

# ECDC update on annual reporting of STEC in EU/EEA

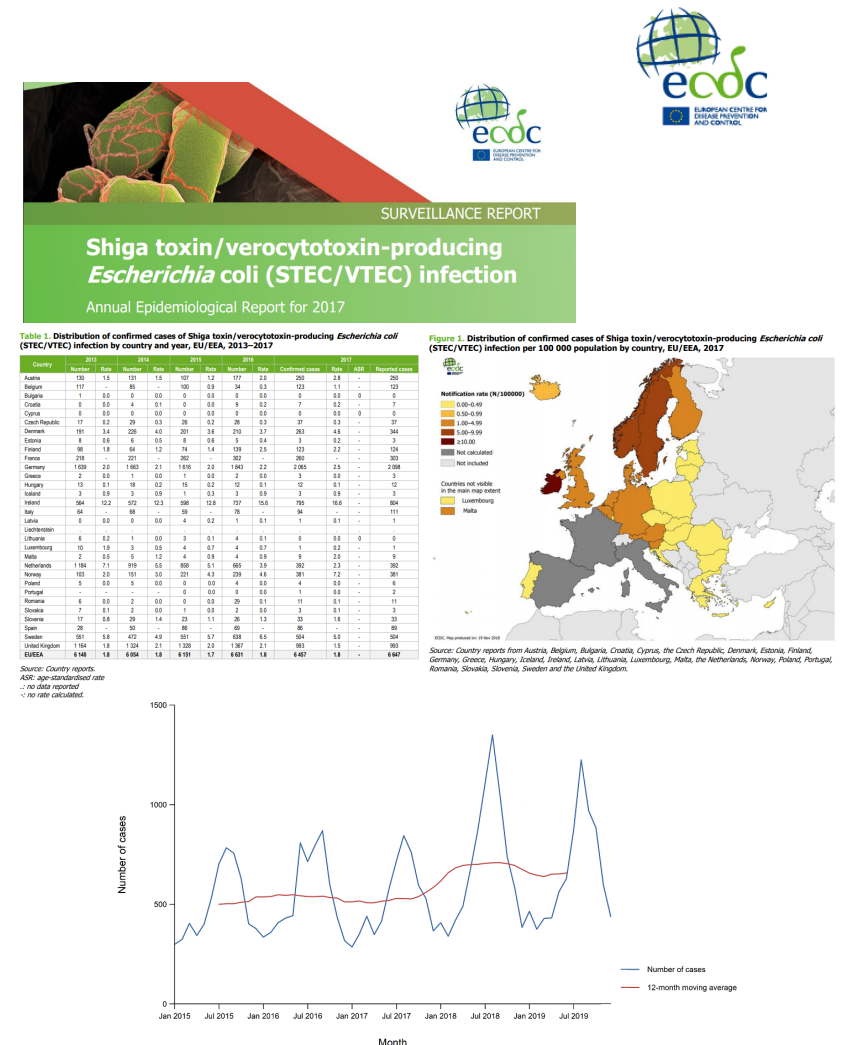
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Saara Kotila, Scientific Officer Molecular Surveillance

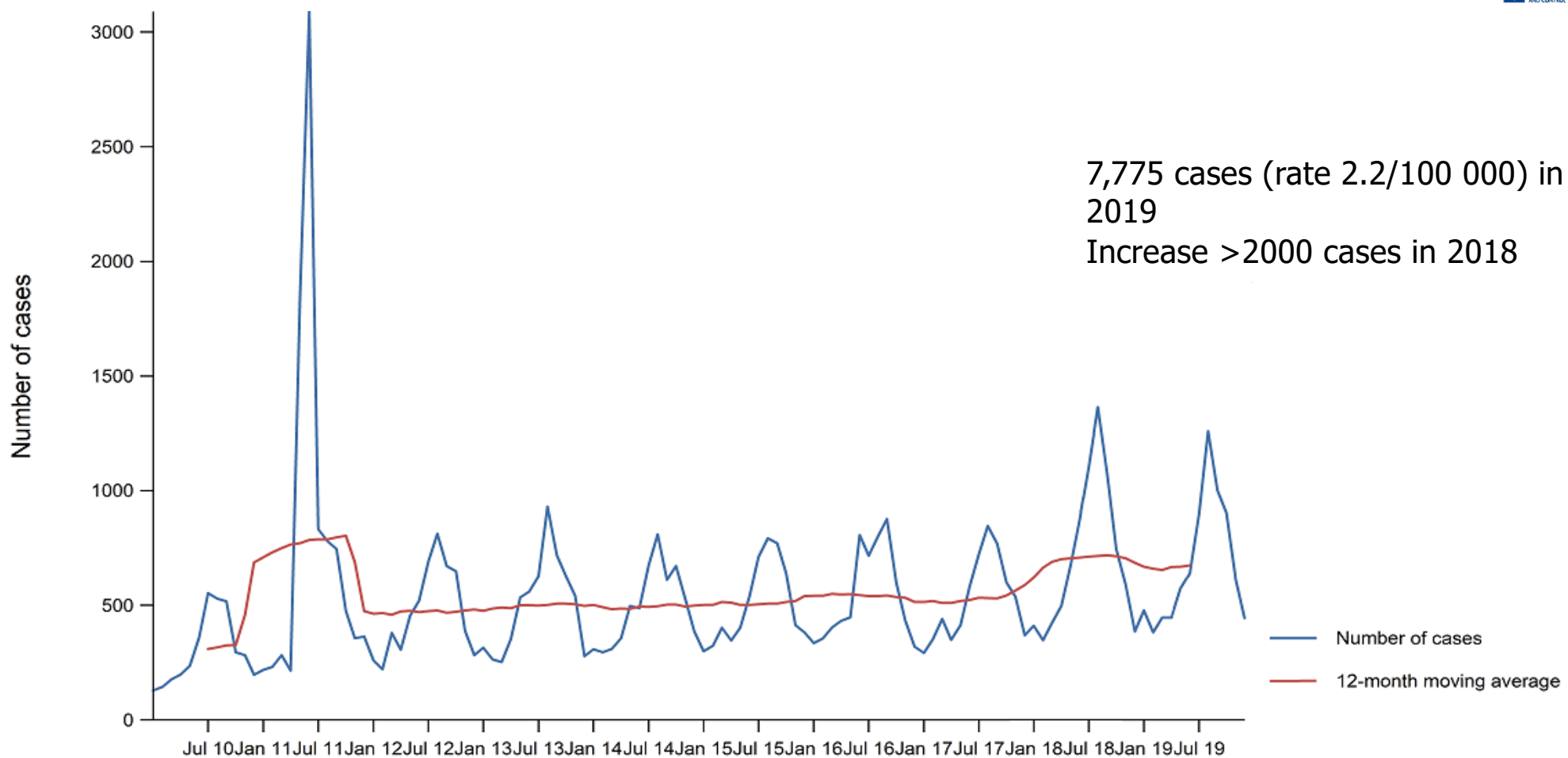
15th Annual Workshop of the NRLs for *E. coli* in the EU 21-22 September 2020

# STEC activities at ECDC

- Annual case-based data collection and reporting at the EU/EEA-level
- Contribution to EFSA scientific opinions on STEC
- EQA scheme for STEC molecular (WGS) typing
- WGS support for possible multi-country events through laboratory contractor



# 10-year trend of STEC in EU/EEA, 2010-2019



Source: ECDC TESSy data

# Severity of STEC in EU/EEA



## Hospitalised STEC cases in EU/EEA

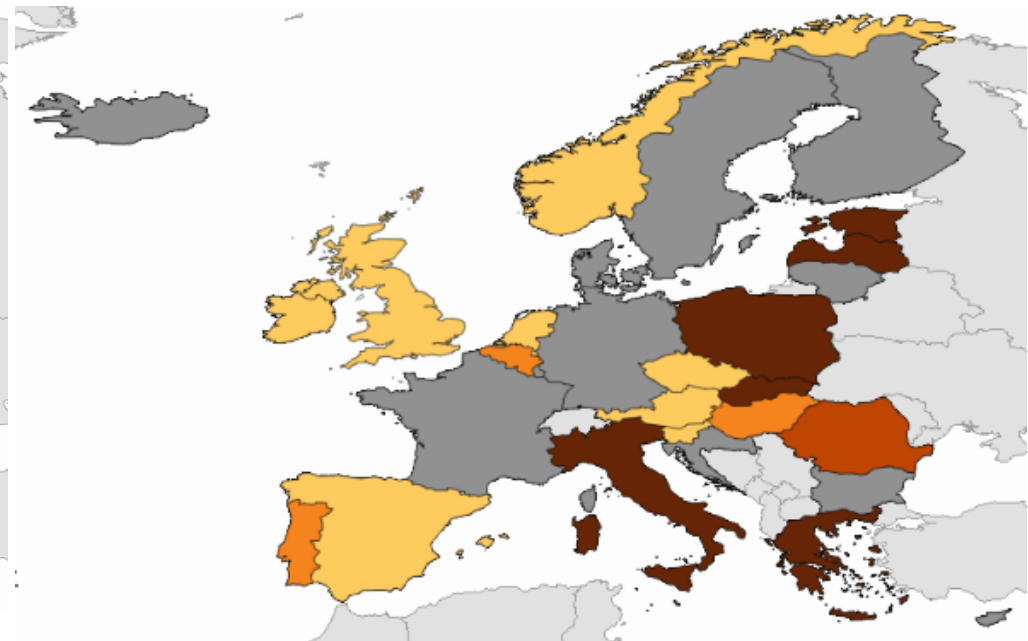
n=1,100 cases, 38% in 2019



Number of deaths 10, mortality rate 0.2%

Source: TESSy data, ECDC

## Proportion of hospitalised STEC cases in EU/EEA



Number of HUS, 394 cases in 2019

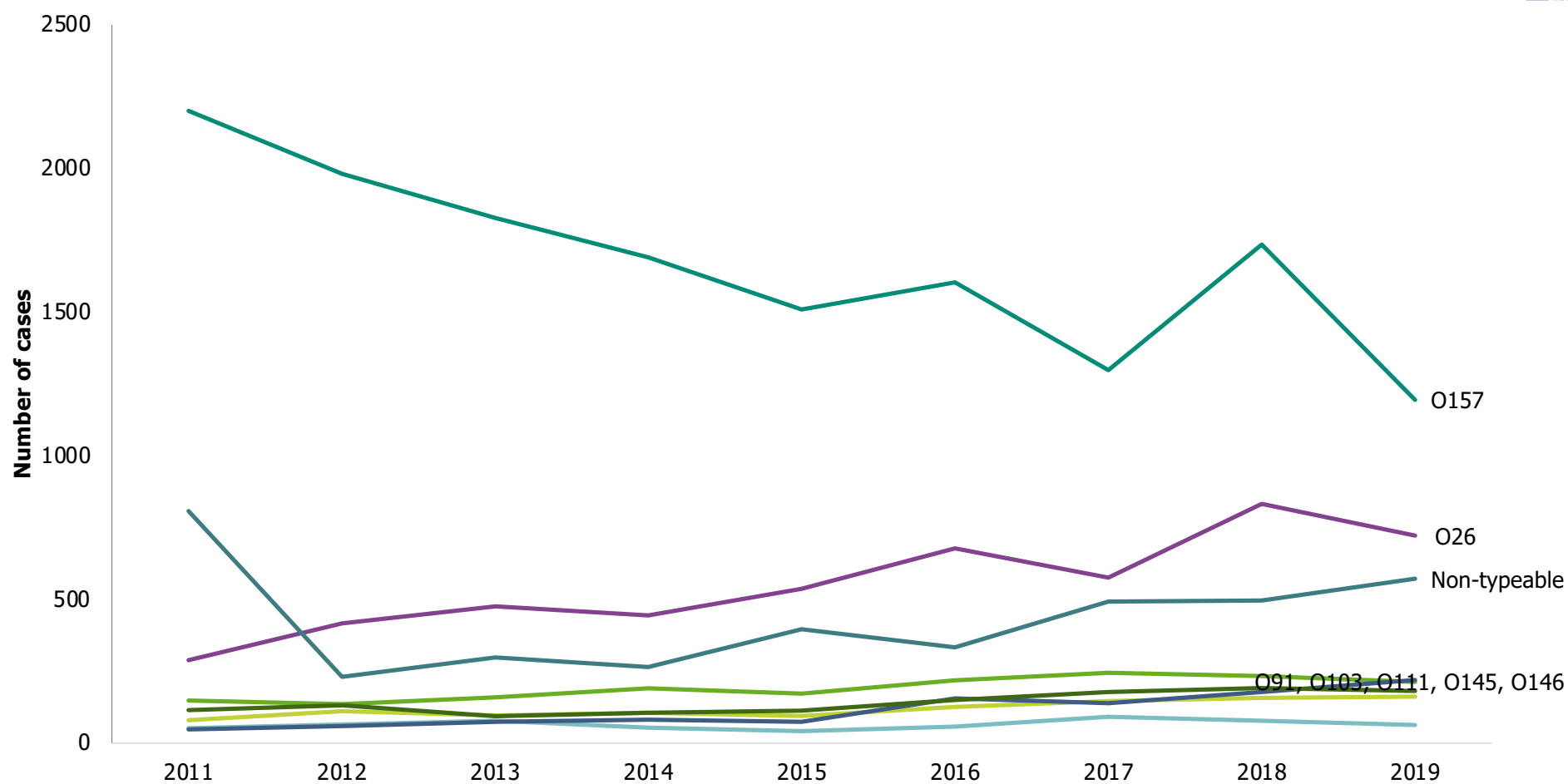
# Most commonly reported serogroups in EU/EEA, 2019



Serogroup	Cases	MSs	%
<b>O157</b>	<b>1,195</b>	<b>22</b>	<b>26.6</b>
<b>O26</b>	<b>722</b>	<b>16</b>	<b>16.0</b>
<b>Non-typeable</b>	<b>572</b>	<b>11</b>	<b>12.7</b>
O146	220	11	4.9
O103	213	13	4.7
O91	181	12	4.0
O145	162	11	3.6
O128	113	12	2.5
O80	80	9	1.8
O111	63	12	1.4
O63	62	8	1.4
O113	60	10	1.3
O117	52	6	1.2
O76	48	9	1.1
O27	44	6	1.0
O55	36	10	0.8
O8	36	7	0.8
O78	30	8	0.7
O121	29	8	0.6
O182	28	7	0.6
Other	554	-	12.3
<b>Total</b>	<b>4,500</b>	<b>22</b>	<b>100.0</b>

> 55%

# Trends of the most common serogroups in 2011-2019

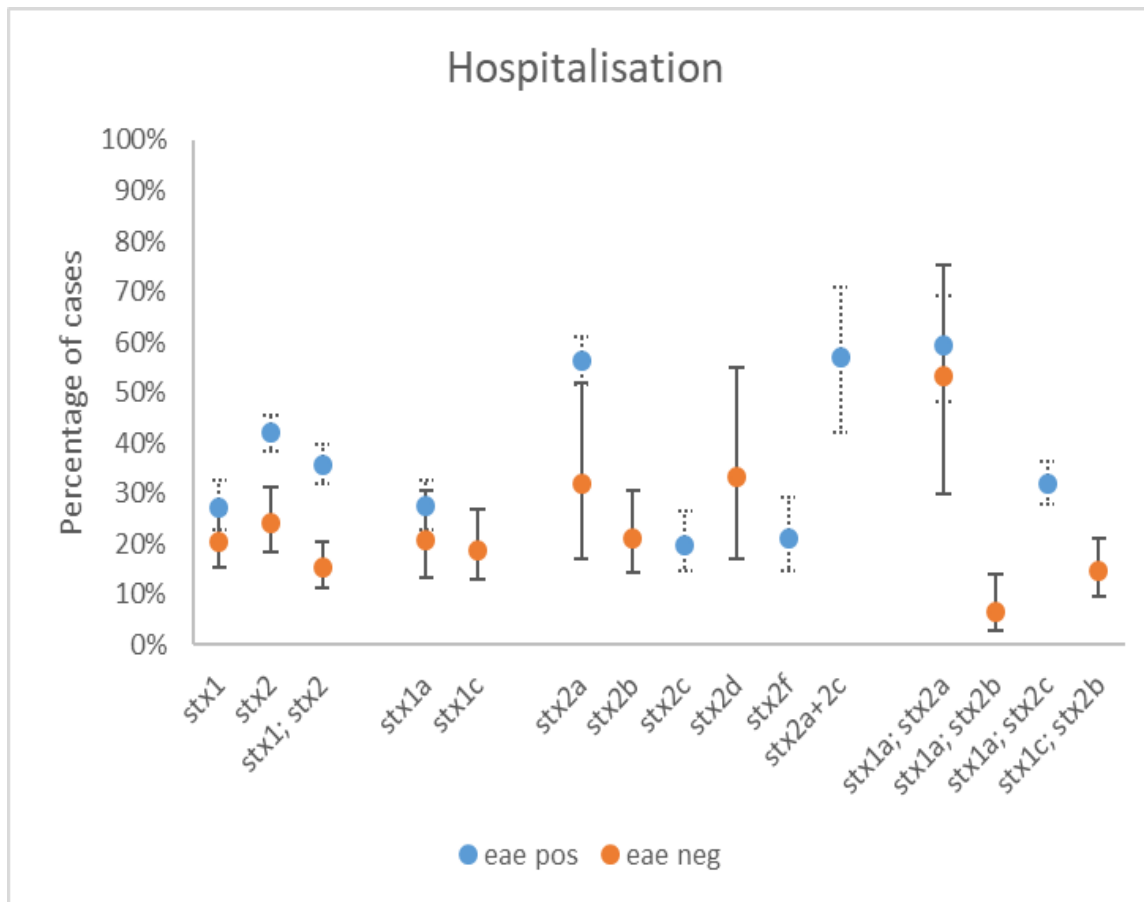


# Serogroup and virulence gene reporting in 2019



- Serogroups were reported by 25/30 countries, completeness 58%
- Virulence genes *stx1* and *stx2* were reported by 18/30 and 20/30 countries
- Completeness 74% and 77%, respectively
- 10/30 and 14/30 countries reported virulence gene subtypes of *stx1* and *stx2*, respectively
- Completeness of *stx1* subtypes was 41% and *stx2* subtypes 45%

# Severity of STEC (hospitalisation)



## Hospitalised cases in 2019

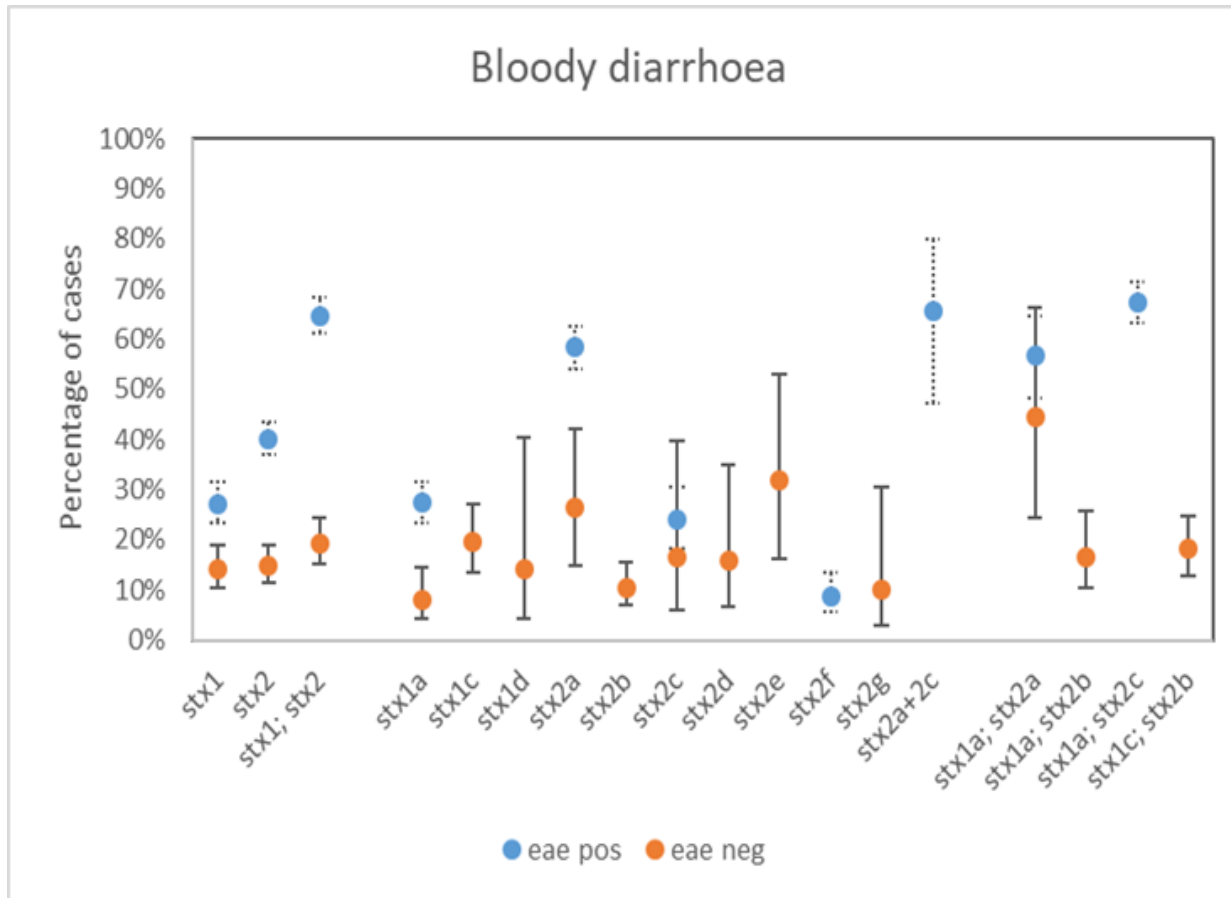
stx1-,stx2+,eae+	43%	} 68%
stx1+,stx2+,eae+	25%	
stx1-,stx2+,eae-	11%	

## Most common stx-subtypes among hospitalised cases in 2019

stx1a  
**stx2a**, stx2c or st2a+st2c



# Severity of STEC (bloody diarrhea)



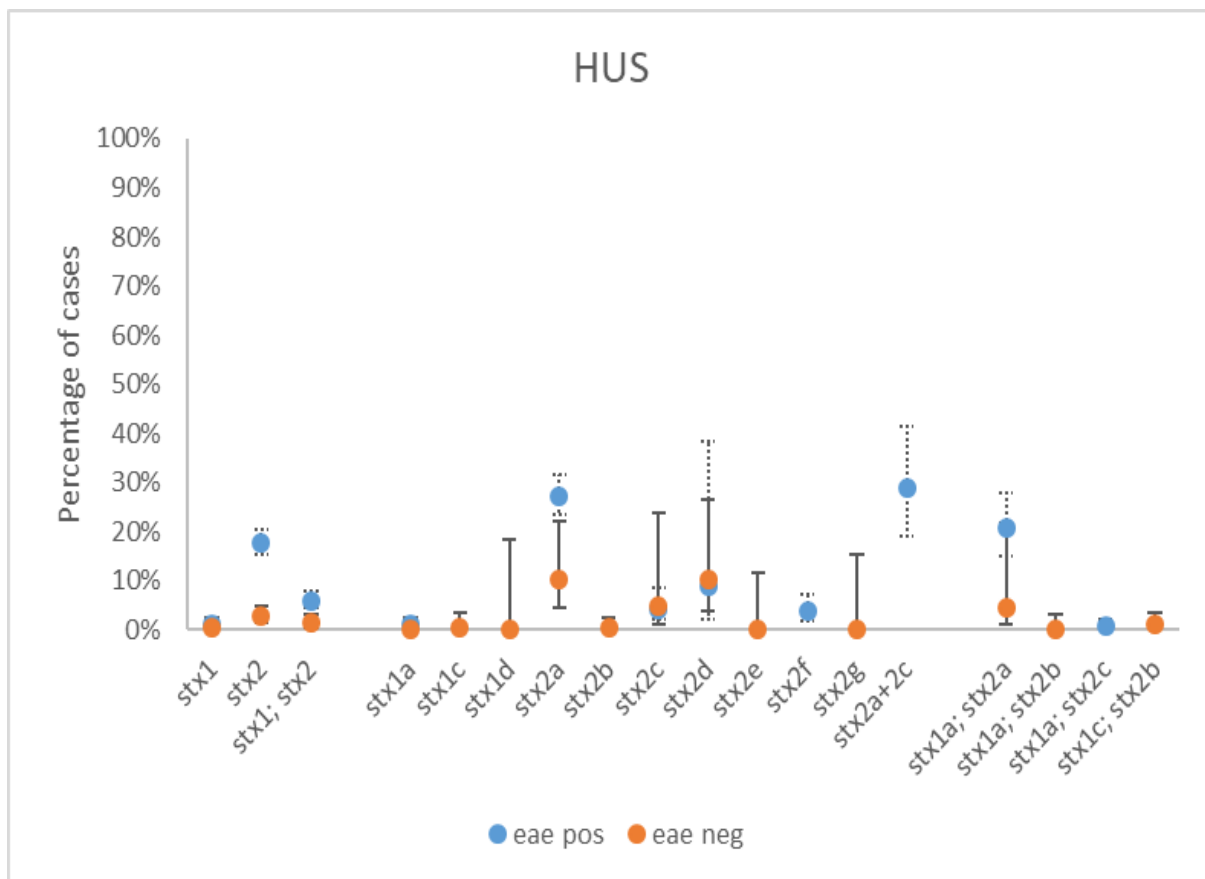
## BD cases in 2019

stx1-, <b>stx2+,eae+</b>	40%	} 75%
<b>stx1+,stx2+,eae+</b>	35%	
stx1+,stx2-,eae+	11%	

## Most common stx-subtypes among BD cases in 2019

St1a  
**St2a**, vt2a+st2c, and st2c

# Severity of STEC (HUS)



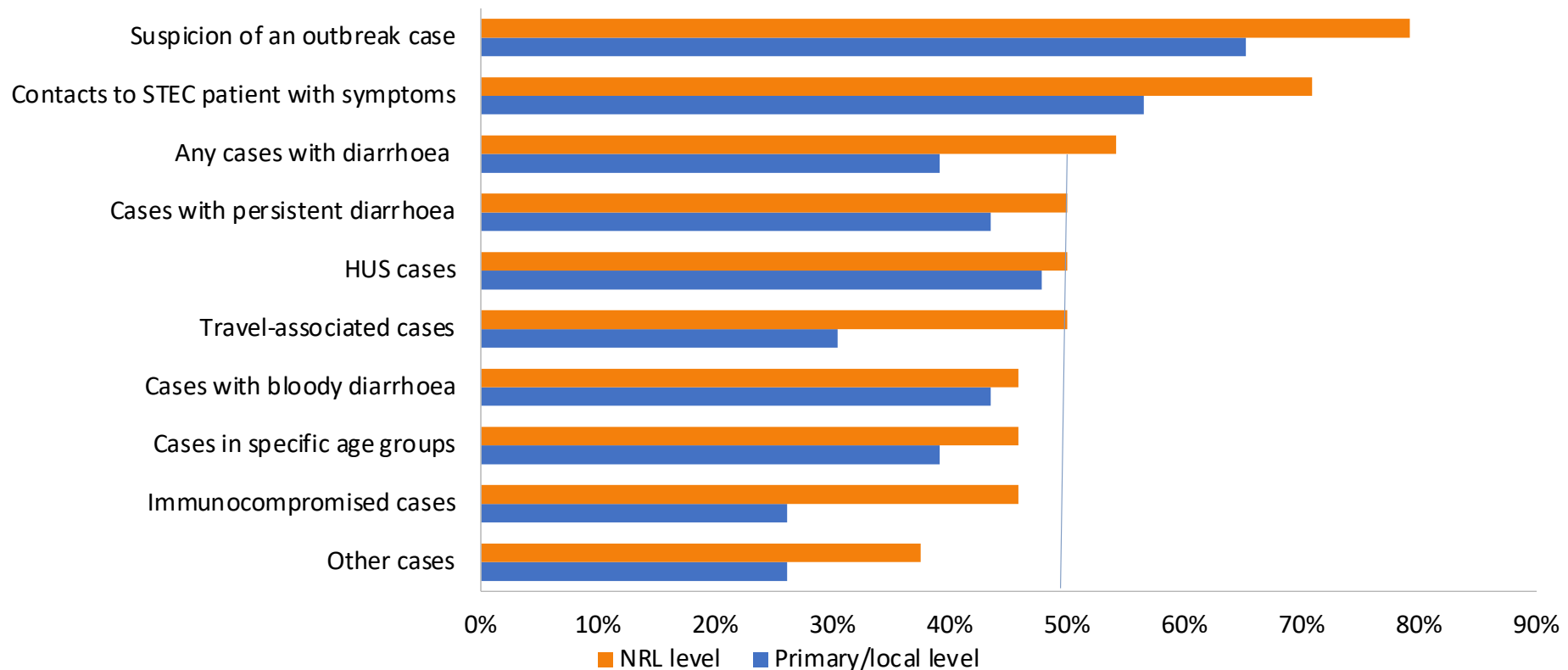
## HUS cases in 2019

stx1-,stx2+,eae+	67%	} 84%
stx1+,stx2+,eae+	16%	
stx1-,stx2+,eae-	11%	

## Most common stx- subtypes among HUS cases in 2019

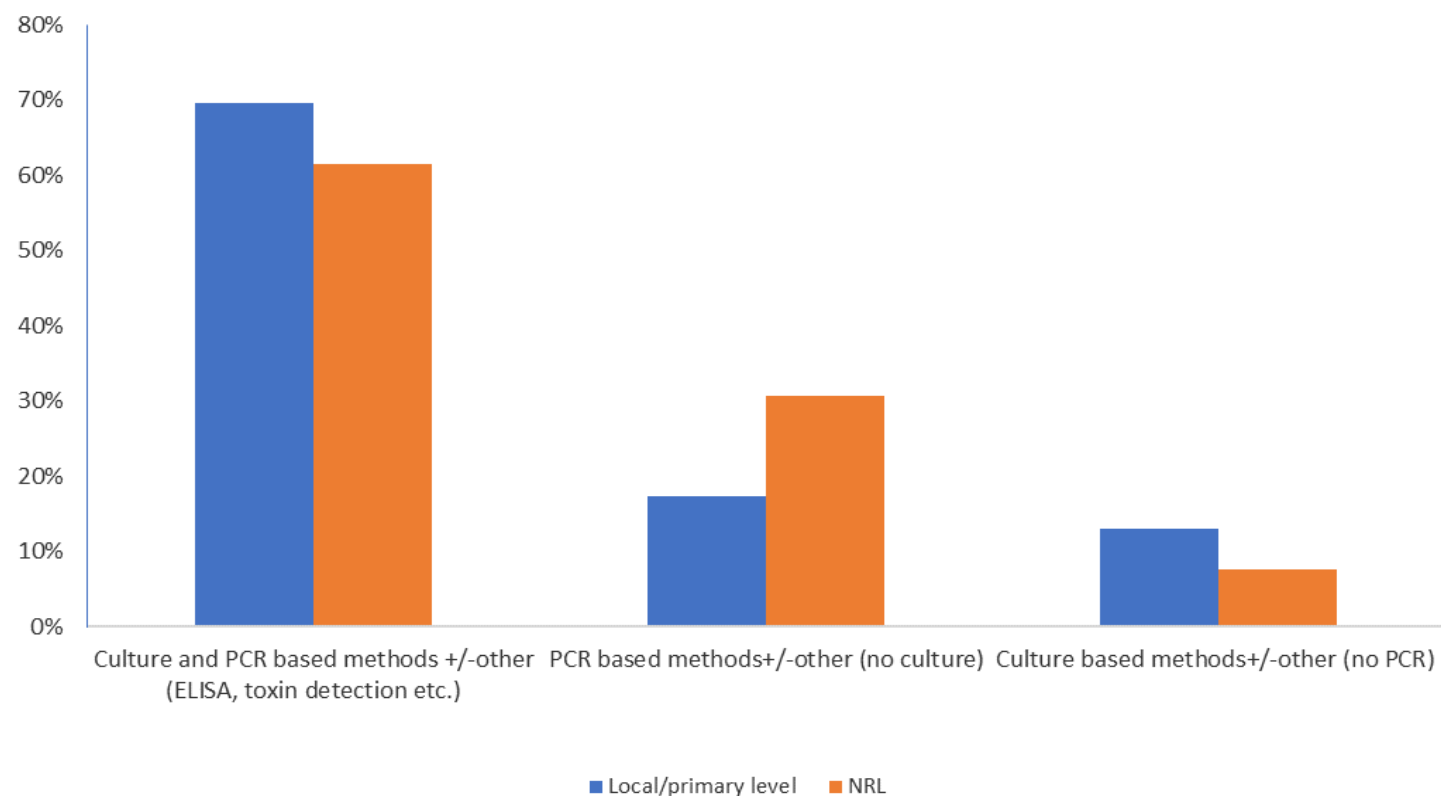
Stx1a  
**Stx2a**, stx2c and stx2a+stx2c

# Detection for the presence of STEC in human samples of different cases or specific situations at EU/EEA level



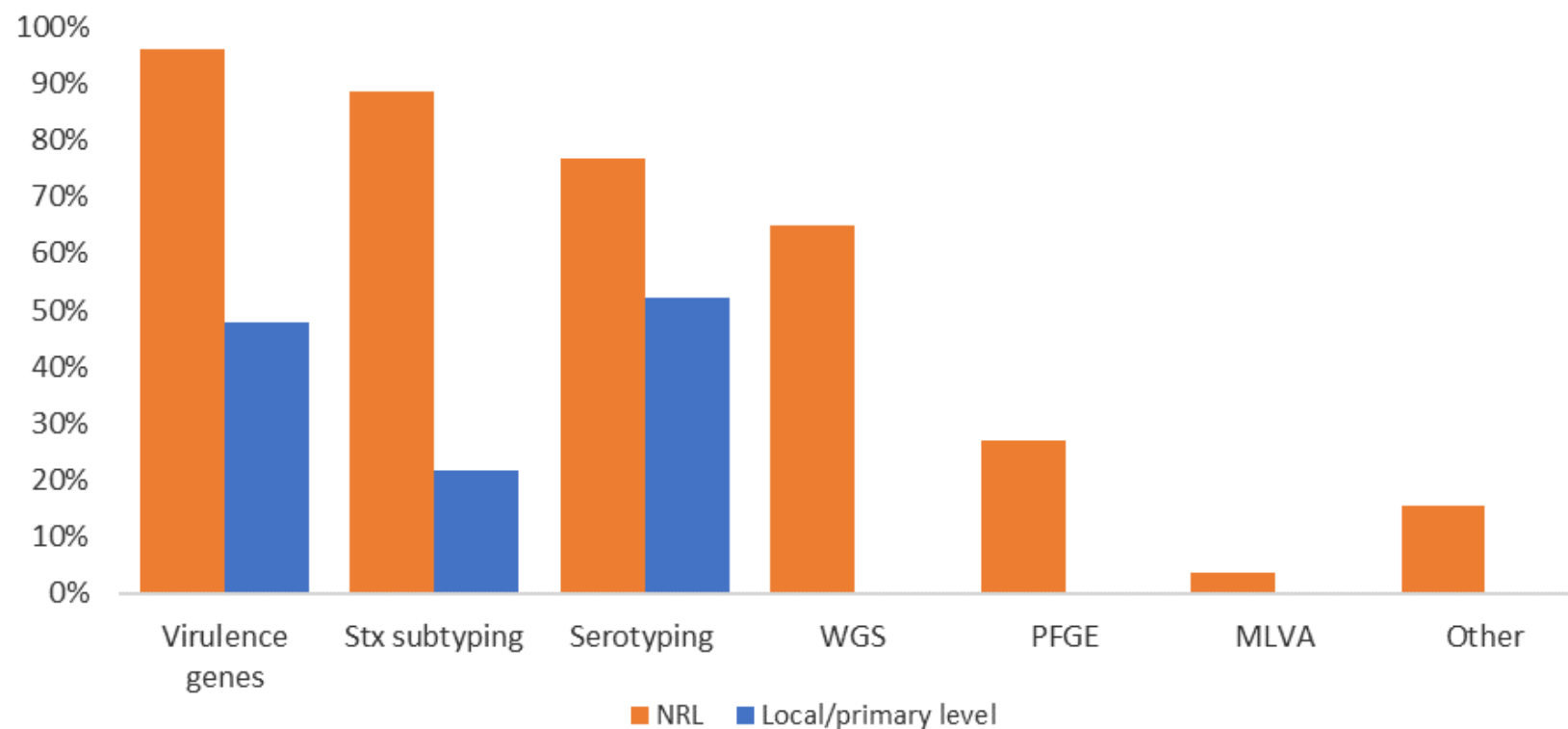
Source: STEC scientific opinion, EFSA 2020; survey to PH NRLs

# Methods used for detection of STEC in human samples in EU/EEA



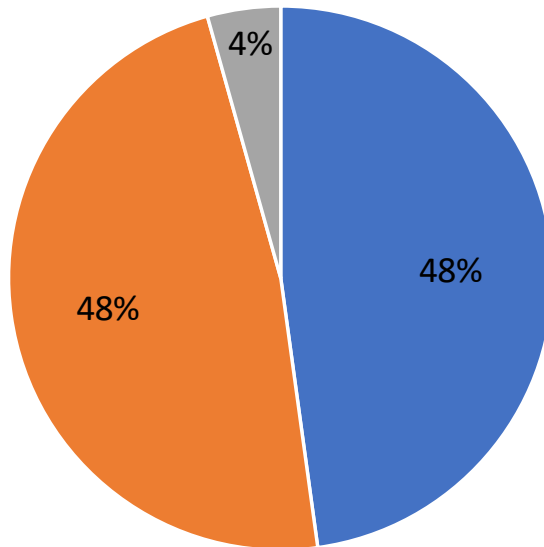
Source: STEC scientific opinion, EFSA 2020; survey to PH NRLs

# Additional characterisation methods of STEC isolates



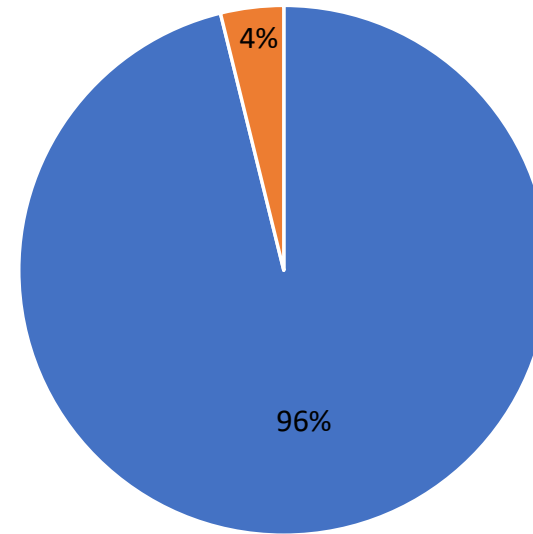
Source: STEC scientific opinion, EFSA 2020; survey to PH NRLs

# Virulence gene profiling done on primary and NRL level



■ Yes ■ No ■ Do not know

Primary/local level

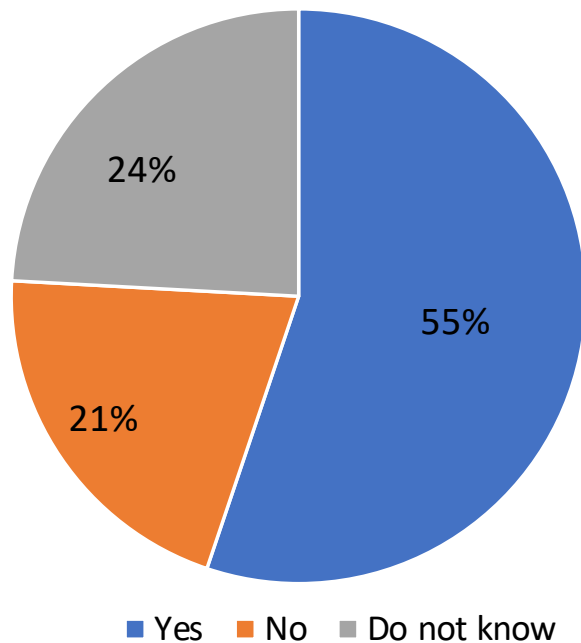


■ Yes ■ No

NRL level

Source: STEC scientific opinion, EFSA 2020; survey to PH NRLs

# Submission of complete set of STEC typing data to ECDC in EU/EEA



Completeness in 2012-2017 compared with 2019

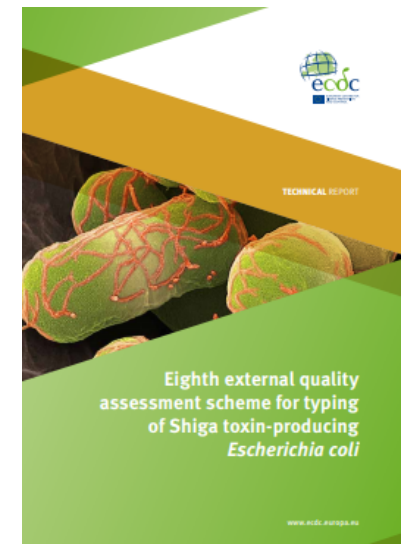
- *Stx1*: 64% -> 74%
- *Stx2*: 64% -> 77%
- *Stx1* subtype 19% -> 41%
- *Stx2* subtype 24% -> 45%
- *eae*: ~60% no change
- *aggR*: 3% -> 6%
- *aaiC*: 2% -> 0.9%

Source: STEC scientific opinion, EFSA 2020; survey to PH NRLs

# The EQA of STEC WGS typing in PH NRLs



- Cluster analysis using WGS was added in 2017
- 11 and 12 laboratories participated using WGS as an only method in the latest EQA-8 and EQA-9
- Main analysis: 72%->84% allele based / 27%->17% SNP based
- High performance: 92% correctly identified the cluster of five strains
- Both allele and SNP based methods seem to be useful for interlaboratory comparability
- cgMLST results were at a comparable level (very high degree of homogeneity), despite analysis with different schemes
- Using a non-standardised SNP analysis indicate more variability and challenges





# WGS-enhanced surveillance implementation for STEC



ECDC upgraded system expected to be operational Q1 2020\*

**\*postponements due to COVID-19 pandemic**

Real-time WGS data collection opened for *Listeria* in 2019 ✓

In 2020 we expect to have support for continuous surveillance for *Listeria*, *Salmonella*, STEC, *Neisseria meningitidis*, Influenza and MDR-TB \*

Outbreak support for STEC ✓

ECDC-EFSA joint database implementation will start Q1 2020 ✓

**THANK YOU!**