reported in south east France one in Alpes-Maritime district and one in the district of Var. One confirmed viraemic chikungunya case imported from India was detected in Fréjus (onset of symptoms 29 August 2010 and arrival in France on 30 August). This imported case lives about 2 km away from the first autochthonous case and in the same street (60 meters distance) as the second autochthonous case [9].

Control measures implemented in France include:

- investigation of both the autochthonous and the imported cases, including an entomological survey around their residence and school;
- vector control measures in the area of residence of the cases, and in areas visited by the cases during their viraemic period (school, etc);
- active case finding in the neighbourhood of the 3 cases, including information of departing and arriving passengers in ports and airports;
- entomological investigations around ports and airports and vector control measures according to the findings of these investigations;
- information to health professionals and the public;
- active case finding in the health care facilities on a weekly basis for up to 45 days after the onset of the last autochthonous case;
- toxicovigilance in the areas where vector control measures have been enhanced;
- risk assessment (in the coming days) for the blood and tissues safety in the Var district.

ECDC threat assessment for the EU

This is the first occurrence of autochthonous transmission of chikungunya fever in metropolitan France. This event is not unexpected; the outbreak in Italy in 2007, when over 200 cases [10] were reported, has illustrated that chikungunya transmission may occur in non-tropical regions where *Aedes albopictus* is established.

The epidemiology around the current cases of autochthonous chikungunya is very similar to the cases of dengue fever reported from the neighbouring district of Alpes-Maritimes. Considering the clustering in time, it is likely that the vector density in the region is currently sufficient to allow for transmission between humans of both viruses. To date only two autochthonous cases of chikungunya have been detected in Fréjus, but the identification of new cases cannot be excluded, until the end of the mosquito season expected towards the end of November; up to now, the occurrence of transovarian transmission of the virus has not been documented. The strong vector control measures implemented in the region should limit the risk for further spread. The enhanced surveillance should allow a close monitoring of the risk for spread. The identification of the genotype of chikungunya virus that infected the reported cases may facilitate the identification of the origin of the virus and the risk of rapid spread if, for example, the virus strain presents the same mutation (E1 226V) as the one isolated during the second phase of 2005-2006 epidemic in La Réunion, known to affect vector specificity and epidemic potential.

Exposure to infected mosquitoes represents the principal risk for infection. However, transmission of the virus via blood transfusion poses a public health risk. Carriers of chikungunya viral infection pose a risk to blood safety if they donate blood during their viraemic period, especially considering that the viraemic titre remains high for approximately 6 days and that up to 15% of the cases remain asymptomatic. Estimated transfusion risks range as high as 150 per 10 000 donations during large outbreaks [11]. Possible measures to prevent chikungunya virus transfusion transmission include deferral of symptomatic donors, discontinuing blood collections in affected areas, and chikungunya nucleic acid screening of donations [11].

Conclusions

While not unexpected, these first two cases of chikungunya fever from autochthonous transmission in Fréjus, France is a significant public health event, and more cases cannot be excluded. With the mosquito season until the end of November and *Aedes albopictus* being the most efficient vector, the risk for establishment of chikungunya transmission in south-eastern France, or the appearance of new foci in regions/Member States where the vector is established, needs to be considered. Vigilance must be maintained, including awareness of clinicians and rapid detection and confirmation of cases, as well as appropriate public health measures in the regions where the *Aedes albopictus* population is established [12]. Those measures have been reinforced in the dengue or chikungunya affected areas of South Eastern France (in Alpes-Maritimes and Var) for those autochthonous cases of dengue and chikungunya according to the French preparedness plan against the spread of those diseases [13].

Together with the earlier reported cases of dengue in the region, and also taking into account the Italian chikungunya outbreak of 2007, the possibility of autochthonous transmission of tropical mosquito-transmitted viruses in continental Europe is again confirmed. These recent events stress the need to strengthen preparedness plans in European Member States where the *Aedes albopictus* vector is established, in terms of enhanced human and vector surveillance, as well as with regards to the timely response once cases have been identified to limit further spread. In addition, in Member States or regions where the vector is not (yet) established, vigilance and adequate measures to avoid and monitor the vector's establishment are important.

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Useful links

ECDC chikungunya communication tool kit:

http://www.ecdc.europa.eu/en/healthtopics/chikungunya_fever/public_health_easures/Pages/Communication_toolkit.aspx

http://www.sante-sports.gouv.fr/IMG/pdf/plan_antidissemiation_dengue_chikungunya_2010-2.pdf

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