Mapping of the local/regional laboratories capacities for the detection and characterization of *Salmonella* and *Campylobacter*

You are hereby invited to participate in a survey of clinical microbiology laboratory capacity for the detection and characterization of Salmonella and Campylobacter. The survey is organized by the NRL within the framework of of the Food and Waterborne Diseases and Antimicrobial resistance – Reference Laboratory Capacity (FWD AMR-RefLabCap) project.

FWD AMR-RefLabCap is a four-year project on "Provision of EU networking and support for public health reference laboratory functions for antimicrobial resistance in *Salmonella* species and *Campylobacter* species in human samples". The project is managed by the European Health and Digital Executive Agency (HaDEA), on behalf of the Directorate General for Health and Food Safety (DG SANTE of the European Commission) and in executed in close cooperation with the European Centre of Disease Prevention and Control (ECDC). The contractors for the project are the Technical University of Denmark (DTU Food, Denmark) and Statens Serum Institut (SSI, Denmark).

Well-functioning microbiology reference laboratory services are essential to support the implementation of effective actions to combat AMR as set out in the European One-Health Action Plan against Antimicrobial Resistance COM (2017) 339 and Decision (EU) 1082/2013 on serious cross-border health threats. The purpose of the FWD AMR-RefLabCap project is to strengthen coordination, support and capacity building in national reference laboratory functions for testing and surveillance of AMR in *Salmonella* and *Campylobacter* in human samples. The overall aim of the project is to improve the proficiency of the local/regional laboratories at the local, regional and national levels in all countries participating in the EU Health Programme. These activities complement the ongoing activities of the ECDC for AMR surveillance in human *Salmonella* and *Campylobacter* infections.

The national reference laboratory/national expert laboratory (NRL or NEL) is already participating in a range of activities organized in the FWD AMR - RefLabCap project: e.g. capacity building activities, including training, external quality assessment (EQA) schemes and networking activities to improve their capacities for detection, phenotypic and genotypic characterization of *Salmonella* and *Campylobacter*.

At this point, as part of FWD AMR – RefLabCap activities, the NRL/NEL have been asked to conduct a mapping survey on the capacity for detection and characterization of *Salmonella* and *Campylobacter* within their national network of clinical microbiology laboratories or if it is not present by engaging with national clinical laboratories.

Your laboratory has been selected by the NRL/NEL to participate in this mapping exercise. We kindly ask you to complete the questionnaire to assist us in our mapping and evaluation of the capacity of the local clinical microbiology laboratory for *Salmonella* and *Campylobacter*. The questionnaire was developed in collaboration with the the FWD AMR-RefLabCap project, and contains 13 general questions and a maximum of 29 specific questions. The survey aims at identifying strengths and weaknesses to inform targeted capacity building activities in your laboratory. A report with the main findings and conclusion of the national survey will be elaborated (in national languages and a summary in English) by the NRL/NEL in your country by March 2023. The English summary will be sent to the RefLabCap project, and the national report will be circulated to the local participants.

How to complete the questionnaire

Please use Microsoft Edge, Mozilla Firefox or Google Chrome to complete the questionnaire. If you use other browsers this might cause compatibility issues. You can complete parts of the survey and save a draft of your answers. After clicking on 'save as draft', you will be automatically redirected to a page with a link to where you can retrieve your draft to edit and submit your answers. Be sure to save this link! When you have entered all your answers, please press "submit" at the bottom of the page.

For FAQs: https://ec.europa.eu/eusurvey/home/helpparticipants

General part

Diagnostics of *Salmonella* and *Campylobacter*

(section 3 in mapping summary report)

1. Please complete the table on details of your laboratory

	Information about the laboratory
Name of the laboratory	
Name and surname of the contact person	
Email address of the contact person	
Address and institution of the laboratory	
Region/Area covered by the laboratory	
Estimated patient population size covered (approximate number of people in the geographical area the laboratory covers)	
Organisation of the laboratory (e.g. hospital, university, public health, private company etc.)*	

**please use classification relevant to your country*

2. Does your laboratory carries out diagnostic testing of *Salmonella* and/or *Campylobacter* (select both answers, if relevant):
Includes both, culture- and PCR-based detection

a) *Salmonella*
b) *Campylobacter*
c) None of the above

3. How many samples and/or isolates are annually tested at your laboratory for the following pathogens?
Includes all testing methods

a) *Salmonella* (please specify)_____
b) *Campylobacter* (please specify)_____

4. Does your laboratory perform species identification of *Campylobacter*? (please select all relevant answers)
Includes both, phenotypic and genotypic testing

a) Yes, C. jejuni
b) Yes, C. coli
c) Yes, other species (please indicate species)_____
d) None of the above

5. Does your laboratory perform species/serovar identification of *Salmonella*? (please select all relevant answers)
Includes both, phenotypic and genotypic testing

a) Yes, species
b) Yes, all serovars
c) Yes, selected serovars (please indicate serovars)_____
d) None of the above

6. Does your laboratory perform antimicrobial susceptibility testing for *Salmonella* and/or *Campylobacter? (*select all relevant answers)
Includes both, phenotypic and genotypic testing

a) Yes, on all Salmonella isolates
b) Yes, on selected Salmonella isolates (please indicate the selection criteria)_____
c) Yes, on all Campylobacter isolates
d) Yes, on selected Campylobacter isolates (please indicate the selection criteria)_____
e) None of the above

7. Does your laboratory hold accreditation or certification for some or all laboratory services provided?
This could have been obtained for one or more methods under national or international standards for laboratory Services

a) Yes (please provide the details)_____
b) No

8. Does your laboratory use control material (specimens, DNA etc.) from a reliable source for quality control testing of the following methods? (please select all relevant answers)
Includes both, phenotypic and genotypic testing

a) Salmonella
    a. Detection
    b. Species identification
    c. Serovar identification
    d. Antimicrobial susceptibility testing
    e. No, the laboratory does not have access to controls from reliable sources
b) Campylobacter
    a. Detection
    b. Species identification
    c. Antimicrobial susceptibility testing
    d. No, the laboratory does not have access to controls from a reliable source

9. Has your laboratory participated in any external quality assurance (EQA) schemes for the following methods within the last 3 years? (please select all relevant answers)
Includes both, phenotypic and genotypic testing

c) Salmonella
    a. Detection
    b. Species identification
    c. Serovar identification
    d. Antimicrobial susceptibility testing
    e. No, laboratory did not participate in any EQAs
d) Campylobacter
    f. Detection
    g. Species identification
    h. Antimicrobial susceptibility testing
    i. No, laboratory did not participate in any EQAs

10. Does your laboratory provide testing services to other laboratories? (please select all relevant answers)
Include any type of tests for detection and characterization of *Salmonella* and *Campylobacter*

a) Yes, for *Salmonella*
b) Yes, for *Campylobacter*
c) No

11. Is your laboratory a member of any of the following types of network? (please select all relevant answers)

a) National network of clinical laboratories
b) Regional network of clinical laboratories
c) National group of laboratories involved in capacity building activities in diagnostics and/or research
d) International group of laboratories involved in capacity building activities in diagnostics and/or research
e) No, none of the above

12. Does your laboratory participate in any type of national surveillance for *Salmonella* and/or *Campylobacter*? (please select all relevant answers)

a) Voluntary continuous surveillance
b) Mandatory continuous surveillance
c) Sentinel surveillance (for example by submitting data in shorter periods a number of times per year)
d) No, none of the above

13. What kind of support would you like to receive from the national reference laboratory (NRL) and/or national network?
    a) Provision of control materials (isolates, DNA etc.)
    b) Shipment of samples/isolates
    c) External quality assessment (EQA) exercises for phenotypic antimicrobial susceptibility testing
    d) Support for outbreak detection and management (including guidance)
    e) Training/workshops for laboratory staff
    f) NRL support visit to your laboratory
    g) Long-term storage of isolates
    h) Participation in laboratory network
    i) Accreditation practices
    j) Other areas of support
    k) We are not interested in or able to join a national network and receive support from the network including the NRL

Specific part

Human resources, laboratory equipment and funding at local/regional laboratories

(section 4 in mapping summary report)

14. On a scale from 1 to 5, how would you rate staffing situation in relation to the workload resulting from the testing of *Salmonella* and/or *Campylobacter* in your laboratory (with 1 being not adequate at all and 5 being fully adequate)?
(e.g. diagnostic testing, quality assurance, participating in EQA, paperwork, training and continuous education of staff etc.)

15. On a scale from 1-5, how would you rate the situation in relation to qualifications and skills of technical staff for all types of *Salmonella* and /or *Campylobacter* testing in your laboratory (with 1 being not adequate at all and 5 being fully adequate)?
Please provide details for specific type of testing, if needed

16. On a scale from 1-5, how would you rate the situation in relation to availability of financial resources to perform Salmonella and/or Campylobacter testing in your laboratory (with 1 being not adequate at all and 5 being fully adequate)?
(e.g. equipment and materials for diagnostic testing, quality assurance, participating in EQA, training and continuous education of staff etc.)

17. On a scale from 1-5, how would you rate the situation in relation to availability of documentation for all methods used in your laboratory (protocols, guidance for interpretation of results) for *Salmonella* and/or *Campylobacter* testing in your laboratory (with 1 being not adequate at all and 5 being fully adequate)?
Please provide details for specific methods, if needed

18. On a scale from 1-5, how would you rate the situation in relation to availability of documentation (SOPs, IQC, QA and biosafety procedures) for all types of *Salmonella* and/or *Campylobacter* testing in your laboratory (with 1 being not adequate at all and 5 being fully adequate)?
Please provide details for specific type of testing, if needed

19. On a scale from 1-5, how would you rate the situation in relation to availability of procedures for the procurement, inventory, use and storage of laboratory equipment, consumables and reagents for all types of *Salmonella* and/or *Campylobacter* testing in your laboratory (with 1 being not adequate at all and 5 being fully adequate)?
Please provide details for specific type of testing, if needed

Salmonella and Campylobacter detection methods used in diagnostic laboratories

(section 5 in mapping summary report)

20. Which media does your laboratory use for culture-based detection of the following pathogens? (please select all relevant answers)

a) Salmonella

a. Direct plating, please indicate media in use_____

b. Selective enrichment and selective plating, please indicate media in use_____

b) Campylobacter

a. Direct plating, please indicate media in use_____

b. Selective enrichment and selective plating, please indicate media in use_____

21. What are the following procedures in your laboratory if *Salmonella* and/or *Campylobacter* is detected using culture-independent methods (please select all relevant answers)

a) In all cases, the laboratory performs culture-based detection
b) In selected cases, the laboratory performs culture-based detection
c) All positive samples are sent to another laboratory for culture-based detection
d) None of the above
e) Other procedure, please specify_____

22. Does your laboratory store *Salmonella* and/or *Campylobacter*-**positive samples**? (please select all relevant answers)

a) Yes, we freeze-store all samples (please specify the temperature and the length of the storage)_____
b) We freeze-store only selected samples (please specify the temperature and the length of the storage)_____
c) We store samples differently (please specify the temperature and length of the storage)_____
d) We don't store positive samples

23. Does your laboratory store *Salmonella* and/or *Campylobacter* **isolates**? (please select all relevant answers)

a) Yes, we freeze-store all isolates (please specify the temperature and the length of the storage)_____
b) We freeze-store only selected isolates (please specify the temperature and the length of the storage)_____
c) We store isolates in a different way (please specify the temperature and length of the storage)_____
d) We don't store isolates

Salmonella and Campylobacter characterisation methods used in local/regional laboratories

(section 6 in mapping summary report)

24. Which of the following methods does your laboratory use for identification of *Salmonella* and/or *Campylobacter*? (please select all relevant answers)

a) Salmonella
   a. MALDI TOF
   b. Biochemical tests
   c. Antisera
   d. Molecular methods
   e. None of the above, please specify_____

b) Campylobacter
   a. MALDI TOF
   b. Biochemical tests
   c. Molecular methods
   d. None of the above, please specify_____

25. Does your laboratory perform antimicrobial resistance testing for the following antimicrobials? (please select all relevant answers)
Includes both, phenotypic and genotypic testing

a) Salmonella
   a. Ampicillin (AMP)
   b. Chloramphenicol (CHL)
   c. Meropenem (MEM)
   d. Cefotaxime (CTX)
   e. Ceftazidime (CAZ)
   f. Ciprofloxacin (CIP)/pefloxacin (PEF)
   g. Gentamicin (GEN)
   h. Colistin (COL)
   i. Tetracycline (TCY)
   j. Trimethoprim (TMP)
   k. Azithromycin (AZM)
   l. Sulfamethoxazole (SMX)
   m. Tigecycline (TGC)
   n. None of the above
   o. Other antimicrobials, please specify_____

b) Campylobacter
   a. Gentamicin (GEN)
   b. Erythromycin (ERY)
   c. Ciprofloxacin (CIP)
   d. Tetracycline (TCY)
   e. None of the above
   f. Other antimicrobials, please specify_____

26. Does your laboratory perform phenotypic and/or genotypic AMR testing of bacterial isolates in compliance with the 'EU protocol for harmonised monitoring of antimicrobial resistance in human *Salmonella* and *Campylobacter* isolates'?

a) Yes
b) No (please specify the reason and which set of guidelines you follow instead)_____

27. Which phenotypic antimicrobial susceptibility testing guidance (for methodology and breakpoints) do you use in your laboratory? (please select all relevant answers)

a) EUCAST
b) CLSI
c) Other guidance, please specify_____

28. Which methods does your laboratory use for phenotypic testing of AMR in *Salmonella* and/or *Campylobacter*? (please select all relevant answers)

a) Automated system (e.g. Vitek)
b) Commercial broth microdilution (e.g. Sensititre/Trek)
c) In-house micro broth dilution
d) Agar dilution
e) Gradient strips (e.g. Etest)
f) Disk diffusion
g) Other methods, please specify_____

29. Which genotypic testing method does your laboratory use for testing the presence of antimicrobial resistance genes or point mutations in *Salmonella* and/or *Campylobacter* isolates? (please select all relevant answers)

a) Conventional PCR
b) Single-gene sequencing
c) Real time PCR
d) DNA array
e) Whole genome sequencing (WGS)
f) Other methods, please specify_____

30. Please indicate the purpose of antimicrobial resistance testing in your laboratory (please select all relevant answers)

a) To inform the clinicians on possibilities for antibiotic treatment
b) To inform infection prevention and control measures
c) Other purposes, please specify_____

31. Does your laboratory provide individual reports on testing results for *Salmonella* and/or *Campylobacter*? (please select all relevant answers)

Includes all types of tests

a) Yes, to hospitals/other healthcare facilities
b) Yes, to relevant public health authority
c) Other, please specify_____

Salmonella and Campylobacter isolate referral and linking to cases

(section 7 in mapping summary report)

32. Does your laboratory (or other authorities) issue guidance on sampling practices of patients suspected to be infected with *Salmonella* and/or *Campylobacter*? (please select all relevant answers)

Guidance can be issued by the laboratory, the hospital and/or local, regional or national health authorities and may contain instructions about populations to be sampled, use of antimicrobial therapy, possible exposure, etc..

a) Yes, *Salmonella*
b) Yes, *Campylobacter*
c) No, none of the above

33. Does your laboratory (or other authorities) issue guidance on submission of clinical samples (including types and quality of samples, shipment conditions and documentation required) to their users? (please select all relevant answers)

Guidance can be issued by the laboratory, the hospital and/or local, regional or national health authorities and may contain instructions about sample type, container and transport medium, transport method etc.

a) Yes, instructions on submissions of clinical samples are provided in a laboratory user manual/handbook /standard operating procedure document or information is provided on a website
b) Yes, instructions on submission of clinical samples are provided on request e.g. via phone calls from users
c) No, instructions on submission of clinical samples are not provided

34. Does your laboratory refer (send) newly detected isolates or positive samples to the national reference (or expert laboratory) laboratory for further testing? (please select all relevant answers)

a) Yes, *Salmonella*
b) Yes, *Campylobacter*
c) No, none of the above

35. Does your laboratory (or other department) routinely communicate pre-defined data sets on species/serovar ID and/or antimicrobial test results from your laboratory for any of the following purposes? (please select all relevant answers)

a) Infection prevention and control purposes
b) Local surveillance purposes (e.g. surveillance within the specific area, etc.)
c) Early warning purposes (e.g. accumulation of cases, new variants of concern)
e) No, none of the above

36. Does your laboratory (or other authorities) issue guidance on positive sample/isolate referral (includes handling, storage, transportation and frequency) from your laboratory to the national reference (or expert) laboratory? (please select all relevant answers)

Please answer 'yes' if guidance is followed by your laboratory staff

a) Yes
b) No
c) Other, please specify_____

37. Does your laboratory (or other authorities) issue test requisition form (e.g. may include background information about laboratory methods used in your laboratory, results, patient data) for positive sample/isolate referral from your laboratory to the national reference (or expert) laboratory? (please select all relevant answers)

Please answer 'yes' if guidance is followed by your laboratory staff

a) Yes
b) No
c) Other, please specify_____

38. How does your laboratory record information about samples/isolates tested in your laboratory (includes collection, tracking, storage and diagnostic test results)?

a) We use a pre-defined physical paper form
b) We use electronic laboratory information management system (LIMS) or software application (e.g.WHONET)
c) Other, please specify_____

39. How does your laboratory send laboratory data to the national reference (or expert) laboratory or to relevant public health authorities? (select all relevant answers)

a) We send a pre-defined physical paper form
b) We send a pre-defined form by email
c) We use a pre-defined web-based form
d) We have access to electronic laboratory information management system (LIMS) or software application (e.g.WHONET)
e) Other, please specify_____

40. Does your laboratory have access to case data for samples sent to your laboratory for *Salmonella* and/or *Campylobacter* testing? (please select all relevant answers)

a) Patient age
b) Patient gender
c) Travel information
d) Hospitalization status
e) Underlying diseases
f) Antimicrobial treatment
g) None of the above
h) Other, please specify_____

41. Does your laboratory have procedures for laboratory test result recording, review and notification of laboratory results?

a) Yes
b) No
c) Other, please specify_____

42. Does your laboratory have procedures for patient and/or laboratory data protection and data loss?

a) Yes
b) No
c) Other, please specify_____