

THE EFSA-ECDC ONE HEALTH SYSTEM AND THE USE OF WGS DATA

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WHY NOW

FROM DEVELOPMENT TO ROUTINE SURVEILLANCE

A seven-year journey: shifting from building the system to embedding it in routine surveillance at EU level

2019



EC mandate

Design the joint
One Health WGS
sharing model

2022



Operational

EFSA and ECDC
One Health WGS
system goes live

23 Aug 2026



Compliance phase

Mandatory sharing
for **food/animal** sector
isolates

2027–30



Full-scale operation

Consolidation and scale
up to routine
surveillance

The goal is detecting cross-border links that no country can see alone

WHAT THE EFSA-ECDC ONE HEALTH WGS SYSTEM IS

TWO SECTOR PLATFORMS, ONE SHARED UNDERSTANDING

The architecture keeps governance sector-specific while creating one coherent understanding of a joint cluster

EFSA PLATFORM

Food and animal sector

- Food-chain governance
- Food, feed, animal and environmental data

INTEROPERABILITY

Cross-sector matches

Machine-to-machine exchange only after a verified correlation

ECDC PLATFORM

Public health sector

- Public-health governance
- Human-health data

Exchange rule

No match



no automatic exchange

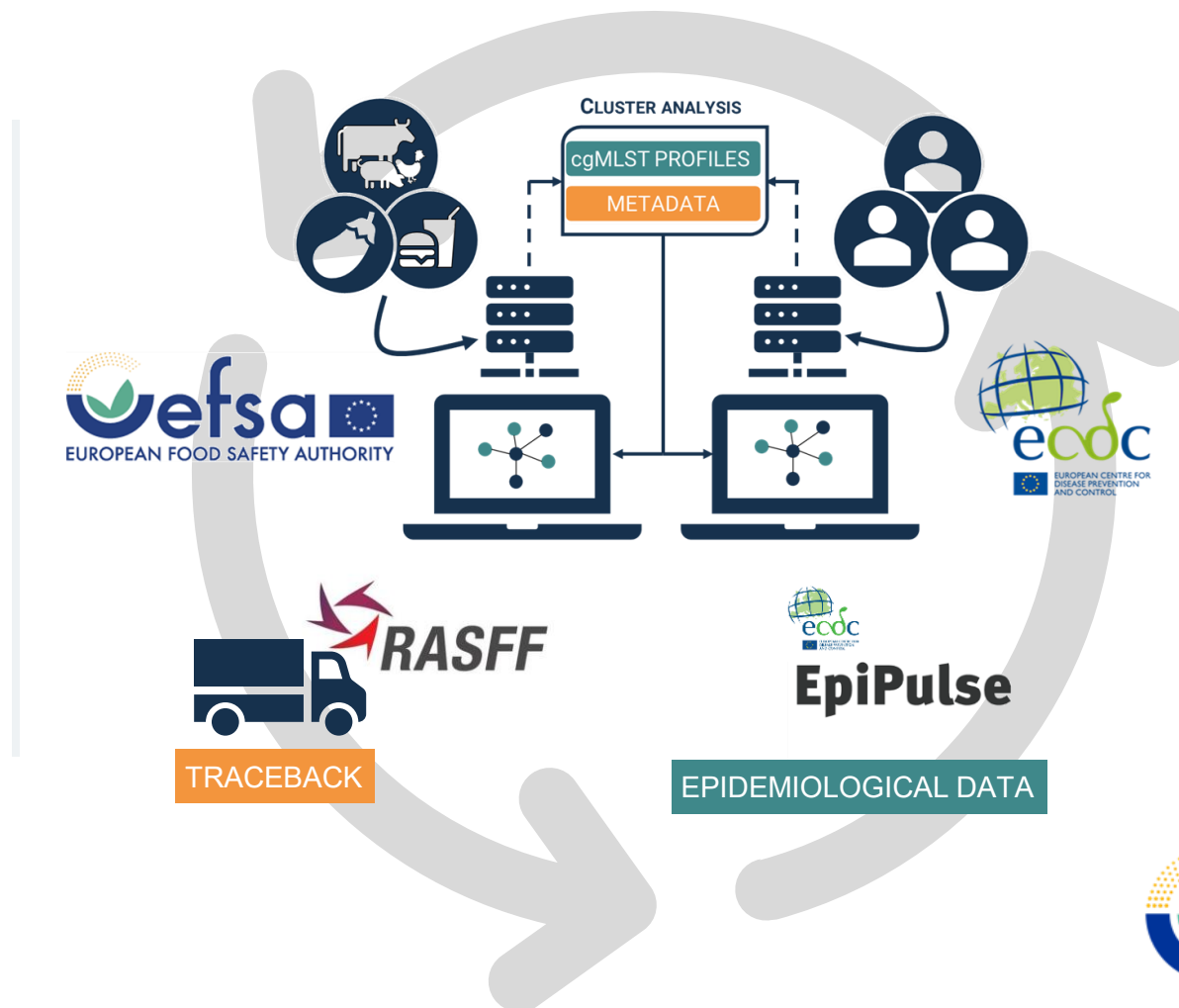
Verified match



automatic & multidisciplinary exchange evaluation

HOW EFSA AND ECDC WORK FROM GENOMIC MATCH TO SOURCE IDENTIFICATION

Connecting evidences: WGS finds the link; evidence identifies the source



WHAT IS SHARED

ESSENTIAL DATA IS SHARED; SENSITIVE DETAIL REMAINS AT SOURCE

Cluster assessment supports action without transferring detailed personal or sensitive records

REMAINS AT SECTOR LEVEL

- Direct identifiers
- Case-level personal data
- Confidential and sensitive data



SHARED CROSS-SECTOR

- cgMLST profiles + typing data
- Core sampling metadata
- Expanded metadata in case of outbreak assessment



ENABLES

- Cross-sector comparison
- Cluster prioritisation
- Coordinated assessment

The shared view is sufficient to detect and assess a signal – while sensitive detail stays under sector control



THE EFSA WGS SYSTEM

WHY: PURPOSE OF EFSA WGS SYSTEM

1 | PREPAREDNESS

A genomic profiles database to support outbreak detection and hypotheses generation.

2 | RESPONSE

Real-time support to multi-country foodborne outbreak investigations.

3 | ENGAGEMENT

A durable cross-sector partnership among Member States and EU agencies.

4 | COMPLIANCE

A consistent route for meeting EU data-sharing obligations.

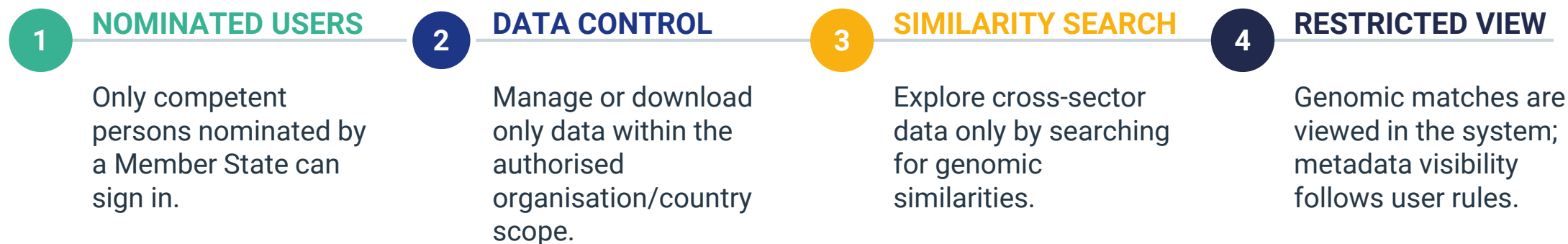
Success metric: more usable profiles → earlier cross-sector signal at EU level → faster coordinated assessment



WHO AND HOW: ACCESS THE EFSA WGS SYSTEM

A **closed environment**: nominated users act within a defined scope; cross-sector exploration is query-based and portal-only.

FOUR CONTROL GATES



NO PUBLIC ACCESS External parties cannot enter, browse records or extract data

Chain of custody

OFFICIAL SUBMISSION → AUTHORISED RELEASE → LOGGED QUERY → TRACEABLE RESULT

Only released official data enters analysis; every action and result can be reconstructed to its source.



WHEN: SHARING DATA TO EFSA

Voluntary sharing remains highly valuable; mandatory sharing creates a minimum common baseline.

VOLUNTARY

- Reactive** Countries respond to EFSA data calls.
- Proactive** Data providers share voluntarily according to national strategy (e.g. all official controls, RASFF data).

MANDATORY (SINCE 23 AUGUST 2026)

- In scope** In scope of Implementing Regulation (EU) 2025/179
- Effective** Share as soon as sequencing results are available

FOOD BUSINESS OPERATORS

Cooperate; provide available isolates and existing WGS results when requested. No routine sequencing duty.

**Operational change
since 23 August**

Timely sharing, complete metadata and coordinated workflows become routine



WHAT: WGS RESULTS AND CONTEXTUAL DATA

WGS results

EXPERIMENTAL DATA

How the sequence is generated

TYPING DATA

Genomic profile and other typing outputs

The value comes from linking sequence evidence with the related context

CONTEXTUAL DATA

COMPOSED OF THREE DATASETS

OUTBREAK
Investigation

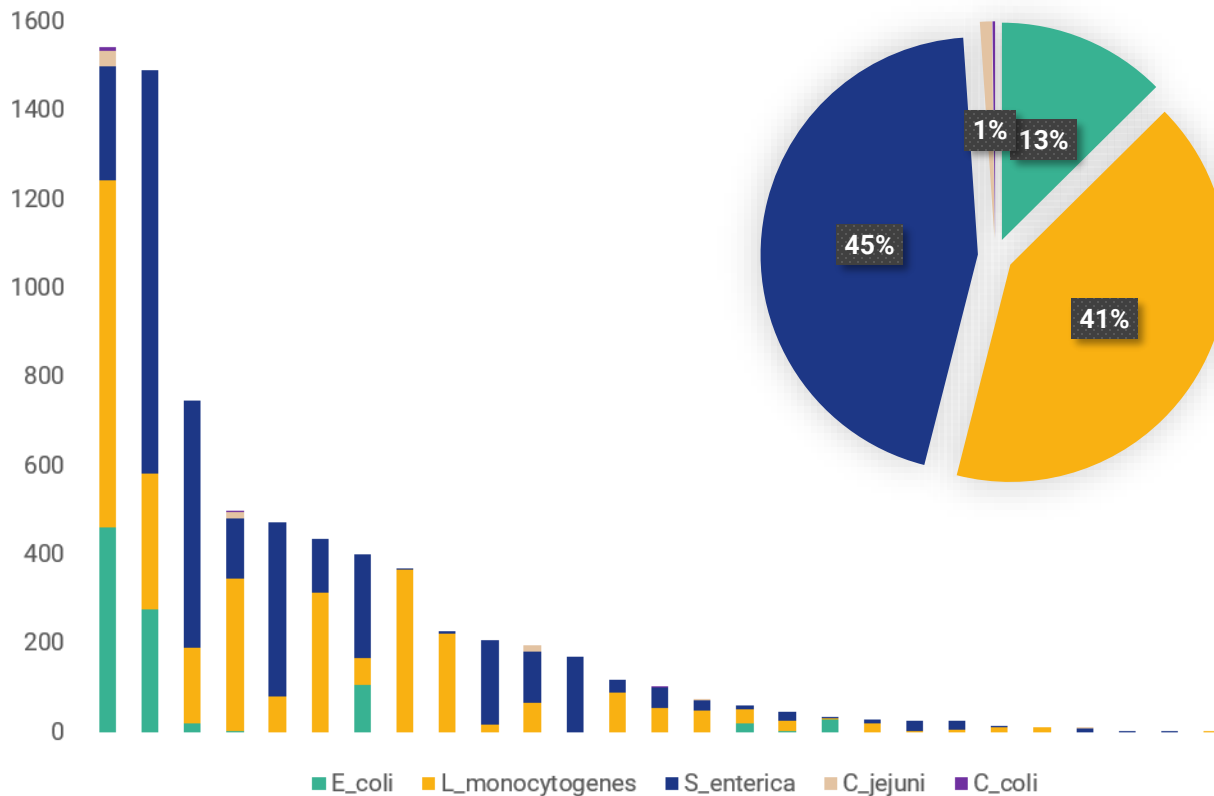
SAMPLING UNIT
Including RASFF data

SAMPLE
Including isolate data



CONTRIBUTION MEMBER STATES

Participation is broad, coverage is still uneven: a small number of countries account for most of the database



7,467

Total uploads
100 uploads/month

27

contributing
countries

97.6% successful release for ECDC comparison

53% found matching within ECDC clusters

NEXT STEPS TO FULL-SCALE OPERATION

2026–2030: stabilize the service, automate routine workflow and scale up routine use across countries

01

STABILIZE OPERATION

Support mandatory submissions; monitor reliability and data flows; resolve issues; keep guidance and support updated.

02

AUTOMATE

Expand programmatic machine-to-machine submission and automate routine validation.

03

SCALE UP

Improve timeliness and metadata completeness; widen routine submissions: move to proactive sharing

Enabling conditions Clear roles • trained users • coordinated workflows • minimum operating standards



ECDC WGS SYSTEM

Integration of molecular and genomic typing data into ECDC

2016

WGS data collection

As part of validation study of WGS-enhanced surveillance of listeriosis in Europe, 2010-2015

2019

Strategic framework¹

ECDC strategic framework for the integration of molecular and genomic typing into European surveillance and multi-country outbreak investigations

2022

Regulation on serious cross-border threats to health²

Article 13 - ... molecular pathogen data, if required for detecting or investigating serious cross-border threats to health;

2025

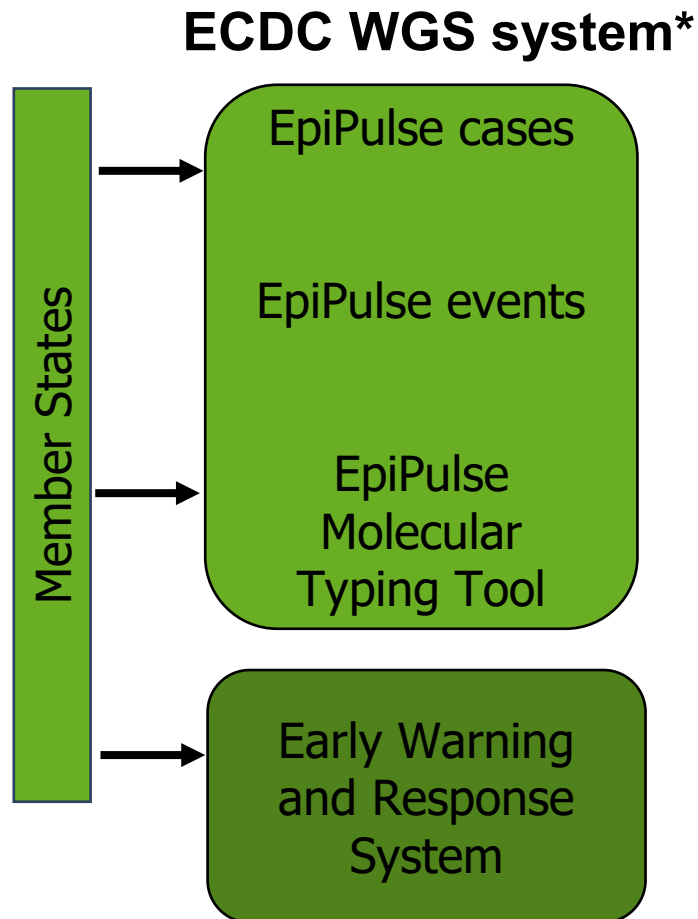
EpiPulse Cases

Enabling easier submission of WGS data along with epidemiological data

¹ [ECDC strategic framework for the integration of molecular and genomic typing into European surveillance and multi-country outbreak investigations](#)

² [Regulation on serious cross-border threats to health](#)

How do we collect the data?



Designed for

Collecting, analysing and disseminating surveillance data [structured data; allows for uploading large batches of data; entry point for indicator-based surveillance data].

Collecting, analysing, sharing, and discussing infectious disease data for threat detection, monitoring, risk assessment and outbreak response. Data are shared on a voluntary basis [event-based surveillance].

Visualize WGS data

Formal notification of outbreaks, clusters and contact tracing data. Data are used for risk management.

Who can access

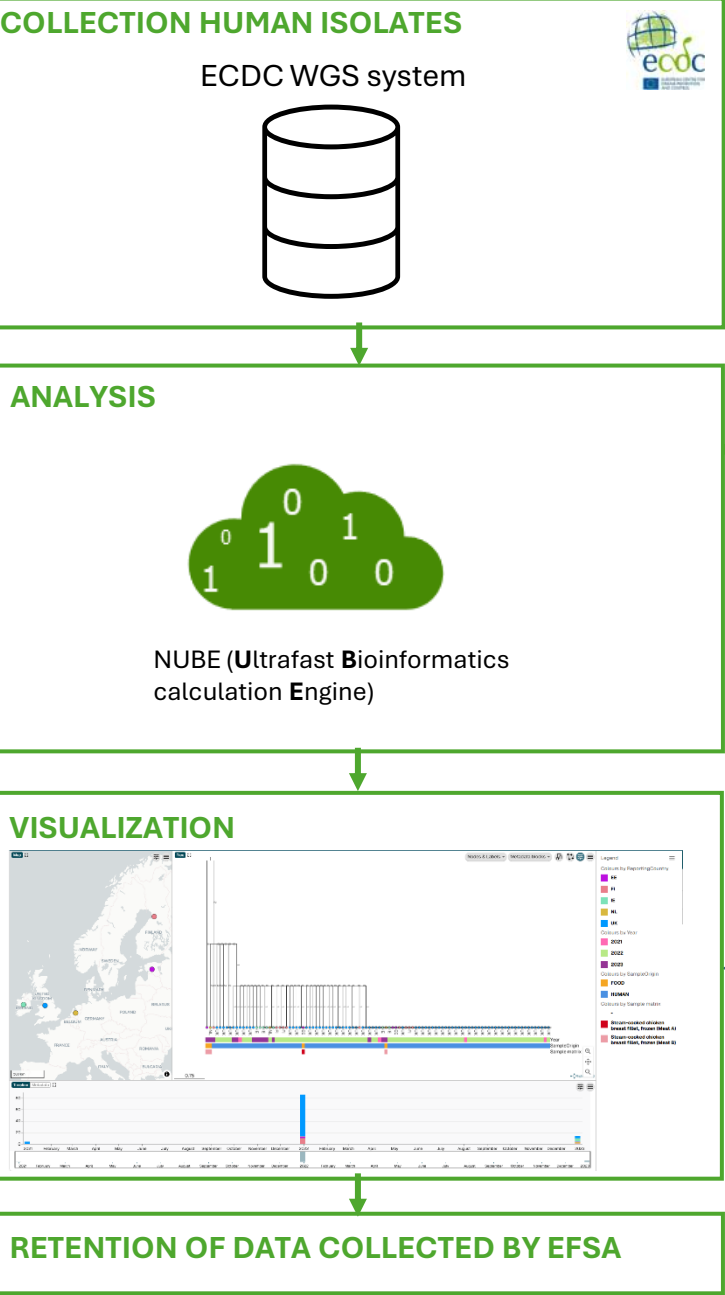
Nominated contact points on the country level

NO PUBLIC ACCESS External parties cannot enter, browse records or extract data

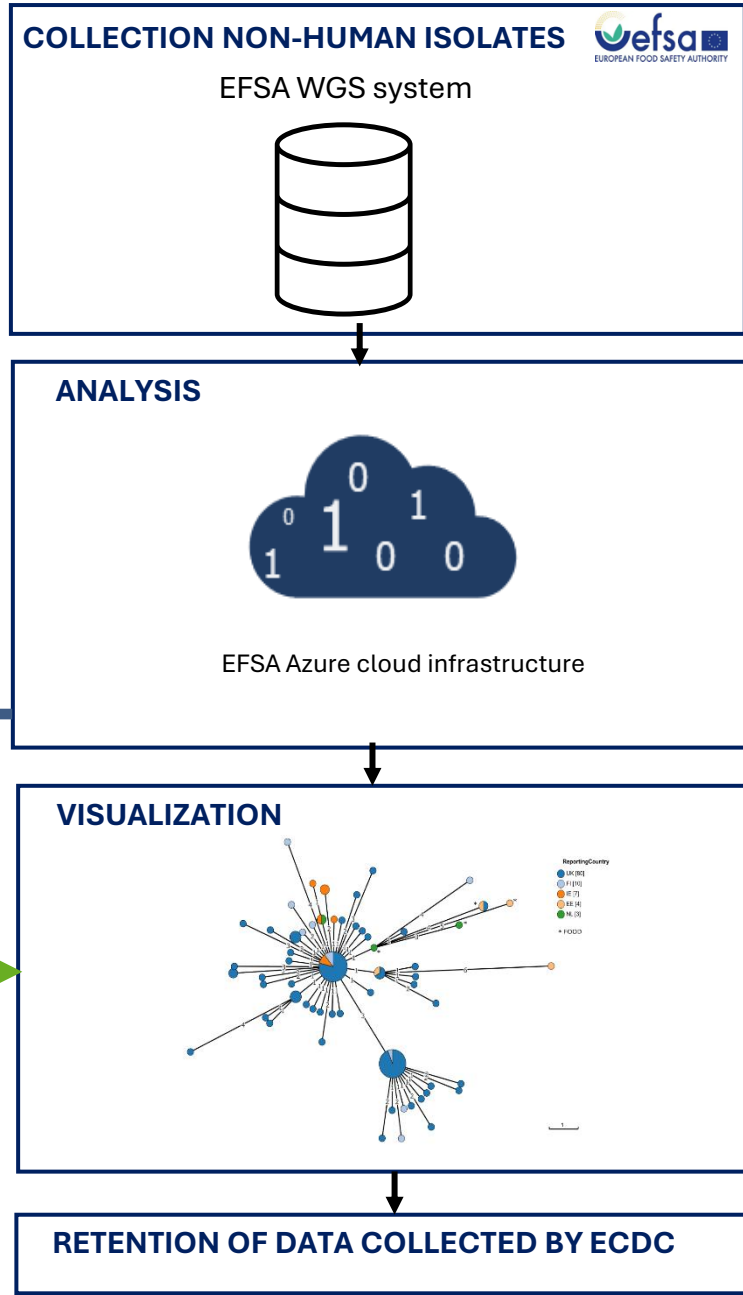
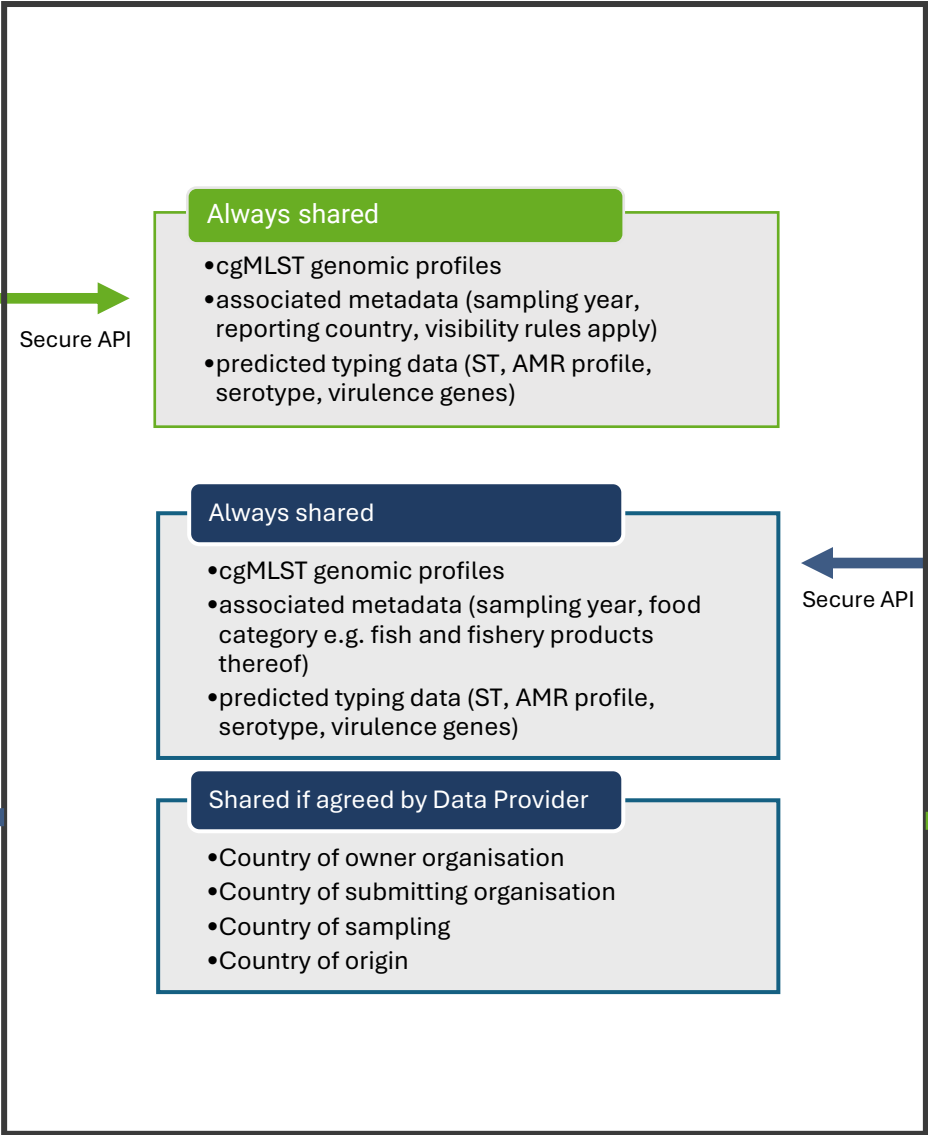
*for the purpose of the presentation, several components within EpiPulse platform hereby called ECDC WGS system

ECDC principles for handling and analyzing the WGS data

Principle	Driven by
Open science: Use open source software and promote open data whenever possible.	<u>European Commission</u> , ECDC Bioinformaticians
Scalability: Calculation intensive processes and large storage in cloud. High level of automation.	<u>ECDC preparedness recommendations</u> , ECDC ICT principles, ECDC Bioinformaticians
Data protection: Adherence to the GDPR, legal basis for activities, maintaining high trust among data providers.	EDPS, ECDC DPO, ECDC Disease programmes and networks
Quality: Identify issues and strive to always improve. Use version control and good development practices. Maintain an environment without hierarchy or prestige.	ECDC Bioinformaticians, ECDC Disease programmes and networks

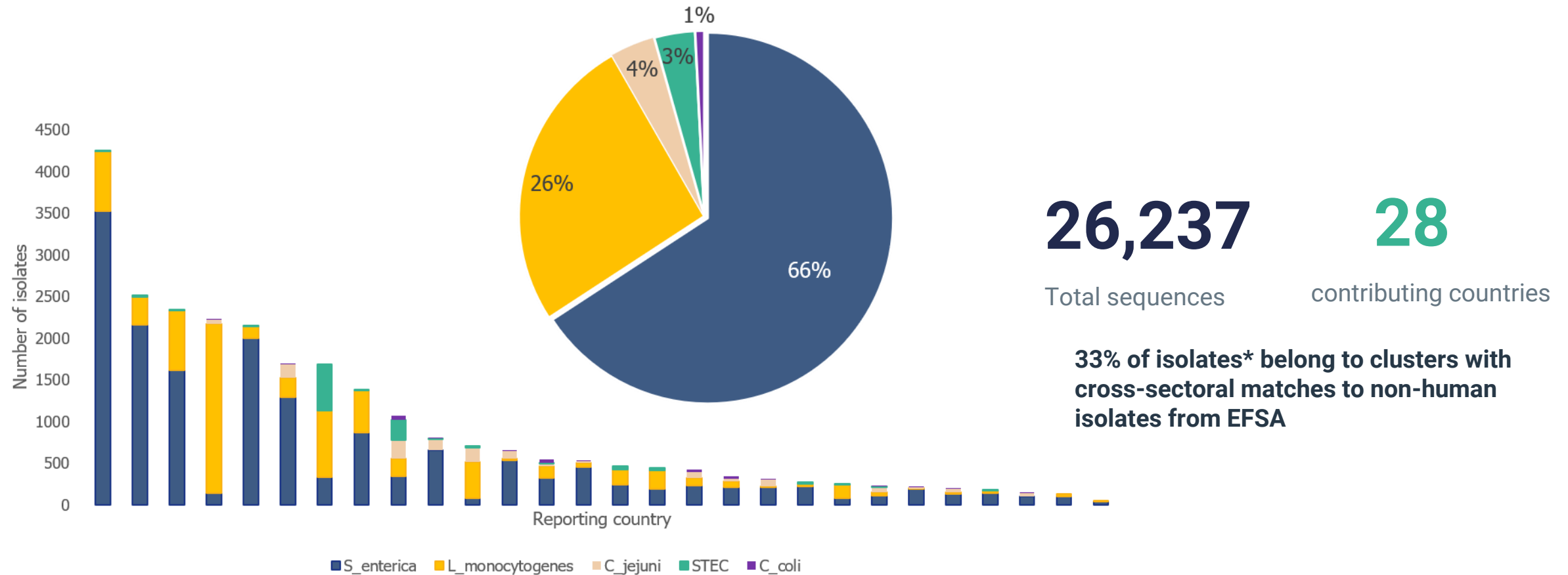


The ECDC – EFSA One Health WGS system



WGS data from countries

Participation is broad, coverage is still uneven across countries as well as pathogens



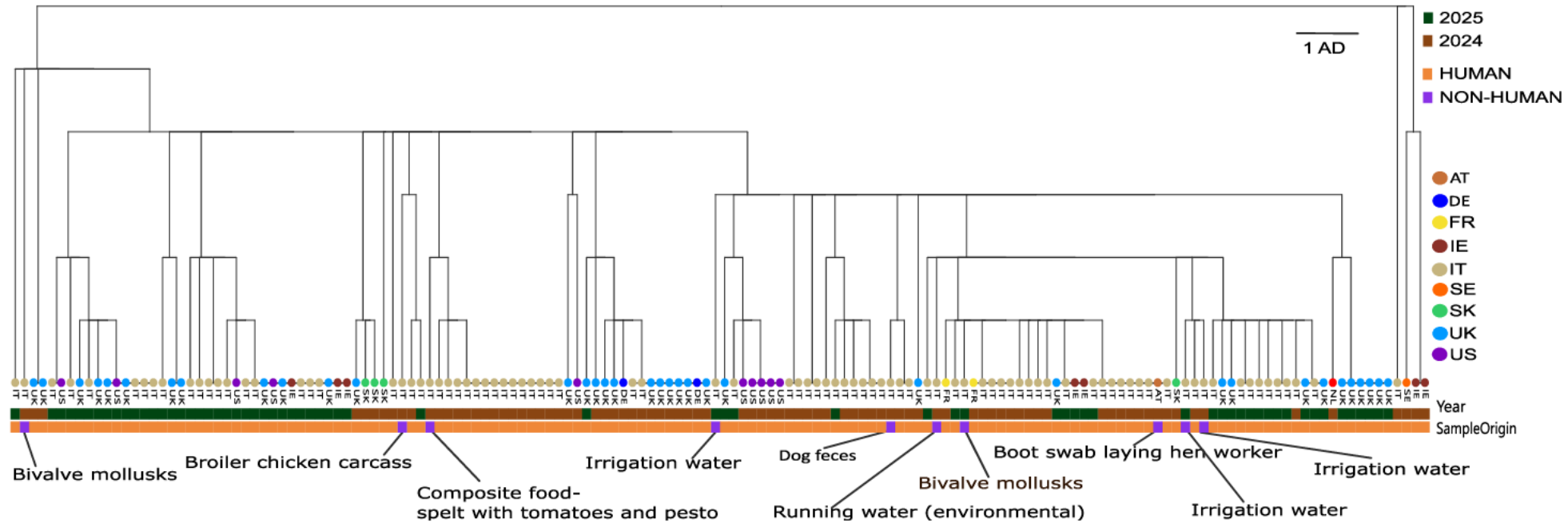
**S. enterica and L. monocytogenes*

Future directions and opportunities for improvement

- Strengthen genomic surveillance through harmonized surveillance protocols, sampling frameworks, and actionable outputs.
- Expand sequencing and bioinformatics capacity-building activities across Member States.
- Improve the robustness, quality, and pathogen-specific performance of WGS analysis pipelines.
- Support the adoption and evaluation of emerging sequencing technologies.
- Increase transparency and reproducibility through continuous public sharing of ECDC analysis pipelines and tools.
- Streamline data sharing and reporting via the EpiPulse cases Command-line Interface (API), reducing the workload for data submitters.

ECDC-EFSA ONE HEALTH WGS SYSTEM

15 Rapid Outbreak Assessments since the launch of the ECDC-EFSA One Health WGS system from 2022



Single-linkage cluster showing the cross-sectoral data, from one of our recent joint assessments

[Prolonged multi-country outbreak of Salmonella Strathcona ST2559 linked to consumption of tomatoes in the European Union/European Economic Area – first update](#)

TOWARD EU-LEVEL GENOMIC SURVEILLANCE

Smoother operation and broader, timely coverage build the basis for genomic surveillance at EU level.

NOW · 2026

CONSOLIDATE

Ensure smoother operation in both platforms
Align roles, methods and thresholds

NEXT · 2027–2029

ENABLE BROAD COVERAGE

Work with countries for representative and timely data in both sectors
Close surveillance gaps
Move toward proactive sharing

2030+

FULL-SCALE OPERATION

Connect signals across countries and sectors routinely
Assess trends and emerging clusters at continental scale
Coordinate earlier EU action

Main enablers

aligned roles and thresholds • shared quality and metadata standards • Member State engagement • training and operational support • joint performance monitoring

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