ESCMID experts gather data on the Zika virus as they prepare for potential outbreaks in Africa and southern Europe

9 February 2016, Basel: Experts at the European Society of Clinical Microbiology and Infectious Diseases (ESCMID) – an organization promoting research, risk assessment, knowledge sharing and best practices in the fight against infectious diseases – are developing tools to monitor the spread of the Zika virus and are conducting research to gather more solid data to better assess the risks associated with the infection. According to ESCMID experts, researchers need to find evidence on how the Zika virus affects the body, why it is spreading rapidly in the Americas, how else it can be transmitted apart from mosquito bites, and whether it is linked with congenital defects in babies and nervous system diseases.

In a review¹ published late last week, researchers including the ESCMID network discussed the rapid spread of Zika virus in the Americas and concluded that the virus and other arboviruses may not only pose a threat to residents of Brazil, but also to attendees of the 2016 Olympic and Paralympic games in Rio de Janeiro. Meanwhile, ESCMID researchers are also working hard on the development of better diagnostic tools and on improving the monitoring of the virus’ spread, as they are preparing for a possible outbreak in Europe and the return of the virus to the African continent where it was first isolated in the Zika Forest in Uganda in 1947.

An international research team led by Prof. Eskild Petersen from Aarhus University in Denmark – executive committee member of the ESCMID Study Group on Infections in Travellers and Migrants (ESGITM) – and Prof. Alimuddin Zumla, University College London, United Kingdom, published the review on the Zika virus in the International Journal of Infectious Diseases. The paper concludes that “molecular analyses of the virus are most urgently needed to understand whether a change in the virus can explain the rapid spread and the association with microcephaly in babies exposed to the virus during pregnancy.” Research into rapid diagnostics, treatments and vaccines are underway, the review authors said. Specific and rapid diagnostic tests for the virus will allow better surveillance and assessment of the risk for microcephaly, Guillain-Barré syndrome, and other complications, Prof. Petersen explained.

“The emergence of Zika virus soon after the Ebola outbreak is yet another reminder for the urgent need for a coordinated global effort to have sufficiently resourced rapid response groups for proactive surveillance and conduct of priority research in emergency situations,” Prof. Petersen concludes.

Prof. Hakan Leblebicioglu, chairperson of ESGITM, added: "Emerging and re-emerging infections usually arise from resource-limited countries and since the infrastructure for diagnostics is not well-established, the timely diagnosis and control of outbreaks are usually late. For this reason, an international collaboration for capacity building of the laboratories and technology transfer is essential."
ESGITM board member Dr. Nick Beeching from the Liverpool School of Tropical Medicine notes that *Aedes* mosquitoes are widespread in the tropics, including both *Aedes aegypti*, implicated in the outbreak in Latin America and *Aedes albopictus*, which is increasingly found in southern Europe. These mosquitoes are already responsible for huge epidemics of fevers due to dengue and chikungunya viruses in the tropics and for smaller outbreaks in Italy and France, so there may be potential for transmission of Zika in parts of Europe too. It is not known whether other types of mosquito that are more common in Europe can act as vectors for Zika virus and research on this is urgently needed.

Dr. Beeching points out that only one in five people infected with the virus show any symptoms, so that many people will be unaware that they have been infected. He thinks it is very likely that the virus will return to sub-Saharan Africa soon, as it is already present in an archipelago just off the coast of Western Africa, in the island country Cape Verde.

"The next stage for the virus might be to move from Cape Verde to Guinea-Bissau, and from there to neighbouring countries in West Africa. It could also be exported to Madeira, which is part of Europe, and which experienced a dengue fever outbreak in 2012, transmitted by *Aedes* mosquitoes that were already established there." Dr. Beeching speculates.

One of the main questions to be answered is why the virus was able to spread so rapidly now and why such huge outbreaks did not occur before. The problem with current prevention techniques is that researchers are working with empirical and epidemiological data, and until the RNA of the virus is analyzed – which will take several months – we will not know if it is a mutation in the virus or other factors that play a role in the apparent increased occurrence of microcephaly and Guillain-Barré syndrome in the affected regions, according to researchers. Investigations into the associations with central nervous system complications may prove particularly important, including follow-up of patients and babies born to infected mothers to detect other possible sequelae.

For European residents there is an infection risk if they travel to affected countries or if they have unprotected sexual contact with someone who has recently returned from an affected area. There is also a risk from transfusion of blood donated by those recently infected. Perhaps more alarming would be if the virus manages to reach southern Europe. Experts are concerned that countries like France, Spain and Italy, which in the past have registered cases of dengue transmission, may be at risk.

Dr. Rogelio López-Vélez, ESGITM member from the Spanish national referral centre for tropical medicine of the Hospital Ramón y Cajal in Madrid, added “Even in Brazil 25% of the cases of microcephaly showed no symptoms of Zika. If the virus spreads to Africa and Southern Europe, we urgently need rapid diagnostic tests and more information on how long the risk of microcephaly exists after infection. For now however, particularly among female migrants from South America or Europeans visiting Latin America, we need to ensure they remain vigilant when travelling between the two continents.”

ESCMID researchers also support monitoring of the virus outbreak. The society is a partner in the PREPARE project, where researchers develop tools including clinical research protocols and case report forms, which are systematically used to collect essential data and laboratory results for clinical studies on the virus. In cooperation with PREPARE, ESCMID organizes an educational course entitled PREPAREing for (Re-)Emerging Arbovirus Infections in Europe from 7 – 9 March 2016 in Thessaloniki, Greece.
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Note to editors
ESCMID is a non-profit organization dedicated to improving the diagnosis, treatment and prevention of infectious diseases. The Society promotes and supports research, education and training and shares good medical practice in the infection disciplines to build capacity throughout the world. www.escmid.org

About ESGITM
The ESCMID Study Group on Infections in Travellers and Migrants promotes collaborative research to obtain multi-centre data on the epidemiology, clinical presentation and prevention of travel-related infections. The group takes a multidisciplinary approach to the management of infections in travellers and immigrants, offering advice for travellers’ and promoting awareness of the importance of travel- and migration-related infections in scientific community, public and among other stakeholders.

About PREPARE
A key lesson from a series of recent epidemics of emerging pathogens of global public health importance (e.g., the 2009 H1N1 influenza pandemic) was that implementing clinical research in response to a rapidly emerging infectious disease is extremely challenging and often delayed. We currently have no European framework for ensuring clinical research is built into epidemic responses and in fact our present research culture often precludes a rapid clinical response. Because of this, clinical research studies generally miss the initial waves of an epidemic or pandemic and in many cases fail to enrol significant numbers of patients across the clinical spectrum of disease, even during subsequent waves. This in turn means the opportunity is missed to improve patient outcomes and develop high-quality evidence to inform future clinical management strategies at the ‘coalface’. Indeed, in almost all epidemics over the last decades very little research directly aimed at improving clinical management or understanding pathogenesis has been able to be conducted. These experiences have demonstrated that unless something is done now to change the approach to clinical research, the next epidemic will result in a similar missed opportunity to save lives and advance medical knowledge. PREPARE has been designed to address this problem.

Useful links:
http://www.lstmed.ac.uk/research/topics/zika-virus
www.au.dk/en/