



# MONITORING OF *CAMPYLOBACTER* AND RELATED ANTIMICROBIAL RESISTANCE IN THE EU, 2021



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# OUTLINE

- **Monitoring of *Campylobacter* in EU, 2021**
  - EU One Health Zoonoses (EUOHZ) Report 2021 and interactive online tools (story maps and dashboards)
- **Monitoring of AMR in *C. jejuni* and *C. coli* isolates in EU, 2021**
  - Main findings from EU Summary Report on AMR, 2021
- **What's next?**



# MONITORING OF ZOOSES AND FOODBORNE OUTBREAKS IN EU

- **Mandatory monitoring** of zoonoses and foodborne outbreak in accordance with **Directive 2003/99/EC**



- On **annual basis**, MSs report data to EFSA in the context of the *Campylobacter* Process Hygiene Criterion (PHC), set out in **Regulation 2073/2005**
  - In 2019, as part of the food control strategy, it became **mandatory** to report data from ***Campylobacter* PHC on the neck skins of chilled broiler carcasses**, according with **Regulation 2019/627**
- According to this legislation, the Competent Authority (CA) **must verify whether the food business operator (FBOp) is correctly implementing the PHC**, either by ad hoc official sampling or by collecting the relevant information on the test analyses carried out by the FBOp for own-check purposes



# EU FOODBORNE OUTBREAK REPORTING SYSTEM (UPDATED EU-FORS)

- ❑ EU-FORS\*: current system for monitoring FBOs in the EU, implemented since 2010 and updated in 2014

Classification of foodborne outbreaks: **'strong'-'weak'-evidence outbreaks** based on the strength of evidence implicating a suspected food vehicle as the cause of the outbreak



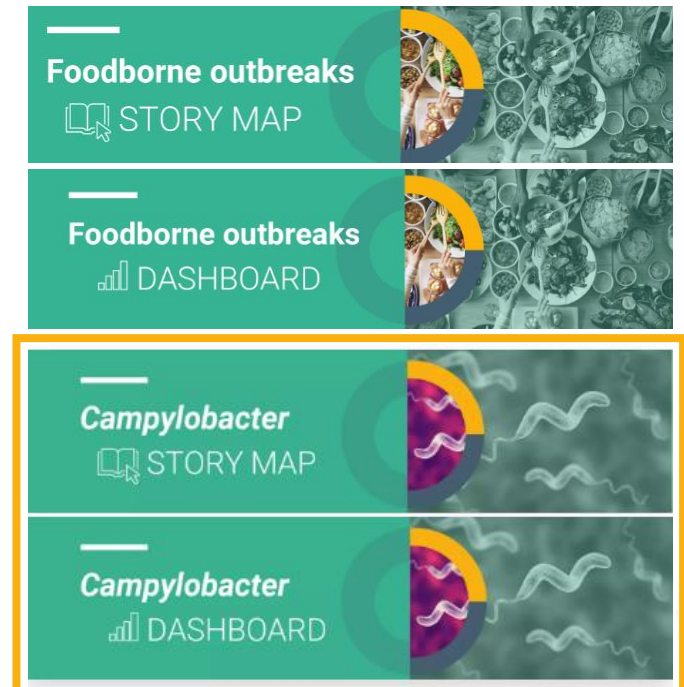
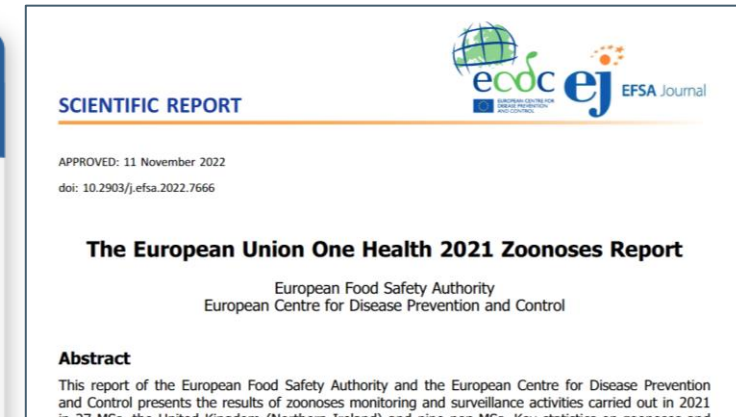
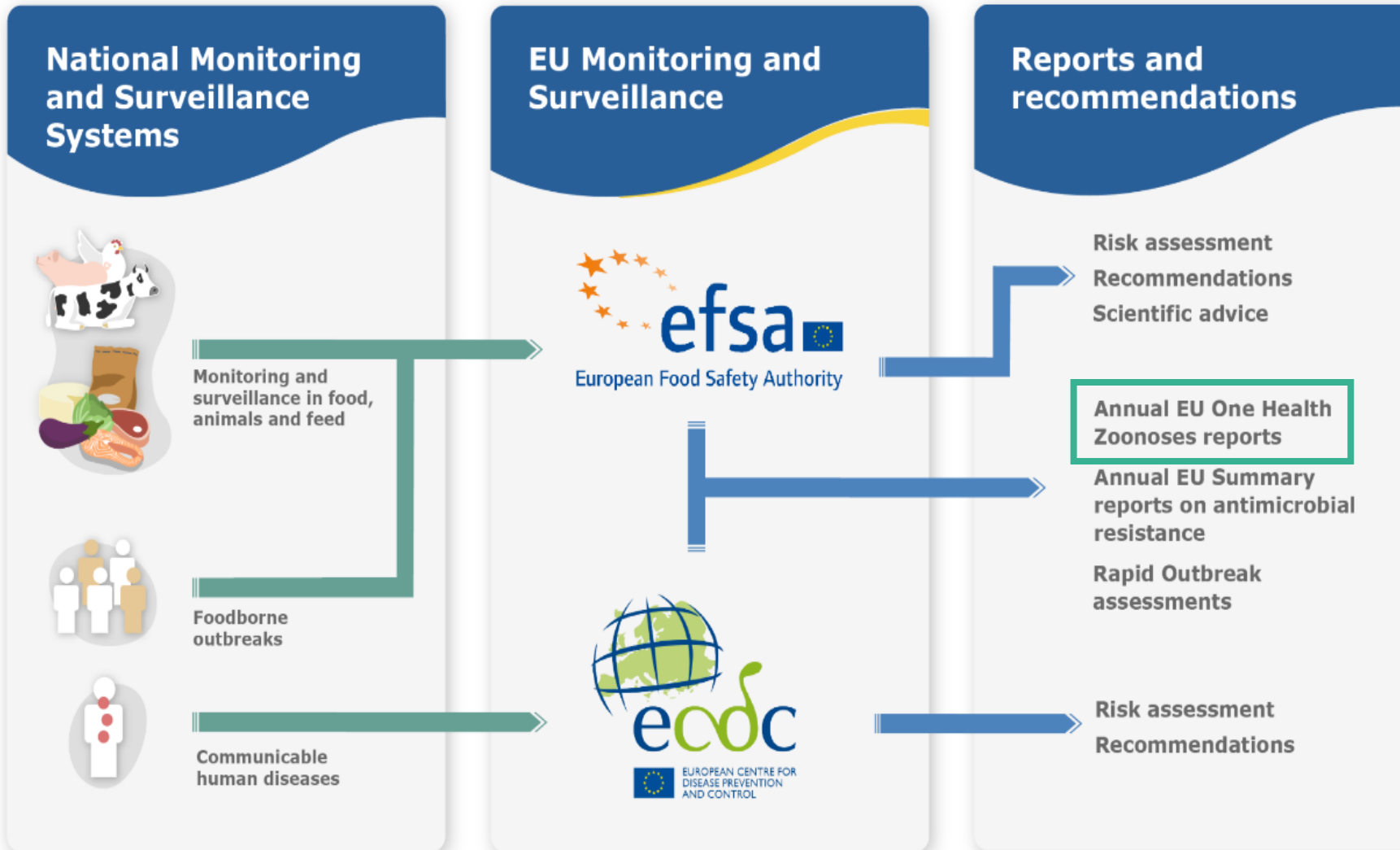
**Strength of evidence:** qualitative measure of the level of uncertainty which affects the likelihood that a food item is the vehicle of the outbreak. It is based on a carefully assessment of all available categories of evidence

Although the data reporting rules follow the same standard EFSA harmonized specifications\*, **foodborne outbreak surveillance activities are not fully harmonized across the EU**

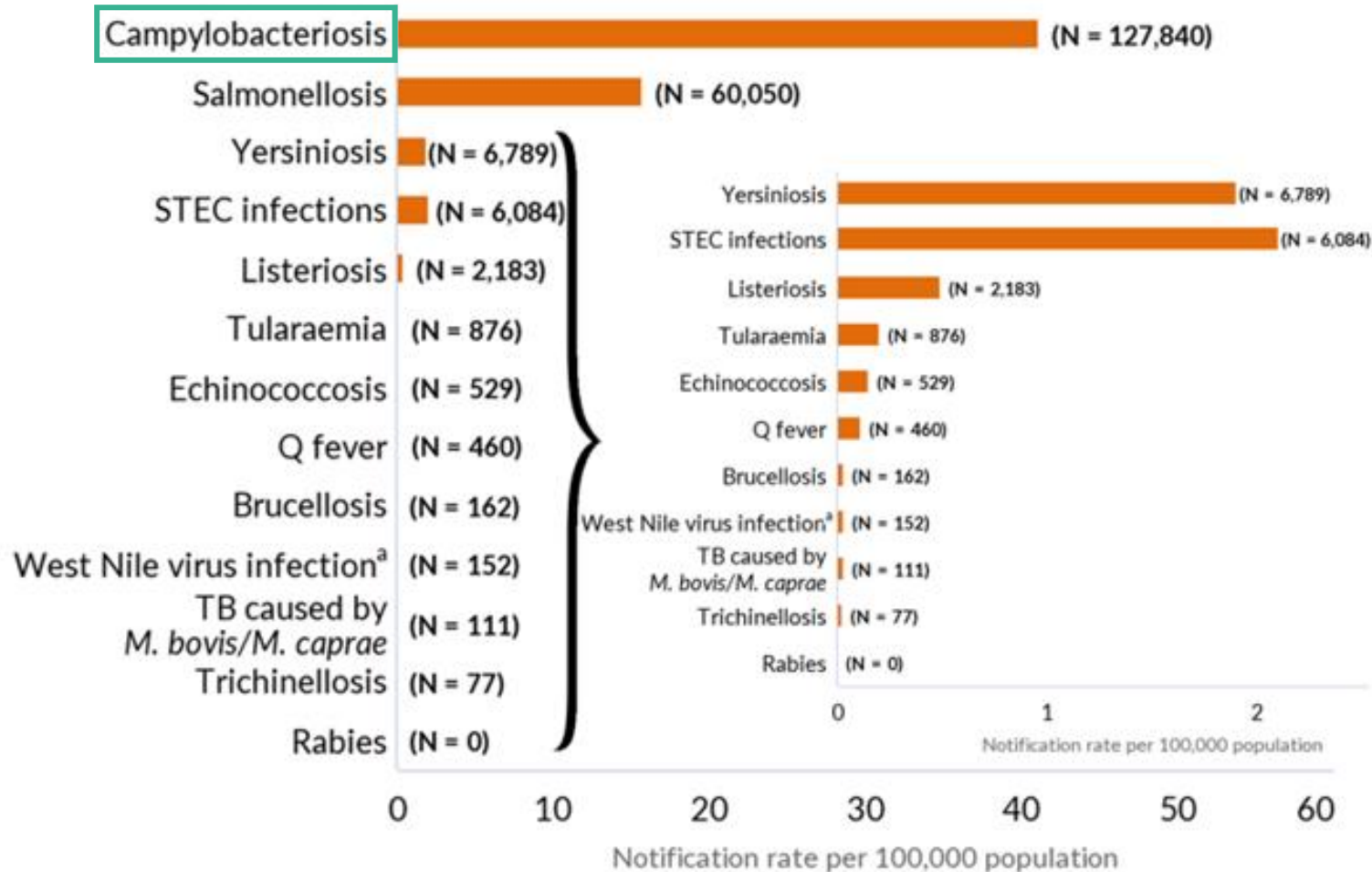
**Differences in sensitivity and type of outbreaks under surveillance may exist.** Therefore, difference in the numbers and types of reported outbreaks, as well as in the causative agents, may not necessarily reflect the level of food safety among MS.

**Aggregated findings at EU level and direct comparison between reporting countries should be interpreted with caution**

# EU ONE HEALTH ZOOZOSES REPORT (EUOHZ) & ONLINE TOOLS



# EUOHZ REPORT, 2021 HUMAN DATA



Reported numbers of cases and notification rates for confirmed human zoonoses in the EU, 2021

Data on congenital toxoplasmosis are not shown since 2021 data are not available yet.

Note: The total number of confirmed cases is indicated in parentheses at the end of each bar.

(a) Regarding West Nile virus infection, the total number of locally acquired cases was used (includes probable and confirmed cases).



# EUOHZ REPORT, SUMMARY INFOGRAPHICS



## Campylobacter in the EU, 2021

### Human cases

Notification rate (per 100,000 population) **41.1** Trend (2017-2021) **—** ↑ Increasing  
↓ Decreasing  
— Stable

**127,840** Cases of illness

**81,311** Infections acquired in the EU **10,469** Hospitalisations

**704** Infections acquired outside the EU

**26** Deaths

**45,825** Unknown travel status or unknown country of infection

### Human cases in foodborne outbreaks

**249** Foodborne outbreaks

**20** Strong-evidence outbreaks

**229** Weak-evidence outbreaks

**1,051** Cases of illness

**134** Hospitalisations

**6** Deaths

### Foodborne outbreaks

Food vehicles causing strong-evidence outbreaks

Broiler meat (*Gallus gallus*) and products thereof **7** Outbreaks

Mixed foods **5** Outbreaks

Bovine meat and products thereof **3** Outbreaks

Other, mixed or unspecified poultry meat and products thereof **2** Outbreaks

N of outbreaks

6	Austria
6	Belgium
0	Bulgaria
2	Croatia
0	Cyprus
2	Czechia
3	Denmark
2	Estonia
6	Finland
55	France
64	Germany
0	Greece
0	Hungary
0	Ireland
10	Italy
0	Latvia
1	Lithuania
0	Luxembourg
9	Malta
5	Netherlands
5	Poland
0	Portugal
0	Romania
55	Slovakia
0	Slovenia
15	Spain
3	Sweden
0	UK (N. Ireland)

N of outbreaks per 100,000 population\*

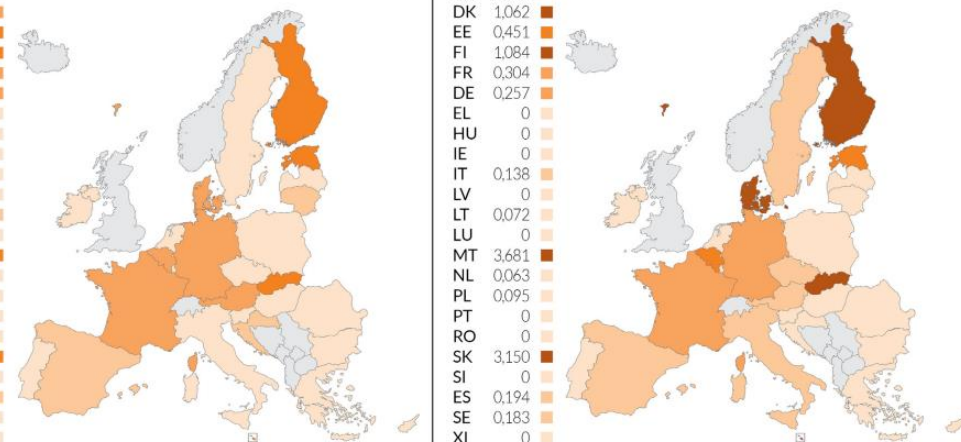
AT	0.067
BE	0.052
BG	0
HR	0.050
CY	0
CZ	0.019
DK	0.051
EE	0.150
FI	0.108
FR	0.081
DE	0.077
EL	0
HU	0
IE	0
IT	0.017
LV	0
LT	0.036
LU	0
MT	1.744
NL	0.029
PL	0.013
PT	0
RO	0
SK	1.007
SI	0
ES	0.032
SE	0.029
XI	0

<0.03  
0.031-0.05  
0.051-0.09  
>0.091  
non-EU

N of outbreak cases per 100,000 population

AT	0.134
BE	0.477
BG	0
HR	0.099
CY	0
CZ	0.196
DK	1.062
EE	0.451
FI	1.084
FR	0.304
DE	0.257
EL	0
HU	0
IE	0
IT	0.138
LV	0
LT	0.072
LU	0
MT	3.681
NL	0.063
PL	0.095
PT	0
RO	0
SK	3.150
SI	0
ES	0.194
SE	0.183
XI	0

<0.1  
0.11-0.20  
0.21-0.30  
0.31-0.90  
>0.90  
non-EU



\* Differences among countries shall be interpreted with caution as this indicator depends on several factors including the type of outbreaks under surveillance and does not necessarily reflect the level of food safety in each country.

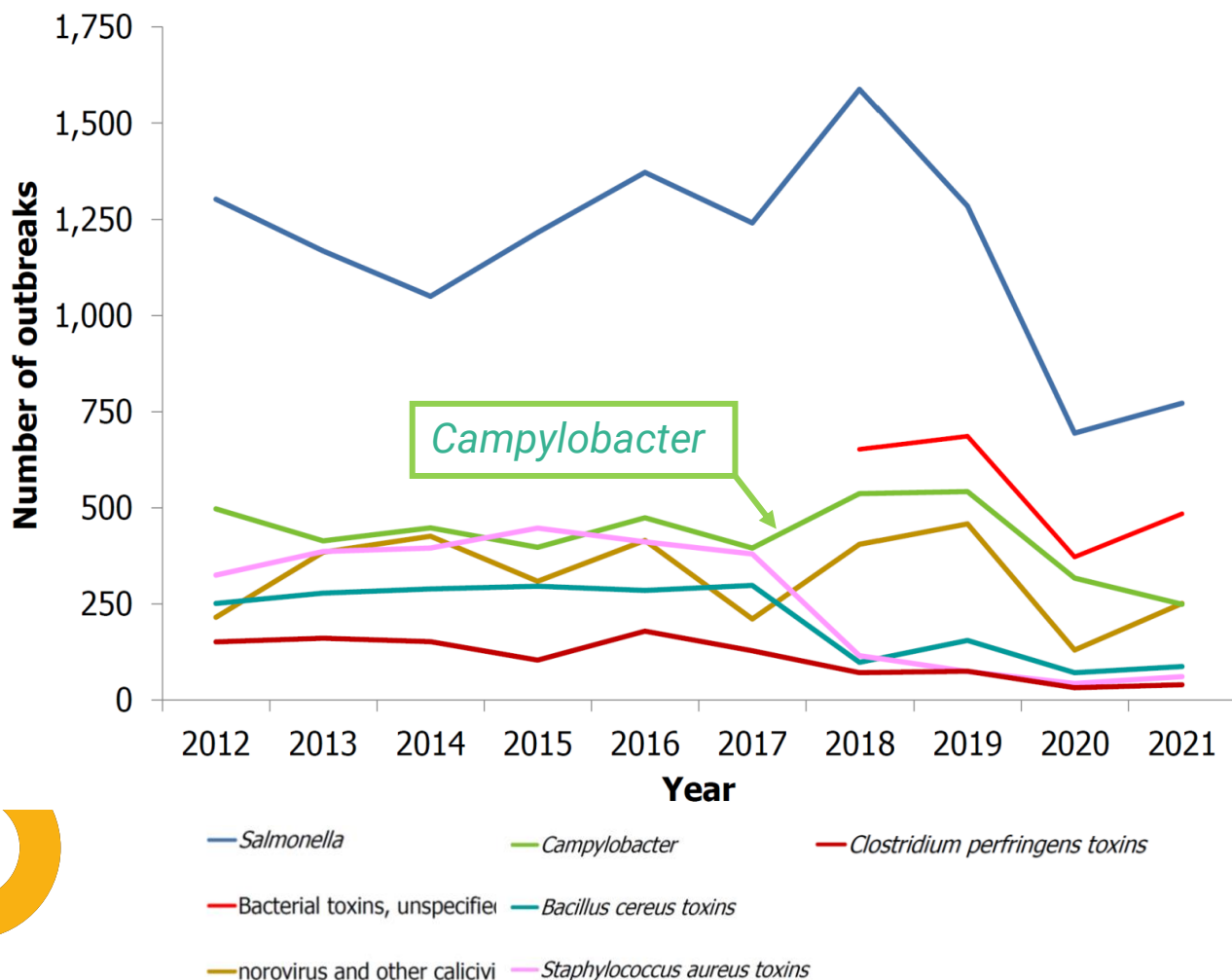
■ ECDC data ■ EFSA data

Of the 112 FBOs reported by MSs with known *Campylobacter* species: **C. jejuni** was the causative agent in 106 FBOs (94.6%) and **C. coli** in six (5.4%). For 137 outbreaks, species information was missing.



# EUOHZ REPORT, MONITORING OF **FOODBORNE OUTBREAKS** IN EU, 2021

Number of foodborne outbreaks by causative agent, reported to the EU by MSs, 2012–2021



Foodborne outbreaks caused *Campylobacter* in 2021, by country and % of difference compared with 2020, in EU MS and non-MS

Country	<i>Campylobacter</i>	
	N	variation (%)
European Union (27 MS + XI)	249	-21%
Austria	6	-40%
Belgium	6	100%
Bulgaria	0	-
Croatia	2	-
Cyprus	0	-
Czechia	2	-
Denmark	3	0%
Estonia	2	-71%
Finland	6	50%
France	55	-20%
Germany	64	-35%
Greece	0	-100%
Hungary	0	-
Ireland	0	-100%
Italy	10	25%
Latvia	0	-
Lithuania	1	-
Luxembourg	0	-
Malta	9	80%
Netherlands	5	-38%
Poland	5	25%
Portugal	0	-100%
Romania	0	-
Slovakia	55	-38%
Slovenia	0	-
Spain	15	275%
Sweden	3	0%
United Kingdom (Northern Ireland)	0	NA
Bosnia and Herzegovina	0	-
Iceland	0	-
Montenegro	0	-
Norway	4	300%
Rep. North Macedonia	0	-
Serbia	1	-
Switzerland	3	200%



# CAMPYLOBACTER IN FOOD, 2021 [CONTEXT: REG (EC) 2073/2005]

Country	Competent Authority (CA)				Food business operator (FBOp)				p-value <sup>(b),(c)</sup>	Interpretation <sup>(c)</sup>
	N samples Tested	N (%) samples positive	N (%) samples above 1,000 CFU/g	CI <sub>95</sub> samples above 1,000 CFU/g	N samples Tested	N (%) samples positive	N (%) samples above 1,000 CFU/g	CI <sub>95</sub> samples above 1,000 CFU/g		
Austria	–	–	–	–	957	NA	61 (6.4)	[4.9; 8.1]	–	–
Belgium	633	NA	89 (14.1)	[11.4; 17.0]	2,421	NA	172 (7.1)	[6.1; 8.2]	< 0.001	CA > FBOp
Bulgaria	1,048	218 (20.8)	16 (1.5)	[0.88; 2.5]	–	–	–	–	–	–
Croatia	832	417 (50.1)	253 (30.4)	[27.3; 33.7]	–	–	–	–	–	–
Cyprus	220	180 (81.8)	113 (51.4)	[44.6; 58.1]	–	–	–	–	–	–
Czechia	–	–	–	–	4,110	2,573 (62.6)	1,620 (39.4)	[37.9; 40.9]	–	–
Denmark	–	–	–	–	1,150	164 (14.3)	86 (7.5)	[6.0; 9.2]	–	–
Estonia	12	1 (8.3)	1 (8.3)	[0.21; 38.5]	260	0	0	[0; 1.4] <sup>(a)</sup>	0.04	CA > FBOp
Finland	–	–	–	–	585	1 (0.17) <sup>(f)</sup>	1 (0.17)	[0; 0.95]	–	–
France	–	–	–	–	16,357	NA	4,389 (26.8)	[26.2; 27.5]	–	–
Germany	28	NA	9 (32.1)	[15.9; 52.4]	6,604	NA	510 (7.7)	[7.1; 8.4]	< 0.001	CA > FBOp
Greece	75	52 (69.3)	33 (44.0)	[32.5; 55.9]	612	31 (5.1)	31 (5.1)	[3.5; 7.1]	< 0.001	CA > FBOp
Hungary	344	41 (11.9)	14 (4.1)	[2.2; 6.7]	–	–	–	–	–	–
Ireland	164	96 (58.5)	10 (6.1)	[3; 10.9]	1,031	379 (36.8)	75 (7.3)	[5.8; 9.0]	NS	–
Italy	1,233	639 (51.8)	310 (25.1)	[22.7; 27.7]	5,591	NA	466 (8.3)	[7.6; 9.1]	< 0.001	CA > FBOp
Latvia	100	4 (4.0)	0 (0)	[0; 3.6] <sup>(a)</sup>	434	90 (20.7)	24 (5.5)	[3.6; 8.1]	0.01	CA < FBOp
Netherlands	333	79 (23.7)	10 (3.0)	[1.4; 5.5]	3,336	201 (6.0)	201 (6.0)	[5.2; 6.9]	0.0239	CA < FBOp
Poland	885	287 (32.4)	174 (19.7)	[17.1; 22.4]	1,365	112 (8.2)	109 (8.0)	[6.6; 9.6]	< 0.001	CA > FBOp
Portugal	–	–	–	–	3,528	1,006 (28.5)	521 (14.8)	[13.6; 16.0]	–	–
Romania	1,399	521 (37.2)	84 (6.0)	[4.8; 7.4]	1,450	491 (33.9)	6 (0.41)	[0.15; 0.90]	< 0.001	CA > FBOp
Slovakia	–	–	–	–	1,075	20 (1.9)	0	[0; 0.34] <sup>(a)</sup>	–	–
Slovenia	–	–	–	–	804	595 (74.0)	333 (41.4)	[38; 44.9]	–	–
Spain	757	584 (77.1)	370 (48.9)	[45.3; 52.5]	635	139 (21.9)	139 (21.9)	[18.7; 25.3]	< 0.001	CA > FBOp
Sweden	–	–	–	–	1,046	15 (1.4)	15 (1.4)	[0.8; 2.4]	–	–
<b>EU Total (27 + XI)</b>	<b>8,063</b>	<b>3,119 (42.1)<sup>(d)</sup></b>	<b>1,486 (18.4)</b>	<b>[17.6; 19.3]</b>	<b>53,351</b>	<b>5,817 (27.2)<sup>(e)</sup></b>	<b>8,759 (16.4)</b>	<b>[16.1; 16.7]</b>	<b>&lt; 0.001</b>	<b>CA &gt; FBOp</b>
<b>EU Total (27 + XI) providing CA and FBOp data</b>	<b>5,619</b>	<b>2,263 (45.6)<sup>(d)</sup></b>	<b>1,090 (19.4)</b>	<b>[18.4; 20.5]</b>	<b>23,739</b>	<b>1,443 (15.8)<sup>(e)</sup></b>	<b>1,733 (7.3)</b>	<b>[7.0; 7.6]</b>	<b>&lt; 0.001</b>	<b>CA &gt; FBOp</b>

**Comparison of proportions (%) of Campylobacter-positive samples & samples exceeding Campylobacter PHC limit according with Reg. 2073/2005, by sampler and reporting MS, EU, 2021**

N MSs	Data reported
24	Data on PHC
15	Official control results
20	Monitoring results from FBOp
11	Data from both official and FBOp

(a): One-sided, 97.5% confidence interval

(b): p-value: NS, not significant.

(c): Related to the percentage of positive samples above 1,000 CFU/g.

(d): Belgium and Germany did not report Campylobacter-positive samples below 1,000 CFU/g from test results of the Competent Authority.

(e): Austria, Belgium, France, Germany and Italy did not report Campylobacter-positive samples below 1,000 CFU/g from test results of food business operators.

(f): Reporting error. Finland indicated, during the last phase of the production of this report, that the number of Campylobacter-positive samples below 1,000 CFU/g from the FBOp was unknown.

# Campylobacter


## DASHBOARD



LET'S HAVE A LOOK ON THE ONLINE TOOL

Cover Units tested Official sampling results from Food business operator samp... Other food monitoring data

# CAMPYLOBACTER



**Campylobacter** is the leading cause of human foodborne bacterial gastroenteritis worldwide. In EU the cost in terms of public health systems as well as of lost productivity is estimated to be around €2.4 billion a year.

Campylobacteriosis is a zoonotic disease transmitted directly or indirectly between animals and humans, mainly by foodborne route.

Campylobacteriosis usually takes the form of a self-limiting gastroenteritis, characterised by diarrhoea, fever and abdominal cramps but may also lead to autoimmune sequelae, e. g. Guillain Barré syndrome. Antimicrobial therapy is seldom needed.

Prevention of campylobacteriosis relies on a comprehensive approach at farm, manufacturing, distribution and consumer level. Proper handling of food, avoiding cross-contamination, and thorough cooking can reduce the risk.

EU One Health Zoonoses Report | User guide | Story map

## Campylobacter dashboard | EFSA (europa.eu)

Cover Units tested Official sampling results from Food business operator samp... Other food monitoring data

### Campylobacter

Campylobacter-positive single samples and samples exceeding the Campylobacter process hygiene criterion limit of 1,000 CFU/g for chilled broiler carcasses, official sampling by competent authorities

Reporting year: 2021 | Reporting country: EU (All)

Number of countries: 15 | Number of samples tested: 8,063 | Percentage of positive samples: 42.1% | Percentage of samples exceeding 1,000 CFU/g: 18.4%

You can select multiple countries in the map using the key and each graph can be maximized with the "m" icon that appears in the right corner of the titlebar.

Reporting country	N samples tested	N positive samples	% positive samples	N samples exceeding 1,000 CFU/g	% samples exceeding 1,000 CFU/g
Total	8,063	3,119	42.1%	1,486	18.4%
Belgium	553	165	30%	89	16.1%
Bulgaria	1,048	219	20.8%	15	1.5%
Croatia	832	417	50.1%	253	30.4%
Cyprus	220	180	81.8%	113	51.4%
Estonia	32	3	9.3%	3	9.3%
Germany	28	16	56%	9	32.1%
Greece	75	32	42.7%	33	44.0%
Hungary	344	41	11.9%	14	4.1%
Ireland	164	96	58.5%	10	6.1%
Italy	1,233	639	51.8%	310	25.1%
Lithuania	100	4	4.0%	0	0.0%
Netherlands	333	75	22.5%	10	3.0%
Poland	885	287	32.4%	174	19.7%
Romania	1,399	521	37.2%	84	6.0%
Spain	797	584	73.3%	370	46.4%

Please note that the data visualised are affected by the selected filters. If you have any questions on the dashboard, please contact [zoonoses@efsa.europa.eu](mailto:zoonoses@efsa.europa.eu)

EU One Health Zoonoses Report | User guide | Story map



# Campylobacter

## STORY MAP



**Campylobacter story map**

Last updated on 12.07.2022

LET'S HAVE A LOOK  
ON THE ONLINE TOOL

[Campylobacter story map \(arcgis.com\)](https://arcgis.com)



# EU MONITORING OF AMR IN *CAMPYLOBACTER*, 2021



## EFSA advises for the AMR monitoring legislation

EFSA technical specifications on harmonised monitoring and reporting of AMR - 2012

EFSA technical specifications on representative randomised sampling - 2013

EFSA technical specifications on harmonised monitoring of AMR - 2019

EFSA technical specifications on representative randomised sampling - 2020

Technical support provided by EFSA

Directive 2003/99/EC  
Art. 7(3) and 9(1) + Annexes II (B) IV

Lays down legislative basis since 2004

Commission Implementing Decision 2013/652/EU

Lays down detailed technical requirements 2014 - 2020

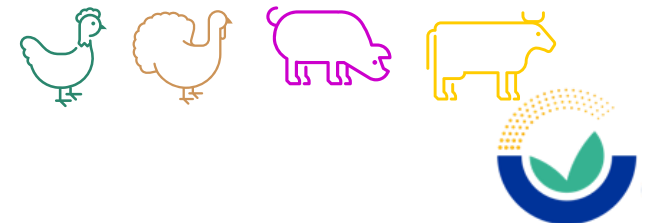
Commission Implementing Decision 2020/1729/EU

Lays down detailed technical requirements 2021 - 2027

Monitoring of AMR in animals and food performed by the EU MSs

- Monitoring of AMR in *Campylobacter* spp. from food-producing animals focused on *C. jejuni* and *C. coli*
- Until 2020, based on this [Decision 2013/652/EU](#), the biennial monitoring of AMR in *C. jejuni* isolates from caecal samples gathered at slaughter from broilers and fattening turkeys was mandatory, while for *C. coli* was voluntary
- From 2021, according with [Decision 2020/1729/EU](#), *C. coli* has been included in the monitoring programs

Technical support provided by the EURL-AR



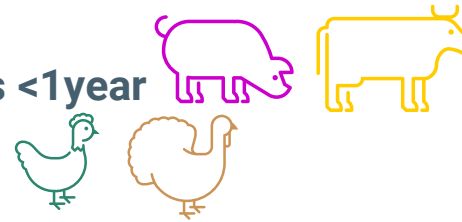
# DECISION 2020/1729/EU - EU MONITORING OF AMR IN *CAMPYLOBACTER*

- **Harmonised rules** for the period **2021-2027** for the monitoring and reporting of AMR to be carried out by Member States
- ***C. jejuni*** and ***C. coli***
- Samples of **caecal content taken at slaughter** from: **broilers, fattening turkeys\***, **calves < 1 year\***, **fattening pigs**

- **Biannual sampling:**

**Odd years** (2021, 2023, 2025, 2027) **fattening pigs** and **calves <1year**

**Even years** (2022, 2024, 2026) **broilers** and **fattening turkeys**



- **Harmonised sampling design:**

- proportionate stratified sampling / slaughterhouses processing at least 60 % of the specific domestic animal population/ even distribution over the monitoring period
- samples from **healthy animals** sampled from randomly selected epidemiological units (poultry: flocks; pigs/bovines: slaughter batch)
- **Sample size:** MSs shall take annually **at least 300 samples** from each animal population. By way of **derogation**, where annual national production <100 000 tonnes of broiler meat/turkey meat /pig meat or <50 000 tonnes of bovine meat, → **minimum of 150 samples** instead of 300 samples for each specific animal population considered



\*samples of caecal content taken at slaughter from fattening turkeys/calves<1 year where the national production of turkey meat/bovine meat is more than 10000 tonnes per year

# EU MONITORING OF AMR IN CAMPYLOBACTER, 2021

- Harmonised **isolation and identification methods**
- Harmonised AST: **microdilution**
- Harmonised **panel of antimicrobials**
- Harmonised interpretative criteria of resistance: **ECOFFs**

**Harmonisation** contributes to the representativeness and reliability of AMR data

The findings of EU AMR monitoring activities are summarised in the annual **joint EFSA-ECDC EU Summary Report on AMR**

**Panel of antimicrobial substances to be included in AMR monitoring, EUCAST interpretative thresholds for resistance and concentration ranges to be tested in *C. jejuni* and *C. coli***

Antimicrobial	Class of antimicrobial	Species	Interpretative thresholds of AMR (mg/L)		Range of concentrations (mg/L) (No of wells in brackets)
			ECOFF	Clinical breakpoint	
Chloramphenicol	Phenicol	<i>C. jejuni</i>	> 16	NA	2-64 (6)
		<i>C. coli</i>	> 16	NA	
Ciprofloxacin	Fluoroquinolone	<i>C. jejuni</i>	> 0,5	> 0,5	0,12-32 (9)
		<i>C. coli</i>	> 0,5	> 0,5	
Ertapenem	Carbapenem	<i>C. jejuni</i>	NA	NA	0,125-4 (6)
		<i>C. coli</i>	NA	NA	
Erythromycin	Macrolide	<i>C. jejuni</i>	> 4	> 4	1-512 (10)
		<i>C. coli</i>	> 8	> 8	
Gentamicin	Aminoglycoside	<i>C. jejuni</i>	> 2	NA	0,25-16 (7)
		<i>C. coli</i>	> 2	NA	
Tetracycline	Tetracycline	<i>C. jejuni</i>	> 1	> 2	0,5-64 (8)
		<i>C. coli</i>	> 2	> 2	

NA: not available

# EU SUMMARY REPORT ON AMR 2020/2021 (EFSA-ECDC, 2023)



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## The European Union Summary Report on Antimicrobial Resistance in zoonotic and indicator bacteria from humans, animals and food in 2020/2021

Published: 6 March 2023 | Approved: 31 January 2023



### Contents

- Meta data
- Abstract
- Related topic(s)



[Plain language summary](#)



### SCIENTIFIC REPORT

APPROVED: 31 January 2023

doi: 10.2903/j.efsa.2023.7867

## The European Union Summary Report on Antimicrobial Resistance in zoonotic and indicator bacteria from humans, animals and food in 2020/2021

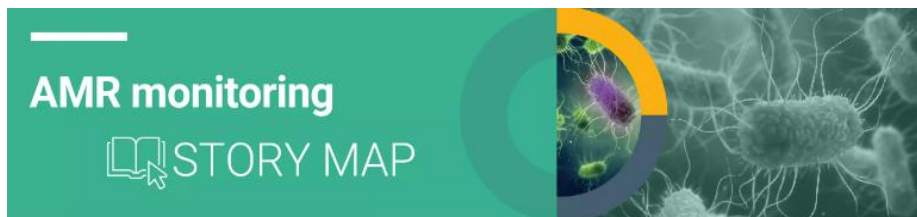
European Food Safety Authority (EFSA) and  
European Centre for Disease Prevention and Control (ECDC)

### Abstract

Antimicrobial resistance (AMR) data on zoonotic and indicator bacteria from humans, animals and food are collected annually by the EU Member States (MSs) and reporting countries, jointly analysed by EFSA and ECDC and presented in a yearly EU Summary Report. This report provides an overview of the main findings of the 2020–2021 harmonised AMR monitoring in *Salmonella* spp., *Campylobacter*

<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2023.7867>

Annex B, part B: available in Zenodo: <https://zenodo.org/record/7544221>

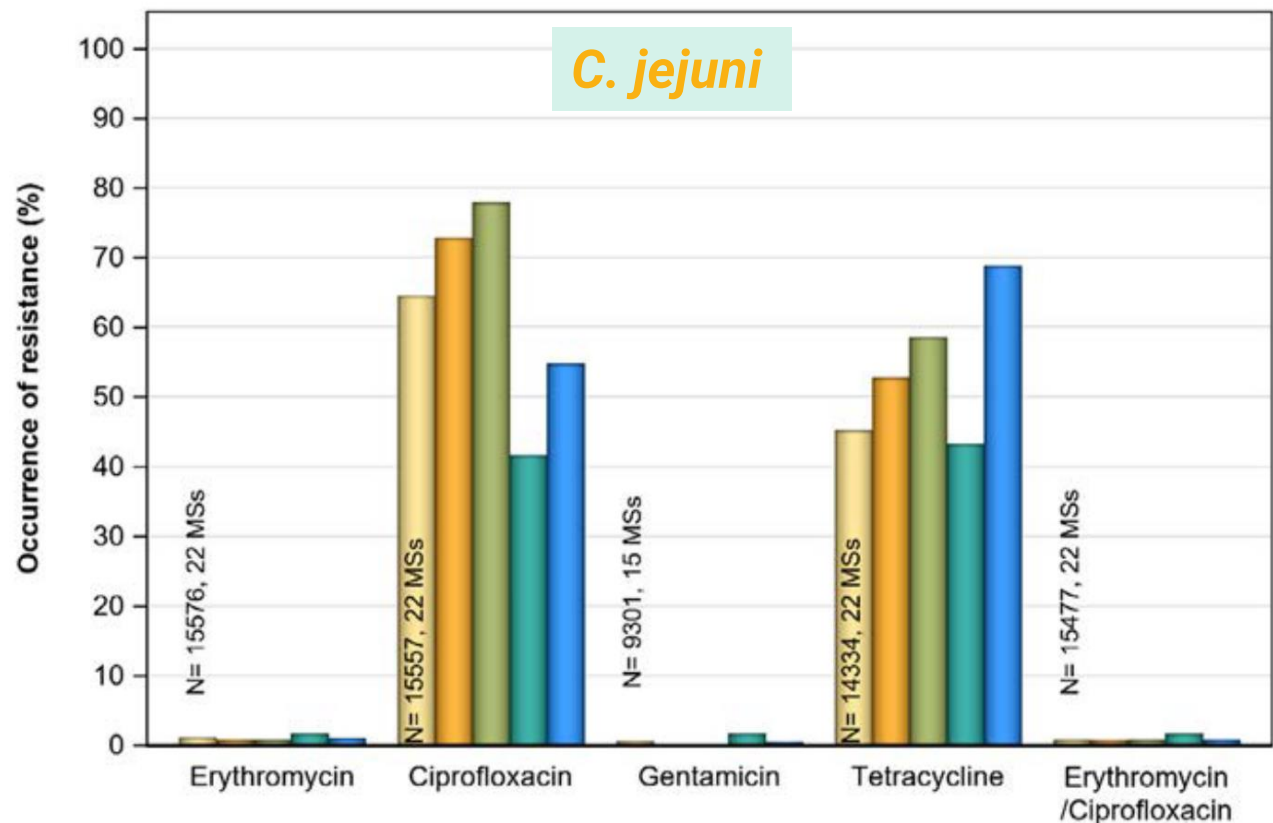


<https://storymaps.arcgis.com/stories/a513eca219c14f6c800a0520e8f56a9b>



# COMPARISON OCCURRENCE OF RESISTANCE BETWEEN HUMANS AND ANIMALS (EUSR-AMR 2020/2021)

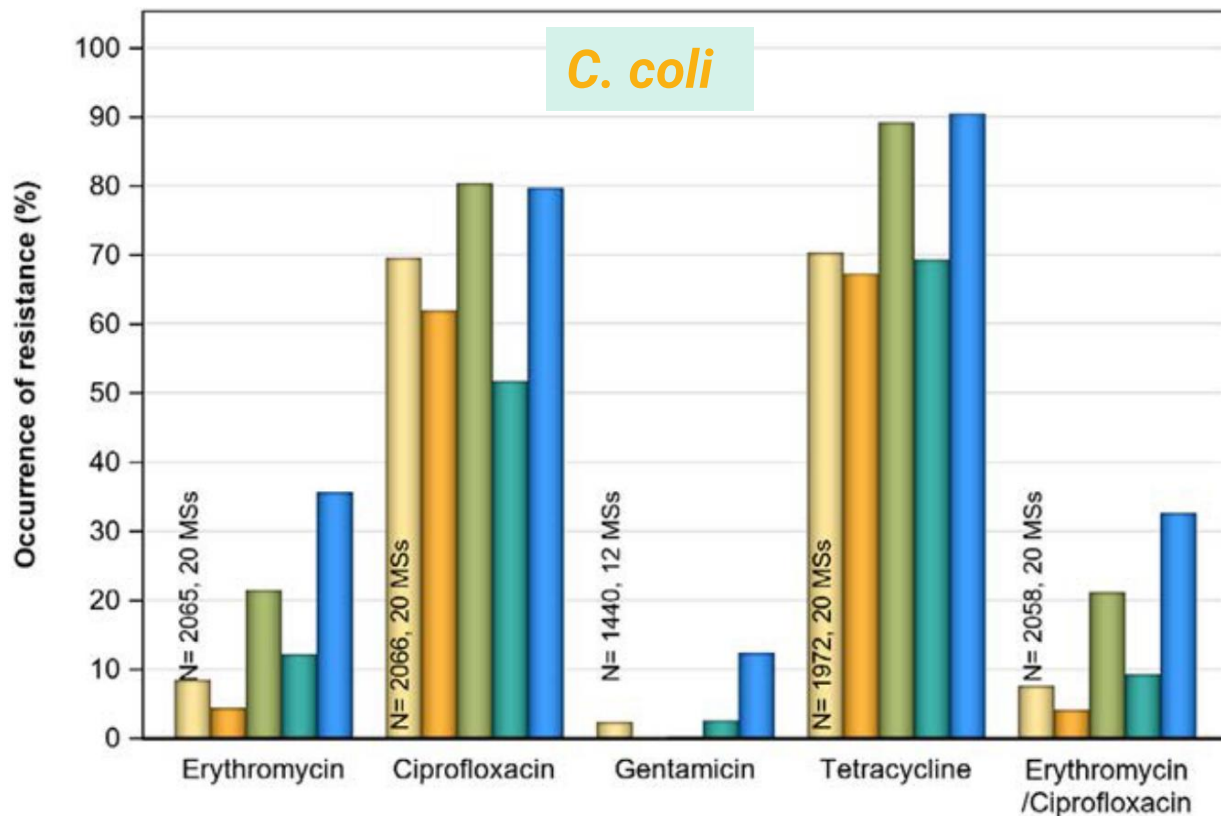
*C. jejuni*



- Humans 2021
- Broilers 2020 (N=3382, 27 MSs)
- Fattening turkeys 2020 (N=1066, 9 MSs)
- Fattening pigs 2021 (N=60, 12 MSs)
- Calves 2021 (N=1198, 10 MSs)



*C. coli*



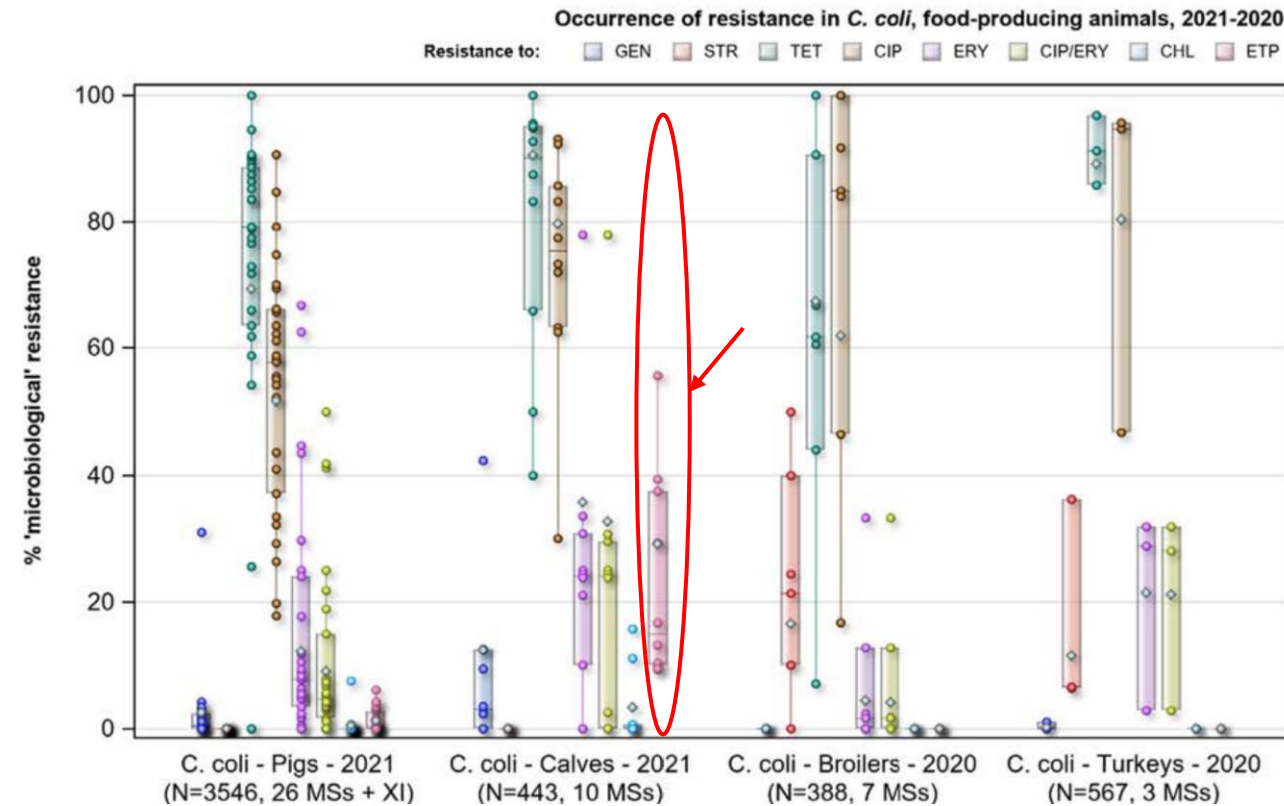
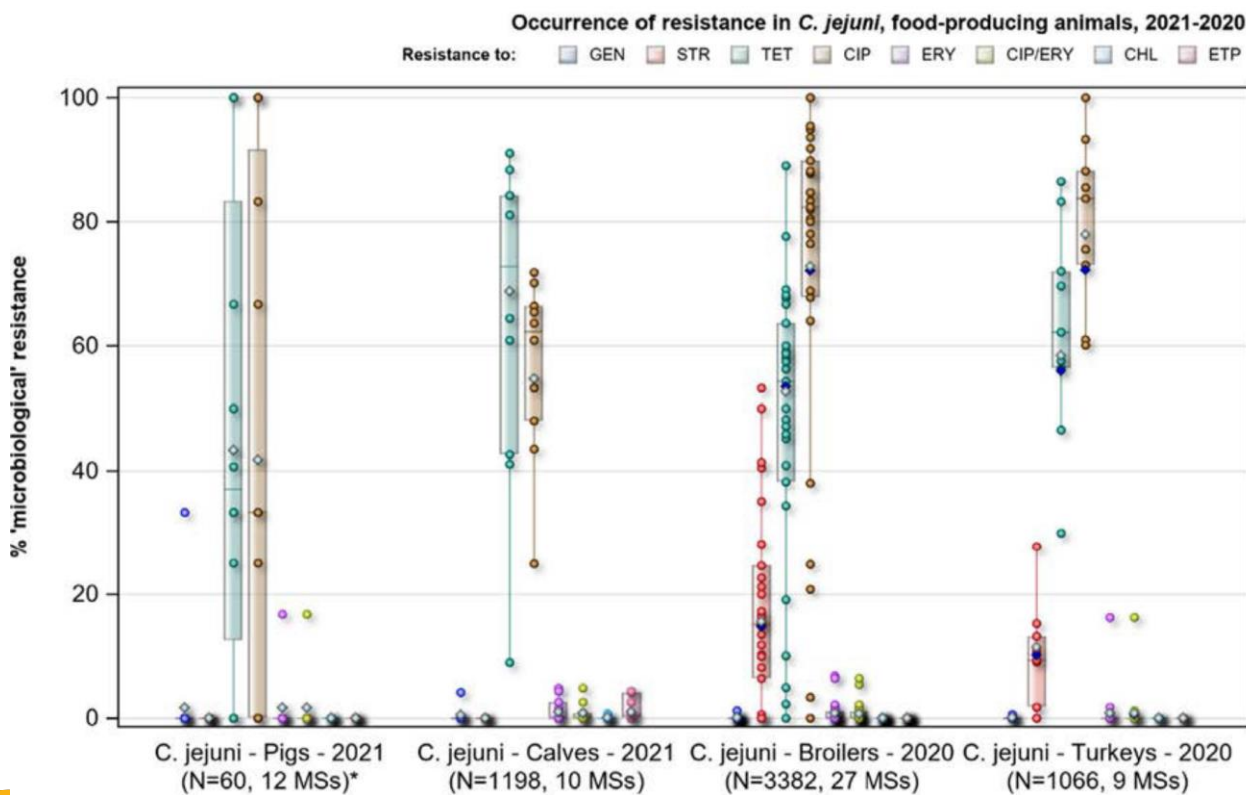
- Humans 2021
- Broilers 2020 (N=388, 7 MSs)
- Fattening turkeys 2020 (N=567, 3 MSs)
- Fattening pigs 2021 (N=3546, 26 MSs + XI)
- Calves 2021 (N=443, 10 MSs)





# OCCURRENCE OF RESISTANCE (EUSR-AMR 2020/2021)

## Occurrence of resistance to selected antimicrobials in poultry, pigs and calves



Occurrence of resistance to the new antimicrobials tested chloramphenicol and ertapenem



# OCCURRENCE OF RESISTANCE (EUSR-AMR 2020/2021)

## Occurrence of resistance to selected antimicrobials in poultry, pigs and calves

Occurrence of resistance in *C. jejuni*, food-producing animals, 2021-2020

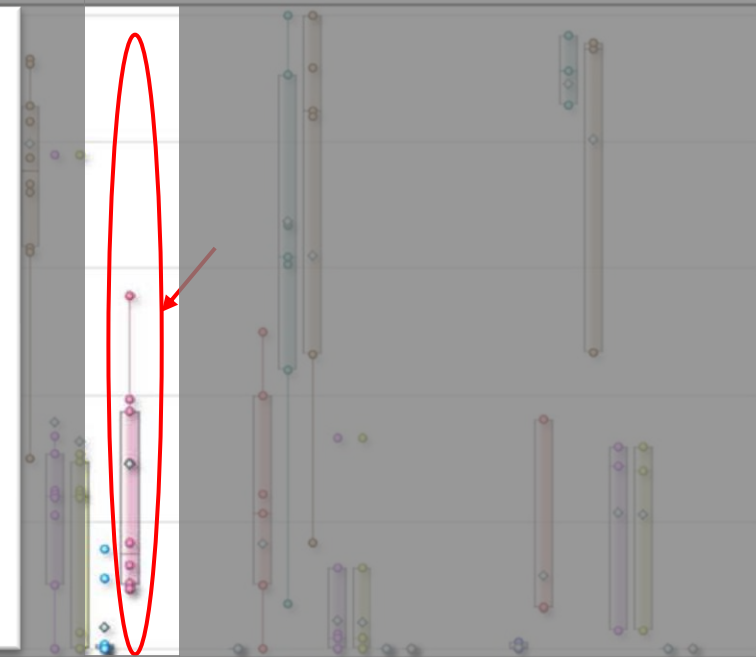
Resistance to:  GEN  STR  TET  CIP  ERY  CIP/ERY  CHL  ETP

Occurrence of resistance in *C. coli*, food-producing animals, 2021-2020

Resistance to:  GEN  STR  TET  CIP  ERY  CIP/ERY  CHL  ETP

MIC distribution in ertapenem resistant and susceptible *C. coli* isolates from calves (ECOFF = 0.5 mg/L) reported in 2021 by 10 MSs.

MIC	Number of isolates	%	ETP resistance
≤ 0.125	133	30.0	Susceptible
0.25	78	17.6	Susceptible
0.5	103	23.2	Susceptible
1	103	23.2	Resistant
2	23	5.2	Resistant
4	3	0.7	Resistant
<b>Total</b>	<b>443</b>		



*C. jejuni* - Pigs - 2021  
(N=60, 12 MSs)\*

*C. jejuni* - Calves - 2021  
(N=1198, 10 MSs)

*C. jejuni* - Broilers - 2020  
(N=3382, 27 MSs)

*C. jejuni* - Turkeys - 2020  
(N=1066, 9 MSs)

*C. coli* - Pigs - 2021  
(N=3546, 26 MSs + XI)

*C. coli* - Calves - 2021  
(N=443, 10 MSs)

*C. coli* - Broilers - 2020  
(N=388, 7 MSs)

*C. coli* - Turkeys - 2020  
(N=567, 3 MSs)

Occurrence of resistance to the new antimicrobials tested chloramphenicol and ertapenem



# PREVALENCE OF RESISTANCE IN *C. COLI* FROM PIGS (EUSR-AMR 2020/2021)

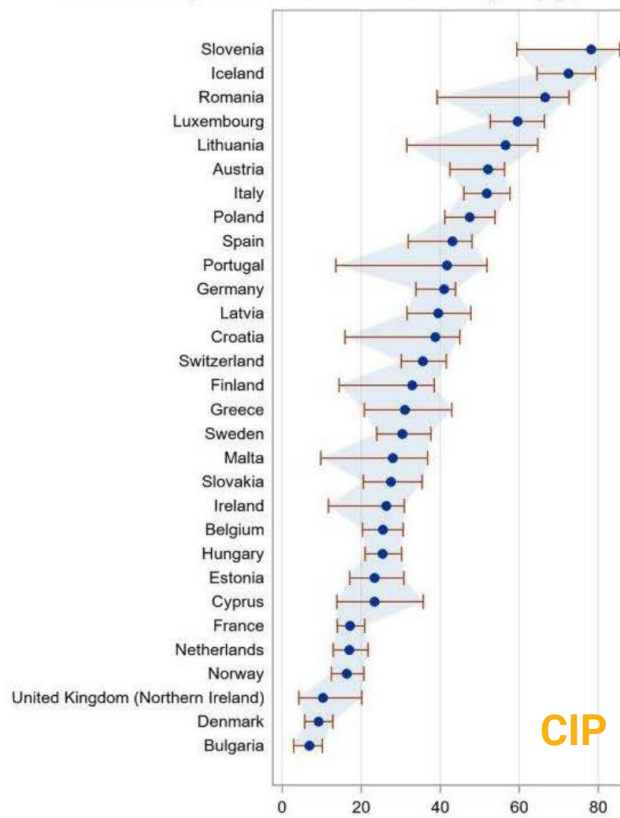


## Prevalence of resistances to CIP, ERY, TET and related 95% confidence intervals in *C. coli* from fattening pigs, 2021

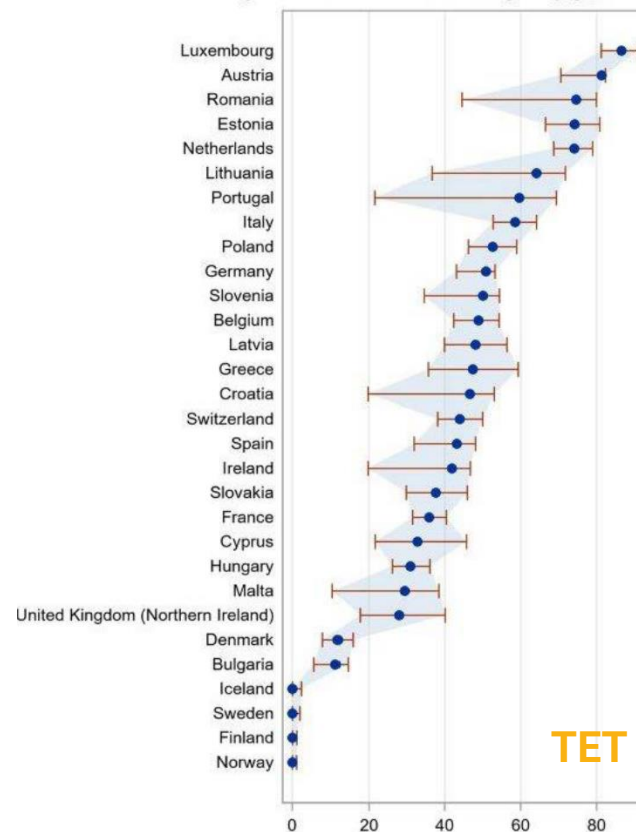
The prevalence of resistance to selected antimicrobials in *C. coli* from fattening pigs has been estimated at country level as the proportion of *C. coli* showing microbiological resistance to each selected antimicrobial as a percentage of all caecal samples cultured for *C. coli*

Prev. of resistance = prev. of *C. coli* in caecal samples from fattening pigs \* the occurrence of resistance in the *C. coli* isolates tested for susceptibility

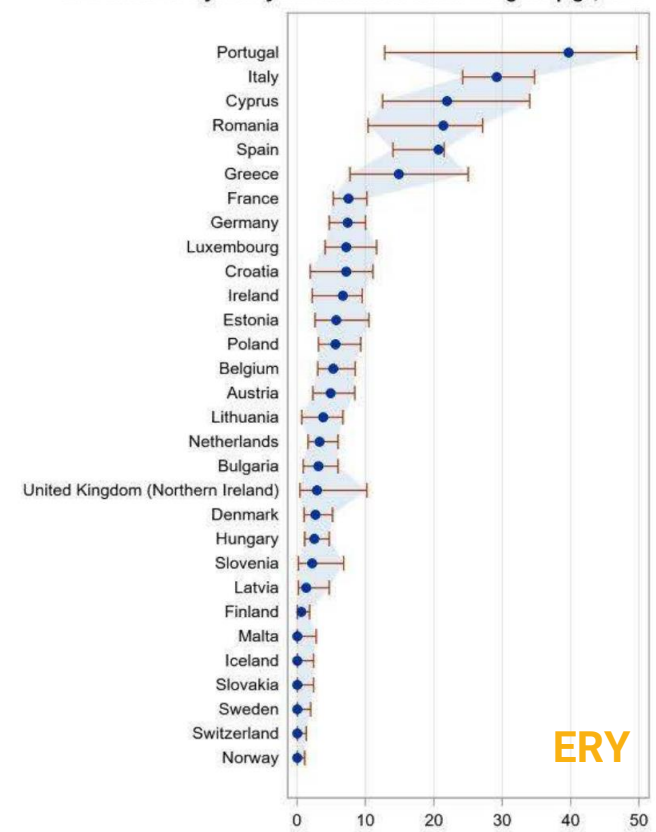
Prevalence of ciprofloxacin resistant *C. coli* in slaughter pigs, 2021



Prevalence of tetracycline resistant *C. coli* in slaughter pigs, 2021



Prevalence of erythromycin resistant *C. coli* in slaughter pigs, 2021



# COMPLETE SUSCEPTIBILITY & MULTIDRUG RESISTANCE (EUSR-AMR 2020/2021)

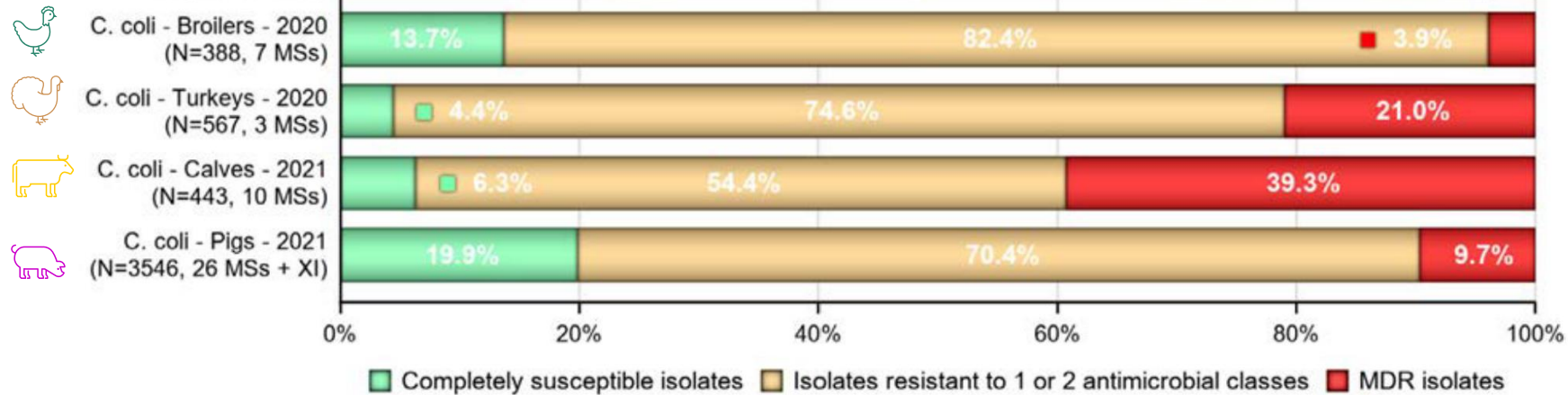
Number of isolates completely susceptible, resistant to one or two antimicrobial classes and MDR in *C. jejuni* and/or *C. coli* from broilers, fattening turkeys, fattening pigs and calves (<1 age) in reporting EU MSs, 2020/2021

Complete susceptibility and multidrug resistance in *C. jejuni* and *C. coli*, food-producing animals, 2020/2021

## *C. jejuni*



## *C. coli*

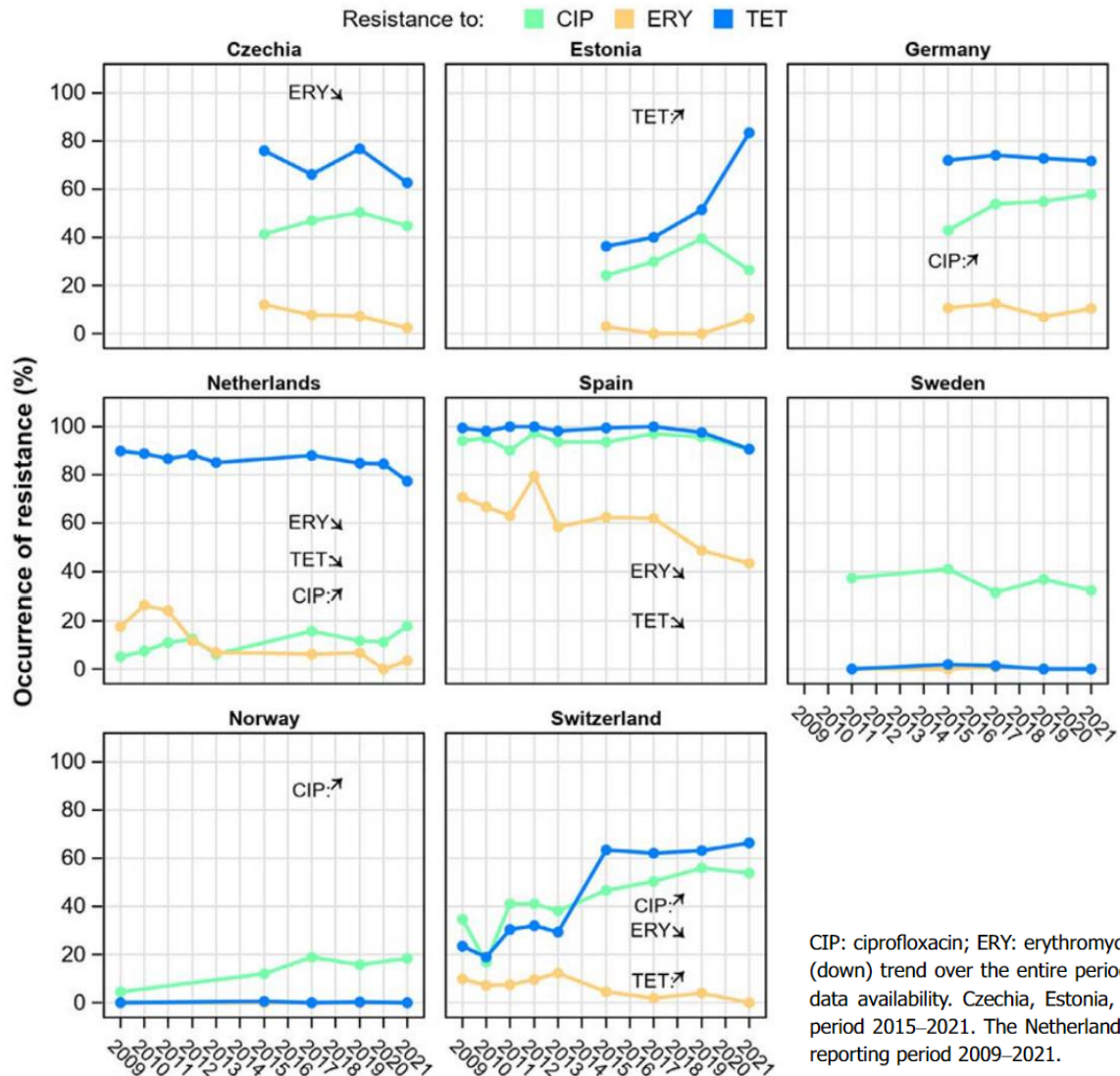


N: Total number of isolates reported by the EU MSs. Complete susceptibility is defined as susceptibility to ciprofloxacin/nalidixic acid, erythromycin, gentamicin and tetracycline. MDR (multidrug resistance) is defined as resistance to at least three antimicrobial classes (including: GEN: gentamicin; CIP: ciprofloxacin; ERY: erythromycin; TET: tetracycline).



# TRENDS IN RESISTANCE (EUSR-AMR 2020/2021)

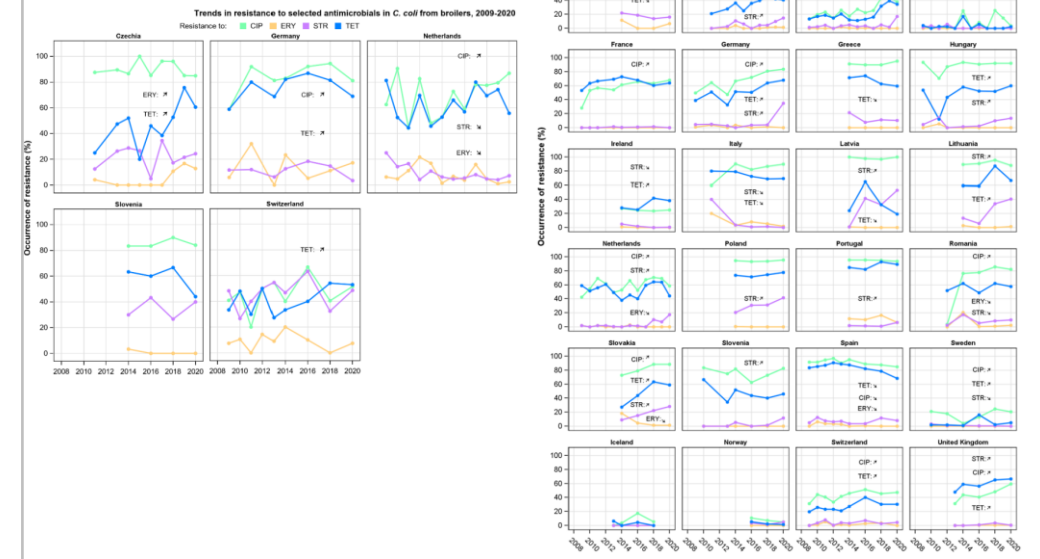
Trends in resistance to selected antimicrobials in *C. coli* from pigs, 2009-2021



## Trends in CIP, ERY and TET resistance in *C. coli* from fattening pigs, 2015–2021/2009–2021

### Annex B, part B

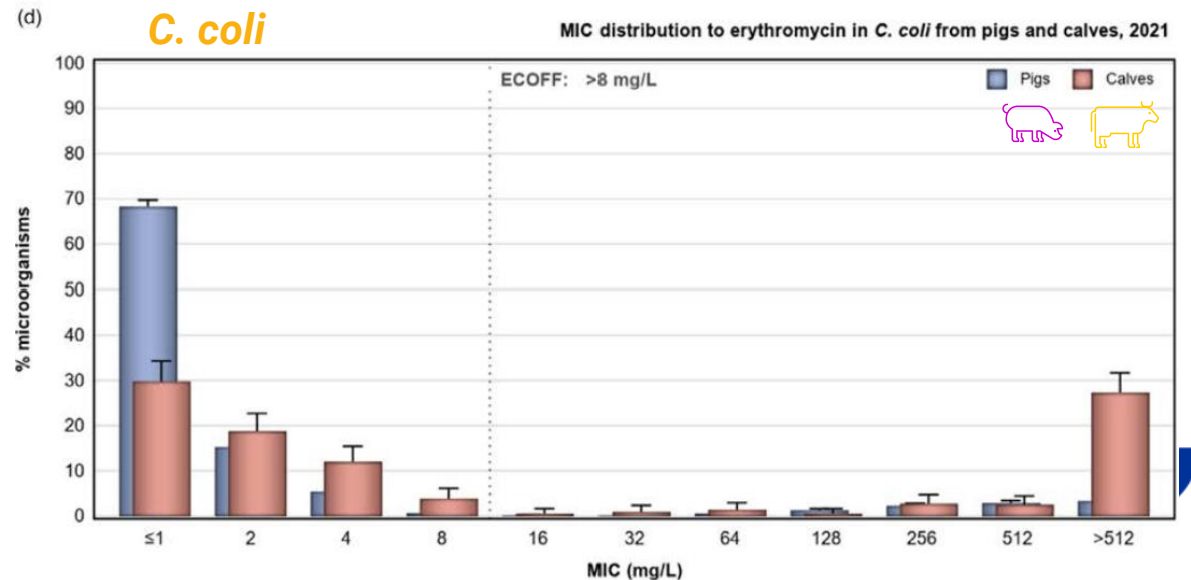
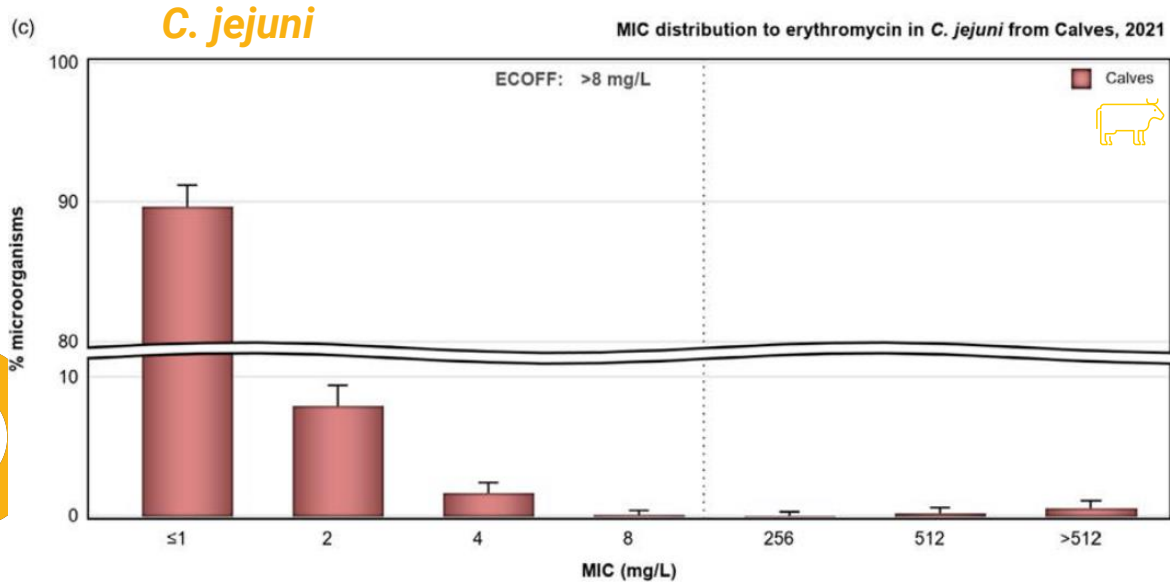
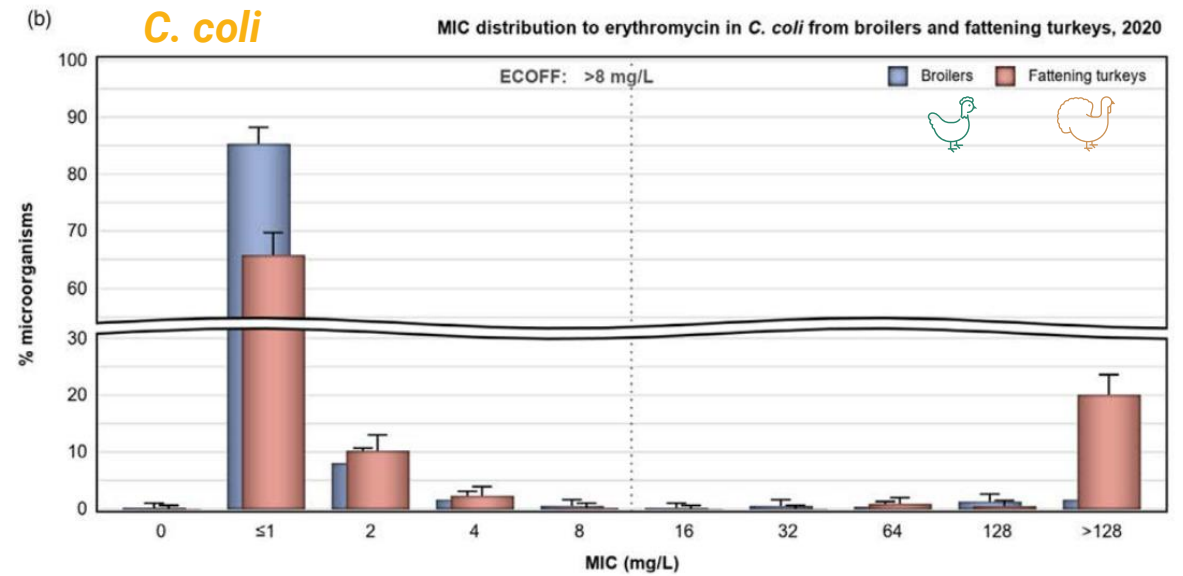
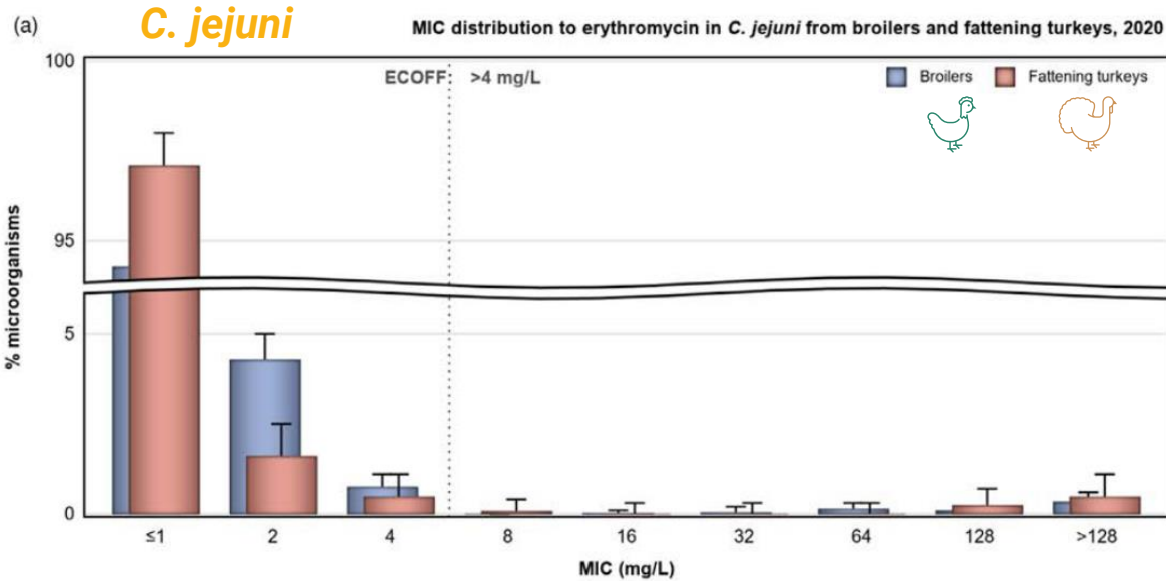
(available in Zenodo:  
<https://zenodo.org/record/7544221>)



CIP: ciprofloxacin; ERY: erythromycin; TET: tetracycline. Arrows indicate significant increasing (up) or decreasing (down) trend over the entire period. \*The trend analysis was performed for different periods depending on the data availability. Czechia, Estonia, Germany and Sweden: the trend analysis was performed for the reporting period 2015–2021. The Netherlands, Spain, Norway and Switzerland: The trend analysis was performed for the reporting period 2009–2021.

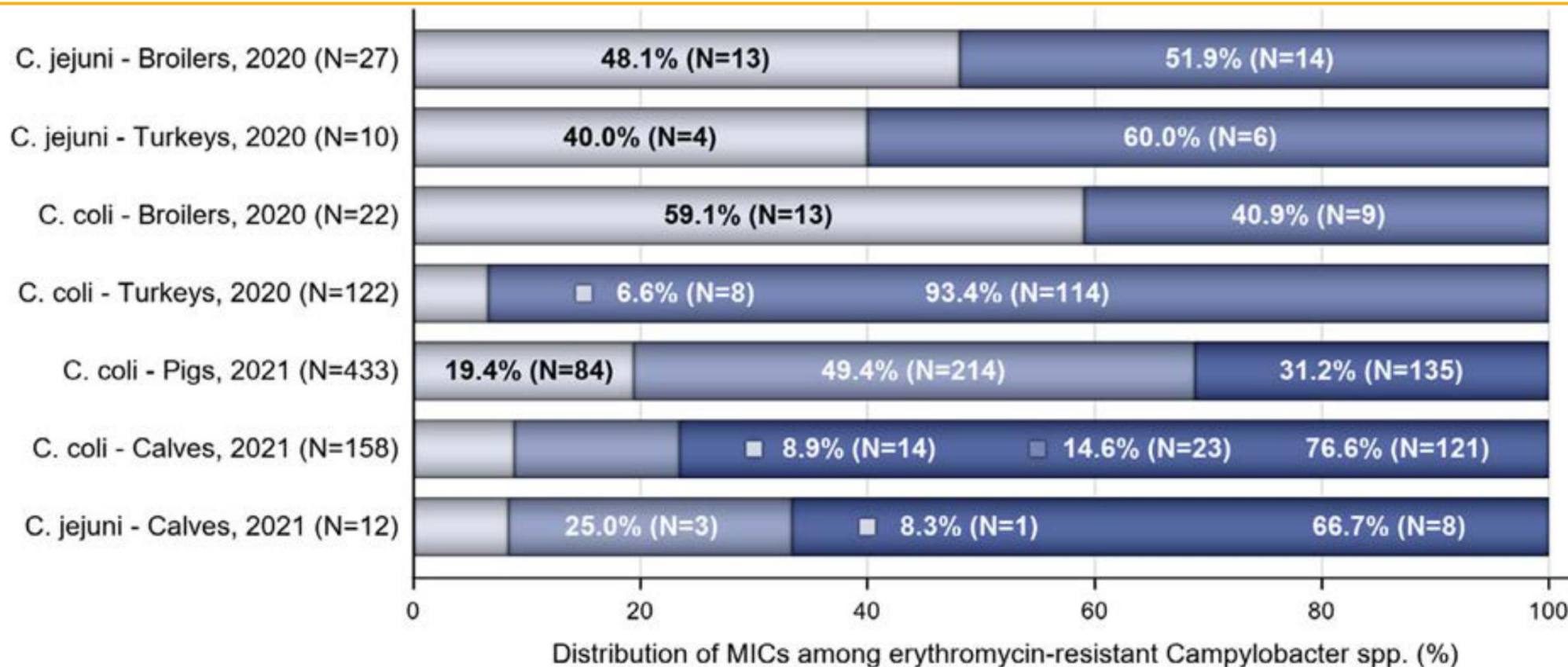


# MIC DISTRIBUTION RELATED TO ERY RESISTANCE, IN EU & NON-EU (EUSR-AMR 2020/2021)



# HIGH-LEVEL RESISTANCE TO ERYTHROMYCIN (EUSR-AMR 2020/2021)

Number of isolates (and %) exhibiting different levels of ERY resistance in broilers, fattening turkeys, fattening pigs and calves in reporting EU MSs and non-EUMSs, 2020–2021



- ERY resistance: 4 or 8 mg/L < MIC ≤ 128 mg/L
- Highest-level ERY resistance (2020): MIC > 128 mg/L
- High-level ERY resistance (2021): 128 mg/L < MIC ≤ 512 mg/L
- Highest-level ERY resistance (2021): MIC > 512 mg/L

N: Total number of *C. jejuni* or *C. coli* isolates exhibiting erythromycin resistance. ERY: erythromycin. ERY resistance in *C. jejuni* isolates: 4 mg/L < MIC ≤ 128 mg/L. ERY resistance in *C. coli* isolates: 8 mg/L < MIC ≤ 128 mg/L. For 2021 data, it is possible to discriminate between ERY-resistant *C. coli* and *C. jejuni* isolates with MIC ranging from 128 mg/L to (equal) 512 mg/L and those with MIC above 512 mg/L.



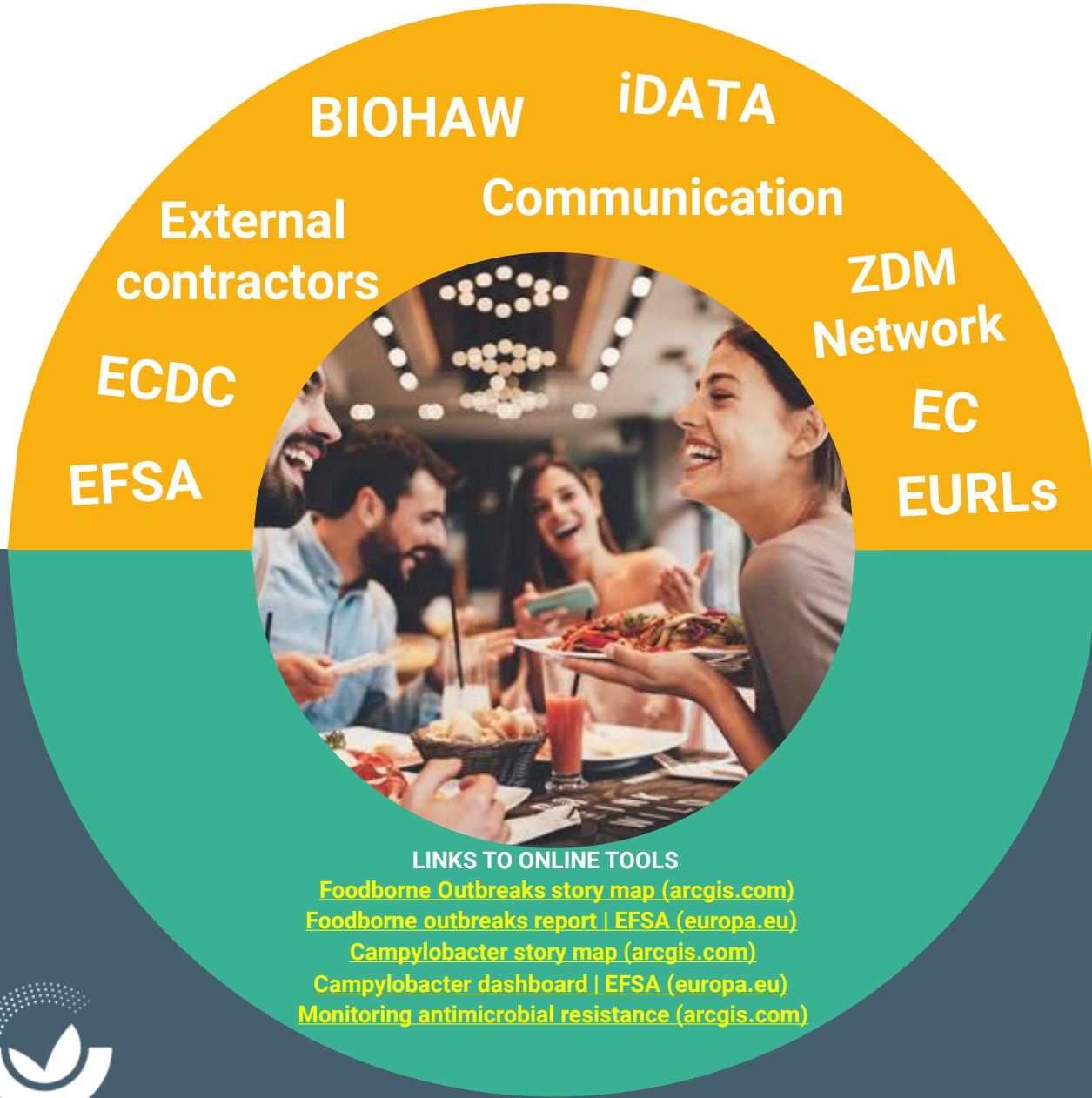
# WHAT'S NEXT?

- **EU One Health Zoonoses Report** including **2022** monitoring data
  - **Updated online tools: story maps and dashboards on *Campylobacter* and on foodborne outbreaks** including **2022** monitoring data
- **EU Summary Report on AMR** including **2021-2022** monitoring data (Dec. 2020/1729)
- **NEW story map and dashboard on AMR in *Campylobacter***
- Publication December 2023**
- Publication February 2024**

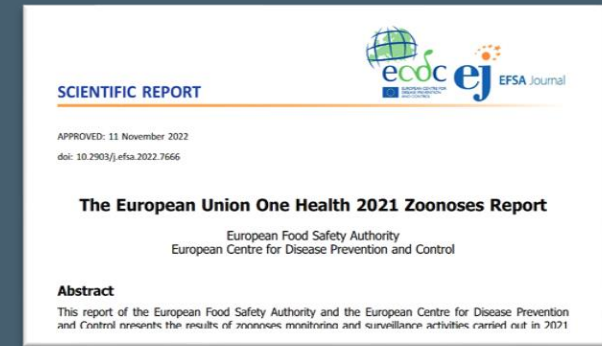
From 'static' reports to **interactive online tools** for **data visualisation** and **communication**







Thank you very much  
for your attention!



**SCIENTIFIC REPORT**


ecdc ej EFSA Journal

APPROVED: 11 November 2022  
doi: 10.2903/efsa.2022.7666

**The European Union One Health 2021 Zoonoses Report**

European Food Safety Authority  
European Centre for Disease Prevention and Control

**Abstract**  
This report of the European Food Safety Authority and the European Centre for Disease Prevention and Control presents the results of zoonoses monitoring and surveillance activities carried out in 2021



**SCIENTIFIC REPORT**

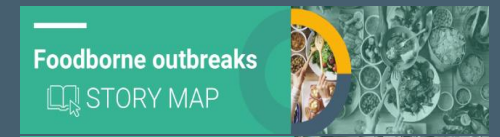
ecdc efsa JOURNAL

APPROVED: 31 January 2023  
doi: 10.2903/efsa.2023.7867

**The European Union Summary Report on Antimicrobial Resistance in zoonotic and indicator bacteria from humans, animals and food in 2020/2021**

European Food Safety Authority (EFSA) and  
European Centre for Disease Prevention and Control (ECDC)

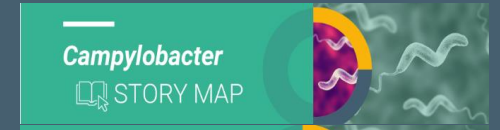
**Abstract**  
Antimicrobial resistance (AMR) data on zoonotic and indicator bacteria from humans, animals and food



Foodborne outbreaks  
STORY MAP



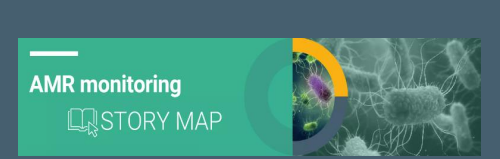
Foodborne outbreaks  
DASHBOARD



Campylobacter  
STORY MAP



Campylobacter  
DASHBOARD



AMR monitoring  
STORY MAP

