

# Overview of 2019 Zoonoses Data

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## Introduction

Zoonoses are diseases and infections naturally transmissible between animals and humans. Transmission may occur via direct contact with an animal or indirect contact with animal excreta (e.g. faeces) present in contaminated food, water or the environment. Foodborne zoonotic diseases are caused by consuming food or drinking water contaminated by zoonotic pathogenic (disease-causing) microorganisms such as bacteria and their toxins, viruses and parasites. They enter the body through the gastrointestinal tract where the first symptoms often occur. Many of these microorganisms are commonly found in the intestines of healthy food-producing animals. The risks of contamination are present from farm to fork and require prevention and control throughout the food chain. While it is possible for anybody to become infected with a zoonotic pathogen, certain population groups such as the very young, the elderly and immunocompromised are particularly vulnerable and at greater risk of more serious consequences.

The eradication of zoonoses in humans and animals is very challenging. The impact of zoonoses on the health of humans and animals can however be limited, by (i) monitoring the reservoirs of infectious zoonotic pathogens with a view to understanding and controlling their modes of transfer; (ii) by businesses controlling the hazard along the food chain and; (iii) by educating the public about how to avoid or limit the risk of infection.

The Irish zoonoses report is published annually by the FSAI, in collaboration with the Department of Agriculture, Food and the Marine (DAFM), the Health Service Executive (HSE), the Local Authority Veterinary Service (LAVS), the Sea-Fisheries Protection Authority (SFPA) and the Health Protection Surveillance Centre (HPSC). The report brings together the results of thousands of tests carried out on samples of food and feed, as well as tests on material of animal or human origin, in an effort to determine the pattern and extent of infection by zoonotic pathogens transmitted to humans from animals.

Zoonoses data collected by EU Member States serve as a basis for the EU to set targets for the reduction of these microorganisms in food-producing animals and foodstuffs. The impact of the reduction programmes on the actual prevalence of zoonoses in animals and foods and related human health cases are then monitored and analysed in the annual EU summary reports published by the European Food Safety Authority and the European Centre for Disease Control and Prevention (EFSA and ECDC, 2020).

The data in the 2019 tables for the results of Irish testing carried out in food, animal and animal feed samples are presented in four categories (routine, census, objective and suspect sampling) depending on the sampling context. Routine sampling is planned sampling but does not involve statistically random sampling. Census sampling is when the totality of a population, on which the data are reported, is controlled. Objective sampling is the planned

selection of a random sample, which is statistically representative of the population to be analysed (EFSA, 2020). Suspect sampling is the unplanned selection of a sample whereby the individual units are selected based on the recent judgement and experience regarding the population, lot or sampling frame, e.g., earlier positive samples (EFSA, 2020). The samples obtained from suspect sampling may have a higher likelihood of having pathogens present.

## Overview of 2019 data

### Campylobacteriosis

- *Campylobacter* remained the most common bacterial cause of gastroenteritis in Ireland and in the European Union in 2019 (EFSA and ECDC, 2020). There were 2,777 cases of human campylobacteriosis reported in Ireland in 2019 (HPSC, 2021), corresponding to a crude incidence rate (CIR) of 56.4 cases per 100,000 population. This was a decrease on the 3,029 cases (CIR 62.4 per 100,000 population) reported in Ireland in 2018. In Europe, there were 220,682 cases reported in 2019 with a corresponding CIR of 59.7 per 100,000 population.
- A total of 58 routine and 119 suspect food samples were tested for *Campylobacter* spp. in 2019. *Campylobacter* was detected in four routine meat samples in 2019.

### Salmonellosis

- In 2019, there were 355 reported cases of salmonellosis in Ireland (CIR 7.2 per 100,000 population) which is a decrease on the previous year (363 reported cases, CIR 7.5 per 100,000 population; HPSC, 2021). The Irish CIR for 2019 were again below the European average CIR of 20.0 per 100,000 population (EFSA and ECDC, 2019).
- Of 354 human *Salmonella* isolates reported to be contracted in Ireland referred to the National Salmonella Shigella and Listeria Reference Laboratory (NSSLRL) for typing in 2019, the most common serotypes were *Salmonella* Enteritidis (29.1%) and *Salmonella* Typhimurium (including monophasic *S.* Typhimurium; 22.9%).
- A total of 5,164 food samples were tested for *Salmonella* in 2019.
- A total of 2,560 meat samples were tested. *Salmonella* was detected in 35 (1.5%) of 2,376 routine meat samples tested. Of these, 25 were detected in samples of unspecified RTE status and 10 were detected in raw meat samples. Of the 184 total suspect meat samples taken in 2019, two (1.1%) samples of ready-to-eat meat were positive for *Salmonella*.
- A total of 2,604 non-meat foods were tested. *Salmonella* was detected in 2 (0.9%) of 2,343 routine samples tested. The two *Salmonella* positive routine samples were of unspecified RTE status. None of the 261 non-meat suspect food samples taken were positive for *Salmonella* in 2019.

- *Salmonella* spp. unspecified (33.3%), followed by *S. Brandenburg* (25.6%) and *S. Schwarzengrund* (23.1%) were the predominant serotypes reported from 39 food isolates in 2019.
- In 2019, 34 of 10,055 (0.8%) breeding, parent, fattening, laying hens and commercial poultry flocks were positive for *Salmonella* (Official control and industry sampling). Thirty-two of the positive samples were detected in census sampled flocks and two were detected in objectively sampled flocks. These included:
  - 8 positives (0.2%) of 4,233 broilers sampled before slaughter
  - 9 (1.5%) of 602 laying hens (*Gallus gallus*)
  - 5 (1.1%) of 364 grandparent breeding flocks (*Gallus gallus*)
  - 12 (1.9%) of 625 turkey fattening flocks.
- *Salmonella* Senftenberg (7) and *Salmonella* Braenderup (4) were the most common serotypes detected in census flocks. *Salmonella* Derby (2) was detected in objectively sampled flocks.
- In total, 4,252 suspect samples of animals other than poultry were tested for *Salmonella*. Of 3,098 suspect cattle samples tested for *Salmonella* spp. in 2019, 98 (3.2%) were positive. Ninety-four (95.9%) of the 98 isolates were *Salmonella* Dublin and 4 (4.1%) were *Salmonella* Typhimurium. Positive samples included:
  - 4 positives (1.4%) of 289 sampled cattle (bovine adult over 2 years)
  - 71 positives (4.4%) of 1,621 sampled cattle (bovine calves under 1 year).
  - 23 positives (2.1%) of 1,114 sampled cattle (bovine calves under or around 1 year)
- Other positive suspect animal samples included:
  - 7 positives (6.1%) of 111 sampled pigs (fattening)
  - 2 positives (0.5%) of 368 sampled pigs sheep (lambs under 1 year)
  - 14 positives (1.9%) of 721 sampled sheep.
- *Salmonella* 3,19:-:- was detected in 1 (0.2%) of 422 feed material samples analysed in 2019 (all objective sampling). The positive sample was in pig feed in the “feed material for land animals” category.

### Shiga toxin-producing *Escherichia coli* (STEC) also known as Verocytotoxigenic *Escherichia coli* (VTEC)

- In 2019, there were 873 STEC notifications (CIR 17.7 per 100,000 population) in Ireland, which is a decrease from 2018 (1,113 cases, CIR of 22.9 per 100,000 population; HPSC, 2021). In Europe 7,894 confirmed cases of STEC were reported in 2019 with a CIR of 2.2 per 100,000 population (EFSA and ECDC, 2020). The reported STEC incidence rate in Ireland is generally high relative to other European countries. For many years, Ireland has reported the highest STEC incidence rate of any Member State in the EU, reporting over

8 times the EU average in 2019, except in 2011 when Germany reported the highest rate due to a large STEC O104 outbreak linked to fenugreek seeds.

- No published STEC outbreak data for 2019 was available at the time of publication of this report.
- Of 2,620 meat samples tested for STEC in 2019, 9 of the 2,562 routine samples were positive. All positive samples (0.2%) were of unspecified RTE status. None of the 58 suspect meat samples tested were positive.
- Of 115 non-meat samples tested for STEC in 2019, none were positive.

### Listeriosis

- Eighteen cases of listeriosis were notified in Ireland in 2019 (CIR of 0.37 per 100,000 population; HPSC, 2021). This is higher than reported in 2018 (22 cases, CIR of 0.45 per 100,000 population). Listeriosis in Ireland is close to the 2019 European average CIR of 0.46 per 100,000 population (EFSA and ECDC, 2020).
- Of 2,599 detection tests (detected or not detected in 25 grams) carried out on 2,380 routine and 219 suspect food samples. One hundred and thirteen (4.3%) of samples were positive for *Listeria monocytogenes*. Of these, 81/2,380 (3.1%) positives were detected in routine food samples (RTE (19), raw (26), cooked (3) and unspecified RTE status (33)). A further 32/219 (14.6%) positives were detected in suspect samples (RTE (1), raw (5), cooked (0) and unspecified RTE status (26)).
- Of total 4,613 enumeration tests (number of colony forming units per gram) on 4,356 routine and 257 suspect samples, no *L. monocytogenes* was detected in any 25g sample. The microbiological criteria for *L. monocytogenes* in Commission Regulation (EC) 2073/2005, as amended, sets a legislative limit of 100 cfu/g for certain categories of RTE food products during their shelf-life when they are placed on the market.
- Of 6,644 suspect samples for *Listeria* spp. taken in Irish animals in 2019. Seventy-four (1.1%) samples were positive for *Listeria* spp. Positive samples included:
  - 57 positives (1.4%) of 4,087 sampled cattle (bovine adult over 2 years)
  - 1 positives (0.2%) of 455 sampled cattle (bovine – dairy cows).
  - 16 positives (1.2%) of 1,377 sampled sheep.

### Cryptosporidiosis

- In 2019, 605 cases of cryptosporidiosis were notified in Ireland (CIR of 12.3 per 100,000 population) which is a decrease on the 629 cases (CIR 13.0 per 100,000 population) reported in 2018 (HPSC, 2021). In 2018, the most recent data available from the European Centre for Disease Prevention and Control (ECDC) reported an overall notification rate of

4.4 per 100,000 populations in the European Union. Among the countries reporting on cryptosporidiosis in 2018, Netherlands has the highest rate (20.0/100,000) followed by Ireland (13.0/100,000) and Belgium (11.0/100,000) (ECDC, 2021).

### **Tuberculosis (TB)**

- In 2019, 266 cases of TB were notified in Ireland (CIR of 5.4 per 100,000 population), which is a decrease in the number of cases on the previous year (307 cases, CIR of 6.3 per 100,000 population). Globally, most cases of zoonotic TB are caused by *M. bovis*, and cattle are the major reservoir. Zoonotic transmission of *M. bovis* occurs primarily through close contact with infected cattle or consumption of contaminated animal products such as unpasteurized milk. Bovine TB is a notifiable disease in Ireland and an ongoing national eradication program means that all herds are subject to test and control measures. Currently, in high-income countries, bovine TB is well controlled or eliminated in most areas, and cases of zoonotic TB are rarely seen. However, reservoirs of TB in wildlife populations have been linked to the persistence or increase of the incidence of bovine TB in some countries (Müller et al, 2013).
- In 2019, 3.7% of bovine herds were positive for TB compared to 3.5% of bovine herds in 2018.
- Of 794 suspect samples from animals other than bovine tested for *Mycobacterium* in 2019, 33.5% (n=266) tested positive. Positive suspect samples were detected in alpacas (2 of 5), badgers (228 of 572), cats (1 of 4), deer unspecified (22 of 112), dogs (1 of 3), elephants (1 of 2), foxes (9 of 90), and fattening pigs (2 of 2).

### **Brucellosis**

- No cases of brucellosis were reported in humans in 2019 or in 2018.
- Of the 387 ovine or caprine herds suspect samples tested in 2019, none were positive for *Brucella*.
- Of the 15,593 bovine herds objective samples tested in 2019, none were positive for *Brucella*.

### **Variant Creutzfeldt-Jakob disease (vCJD), Bovine Spongiform Encephalopathy (BSE) and Transmissible Spongiform Encephalopathy (TSE)**

- No human cases of vCJD was reported in 2019. The last case of vCJD was notified in 2006.
- In 2019, no positive BSE cases were identified.
- In 2019, twelve cases of atypical scrapie were reported.

### Toxoplasmosis

- There were 47 toxoplasmosis notifications in humans in 2019 (CIR of 1.0 per 100,000 population), compared with 32 notifications reported in 2018 (CIR of 0.7 per 100,000 population).
- Of 842 suspect animal samples tested for toxoplasma in 2019, 288 (34.2%) were positive for *T. gondii*. Positive suspect samples were detected in bovine cattle over 2 years (30 of 58), sheep (251 of 769), wallabies (5 of 8) and zoo animals (2 of 2).

### Leptospirosis

- There were 25 cases of leptospirosis notified in humans in 2019, (CIR of 0.5 per 100,000 population) compared to 19 cases in 2018 (CIR of 0.4 per 100,000 population).

### Other Zoonoses

- Nine cases of yersiniosis were reported in humans in 2019. Of 6,987 suspect private and industry samples tested, 9 (0.1%) were positive for *Yersinia*. Positive samples included bovine cattle over 2 years (4 of 4,807), goats (1 of 44), fattening pigs (1 of 478) and sheep (3 of 1,377). *Y. pseudotuberculosis* (n=7) was the most commonly detected species.
- No human cases of trichinellosis were notified in Ireland in 2019. There were 3,534 objective samples tested for *Trichinella* in pigs, solipeds, sows and boars with no positive samples detected. Of 3,389,544 census samples taken in pigs, solipeds, sows and boars in 2019, none were positive for *Trichinella*.
- Two cases of Q fever were reported in Ireland in 2019. No published data was available on *Coxiella* in Irish animals in 2019 at the time of publication of this report.
- No cases of echinococcosis were notified in 2019.

### Foodborne outbreaks

In 2019, 25 foodborne outbreaks were reported. These were all categorised as weak evidence outbreaks. No strong evidence outbreaks were reported. Outbreaks are categorised as having 'strong evidence' or 'weak evidence' based on an assessment of multiple types of evidence linking the suspect food to illnesses and exposure (i.e., microbiological, epidemiological, descriptive, environmental, traceability (tracing back/forward) of the investigated foodstuffs).

Fourteen outbreaks were linked to tap water, including well water.

### Foodborne outbreaks reported in 2019

Causative Agent	Food Vehicle	No. of weak evidence outbreaks	No. of human cases	No. hospitalised	No. deaths
<i>Campylobacter</i>	Unknown	1	11	1	0
<i>Cryptosporidium</i>	Tap water, including well water	1	2	0	0
<i>Giardia</i>	Tap water, including well water	2	4	0	0
Norovirus	Tap water, including well water	1	55	0	0
Norovirus	Unknown	2	41	0	0
<i>Salmonella</i>	Other, mixed or unspecified poultry meat and products thereof	1	5	0	0
<i>Salmonella</i>	Unknown	3	9	1	0
Unknown	Tap water, including well water	1	17	0	0
Unknown	Other foods	1	9	0	0
Unknown	Unknown	1	11	0	0
STEC O145	Tap water, including well water	1	2	0	0
STEC O26	Tap water, including well water	6	19	3	0
STEC, unspecified	Tap water, including well water	2	4	0	0
STEC, unspecified	Unknown	2	4	1	0
<b>TOTALS</b>		<b>25</b>	<b>193</b>	<b>6</b>	<b>0</b>

### References

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