



Weekly Epidemiological Report for West Nile Virus infection, Greece, 2021 - 30 November 2021 -

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 2021. As no new cases have been diagnosed in Greece in the previous three weeks, this is the final weekly update for the 2021 transmission season.

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 Directorate of Epidemiological Surveillance and Intervention for Infectious Diseases of the NPHO undertakes a verification procedure through communication with the treating physicians and the patients, as necessary.

In 2021 period, up to 30/11/2021, fifty-nine (59) laboratory diagnosed cases of WNV infection have been reported to NPHO, thirty-eight (38) of which presented with neuro-invasive disease (WNND, encephalitis and/or meningitis and/or acute flaccid paralysis) and twenty-one (21) cases with mild symptoms (e.g., febrile syndrome) ([Table 1](#)). One imported case (infected abroad) with WNND is not included in the abovementioned total number of cases and in the following analysis. Eight (8) deaths were recorded, concerning patients older than 69 years of age (median age of the deceased= 79 years), with underlying diseases.

Table 1. Number of reported locally acquired cases of WNV disease, Greece, period 2021, up to 30/11/2021^[1]

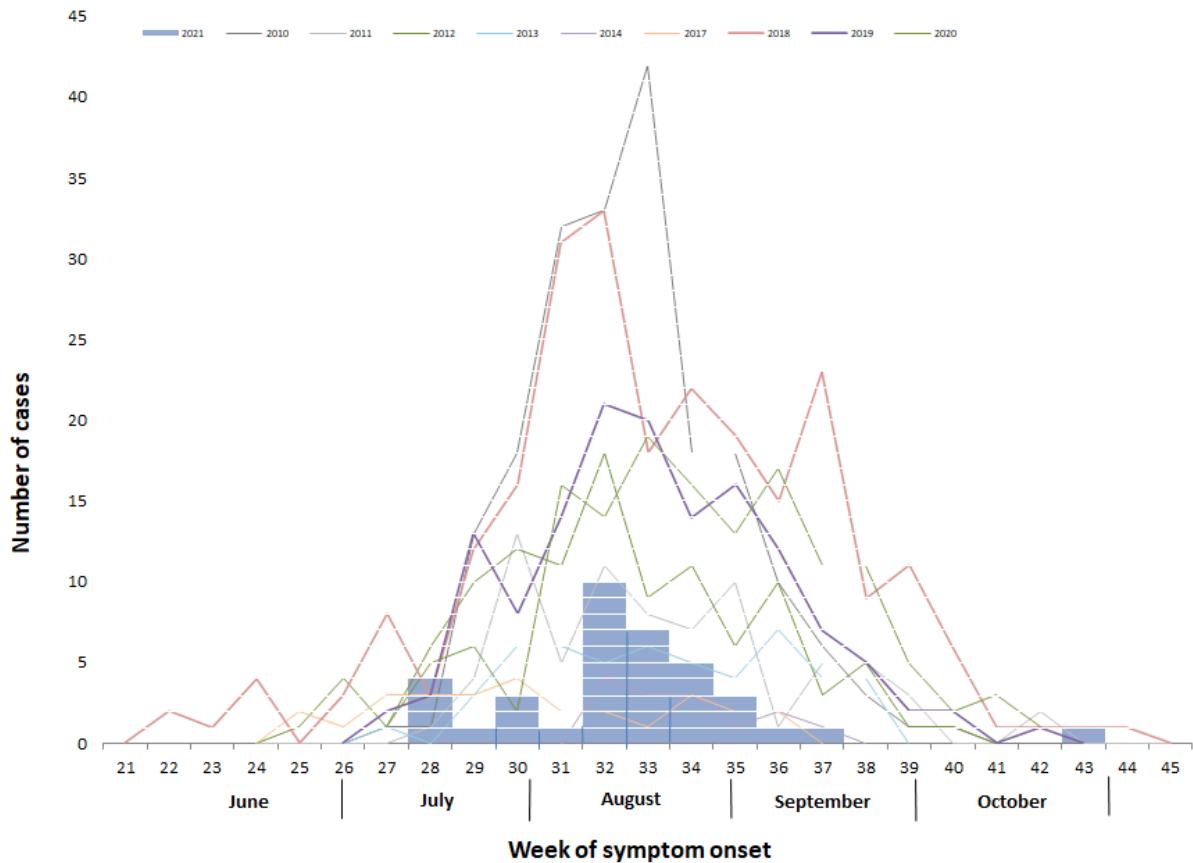
	Number of cases with central nervous system (CNS) manifestations ^[2]	Number of cases without CNS manifestations	Total number of cases	Number of deaths ^[3]
Number of WNV cases and deaths	38	21	59	8

1. One imported case is not included.
2. Refers mainly to encephalitis, aseptic meningitis and meningoencephalitis cases.
3. The number of deaths is included in the total number of cases.

For the first diagnosed case of WNV infection for transmission period 2021 (case with WNND), the reported onset of symptoms was on 14th July 2021 (wk 28/2021). The last reported case had symptoms onset on 25th

October 2021 (wk 43/2021). [Figure 1](#) shows the reported locally acquired WNND cases by week of symptom onset.

Figure 1. Number of laboratory diagnosed locally acquired WNND cases by week of symptom onset, Greece, 2010-2021, until 30/11/2021 (n=37)^{1,2}.



1. Each blue box represents one laboratory diagnosed case of WNND reported to NPHO in transmission period 2021.
2. For one patient, the date of symptom onset is unknown.

The median age of WNND cases is 72 years (range: 12 - 90 years).

[Table 2](#) show the geographic distribution of the notified locally acquired cases with laboratory diagnosed WNV infection at the level of probable Municipalities of exposure. The patient's probable place of exposure is a rough indicator of the area of WNV circulation.

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 WNND disease develops in 1:140 infected persons.

Table 2. Reported locally acquired cases with laboratory diagnosed WNV infection (with and without WNND) by probable Municipality of exposure, Greece, transmission period 2021, up to 30/11/2021 (n=59)

Region	Regional Unit	Probable Municipality of exposure	Number of cases with WNND	Incidence of WNND per 100,000 population ^[1]	Number of West Nile Fever cases (non WNND)	
Central Macedonia	Pella	Pella	8	12.7	5	
		Skydra	5	24.8	0	
	Imathia	Veroia	5	7.5	4	
		Alexandria	6	14.4	6	
		Heroic City Naoussa	0	-	2	
	Thessaloniki	Ampelokipi - Menemeni	3	5.8	0	
		Delta	1	2.2	0	
		Thermaikos	0	-	1	
		Chalkidona	1	3.0	0	
		Kordelio- Evosmos	1	1.0	0	
	Serres	Irakleia	1	4.7	0	
	Attica	East Attica	Pallini	1	1.8	0
			Spata - Artemida	2	5.9	0
Central Greece	Viotia	Tanagra	1	5.1	0	
	Evia	Chalkideon	1	1.0	0	
East Macedonia & Thrace	Kavala	Paggaio	1 ²	3.1	1	
		Kavala	0	-	1	
	Drama	Drama	0	-	1	
Undetermined			1	-	0	
Total Greece			38	0.35	21	

1. Calculations based on 2011 census data (Hellenic Statistical Authority).

2. Due to a complex travel history, the most probable place of exposure of this patient was considered to be at the Municipality of Paggaio, Regional Unit of Kavala; however, the possibility of exposure to the Municipality of Amfipolis, Regional Unit of Serres, cannot be excluded.

PUBLIC HEALTH MEASURES SUPPORTED BY THE NPHO, 2021

In every mosquito circulation season, the 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:

- **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 2021 period, an informative letter was sent to all Health Units and Medical Associations of the country for vigilance regarding West Nile Virus, in late May 2021. 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.
- **Enhancing laboratory diagnosis** of suspected cases, by supporting 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).

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 2021, NPHO:

- Published an announcement (in June 2021) regarding the expected recurrence of cases in the current transmission period, and the recommended prevention measures.
- Published a Press Release (in 2nd of August 2021) regarding the diagnosis of the first two cases of West Nile Virus infection and the recommended prevention measures.
- Updated informative leaflets for the protection against mosquito bites and for West Nile virus infection.
- Sent -via email- the new informative material to regional and local authorities in mid June 2021.
- Sent informative leaflets for the protection against mosquito bites to all Regions of Greece, in order to be distributed to the public.
- In every affected Municipality, informative leaflets are urgently provided.

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 issue 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 2021, NPHO sent relevant awareness letters in February 2021 (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 2021 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 the Benaki Phytopathological Institute, 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 2017-2020, cases of West Nile virus infection were recorded in various areas of Greece also, while virus circulation has been recorded in almost all regions. The recurrence of WNV infection cases was considered likely and expected in the country, as well as in other European countries (as in each transmission season).

In 2021, up to 30/11/2021, locally acquired human cases of WNV infection have been recorded in Greece, in some Municipalities in the Regional Units (NUTS3 level) of Pella, Imathia, East Attica, Viotia, Evia, Kavala, Drama, Serres and Thessaloniki. The last recorded case of WNV infection in Greece, up to 30/11/2021, reported onset of symptoms on 25th October 2021 (wk 43/2021).

In the EU Member States and EU neighboring countries, in transmission period 2021, up to 11/11/2021, human WNV infection cases have been also recorded -besides Greece- in Italy, Serbia, Hungary, Romania, Spain, Germany, and Austria (source: ECDC, [Weekly updates: 2021 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 are encouraged, during the period of mosquito activity.

National public health authorities have taken timely preventive measures, including communication activities regarding the recommendation for personal protection measures against mosquito bites. General information regarding personal protection measures against mosquitoes is available at: https://eody.gov.gr/wp-content/uploads/2019/04/mosquito_brochure_2019.pdf