



# Development of laboratory-based surveillance for human cases in EU

Ivo Van Walle On behalf of the ECDC Food and Waterborne Diseases programme

## Molecular surveillance of food and waterborne diseases at EU/EEA level



#### Participants

- National public health reference laboratories.
- Voluntary participation, nominated by national competent body.

#### Pathogens and molecular typing methods

- Salmonella: PFGE, MLVA (for S. Typhimurium).
- Listeria monocytogenes: PFGE.
- E. coli: PFGE.

### Participation and cluster detection



#### **Participating countries**

Pathogen	AT	BE	DE	DK	EL	ES	FI	FR	HR	IE	IT	LU	NL	NO	RO	SE	SI	υк	Cases Total / 2013-14
Salmonella	S	S	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	20863 / 5369
STEC/VTEC	Y	Y	Y	Y	-	Y	Y	-	-	S	Y	S	-	-	-	S	Y	-	1078 / 558
L. monocytogenes	Y	-	Y	Y	-	-	Y	S	-	Y	Y	Y	-	-	-	Y	Y	Y	1823 / 572

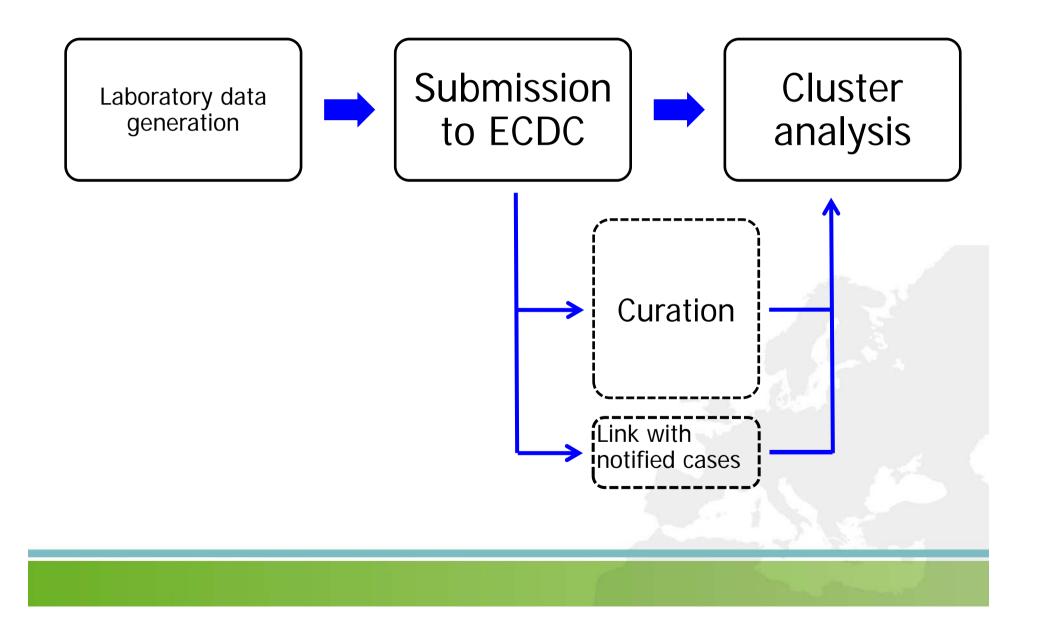
Y: Actively submitting data; S: technical setup phase.

#### Multi country cluster detection

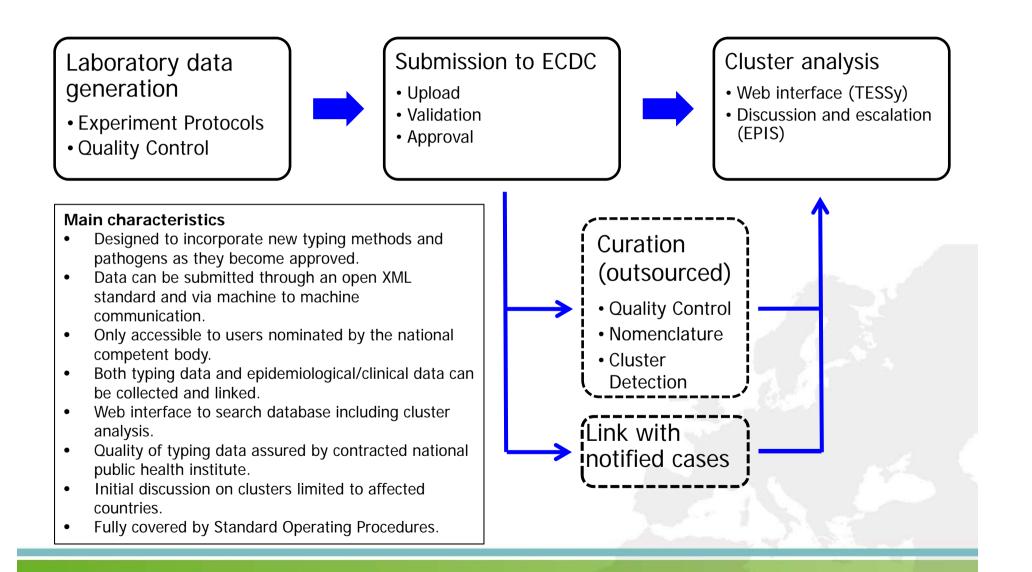
Pathogen	2013-Q2	2013-Q3	2013-Q4	2014-Q1	2014-Q2	2014-Q3	Total
Salmonella	9	22	19	12	15	18	95
STEC/VTEC	-	-	-	-	-	-	-
L. monocytogenes	1	8	4	5	5	3	26

Data as of 2014-09.

## Process for collecting, analysing and acting on molecular typing data



## Process for collecting, analysing and acting on molecular typing data



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	2009-05-12	11	к	Typhimurium	Human	SØNDERJYLLA				Fingerprint	
	2009-05-07	62	к	Typhimurium	Human	VIBORG AMT	• • • •		PFGE-Spel	Fingerprint	тур
	2009-10-22	68	M	Goldcoast		ÅRHUS AMT					1
	2009-10-14	68	к	Goldcoast		KØBENHAVNS		Experiments	s Entry relation	S	
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Fast upload of Member State data to ECDC: select isolates to upload, data prepared automatically and sent machine to machine in less than 10 clicks.

After validation and upload: single click to go to ECDC web page to match these isolates against European wide data. There is no need for Member States to perform this matching each time: ECDC also does this for all uploads in the background and notifies when relevant matches/clusters are found.

ECDC	T	E (	56	v		
Extranet				y	The European Surveillance System	

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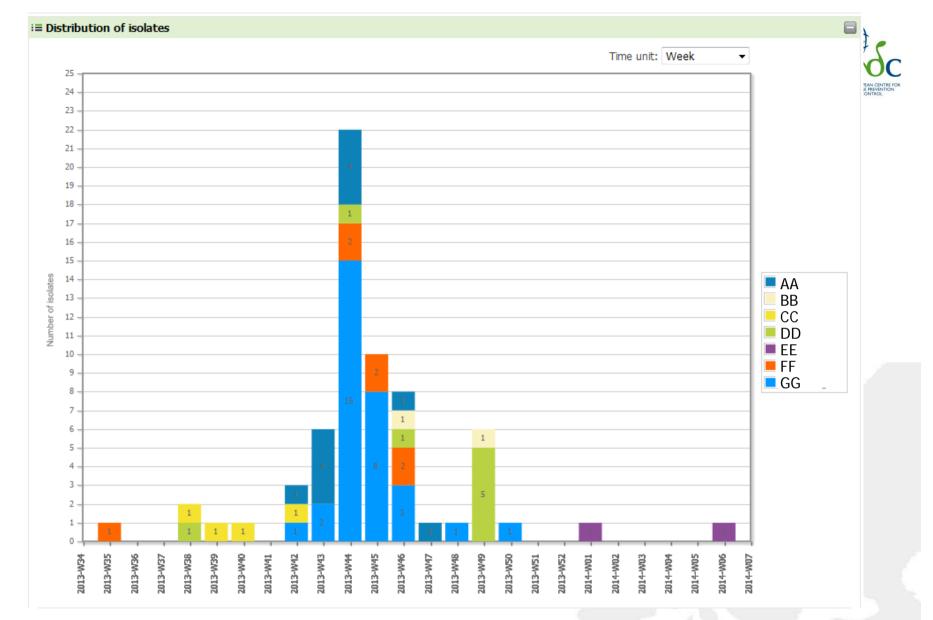
MSS

Several matches found in other countries within 100 days from the isolates just uploaded by MS. Data can be explored by microbiological similarity (dendrogram), time (epi curve) etc. Isolates can be linked to the clinical/epidemiological data of the case they were taken from by means of a unique identifier supplied by ECDC.

Food isolates will in the future also be uploaded via EFSA, allowing initial linkage of cases with food.

Dendrogram	F		PFGE_XbaI			ST_S	SIR								Nomenclature	Isolate	Isolate	£
PFGE XbaI	•				QMQ	E	CIP	CTX	GEN	KAN	NAL	STR	SXT	TCY	ECDC_PFGE_XbaI	RecordId	Age	
	E	7			L										XbaI.0063			-
	F	7															10	
	E	7		M											XbaI.0063		38	
	F	~		1	S	S	S	S	S	5 5	5 S	S	S	S	XbaI.0063		42	
	E	7													XbaI.0063		3	
	F	7													XbaI.0063		60	
	E	7													XbaI.0063			
	P	7			S	S	S	S	S	5 5	5 S	S	S	S	XbaI.0063		74	
	E	7													XbaI.0063		13	
	F	~													XbaI.0063		45	
	E	7		<b>M</b>											XbaI.0063		33	
	F	~			S	S	S	S	S S	5 9	5 S	S	S	S	XbaI.0063		37	
	E	7													XbaI.0063		59	
	F	~													XbaI.0063		59	
	E	~													XbaI.0063		28	
96.3	- F	~			S	S	S	S	S	5 5	5 S	S	S	S	XbaI.0063		56	
-	l p	~													XbaI.0063			
96.3		~		11 11											XbaI.1101		100	E
95.9	[	7															51	
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5.8	[	7																-
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Dendrogram based on Pulsed Field Gel Electrophoresis. Designed to incorporate other techniques as relevant, in the future likely whole genome sequencing.



Clear multi country cluster: what action to take and how? Timeliness is an issue.

### **EPIS Molecular Typing Cluster Investigation**



List Tools       Browse     Items			0	ECDC - Reader. Ivo Van Walle 👻
ECDC Extranet   EPIS F	<b>ND</b> Epidemic Intelligence Information System Food- and Waterborne Diseases and Zoonoses	All Sites	•	
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Comments				
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Disease	listeriosis			
Pathogens	Listeria monocytogenes			
Countries Involved	AA, BB, CC			
Urgent inquiry				
Line listing	line listing			
Status	Open			
Initial investigation	and comments			
Country or Modified	Comment		Modified	Ву
ECDC 30/08/ 02:16 F		ve isolates with an Germany (2), Finland (2) and 120 days. Subsequent search of	Celine	Gossner

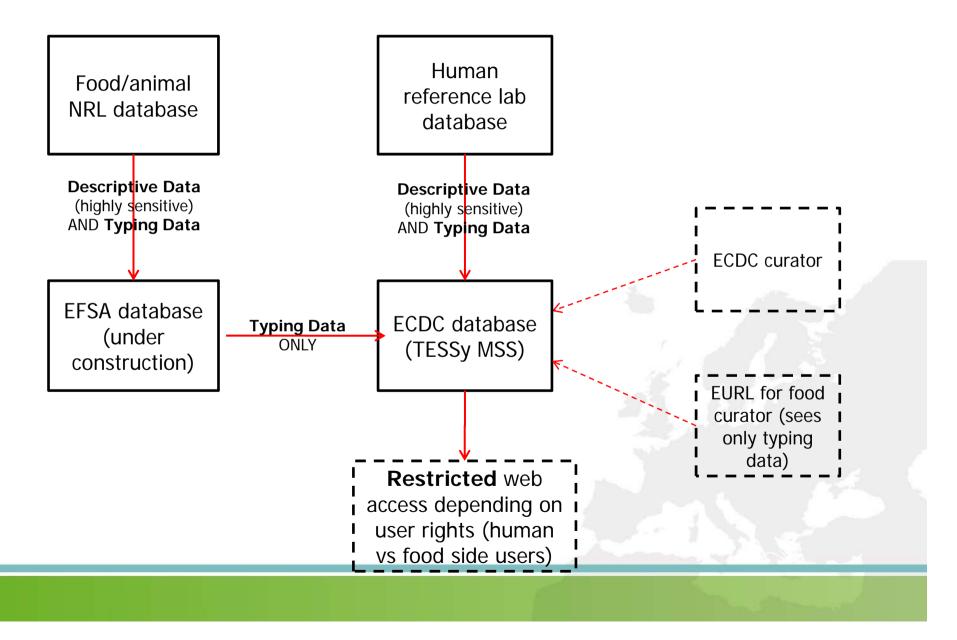
### The joint ECDC-EFSA database: linking human, food, feed, animal and environment typing data



Dendrogram		PFGE_XbaI	AS	T_SI	R							Nomenclature	Isolate 🛛 🗖	Isolate	
PFGE XbaI 👻			AMP	CHL		GEN	KAN	NAL	SSS	SXT	TCV	ECDC_PFGE_XbaI	RecordId	Age	
	◄											XbaI.0063			<b>FOOD</b>
														10	
	◄											XbaI.0063		38	
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												XbaI.0063		60	
	◄											XbaI.0063			FOOD
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## Joint ECDC-EFSA database – General data flow





### **Further steps**



### • Surveillance of human cases

- Increase timeliness and efficiency of data upload.
- Incorporation of MLVA for *Salmonella* Enteritidis.
- Assist transition to whole genome sequencing as a typing method: FWD-NEXT Expert Group.

### • Joint ECDC-EFSA database

- EFSA is currently implementing molecular typing data collection from food side.
- Agreement ECDC-EFSA-EC-EURL on data access and usage.
- ECDC to upgrade TESSy Molecular Surveillance Service to be able to receive also food data, and show this data with appropriate visibility to different users.
- What is your opinion on VTEC molecular surveillance?