

# Overview of 2014 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 and; (ii) 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 nationwide 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 (EFSA, 2016).

The data in the 2014 tables for the results of Irish testing carried out in food, animal and animal feed samples are presented in two categories (convenience and suspect sampling) depending on the sampling context. 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. The samples obtained from this procedure are not randomly collected and may have a

higher likelihood of having pathogens present. Convenience sampling is used in exploratory research when the researcher is interested in getting an inexpensive approximation of the truth. The samples are selected because they are convenient and easy to obtain. This non-probability method is often used during preliminary research efforts to get a gross estimate of the results, without incurring the cost or time required to select a random sample. This methodology is potentially subject to serious bias (EFSA, 2015).

## Overview of 2014 data

### Campylobacteriosis

- *Campylobacter* remained the most common bacterial cause of gastroenteritis in Ireland and in the European Union in 2014 (EFSA and ECDC, 2015). There were 2,616 cases of human campylobacteriosis reported in Ireland in 2014, corresponding to a crude incidence rate (CIR) of 57.0 cases per 100,000 population. This was an increase on the 2,276 cases (CIR 49.6 per 100,000 population) reported in Ireland in 2013. In Europe, there were 236,851 cases reported in 2014 with a corresponding CIR of 71.0 per 100,000 population.
- A total of 731 food samples were tested for *Campylobacter* spp. in 2014 with a total of four positive food samples detected (0.5%). Of these, three were detected in convenience sampling of meat products [broiler (n=1), mixed meat (n=1) and turkey (n=1)] and one was detected in convenience sampling of fresh meat [broiler (n=1)]. The positive sample was found in a meat product [broiler (n=1)]. Four of the positives samples were detected in ready-to-eat (RTE) foods.
- Out of 2,581 suspect animal samples tested for *Campylobacter*, 203 (7.9%) were positive. *Campylobacter jejuni* was identified from 92.6% of positive samples (n=188).

### Salmonellosis

- In 2014, there were 260 reported cases of salmonellosis in Ireland (CIR 5.7 per 100,000 population) which is a decrease on the previous year (324 reported cases, CIR 7.1 per 100,000 population). The Irish figures for 2014 were below the European average CIR of 23.4 per 100,000 population (EFSA and ECDC, 2015)).
- Of 258 human *Salmonella* isolates referred to the National Salmonella Shigella and Listeria Reference Laboratory (NSSLRL) for typing in 2014, the most common serotypes were *Salmonella* Typhimurium (including monophasic *S. Typhimurium*) (n=107, 41.5%) and *Salmonella* Enteritidis (n=44, 17.1%).
- A total of 6,735 food samples were tested for *Salmonella* in 2014. *Salmonella* was not detected in any of 1,893 (convenience sampling) or 145 (suspect sampling) RTE meat samples tested. Two of 202 convenience raw meat samples (1%) and 35 of 386 (9.1%)

convenience meat samples of unspecified RTE status were positive for *Salmonella* spp. *Salmonella* was not detected in any of 4,098 non-meat foods tested.

- *Salmonella* Bredney (37.8%), *Salmonella* Kentucky (13.5%), *Salmonella* Amager (10.8%), *Samonella* spp. (10.8%) and *Salmonella* Brandenburg (8.1%) were the predominant serotypes recovered from meat in 2014.
- In 2014, 1 of 598 (0.2%) of breeding and commercial flocks were positive for *Salmonella*. The isolate was detected in a broiler (convenience sample) and serotyped as *S. Tennessee*.
- Of 12,039 suspect samples from other animals tested for *Salmonella* spp. in 2014, 2.7% (n=324) were positive. Positive samples were from bison (zoo animal) (n=1), cattle (n=263), dogs (n=3), pigs (n=36), sheep (n=16) and solipeds (n=5).
- *Salmonella* spp. was detected in two of 253 (0.8%) feed material samples analysed in 2014 (all convenience sampling).
- In 2014, 20% (n=1 of 5 tested), 100% (n=8 of 8 tested), 100% (n= 2 of 2 tested) of *S. Typhimurium* poultry, bovine and porcine isolates, respectively, tested against a panel of 15 antimicrobial agents were resistant to at least one antimicrobial.

### Cryptosporidiosis

- In 2014, 394 cases of cryptosporidiosis were notified in Ireland (CIR of 8.6 per 100,000 population) which is a decrease on the 514 cases (CIR 11.2 per 100,000 population) reported in 2013.

### Verocytotoxigenic *Escherichia coli* (VTEC)

- In 2014, there were 707 VTEC notifications (CIR 15.4 per 100,000 population) in Ireland, which is a slight increase from 2013 (701 cases, CIR of 15.3 per 100,000 population). The European CIR for VTEC infections in 2014 was 1.56 per 100,000 population (5,995 confirmed cases of VTEC were reported in the EU in 2014; EFSA and ECDC, 2015). The reported VTEC incidence rate in Ireland is generally high relative to other European countries. For many years, Ireland has reported the highest VTEC incidence rate of any Member State in the EU, except in 2011 when Germany reported the highest rate due to a large VTEC O104 outbreak linked to fenugreek seeds.
- In 2014, there were 83 VTEC outbreaks which involved 275 cases of illness. One outbreak (family outbreak, 3 persons ill) was reported as being suspected to be foodborne, however the suspected food item was not reported. A higher number of outbreaks were reported in 2013 (96 outbreaks) which included 221 reported cases of illness. The dominant transmission routes reported for VTEC infection in Ireland have

been person-to-person spread, especially in childcare facilities and among families with young children, and waterborne transmission associated with exposure to water from untreated or poorly private water sources. Person-to-person was suspected to have played a role in 45 (54%) VTEC outbreaks in 2014 in which 140 persons were reported ill. Waterborne transmission was reported to have contributed to nine outbreaks (10.8%) with 19 persons ill.

- Of 309 food samples tested for VTEC in 2014, 3 (1%) were positive. The VTEC isolates (serotype unspecified) were detected in convenience samples of raw beef (n=2) and raw minced meat (n=1) at retail level.

### Listeriosis

- Fifteen cases of listeriosis were notified in Ireland in 2014 (CIR of 0.3 per 100,000 population). This is higher than reported in 2013 (eight cases, CIR of 0.2 per 100,000 population). Listeriosis in Ireland is below the 2014 European average CIR of 0.52 per 100,000 population (EFSA and ECDC, 2015).
- Of 3,048 detection tests (presence or absence) carried out on foods for *Listeria*, 46 (1.5%) were positive for *Listeria monocytogenes*. Of these, 9 positives were detected in convenience samples of meat (5 of which were RTE foods and two were offal-liver samples of unspecified RTE status). A further two positives were detected in suspect samples of RTE meat. The remaining positives were detected in other foods, with 31 positives detected in convenience samples (4 RTE foods and 27 of unspecified RTE status) and 6 detected in suspect samples (3 RTE foods and 3 of unspecified RTE status).
- Of 8,215 enumeration tests (number of colony forming units per gram) carried out on foods for *Listeria*, *L. monocytogenes* was detected in 5 samples at >100 cfu/g. Of these, four were detected in convenience meat samples (two in RTE foods and two other samples of unspecified RTE status) and one in other foods of unspecified RTE status (convenience sampling).
- In 2014, *Listeria* was detected in 97 of 12,046 (0.8%) animal samples from alpacas (n=1), cattle (n=80) and sheep (n=16). Of these, 90.7% (88/97) were serotyped as *L. monocytogenes*.

### Tuberculosis (TB)

- In 2014, 318 cases of TB were notified in Ireland (CIR of 6.9 per 100,000 population), which is a decrease on the previous year (372 cases, CIR of 8.1 per 100,000 population). *Mycobacterium tuberculosis* was identified in 226 (97.8%) of the 231 culture confirmed cases for 2014.

- Two cases of *Mycobacterium bovis*-associated TB were reported in 2014, which is a decrease on the five cases reported in Ireland in 2013. 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 2014, 3.6% of bovine herds were positive for TB which is slightly less than the 3.9% reported in 2013.
- Of 1,750 convenience and 17 suspect animals other than bovine tested for *Mycobacterium* in 2014, 21.1% and 23.5% were positive respectively. Positive convenience samples were detected in badgers (n=313), deer (n=53), ducks (n=2), land game (n=1), while positive suspect samples were detected in cats (n=4).

### Brucellosis

- There were three cases of brucellosis reported in humans (two female and one male) in 2014, compared to one reported case in 2013.
- Tests on 20,022 bovine herds and 10,218 bovine herds by bulk milk in 2014 were negative for *Brucella*. There were five seropositive animals detected out of 5,714 animals serologically tested under investigations of suspect cases. However, there were no animals positive in microbiological testing and/or positive to the brucellosis skin test (BST) under investigation of suspect cases.

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

- No new vCJD cases were notified in 2014. The last case of vCJD was notified in 2006.
- There were no cases of BSE in cattle was reported in 2014 compared to one case reported in 2013.
- In 2014, 26 (0.12%) out of 21,660 sheep tested were positive for scrapie.

### Toxoplasmosis

- There were 20 toxoplasmosis notifications in humans in 2014 (CIR of 0.4 per 100,000 population), a decrease to the previous year in which 32 notifications were reported (CIR of 0.7 per 100,000 population).

- *Toxoplasma gondii* was detected in 8.9% (62 of 697) of sheep and 4.5% (2 of 44) cattle tested.

### Leptospirosis

- There were 23 cases of leptospirosis notified in humans in 2014, (CIR of 0.5 per 100,000 population) which is higher than 2013 in which 14 cases were notified (CIR of 0.3 per 100,000 population).

### Others

- No human cases of trichinellosis, echinococcosis or Q fever were notified in Ireland in 2014. There were five reported cases of yersiniosis (CIR of 0.1 per 100,000 population).
- Of 11,806 animals tested for *Yersinia*, 7 (0.06%) were positive.
- There were 3,054,092 tests carried out for *Trichinella* in animals with no positive samples detected.
- *Coxiella* was detected in 5.1% (21 of 413) of animals tested in 2014. All 21 positives were from cattle and identified as *Coxiella burnetii*.

### References

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