



One Health WGS System and AMR Gene Detection Service in EFSA

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Objective of the One Health WGS System



To **collect genomic profile of foodborne pathogens and associated epidemiological data** of isolates from food, feed, animals and related environment

To **allow ECDC to query the EFSA database** for finding possible matches between human and non-human isolates

To offer a **set of services through a user-friendly interface** for the analysis and managing of the submitted data

Aims of the WGS data collection through the One Health WGS System

Build a database of genome profiles that can be queried in case of food-borne outbreaks

- EU/EEA countries are invited to submit WGS-based typing data on a voluntary basis at any time throughout the year

Support the real-time investigation of multi-country food-borne outbreaks

- EU/EEA countries shall provide WGS-based typing data to EFSA related to the specific event

Any S. enterica, L. monocytogenes or E. coli isolates from food, feed, animals and related environments collected sequenced at EU/EEA country level are eligible for this data collection

Objective of the AMR gene detection service



To offer to MS the opportunity to use EFSA computing resources for extracting AMR genes from WGS data

To give access to User-Friendly Interface for accessing and managing the data in a secured and private environment, no sharing of data

Automate mapping against the PARAM catalogue and different downloads options for the results

Define the AMR gene detection service

The AMR gene detection service is...

- a web application for extracting AMR genes and mutations conferring resistance to beta-lactams in a standardized format, already mapped against EFSA PARAM catalogue
- designed so that all users of the same organization access the same environment and users from other organizations cannot see the data

The AMR gene detection service is not...

- a data submission tool, submission remains through Data Collection Framework (DCF) of EFSA. EFSA cannot use the data temporarily stored in the system
- a tool for sharing information among MSs and between MS and EFSA
- a system allowing permanent storage of raw data

One Health WGS system

- **Country Officer** nominated by the Food Authority
- **Data Providers** nominated by the country officer and the Food Authority

EFSA One Health WGS System Portal

The EFSA One Health WGS System has been developed by EFSA as response to the European Commission mandate for the collection of sequencing data of isolates from food, feed, animals, and the farm and food processing environment, for the purpose of supporting ECDC in rapid detection of multi-country foodborne outbreaks

AMR gene detection service

- **AMR users** appointed by the AMR Network (Zoonosis monitoring data network) member or reporting officer for each country

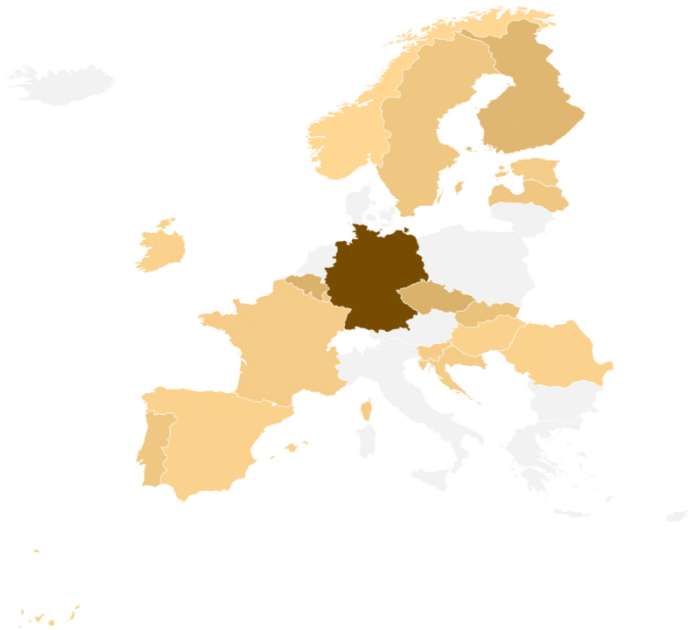
AMR gene detection service

Following the protocol provided by EURL-AR, this service extracts AMR genes in a standardized format from raw sequencing reads using ResFinder 4.1. If ESBL, AMPC or CARBA genes are detected the system automatically maps the results against the EFSA PARAM catalogue and provides the codes.

Status nomination EFSA One Health WGS system

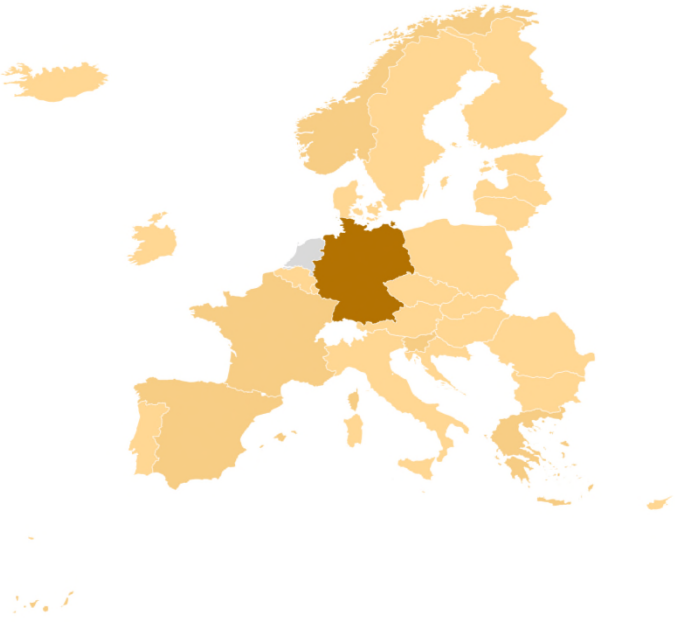


Data Providers



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Country Officer

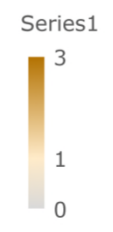
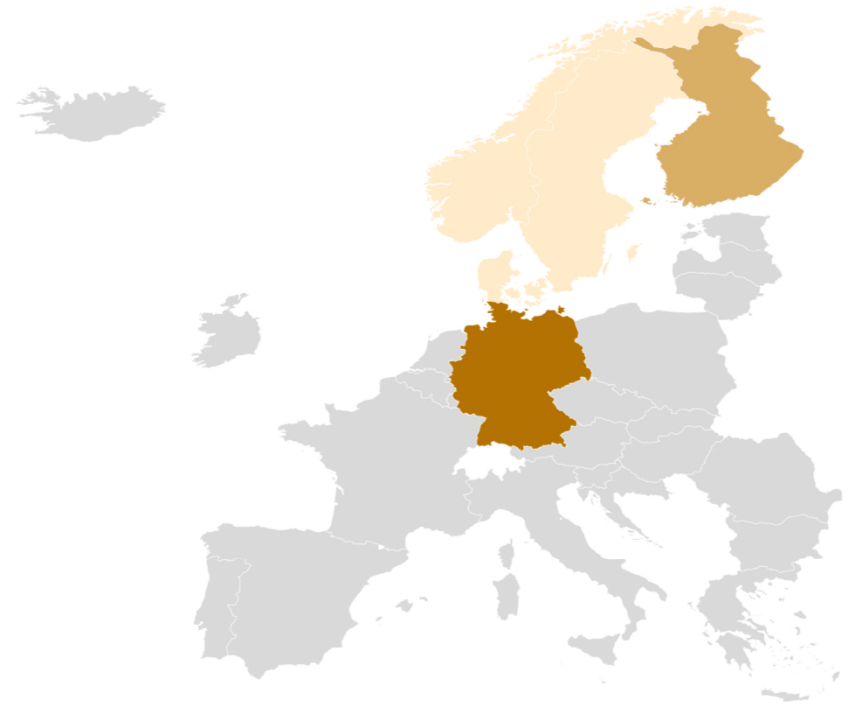


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AMR users as nominated by the MS for 2021 reporting season



AMR users



Take home messages

1. EFSA doesn't consider WGS generated for the scope of AMR monitoring and uploaded to the AMR Gene Extraction Service as submission for outbreak investigation
2. AMR Gene Extraction Service is not a data collection tool, EFSA cannot use the data upload to the system
3. The EFSA One Health WGS System and AMR Gene Extraction Service are two different systems with different scopes, actors and rules
4. Only Data Providers formally appointed from MS for the scope of submitting WGS data for outbreak investigation submit data to the EFSA One Health WGS System
5. It is on discretion of the MS through the appointed Data providers of the EFSA One Health WGS System to decide if the WGS data generated for AMR monitoring activity can be submitted also with the scope of supporting outbreak investigation