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FWD AMR-
RefLabCap

Introduction to exercises
2nd Multidisciplinary training workshop
October 2023

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Exercises

Learning objectives

- The microbiologist and epidemiologist will throughout the exercise apply steps of an epidemiological outbreak investigation, conduct whole genome sequencing (WGS) analyses and interpret the results

- Each specialist will acquaint themselves with the terminology from the other field of expertise

- The primary focus will be to improve the communication and the information flow between the microbiologist and the epidemiologist

Exercises

Structure requirements

- Tabletop outbreak investigation exercise combined with WGS cluster and AMR profile analysis on provided data

The focus is on

- WGS analysis of *Salmonella* / Campylobacter
- cross-sector collaboration
- communications flow

Exercises

Two scenarios

- *Salmonella*
- *Campylobacter*

- Different starting points

- The scenarios develops over time

- **Please DO NOT READ AHEAD**
  - **Some of the answers to the questions will be revealed on the next pages**

General info

IN BLACK:

- Scenario text
- Development of the outbreak, detailed information etc.

IN BLUE:

- ***Questions***

Exercises

- Outbreak investigation (some of the 10 steps)
  - Case definition and descriptive epidemiology
  - Patient interviews and hypothesis generation
  - Analytical study
  - WGS analysis and interpretation
  - Traceback and microbiological testing
  - Communication of results

- Open questions to encourage discussion between you (Epi/Micro) or Country
  "How many cases would you inform the epidemiologist about? and how would the information be delivered in your country"?

- **Epidemiologist please include your microbiologist in the interpretation of the epi-data**

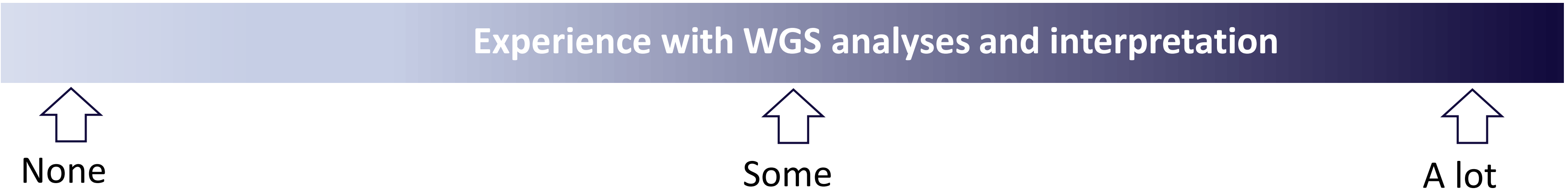
- **Microbiologist please include your epidemiologist in the interpretation of the WGS-data**

Exercises

WGS analysis and interpretation

- *Salmonella*:
  - Species identification, subspecies, 7-MLST, serotype, AMR profile, cluster analysis

- *Campylobacter*:
  - Species identification, 7-MLST, AMR profile, cluster analysis



WGS analysis

Either using your own pipeline setup for cluster analysis and antimicrobial resistance (AMR) profile. *Download fastq files* ***here****, code: FWD_AMR_download*

or

Try CGE tools on two fasta files and interpret pre-analysed results
Download fasta files and pre-analysed results ***here****, code: FWD_AMR_download*

Data Hints

Links to CGE tools

- *Species identification and contamination evaluation*
- *7 -loci MLST*
- *Serotype*
- *ResFinder*

We provide results for 10/12 isolates

Cluster analysis outputs:

- *CSIPhylogeny (link to the analysis and SNP matrix and newick file)*
- *Enterobase (Allele based) HC levels (Salmonella)*
- *BioNumerics (Enterobase scheme, cgMLST allele differences matrix)*

Breakout session today (from 12:00)

- 5-6 countries/laboratories - one project member
  - Group 1: Egle
  - Group 2: Susanne
  - Group 3: Jette
  - Group 4: Ana Rita
  - Group 5: Jeppe
  - Group 6: Mia

- The breakout session is the final session for today (no plenary afterwards)

Breakout session today (from 12:00)

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- Get familiar with the group
- How outbreak investigation in general is organized in the country?
- Criteria for starting investigation (signal detection by lab or epi, number of isolates)?
- How do epi and lab contribute?
- How communication (between epi/micro, to PH authorities, to population)?
- Involvement of other authorities (national and EU level?)
- Point of view on submitting sequences to EpiPulse (real-time, Event, fasta, ENA/NCBI)
- Compare sequences with food/animals?

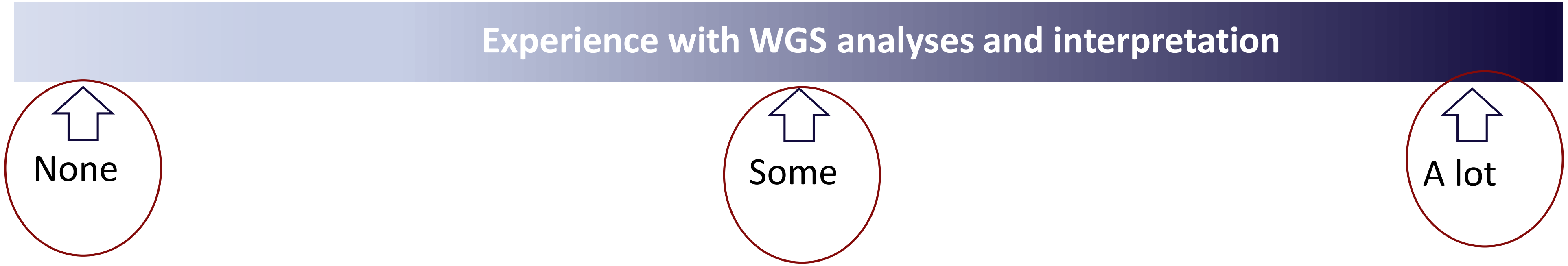
- How are you planning to conduct the exercise tomorrow (Day 2)
  - together or remotely – teams/zoom?

- Is there a plan for the sequence analysis?
  - Who? Microbiologists and /or Bioinformaticians?
  - How? Own workflows, pipelines or online tools etc.

Exercise release

Today at 13:00 an email with the two exercises will be sent to all participants

- Contact fwdamr@ssi.dk – in case of downloading issues etc.
- Day 2: work with the exercises, the data and interpretation (approx. 3 hours)



Experience with WGS analyses and interpretation

None

Some

A lot

Discuss the exercise in the small groups

Day 3: 9:00 (Group1 -4) or 10:30 (Group 5-6)

- We will talk about the results of the ***Salmonella* exercise**
  - Specific difficulties issues, interpretations, differences between countries etc.
  - lessons learned
  - *only Salmonella labs are invited*

Day 4: 9:00 (Group1 -4) or 10:30 (Group 5-6)

- We will talk about the results of the ***Campylobacter* exercise**
  - Specific difficulties issues, interpretations differences between countries etc.
  - lessons learned
  - *only Campylobacter labs are invited*

Group 5: Egle, Group 6: Susanne

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LUNCH BREAK BACK AT 12:00