INTRODUCTION TO SESSION 3 WGS FOR SURVEILLANCE AND OUTBREAK DETECTION

Hanna Skarin

WHY PERFORM WHOLE GENOME SEQUENCING FOR OUTBREAK INVESTIGATIONS AND SURVEILLANCE?

WGS data can be used for different approaches of clustering (comparisons) to obtain results of high resolution:

Outbreak investigations
– To determine the source of an outbreak,
– To determine routes of infection/spread -> interventions

Surveillance

– To detect outbreaks, detect multi-country clusters

WGS = whole genome sequencing

NGS = next generation sequencing

INTER-EURLS WORKING GROUP ON NGS (WG-NGS)

- Initiated by the EC in 2017

- Main scope:
- To promote the use of NGS across the EURL networks
- To build NGS capacity within the EU
- Ensure liaison with the work of the EURLs and the work of EFSA and ECDC on the NGS mandate sent by the Commission

- The WG includes all the EURLs operating in the field of the microbiological contamination of food and feed and is coordinated by the EURL for *E. coli*

- Activities:
- Joint organisation of training courses (2021 and 2022)
- Joint organisation of PTs (discussions ongoing – CARE)
- Provide reference collections of NGS data for the target organisms
- Production of "helping documents" – for different procedures relating to NGS   ⟶

DOCUMENTS PRODUCED IN WG-NGS

The documents are meant to provide guidance to the laboratories in the area of application of NGS and have been produced by the working group with the aim of being diffused to all the networks of NRLs.

Will be available from all EURLs webpages at the end of 2020

- Overview of conducted and planned PTs – curated by EURL Antimicrobial Resistance

- Reference Whole Genome Sequencing collection – curated by EURL *Salmonella*

- NGS laboratory procedures – curated by EURL Parasites

- Bioinformatics tools for basic analysis of Next Generation Sequencing data – curated by EURL VTEC

- Guidance document for cluster analysis of Whole Genome Sequencing data – curated by EURL *Campylobacter*

- Guidance document for NGS-Benchmarking – curated by EURL *Listeria*

- Inventory of training supports – curated by EURL Coagulase Positive *Staphylococci*

- Survey on the use of NGS across the NRLs networks – curated by EURL VTEC

SCIENCE MEETS POLICY CONFERENCE
## MODERN TECHNOLOGIES TO ENABLE RESPONSE TO CRISES: NGS TO TACKE FOOD-BORNE DISEASES IN THE EU

- Organised by EURL- *E. coli* (Stefano Morabito) and WG-NGS

- Presenters from EC, EFSA, ECDC, RIVM and FDA

- Topics: how to build the capacity in Europe and also how the legal framework can have an impact on implementation of WGS or sharing data etc.

- Key points:

- How do we get MS to share data in the joint databses when it is a voluntary system? *Submission should be easy, the system should be useful also for the submitter*

- Ownership of data

- Hopefully be available on the ISS YouTube channel

FOODBORNE OUTBREAKS: EU APPROACH
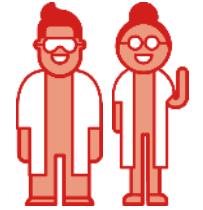
- Prevention ⟶ *Campylobacter* control strategies

- Preparedness ⟶ PTs, surveys

- Detection ⟶ Training courses, PTs

- Investigation ⟶

Session 3 – challenges and tools for cross agency/cross-border investigations

- Management ⟶

- Communication ⟶

- Reporting/publication ⟶ Lessons learnt – publish the results

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WGS CAPACITY IN NRL-CAMPYLOBACTER NETWORK
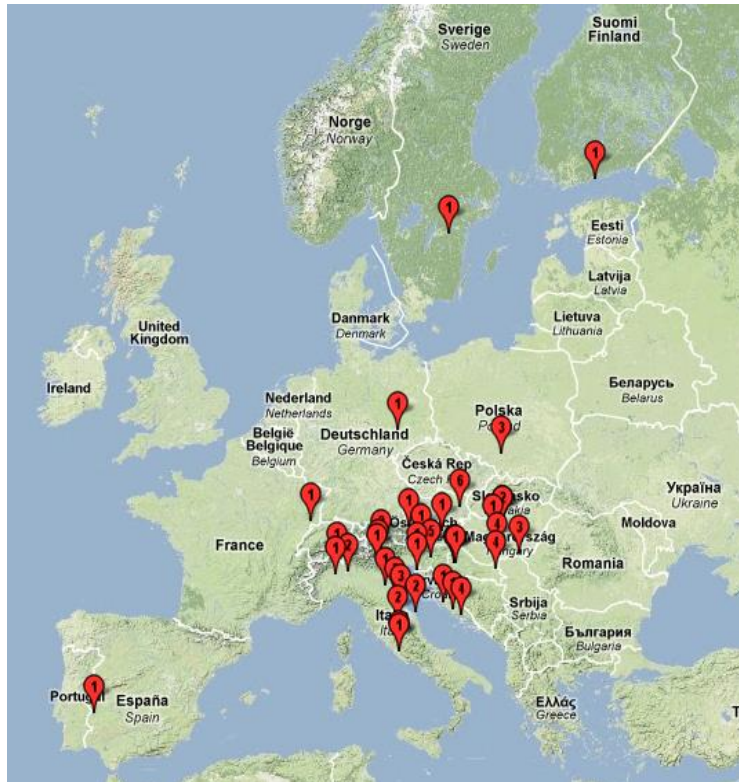
- PT 25 (2019) subtyping (including WGS cluster analysis)
- PT 28 (2020) quality of WGS data

- Variations in quality and sequence analyses may add to differences that can have an impact on interpretation

- When each lab analysis the results, the interpretation of clusters is dependent on the analyst

- But with a standardized work flow, training, and PTs to harmonise production of WGS data we have the possibility to detect cross-country outbreaks of *Campylobacter*
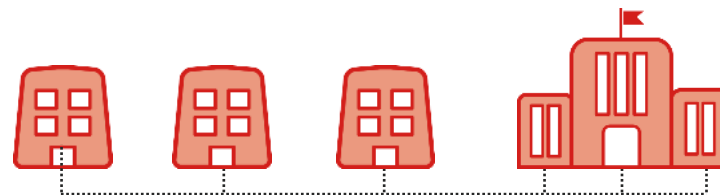
THE AGENDA SESSION 3

09:00–09.30	**Registration day 2**	
09:30-11.45	Session 3: WGS for surveillance and outbreak detection	
	Introduction to Session 3	Hanna Skarin, EURL-Campylobacter
	WGS of isolates from UK retail chicken and phylogeny in relation to time and processor	Frieda Jorgensen, NRL-UK
	Human Campylobacter infections in EU/EEA and One Health approach – points for discussion	Johanna Takkinen, ECDC
10:30-10:45	Coffee break	
	Outcome of the survey "WGS for surveillance and outbreak detection" in the EURL-Campylobacter NRL network	Hanna Skarin, EURL-Campylobacter
	European Commission mandate on 'One Health' system for the collection and analysis of whole-genome sequencing (WGS) data from food/animal isolates	Mirko Rossi, EFSA
	General discussion of session 3	
	Future work and closure of workshop	Hanna Skarin, EURL-Campylobacter
12.00	End of day 2	

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