INFORMATIVE REPORT ON A MALARIA CASE IN GREECE, June 2012

Malaria case with evidence of domestic transmission, 2012

On June 18\textsuperscript{th} 2012, one case of \textit{P. vivax} malaria (laboratory infection with \textit{P. vivax} was confirmed by the the Department of Parasitology and Tropical Diseases of the National School of Public Health-NSPH) was reported to the Department of Epidemiological Surveillance and Intervention of the Hellenic CDCP. The case was diagnosed in a Greek 78-year-old male, with no recent travel history in malaria endemic countries. The investigation revealed that the patient resided in Menidi, Attica, yet the area of Marathon is considered as the possible site of disease transmission (where the patient retains a summer house).

Since June 20\textsuperscript{th} 2012, HCDCP has dispatched a team of experts who are working in the field of Marathon area. Until June 23\textsuperscript{rd}, the focus investigation was completed in order to timely detect additional cases in the same area. It included visits in all houses and accommodations within a distance of 150 meters from the site of the case. In particular, the team of experts visited 91 houses/accommodations and examined a total of 163 people for fever, 140 of which were Greek and 16, 3 and 4 subjects were migrants from India, Pakistan and Albania, respectively. A total of 42 blood samples were drawn from close contacts of the case (24 close contacts-relatives and roommates-and 18 migrants from malaria-endemic areas), which were sent to be tested by the Department of Parasitology and Tropical Diseases of NSPH. The samples were tested both with Rapid Diagnostic Tests (RDTs) and with microscopic examination (which was also performed by the Department of Parasitology and Tropical Diseases of NSPH). All of them were found negative for malaria in both tests.

During inspection visits, the expert team informed all residents about malaria and mosquito-bite prophylaxis. Area maps are always used in order to arrange visits to accommodations. These activities are implemented in cooperation with the municipality of Marathon. Moreover, on 20/06/2012 and 23/6/2012 the team of
experts visited the Health Centre of Nea Makri and the regional medical station of Marathon, where they delivered 100 RDTs in total and trained health professionals on how to use them.

Since June 25th 2012, screening of migrants from malaria-endemic countries is conducted in the region of Marathon. This screening includes detection of symptoms related to malaria, thermometry and performance of RDTs. Subjects with symptoms or RDT (+) result are further evaluated with microscopic examination and PCR testing for malaria. During the screening procedure, which is ongoing, 146 blood samples have been examined for malaria and one patient has been identified with positive RDT. This case refers to a 21-year-old migrant from Pakistan, who arrived in Greece three months ago. For this case, a focus investigation has already been conducted (laboratory tests in 22 close contacts).

The Hellenic Center for Disease Control and Prevention, in collaboration with the Ministry of Health and Social Solidarity and all stakeholders, has already developed and is implementing a Strategic Plan of Action for Malaria Control in our country. This strategic plan determines all the activities to be undertaken for the control of malaria in the next period of high breeding of Anopheles mosquitoes (spring-autumn 2012) in Greece. Its main goal is to avoid the re-establishment of the disease in our country, through coordinated actions, which are implemented nationally and locally in a systematic manner.

Following the above plan, during the spring of 2012, HCDCP organized in the area of Marathon and the eastern part of Attica meetings for the information of citizens regarding vector-borne disease transmission and the protection measures against mosquito-bites.

In addition, malaria training courses of healthcare professionals of Eastern Attica were conducted in Health Centers, while training sessions on protection measures against mosquitoes were also provided to competent local authorities’ officials.

(For more detailed information on the malaria-control activities of HCDCP in Greece see Annex 1).

Regarding the municipality of Evrotas, where a cluster of malaria cases with evidence of domestic transmission was reported last year, an active case finding of malaria is still in progress since 1st October 2011. So far, zero malaria cases of domestic transmission are reported, while three imported cases in migrants from malaria-endemic countries have been diagnosed, in whom directly observed therapy (DOT) is administered.

A malaria case in a Moroccan migrant was reported through the Mandatory Notification System (MNS) in early April 2012, whose contamination probably took place during the last year’s period of mosquito movement. Additionally, since April 2012 an integrated mosquito control program is conducted by the municipality of Evrotas.
Recommendations to travelers intending to visit Greece

According to the existing epidemiological data, the Hellenic Center for Disease Control and Prevention considers the risk of transmission of malaria in Greece-and specifically in the area of Marathon- extremely low. Only one sporadic case has been recorded so far. Therefore, HCDCP does not recommend any malaria chemoprophylaxis in people who intend to visit Greece. However, HCDCP recommends all the proposed measures to avoid mosquito bites.

The proposed recommendations are available here (currently available only in Greek)

Annex 1. Malaria control activities of the Hellenic Center for Disease Control and Prevention

- After the notification of each case with no history of travel to a malaria-endemic area, the Hellenic CDC notifies:
  - the Ministry of Health and Social Solidarity
  - the Public Health Directorates in the Greek regional units
  - all local health and public health professionals (General Hospitals, Health Centers, private physicians) to raise their awareness for early diagnosis
  - the Coordinating Haemovigilance Centre (SKAE) in order to implement the necessary measures for blood safety.

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Upon the end of malaria transmission period in 2011, HCDCP has collected various data regarding climate, ecological, social conditions and historical information about the disease, so as to develop a risk-assessment tool and to prepare for 2012.

The levels of risk for the transmission of the infection, according to this risk assessment were determined as follows:

**Table 1: Areas of risk for malaria re-emergence according to level risk 1, 2 and 3***

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<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
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<tbody>
<tr>
<td>PD of Ilia</td>
<td>Municipality of Orhomenos, PD Viotia</td>
<td>Municipality of Evrotas, PD of Lakonia</td>
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<tr>
<td>PD of Achaia</td>
<td>Municipality of Thiva, PD Viotia</td>
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<tr>
<td>PD Aitoloakarnania</td>
<td>Municipality of Chalkida, PD of Evia</td>
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<tr>
<td>PD of Messinia</td>
<td>Municipality of Marathon, PD of Eastern Attica</td>
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<td>PD of Argolida</td>
<td>Municipality of Saronikos, PD of Eastern Attica</td>
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<td>PD of Corinthia</td>
<td>Municipality of Agia, PD of Larissa</td>
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<td>PD of Evros</td>
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- **Information literacy of the public and awareness-raising activities regarding malaria and mosquito-bite protection.** Leaflets and other information are provided through the HCDCP website (www.keelpno.gr) and have already been distributed to Municipalities, Hospitals and Health Centers, Toll Stations throughout the country, churches and post-offices. Over 1,5 million leaflets and more than 50,000 posters have been distributed for this purpose so far. During 2011, HCDCP had performed individual house visits to all communities of the municipality of Evrotas, in order to inform and raise awareness regarding malaria transmission and measures of prophylaxis from mosquito-bites. Since the beginning of 2012, HCDCP has scheduled and performed informative meetings of the public and the school students, in all areas of Level Risk 2 and 3. Public education meetings are in progress for all other areas of Level Risk 1.

- **HCDCP has undertaken educational activities of the health care personnel** in areas of Levels 1, 2 and 3, in order to raise awareness regarding early diagnosis of the infection and disease management. Moreover, in areas of Levels
2 and 3, HCDCP has organized educational seminars for microbiologists, concerning the laboratory diagnosis of the disease.

- Furthermore, **training courses** regarding the procedures of mosquito control programs and evaluation of the actions executed are conducted by competent bodies.

- The Hellenic CDCP along with the Ministry of Health and Social Solidarity are in constant communication and cooperation with European and international public health centers and the World Health Organization (WHO) to form an accurate risk assessment for our country and Europe in general. Moreover, the Hellenic CDCP, in collaboration with all stakeholders, has developed a Strategic Plan for the Control of Malaria in Greece, which defines actions for the next period of high mosquito density (spring-autumn 2012).

- According to the report «Joint WHO-ECDC assessment mission in response to the 2011 malaria outbreak in Lakonia, Greece, 10-14 October 2011 (WHO travel report)» and in accordance with the working groups at the inaugural meeting "Special Programme for the Control of West Nile virus and Malaria, Strengthening the Supervision on Greek territory", which takes place under the operational program Human Resource Development of the NSRF (2007-2013), the following actions are being taken:

  **Malaria case detection and management**
  In any suspected case of malaria laboratory testing for malaria is conducted. Confirmed cases receive the appropriate treatment, either during hospitalization or directly supervised (Directly Observed Therapy) by the Hellenic CDC units.

  **Reinforcement of rapid diagnostic tests of malaria at a local level**
  Training sessions for laboratory personnel working in areas of increased risk of disease transmission are being held under the auspices of the National Malaria Reference Laboratory from the National School of Public Health. Rapid diagnostic tests will be distributed in primary health care services in these areas, for the valid and feasible early testing of each suspected case of malaria (within 24 hours of the start of the examination) and the immediate treatment initiation.

  **Case investigation**
  Each confirmed case of domestic malaria is directly investigated by personal interview using a structured questionnaire to investigate the risk factors, identify potential site of disease transmission and assess the risk of further transmission.
Focus investigation
Active search for infected cases. In each confirmed case of domestic malaria a focus investigation is carried out as quickly as possible, by actively searching for other malaria cases in the environment of the outbreak, within a respective radius of 100 meters around the domicile (fever screening or other compatible clinical picture or/and laboratory blood testing).

Active Laboratory Surveillance
The goal is finding and declaring new diagnosed cases. During the summer and autumn of 2011 an active laboratory surveillance program took place in Laconia on a daily basis, in collaboration with the microbiology laboratory of the General Hospital of Sparti.

Active search for cases of malaria in the general population
Since October 2011, the active search for cases is implemented in the municipality of Eurotas in Laconia. This action is carried out in regular visits (every 15 days) in all accommodations of the permanent and occasional (such as immigrants who work in seasonal agricultural work) residents of a certain area, to identify suspected cases of fever (thermometry, fever screening) or with a history of fever and to conduct a further laboratory test for malaria. Following the alertness and awareness of the indigenous population on the clinical presentation of malaria and the importance of early diagnosis, the active case search is in progress only in high-risk groups such as immigrants and Roma, as suspected cases of non-minority population groups are directly referred to health services.

Mass screening in migrants from malaria-endemic countries
The mass screening for malaria in migrants from malaria-endemic countries began in the municipality of Evrotas, Laconia, in April 2012. The aim is to test using RDTs all migrants from endemic countries for malaria. The screening refers to asymptomatic migrants and all suspected cases of malaria, namely symptomatic cases with compatible clinical picture or history of fever the last 15 days. Screening also includes other people who are considered to be at high risk due to heavy exposure to mosquitoes or with limited access to health services, such as Roma. Furthermore, from 25 June 2012, screening for malaria in migrants from malaria-endemic countries in the region of Marathon is being implemented.

Informing the public about malaria and prevention measures
For the protection against mosquitoes the Hellenic CDC created informative material, which is available on the website of the Hellenic CDC
and it has already been distributed in municipalities, hospitals and health centers, toll stations (Elefsina and Afidnes), post offices and churches. More than 1.5 million brochures have been distributed along with 50,000 posters. Additionally, in 2011, door-to-door visits were made to all villages of the municipality of Evrotas, where cases of malaria occurred, in order to inform local residents about the symptoms of malaria and the measures against it. For 2012, public information meetings in all villages, including special population groups (e.g. Roma) of the municipality of Evrotas, are in progress. Information meetings among students, teachers, parents and guardians in local schools, in all high-risk areas for increased transmission, are also implemented.

**Information for health professionals**
The Hellenic CDC after reporting a malaria case with no travel history to an endemic country, it directly informs the Ministry of Health and Social Solidarity and the Public Health Directorate of the competent region. It also sensitizes the clinicians of the region (general hospitals, health centers, private physicians) about early diagnosis and treatment of malaria. Furthermore, it informs the Coordinating Haemovigilance Center (SKAE) to take the necessary measures for the blood safety. In the municipality of Evrotas in Laconia, all healthcare professionals of public health services have attended information meetings held in the General Hospital of Sparti, the General Hospital-Health Centre of Molaoi and the Health Centers of Gythio, Areopolis, Vlachiotis, Kastoria and Neapolis. Also, private informational visits were made to private physicians (i.e. pediatricians, general practitioners, microbiologists, hematologists and pulmonologists), who could not attend the workshops. Also, there have been updates to, especially physicians, for health professionals who could not attend the workshops. In the summer of 2012, there will be another meeting to inform health professionals of the municipality of Evrotas and surrounding areas as well as to remind and re-sensitize them about the timely diagnosis of malaria infection.

**Educational seminars**
Furthermore, training courses regarding the procedures of mosquito control programs and evaluation of the actions executed are conducted by competent bodies.

The Hellenic CDC cooperates with the University of Thessaly in the “Special Special Programme for the Control of West Nile Virus and Malaria, Strengthening Surveillance at the Greek territory”, which takes place under the operational program Human Resource Development of the NSRF (2007-2013). The axes of the program refer to the development of
geographic information systems (GIS), strengthening the epidemiological surveillance of both diseases, the mosquito habitat maps and mosquito samples from high risk areas, strengthening the monitoring of birds and horses for transmitting West Nile virus, running information campaigns for the public and the high-risk groups, as well as the health professionals to cure and control the two diseases, in addition to screening immigrants at entry into the country (especially those from endemic countries).

June 29, 2012