

**FWD AMR-RefLabCap, 2nd Multidisciplinary training workshop**

# **EU level surveillance using EpiPulse molecular typing tool**

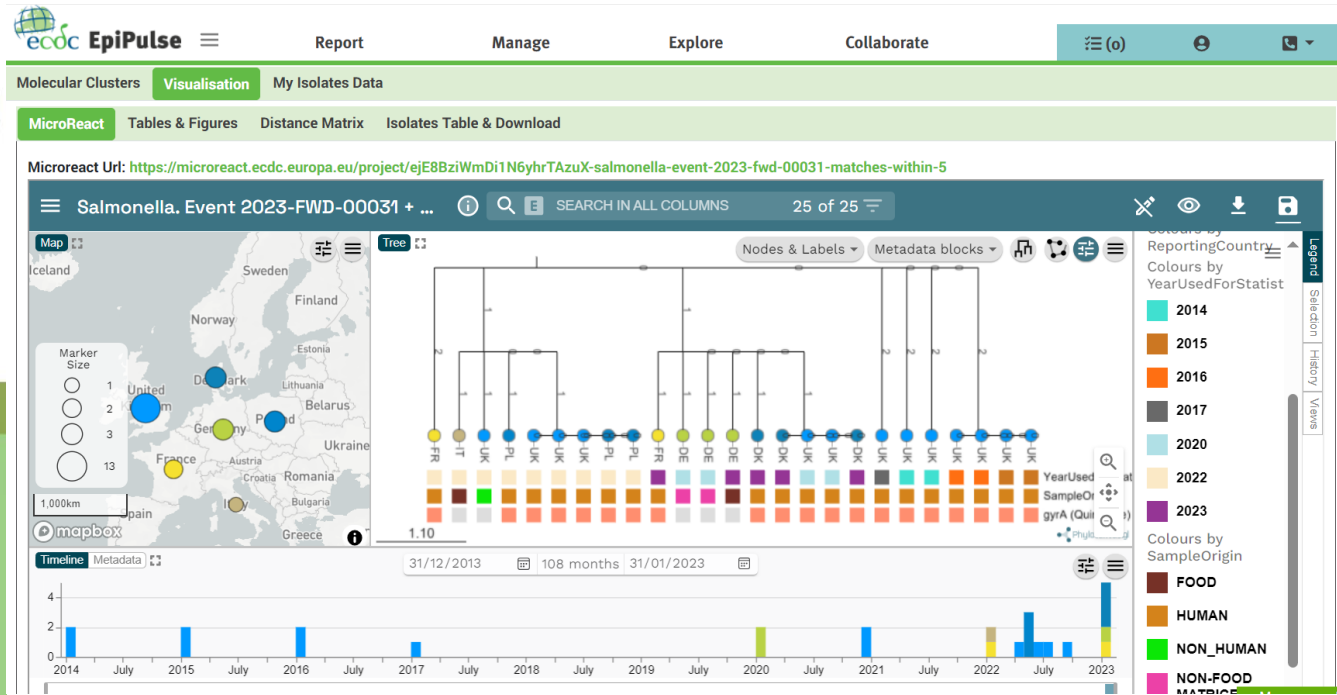
Cecilia Jernberg

Microbiology and Molecular Surveillance group, ECDC

JOINT ECDC-EFSA RAPID OUTBREAK ASSESSMENT

# Three clusters of *Salmonella* Enteritidis ST11 infections linked to chicken meat and chicken meat products

26 October 2023



# Legislation

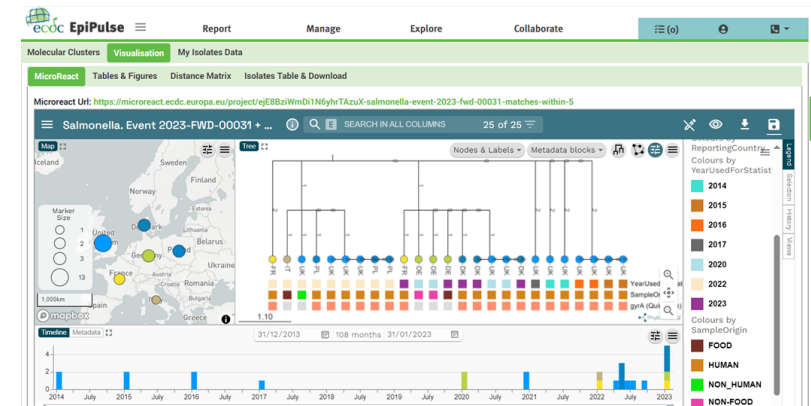
- New Regulation On Serious Cross Borders Threats to Health (2022/2371)

## *Article 13*

### Epidemiological surveillance

3. The national competent authorities referred to in paragraph 1 shall communicate the following information, based on agreed indicators and standards, 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



# Core components of ECDC WGS-enhanced surveillance



- TESSy – The system for submitting data to ECDC
- Epipulse – The ECDC platform for nominated users
  - Molecular Typing Tool – A tool for visualising WGS-based results integrated with epidemiological data
  - Events, Forum & News – Notification and discussion platform, can also connect to the Molecular Typing Tool
- ECDC Bioinformatics infrastructure
  - Bionumerics
  - Open-source tools to complement Bionumerics

# Use of Public data

- ECDC downloads public data when appropriate for ongoing investigations
- The public data are analysed using the same ECDC bioinformatics pipelines as data submitted through TESSy
- Several methods are used to find relevant public data, mainly:
  - NCBI Pathogen Detection
  - Enterobase

# Matching with EFSA

- Every week, every cluster for Listeria (where we perform continuous surveillance) is queried to the EFSA system with a 7 AD cut-off
- Any matches are saved in the ECDC system temporarily (updated every week if they are found again)
  
- ECDC staff can also perform ad-hoc queries whenever it is deemed necessary for an ongoing investigation, this can currently be performed for Listeria, and Salmonella, and with up to 20 AD cut-off

# Data visibility restrictions

- National identifiers can only be seen by ECDC and the submitting country
- For EFSA data, country of origin can only be seen by ECDC and the same country, and further restrictions on data visibility can be applied by the EFSA users
- These restrictions on EFSA data do not apply to data that are also in the public domain

# Access rights to the typing tool for the FWD domain

- Access rights correspond to TESSy Download rights for subjects LIST/LISTISO (*Listeria*), SALM/SALMISO (*Salmonella*), CAMP/CAMPISO (*Campylobacter*), and ECOLI/ECOLIISO (*E. coli*)



Cases  
 Events, Forum & News  
 Sequence Data  
 Determinant Data  
 Surveillance system  
 descriptors  
 COVID-19

Edit case/Case validation  
[Atlas](#) ▶  
 TALD cases  
 TALD sites  
[Validate COVID-19](#) ▶  
[Dataset Manager](#) ▶

Public Atlas  
[Surveillance Dashboards/Reports](#) ▶  
 Events, Forum & News  
 Download data  
 Signal detection tool  
[Molecular typing tool](#)  
 Documents Overview  
 EQA Lab Reports

CCB contacts  
[Domain Contacts](#) ▶  
 Extranets  
 Duty Schedule  
 TESSy Help & Docs

Welcome to **EpiPulse - the European surveillance portal for infectious diseases!**

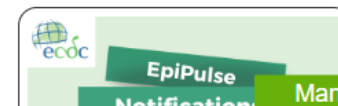
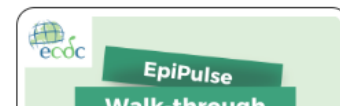
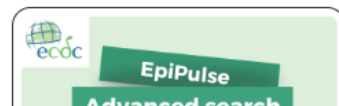
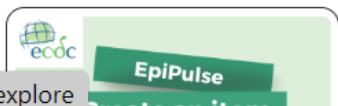
Through this portal you can report and share information on cases or events of infectious diseases/pathogens, explore European data or exchange information with other nominated users.

Note: **EPIS ELDSNet continues to work as usual**, migration will occur on a later stage. The function and use of EWRS remain unaffected.

TESSy can also be accessed through the EpiPulse menu. To report cases or molecular typing data go to 'Report' → 'Cases' or 'Sequence data'. The existing **TESSy URL** and functionalities have not changed.

Should you have any further questions or suggestions for improvement, please send them to [epipulse@ecdc.europa.eu](mailto:epipulse@ecdc.europa.eu).

Click on the menu above to get started. Through the help button on the top right-hand side of the screen, you can access **built-in tutorials** to guide you around. **You can also watch the videos to learn how to use EpiPulse:**



Please, select a Pathogen to review and analyse its data.

Select a pathogen

- Listeria monocytogenes
- Salmonella
- Escherichia coli
- Campylobacter
- Mycobacterium tuberculosis
- Klebsiella pneumoniae
- C. difficile
- Pseudomonas aeruginosa
- Neisseria meningitidis
- Legionella pneumophila

Help

[Assets](#) [Visualisation](#) [My Isolates Data](#)

Please, select a Pathogen to review and analyse its data.



Please, select a Pathogen to review and analyse its data.

Salmonella

> Search & Refine Selection

Help

**Molecular Clusters**

Visualisation

My Isolates Data

This table shows molecular clusters detected by ECDC by applying automated algorithms, see respective surveillance protocols for details. Only multi-country clusters & clusters in your country are shown. Included are also generated datasets of particular interest.

**Salmonella clusters**

Copy

Column groups visi... ▾

Columns visibility ▾



Clear filters

	Cluster ID	Clustering method	Cluster info	Event ID	Cluster status	Number of isolates	Countries
<input type="checkbox"/>	2023-10.SALM.06.ENTERITIDIS	cgMLST	Salmonella Enteritidis ST11 associated with travel to Turkey	UI602	OPEN		

✔ Pathogen: Page has been loaded successfully. ✕

Please, select a Pathogen to review and analyse its data.

Salmonella ▼

▼ Search & Refine Selection

Serotype

Please, select one Serotype ▼

Cluster

Please, select one or more clusters x ▼

If empty, all the clusters will be selected.

Events

Events

Isolates

Isolates

Countries

Please, select one or more countries x ▼

If empty, all the countries will be selected.

Date used for statistics

dd/mm/yyyy 📅

dd/mm/yyyy 📅

Submission Date

dd/mm/yyyy 📅

dd/mm/yyyy 📅

Distance metric to match

Default ▼

Match Distance

Match Distance

Cluster Method

Default ▼

Epidemiological Data

BN\_Cluster, PB\_DateUsedForStatistics, x ▼

Reset form

Search

Help

Please, select a Pathogen to review and analyse its data.

Salmonella

▼ Search & Refine Selection

Serotype

Please, select one Serotype

Cluster

Please, select one or more clusters

If empty, all the clusters will be selected.

Events

2023-FWD-00031

Isolates

Isolates

Countries

Please, select one or more countries

If empty, all the countries will be selected.

Date used for statistics

dd/mm/yyyy

dd/mm/yyyy

Submission Date

dd/mm/yyyy

dd/mm/yyyy

Distance metric to match

Default

Match Distance

5

Cluster Method

Default

Epidemiological Data

BN\_Cluster, PB\_DateUsedForStatistics, ✕

Reset form

Search

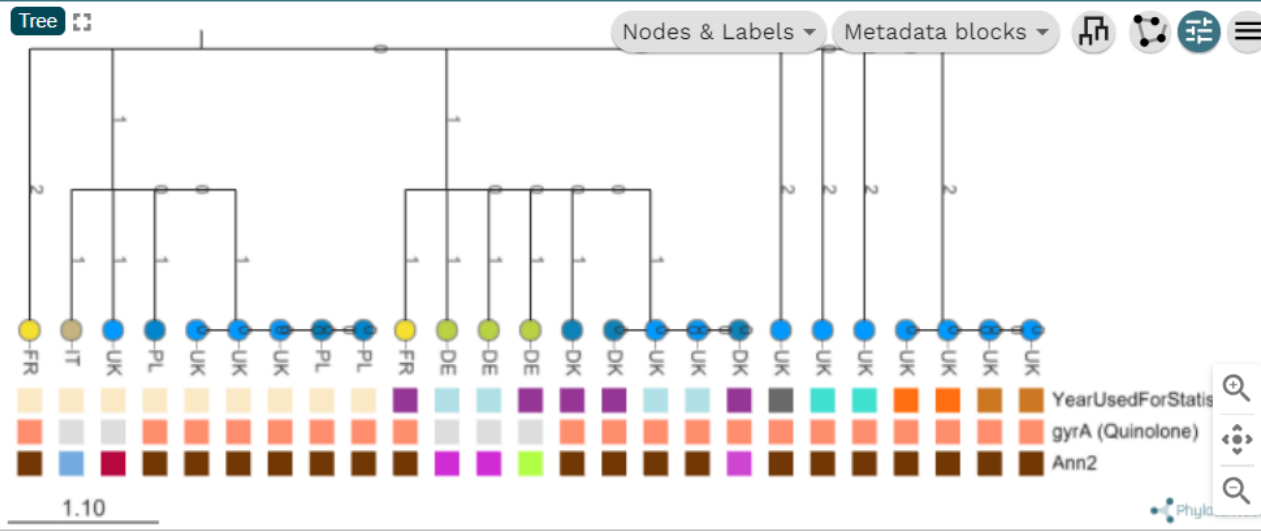
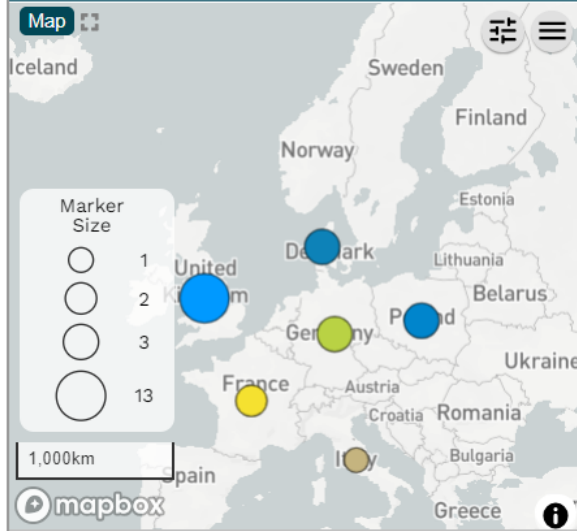
Help

Microreact Url: <https://microreact.ecdc.europa.eu/project/ihborcHvksS3LzeFbbUrUD-salmonella-event-2023-fwd-00031-matches-within-5>

Salmonella. Event 2023-FWD-00031 + ...

SEARCH IN ALL COLUMNS

25 of 25



Legend

- Colours by YearUsedForStatistic
  - 2015
  - 2016
  - 2017
  - 2020
  - 2022
  - 2023
- Colours by gyrA (Quinolone)
  - missing data
  - S83Y
- Colours by Ann2
  - 
  - Cattle sample
  - Chicken fresh meat
  - Chicken sausage

id	key	ReportingC...	DateUsedF...	YearUsedF...	Serotype	REF_MLST...	REF_MLST...	WGSBASE...	WGSBASE...
	EFSA-S-20...	DE	2023	2023	ENTERITIDIS	-	11	-	-
	EFSA-S-20...	UK	2022-06	2022	SALMONEL...	-	11	-	-
	SEQ-C8211...	FR	2023	2023	ENTERITIDIS	-	11	-	-
	SFO-D2AR	FR	2022	2022	FNTFRITIDIS	-	11	-	-

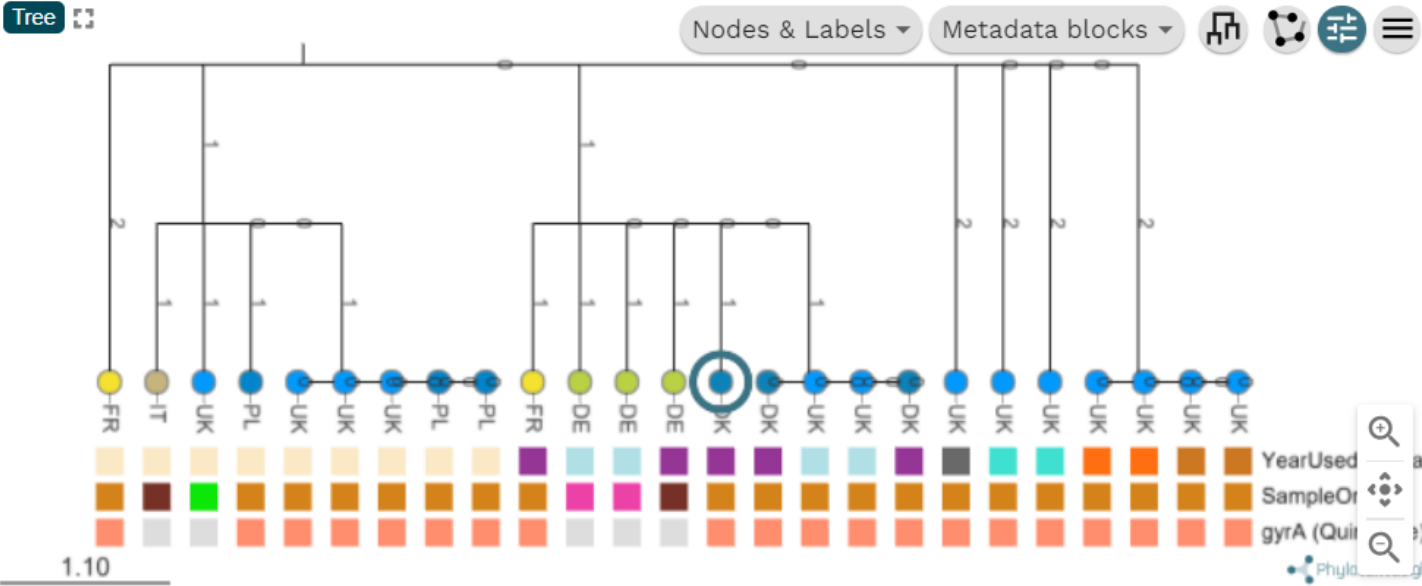
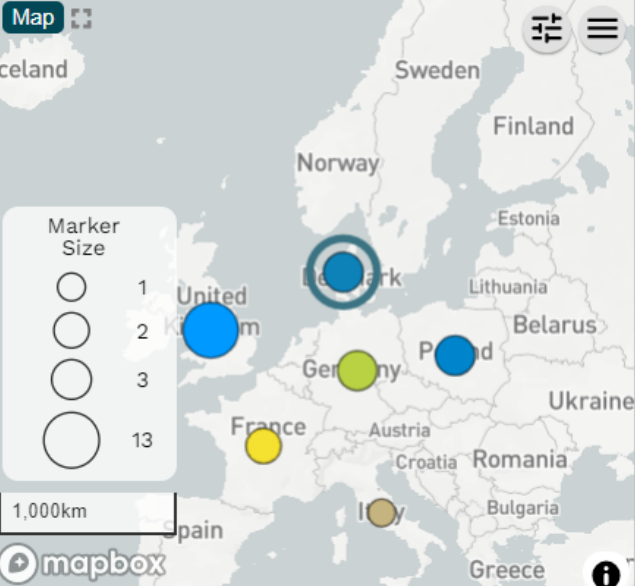
Microreact Url: <https://microreact.ecdc.europa.eu/project/ejE8BziWmDi1N6yhrTAzuX-salmonella-event-2023-fwd-00031-matches-within-5>

Salmonella. Event 2023-FWD-00031 + ...



SEARCH IN ALL COLUMNS

25 of 25



Legend

- Colours by YearUsedForStatist
  - 2014
  - 2015
  - 2016
  - 2017
  - 2020
  - 2022
  - 2023
- Colours by SampleOrigin
  - FOOD
  - HUMAN
  - NON\_HUMAN
  - NON-FOOD MATRICES
- Colours by gyrA (Quinolone)
  - missing data

Timeline Metadata

	WGSBASE...	WGSBASE...	C...	C...	C...	RecordId	Ann1	EFSALABID	WGSENAID	Ann2	SampleOri...	SampleMa...
<input type="checkbox"/>	gyrA:S83Y	Enteritidis	-	-	-	SRR20231171	2023-FWD-000...	-	SRR20231171	-	HUMAN	-
<input checked="" type="checkbox"/>	gyrA:S83Y	Enteritidis	-	-	-	SRR24791065	2023-FWD-00031	-	SRR24791065	-	HUMAN	-
<input type="checkbox"/>	gyrA:S83Y	Enteritidis	-	-	-	SRR18762212	2023-FWD-000...	-	SRR18762212	-	HUMAN	-

Please, select a Pathogen to review and analyse its data.

Salmonella

▼ Search & Refine Selection

Serotype

Please, select one Serotype

Cluster

Please, select one or more clusters

If empty, all the clusters will be selected.

Events

Events

Isolates

SRR24791065

Countries

Please, select one or more countries

If empty, all the countries will be selected.

Date used for statistics

dd/mm/yyyy

Submission Date

dd/mm/yyyy

Distance metric to match

Default

Match Distance

10

Cluster Method

Default

Epidemiological Data

BN\_Cluster, PB\_DateUsedForStatistics, \*

Reset form

Search

Help

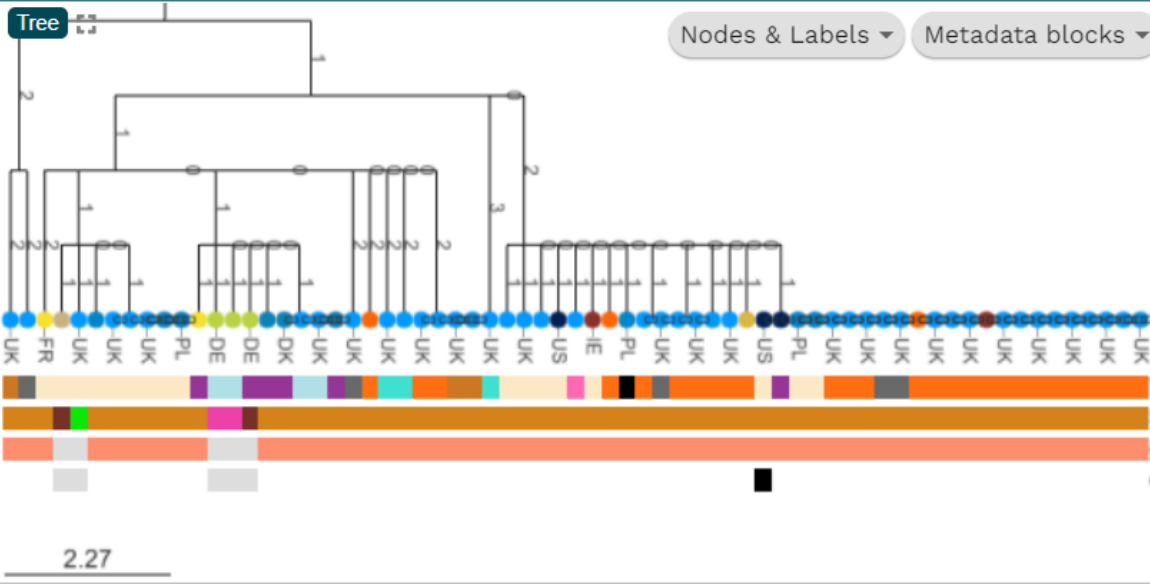
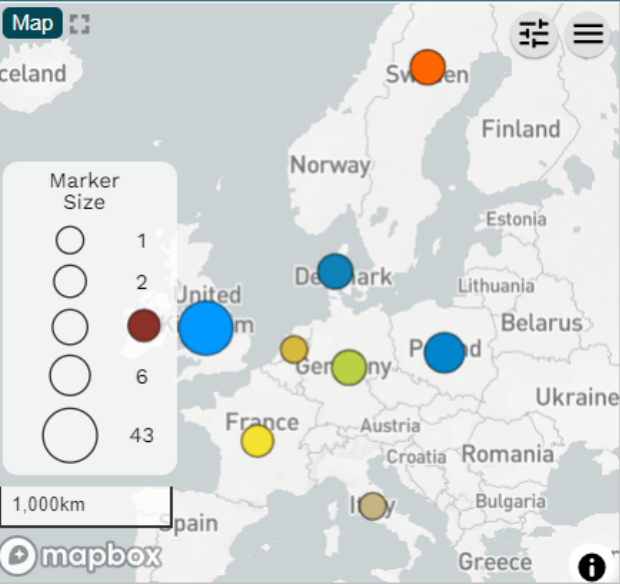




Salmonella. selected isolates + matche...

SEARCH IN ALL COLUMNS

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Colours by YearUsedForStatistic

- 2015
- 2016
- 2017
- 2020
- 2021
- 2022
- 2023
- UNK

Colours by SampleOrigin

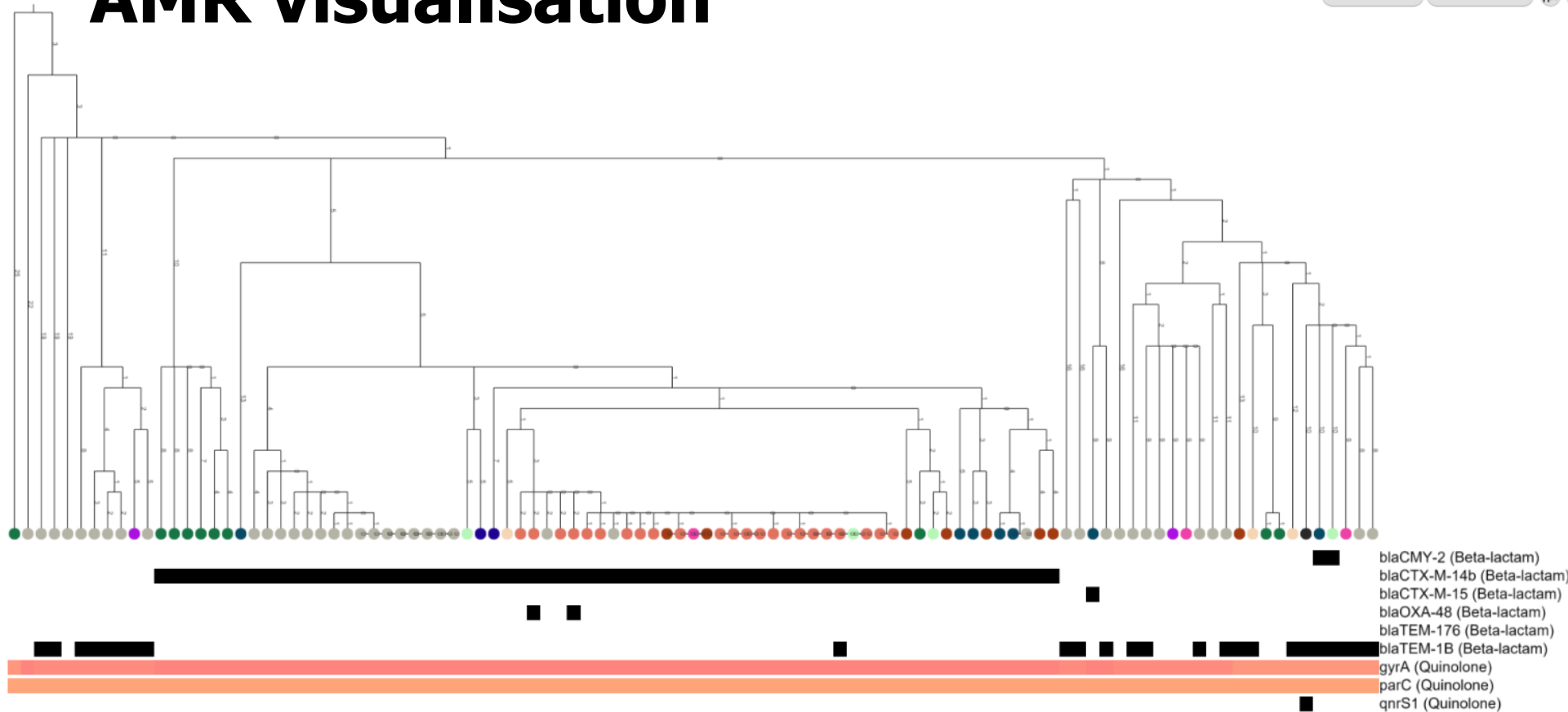
- FOOD
- HUMAN
- NON\_HUMAN
- NON-FOOD MATRICES

Colours by gyrA

Timeline Metadata

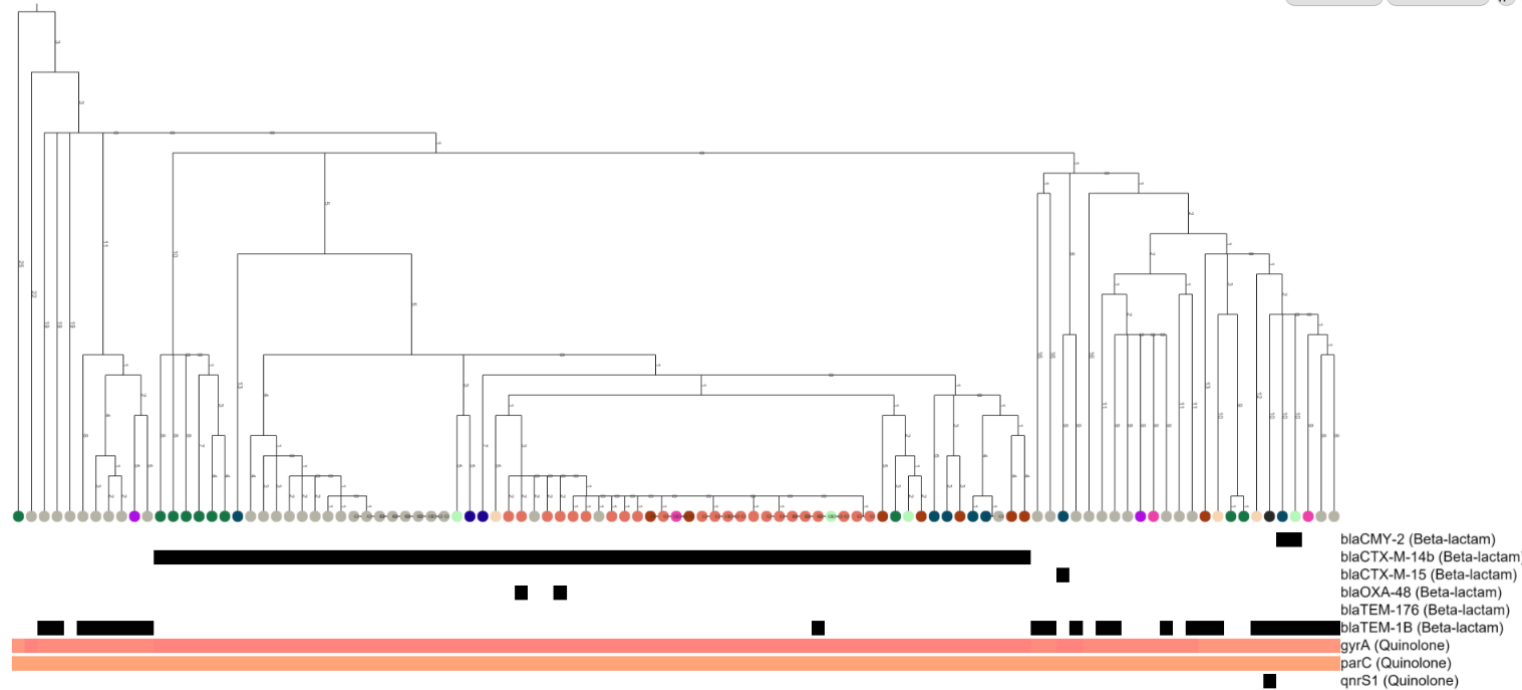
	id	key	ReportingC...	DateUsedF...	YearUsedF...	Serotype	REF_MLST...	REF_MLST...	WGSBASE...	WGSBASE...
<input type="checkbox"/>		SEQ-D0C2...	DK	2023	2023	ENTERITIDIS	-	11	-	-
<input type="checkbox"/>		SEQ-0C479...	UK	2020-12	2020	ENTERITIDIS	-	11	-	-
<input type="checkbox"/>		EFSa-S-20...	DE	2020	2020	ENTERITIDIS	-	11	-	-

# AMR visualisation

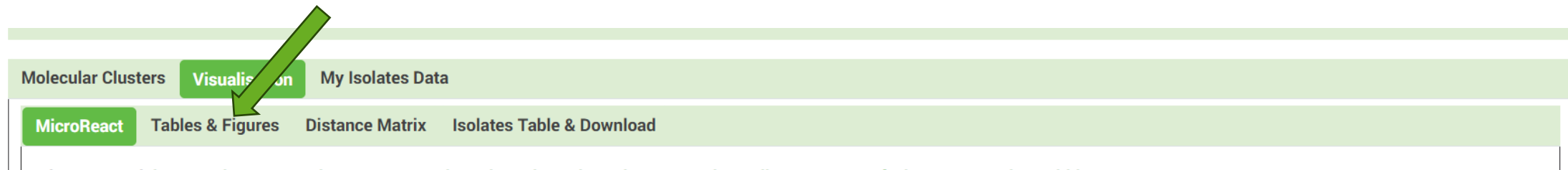


- Currently absence/presence of resistance genes are shown, as well as resistance point mutations
- There is also a detailed table with length/identity values for each detected gene

# AMR visualisation



- Currently absence/presence of resistance genes are shown, as well as resistance point mutations
- There is also a detailed table with length/identity values for each detected gene



The screenshot shows a web interface with a navigation menu. The 'Visualisation' tab is highlighted with a green arrow. The menu includes the following options:

- Molecular Clusters
- Visualisation
- My Isolates Data
- MicroReact
- Tables & Figures
- Distance Matrix
- Isolates Table & Download

## **To be able to use EpiPulse Molecular Typing tool to visualise your own data in the context of the data in ECDC db and those that would cluster with isolates from EFSA db you need:**

- Have access rights for TESSy Download rights for subjects SALMISO (and SALM), CAMPISO (and CAMP).
- If you do not have this your country's National Coordinator need to nominate you. You will then be granted access to the system.
- Contact us if you need support with this process
- Contact us if you need support with sequence data uploads or with learning more about the Molecular typing tool.

**Thank you!**