NATIONAL PUBLIC HEALTH ORGANIZATION

# Weekly Epidemiological Report for West Nile Virus infection, Greece, 2022
# - 01 November 2022 -

This weekly epidemiological report aims to present an overview of the epidemiological data on West Nile Virus (WNV) human infection, the reported cases and the public health response to WNV in Greece for transmission period 2022.

Data presented in this report are derived from the notifications of laboratory diagnosed human cases of WNV infection sent to the Hellenic National Public Health Organization (NPHO) by the treating physicians and from the daily communication with diagnostic laboratories: i) the National Reference Centre for Arboviruses, Aristotelian University of Thessaloniki, ii) the Department of Microbiology, School of Medicine,University of Athens, iii) the Hellenic Pasteur Institute, iv) the Laboratory of Clinical Virology, School of Medicine, University of Crete.

The Vector-borne Diseases Department of the Directorate of Epidemiological Surveillance and Intervention for Infectious Diseases of the NPHO undertakes a verification procedure and investigates all reported cases within 24 hours, through communication with the treating physicians and the patients, in order to identify the probable place of exposure, the characteristics of the disease and the risk factors. In addition, the health status/ outcome of hospitalized cases is daily updated.

In 2022 period, up to 01/11/2022, two hundred eighty-four (284) laboratory diagnosed cases of WNV infection have been reported to NPHO, one hundred eighty-four (184) of which presented with neuro-invasive disease (WNND, encephalitis and/or meningitis and/or acute flaccid paralysis), and one hundred (100) cases with mild symptoms (e.g., febrile syndrome) (Table 1). Thirty (30) deaths have been recorded, concerning patients with WNV disease, older than 58 years of age (median age of the deceased= 84 years). Three more deaths in patients were attributed to other causes.

**Table 1. Number of reported cases of WNV disease, with and without central nervous system (CNS) manifestations, Greece, period 2022, up to 01/11/2022**

| | Number of WNND cases - **with** CNS manifestations [1] | Number of cases **without** CNS manifestations | **Total number of cases** | **Number of deaths** |
|---|---|---|---|---|
| Number of WNV cases and deaths | 184 | 100 | **284** | **30** [2] |

1. Refers mainly to encephalitis, aseptic meningitis and meningoencephalitis cases.
2. Three more deaths in patients were attributed to other causes.

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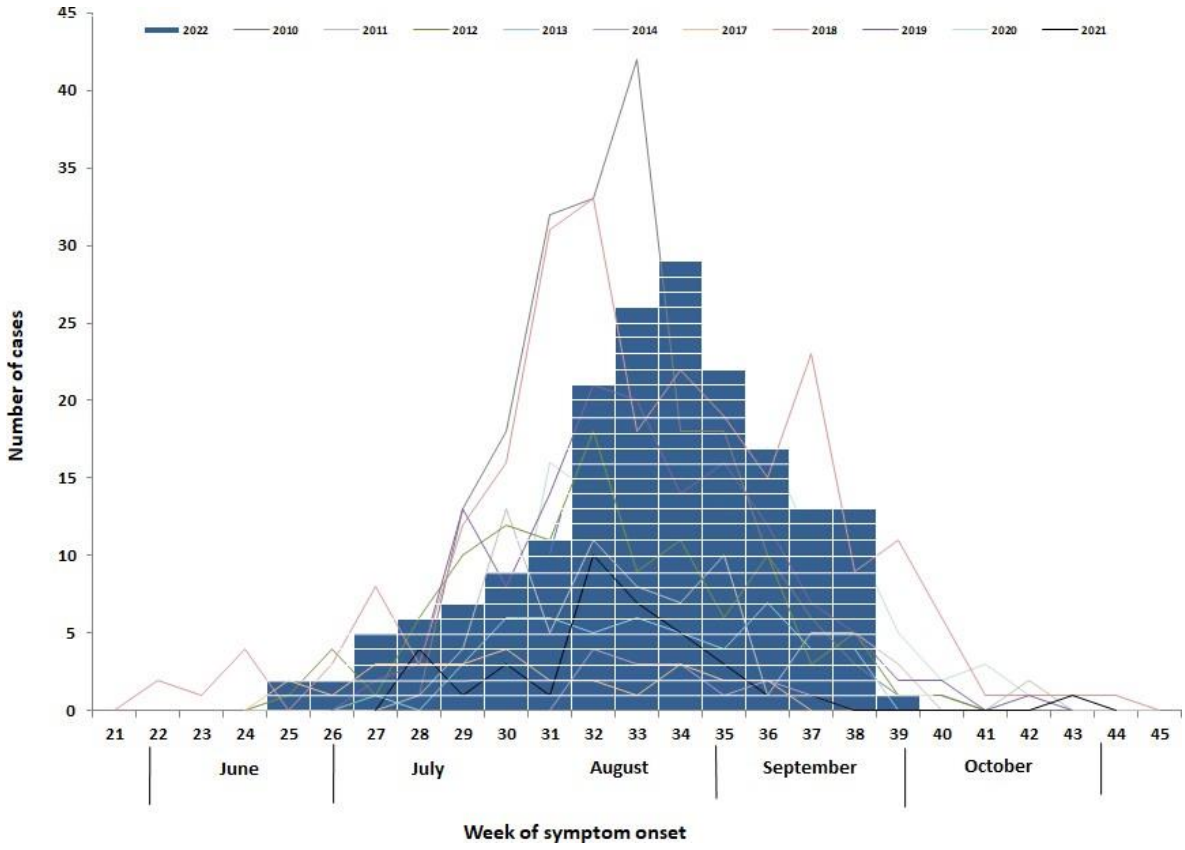
Figure 1 shows the reported WNND cases by week of symptom onset, in 2010-2022. For the first diagnosed case of WNV infection for transmission period 2022 (case with WNND), the reported onset of symptoms was on 23th June 2022 (week 25/2022).

**Figure 1. Number of reported WNND cases (with central nervous system manifestations) by week of symptom onset, Greece, 2010-2022, up to 01/11/2022 (n=184)[1].**




1. Each blue box represents one laboratory diagnosed case of WNND reported to NPHO in transmission period 2022.

The median age of WNND cases is 76 years (range: 14 - 96 years).

Table 2 shows the geographic distribution of the recorded cases with laboratory diagnosed WNV infection at the level of probable Municipality of exposure. The patient's probable place of exposure is a rough indicator of WNV circulation areas.

According to a serosurvey conducted in 2010 by the NPHO and the National School of Public Health, at the epicentre of the 2010 WNV outbreak in Central Macedonia, it was estimated that WNV neuro-invasive disease develops in 1:140 infected persons.

**Table 2. Reported cases of WNV infection (with and without central nervous system manifestations/ WNND) by probable Municipality of exposure, Greece, transmission period 2022, up to 01/11/2022 (n=284)**

| Region | Regional Unit | Probable Municipality of exposure | Number of cases with CNS manifestations (WNND cases) | Incidence of WNND per 100,000 population [1] | Number of cases without CNS manifestations |
|---|---|---|---|---|---|
| Central Macedonia | Chalkidiki | Nea Propontida | 14 | 38.4 | 4 |
| | | Polygyros | 1 | 4.5 | 1 |
| | | Aristotelis (Aristotle) | 1 | 5.5 | 1 |
| | Thessaloniki | Ampelokipoi | 6 | 11.5 | 0 |
| | | Delta | 5 | 10.9 | 0 |
| | | Chalkidona | 7 | 20.8 | 3 |
| | | Thermaikos | 5 | 9.9 | 6 |
| | | Thermi | 7 | 13.2 | 2 |
| | | Thessaloniki | 15 | 4.6 | 8 |
| | | Kalamaria | 5 | 5.5 | 6 |
| | | Kordelio - Evosmos | 4 | 3.9 | 2 |
| | | Neapoli- Sykies | 2 | 2.4 | 3 |
| | | Pavlos Melas | 4 | 4.0 | 2 |
| | | Oreokastro | 2 | 5.2 | 3 |
| | | Pilea – Hortiatis | 4 | 5.7 | 3 |
| | | Volvi | 1 | 4.3 | 2 |
| | | Lagada | 2 | 4.9 | 1 |
| | Kilkis | Kilkis | 10 | 19.3 | 2 |
| | | Paeonia | 1 | 3.5 | 0 |
| | Pella | Almopia | 2 | 7.3 | 0 |
| | | Pella | 6 | 9.5 | 4 |
| | | Skidra | 4 | 19.8 | 1 |
| | | Edessa | 1 | 3.5 | 0 |
| | Pieria | Dion- Olympus | 4 | 15.6 | 2 |
| | | Katerini | 1 | 1.2 | 0 |
| | | Pydna- Kolindros | 1 | 6.6 | 1 |
| | Imathia | Veria | 8 | 12.0 | 10 |
| | | Alexandria | 14 | 33.7 | 10 |
| | | Heroic City of Naoussa | 2 | 6.2 | 2 |
| | Serres | Serres | 1 | 1.3 | 0 |
| | | Visaltia | 0 | 0 | 1 |
| | | Sintiki | 4 | 18.0 | 0 |
| | | Irakleia | 2 | 9.5 | 0 |
| | | Emmanouil Pappa | 2 | 13.6 | 0 |

| | | | | | |
|---|---|---|---|---|---|
| **Thessaly** | **Larisa** | Tempi | 4 | 29.2 | 0 |
| | | Larissa | 15 | 9.2 | 12 |
| | | Kileler | 4 | 19.2 | 0 |
| | | Tirnavos | 1 | 4.0 | 0 |
| | | Farsala | 1 | 5.4 | 0 |
| | **Trikala** | Farkadona | 3 | 22.4 | 0 |
| **East Macedonia and Thrace** | **Kavala** | Paggaio | 2 | 6.2 | 1 |
| | **Drama** | Prosotsani | 1 | 7.7 | 0 |
| | | Drama | 1 | 1.7 | 0 |
| **Central Greece** | **Fthiotida** | Lokroi | 1 | 5.1 | 0 |
| | **Evia (Euboea)** | Dirfys – Messapia | 1 | 5.3 | 0 |
| **Ionian islands** | **Lefkada** | Lefkada | 1 | 4.4 | 0 |
| **Unknown - undetermined** | | | 1 | - | 7[2] |
| **Total Greece** | | | **184** | **1.7** | **100** |

1. Calculations based on 2011 census data (Hellenic Statistical Authority).
2. These cases refer to permanent residents of Thessaloniki Regional Unit [Municipalities of Delta (n=1), Thermi (n=1), Thessaloniki (n=2), Kalamaria (n=1), Pavlos Melas (n=1)] and Larisa Regional Unit [Municipality of Larissa (n=1)].

**PUBLIC HEALTH MEASURES SUPPORTED BY THE NPHO, 2022**

In every mosquito circulation season, the Hellenic National Public Health Organization -in collaboration with other involved stakeholders- implements a series of preventive and response public health measures for the management of West Nile Virus infection, which include:

I. **Enhanced surveillance for WNV disease in humans and communication for health professionals and stakeholders**:

- **Awareness raising of physicians** about the WNV infection: Testing for West Nile virus infection in suspected cases (such as cases with encephalitis, aseptic meningitis, acute flaccid paralysis, fever of undetermined etiology) is recommended. The NPHO provides guidelines for the recognition and diagnosis of WNV disease and the recommended laboratory investigation (mailings and website www.eody.gov.gr). For the 2022 period, an informative letter was sent to all Health Units and Medical Associations of the country for vigilance regarding West Nile Virus, in May 2022. In addition, following the recording of cases in an area, local Health Units are urgently informed.
- **Daily communication and information exchange with laboratories** conducting diagnostic testing for WNV (active laboratory-based surveillance).
- **Enhancing laboratory diagnosis** of suspected cases, by supporting the National Reference Centre and other specialised diagnostic laboratories.
- **Case investigation:** The Department of Vector Borne Diseases of NPHO undertakes the investigation of every reported WNV case within 24 hours after diagnosis, in order to determine the probable place of exposure, the risk factors and the severity of the disease. Health status of hospitalized cases is daily updated.
- **Immediate update of stakeholders** on the diagnosed cases (Ministry of Health, Ministry of Rural Development and Food, Hellenic National Blood Transfusion Center, Regions/ Directorates of Public Health and Social Welfare, Municipalities). Information and guidance on WNV circulation risk

assessment, surveillance, vigilance and enhancement of targeted prevention measures was providedto regional/ local authorities, before the onset of 2022 transmission season.

- **Weekly surveillance reports on human WNV infection cases**.

II. **Communication and health promotion activities for the public:** Informative material for the public regarding West Nile Virus infection and the recommended protective measures against mosquito bites is available in the NPHOs website (https://eody.gov.gr). In 2022, NPHO:

- Published an announcement (in early June 2022) regarding the expected recurrence of cases in the current transmission period, and the recommended prevention measures.
- Published three Press Releases: i) on 08/07/2022, following the diagnosis of the first case of West Nile virus infection, ii) on 26/07/2022 regarding the current recording of cases, and iii) on 02/09/2022 regarding the recording of increased number of cases in the 2022 transmission period, including recommendations for personal prevention measures against mosquito bites.
- Sent -via email- informative material (leaflets) for the protection against mosquito bites and for West Nile virus infection to regional and local authorities, in early May 2022.
- Sent informative leaflets for the protection against mosquito bites to all Regions of Greece, in mid-May 2022, in order to be distributed to the public.
- In every affected Municipality, informative leaflets are urgently provided, if needed.

III. **Coordination of an intersectional Working Group (WG) on the definition of affected areas by vector borne diseases.** This WG, under the MoH Committee for the Prevention and Management of Tropical Diseases, considers all available entomological and epidemiological data and decides on the characterization of affected areas assisting the implementation of blood safety measures. The list of affected areas is published on NPHOs website and updated regularly. These are used by the Hellenic National Blood Transfusion Center to issue guidance on blood safety. In addition, the Coordinating Haemovigilance Centre of NPHO issues guidance for the haemovigilance competent authorities.

**IV.** Collaboration and exchange of information with the **Ministry of Rural Development and Food** regarding the West Nile virus infection in equids.

**V. Vector surveillance and control activities:**

- **Raising awareness and guidance to Regional Authorities:** NPHO communicates regularly (workshops, meetings, letters) with all Regional Authorities in Greece recommending the timely planning, organization and implementation of integrated vector control programmes. In 2022, NPHO sent relevant awareness letters in mid-January 2022 (with a brief guide to the key steps to achieve timely implementation of the vector control program) and urgently informs local authorities of the affected areas regarding the recommended preventive and response measures (intensified mosquito control and raising awareness of the local population).
- **Entomological surveillance**: For the 2022 period, NPHO performs an active vector surveillance programme in various areas of the country, in collaboration with local/regional authorities, private mosquito control sub-contractors, the School of Public Health-University of West Attica and theBenaki Phytopathological Institute, including testing of mosquitoes for WNV (as an early warning and alert system), and continues the effort to collect entomological data.
- **Communication with international public health stakeholders:** Frequent communication and weekly information exchange with ECDC (real-time reporting of the diagnosed cases in TESSy).

**CONCLUSIONS**

West Nile virus infection cases are recorded -on an annual basis- in many countries worldwide, including many European countries. In 2010-2014 and 2017-2021, cases of West Nile virus infection were recorded in various areas of Greece also, while WNV circulation has been recorded in all regions, in the past. The occurrence of human cases in an almost annual basis during the last decade suggests that WNV has been established in our country, as well as in other European and neighboring countries; thus, its circulation and the recurrence of cases was considered likely and expected in the country, as well as in other European countries, in the 2022 period (as in each transmission season).

In 2022, up to 01/11/2022, human cases of WNV infection have been recorded in Greece, in some Municipalities, in the Regional Units (NUTS3 level) of Thessaloniki, Imathia, Kilkis, Pella, Pieria, Chalkidiki, Serres, Trikala, Larisa, Kavala, Drama, Fthiotida, Evia, and Lefkada. It still remains likely that more cases will be diagnosed in the immediate future.

In the EU Member States and EU neighboring countries, in transmission period 2022, up to 26/10/2022, human WNV infection cases have been also recorded -besides Greece- in Italy, Romania, Hungary, Germany, Croatia, Austria, Spain, France, Slovakia and Serbia (source: ECDC, Weekly updates: 2022 West Nile virus transmission season).

Epidemiological surveillance of the disease, systematic and early implementation of mosquito control programs and personal protective measures against mosquito bites are considered the most appropriate measures to control WNV infection outbreaks.

Since the circulation of WNV and its geographical distribution (i.e., the areas with recording of human cases) during each period cannot be predicted, personal protective measures against mosquitoes areencouraged, during the period of mosquito activity. General information regarding personal protection measures against mosquitoes is available at: https://eody.gov.gr/wp-content/uploads/2019/04/mosquito_brochure_2019.pdf

In addition, during the transmission season, weekly surveillance reports are published on the NPHO website https://eody.gov.gr/en/disease/west-nile-virus/, which include updated information.