Update on Campylobacter in the EU,

based on the EU One Health Zoonoses 2019 report

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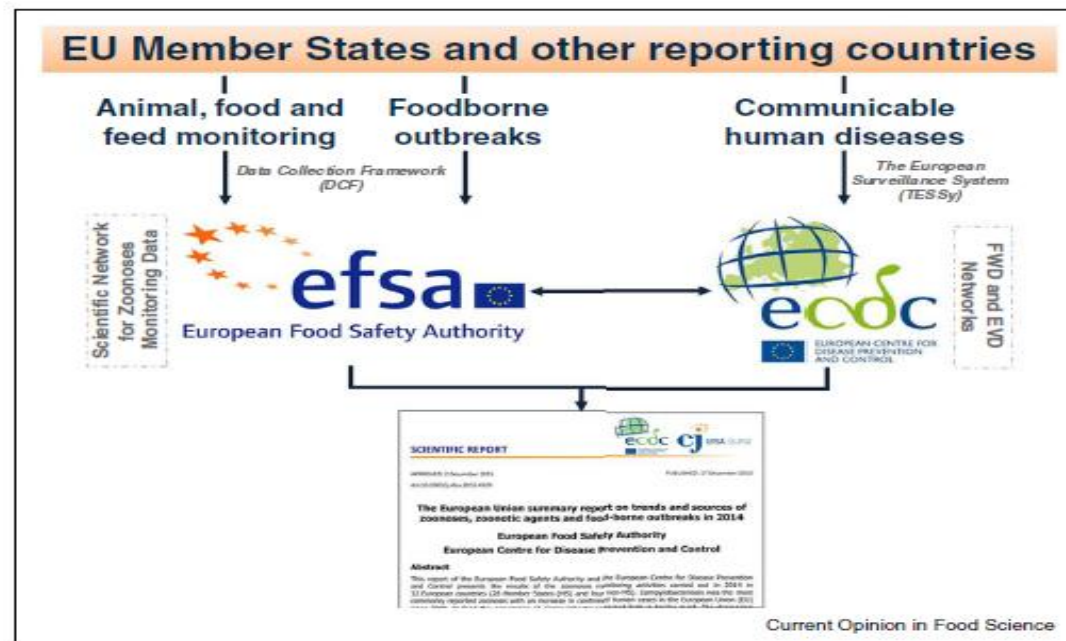efsa

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The European Union One Health 2019 Zoonoses Report

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Data flow and EFSA's integrated approach for the production of the joint EFSA-ECDC EU Summary Report on zoonoses and food-borne outbreaks in the EU. Note: FWD Network: European Food and Waterborne Diseases and Zoonoses Network; EVD Network: European Emerging and Vector-borne Diseases Network.
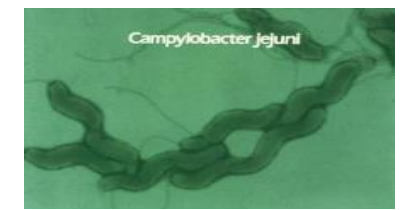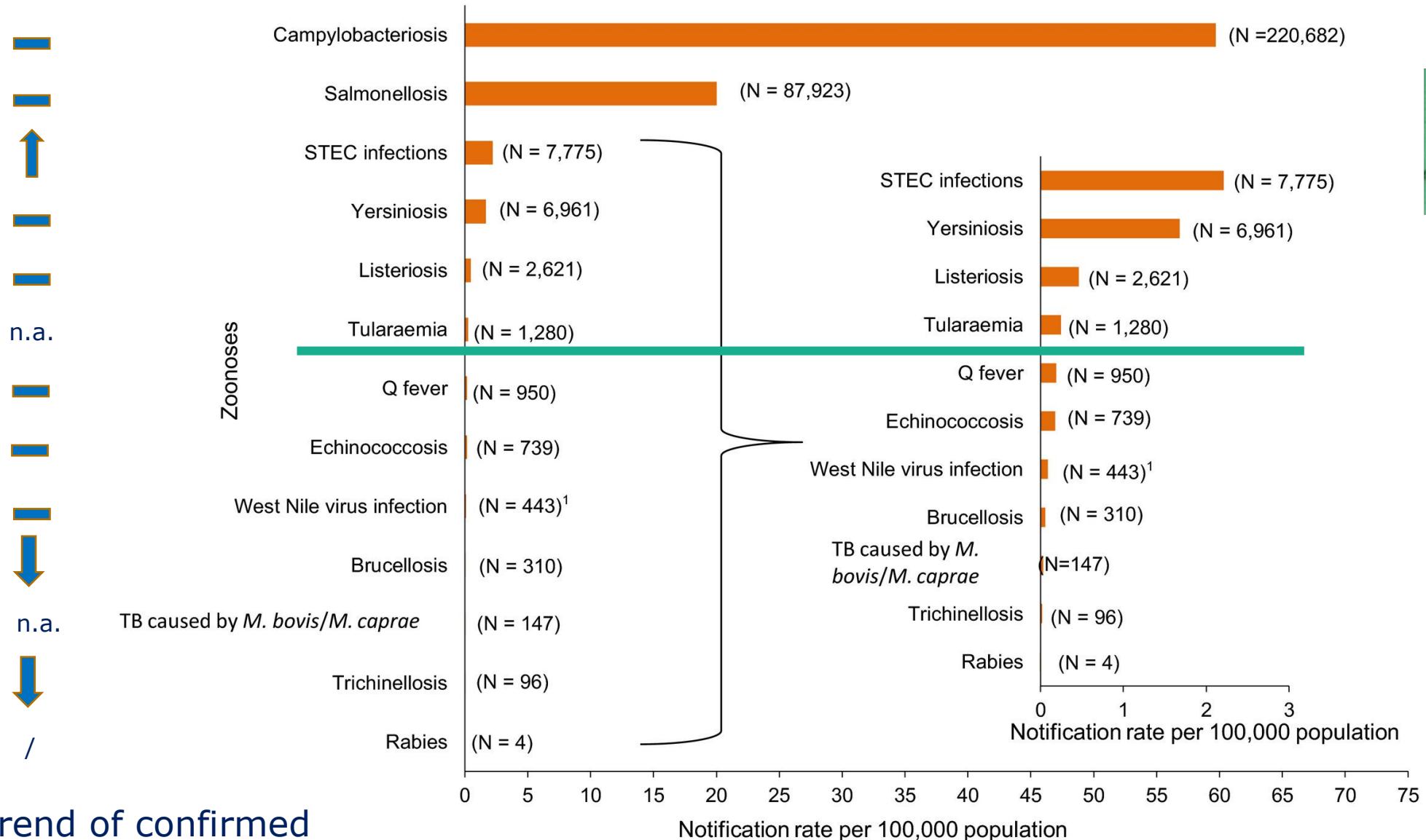
The EUOHZ:
- a joint scientific report by EFSA and ECDC, and
- the product of intensive collaboration with MS and EC DG SANTE (D4, G2 and G4)

Reported numbers and notificaton rates of confirmed human zoonoses in the EU, 2019

EU trend of confirmed cases in 2015–2019

Reported hospitalisations and case fatalities due to zoonoses in confirmed human cases in the EU, 2019

Disease	N confirmed human cases	Hospitalisation				Outcome available (%)	Deaths		
		Status available (%)	N reporting MS [b]	N reported hospitalised cases	Proportion hospitalised (%)		N reporting MS [b]	N reported deaths	Case fatality (%)
Campylobacteriosis	220,682	29.1	16	20,432	31.8	78.0	17	47	0.03
Salmonellosis	87,923	44.5	15	16,628	42.5	71.8	17	140	0.22
STEC infections	7,775	37.3	18	1,100	37.9	61.0	20	10	0.21
Yersiniosis	6,961	27.4	15	648	33.9	57.0	14	2	0.05
Listeriosis	2,621	51.1	19	1,234	92.1	65.1	20	300	17.6
Tularaemia	1,280	22.8	12	149	51.0	21.6	13	1	0.4
Echinococcosis	739	33.3	14	109	44.3	31.4	14	2	0.86
Q fever	950	NA[c]	NA	NA	NA	67.3	13	4	0.63
West Nile virus infection[a]	443	83.7	9	347	93.5	99.3	11	52	11.8
Brucellosis	310	44.5	11	98	71.0	36.8	12	2	1.75
Trichinellosis	96	16.7	5	6	37.5	25.0	7	1	4.2
Rabies	4	NA[c]	NA	NA	NA	75.0	3	3	100.0

(a): Instead of confirmed human infections, total number of human infections was included.

(b): Not all countries observed cases for all diseases.

(c): NA-not applicable as the information is not collected for this disease.

Severity of the diseases was analysed based on hospitalisation and outcome of the reported cases. Based on data on severity, **listeriosis** and **West Nile virus infection** were the two most severe diseases with the highest case fatality (listeriosis, 17.6%) and the highest hospitalisation (West Nile virus infection, 93.5%). Almost all confirmed cases with data available on hospitalisation for these two diseases were hospitalised. About one out of every fifth and one out of 10 confirmed listeriosis and WNV cases, respectively, with known data were fatal.

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Category	Type of analyses	Type/comparability between MS	Examples
I	Descriptive summaries at the national level and EU level EU trend watching (trend monitoring) Spatial and temporal trends analyses at the EU level	Programmed harmonised monitoring or surveillance Comparable between MS; results at the EU level are interpretable	*Salmonella* national control programmes in poultry; bovine tuberculosis; bovine and small ruminant brucellosis; *Trichinella* in pigs at slaughterhouse
II	Descriptive summaries at national level and EU level EU trend watching (trend monitoring) No trend analysis at the EU level	Not fully harmonised monitoring or surveillance Not fully comparable between MS; caution needed when interpreting results at the EU level	Food-borne outbreak data Monitoring of compliance with process hygiene and food safety criteria for *Campylobacter*, *L. monocytogenes*, *Salmonella* and *E. coli* in the context of Regulation (EC) No 2073/2005 Monitoring of rabies
III	Descriptive summaries at national level and EU level No EU trend watching (trend monitoring) No trend analysis at the EU level	Non-harmonised monitoring or surveillance data with no (harmonised) reporting requirements Not comparable between MS; extreme caution needed when interpreting results at the EU level	*Campylobacter*; *Yersinia*; Q fever; *Francisella tularensis*; West Nile virus; *Taenia* spp.; other zoonoses; *Toxoplasma*

Table I
Appropriate use of models in the context of epidemiological knowledge and data quality (47, 93, 96)

Epidemiological knowledge	Data quality and quantity	
	Poor	Good
Poor	Exploration of hypotheses	Hypothesis testing
Good	Simplified representation of past events, and guarded use for prediction of future events	Detailed representation of past events, and prediction of future events

Use and abuse of mathematical models: an illustration from the 2001 foot and mouth disease epidemic in the United Kingdom

R P Kitching [1], M V Thrusfield, N M Taylor

	2019	2018	2017	2016	2015	Data source
Humans						
Total number of confirmed cases	220,682	246,571	246,194	246,980	232,226	ECDC
Total number of confirmed cases/100,000 population (notification rates)	59.7	64.1	64.9	66.4	63.0	ECDC
Number of reporting MS	28	28	27	27	27	ECDC
Infection acquired in the EU	109,930	116,247	122,280	122,819	112,808	ECDC
Infection acquired outside the EU	6,513	7,685	6,583	5,966	6,444	ECDC
Unknown travel status or unknown country of infection	104,239	122,639	117,331	118,195	112,974	ECDC
Number of food-borne outbreak-related cases	1,254	2,365	3,608	4,645	1,483	EFSA
Total number of food-borne outbreaks	319	537	395	474	397	EFSA
Food[(a)]						
Meat and meat products[(b)]						
Number of sampling units	58,050	26,514	21,521	18,253	16,752	EFSA
Number of reporting MS	24	26	22	21	21	EFSA
Milk and milk products[(c)]						
Number of sampling units	2,749	3,227	2,317	2,062	2,273	EFSA
Number of reporting MS	11	13	13	11	10	EFSA

ECDC: European Centre for Disease Prevention and Control; EFSA: European Food Safety Authority; MS: Member State.

(a): The summary statistics, referring to MS, were obtained by summing all sampling units (single, batch, slaughter batch), sampling stage (farm, packing centre, automatic distribution system for raw milk, processing plant, cutting plant, slaughterhouse, catering, hospital or medical care facility, restaurant or cafe or pub or bar or hotel or catering service, retail, wholesale, unspecified), sampling strategies (census, convenience sampling, objective sampling and unspecified) and sampler (official sampling, official and industry sampling, private sampling, unspecified, not applicable).

(b): Meat and meat products refer to carcases and fresh meat/ready-to-eat (RTE), cooked and fermented products.

(c): Milk and milk products refer to raw and pasteurised milk and all dairy products including cheeses.

Reported human cases of campylobacteriosis and notification rates per 100,000 population in the EU/EFTA, by country and year, 2015–2019
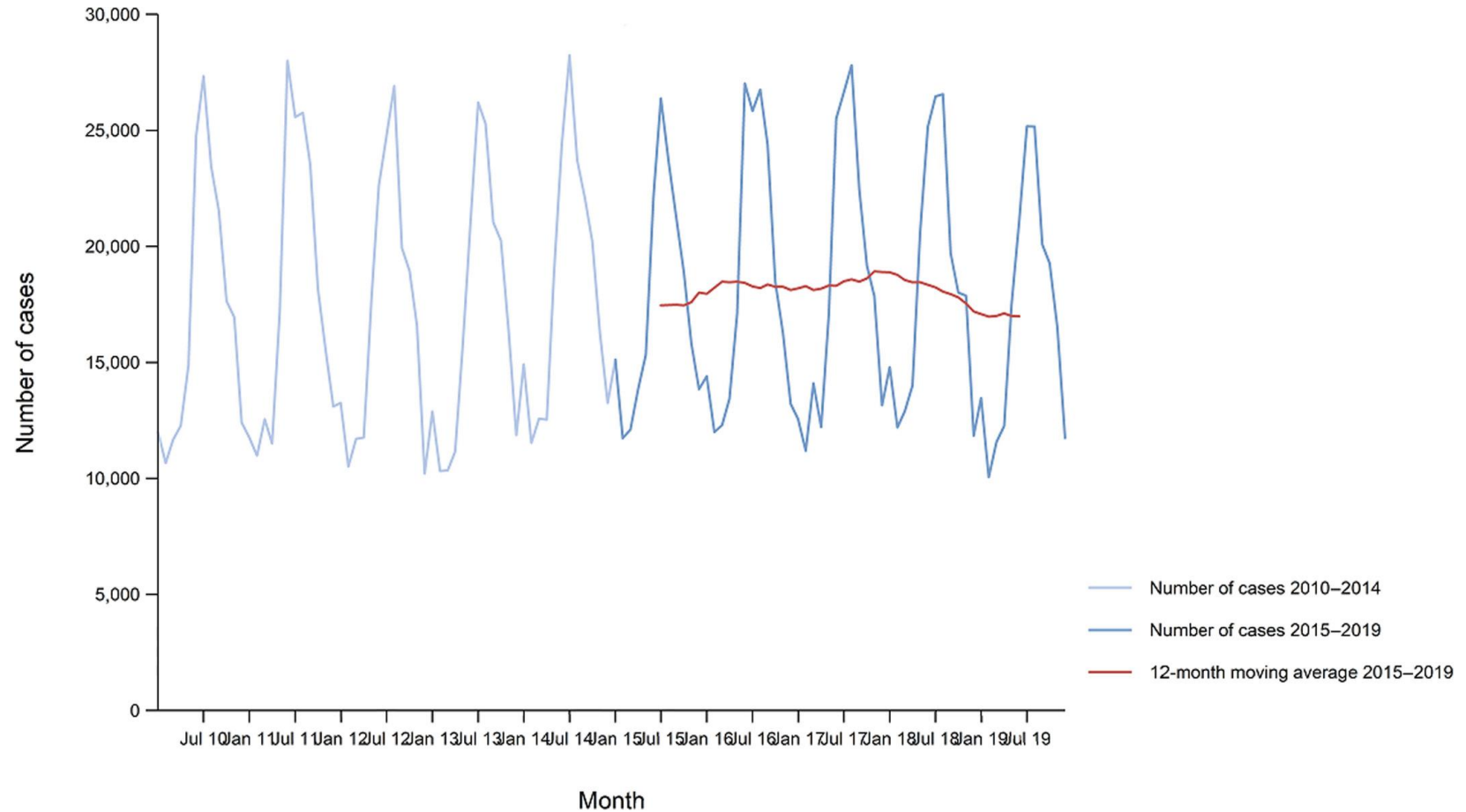
Country	National coverage[a]	Data format[a]	2019 Total cases	2019 Confirmed Cases	2019 Rate	2018 Confirmed Cases	2018 Rate	2017 Confirmed Cases	2017 Rate	2016 Confirmed Cases	2016 Rate	2015 Confirmed Cases	2015 Rate
Austria	Y	C	6,573	6,573	74.2	7,999	90.7	7,204	82.1	7,083	81.4	6,258	72.9
Belgium	Y	A	7,337	7,337	64.0	8,086	70.9	8,649	76.2	10,055	88.9	9,066	80.7
Bulgaria	Y	A	231	229	3.3	191	2.7	195	2.7	202	2.8	227	3.2
Croatia	Y	C	1,732	1,722	42.2	1,965	47.9	1,686	40.6	1,524	36.4	1,393	33.0
Cyprus	Y	C	21	21	2.4	26	3.0	20	2.3	21	2.5	29	3.4
Czechia	Y	C	23,169	22,894	215.0	22,895	215.8	24,326	230.0	24,084	228.2	20,960	198.9
Denmark	Y	C	5,402	5,402	93.0	4,559	78.9	4,255	74.0	4,712	82.6	4,327	76.5
Estonia	Y	C	348	347	26.2	411	31.2	285	21.7	298	22.6	318	24.2
Finland	Y	C	4,382	4,382	79.4	5,099	92.5	4,289	77.9	4,637	84.5	4,588	83.8
France[b]	N	C	7,712	7,712	57.5	7,491	56.0	6,579	49.2	6,698	50.3	6,074	45.7
Germany	Y	C	61,526	61,254	73.8	67,585	81.6	69,251	83.9	73,736	89.7	69,921	86.1
Greece	Y	A	366	366	3.4	357	3.3	.	.	.	.	.	.
Hungary	Y	C	6,441	6,400	65.5	7,117	72.8	7,807	79.7	8,556	87.0	8,342	84.6
Ireland	Y	C	2,776	2,776	56.6	3,044	63.0	2,779	58.1	2,511	53.1	2,453	52.4
Italy[d]	N	C	1,633	1,633	–	1,356	–	1,060	–	1,057	–	1,014	–
Latvia	Y	C	133	133	6.9	87	4.5	59	3.0	90	4.6	74	3.7
Lithuania	Y	C	1,225	1,221	43.7	919	32.7	990	34.8	1,225	42.4	1,186	40.6
Luxembourg	Y	C	271	271	44.1	625	103.8	613	103.8	518	89.9	254	45.1
Malta	Y	C	298	278	56.3	333	70.0	231	50.2	212	47.1	248	56.4
Netherlands[c]	N	C	3,415	3,415	34.1	3,091	34.6	2,890	32.5	3,383	38.3	3,778	43.0
Poland	Y	C	715	715	1.9	719	1.9	874	2.3	773	2.0	653	1.7
Portugal	Y	C	942	887	8.6	610	5.9	596	5.8	359	3.5	271	2.6
Romania	Y	C	805	805	4.1	573	2.9	467	2.4	517	2.6	311	1.6
Slovakia	Y	C	7,829	7,690	141.1	8,339	153.2	6,946	127.8	7,623	140.5	6,949	128.2
Slovenia	Y	C	1,085	1,085	52.1	1,305	63.1	1,408	68.2	1,642	79.5	1,328	64.4
Spain[d],[f]	N	C	9,723	9,723	–	18,411	–	18,860	–	15,542	–	13,227	–
Sweden	Y	C	6,693	6,693	65.4	8,132	80.4	10,608	106.1	11,021	111.9	9,180	94.2
United Kingdom	Y	C	58,718	58,718	88.1	65,246	98.4	63,267	96.1	58,901	90.1	59,797	92.2
EU Total	–	–	**221,501**	**220,682**	**59.7**	**246,571**	**64.1**	**246,194**	**64.9**	**246,980**	**66.4**	**232,226**	**63.0**
Iceland	Y	C	136	136	38.1	145	41.6	119	35.2	128	38.5	119	36.2
Norway	Y	C	4,154	4,154	78.0	3,668	69.3	3,883	73.8	2,317	44.5	2,318	44.9
Switzerland[e]	Y	C	7,223	7,223	84.0	7,675	90.1	7,219	85.4	7,980	94.4	7,070	84.5

Trend in reported confirmed human cases of campylobacteriosis in the EU/EEA, by month: the EU/EEA trend was stable (flat) during 2015–2019

Hungary was the only MS reporting decreasing (*p* < 0.01) trend, in the period 2015–2019. Four MS (Italy, Latvia, Portugal and Romania) reported increasing trends in the same time period

Campylobacteriosis FBO, by incriminated food vehicle, EU

2019

Food vehicle	N outbreaks	% outbreaks
Broiler meat (Gallus gallus) and products thereof	8	44.4%
Milk	3	16.7%
Mixed food	2	11.1%
Bovine meat and products thereof	1	5.6%
Pig meat and products thereof	1	5.6%
Bakery products	1	5.6%
Unknown	1	5.6%
Meat and meat products	1	5.6%
Total	**18**	**100.0%**

2018-2010

Food vehicle	N outbreaks	% outbreaks
Broiler meat (Gallus gallus) and products thereof	112	41.3%
Milk	72	26.6%
Other, mixed or unspecified poultry meat and products thereof	21	7.7%
Mixed food	14	5.2%
Tap water, including well water	9	3.3%
Other or mixed red meat and products thereof	6	2.2%
Dairy products (other than cheeses)	5	1.8%
Bovine meat and products thereof	5	1.8%
Pig meat and products thereof	5	1.8%
Other foods	4	1.5%
Buffet meals	4	1.5%
Cheese	3	1.1%
Meat and meat products	3	1.1%
Turkey meat and products thereof	2	0.7%
Eggs and egg products	1	0.4%
Sheep meat and products thereof	1	0.4%
Fish and fish products	1	0.4%
Vegetables and juices and other products thereof	1	0.4%
Fruit, berries and juices and other products thereof	1	0.4%
Unknown	1	0.4%
Total	**271**	**100.0%**

Data from strong-evidence food-borne outbreaks

Overall, for the year 2019, 94.5% of the number of reported human campylobacteriosis cases who acquired the infection in the EU (109,930) were domestic (acquired within the home country) infections and 5.5% were acquired through travel in EU.

Campylobacter was the third most frequently reported causative agent for food-borne outbreaks at the EU level, by 18 MS, with 319 outbreaks communicated to EFSA, 1,254 cases of illness, 125 hospitalisations and no deaths. Comparing the **food-borne outbreak cases (1,254)**, reported to EFSA, and cases of **human campylobacteriosis acquired in the EU (109,930)** considering also the proportion of unknown travel data (0.944 x 104,239), reported to ECDC, could suggest that overall in the EU, in 2019, only **0.6%** of human campylobacteriosis cases would be reported through food-borne outbreaks investigation.

It is important to clarify that the case classification for reporting is different between these two databases. In TESSy, the cases reported are classified based on the EU case definition. All these cases visited a doctor and are either confirmed by a laboratory test (confirmed case) or not (probable case and classification is based on the clinical symptoms and epidemiological link). Cases that never visited a doctor are not reported to TESSy. Moreover, there may be missing probable cases in TESSy, as these data are not analysed or published and there is no incentive for reporting such cases. Information on which cases are linked to an outbreak and which not is also not systematically collected. In practice, the cases reported to TESSy are considered to be mostly sporadic cases. In food-borne outbreaks, the human cases are the people involved in the outbreak as defined by the investigators (case definition), and cases must be linked, or probably linked, to the same food source (Directive 2003/99/EC). This can include both ill people (whether confirmed microbiologically or not) and people with confirmed asymptomatic infection.

Campylobacter, monitoring results from samples collected in the context of the *Campylobacter* process hygiene criterion in force for food business operators, EU, 2019

Examples of reported data (mandatory reporting as from 2020 data onwards):

EU/Non EU	Reporting country	Quantity	<=1000	>1000	<=10	>10 TO <=40	>40 TO <=100	>100 TO <=1000	>1000 TO <=10000	>10000	Total
EU	Belgium	Total Units Tested	643	643							643
EU	Belgium	Total Units Positive	238	238							238
EU	Belgium	Percent positive	37%	37%							37%
EU	Belgium	Units Positive	143	95							238
EU	Belgium	Percent units positive	22.24%	14.77%							37.01%
EU	Bulgaria	Total Units Tested	650	650							650
EU	Bulgaria	Total Units Positive	160	160							160
EU	Bulgaria	Percent positive	25%	25%							25%
EU	Bulgaria	Units Positive	143	17							160
EU	Bulgaria	Percent units positive	22.00%	2.62%							24.62%
EU	Croatia	Total Units Tested			1,058	1,058	1,058	1,058	1,058	1,058	1,058
EU	Croatia	Total Units Positive			324	324	324	324	324	324	324
EU	Croatia	Percent positive			31%	31%	31%	31%	31%	31%	31%
EU	Croatia	Units Positive			0	0	0	5	217	102	324
EU	Croatia	Percent units positive			0.00%	0.00%	0.00%	0.47%	20.51%	9.64%	30.62%
EU	Cyprus	Total Units Tested	230	230							230
EU	Cyprus	Total Units Positive	162	162							162
EU	Cyprus	Percent positive	70%	70%							70%
EU	Cyprus	Units Positive	75	87							162
EU	Cyprus	Percent units positive	32.61%	37.83%							70.43%
EU	Czechia	Total Units Tested			3,738	3,738	3,738	3,738	3,738	3,738	3,738
EU	Czechia	Total Units Positive			2,267	2,267	2,267	2,267	2,267	2,267	2,267
EU	Czechia	Percent positive			61%	61%	61%	61%	61%	61%	61%
EU	Czechia	Units Positive			41	91	145	735	901	354	2,267
EU	Czechia	Percent units positive			1.10%	2.43%	3.88%	19.66%	24.10%	9.47%	60.65%

Summary : seven MS reported monitoring results from **official control samples** collected in the context of the *Campylobacter* process hygiene criterion in force for food business operators. Of the 3,346 neck skin samples from chilled broiler carcases, 1,365 (41%) were *Campylobacter-positive* and **506 (15%) exceeded the limit of 1,000 CFU/g**. Seven MS reported such monitoring data based on sampling results collected from the **food business operators**. Of the 15,323 neck skin samples, 2,038 (13%) tested positive and **1,033 (7%) exceeded the limit of 1,000 CFU/g**.

Campylobacter, occurrence in RTE food, EU, 2015-2019

Food	2019			2015–2018		
	N reporting MS	N sampling units	Positive N (%)	N reporting MS	N sampling units	Positive N (%)
RTE food						
All	8	3,691	6 (0.16)	15	7,272	36 (0.50)
Meat and meat products	6	328	0	9	1,040	27 (2.60)
Meat and meat products from broilers	1	18	0	3	117	22 (18.80)
Milk and milk products	6	821	2 (0.24)	11	2,258	8 (0.35)
Milk	5	204	2 (0.98)	6	675	6 (0.89)
Raw milk[a]	4	185	2 (1.08)	5	652	6 (0.92)
Cheese	4	615	0	7	1,566	2 (0.13)
Dairy products excluding cheeses (butter, cream, ice cream, whey, yoghurt and fermented dairy products)	2	3	0	4	71	0
Fruits, vegetables and juices	2	1,008	2 (0.20)	4	1,119	1 (0.09)
Salads	5	309	1 (0.32)	2	30	0
Other processed food products and prepared dishes	4	1,002	1 (0.1)	7	2,564	0

Campylobacter, occurrence in non-RTE food, EU, 2015-2019

Food	2019			2015–2018		
	N reporting MS	N sampling units	Positive N (%)	N reporting MS	N sampling units	Positive N (%)
Non-RTE food						
All	16	26,687	5,504 (20.62)	20	54,295	13,892 (25.59)
Meat and meat products	15	23,837	5,475 (22.97)	20	49,959	13,817 (27.66)
Milk and milk products	5	884	18 (2.04)	9	1,552	39 (2.51)
Fruits, vegetables and juices	5	512	1 (0.20)	7	1,803	3 (0.17)
Other food	6	1,454	10 (0.69)	8	981	33 (3.36)

Summary of *Campylobacter* statistics related to major animal species, reporting MS and non-MS, EU, 2019

Animals	N reporting MS/non-MS	N tested units[a], EU	Proportion (%) of positive sampling units, EU
Broilers	5/2	10,196	13.27
Turkeys	0/1	–	–
Pigs	7/1	1,125	58.58
Bovine animals[b]	6/0	3,493	9.28
Cats and dogs	5/2	1,373	6.85
Other animals[c]	7/3	3,024	12.63

MS: Member State.

(a): The summary statistics were obtained summing all sampling units (single samples, batch samples, animals, slaughter animal batches and herds or flocks).

(b): 'Artificial insemination stations' in 'sampling stage' was not included in the count of the units tested.

(c): Antelopes, badgers, birds, bison, budgerigars, canary, Cantabrian chamois, chinchillas, deer, dolphin, ferrets, foxes, geese, goats, guinea pigs, hamsters, hares, hedgehogs, lion, lynx, marten, minks, monkeys, night herons, oscine birds, other animals, parrots, peafowl, pheasants, pigeons, rabbits, raccoons, ratites (ostrich, emu, nandu), rats, reindeers, reptiles, rodents, sheep, snakes, domestic solipeds, Steinbock, turtles, water buffalos, wild boars, wild ducks, wolves and zoo animals.
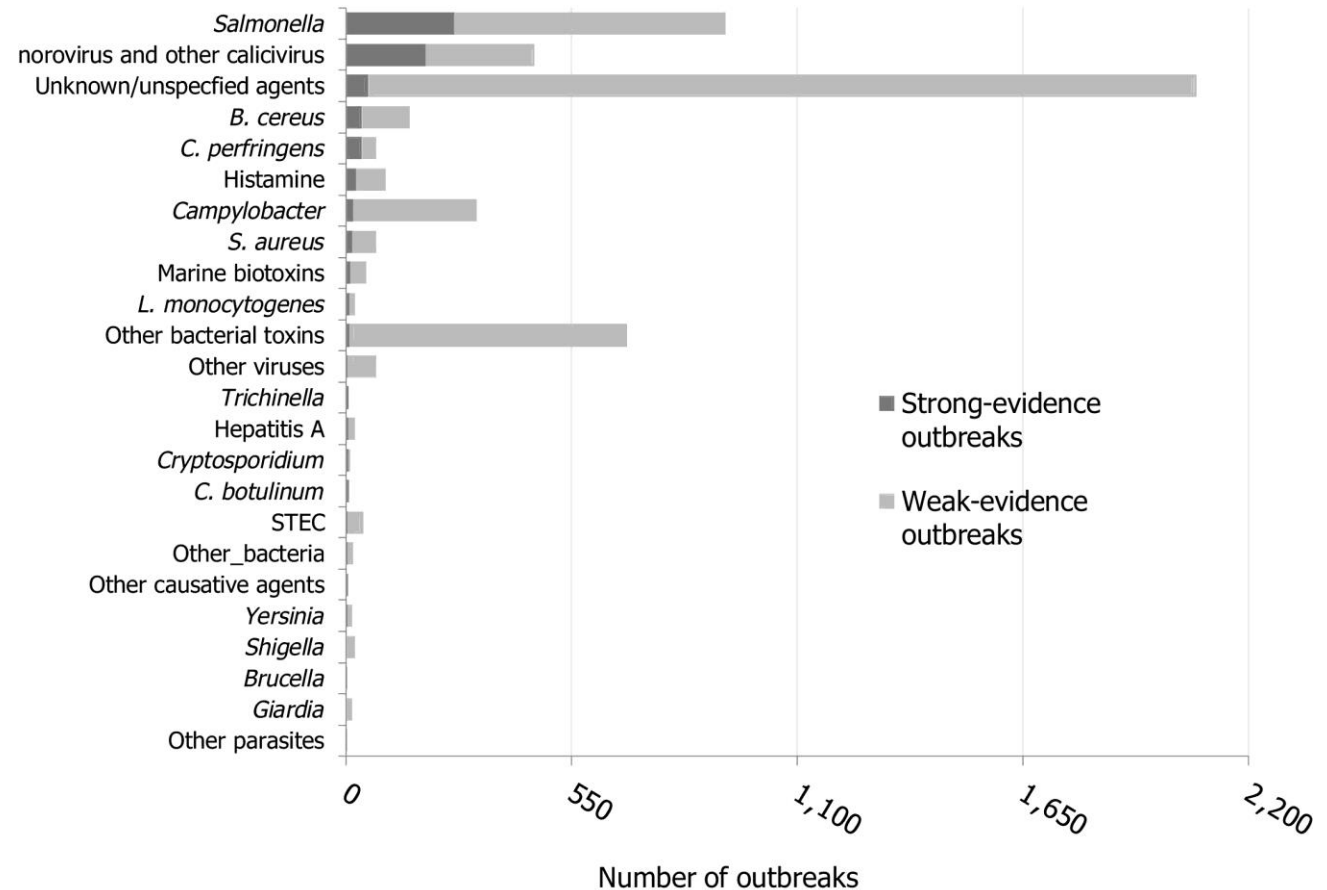
Campylobacter, key facts 2019

- Campylobacteriosis is the **most commonly** reported gastrointestinal infection in humans in the EU and has been so since 2005.

- In 2018, the number of confirmed cases of human campylobacteriosis was 220,682 corresponding to an **EU notification rate of 59.7** per 100,000 population, which is a **decrease** by 6.9% compared with the rate in 2018 (64.1 per 100,000 population).

- The trend for **campylobacteriosis** in humans **remained stable (flat) during 2015-2019**.

- Most cases (94.4%) with known origin of infection had acquired the infection in the EU.

- In 2019, *Campylobacter* was the **third most frequently reported causative agent of food-borne outbreaks** at EU level, by 18 MS, with 319 outbreaks reported to EFSA, involving 1,254 cases of illness, 125 hospitalisations and no deaths. Eighteen outbreaks were reported with strong evidence and 301 with weak evidence. The most common sources for the strong-evidence campylobacteriosis food-borne outbreaks were **broiler meat** and **milk**, as in previous years.

- Seven MS reported monitoring results from **official control samples** collected in the context of the *Campylobacter* process hygiene criterion in force for food business operators. Of the 3,346 neck skin samples from chilled broiler carcases, 1,365 (41%) were *Campylobacter-positive* and **506 (15%) exceeded the limit of 1,000 CFU/g**. Seven MS reported such monitoring data based on sampling results collected from the **food business operators**. Of the 15,323 neck skin samples, 2,038 (13%) tested positive and **1,033 (7%) exceeded the limit of 1,000 CFU/g**.

- The proportion of *Campylobacter*-positive samples within the categories 'ready-to-eat' and 'non ready-to-eat' food was 0.2% and 20.6% respectively.

- During 2019, 27 Member States reported **5,175 food-borne outbreaks**, a decrease of 12.3% compared to 2018, involving 49,463 cases of illness, 3,859 hospitalisations and 60 deaths. In addition, 117 outbreaks, 3,760 cases of illness and 158 hospitalisations were communicated by six non-MS.

- The health impact of food-borne outbreaks in the EU was important in 2019 since **60 outbreak-related deaths** were reported; 20 more fatal cases than in 2018 (+50%).

- A high number of deaths (N = 10) were registered in community settings such as 'residential institution (nursing home or prison or boarding school)'. In addition, nearly 19% of cases involved in strong-evidence outbreaks (2,407 cases) were exposed to contaminated foods in schools or kindergartens. These findings highlighted the need for **attention to the high risk of vulnerable populations to food-borne hazards**.

- **Bacteria** were reported to have caused most outbreaks (N = 1,364; **26.4%**) followed by bacterial toxins (N = 997; 19.3%), viruses (N = 554; 10.7%), other causative agents (N = 155; 3.0%) and parasites (N = 31; 0.6%). For a high proportion of outbreaks **(40.1%), the causative agent was 'unknown' or 'unspecified'**.

- At the EU level, the consumption of food of animal origin ('fish and fishery products', 'eggs and egg products', 'meat and meat products', 'milk and milk products') was associated with most of the strong-evidence outbreaks.

Distribution of strong- and weak-evidence food-borne outbreaks, per causative agent, in reporting EU MS, 2019

Note: Only FBOs reported by EU Member States are visualised. FBOs are sorted by number of strong-evidence outbreaks.
'Hepatitis A' includes also FBOs with causative agent encoded as 'hepatitis virus, unspecified'. 'Bacillus cereus' includes FBOs with causative agent encoded as *B. cereus* enterotoxins.
'*Clostridium perfringens*' includes FBOs with causative agent encoded as *Clostridium* unspecified. '*Staphylococcus aureus*' includes FBOs with causative
agent encoded as *Staphylococcus*, unspecified' or Staphylococcal enterotoxins. 'Other bacteria' includes *Arcobacter butzleri*, enteropathogenic *Escherichia coli* (EPEC), Enterotoxigenic
Escherichia coli (ETEC), *Escherichia coli*, unspecified, *Vibrio parahaemolyticus* and other unspecified bacteria. 'Other bacterial toxins' includes FBOs by
unspecified toxin-producing bacteria.
'Other viruses' includes adenovirus, flavivirus, hepatitis E virus, rotavirus and other viruses, unspecified. 'Other causative agents' includes atropine, mushroom toxins/mycotoxins and
unspecified toxins.

- **Outbreaks associated with the consumption of 'crustaceans, shellfish, molluscs and products thereof' increased markedly in the EU** (by 80 outbreaks; 101.3% more than in 2018) even if this rise was entirely attributable to France which reported 129 outbreaks (81.1% of total outbreaks in the EU). Norovirus in 'fish and fishery products' was the agent/food pair causing the highest number of strong-evidence outbreaks in the EU.

- ***Salmonella* in 'mixed food'**, **norovirus in 'fish and fishery products'** and ***Salmonella* in 'eggs and egg products'** were the agent/food pairs that caused the highest number of cases. Pairs with *Salmonella* in different types of food ('eggs and egg products', 'mixed foods', 'meat and meat products', 'bakery products', 'buffet meals') caused the highest numbers of hospitalisations.

- **Mixed foods** (i.e. food resulting from mixing together multiple ingredients in the same preparation) were the foodstuff most frequently consumed by outbreaks cases. These mixed foods were associated with a wide range of causative agents including bacteria, viruses, bacterial toxins and histamine.

- The number of **outbreaks implicating food of non-animal origin (FNAO)** reported in 2019 was **similar to those reported in recent years**. Outbreaks by FNAO (mainly vegetables) were larger, on average, compared with outbreaks caused by food of animal origin and were associated with the widest variety of causative agents, mainly norovirus, *Salmonella*, *Bacillus cereus* and *Cryptosporidium*.

FBO, 2019 data, public dashboard

Link provided on main landing page and on related EFSA web pages : **Foodborne outbreaks reported in 2019**

https://app.powerbi.com/view?r=eyJrIjoiY2FmNmUzYWEtZjg4Zi00ODJiLTkwMDMtOGUzYTY0YzYxMWY5IiwidCI6ImM0ODdkZDVhLTM3Njkt
NDQyYy1hYjc3LTI5MTkwODFkODVmYyIsImMiOjl9

Foodborne outbreaks reported in 2019

Explore data by

(Overview)   (Reporting country)   (Food vehicle)   (Place of exposure)

Overview of causative agents

Salmonella, bacterial toxins unspecified, 'norovirus and other caliciviruses' and *Campylobacter* are the most reported causative agents of foodborne outbreaks and account for the highest number of human cases (excluding 'unknown').

2019 report in numbers

5292
Outbreaks

53223
Human cases

4017
Hospitalised

60
Deaths

REPORTING COUNTRY   STRENGTH OF EVIDENCE   EXTENT OF OUTBREAK

(EU) (Non-EU)   (Strong-evidence outbreak)   (Weak-evidence outbreak)   (General) (Household) (Unknown)

Thank you for your attention

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AHAW Panel   **BIOHAZ Panel**   **DG SANTE D4, G2 and G4**

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