



Whole genome sequencing in foodborne outbreak investigations

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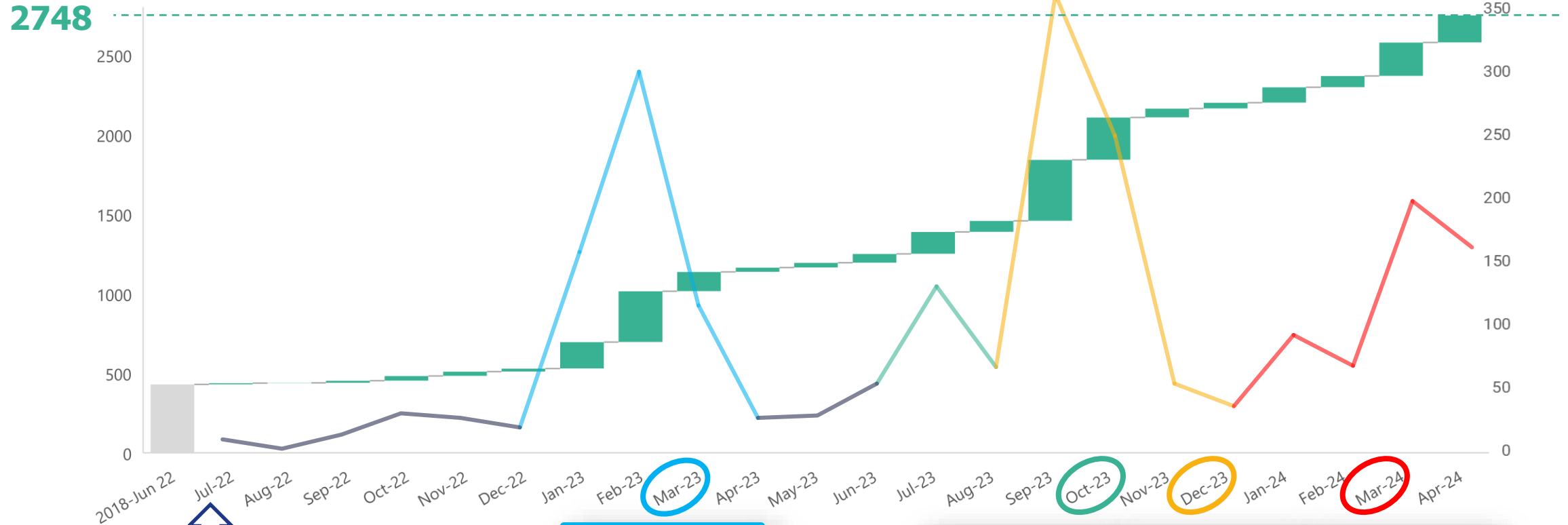
EURL-Campylobacter Workshop

Uppsala, 21-23 October 2024

Background

- Article 8(2) of Directive 2003/99/EC requires (food safety) competent authorities to investigate food-borne outbreaks in cooperation with public health competent authorities;
- Whole genome sequencing (WGS) facilitates greatly the swift identification of causes of an outbreak and the batches, lots or consignments of unsafe food since it enables to establish links between different isolates recovered from humans, food, animals, feed and the related environment
- EFSA has developed a molecular typing system (EFSA One Health WGS System) for the collection of WGS data of isolates of *Salmonella enterica*, *Listeria monocytogenes* and *Escherichia coli* recovered from food, animals, feed and related environment. Addition of *Campylobacter* under development. ECDC has developed and integrated a Molecular Typing system in EpiPulse for the collection of WGS and epidemiological data of isolates recovered from patients.

MEMBER STATES CONTRIBUTION TO EFSA DATABASE



Start data collection

Multi-country outbreak of *Salmonella* Virchow ST16 infections linked to the consumption of meat products containing chicken meat
30 March 2023

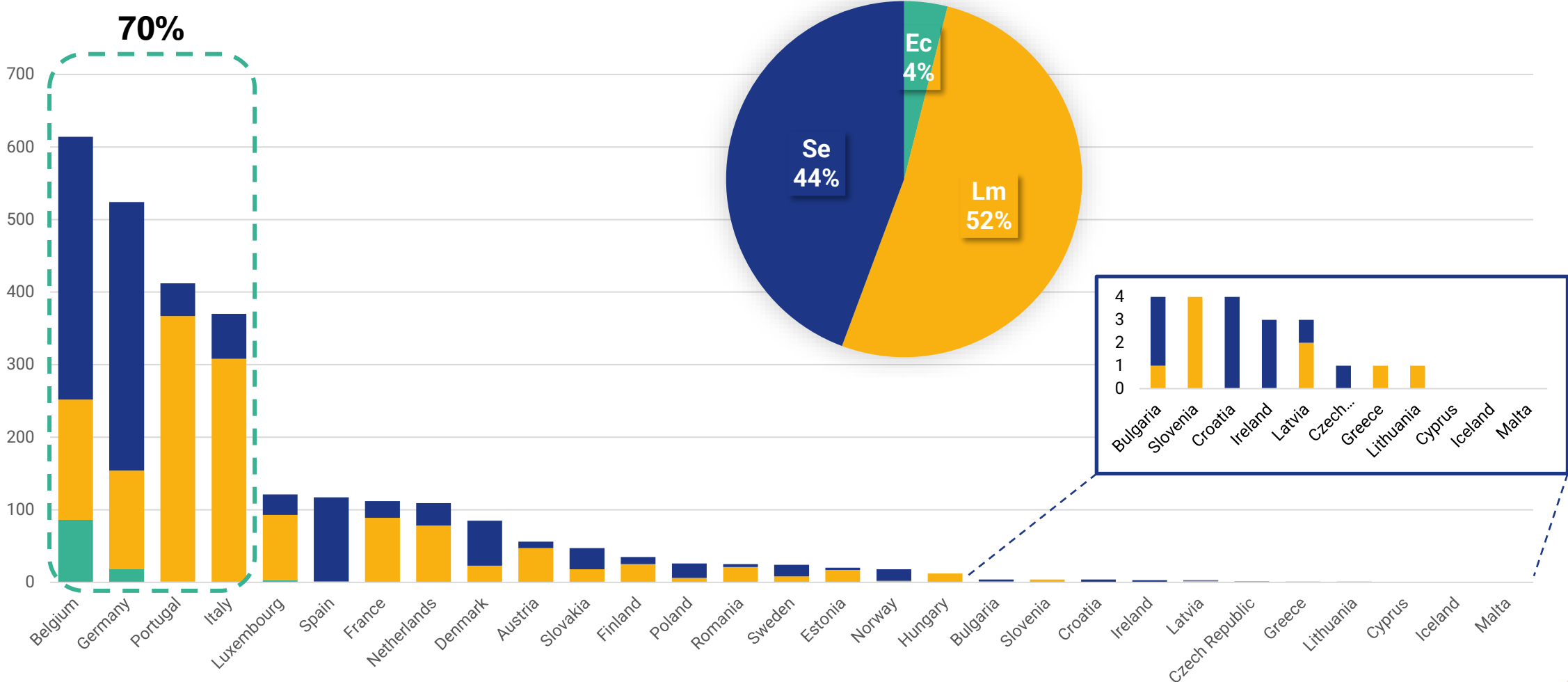
Three clusters of *Salmonella* Enteritidis ST11 infections linked to chicken meat and chicken meat products
26 October 2023

Prolonged multi-country cluster of *Listeria monocytogenes* ST155 infections linked to ready-to-eat fish products
13 December 2023

Multi-country outbreak of *Salmonella* Mbandaka ST413 linked to consumption of chicken meat products in the EU/EEA and the UK – first update
22 March 2024



MEMBER STATES CONTRIBUTION TO EFSA DATABASE



Proposal from the Commission

- Mandatory WGS analysis and reporting to EFSA of at least one isolate from sampling of food, animals, feed or related environment within the frame of a foodborne outbreak;
- *Salmonella enterica*, *Campylobacter jejuni/coli*, *Listeria monocytogenes* and *Escherichia coli*;
- Number of reported *Campylobacter* outbreaks in 2022:
 - Total: 255
 - Strong-evidence*: 16
- Questions circulated to NRLs: cost, experience capacity: See EURL presentation
- Favorable vote on 11 October 2024, publication expected beginning of 2025; main point of discussion: accreditation.
- Applicable 18 months after publication
- WGS on other isolates remains voluntarily but strongly recommended

*: see <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2014.3598>



European
Commission

WGS on human isolates?

- Regulation (EU) 2022/2371 of the European Parliament and of the Council on serious cross-border threats to health, Article 13 (Epidemiological surveillance):
 - (1) Network of epid. surveillance on communicable diseases: permanent communication between ECDC, COM, National authorities;
 - (3) « The national competent authorities shall communicate the following information, ..., to the participating authorities of the network for epidemiological surveillance:
 - ...
 - (d) molecular pathogen data, if required for detecting or investigating serious cross-border threats to health; ...”

Mandatory?

(interpretation of public health colleagues:) yes for diseases with mandatory notification at Union level which require as for their case definition laboratory confirmation (but the implementing act for article 13 defining the updated list of diseases and the related case definitions is yet to be adopted).

WGS on human isolates?

ECDC Molecular Typing system in EpiPulse:

Since 2018, profiles from

- *Listeria*: about 7500 isolates (so far (August) 500 in 2024)
- *Salmonella*: about 11 000 isolates (so far 3000 in 2024)
- *E. coli/Shigella*: around 1000 isolates (so far 400 in 2024)
- *Campylobacter*: around 1500 isolates (so far 1000 in 2024)

Note that recently a Public Health EURL for Food- and water-borne bacteria, has been nominated by the Commission

The use of WGS data

Exchanges of profiles from national authorities to EFSA/ECDC, but also from EFSA/ECDC to national authorities (at request).

Within the management of foodborne outbreaks laid down in Decision (EU) 2019/300 establishing a general plan for crisis management in the field of the safety of food and feed.

Conclusions on sources of outbreaks to be drawn only in combination with the results from epidemiological investigations.

No public access of profiles.

Frequently asked question being developed by EFSA and the EC.

Thank you (and counting on your full support for this initiative!)



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