

# Arboviral Surveillance and Response Capacity Survey 2021

## Section I: Respondent details

### 1. Country

Greece

### 2. Respondent/person to be contacted for clarification, if needed (last name, first name, e-mail address)

### 3. Professional title and affiliation

### 4. Date (dd/mm/yyyy)

14/6/2021

## Section II: Arboviral disease surveillance system

### 5. Which arboviruses have circulated in your country at any time since the year 2000? This refers only to arboviruses with autochthonous i.e., local mosquito-borne transmission.

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Chikungunya	Not selected
Dengue	Not selected
Yellow fever	Not selected
Zika	Not selected
Other	West Nile virus (seasonal outbreaks), Tick-borne encephalitis virus (6 cases), CCHF virus (one case in 2008), Toscana virus (one notified case in 2012)

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**6. Do you have any written arbovirus surveillance and control plan(s) and/or guideline(s) for your country?**

Yes, we have arbovirus-specific plans(s) or guidelines(s)

**6b. For which of the following arboviruses do you have written surveillance and control plans for your country? Please choose all that apply.**

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Chikungunya	Yes
Dengue	Yes
Yellow fever	Not selected
Zika	Yes
Other	Mosquito control plans (for West Nile virus and other mosquito-borne pathogens)

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**6c. Please upload surveillance and control plan(s) or protocol(s), or guideline(s)**

2 file(s) submitted

**7. Is there a specific national programme for arboviral diseases surveillance or is it integrated in another programme? Please select the appropriate answer:**

Specific programme

**7b. Please specify the programme into which arboviral diseases is integrated**

**8. For which level of the health structure are individual and aggregated data available? (Select all relevant levels)**

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	Individual level	Aggregated
Primary health care level	Yes	Not selected
District level	Yes	Not selected
Regional level	Yes	Not selected
National level	Yes	Not selected

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**9. What are the tools used for recording case data for surveillance purposes? Select all that apply**

National	Mixed methods
State/provincial	Mixed methods
District	Mixed methods

**10. Which training has been provided to the staff working on arboviral disease surveillance data?**

One-time basic training on data capture and analysis (MS Excel, MS Access, EpiInfo) and/or geographic information systems (GIS)	Not selected
Repeated/continuing basic training on data capture, analysis, and/or GIS	Not selected
One-time advanced training on statistical software for data analysis (e.g. STATA, R, SAS, Tableau, etc)) and GIS	Yes
Repeated/continuing training on advance statistical software for data analysis (eg STATA, R, SAS, etc) and GIS	Not selected
No training	Not selected

**11. Is reporting mandatory for any arboviral disease cases in your country?**

Yes

**11b. For which of the following arboviral disease cases is reporting mandatory in your country?**

Chikungunya	Mandatory reporting of confirmed cases only
Dengue	Mandatory reporting of confirmed cases only
Yellow fever	Mandatory reporting of confirmed cases only
Zika (non-congenital)	Mandatory reporting of confirmed cases only
Zika (congenital)	Mandatory reporting of confirmed cases only
Other	Mandatory reporting of confirmed cases only

**11c. For which other arboviral diseases is reporting mandatory?**

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1	West Nile virus	Confirmed cases only
2	Tick-borne encephalitis virus (in the context of "Arboviral encephalitis" group)	Confirmed cases only
3	Sandfly fever viruses that cause encephalitis (in the context of "Arboviral encephalitis" group)	Confirmed cases only
4	Other Arboviruses that cause encephalitis (in the context of "Arboviral encephalitis" group)	Confirmed cases only
5	Crimean Congo Haemorrhagic Fever virus (in the context of "Viral haemorrhagic fever" group)	Confirmed cases only
6	Other Arboviruses that cause haemorrhagic fever (in the context of "Viral haemorrhagic fever" group)	Confirmed cases only

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**11d. Please upload document(s) containing surveillance case definitions used for reporting of arboviral diseases**

1 file(s) submitted

**12. In the last 2 years, did your country conduct national epidemiological surveillance for human cases of arboviral disease?**

Yes

**12b. How frequently are surveillance data reported to the national level?**

Ad hoc

**12c. What type of national epidemiological surveillance was conducted?**

Combination of active and passive

For reference, here are the relevant definitions:

**Active surveillance** is defined as having dedicated systems and staff that routinely and with effort survey for cases of disease or detection of vectors and associated pathogens by the public health department.

**Passive surveillance** is defined as having a reporting system where physicians, laboratories, mosquito control districts, academic institutions or others routinely report cases of disease or detection of vectors and associated pathogens to the public health department.

**12d. If available, please upload the most recent report(s) on arboviral surveillance in humans**

1 file(s) submitted

**13. Does your country provide regular training sessions for healthcare workers on notification of *Aedes*-borne arboviral diseases?**

Yes : Only a few imported cases of *Aedes*-borne arboviral diseases have been recorded in Greece (among travelers). The Hellenic National Public Health Organization (NPHO) receives immediate notification of all cases of *Aedes*-borne diseases diagnosed in the National Reference and other specialised laboratories conducting diagnostic testing for these viruses (through networking - direct interpersonal communication). Regarding the awareness raising of physicians about the *Aedes*-borne arboviral diseases: The NPHO has provided guidelines for the recognition and diagnosis of *Aedes*-borne arboviral diseases, the recommended laboratory investigation, and the timely notification of cases (mailings and website [www.eody.gov.gr](http://www.eody.gov.gr)), including the non-mandatory notification of all suspect cases to the NPHO. Informative letters were sent -on an almost annual basis- to all Health Units and Medical Associations of the country for awareness raising of the health-care workers for these diseases (for the timely diagnosis and notification of imported cases) - last letter sent in June 2021 .

**14. What do the arboviral disease surveillance staff perceive as factors contributing to the a) success and b) barriers/challenges to arboviral disease surveillance in humans?**

Success factors: 1) Enhancement of passive surveillance - Regular awareness raising of health-care workers for testing suspected cases. 2) Active surveillance (for West Nile virus infections: active laboratory-based surveillance for human cases, active surveillance in equids, and active vector surveillance are implemented in Greece) - Animal and vector surveillance data are used as early warnings/ alerts for the WNV circulation, for raising awareness of local health-care workers (for the diagnosis of human cases). 3) Enhancement of the laboratory capacity – Support of Reference and specialised laboratories - laboratory expertise and free-of-charge testing of suspect cases. 4) Multi-sectoral collaboration (national, regional and local level): - intersectoral National Committee/ advisory working groups - networks at national and local level, information flow - good interpersonal communication. 5) Action plans, established procedures, experience. 6) Free access to healthcare facilities (diagnosis, management). 7) Strong commitment of involved stakeholders and public health staff in their work and service. 8) Timeliness of communication, real-time information sharing. 9) Communication to health-care workers on the rationale of enhanced surveillance and the real-time use/ impact of surveillance data on the PH measures implemented (published surveillance outputs/ reports, timely implementation of response measures).

Challenges: 1) Human resources/ public health workforce at national and local level (high workload), Advocacy. 2) Coordination of One Health strategy for preparedness and response, at the policy level - integrated plan and coordination among sectors (public health + animal health + vector control). 3) Vector surveillance at national level (guidance, legislation, resources allocation, quality assessment). 4) Awareness of health-care workers for Arboviral

diseases which have a very low incidence in the country or for imported cases of non-endemic diseases (regular awareness is needed).

### Section III: Arbovirus laboratory capacity

**15. Is arbovirus diagnostic laboratory testing performed for confirmation of suspected cases in your country? (Please select the applicable option during outbreak periods and during non-outbreak periods, respectively)**

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Outbreak periods	All suspect cases tested
Non-outbreak periods	All suspect cases tested

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**15b. On average, for what percentage of suspected arboviral disease cases your country is laboratory confirmatory testing performed? Please indicate for outbreak and non-outbreak periods, respectively**

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Non-outbreak (routine) percentage in a year	100
During outbreaks percentage per identified cluster	100

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**16. In the last two years, were the positive cases of arboviruses confirmed by a national reference laboratory?**

Yes, for all arboviral infections. Please specify them:

WNV, Dengue, Zika, Chikungunya, TBE, CCHF, Sandfly fevers. For WNV and Dengue, Zika, Chikungunya viruses, the positive cases were confirmed either in the National Reference Laboratory for Arboviruses or in other specific specialised laboratories (e.g. Pasteur Institute, and -for WNV infections- also in other University laboratories).

**16b. If your country does not have capacity to type and serotype arboviruses, do you send samples for typing to other countries?**

Yes. Please specify where:

All PCR positive samples are sequenced in our National Reference Laboratory for Arboviruses, therefore, they are all confirmed and typed. In addition, samples from other countries are sent to our Reference Laboratory for this purpose. In case there is a need for typing in PCR-negative samples, the Reference lab is member of the EVD-LabNet network, and samples can be sent to other countries (e.g. BNI in Germany).

**17. Overall, what arboviral testing capacity(ies) is(are) available in your country? Please check all applicable boxes**

	Antigen testing	IgM antibody testing	IgG antibody testing	Neutralizing antibody testing	Virus isolation	RT-PCR or other nucleic acid amplification test	Viral gene/genome Sequencing
Chikungunya		Yes	Yes			Yes	Yes
Dengue	Yes	Yes	Yes			Yes	Yes
Yellow fever		Yes	Yes			Yes	Yes
Zika		Yes	Yes			Yes	Yes
Other		Yes	Yes	Yes		Yes	Yes

**18. Which additional resources are most needed for your country to perform adequate testing for arboviral diseases? Please describe what would be needed for each checked resource in the adjacent comment field**

Additional personnel: Yes

Estimate of number of full-time staff: 3

Additional training of personnel: Further training on specific specialised laboratory investigation methods (for laboratories other than the National Reference Laboratory)

**19. Do you perform virological surveillance on humans, ie, tracking of prevailing genotypes/serotypes? Please select all that apply**

Yes, using virus isolation: NA

Yes, using RT-PCR: NA

Yes, using other acid nucleic tests. Please specify: Next Generation Sequencing (NGS)

Yes, using serological testing. Please specify: neutralization for WNV

**19b. Which samples do you use for virological surveillance?**

Samples from suspected arboviral diseases routinely notified	Yes
Samples routinely collected from patients with fever of unknown origin	Yes

**19c. For which viruses do you perform virological surveillance? (check all that apply)**

Chikungunya virus	Not selected
Dengue viruses	Not selected
Yellow fever virus	Not selected
Zika virus	Not selected
Other	West Nile virus

**19d. Does your country provide regular training sessions for healthcare workers on arboviruses virological surveillance?**

No

**20. What do the arboviral diagnostic laboratory staff perceive as factors contributing to the a) success and b) barriers/challenges with respect to laboratory testing for arboviral infections?**

Success: Regular participation to External Quality Assurance Services (EQAs)  
 Funding Expertise of laboratory personnel - laboratory capacity Networking - good interpersonal communication among clinicians, laboratory experts and public health workers of the NPHO

Challenges: Human resources

## **Section IV: Management of arboviral disease cases**

**21. Does your country have clinical guidelines for healthcare workers on diagnosis and clinical management of cases and severe cases of *Aedes*-borne arboviral diseases?**

Yes

**21b. Please upload the clinical guideline(s) for arboviral disease management**

1 file(s) submitted

**22. Are severe cases of arboviral diseases managed in a special area (part of the hospital, isolation beds)?**

Yes

**23. How many hospital beds are available per 100,000 population?**

292



**24. Does your country provide regular training sessions for healthcare workers on clinical diagnosis and management of *Aedes*-borne arboviral diseases?**

No

**25. What do the arboviral disease surveillance/clinical staff perceive as factors contributing to the a) success and b) barriers/challenges with respect to case management?**

Success: Laboratory capacity - laboratory expertise, free-of-charge (for the patient) diagnosis. ICU availability for severe cases. Direct communication for guidance and consultation of the treating clinicians is available (provided by infectious diseases specialists of the National Public Health Organization, upon request).

Challenges: Timeliness of diagnosis - Awareness of clinicians regarding imported cases of non-endemic diseases - Regular training. Low experience in managing imported cases of some non-endemic diseases - Regular training and development of guidelines for case management.

## **Section V: Routine vector surveillance and control**

**26. Is there a disease programme, agency, or service in charge of arbovirus vector surveillance in your country?**

Yes. If so, please specify in the comment field.

Regional and Municipal Authorities are in charge of integrated mosquito management programmes (including mosquito surveillance). The National Public Health Organization implements active mosquito surveillance programme in each transmission season, in collaboration with Regions and other stakeholders. The Benaki Phytopathological Institute (Ministry of Rural Development and Food) implements active mosquito surveillance programme in several areas of the country.

**27. Which institution/department is in charge of reporting entomologic surveillance data to the national ministry of health/health department? (Check all that apply)**

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State/provincial health agencies	Yes
Other national agency	Yes
City/country health departments	Not selected
Local mosquito control districts or similar organisations	Yes
Universities or academic institutions	Yes
Private companies	Yes
Other	The National Public Health Organization/ MoH also performs its own active mosquito surveillance programme.

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**28. For the last 2 years, did your country conduct entomologic surveillance for arboviral infections in mosquito vectors?**

Yes

**28b. Please upload the most recent national vector surveillance report**

1 file(s) submitted

**28c. Did the entomologic surveillance entail country wide programmes or was it restricted to specific locations?**

Country wide

**28d. How many sentinel surveillance sites do you have?**

522

**28e. How often was the surveillance conducted? Please choose one of the following:**

Mosquito surveillance programmes of the National Public Health Organization and the Regions: Adult mosquito traps are usually placed bimonthly during the transmission season (usually from April to November, on an annual basis). Mosquito surveillance programmes of the Benaki Phytopathological Institute: Adult mosquito traps (65 BGs traps for adult mosquitoes, employed with attractants), and 110 ovitraps for Aedes invasive species are placed weekly.

**29. Do you conduct adult mosquito surveillance?**

Yes

**30. Do you conduct larval/pupal mosquito surveillance?**

Yes

**31. Are trapped mosquitoes identified to species?**

Yes

**32. Does your country either calculate minimum infection rates (MIR) for any *Aedes*-borne arboviruses with your mosquito data or receive such data from other agencies? Please choose only one of the following:**

No

**33. Which laboratories performed testing for arboviruses on mosquito pools collected in your country in the last two years? (check all that apply)**

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National public health laboratory	Yes
State/provincial/regional public health laboratory	Not selected
Local health department laboratory	Not selected
University or academic institution	Yes
Local MCD (if different from county health dep't)	Not selected
Mosquito surveillance done, but no testing done on mosquito pools	Not selected
Not applicable (no mosquito surveillance done)	Not selected

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**34. Is there a record of *Aedes aegypti* or *Aedes albopictus* being found in your country in the past 5 years? Please choose only one of the following**

Yes, only *Aedes albopictus*

**34b. Please describe the potential public health threat from *Aedes aegypti* in your country**

**34c. Please describe the potential public health threat from *Aedes albopictus* in your country**

*Aedes albopictus* populations are abundant and pose a significant public health threat (Aedes-transmitted arboviruses are not circulating in the country, i.e., only imported DENV, ZIKV, CHIKV cases have been recorded so far)

**35. Over the past two years, did your country use any of the following vector control methods in local jurisdictions (either using government staff and resources, or subcontracting to a different entity to do so)? Please select all that apply**

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Adulticiding (insecticide application against adult mosquitoes)	Yes
Larviciding	Yes
Insect growth regulators (eg , pyriproxyfen)	Yes
Wolbachia method	Not selected
Sterile insect release	Yes
None	Not selected
Other	Door-to-door method (to reduce the breeding sites in private areas and raise community awareness) has been conducted in specific areas

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**35b. Would your country have conducted or financially supported adulticiding/larviciding or source reduction activities in the last two years if sufficient funding were available?**

**35c. Which adulticides and/or larvicides (brand and product name) were used?**

You can find the list of the approved adulticides and larvicides in the following link on the website of the Ministry of Rural Development and Food: [http://www.minagric.gr/syspest/syspest\\_bycat\\_byactive.aspx](http://www.minagric.gr/syspest/syspest_bycat_byactive.aspx). The initial list is also included in the Annual Circular of the Ministry of Health “Integrated mosquito management, action plan, communication and prevention measures for the public, for 2021” (page 16, see Question 6c).

Larvicides: Product Name: Active Ingredient VECTOBAC 12 AS, VECTOBAC 200G, AQUABAC XT, AQUABAC 200G: Bacillus thuringiensis (Bti) DU-DIM 15 SC, DU-DIM 2 DT, DU-DIM 2 GR: diflubenzuron BIOPRENE 4GR, MASINA (TELOS), BIOPREN MOSQUITO LARVICIDE TABLET: s-methoprene

Adulticides (mainly for residual spaying): Product Name: Active Ingredient: STEEL 25 EC: permethrin TETRAMETHRIN – ZARI 1 WP: tetramethrin KERBOFOS 25 EC: permethrin AMCOSIN: cypermethrin, iperonyl butoxide, tetramethrin SOSPIN 25 EC: permethrin AMCOSIN PLUS: deltamethrin, piperonyl butoxide, tetramethrin DOBOL MICROEMULSION: d-tetrmethrin, acetamiprid, piperonyl butoxide AMCOTHRIN GOLD: tetramethrin, permethrin, piperonyl butoxide CYPELL 100 WP: cypermethrin DRAKER

10.2: tetramethrin, cypermethrin, piperonyl butoxide LANCET: etofenprox BOMBEX PERM 25C: permethrin TATOR EC: tetramethrin, cypermethrin, piperonyl butoxide ZAPI EW: permethrin, tetramethrin, piperonyl butoxide KERBOFOS 5EC: permethrin SEGETHRIN 10EC: permethrin BOMBEX FARUMY: cyphenothrin, prallethrin DOBOL MICROCYP: cypermethrin 3A MATE: Deltamethrin CYTROL FORTE: cypermethrin PIRETROX: Chrysanthemum, cinerariaefolium, extract from open and mature flowers of Tanacetum cinerariifolium obtained with hydrocarbon solvents DIPTRON EC: Etofenprox, piperonyl butoxide PERMEX 22E: Permethrin, Tetramethrin, Piperonyl butoxide CYPELL FLASH EW: cypermethrin BLATA SPRAY: cypermethrin, tetramethrin, Piperonyl butoxide CYTROL 10/4: Cypermethrin, Piperonyl butoxide TOXOTIS PRO 100EW: cypermethrin MICROFLY: cypermethrin KILLMETHRIN 2.5 WP, TRIANOS 2.5 WP, DELTASECT WP, DELTAMETHRIN SHARDA EUROPE WP, ECLAT GIVESOL 2.5 WP, RIPCOCK 2.5 WP: deltamethrin JETFLY: Cypermethrin TETRAPIÙ Multipurpose: Permethrin, Tetramethrin, Piperonyl butoxide PERMEPLUS: Permethrin, Tetramethrin, Piperonyl butoxide ETOCINQUE, PUBEX L, ETO5: Etofenprox FENDONA 1.5 SC, PAMOVA1.5 SC, CANASTA 1.5SC, FENDONA TOP: alpha-cypermethrin FENDONA 6SC, PAMOVA 6SC, FENDONA PRO: alpha-cypermethrin VELTO RTU: tetramethrin, piperonyl butoxide, cypermethrin INASTRO 6SC, INASTRO PRO: alpha-cypermethrin OLIMERO 6SC, OLIMERO PRO: alpha-cypermethrin CARDAMON 6SC, CARDAMON PRO: alpha-cypermethrin DK 10.2: Tetramethrin, Piperonyl butoxide, cypermethrin MASTERCID MICRO: Tetramethrin, Piperonyl butoxide, cypermethrin DELETE III: Tetramethrin, Piperonyl butoxide, cypermethrin TETRACIP EW: permethrin, tetramethrin TATOR GOLD: tetramethrin, piperonyl butoxide, permethrin IMPERATOR: tetramethrin, piperonyl butoxide, permethrin ZAPI NEXT: permethrin, piperonyl butoxide, tetramethrin DIPTRON CYPERMETHRIN: cypermethrin, piperonyl butoxide DRAKER ONE: cypermethrin WACIP 1000: cypermethrin PUBEX COMBO: cypermethrin, piperonyl butoxide, tetramethrin DK ONE: cypermethrin CARDAMON TOP: alpha-cypermethrin INASTRO TOP: alpha-cypermethrin DIPTRON RTU CYPERMETHRIN: cypermethrin, piperonyl butoxide LANCET: etofenprox NUVEX NO PBO: chrysanthemum cinerariaefolium, extract from open & mature flowers of Tanacetum cinerariifolium obtained with hydrocarbon solvents AQUA K-OTHRINE (for indoor ULV applications): deltamethrine (for indoor ULV applications).

Emergency outdoor ULV applications can be performed upon special approval.

**36. Does your country provide regular training sessions for staff in charge of vector control and vector surveillance?**

No

**37. For the last two years, did your country have a plan for mosquito-borne disease control that includes a threshold (eg, level of vector mosquito abundance or minimum infection rate) that would result in a recommendation for mosquito adulticiding/other mosquito reduction measures?)**

Yes, have a threshold that does not require concurrent human cases

**37b. Which indicator(s) is(are) used as threshold(s)?**

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Concurrent human cases	Yes
Minimum infection rate	Not selected
Vector density	Yes
Breteau Index	Not selected
House Index	Not selected
Container Index	Not selected
Other	One WNV positive mosquito pool triggers targeted intensified response vector control in the area

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**38. Overall, are data on any of the following arboviral outbreak risk factors routinely collected and analysed? (Select all that apply)**

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House Index	Not selected
Breteau Index	Not selected
Container Index	Not selected
Temperatures	Not selected
Rainfall	Not selected
Migration of a non-immune population	Not selected
None	Yes

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**39. Is there a surveillance system in place for monitoring *Aedes* resistance to the insecticide(s) used?**

No

**40. What do the vector surveillance staff perceive as factors contributing to the a) success and b) barriers/challenges with respect to vector surveillance and control in the country?**

Success factors: Experience - established procedures for routine vector surveillance and control Experience in laboratory procedures for pathogen (virus) detection in mosquito pools High vigilance of the vector surveillance and control authorities Strong commitment of involved stakeholders and staff Intersectoral work and collaboration - National Committee, Multi-sectorial working groups Good interpersonal communication and information flow-data sharing (at national and regional level) - networking Operational preparedness plan for response measures

(MoH Circulars i.e. on integrated vector management, and ii. on vector management in case of imported Aedes-borne viruses).

Challenges: Vector surveillance and control strategy (guidance, legislation, resources allocation, quality assessment) Use of biocides: availability, access, restrictions of use Jurisdictions, roles and coordination of responsibilities for vector control at local level Diversity of experience and planning on vector control among Regions and Municipalities Procurement procedures: prolonged, not flexible, having an impact on the starting date of annual surveillance and control programmes in certain areas (at the onset of mosquito circulation period) Resources (in some localities) Community involvement, acceptance of vector control measures, access in private properties Quality control of mosquito control programs (targets, methodology) Entomological surveillance (harmonization of methodologies) Evaluation of “innovative” technologies in the context of Greece Citizen science (door-to-door, mobile applications) Provision of necessary capacity building (training, know-how, staff, costs) - Regular training sessions for staff in charge of vector control and vector surveillance

## **Section VI: Animal surveillance**

**41. During the last 2 years, did your country conduct national epidemiological surveillance for arboviral disease in animals (eg, epizootic surveillance for yellow fever in endemic areas)?**

Yes

**41b. How often was the animal surveillance conducted?**

The West Nile Fever (WNF) surveillance programme of Greece consists of active surveillance in equine and wild avian populations and passive surveillance in wild and domestic birds, in Equidae and in other domestic animals sensitive to WNF. Passive surveillance is conducted throughout the year. Regarding the periodic serological examination of sentinel horses (active surveillance): sentinel horses get sampled 3 times during the period from mid-May until the end of September, with minimum intervals of 3 weeks, on an annual basis.

**41c. What type of surveillance was conducted in animals?**

Combination of active and passive

**41d. Please upload a report on the animal surveillance**

1 file(s) submitted

**42. Does your country (or local jurisdictions within the country) perform sentinel animal surveillance or epizootic surveillance, eg, for yellow fever in nonhuman primates in endemic regions?**

Yes

**42b. For which viruses is sentinel surveillance conducted and in which animal species?**

Virus name	Sentinel animal species (list all)
West Nile virus	equines, wild birds

**42c. Please upload the most recent report(s) on sentinel animal surveillance**

1 file(s) submitted

## **Section VII: Community sensitization and participation**

**43. Does your country have a community outreach program that also covers arboviral diseases?**

Yes

**43b. What entity(ies) is(are) in charge of the outreach program in your country?**

Some Regional and municipal vector control and public health authorities perform communication activities for the public/ community outreach programmes. The National Public Health Organization conducts communication activities for the public, including development and distribution of educational/ informative materials for the public (on personal protection measures against mosquitoes and on West Nile virus infection), press releases (when needed), TV spot on mosquito personal protection measures, and seminars - informative meetings for the public (upon request). In addition, NPHO publishes weekly surveillance reports for West Nile virus infection in humans, during the transmission season.

**43c. What is the geographical coverage of the outreach program in your country?**

Countrywide

**43d. Is the community outreach/social mobilization program sufficiently funded to cover staff time, prevention and outreach activities as needed?**

No

**43e. Which resources would help ensure adequate capacity?**



Educational materials for the public	Not selected
Educational and reference materials for providers	Not selected
Educational and reference materials for local health departments	Not selected
Additional staff	Yes
Staff training	Not selected

**44. Did your national arboviral disease program issue notifications to the public about local transmission risk and/or possible vector-control activities (eg larviciding, adulticiding, community mobilization and participation, etc) as a prevention message for arboviral diseases within last 2 years? (Check all that apply)**

	During outbreaks	During non-outbreak periods
Issued by national public health agency	Yes	Yes
Issued by state/local health agencies	Yes	Yes
No risk in the past two years	Not selected	Not selected
No notifications even though risk was present	Not selected	Not selected

**44b. Which means does your program use for community sensitization, mobilization and acceptance of interventions in your country? (Check all that apply)**

Press releases to electronic and printed media	Yes
Public service announcements on television or radio	Yes
Passive distribution of informational brochures	Yes
Active distribution of informational brochures	Yes
Town, community, or neighborhood meetings	Yes
Posting information on the home page of your agency's website	Yes
Social media outlets (Facebook, Twitter, etc)	Yes
Door-to-door outreach in selected locations	Yes
Participation in community clean-ups	Not selected
Modification of messages for all local languages	Yes

**45. Does your country provide regular training sessions for staff in charge of community sensitization, mobilisation and acceptance of interventions dedicated to control arboviral diseases?**

No

**46. What do the community outreach staff perceive as factors contributing to the a) success and b) barriers/challenges with respect to community participation**

Success: - Direct communication and collaboration among national and regional/local authorities for specific interventions, e.g. distribution of education material. - Press releases at national level that alert the public for the risk nationwide (e.g., following the seasonal recording of the first case of WNV disease, in the beginning of the transmission season). - Regular published surveillance reports to timely inform the public regarding Arbovirus transmission. In Greece, weekly surveillance reports for West Nile virus infection in humans are published, during the transmission season, to inform the public and health professionals about the circulation of WNV - recording of human cases at Municipality level.

Challenges: Human resources - limited staff in regional and local public health authorities (e.g., door-to-door interventions/ outreach -which are considered most effective- require adequate human resources).

## **Section VIII: Preparedness for arboviral outbreaks/epidemics**

**47. Is there either a surveillance and outbreak response committee in your country, or a steering committee for that purpose?**

Yes

**48. Does your country have a contingency plan to organize healthcare services during an outbreak (including outbreaks of arboviral diseases)?**

I don't know

**48b. Please upload the contingency plan**

**49. Are there defined or established criteria for declaring an outbreak of arboviral disease outbreak in your country?**

Yes. If so, in the comments field, please briefly describe the criteria or reference the document in which those are sta

Even one locally acquired case of Arboviral disease is considered as an outbreak alert. - Local Aedes-borne transmission of Dengue, Zika, and Chikungunya viruses has not been recorded

in Greece; thus, the recording of even one locally acquired case will trigger urgent response measures. - West Nile virus seasonal outbreaks are expected during the transmission seasons; the recording of even one WNV human case defines the Municipality of exposure as affected, and triggers response measures (e.g., intensified vector control, communication, blood safety measures).

**50. Do you have established collaborations with national/regional research institutions / international agencies that are planned to be activated in case of arboviral outbreak?**

Yes. If so, please specify institutions/agencies in the comments field:

Hellenic National Public Health Organization (NPHO), National Reference Laboratory for Arboviruses (University), National animal health authorities (Ministry of Rural Development and Food), Competent Authority for Biocides Registration and Market Control (for product types PT8-10 and PT12-21 according to Regulation 528/2012 EE) of the Ministry of Rural Development and Food, National blood safety authorities (Hellenic National Blood Transfusion Centre - EKEA), Coordinating Centre for Haemovigilance and Surveillance of Transfusion -SKAEM/NPHO, Benaki Phytopathological Institute (Ministry of Rural Development and Food), Medical Entomology Unit/School of Public Health-University of West Attica, Regional authorities (Regional Directorates of Public Health), regional and municipal vector control authorities.

**51. What vector control interventions are deployed in case of an emergency?**

Breeding sites management, intensified larviciding, adulticiding (spraying).

**52. For the last 2 years, which of the following government levels had an emergency fund or a specified emergency funding mechanism for arbovirus outbreak response?**

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National level	Not selected
State/local level	Yes
None	Not selected

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**53. Does your country provide regular training sessions for staff/committee in charge of preparedness for arboviral outbreaks/epidemics?**

No

**54. What do the arboviral disease surveillance staff perceive as factors contributing to the a) success and b) barriers/challenges with respect to preparedness of arboviral diseases epidemics in your country?**

Success factors: 1) Multi-sectoral collaboration (national, regional and local level): - intersectoral National Committee/ Working Groups - networks at national and local level (information flow) - good interpersonal communication 2) Action plans, established procedures, experience 3) Strong commitment of involved stakeholders and staff 4) Timeliness of communication, real-time information sharing

Challenges: 1) Human resources/ public health workforce at national and local level (high workload), Advocacy 2) Coordination of One Health strategy for preparedness and response, integrated plan and coordination among sectors 3) Development of criteria for declaring an emergency at regional and national level

4) Regular training on preparedness for arboviral outbreaks

## Section IX: Arboviral disease surveillance data

**55. Please provide total number of cases and deaths for the following arboviral diseases from 2015 to 2020 (if available).**

	Dengue	Chikungunya	Yellow fever	Zika
2015 Cases	0	0	0	0
2015 Deaths	0	0	0	0
2016 Cases	0	0	0	0
2016 Deaths	0	0	0	0
2017 Cases	0	0	0	0
2017 Deaths	0	0	0	0
2018 Cases	0	0	0	0
2018 Deaths	0	0	0	0
2019 Cases	0	0	0	0
2019 Deaths	0	0	0	0
2020 Cases	0	0	0	0
2020 Deaths	0	0	0	0

(NA = Not Available)

**55b. Were cases of other mosquito-borne arboviruses, not listed in the previous question, reported in your country from 2015-2020?**

Yes

**55c. Please select any of the following other mosquito-borne viruses that have been reported in your country from 2015-2020**

West Nile	Yes
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**55d. Please provide total number of cases and deaths due to each of the following other arboviruses that you selected from 2015-2020**

	West Nile
2015 Cases	0
2015 Deaths	0
2016 Cases	0
2016 Deaths	0
2017 Cases	48
2017 Deaths	5
2018 Cases	317
2018 Deaths	51
2019 Cases	227
2019 Deaths	35
2020 Cases	145
2020 Deaths	23

**56. Please provide the number of cases of locally acquired, mosquito-borne *Aedes*-borne arbovirus infections by case classification for 2020 and, if not available, for 2019**

	Suspect cases	Probable cases	Confirmed cases	Deaths
Chikungunya	0	0	0	0
Dengue	0	0	0	0
Yellow Fever	0	0	0	0
Zika	0	0	0	0

**57. Do arbovirus surveillance staff have any perceived reasons for increasing trends in arboviral disease incidence? Check all answers that apply.**

Climate change (as evidenced by changes in meteorological data)	Yes
Construction activities	Not selected
Population migration (within the country or between countries)	Not selected
Increased availability of peri-domestic water-bearing containers suitable for mosquito egg deposition	Yes

## Section X: Surveillance staffing

**58. During 2019 (prior to the Covid-19 pandemic), indicate below the number of arbovirus surveillance staff at the national level.**

	Number of personnel
Clinicians	0.0
Epidemiologists	2.0
Laboratorians	9.0
Entomologists/ vector control specialists	4.5
Support staff (administration; logistics; other)	5.0

**59. Indicate below how many total staff persons are needed at the national level in your country to achieve full epidemiology and laboratory capacity\* to conduct arbovirus surveillance.**

	Number of personnel
Clinicians	0.0
Epidemiologists	3.0
Laboratorians	4.0
Entomologists/vector control specialists	12.0
Support staff (administration; logistics; other)	5.5

**60. Optional comments to explain responses to questions 58 and 59 above**

Only surveillance staff working at national authorities/ institutes (Ministries, National Public Health Organization, Benaki Phytopathological Institute), at the National Reference Laboratory and specialised laboratories funded by the NPHO to perform Arboviruses testing (i.e., Pasteur Institute), and University laboratories funded by the NPHO for Arboviruses vector surveillance (i.e., the Medical Entomology Unit of the School of Public Health - University of West Attica) is

included (and not staff from the regional/ local state authorities). The national public health authorities (NPHO/MoH) reimburse the testing for Arboviruses (in humans or mosquitoes, nationwide) in the National Reference Laboratory (for humans), in the Pasteur Institute (for humans), and in the Medical Entomology Unit of the School of Public Health - University of West Attica (for mosquitoes), and not the salary of the staff working in these laboratories for Arbovirus surveillance.

Veterinarians working at the national animal health authorities (Ministry of Rural Development and Food) are included in the “Epidemiologists” category, and laboratorians working at the national animal health authorities (for WNV testing of animals) are included in the “Laboratorians” category.

“Laboratorians” include staff working/needed for either human (n=6.5/2), or animal (n=1.5/1) or mosquito (n=1/1) surveillance for pathogen (Arboviruses) detection in humans, animals or mosquitoes. “Entomologists” (4,5 full time persons working in national authorities, and 12 more persons needed at national level, in total) include: i) medical entomologists (1,5 full time persons working in national authorities, and 6 more persons needed) and ii) laboratorians working for mosquito species identification (3 full time persons working in national authorities for mosquito identification, and 6 more persons needed).

Regarding Question 59: - In Greece there is full epidemiology and laboratory capacity for the Arboviruses surveillance in humans; however, this is achieved with a high workload of the available staff. So, in the question 59, the ideal number of staff persons needed is included (to maintain the full capacity with an adequate workload). - Mosquito surveillance and control programmes are under the responsibility of regional and municipal authorities. NPHO/MoH and Benaki Phytopathological Institute (BPI)/Ministry of Rural Development and Food, in collaboration with other stakeholders (laboratory, regional authorities), also conduct active mosquito surveillance programmes in a limited scale. - As in Greece no Aedes-borne transmission has been recorded, Aedes circulation is routinely monitored in several areas in the context of the abovementioned mosquito surveillance programmes (and urgently around the recorded imported human cases of Aedes-borne diseases, if needed). The capacity on epidemiologists (for human and animal health sectors), entomologists/ vector control specialists and support staff only at the national level (in Ministries, NPHO, BPI) is included in this answer, and not at regional/local level, as the staff needed for capacity building at the regional/local level cannot be easily assessed at the national level. However, the capacity of the regional authorities regarding the human resources (on human, animal and vector arboviral surveillance staff) is limited and needs enhancement in every sector (human and animal and vector surveillance).

**61. The national health authority/ministry of health has access to expertise in clinical management of arboviruses (Check all that apply)**

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Within the ministry of health (eg, public health medical officers, clinicians in state hospitals)	Yes
Through other national agency with regulatory authority	Not selected
Through academic institution(s)	Yes
Private hospitals	Not selected
Does not have access	Not selected

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**62. The national health authority/ministry of health has access to expertise in arbovirus epidemiology (Check all that apply)**

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Within the ministry of health	Yes
Through other national agency with regulatory authority	Not selected
Through academic institution(s)	Yes
Does not have access	Not selected

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**63. The national health authority/ministry of health has access to expertise in arbovirus laboratory diagnosis (Check all that apply)**

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Within the ministry of health (e.g., public health laboratory scientists)	Not selected
Through other national agency with regulatory authority	Yes
Through academic institution(s)	Yes
Does not have access	Not selected
Other	National Reference Laboratory (University laboratory) funded by the NPHO/MoH

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**64. The national health authority/ministry of health has access to expertise in entomology (Check all that apply)**



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Within the ministry of health	Not selected
Through other national agency with regulatory authority	Yes
Through academic institution(s)	Yes
Does not have access	Not selected
Other	Intersectoral MoH National "Committee for the Prevention and Management of Tropical diseases" also includes medical entomologist from the Benaki Phytopathological Institute (Ministry of Rural Development and Food)

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**65. Optional comments to explain responses to any of Questions 61-64**

## **Section XI: Survey conclusion**

**66. If you have any further comments to add regarding arbovirus surveillance and control in your country, including whether arboviruses other than *Aedes*-borne arboviruses are of higher priority, please do so in the text field below**

The questionnaire was completed with the collaboration of many national stakeholders, i.e., the National Public Health Organization/ Ministry of Health, the Ministry of Rural Development and Food [MRDF - the national animal health authorities and the Competent Authority for Biocides Registration and Market Control (for product types PT8-10 and PT12-21 according to Regulation 528/2012 EE) of the MRDF], the Benaki Phytopathological Institute/MRDF, the National Reference Laboratory for Arboviruses (Aristotle University of Thessaloniki), the Hellenic Pasteur Institute, the Medical Entomology Unit of the School of Public Health-University of West Attica (for the relevant Sections).

In Greece, no recent local *Aedes*-borne transmission has been recorded so far. West Nile virus (WNV) infection cases are recorded -on an annual basis- in many European countries, including Greece. Since 2010, cases of WNV infection were recorded in various areas of Greece on an almost annual basis (in 2010-2014 and 2017-2020). This suggests that the WNV has been established in our country, as well as in other European and neighbouring countries. Therefore, the recurrence of WNV infection cases in our country and in other European and neighboring countries is considered likely and expected in each transmission period, during the mosquito circulation season. Thus, West Nile virus is of higher priority in Greece, than other Arboviruses (as only imported cases of DENV, ZIKV, CHIKV cases

has been recorded, and a very limited number of locally acquired cases of other Arboviral diseases with tick-borne or sandfly-borne transmission).

Regarding question 18: Adequate testing of arboviral diseases is already performed in Greece (with a high workload of the available staff). In this question we have included additional resources needed to perform the (same) testing with a lower workload of the staff.

Regarding questions 13 and 24 (about the training on Aedes-borne arboviral diseases): Only a few imported cases of Aedes-borne arboviral diseases have been recorded in Greece (among travelers). The Hellenic National Public Health Organization (NPHO) has provided guidelines for the recognition and diagnosis of Aedes-borne arboviral diseases and the recommended laboratory investigation. Informative material-letters were sent -on an almost annual basis- to all Health Units and Medical Associations of the country for awareness raising of the health-care workers for these diseases (for the timely diagnosis and management of imported cases of Dengue, Chikungunya and Zika virus infections) - last letter sent in early June 2021. In this material (letter), guidance is included regarding the diagnosis of the suspected cases, the case definition of suspected cases (cases under investigation), the clinical manifestations of these diseases, and some guidelines regarding the case management (e.g., mosquito protection of the infectious patients, warning signs for severe Dengue, avoidance of NSAIDs). No detailed/ analytical guidelines for the clinical treatment of cases/ severe cases were included in this material. This informative material will be also published on the NPHO's website. Furthermore, as WNV seasonal outbreaks occur in the country, the NPHO provides training for healthcare workers on the notification, diagnosis, and management of WNV disease - 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, especially during the transmission period) is recommended. The Hellenic National Public Health Organization provides guidelines for the recognition and diagnosis of WNV disease and the recommended laboratory investigation (mailings and website [www.eody.gov.gr](http://www.eody.gov.gr)), and notification. On an annual basis, in the beginning of each transmission period (in May), an informative letter is sent to all Health Units and Medical Associations of the country for vigilance and awareness raising of the health-care workers regarding West Nile virus (including case definition of suspected cases and clinical diagnosis). In addition, following the recording of WNV infection cases in an area, local Health Units are urgently informed. In addition, regarding the timely notification of WNV disease, active laboratory-based surveillance is established, including the daily communication and information exchange between the NPHO and laboratories conducting diagnostic testing for WNV; thus, all WNV diagnosed cases are notified to the national level (and further investigated) within 24 hours after their diagnosis.

Regarding Section V: Mosquito surveillance and control is under the responsibility of the regional and/or municipal authorities, who outsource integrated mosquito control programmes to private contractors through a tender. The National Public Health Organization (NPHO)/MoH) and the Benaki Phytopathological Institute (BPI)/Ministry of Rural Development and Food also conduct active mosquito surveillance programmes in a limited scale.

Regarding question 28d: A total number of 522 sentinel adult mosquito surveillance sites for

the 2021 season has been estimated including all traps included to the planned surveillance protocols of both the national and regional authorities; i. approximately 465 sites for adult mosquitoes' traps either from the regional authorities (according to their plan for 2021, a few still in ongoing call for tenders procedure) or (for a total of 157 traps) from the collaboration of regional and national authorities [including 72 sites in collaboration of Regions and NPHO, 65 sites in collaboration of one Region and the Benaki Phytopathological Institute (BPI), and 20 sites in collaboration of NPHO, BPI and one Region], and ii. 57 additional sites for adult mosquitoes' traps of the NPHO (still in ongoing call for tenders procedure). In addition, 110 sites for ovitraps (for Aedes mosquitoes) are placed from the BPI in collaboration with one Region. Larval/ pupal mosquito surveillance (or other ovitraps for Aedes mosquitoes placed by regional authorities) are conducted only by the regional authorities and information about the number of these sites is not available at the national level.

Regarding question 30: Larval/ pupal mosquito surveillance is conducted only by the regional authorities.

Regarding question 33: Testing for specific arboviruses on mosquito pools is performed in University/academic institutions, funded mainly by national and regional public health authorities (and ad hoc by EU programmes).

Regarding question 35: The method of sterile insect release has been implemented for 3 years as a pilot programme by the Benaki Phytopathological Institute in collaboration with the International Atomic Energy Agency.

Regarding question 39: No routine surveillance for monitoring resistance of Aedes invasive mosquito species to the insecticides used is conducted at the national level. Some surveys are conducted in Universities and/or Institutions. To our knowledge, for Aedes invasive mosquito species, there is no conclusive evidence of resistance to insecticides in the field so far.

Regarding question 55: Only imported cases of Dengue, Chikungunya, and Zika have been recorded in Greece (a total of 18 imported cases of Dengue, 5 imported cases of Chikungunya and 5 imported cases of Zika have been recorded in Greece during the period 2015-2020).

Regarding question 59: - In Greece there is full epidemiology and laboratory capacity for the Arboviruses surveillance; however, this is achieved with a high workload of the available staff. So, in this question, we have included the ideal number of staff persons needed (to conduct the surveillance with an adequate workload). - Mosquito surveillance and control programmes are under the responsibility of regional and municipal authorities. NPHO (MoH) and Benaki Phytopathological Institute (Ministry of Rural Development and Food) also conduct active mosquito surveillance programmes in a limited scale. Regarding the iv. sub-category: As in Greece no Aedes-borne transmission has been recorded, Aedes circulation is routinely monitored in several areas in the context of the abovementioned mosquito surveillance programmes (and urgently around the recorded imported human cases of Aedes-borne diseases, if needed). The capacity on epidemiologists (for human and animal health sectors), entomologists/ vector control specialists and support staff only at the national level (in Ministries, NPHO, BPI) is included in this answer, and not at regional/local level, as the staff needed for capacity building at the regional/local level cannot be easily assessed at

the national level. However, the capacity of the regional authorities regarding the human resources (on human, animal and vector arboviral surveillance staff) is limited and needs enhancement in every sector (human and animal and vector surveillance).