Pilot Proficiency Test/External Quality Assessment on detection and characterisation of bacterial food-borne pathogens

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EURL-*Campylobacter* workshop

PREVENT DETECT RESPOND

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WP1: Development of new cross-sectoral Proficiency tests/External Quality Assessments

Objectives

Develop guidance for cross-sectoral proficiency testing aimed at trialing the ability of the collaborative systems to solve food-borne outbreaks

Ensure alignment of the methodologies used in the different sectors

Output(s)

Guidance document and proposals for SOPs (where appropriate) with suggestions for design of future cross-sectoral (one health) PT schemes

Scientific papers

WP1: TASKS

- IA 2.1-WP1-T1 Mapping of existing PT schemes and proposals for new (6 months)
- IA 2.1-WP1-T2 Pilot trials
  - IA 2.1-W1-T2-ST1 Pilot PTs on isolation/detection and characterization of pathogens
    - Sub-Task Lead: SVA/FOHM
  - IA 2.1-W1-T2-ST2 Pilot PTs on typing/characterization including WGS
    - Sub-Task Lead: DTU/WBWR
  - IA 2.1-W1-T2-ST3 Pilot PT on outbreak surveillance based on WGS data
    - Sub-Task Lead: SSI/APHA
- IA 2.1-W1-T3 Development of a guidance document with suggestions for design of future cross-sectorial PT schemes

Pilot PT/EQA on detection and characterisation of bacterial food-borne pathogens

- Why?
  - no previous cross-sectoral PTs/EQAs organised
- Goals
  - to assess the ability to detect and characterise food-borne pathogens across sectors
  - together with the other PTs/EQAs provide recommendations for future PTs/EQAs
- How?
  - to simulate an outbreak investigation
  - matrices relevant for the participants
  - levels close or above the estimated levels present in the routine samples analysed

Outline of the pilot PT/EQA

5 samples simulating a stool sample or an environmental sample

5 vials with freeze-dried bacteria

Dispatched April 12, 2021

Five persons visited their local general practitioner (GP) with symptoms ranging from severe stomach aches to diarrhoea lasting for more than four days. Four of the cases had participated in a weekend event involving hunting of wild boar. Besides hunting, the event included a tour to the neighbouring small abattoir and an all-inclusive castle hotel visit. The fifth case had delivered chicken and vegetables from a nearby farm to the event and had had a quick lunch at the castle.

The weekend event hosted 15 guests, where three additional guests had reported mild gastrointestinal symptoms, which did not involve a visit to the GP.

Target organisms in vials C1-C5

Vial	Microorganism	m
C1	*C. coli*	3.7×10^5
C2	*S*. Stockholm	4.1×10^4
	Y. enterocolitica BT4/O:3	9.9×10^4
C3	*S*. Enteritidis	6.0×10^4
	C. jejuni	5.6×10^4
C5	*Y. enterocolitica* BT 1A	1.2×10^5

Outline

- The participants asked to analyse the samples up to species (*Campylobacter*), serovar (*Salmonella*) and bioserotype (*Yersinia enterocolitica*) level by using their routine or own methods

- A questionnaire on the analytical methods applied, sample size, whether the findings were notifiable and whether the laboratory routinely receives samples or isolates

- 15 participants
  - 12 CARE partners + 3 clinical microbiological laboratories from one country

Results

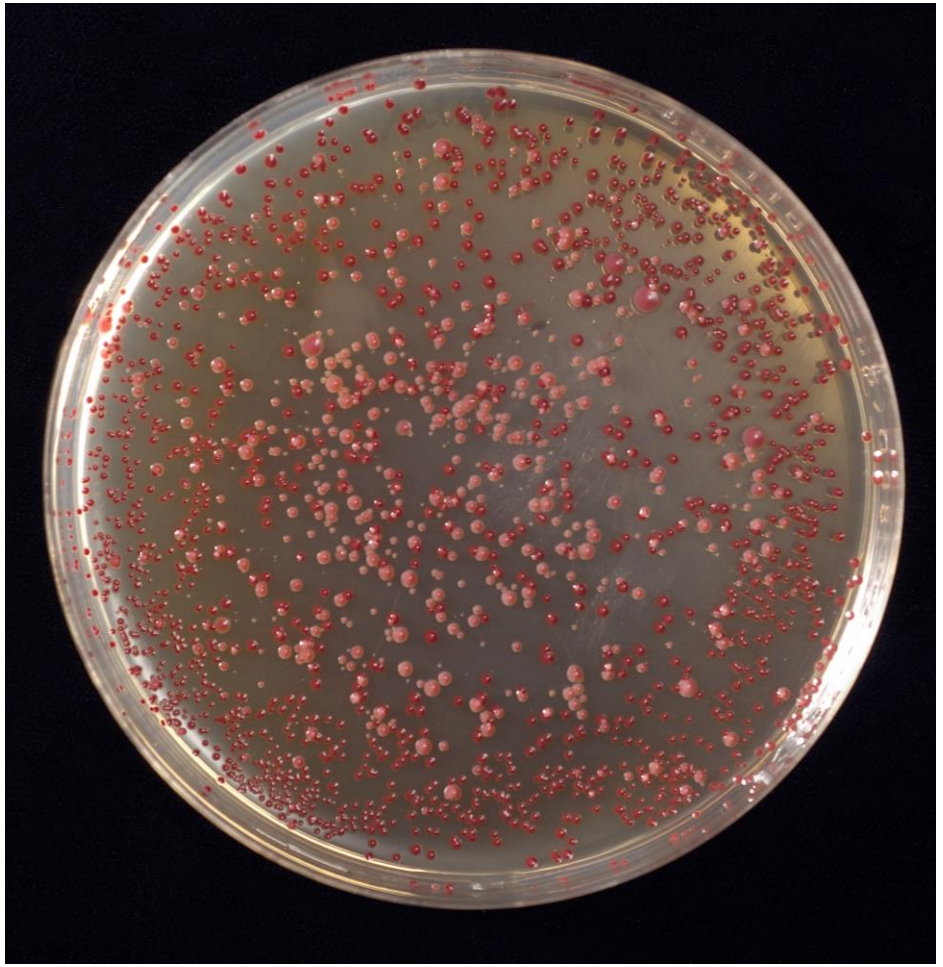
- All 15 participants analysed for *Salmonella*, 13 for *Campylobacter* and 11 for *Yersinia*
- Analytical errors predominantly false negative results (n=7)
  - Sample C2 especially challenging (*S*. Stockholm and *Y. enterocolitica*), related to a smaller size of the test sample and no enrichment
- Detection of *Salmonella* most commonly notifiable across sectors, *Campylobacter* and *Yersinia enterocolitica* less commonly from animal and food matrices

Laboratory methods

Laboratory methods varied across sectors and between laboratories

- Culture-based methods vs molecular methods
- Enrichment
- Selective media
- Confirmation

Sample sizes varied: 10 µl – 25 ml



Laboratory methods - *Campylobacter*

- Sample size
  - 10 µl (n=5), 20 µl (n=1), 100 µl (n=1), 10 ml (n=6)
- Enrichment
  - Yes (n=8): Bolton (n=3), Preston (n=4), enrichment medium not specified (n=1)
  - No (n=6)
- Incubation
  - Temperature: 37°C (n=2), 37°C and 42°C (n=1), 41.5 or 42°C (n=9)
- Selective media
  - One medium: mCCDA
  - Two media: mCCDA and Butzler (n=2), Karmali (n=1), CAT (n=1), blood agar (n=1)
- Confirmation
  - MALDI-TOF (n=8), biochemical tests (n=3), PCR (n=5), WGS (n=1)

Conclusions

- Cross-sectoral panels useful for
- assessment of One Health capacity to detect and characterize bacterial food-borne pathogens
- Interpretation of cross-sectoral surveillance data

- A report of the pilot PT/EQA on Zenodo
  https://zenodo.org/record/6575861#.YoyVBKhBxaQ

- A manuscript in prepation

Reflections, questions, comments

Thank you for your attention!

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