Trusted science for safe food

Visit of Swedish Regional Political Leaders, 16 October 2019, EFSA, Parma

EFSA-ECDC report on zoonoses, trends of zoonoses and zoonotic agents in Sweden

Frank Boelaert

Senior scientific officer

efsa
European Food Safety Authority

Outline

- Introduction
- Few highlights from EUSR
- Discussion/questions

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- *Few highlights from EUSR*
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Zoonosis – zoonoses (Dir 2003/99)

- **Zoonosis** means a disease or infection, which is naturally transmissible directly or indirectly between animals and humans

  Transmission often takes place via contaminated foodstuffs
  A large portion (1/3-1/2) of human infectious diseases has a zoonotic feature

- **Food-borne outbreak** means an incidence, observed under given circumstances, of two or more human cases of the same disease and/or infection, or a situation in which the observed number of cases exceeds the expected number and where the cases are linked, or are probably linked, to the same food source.

Monitoring of zoonoses, FBO and AMR in the EU

- **Directive on the monitoring of zoonoses and zoonotic agents (2003/99/EC)**
  - Publication of the annual EU Summary Report
  - MSs have an **obligation** to report each year

- **Data collection mandatory for 8 zoonotic agents**

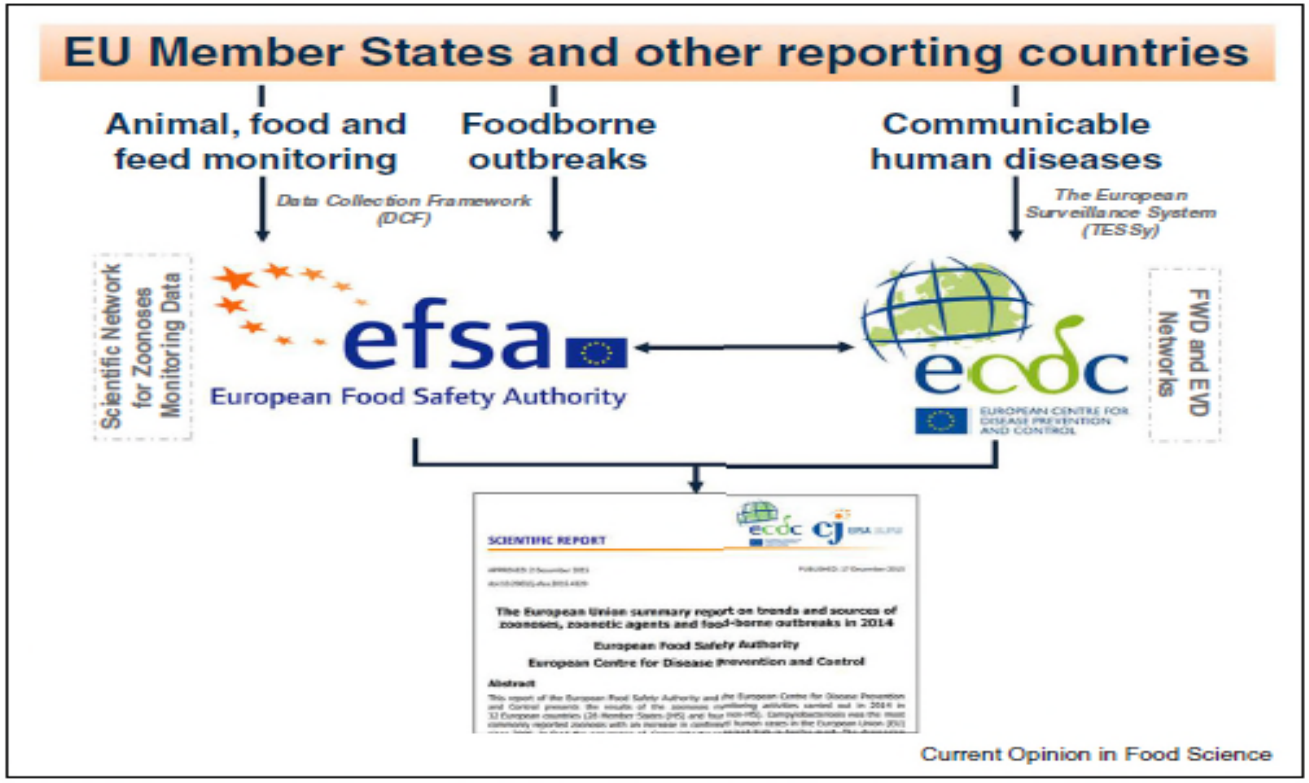
  Salmonella (+ antimicrobial resistance (AMR))
  Campylobacter (+ AMR)
  Listeria monocytogenes
  Brucella
  Tuberculosis due to *Mycobacterium bovis*
  Verotoxigenic *Escherichia coli*
  Trichinella
  Echinococcus

  → **and also for food-borne outbreaks (FBOs)**

  → **and susceptible animal populations**

In a number of cases, such as for example Salmonella in poultry, more specific and harmonised requirements are laid down how to monitor and report these zoonoses.

Data flow and EFSA's integrated approach for the production of the joint EFSA-ECDC EU Summary Reports (EUSRs)



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.

EUSR zoonoses-FBO 2017 on WILEY platform

EFSA JOURNAL

Scientific Report | Open Access

The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017

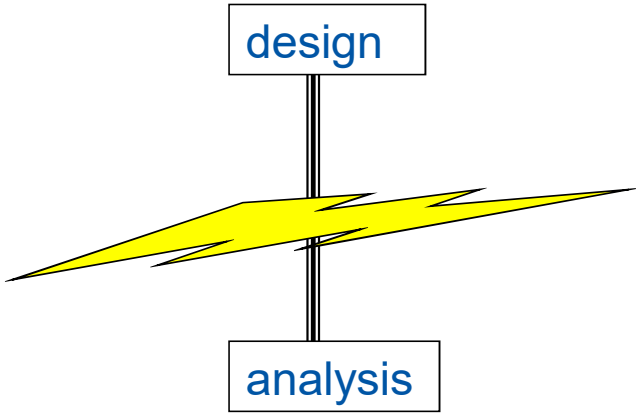
European Food Safety Authority and European Centre for Disease Prevention and Control (EFSA and ECDC)

First published: 12 December 2018 | https://doi.org/10.2903/j.efsa.2018.5500

https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2018.5500

The design conditions the analyses

objectives



report

Categorisation of data used in EUSRs

Table 1: Categorisation of data used in EUSR 2017 (adapted from Boelaert et al., 2016)

Category	Type of analyses	Type/comparability between MS	Examples
I	**Descriptive summaries at 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 EU level are interpretable	*Salmonella* national control programmes in poultry; bovine tuberculosis; bovine and small ruminant brucellosis; *Trichinella* in pigs at slaughterhouse; *Echinococcus granulosus* 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 *L. monocytogenes*, *Salmonella* and *E. coli* according Reg. 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*

Boelaert F, Amore G, Van der Stede Y, Hugas M, 2016. EU-wide monitoring of biological hazards along the food chain: achievements, challenges and EFSA vision for the future. Current Opinion in Food Science 12:52-62

Outline

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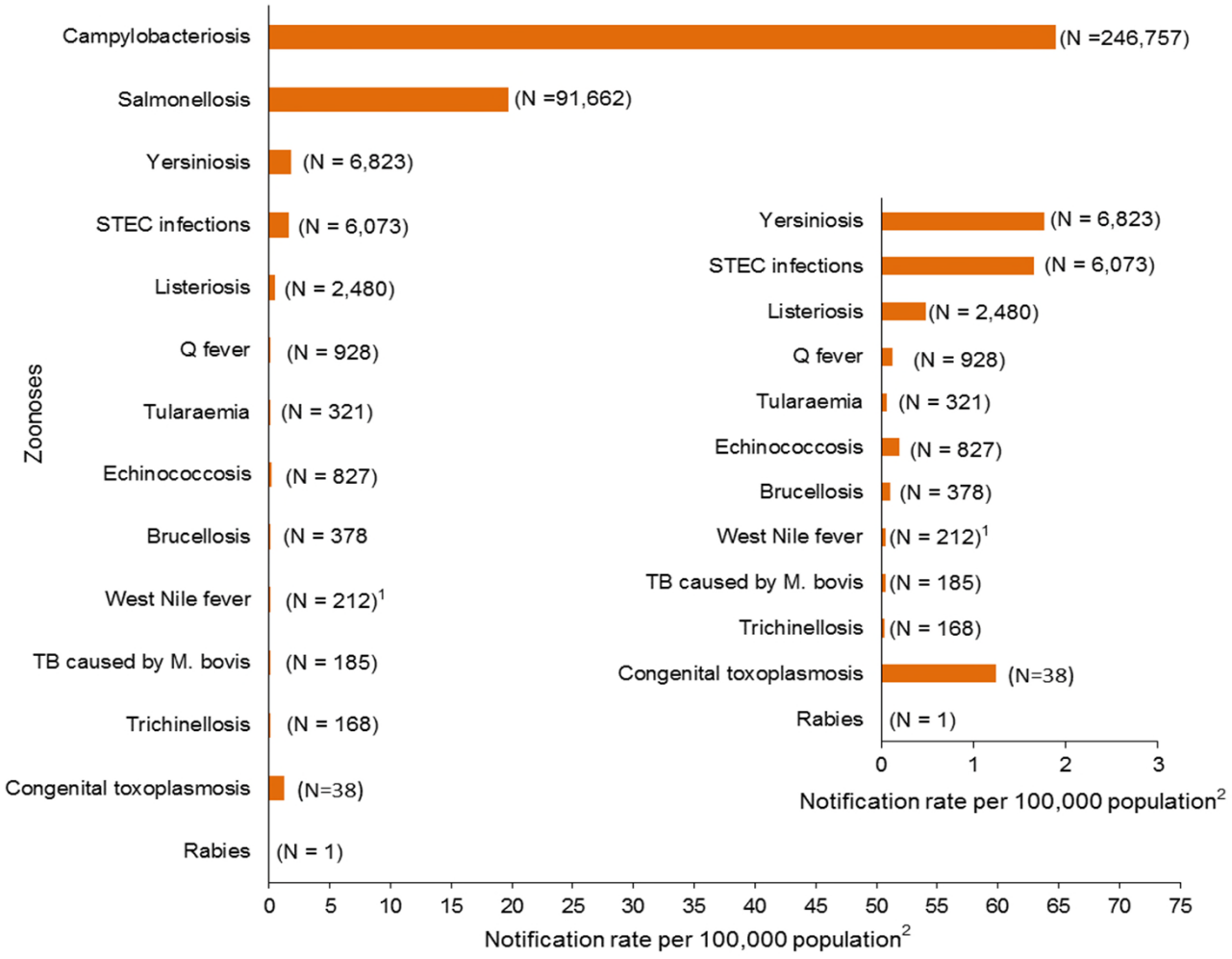
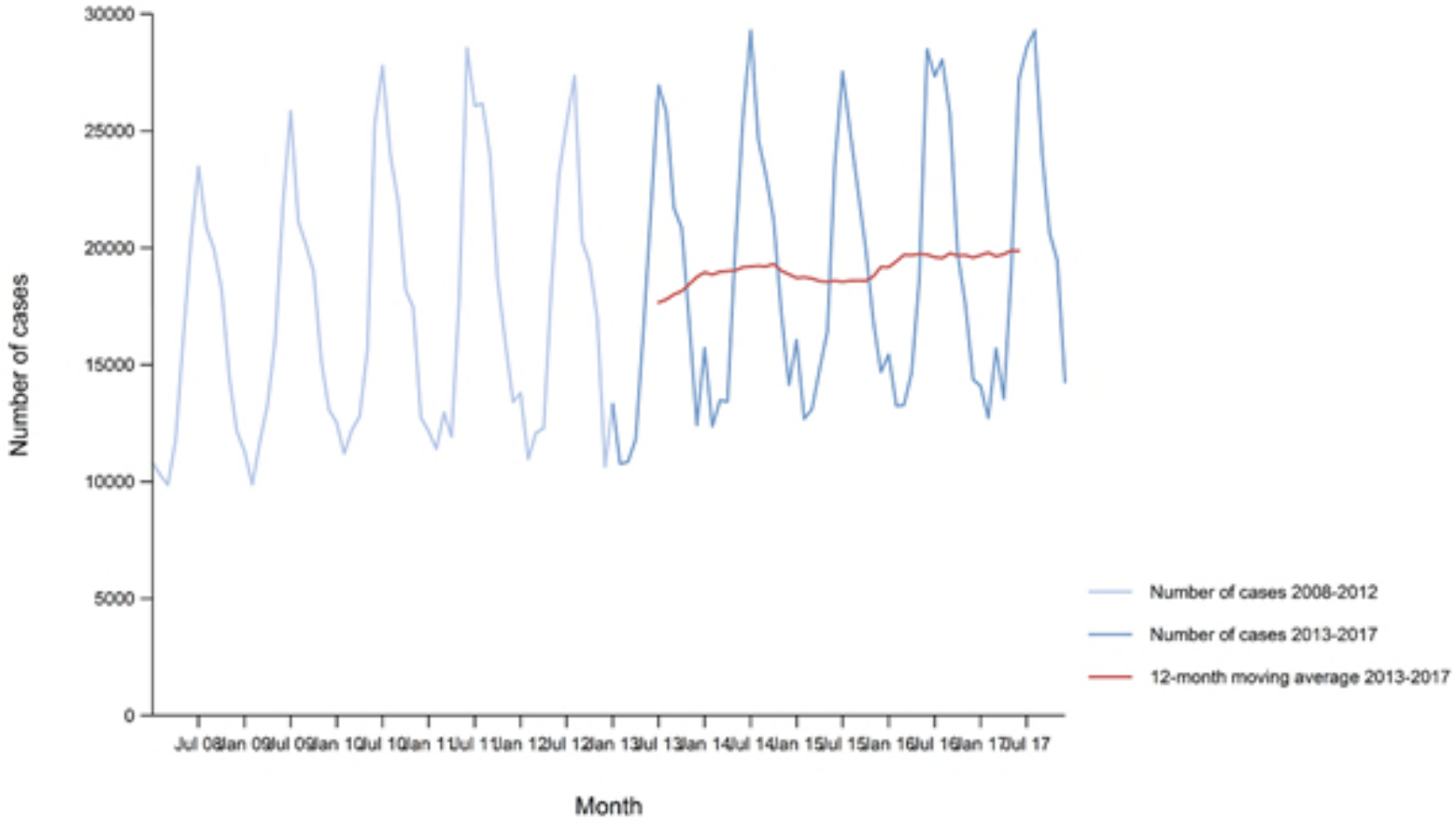
Reported numbers and notification rates of confirmed human zoonoses in the EU, 2017



Campylobacteriosis in humans, EU, 2008-2017

There was a significantly increasing trend over the period 2008–2017; however, in the last 5 years (2013–2017) the EU/EEA trend has not shown any statistically significant increase or decrease.



Campylobacteriosis in humans, EU, 2017

Country	2017					2016		2015		2014		2013	
	National coverage[a]	Data format[a]	Total cases	Confirmed cases & rates		Confirmed cases & rates		Confirmed cases & rates		Confirmed cases & rates		Confirmed cases & rates	
				Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	7,204	7,204	82.1	7,083	81.5	6,258	73.0	6,514	76.6	5,731	67.8
Belgium	Y	A	8,649	8,649	76.2	10,055	88.9	9,066	80.7	8,098	..	8,148	..
Bulgaria	Y	A	196	195	2.7	202	2.8	227	3.2	144	2.0	124	1.7
Croatia	Y	C	1,694	1,686	40.6	1,524	36.4	1,393	33.0	1,647	38.8	0	0.0
Cyprus	Y	C	20	20	2.3	21	2.5	29	3.4	40	4.7	56	6.5
Czech Republic	Y	C	24,508	24,326	230.0	24,084	228.2	20,960	198.9	20,750	197.4	18,267	173.7
Denmark	Y	C	4,255	4,255	74.0	4,712	82.6	4,327	76.5	3,773	67.0	3,772	67.3
Estonia	Y	C	347	285	21.7	298	22.6	318	24.2	285	21.7	382	28.9
Finland	Y	C	4,289	4,289	77.9	4,637	84.5	4,588	83.8	4,889	89.7	4,066	74.9
France[b]	N	C	6,579	6,579	49.1	6,698	50.2	6,074	45.7	5,958	45.2	5,198	39.6
Germany	Y	C	69,414	69,178	83.8	73,663	89.6	69,829	86.0	70,571	87.4	63,280	78.6
Greece[c]	..	..	..	..	..	..	..	..	..	..	..	..	..
Hungary	Y	C	7,840	7,807	79.7	8,556	87.0	8,342	84.6	8,444	85.5	7,247	73.5
Ireland	Y	C	2,788	2,779	58.1	2,511	53.1	2,453	53.0	2,593	56.3	2,288	49.8
Italy[d]	N	C	1,060	1,060	..	1,057	..	1,014	..	1,252	..	1,178	..
Latvia	Y	C	61	59	3.0	90	4.6	74	3.7	37	1.8	9	0.4
Lithuania	Y	C	993	990	34.8	1,225	42.4	1,186	40.6	1,184	40.2	1,139	38.3
Luxembourg	Y	C	613	613	103.8	518	89.9	254	45.1	873	158.8	675	125.7
Malta	Y	C	231	231	50.2	212	48.8	248	57.8	288	67.7	246	58.4
Netherlands[e]	N	C	2,890	2,890	32.5	3,383	38.3	3,778	43.0	4,159	47.5	3,702	42.4
Poland	Y	C	874	874	2.3	773	2.0	653	1.7	650	1.7	552	1.4
Portugal	Y	C	602	596	5.8	359	3.5	271	2.6	..	..	..	..
Romania	Y	C	479	467	2.4	517	2.6	311	1.6	256	1.3	218	1.1
Slovakia	Y	C	7,057	6,946	127.8	7,623	140.5	6,949	128.2	6,744	124.5	5,845	108.0
Slovenia	Y	C	1,408	1,408	68.2	1,642	79.5	1,328	64.4	1,184	57.4	1,027	49.9
Spain[d]	N	C	18,860	18,860	..	15,542	..	13,227	..	11,481	..	7,064	..
Sweden	Y	C	10,608	10,608	106.1	11,021	111.9	9,180	94.2	8,288	85.9	8,114	84.9
United Kingdom	Y	C	63,284	63,284	96.2	59,911	90.1	59,797	91.2	66,716	102.7	66,282	103.0
EU Total	..	..	246,823	246,158	64.8	246,917	66.3	232,134	62.9	236,818	66.5	214,710	61.4

FBO, and human campylobacteriosis cases, EU, 2017

EU/Non-EU	Country	Detailed causative agent	Outbreak strength	Yes				No				Total			
			Metrics	Number of outbreaks	Number of Human cases	Number of hospitalised	Number of Deaths	Number of outbreaks	Number of Human cases	Number of hospitalised	Number of Deaths	Number of outbreaks	Number of Human cases	Number of hospitalised	Number of Deaths
EU	Austria	C. coli						2	4	1	0	2	4	1	0
EU	Austria	Campylobacter spp., unspecified						3	7	1	0	3	7	1	0
EU	Austria	C. jejuni						19	50	11	0	19	50	11	0
EU	Belgium	Campylobacter						3	11	6	0	3	11	6	0
EU	Belgium	C. jejuni						1	7	2	0	1	7	2	0
EU	Croatia	Campylobacter						2	7	3	0	2	7	3	0
EU	Croatia	C. jejuni						4	37	5	0	4	37	5	0
EU	Czech Republic	Campylobacter						1	17	1	0	1	17	1	0
EU	Denmark	C. jejuni		1	66	0	0	1	6	0	0	2	72	0	0
EU	Finland	Campylobacter spp., unspecified		1	9	2	0	1	2	2	0	2	11	4	0
EU	Finland	C. jejuni		1	2	0	0					1	2	0	0
EU	France	C. coli						3	6	0	0	3	6	0	0
EU	France	Campylobacter spp., unspecified		2	4	0	0	22	111	9	0	24	115	9	0
EU	France	C. jejuni		1	2	0	0	12	84	6	0	13	86	6	0
EU	Germany	Campylobacter		2	17	1	0	131	331	61	0	133	348	62	0
EU	Germany	C. jejuni		14	204	25	0					14	204	25	0
EU	Italy	C. jejuni						1	2	0	0	1	2	0	0
EU	Latvia	C. jejuni						3	6	3	0	3	6	3	0
EU	Lithuania	Campylobacter spp., unspecified						7	15	15	0	7	15	15	0
EU	Malta	Campylobacter						8	17	3	0	8	17	3	0
EU	Netherlands	Campylobacter spp., unspecified						5	12	1	0	5	12	1	0
EU	Poland	C. jejuni						1	2	0	0	1	2	0	0
EU	Slovakia	C. coli		1	7	0	0	7	9	2	1	8	16	2	1
EU	Slovakia	Campylobacter spp., unspecified						7	9	4	0	7	9	4	0
EU	Slovakia	C. jejuni		1	14	0	0	101	94	24	0	102	108	24	0
EU	Spain	C. coli						1	2	0	0	1	2	0	0
EU	Spain	Campylobacter spp., unspecified						2	23	0	0	2	23	0	0
EU	Spain	C. jejuni		1	3	1	0	7	82	8	0	8	85	9	0
EU	Sweden	Campylobacter						3	6	1	0	3	6	1	0
EU	Sweden	C. jejuni		1	2,165	0	0					1	2,165	0	0
EU	United Kingdom	Campylobacter spp., unspecified		8	130	8	0	1	16	1	0	9	146	9	0
EU	**Total**			**34**	**2,623**	**37**	**0**	**359**	**975**	**170**	**1**	**393**	**3,598**	**207**	**1**
Total				**34**	**2,623**	**37**	**0**	**359**	**975**	**170**	**1**	**393**	**3,598**	**207**	**1**

Campylobacteriosis FBO, by incriminated food vehicle, EU, 2010-2017

European Food Safety Authority

Distribution of strong-evidence outbreaks caused by *Campylobacter* (including strong-evidence waterborne outbreaks), by food vehicle

EU, 2010-2016

EU, 2017

EU	Food vehicle	Number of outbreaks	Number of outbreaks percentage
EU	Milk	18	52.9%
EU	Broiler meat (Gallus gallus) and products thereof	9	26.5%
EU	Dairy products (other than cheeses)	2	5.9%
EU	Other or mixed red meat and products thereof	2	5.9%
EU	Other, mixed or unspecified poultry meat and products thereof	2	5.9%
EU	Meat and meat products	1	2.9%
EU	**Total**	**34**	**100.0%**
Total		**34**	**100.0%**

EU	Food vehicle	Number of outbreaks	Number of outbreaks percentage
EU	Broiler meat (Gallus gallus) and products thereof	93	44.9%
EU	Milk	43	20.8%
EU	Other, mixed or unspecified poultry meat and products thereof	17	8.2%
EU	Mixed food	11	5.3%
EU	Tap water, including well water	8	3.9%
EU	Pig meat and products thereof	5	2.4%
EU	Bovine meat and products thereof	4	1.9%
EU	Other foods	4	1.9%
EU	Buffet meals	3	1.4%
EU	Cheese	3	1.4%
EU	Dairy products (other than cheeses)	3	1.4%
EU	Other or mixed red meat and products thereof	3	1.4%
EU	Meat and meat products	2	1.0%
EU	Turkey meat and products thereof	2	1.0%
EU	Eggs and egg products	1	0.5%
EU	Fish and fish products	1	0.5%
EU	Fruit, berries and juices and other products thereof	1	0.5%
EU	Sheep meat and products thereof	1	0.5%
EU	Unknown	1	0.5%
EU	Vegetables and juices and other products thereof	1	0.5%
EU	**Total**	**207**	**100.0%**
Total		**207**	**100.0%**

Strong-evidence FBO, Sweden, 2017

Six strong-evidence food-borne campylobacteriosis outbreaks :

Food vehicle	Causative agent	Causative agent details	N outbreaks	% of Total outbreaks
Broiler meat (Gallus gallus) and products thereof	Campylobacter	C. jejuni	1	16.7%
Cheese	Listeria	L. monocytogenes	1	16.7%
Eggs and egg products	Salmonella	S. Enteritidis	1	16.7%
Meat and meat products	Salmonella	S. Typhimurium	1	16.7%
Milk	Escherichia coli	VTEC O157	1	16.7%
Other foods	Escherichia coli	Enteroaggregative E. coli (EAEC)	1	16.7%
Total			**6**	**100.0%**

One strong-evidence waterborne campylobacteriosis outbreak :

Causative agent	Country	N outbreaks	N Human cases	N Number of hospitalised	Number of N Deaths
Campylobacter	Sweden	1	7	0	0

Major zoonoses in humans, EU and Sweden, 2017

Country	2017					2016		2015		2014		2013	
	National coverage[a]	Data format[a]	Total cases	Confirmed cases & rates		Confirmed cases & rates		Confirmed cases & rates		Confirmed cases & rates		Confirmed cases & rates	
				Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Salmonellosis:													
Sweden	Y	C	2,280	2,280	22.8	2,247	22.8	2,312	23.7	2,211	22.9	2,842	29.7
United Kingdom	Y	C	10,177	10,177	15.5	9,900	15.1	9,490	14.6	8,099	12.6	8,465	13.2
EU Total	–	–	**93,583**	**91,662**	**19.7**	**94,425**	**20.5**	**94,477**	**21.0**	**92,012**	**20.7**	**87,753**	**20.3**
Listeriosis:													
Sweden	Y	C	81	81	0.81	68	0.69	88	0.90	125	1.30	93	0.97
United Kingdom	Y	C	160	160	0.24	201	0.31	186	0.29	201	0.31	192	0.30
EU Total	–	–	**2,498**	**2,480**	**0.48**	**2,509**	**0.47**	**2,183**	**0.43**	**2,217**	**0.46**	**1,883**	**0.40**
Shiga-toxin producing *Escherichia coli*:													
Sweden	Y	C	504	504	5.04	638	6.48	551	5.65	472	4.89	551	5.77
United Kingdom	Y	C	993	993	1.51	1,367	2.09	1,328	2.05	1,324	2.06	1,164	1.82
EU Total	–	–	**6,260**	**6,073**	**1.66**	**6,456**	**1.77**	**5,929**	**1.65**	**5,900**	**1.75**	**6,042**	**1.80**
Yersiniosis:													
Sweden	Y	C	243	236	2.36	230	2.33	245	2.51	248	2.57	313	3.28
United Kingdom	Y	C	143	142	0.22	87	0.13	44	0.07	58	0.09	59	0.09
EU Total	–	–	**6,843**	**6,823**	**1.77**	**6,888**	**1.82**	**6,928**	**1.91**	**6,435**	**1.83**	**6,352**	**1.92**

Situation as regards tuberculosis due to bovine tuberculosis, EU, 2017

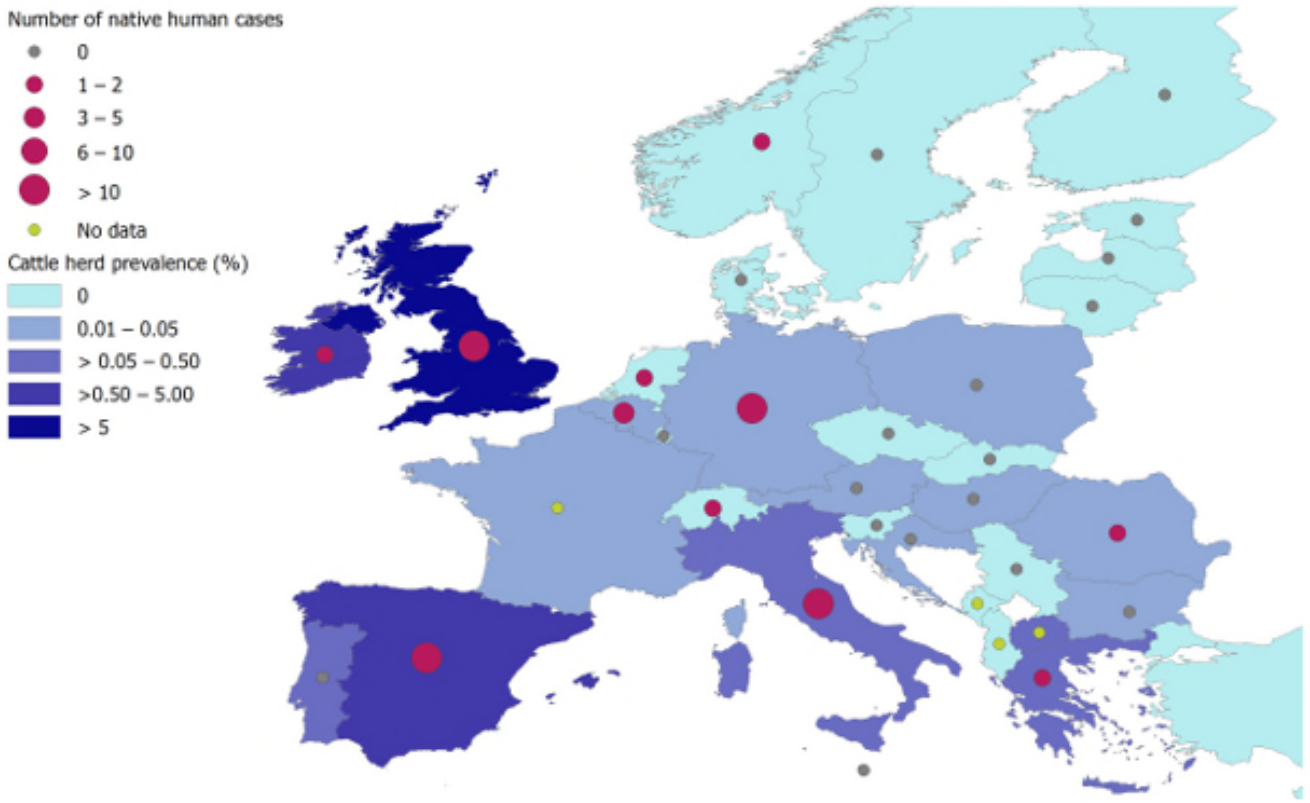


Figure 37: Number of confirmed tuberculosis cases due to *M. bovis* in individuals of EU origin and country-level aggregated herd prevalence of bovine tuberculosis in cattle, EU, 2017

Situation as regards brucellosis, EU, 2017

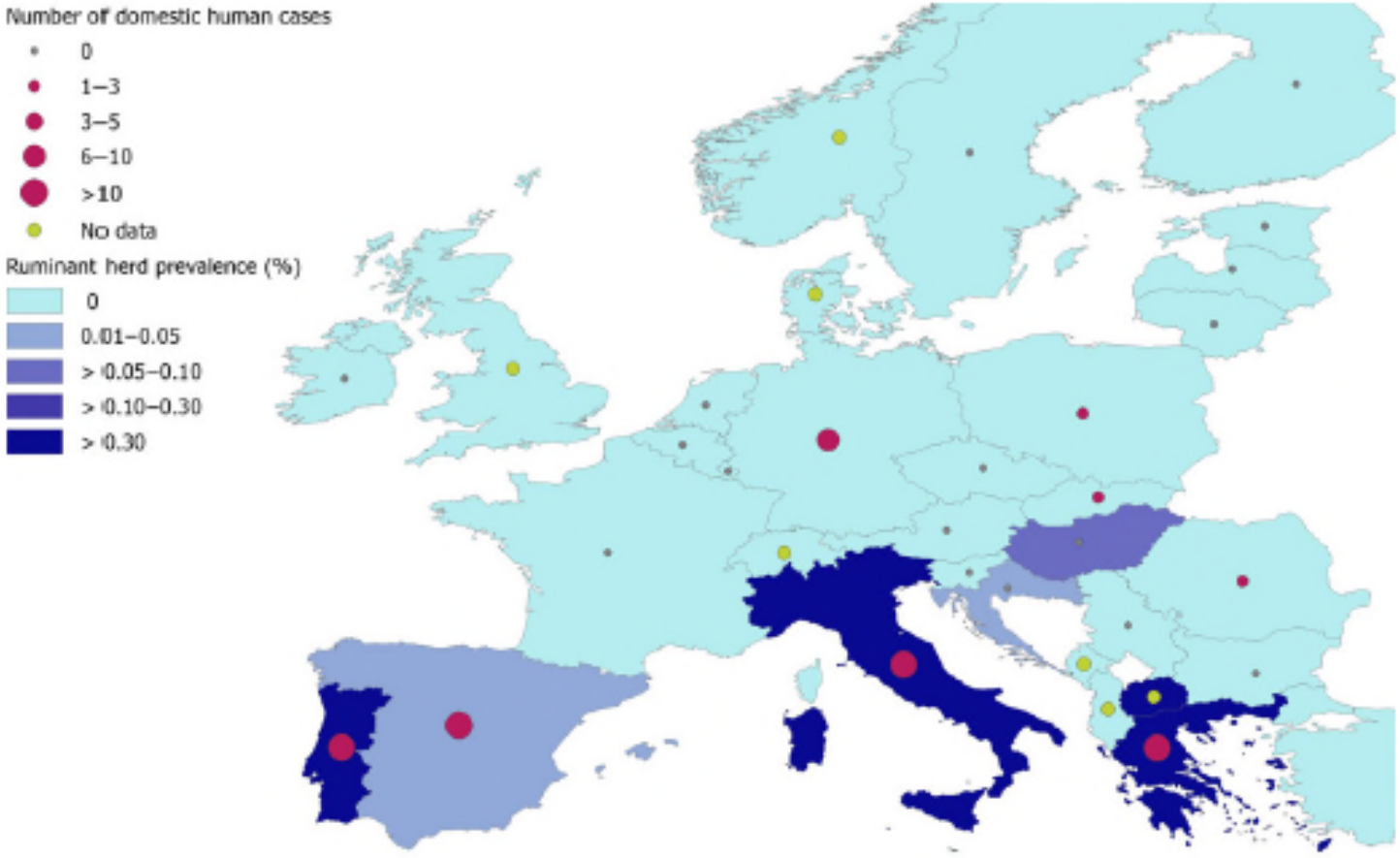
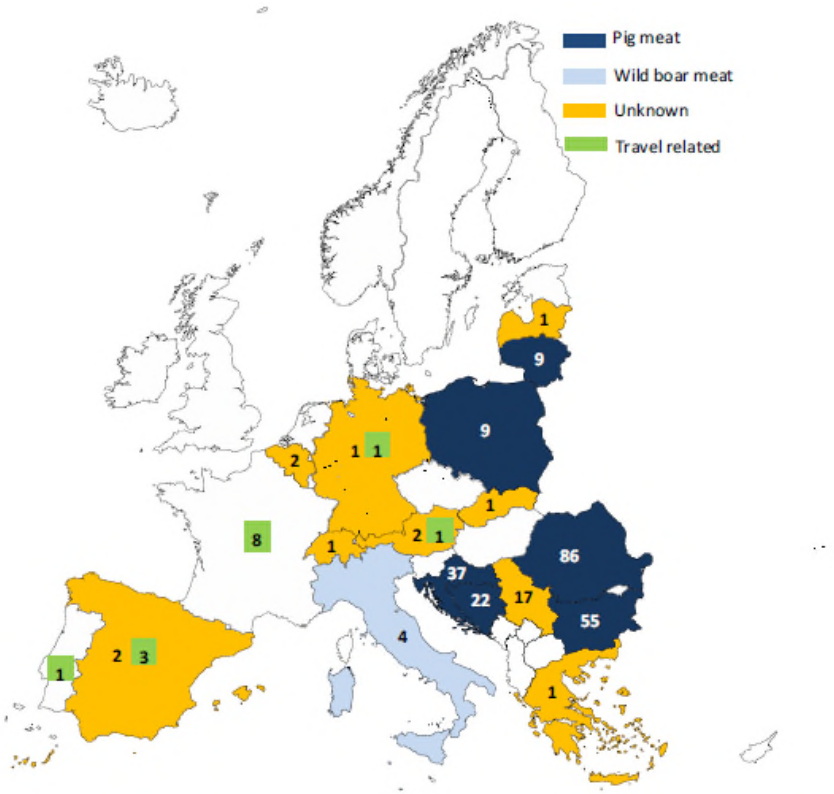


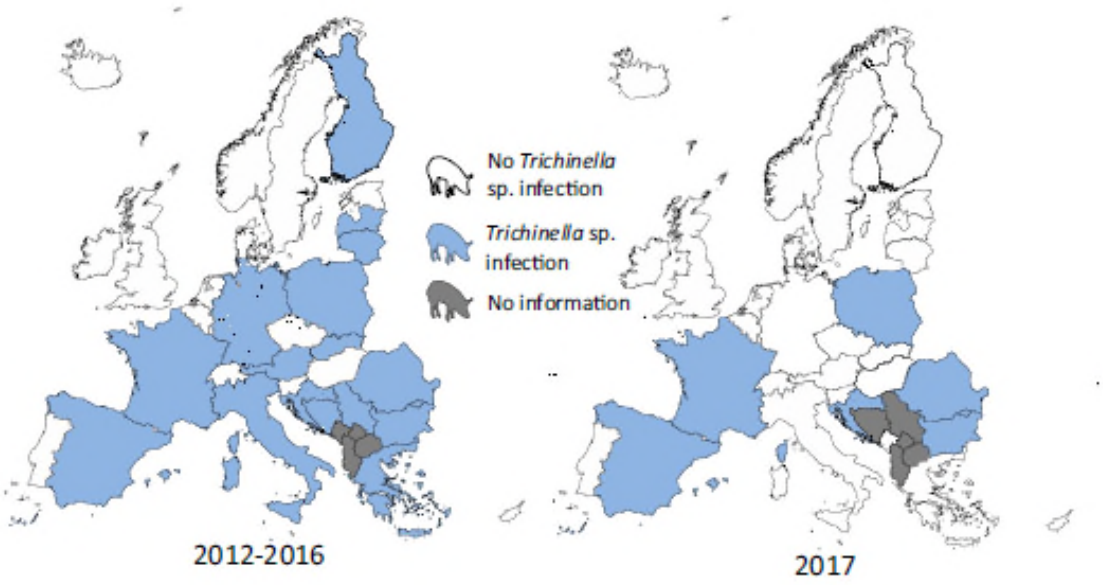
Figure 43: Number of domestically acquired confirmed brucellosis cases in humans, and prevalence of *Brucella* test-positive cattle, sheep and goat herds, EU, 2017

Situation as regards trichinellosis, EU, 2017



Countries in which human cases were reported due to food-borne outbreaks (EFSA data) are in colour according the food vehicle causing the outbreaks ('pigmeat', 'wild-boar meat' or 'unknown' food vehicle). The number of cases in each country indicates domestic trichinellosis cases (ECDC data); numbers in green box indicate the travel-related trichinellosis human cases.

Figure 51: Total human cases in EU, EEA and CH (ECDC data), and in Bosnia and Herzegovina and Serbia (EFSA data, food-borne outbreaks), 2017

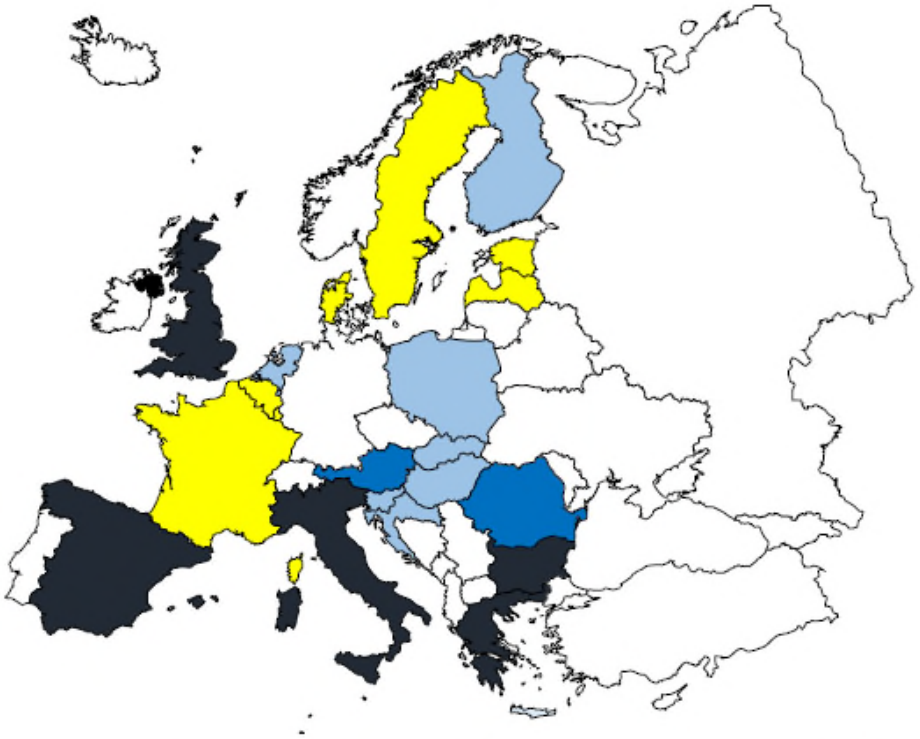


This distribution maps have been built based on data from reports (EFSA and ECDC, 2015a,b, 2016b, 2017b).

Figure 52: *Trichinella* spp. in domestic pigs and farmed wild boar of 28 MS and three non-MS (IC, NO and CH) from 2012 to 2016 (map left) and in 2017 (map right)

Situation as regards echinococcosis, EU, 2017

Figure 53: Pooled prevalence of *Echinococcus multilocularis* in red and Arctic foxes within the European Union and adjacent countries at national level depicting current epidemiological situation in Europe (Oksanen et al., 2016)

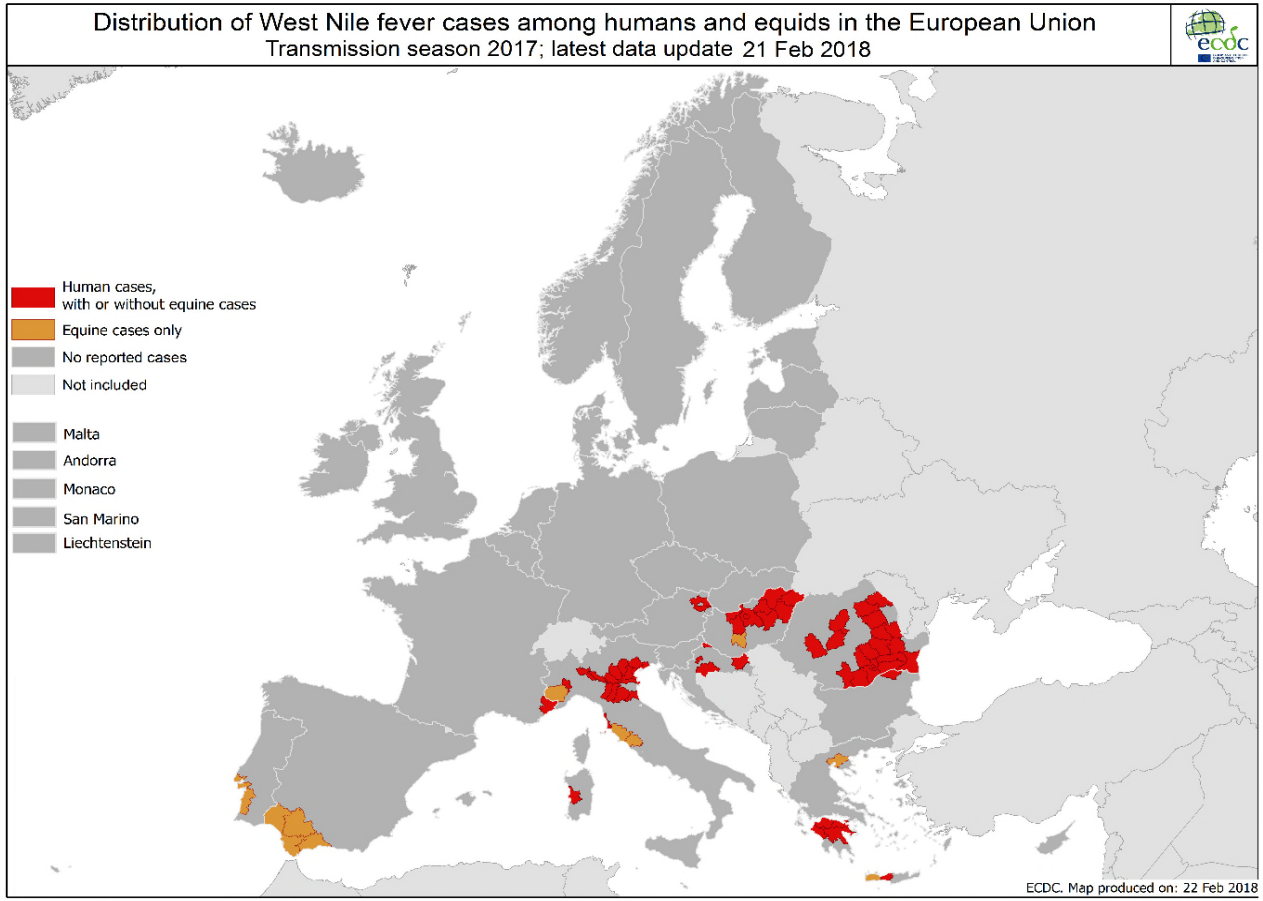


Intermediate hosts included in map are: cattle, deer, goats, moose, mouflons, sheep, horses, water buffalos and wild boars. Pigs were excluded from Poland and Germany because of the co-endemicity with *E. multilocularis*. Colours legend: black > 10,000 positive cases; dark blue < 1,000 positive cases; light blue < 100 cases; yellow: 0 cases reported; white: data not reported.

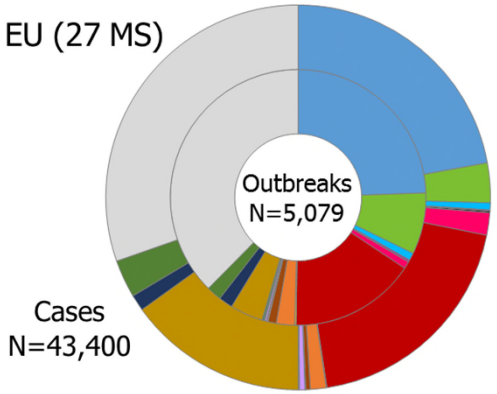
Figure 57: Map of Europe showing the pooled number of *Echinococcus granulosus* s.l. positive cases in intermediate hosts detected in each MS over 5 years (2013/2017)

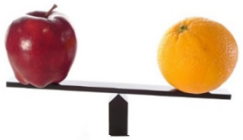
West Nile fever humans – equidae joint map, EU, 2017

Distribution of human and equine West Nile fever cases by affected areas, EU/EEA region, transmission season 2017. *(Source: TESSy and ADNS)*

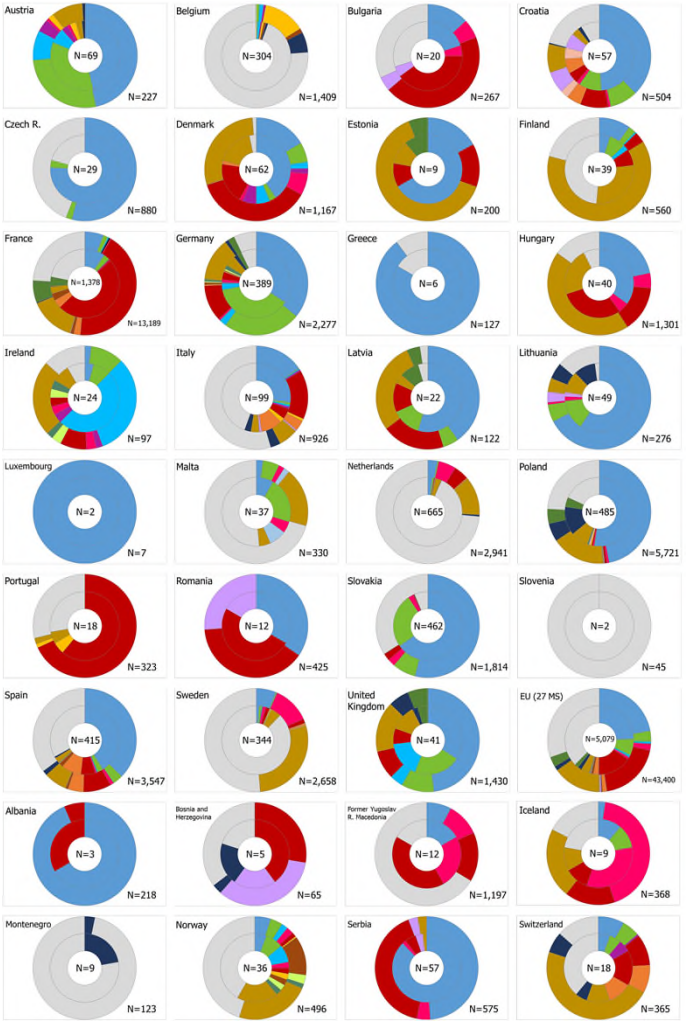


FBO surveillance data, EU, 2017





- Salmonella
- Campylobacter
- STEC
- Listeria
- Vibrio
- Brucella
- other bacterial agents
- Bacterial toxins other than C. botulinum
- C. botulinum
- Histamine
- Marine biotoxins
- Mushroom toxins
- other causative agents
- Trichinella
- Cryptosporidium
- other parasites
- norovirus and other calicivirus
- Hepatitis A
- other viruses
- Unknown / unspecified



FBO surveillance data, by setting, EU, 2017

What were the locations ('settings') where the food was consumed?

About one in three strong-evidence FBO happened at **home ('Household') (34.2%)**, followed by **'Restaurants, pubs, street vendors and take away' (30.0%)**, 'Canteen or catering to workplace, school, hospital' (16.0%) and 'Other settings' (such as farms, fairs and festivals, other) (12.4%).

What were the causative agents of strong-evidence FBO reported in those different settings?

They are shown in the figure to the right: in the home setting, the diversity of agents was largest and *Salmonella* was more frequently reported compared to other settings.

Joint EFSA-ECDC Rapid Outbreak Assessments

Sweden has been involved in the following published ROA

More recent:

- 2019: Multi-country outbreak of ***Listeria monocytogenes*** clonal complex 8 infections linked to consumption of cold-smoked fish products. Available here. Four human cases of infection caused by ***Listeria monocytogenes*** clonal complex 8; ***Listeria monocytogenes*** food isolates matching the human outbreak strain by WGS were detected in smoked fish products in Sweden.
- 2018: Multi-country outbreak of ***Listeria monocytogenes*** serogroup IVb, multi-locus sequence type 6, infections probably linked to frozen corn. Available here. Sweden has reported six confirmed cases with isolates. The Swedish Food Authority reported the finding of a ***Listeria monocytogenes*** isolate from frozen corn that matched the ***Listeria monocytogenes*** ST6 outbreak strain using WGS.

Less recent:

- 2017: Multi-country outbreak of ***Salmonella* Enteritidis** phage type 8, MLVA type 2-9-7-3-2 and 2-9-6-3-2 infections - First update
- 2017: Multi-country outbreak of ***Salmonella* Enteritidis** infections linked to Polish eggs
- 2014: Multi-country outbreak of ***Salmonella* Stanley** infections
- 2014: Outbreak of **hepatitis A** in EU/EEA countries

Outline

- *Introduction*
- *Few highlights from EUSR*
- Discussion/questions

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