SCIENTIFIC REPORT OF EFSA AND ECDC

The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2013[1]

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ABSTRACT

This report of the European Food Safety Authority and the European Centre for Disease Prevention and Control presents the results of the zoonoses monitoring activities carried out in 2013 in 32 European countries (28 Member States and four non-Member States). Campylobacteriosis was the most commonly reported zoonosis. After several years of an increasing European Union (EU) trend, the human campylobacteriosis notification rate has stabilised. In food and animals no EU trends were observed and the occurrence of *Campylobacter* continued to be high in broiler meat at EU level. The decreasing EU trend in confirmed human salmonellosis cases observed in recent years continued. Most Member States met their *Salmonella* reduction targets for poultry. In foodstuffs, the reported EU-level *Salmonella* non-compliance in fresh poultry meat decreased. Human listeriosis increased further, showing an increasing EU trend in 2009-2013. In ready-to-eat foods *Listeria* was seldom detected above the legal safety limit. Also during 2009-2013, a decreasing EU trend was observed in confirmed yersiniosis cases. Positive findings for *Yersinia* were mainly reported in pig meat and products thereof. The number of confirmed verocytotoxigenic *Escherichia coli* (VTEC) infections in humans increased. VTEC was reported from food and animals. A total of 5,196 food-borne outbreaks, including water-borne outbreaks, were reported in the EU. Most food-borne outbreaks were caused by *Salmonella*, followed by viruses, bacterial toxins and *Campylobacter*, whereas in 28.9 % of all outbreaks the causative agent was unknown. Important food vehicles in strong-evidence food-borne outbreaks were eggs and egg products, followed by mixed food, and fish and fish products. The report further summarises trends and sources along the food chain of tuberculosis due to *Mycobacterium bovis*, *Brucella*, *Trichinella*, *Echinococcus*, *Toxoplasma*, rabies, *Coxiella burnetii* (Q fever), West Nile Virus and tularaemia.

KEY WORDS

zoonoses, monitoring, *Salmonella*, *Campylobacter*, *Listeria*, parasites, food-borne outbreaks

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THE EUROPEAN UNION SUMMARY REPORT

Trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2013

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This report was revised to reflect updated datasets submitted by Romania, Ireland, Portugal and Germany during 2015. The updated data relate to Salmonella in poultry species for Romania, verocytotoxigenic Escherichia coli (VTEC) in dairy products for Ireland, rabies in stray dogs and stray cats for Portugal, and West Nile virus (WNV) in birds for Germany. The following sections on Salmonella were amended: Summary – Salmonella (p. 5) and rabies (p. 9); Section 3.1.2 – Salmonella in animals (Table 5 Salmonella in breeding flocks, Table 6 Salmonella in laying hen flocks, Table 7 Salmonella in broiler flocks, Table 9 Salmonella in fattening flocks of turkeys and related Figures); and Section 3.1.4 – Salmonella discussion. The revised data did not change the outcome that Romania met its Salmonella reduction targets for poultry in 2013. At EU level, the prevalence of the five targeted Salmonella serovars in adult breeding flocks tested under the mandatory Salmonella control programmes was 0.6% in 2013, unchanged from 2012. In relation to VTEC, Section 3.4.2 (test results in dairy products found negative by Ireland) was amended. Section 3.11.2 on rabies was amended (rabies in animals with testing results in stray dogs and stray cats found negative by Portugal). Section 3.13.2 on WNV was amended (WNV in animals with test results in birds found negative by Germany).

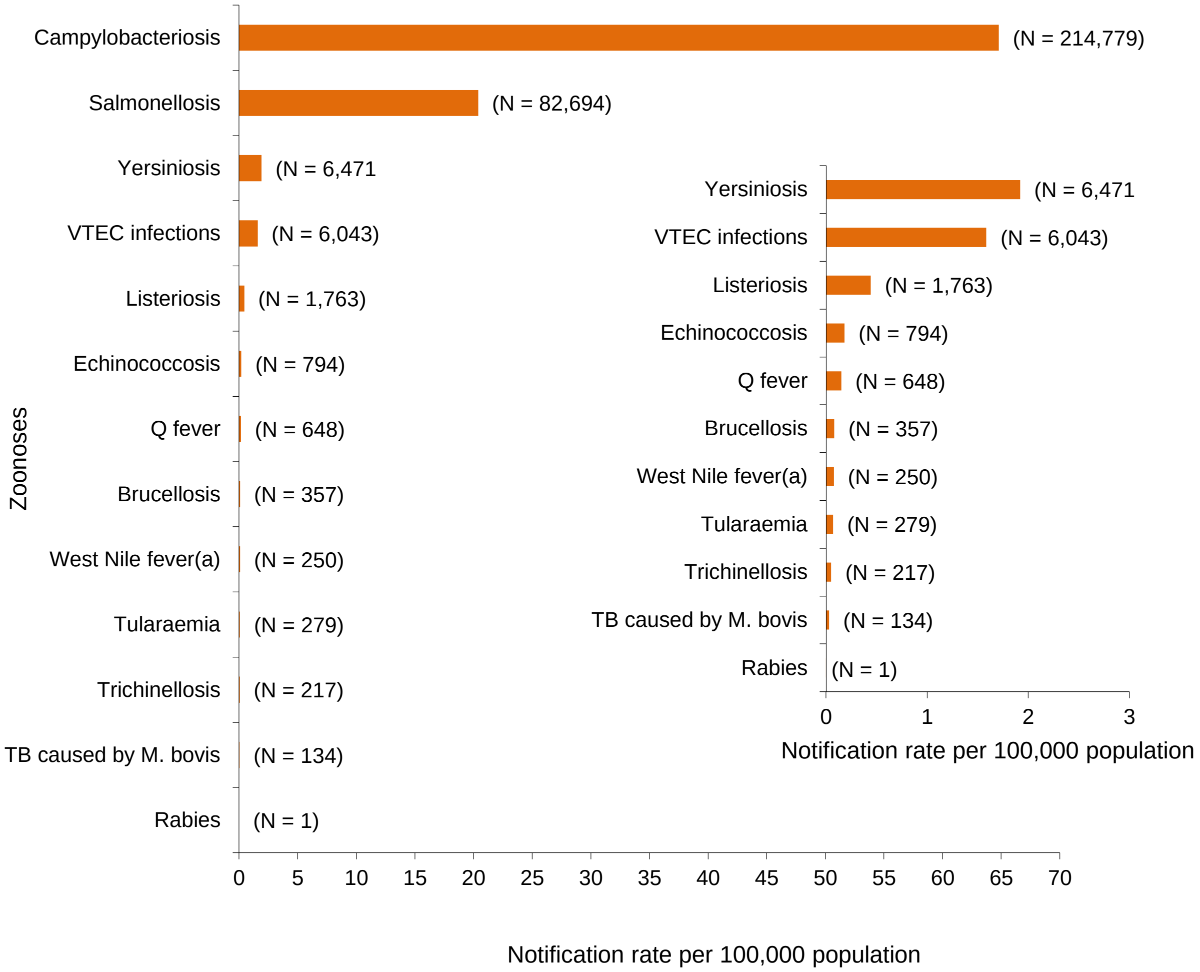
Summary

The report presents the results of the zoonoses monitoring activities carried out in 2013 in 32 European countries:eg 28 Member States (MS) and four non-Member States (non-MS) European Free Trade Association (EFTA) countries. The European Food Safety Authority (EFSA) and the European Centre for Disease Prevention and Control (ECDC) summarised all submitted data on the occurrence of zoonoses and food-borne outbreaks.

Campylobacter

Humans

In 2013, *Campylobacter* continued to be the most commonly reported gastrointestinal bacterial pathogen in humans in the European Union (EU) and has been so since 2005. The number of reported confirmed cases of human campylobacteriosis was 214,779 (Figure 1) with an EU notification rate of 64.8 per 100,000 population which was at the same level as in 2012. The twelve-month moving average was fairly stable over the five-year period 2009-2013 when analysed by month. Considering the high number of human campylobacteriosis cases, the severity in terms of reported case fatality was low (0.05 %) (Table 1).



(a): For West Nile fever, the total number of cases was used.
(b): The ordering of the diseases is according to the notification rate.
(c): Total number of confirmed cases is indicated in parenthesis at the end of each bar.

Figure 1. Reported notification rates of zoonoses in confirmed human cases[(b),(c)] in the EU, 2013

Foodstuffs

Overall, 31.4 % of the samples (single or batch) of fresh broiler meat were found to be positive for *Campylobacter* in the reporting MS, with important variations between MS. The apparent increase in the proportion of *Campylobacter*-positive broiler meat samples from 2012 to 2013 is mainly due to the inclusion of findings from Croatia, who reported data for the first time in 2013. *Campylobacter* was also detected in turkey meat at moderate level and in other foods at low to very low levels.

Animals

The majority of the tested broilers were reported by the Nordic countries, where the *Campylobacter* prevalence in broilers is generally at a low to moderate level due to control programmes. Overall, *Campylobacter* was found in 29.6 % of the tested slaughter batches, 15.1 % of the tested flocks and 30.4 % of the tested animals. The prevalence in the investigations varied greatly between MS.

Campylobacter food-borne outbreaks

In 2013, 414 *Campylobacter* outbreaks were reported, of which 32 were strong-evidence outbreaks. The sources of these strong-evidence outbreaks were, in decreasing order of importance, broiler meat and products thereof; other, mixed or unspecified poultry meat and products thereof, and milk and mixed food.

Table 1. Reported hospitalisation and case-fatality rates due to zoonoses in confirmed human cases in the EU, 2013

Disease	Number of confirmed[a] human cases	Hospitalisation				Deaths			
		Confirmed cases covered[a],[b] (%)	Number of reporting MS[c]	Reported hospitalised cases	Hospitalisation rate (%)	Confirmed cases covered[a],[b] (%)	Number of reporting MS[c]	Reported deaths	Case-fatality rate (%)
Campylobacteriosis	214,779	12.7	13	11,922	43.6	52.9	14	56	0.05
Salmonellosis	82,694	26.4	12	7,841	36.0	49.6	14	59	0.14
Yersiniosis	6,471	15.3	12	481	48.4	62.4	14	2	0.05
VTEC infections	6,043	41.1	16	922	37.1	59.3	18	13	0.36
Listeriosis	1,763	42.1	15	735	99.1	69.7	19	191	15.6
Echinococcosis	794	22.7	12	127	70.6	28.5	13	2	0.88
Q fever	648	NA	NA	NA	NA	51.2	11	2	0.61
Brucellosis	357	55.2	9	139	70.6	28.3	11	1	0.99
Tularaemia	279	26.9	8	39	52.0	46.2	9	0	0
West Nile fever[a]	250	20.8	3	52	91.7	90.8	6	16	3.4
Trichinellosis	217	74.7	7	106	65.4	82.5	8	1	0.56
Rabies	1	100	1	1	100	100	1	1	100

NA: not applicable as the information is not collected for this disease.
(a): For West Nile fever the total number of cases were included.
(b): The proportion (%) of confirmed cases for which the information on hospitalisation or death was available.
(c): Not all countries observed cases for all diseases.

Salmonella

Humans

In 2013, a total of 82,694 confirmed salmonellosis cases were reported by 27 EU MS, resulting in an EU notification rate of 20.4 cases per 100,000 population. This represented a 7.9 % decrease in the EU notification rate compared with 2012, and there was a declining trend of salmonellosis in the EU/European Economic Area (EEA) in the five-year period of 2009-2013, although this was not statistically significant when analysed by month. Fifty-nine fatal cases were reported by 9 MS among the 14 MS that provided data on the outcome of their cases. This gives an EU case-fatality rate of 0.14 % among the 40,976 confirmed cases for which this information was available (Table 1).

As in previous years, the two most commonly reported *Salmonella* serovars in 2013 were *S.* Enteritidis and *S.* Typhimurium, representing 39.5 % and 20.2 %, respectively, of all reported serovars in confirmed human cases. *S.* Enteritidis continued to decrease, with 4,720 fewer cases (14.1 % less) reported in the EU in 2013 than in 2012. In the two-year period from 2011 to 2013, cases of *S.* Typhimurium, including the variant monophasic *S.* Typhimurium 1,4,[5],12:i:-, decreased by 11.1 %. Cases of *S.* Infantis, the fourth most common serovar, increased by 26.5 %. The increase observed in *S.* Derby, the fifth most common serovar in 2013, could be partly explained by a local outbreak in one MS.

Foodstuffs

Generally there was no major change as regards *Salmonella*-contaminated foodstuffs compared with previous years. *Salmonella* was most frequently detected in poultry meat, and less often in pig or bovine meat. The highest proportions of *Salmonella*-positive single samples were reported for fresh turkey meat at an average level of 5.4 %, followed by fresh broiler, pig and bovine meat. *Salmonella* was rarely found in table eggs, at levels of 0.03 % (single samples) or 0.5 % (batch samples). The most important source of food-borne *Salmonella* outbreaks was, however, still eggs and egg products. *Salmonella* was also detected in other foods at low to very low levels. The highest levels of non-compliance with *Salmonella* criteria generally occurred in foods of meat origin, which are intended to be cooked before consumption, and the overall level of non-compliance was low (< 10 %).

Since December 2011, a *Salmonella* criterion for *S.* Enteritidis and *S.* Typhimurium (including monophasic *S.* Typhimurium strains with the antigenic formula 1,4,[5],12:i:-) in fresh poultry meat (including fresh meat from breeding flocks of *Gallus gallus*, laying hens, broilers and breeding and fattening flocks of turkeys) has been in force. Compared with 2012, the reported non-compliance decreased from 0.5 % to 0.2 % in single samples and from 0.7 % to 0.2 % in batches, which is a very encouraging trend, indicating that the continued investment of MS in *Salmonella* control is yielding noticeable results.

Animals

There was a further reduction of the prevalence of target *Salmonella* serovars in all poultry populations. Moreover, the number of countries meeting the specific 2013 reduction target increased compared with 2012; in particular, all countries achieved the target for laying hen flocks and breeding turkey flocks.

Twenty-two MS met the *Salmonella* reduction target of ≤ 1 % set for breeding flocks of *Gallus gallus* (fowl) and, at the EU-level, 0.6 % of these flocks were positive during their production period for the target serovars, as in 2012. In the case of flocks of laying hens, all MS met their relative *Salmonella* reduction targets and the EU prevalence for the two target serovars (*S.* Enteritidis and *S.* Typhimurium) was further reduced from 1.3 % in 2012 to 1.0 % in 2013. In broiler flocks, 26 MS met the reduction target set at ≤ 1 % for the two serovars (*S.* Enteritidis and *S.* Typhimurium) and the EU prevalence for the target serovars was 0.2 %, compared with 0.3 % in 2012. In turkeys, the same reduction target is in force as for broilers, and all 14 MS which reported data on turkey breeding flocks met the target, with an overall prevalence of 0.3 % for the two target serovars (0.5 % in 2012). A further 21 MS met the target for fattening turkey flocks before slaughter. At the EU level, 0.2 % of the fattening turkey flocks were infected with the two target serovars (0.4 % in 2012).

Salmonella findings were also reported in other animal species, including ducks, geese, pigs, cattle, sheep and goats.

Feedingstuffs

The overall level of *Salmonella* contamination in animal- and vegetable-derived feed material in 2013 was low (1.4 %). The highest proportion of positive samples in individual investigations was reported for the feed category ‘Feed material of oil seed or fruit origin’, mainly rape seed-derived, soya (bean)-derived, sunflower seed-derived and cotton seed-derived feed.

In compound feedingstuffs, i.e. the finished feed for animals, the overall EU proportion of *Salmonella*-positive findings in 2013 was low for all animal populations: 1.8 % of 1,091 tested samples for cattle, 1.6 % of 1,590 tested samples for pigs, and 1.9 % of 2,551 tested samples for poultry.

Serovars

From fowl (*Gallus gallus*) *S.* Infantis was the most commonly reported isolated serovar in 2013; in broiler meat the most common serovars were *S.* Infantis and *S.* Enteritidis, while from feed for *Gallus gallus*, *S.* Senftenberg was most commonly reported, followed by *S.* Typhimurium.

In turkeys it was *S.* Saintpaul that was most frequently reported in 2013, while in turkey meat the three most common reported serovars were *S.* Derby, *S.* Typhimurium and *S.* Stanley.

S. Typhimurium was the most frequently reported serovar in pigs and pig meat followed by *S.* Derby and monophasic variants of *S.* Typhimurium. *S.* Senftenberg was the serovar most often reported from pig feed, followed by *S.* Typhimurium.

In cattle, it was *S.* Typhimurium that was most commonly reported, followed by *S.* Dublin. Also in bovine meat, *S.* Typhimurium was the most frequently reported serovar but followed by *S.* Enteritidis and *S.* Derby. *S.* Infantis was the serovar most often reported from feed for cattle, in 2013.

***Salmonella* food-borne outbreaks**

Salmonella remained the most frequently detected causative agent in the food-borne outbreaks reported (22.5 % of total outbreaks). From 2008 to 2013, the annual total number of *Salmonella* outbreaks within the EU decreased markedly by 38.1 %, from 1,888 to 1,168 outbreaks.

As in previous years, eggs and egg products were the most common identified food vehicles, associated with 44.9 % of these outbreaks. The next most commonly implicated single food vehicle category in the *Salmonella* outbreaks was sweets and chocolates (10.5 % of strong-evidence outbreaks), followed by pig meat and products thereof.

Listeria

Humans

In 2013, 27 MS reported 1,763 confirmed human cases of listeriosis. The EU notification rate was 0.44 cases per 100,000 population which represented an 8.6 % increase compared with 2012. There was a statistically significant increasing trend of listeriosis in the EU/EEA over the period 2009-2013.

A total of 191 deaths due to listeriosis were reported in 2013 with France reporting the highest number, 64 cases. The EU case-fatality rate was 15.6 % among the 1,228 confirmed cases with known outcome (Table 1).

Foodstuffs

In 2013, the non-compliance for different ready-to-eat (RTE) food categories was generally at a level comparable to previous years, with the level of non-compliance highest in fishery products at processing plant (mainly smoked fish). Consistent with the results of the EU baseline study on the prevalence of *L. monocytogenes* in certain RTE foods at retail, the proportion of positive samples at retail were highest in fish products (mainly smoked fish), followed by soft and semi-soft cheeses, RTE meat products and hard cheeses.

Listeria food-borne outbreaks

In 2013, a total of 13 *Listeria* outbreaks were reported by seven MS and one non-MS. This was slightly higher than in the previous years. Eight of the outbreaks reported in 2013 were supported by strong evidence, where crustaceans, shellfish and molluscs and products thereof, were implicated in three outbreaks.

Verocytotoxigenic *E. coli*

Humans

In 2013, 6,043 confirmed cases of verocytotoxigenic *Escherichia coli* (VTEC) infections were reported in the EU. The EU notification rate was 1.59 cases per 100,000 population, which was 5.9 % higher than in 2012. The EU notification rate in the two consecutive years following the large outbreak in 2011 was higher than before the outbreak, possibly an effect of increased awareness and of more laboratories testing also for other serogroups than O157. In 2013, 13 deaths due to VTEC infection were reported in the EU which resulted in an EU case-fatality rate of 0.36 % among the 3,582 confirmed cases for which this information was provided (Table 1).

The most commonly reported VTEC serogroup in 2013 was, as in previous years, O157 (48.9 % of cases with known serogroup). Serogroup O26, the second most common in 2013, increased by 65.1 % between 2011 and 2013. The proportion of non-typable VTEC strains doubled in the same period. The serogroup which increased the most between 2011 and 2013 was O182 which was reported by five countries in 2013 compared to only one in 2011 and 2012.

Foodstuffs and animals

No trends were observed in the presence of VTEC in food and animals. VTEC serogroup O157 was primarily detected in ruminants (cattle, sheep and goats) and meat thereof. The proportion of VTEC found in sheep and goats, and ovine meat reported by the MS was higher than the proportion found in cattle and in bovine meat, although only few MS provided data.

The main reported VTEC serogroups in food were O157, O26, O103, O121 and O55. The human pathogenic VTEC serogroups isolated from the bovine meat and cattle samples included VTEC O157, O26, O87, O103 and O113, whereas O145 and O111 were also detected from milk samples.

In 2013, more than twenty different serogroups were reported from cattle, and the most frequently reported were; O157, O26, O174, O103, O91, O185 and O22. Besides serogroup O157, a range of serogroups were detected in sheep: O76, O146, O113, O103: O112, O121, O149 and others.

VTEC food-borne outbreaks

In 2013, a total of 73 outbreaks caused by VTEC were reported, whereof 12 were supported by strong evidence. The main food vehicle was bovine meat and products thereof, followed by 'Vegetables and juices and other products thereof' and cheese.

Yersinia

Humans

A total of 6,471 confirmed cases of yersiniosis were reported in 2013, making it the third most commonly reported zoonosis in the EU. The EU notification rate was 1.92 cases per 100,000 population which was a decrease of 2.8 % compared to 2012. There was a statistically significant decreasing five-year trend in the EU in 2009–2013. The highest country-specific notification rates were observed in MS in north eastern Europe. *Yersinia enterocolitica* was the dominating species among human cases.

The EU case-fatality rate was 0.05 %; two fatal cases due to infections with *Y. pseudotuberculosis* were reported in 2013 among the 4,036 confirmed yersiniosis cases for which this information was reported (Table 1).

Food and animals

Five MS reported positive findings for *Yersinia* (mostly *Y. enterocolitica*) in pig meat and products thereof. Positive findings were also reported in bovine meat and unpasteurized (raw) cow milk intended for direct human consumption. *Yersinia* was reported in pigs at low levels. Positive findings were also reported in other animal species, including wildlife animals, cattle, sheep, goats, dogs, cats, solipeds etc.

Tuberculosis due to *Mycobacterium bovis*

Humans

Tuberculosis due to *M. bovis* is a rare infection in humans in the EU, with 134 confirmed human cases reported in 2013. The case numbers in the EU have been stable in the last two years. There was no clear association between a country's status as officially free of bovine tuberculosis (OTF) and notification rates in humans. The EU notification rate in 2013 was 0.03 cases per 100,000 population.

Animals

At the EU-level, the proportion of cattle herds infected with or positive for *M. bovis* remained very low (0.68 % of the existing herds). The distribution of *M. bovis* across EU is, however, heterogeneous with a prevalence ranging from absence of infected/positive animals in many OTF regions to a prevalence of 12.1 % in the non-OTF regions of the United Kingdom (England, Northern-Ireland and Wales). In the non-OTF regions, the number of herds infected with, or positive for, *M. bovis* was similar to in 2012 and no major changes were observed within the non-OTF MS or parts thereof.

Brucella

Humans

Brucellosis is a rare infection in humans in the EU with 357 confirmed cases reported in 2013. The highest notification rates and the majority of the autochthonous cases were reported from Mediterranean countries that are not officially brucellosis-free in cattle, sheep or goats. No significant increasing or decreasing trend of human brucellosis could be observed at the EU level in the last five years. Seventy percent of the human brucellosis cases had been hospitalised, but only one fatal case was reported in 2013 (Table 1).

Foodstuffs

There were no *Brucella*-positive findings in the surveillance samples of cheeses, other dairy products and raw milk from cows and other animal species, reported by two Mediterranean MS.

Animals

A further decreasing tendency was observed in the prevalence of both bovine and small ruminant brucellosis within the EU. In 2013 brucellosis remained a rare (bovine brucellosis) or very low frequency (ovine and caprine brucellosis) event at the EU level. Both bovine and small ruminant brucellosis cases of infected or positive herds are mostly reported by four Mediterranean MS Italy, Portugal, Greece and Spain. Bovine brucellosis was also reported by Northern Ireland in the United Kingdom in 28 cattle herds. Almost all non-officially brucellosis-free (non-OBF) MS and non-officially *Brucella melitensis* free (non-ObmF) MS reported fewer positive and/or infected herds than in 2012.

Brucella **food-borne outbreaks**

In 2013, four weak-evidence *Brucella* outbreaks (involving seven hospitalised cases) were reported by two MS. No strong-evidence outbreaks were reported. The occurrence of these outbreaks illustrates the health risk related to consumption of food contaminated with *Brucella*.

Trichinella

Humans

In 2013, 217 confirmed trichinellosis cases were reported in the EU. The EU notification rate decreased by 17.7 % compared with 2012 and was 0.05 cases per 100,000 population in 2013. The highest notification rates were reported in Romania, Latvia and Bulgaria. The temporal trend of trichinellosis in the EU in 2009-2013 was greatly influenced by a number of smaller and larger outbreaks with peaks often occurring in January. One death due to trichinellosis was reported in 2013 (Table 1).

Animals

Ten MS reported positive findings in farm animals. In pigs, a total of 357 positive findings were reported out of 154,397,532 animals tested (0.0002 %) and the vast majority originated from pigs not raised under controlled housing conditions. Positive findings were mainly reported by eastern EU MS. From a total of 7,908 farmed wild boars tested, two Mediterranean MS reported one positive finding each. No positive findings were reported from 176,497 horses tested in EU.

The overall EU proportion of *Trichinella* positive samples of hunted wild boars was 0.1 % and originated mostly from eastern EU MS. Most of the *Trichinella*-positive reporting in wildlife other than wild boar was done by eastern and north eastern EU MS, in 11 different animal species. Throughout the past years, the highest proportions of positive samples were from raccoon dogs followed by bears. *Trichinella* is found in large parts of Europe as overall 19 MS and two non-MS reported positive findings.

Trichinella **food-borne outbreaks**

In 2013, a total of 22 outbreaks caused by *Trichinella* were reported, whereof 20 supported by strong evidence. As in the previous years, pig meat was the most commonly reported food vehicle.

Echinococcus

Humans

In 2013, a total of 811 echinococcosis cases, of which 794 were laboratory confirmed, were reported in the EU. The EU notification rate was 0.18 cases per 100,000 population which was a decrease of 5.7 % compared with 2012. An increasing number of cases were reported to be infected with *E. multilocularis* (alveolar echinococcosis) throughout the five-year period 2009-2013. In contrast, the number of cases reported to be infected with *E. granulosus* (cystic echinococcosis) decreased in the same period. Two deaths due to *E. multilocularis* were reported in 2013.

Animals

E. multilocularis was reported at low level in foxes by four MS. Czech Republic reported an increase in prevalence of *E. multilocularis* during 2005-2011, as well as Slovakia during 2010-2013. Four MS reported almost all the positive findings of *E. granulosus*; mainly from domestic animals.

Toxoplasma

Animals

In 2013, 14 MS and two non-MS provided data on *Toxoplasma* in animals. Positive findings were detected in pigs, cattle, sheep, goats, dogs, cats, wild boars, deer, water buffaloes, and some other wildlife animal species.

Rabies

Humans

In 2013, one travel-associated case of rabies was reported from the Netherlands. The patient was a 51-year-old male and died after exposure to an unknown source in Haiti.

Animals

In 2013, 778 animals other than bats tested positive for either classical rabies virus or unspecified *Lyssavirus*, in reporting countries. The number of cases reported in 2013 increased compared with 2012, when 712 cases where detected in animals other than bats. In addition, six MS reported rabies cases from bats.

Q-fever

Humans

In 2013, a total of 648 confirmed cases of Q fever in humans were reported in the EU. The EU notification rate was 0.17 per 100,000 population. The highest notification rate was observed in Hungary (1.37 cases per 100,000 population) where an outbreak occurred in 2013.

There was a decreasing EU trend of confirmed Q fever cases in 2009–2013. Two deaths due to Q fever were reported by Germany and Latvia in 2013. This resulted in an EU case-fatality rate of 0.61 % among the 335 confirmed cases for which this information was reported.

Animals

All but three of the 17 reporting MS found animals testing positive to *Coxiella burnetii* (Q fever) in their cattle, sheep or goat populations in 2013. A positive pig herd was also reported by one MS. Compared to the previous years, no general trend was observed as regards the number of samples tested and the number of samples positives.

West Nile virus

Humans

In 2013, a total of 250 cases of West Nile fever in humans were reported in the EU. The EU notification rate of locally acquired and travel-related cases was 0.08 per 100,000 population. There was an overall 0.01 increase in the notification rate compared with 2012 (238 cases). The highest notification rate was observed in Greece (0.78 cases per 100,000 population), as in previous years; however, case reporting varied between countries.

Case numbers in the mostly affected countries have varied from year to year, but more and more areas are affected. Sixteen deaths due to West Nile fever were reported by Greece, Italy and Hungary in 2013. This resulted in an EU case-fatality rate of 3.4 % among the 227 probable and confirmed cases for which this information was reported (90.8 % of all cases).

Animals

Although the number of tested animals increased in 2013 as compared to the previous year, there were less than half as many cases detected in 2013 as compared to 2012. Presumed acute infections in animals (IgM or Polymerase Chain Reaction (PCR) positive samples) were reported only by some of the Mediterranean countries and by the Czech Republic and Hungary.

Tularaemia

Humans

In 2013, a total of 279 confirmed cases of tularaemia in humans were reported in the EU. The EU notification rate was 0.07 cases per 100,000 population which was a 65.3 % decrease compared with 2012. Notification rates vary however across countries and within each country over time. The highest notification rate was observed in Sweden (1.13 confirmed cases per 100,000 population) as in previous years.

There was a decreasing (not significant) EU trend of confirmed tularaemia cases in 2009–2013, and no deaths were reported.

Animals

Occurrence of *Francisella tularensis* was reported by one MS in wild hares.

Other zoonoses and zoonotic agents

Findings of *Taenia saginata* cysts in bovine carcases were reported at very low to rare level by two MS. In addition one MS investigated the presence of *Taenia solium* cysts in pig carcases but no positive findings were reported.

Rare occurrence of *Sarcocystis* in bovine carcases was reported by one MS.

Food-borne outbreaks

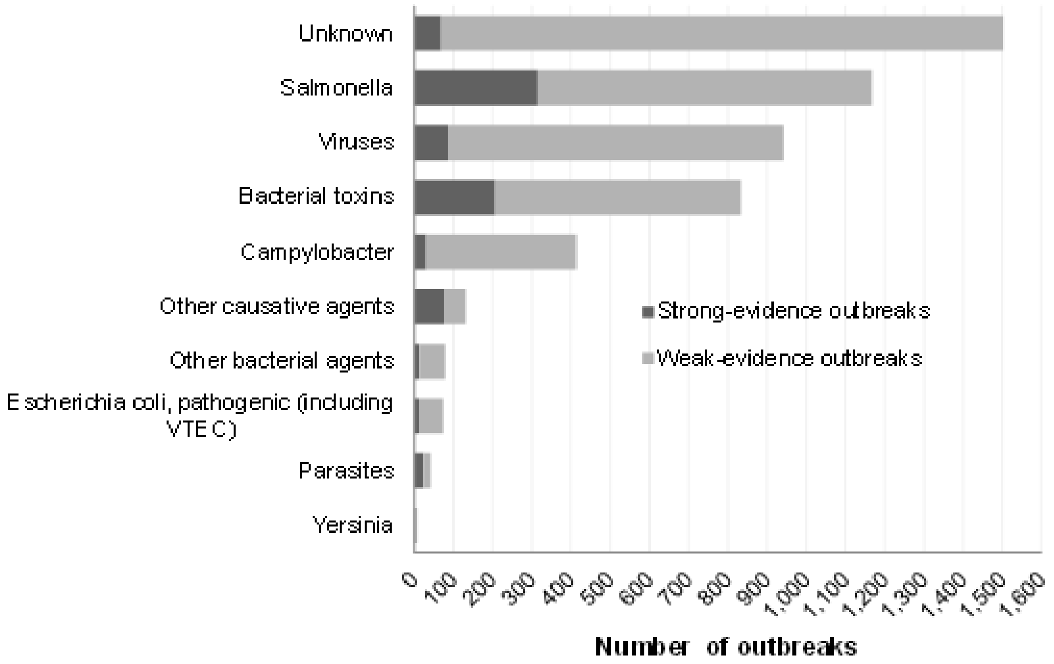
In 2013, a total of 5,196 food-borne outbreaks, including water-borne outbreaks, were reported in the EU. Overall, 43,183 human cases, 5,946 hospitalisations and 11 deaths were reported. The evidence supporting the link between human cases and food vehicles was strong in 839 outbreaks (Figure 2).

The largest number of reported food-borne outbreaks was caused by *Salmonella* (22.5 % of all outbreaks), followed by viruses (18.1 %), bacterial toxins (16.1 %), and *Campylobacter* (8.0 %). For 28.9 % of the outbreaks the causative agent was unknown. Apart from the above mentioned markedly decreasing trend in annual total number of *Salmonella* outbreaks within the EU during the six-year period 2008 to 2013, the number of outbreaks due to bacterial toxins increased by 58.9 %, from 525 to 834 outbreaks, in the same time period. Reported *Campylobacter* food-borne outbreaks decreased compared to 2012, while there was an increase in the outbreaks caused by viruses.

As in the previous years, the most important food vehicles in the strong-evidence outbreaks were eggs and egg products followed by mixed food, and fish and fish products.

Of particular note was the multinational hepatitis A virus (HAV) outbreak occurred in 2013 in several EU/EEA countries, and associated with the consumption of berries and berry products.

In 2013, nine strong-evidence water-borne outbreaks were reported in the EU. Five different pathogens were detected from these nine outbreaks: calicivirus (Norovirus, Norwalk-like virus), verocytotoxigenic *E. coli* (VTEC O128), *Cryptosporidium parvum*, *Cryptosporidium hominis* and *Salmonella*. For three water-borne outbreaks the causative agent was unknown.



Bacterial toxins include toxins produced by *Bacillus*, *Clostridium* and *Staphylococcus*. Food-borne viruses include calicivirus, hepatitis A virus, flavivirus, rotavirus and other unspecified viruses. Other causative agents include mushroom toxins, marine biotoxins, histamine, mycotoxins and escolar fish (wax esters). Parasites include primarily *Trichinella*, but also *Cryptosporidium*, *Giardia* and other unspecified parasites. Other bacterial agents include *Listeria*, *Brucella*, *Shigella*, *Vibrio* and other unspecified bacterial agents. In this figure, the category 'Pathogenic *Escherichia coli* (including VTEC)' also includes one strong-evidence outbreak due to pathogenic *E. coli* other than VTEC.

Figure 2. Distribution of all food-borne outbreaks per causative agent in the EU, 2013

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Legal basis

About EFSA

The European Food Safety Authority (EFSA), located in Parma, Italy, was established and funded by the European Union (EU) as an independent agency in 2002 following a series of food scares that prompted the European public to voice concerns about food safety and the ability of regulatory authorities to protect consumers. EFSA provides objective scientific advice on all matters, in close collaboration with national authorities and in open consultation with its stakeholders, with a direct or indirect impact on food and feed safety, including animal health and welfare and plant protection. EFSA is also consulted on nutrition in relation to EU legislation. EFSA's work falls into two areas: risk assessment and risk communication. In particular, EFSA's risk assessments provide risk managers (EU institutions with political accountability, i.e. the European Commission (EC), the European Parliament and the Council) with a sound scientific basis for defining policy-driven legislative or regulatory measures required to ensure a high level of consumer protection with regard to food and feed safety. EFSA communicates to the public in an open and transparent way on all matters within its remit. Collection and analysis of scientific data, identification of emerging risks and scientific support to the Commission, particularly in the case of a food crisis, are also part of EFSA's mandate, as laid down in the founding Regulation (EC) No 178/2002[4] of 28 January 2002.

About ECDC

The European Centre for Disease Prevention and Control (ECDC), an EU agency based in Stockholm, Sweden, was established in 2004 and became operational in 2005.[5] ECDC's mission is to identify, assess and communicate current and emerging threats to human health from infectious diseases. In order to achieve this mission, ECDC works in partnership with national public health bodies across Europe and other EU agencies to strengthen and develop EU-wide disease surveillance, early warning systems, and response to public health threats in the European Union and European Economic Area countries. By working with networks of experts throughout Europe, ECDC pools knowledge on health so as to provide independent scientific opinions and expert advice about the risks posed by current and emerging infectious diseases.

About the report

The EU system for the monitoring and collection of information on zoonoses is based on the Zoonoses Directive 2003/99/EC,[6] which obliges EU Member States (MS) to collect relevant and, where applicable, comparable data on zoonoses, zoonotic agents, antimicrobial resistance and food-borne outbreaks. In addition, MS are required to assess trends and sources of these agents as well as outbreaks in their territory, submitting an annual report each year by the end of May to the EC covering the data collected. EFSA is assigned the task of examining these data and publishing the EU annual Summary Reports.

The data collection on human diseases from MS is conducted in accordance with Decision 1082/2013/EU[7] on serious cross-border threats to health which in October 2013 replaced Decision 2119/98/EC on setting up a network for the epidemiological surveillance and control of communicable diseases in the EU. The case definitions to be followed when reporting data on infectious diseases to ECDC are described in Decision 2012/506/EU.[8]

Since 2005, ECDC has provided data on zoonotic infections in humans, as well as their analyses, for the EU Summary Report. Starting with the statistics year 2007, data on human cases have been reported from The European Surveillance System (TESSy), developed and maintained by ECDC.

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[4] Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety. OJ L 31, 1.2.2002, p. 1–24.

[5] Regulation (EC) No 851/2004 of the European Parliament and of the Council of 21 April 2004 establishing a European centre for disease prevention and control. OJ L 142, 30.4.2004, p.1-11.

[6] Directive 2003/99/EC of the European Parliament and of the Council of 17 November 2003 on the monitoring of zoonoses and zoonotic agents, amending Council Decision 90/424/EEC and repealing Council Directive 92/117/EEC. OJ L 325, 12.12.2003 p. 31.

[7] Decision No 1082/2013/EU of the European Parliament and of the Council of 22 October 2013 on serious cross-border threats to health and repealing Decision No 2119/98/EC. OJ L 293, 5.11.2013, p. 1-15.

[8] Commission Decision 2012/506/EU amending Decision 2002/253/EC laying down case definitions for reporting communicable diseases to the Community network under Decision No 2119/98/EC of the European Parliament and of the Council. OJ L 262, 27.9.2012, p. 1–57.

Terms of Reference

In accordance with Article 9 of the Zoonoses Directive 2003/99/EC, EFSA shall examine the national reports that MS submit by the end of May to the EC on the trends and sources of zoonoses, zoonotic agents, antimicrobial resistance and food-borne outbreaks in their territory. EFSA shall publish by the end of November a Summary Report on the trends and sources of zoonoses, zoonotic agents and antimicrobial resistance in the EU. The submitted national reports of the MS, and any summaries of them, shall be made publicly available.

1. Introduction

This European Union (EU) Summary Report 2013 on zoonoses, zoonotic agents and food-borne outbreaks was prepared by the European Food Safety Authority (EFSA) in collaboration with the European Centre for Disease Prevention and Control (ECDC). Member States, other reporting countries, the European Commission (EC), members of EFSA's Scientific Panels on Biological Hazards (BIOHAZ) and Animal Health and Welfare (AHAW) and the relevant EU Reference Laboratories (EURLs) were consulted while preparing the report.

The efforts made by MS, the reporting non-MS and the EC in the reporting of zoonoses data and in the preparation of this report are gratefully acknowledged.

The 2013 data on antimicrobial resistance in zoonotic agents submitted and validated by the MS are published in a separate EU Summary Report.

The present EU Summary Report on zoonoses and food-borne outbreaks focuses on the most relevant information on zoonoses and food-borne outbreaks within the EU in 2013. If substantial changes compared with the previous year were observed, they have been reported.

1.1. The structure of the report

The current report, the EU Summary Report 2013, includes an abstract, a summary, an introduction to the zoonoses reporting, a description of materials and methods and an EU assessment of the specific zoonoses. It is available in printable format. The Appendix contains hyperlinks to all data summarised for the production of this report, for humans, food, animals and food-borne outbreaks. It also includes hyperlinks to summary tables and figures that were not displayed in this printable report because they did not trigger any marked observation. The summarised data are presented in downloadable Excel and PDF files, and listed by subject. Moreover, all submitted and validated data by the MS are available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm).

Monitoring and surveillance schemes for most zoonotic agents covered in this report are not harmonised among MS, and findings presented in this report must, therefore, be interpreted with care. The data presented may not have been derived from sampling plans that were statistically designed, and, thus, findings may not accurately represent the national situation regarding zoonoses. Regarding data on human infections, please note that the numbers presented in this report may differ from national zoonoses reports due to differences in case definitions used at EU and national level or because of different dates of data submission and extraction. Results are generally not directly comparable between MS and sometimes not even between different years in one country.

The national zoonoses reports submitted in accordance with Directive 2003/99/EC are published on the EFSA website together with the EU Summary Report. They are available online at http://www.efsa.europa.eu/en/zoonosesscdocs/zoonosescomsumrep.htm.

2. Materials and methods

2.1. Data received in 2013

2.1.1. Human data

The human data analyses in the EU Summary Report for 2013 were prepared by the Food- and Waterborne Diseases and Zoonoses programme at the ECDC and were based on the data submitted via the European Surveillance System (TESSy), hosted at ECDC. Please note that the numbers presented in the report may differ from national reports owing to differences in case definitions used at EU and national level or to different dates of data submission and extraction. The latter may also result in some divergence in case numbers presented in different ECDC reports.

TESSy is a software platform that has been operational since April 2008 and in which data on 52 diseases and special health issues are collected. Both aggregated and case-based data were reported to TESSy. Although aggregated data did not include individual case-based information, both reporting formats were included where possible to calculate country-specific notification rates, case-fatality rates, proportion of hospitalised cases and trends in diseases. Human data used in the report were extracted from TESSy on 29 September 2014. The denominators used for the calculation of the notification rates were the human population data from EUROSTAT March 2014 update.

Data on human zoonoses cases were received from all 28 MS and also from two non-MS: Iceland and Norway. The new MS Croatia reported information for the first time in 2013. Switzerland sent its data on human cases directly to EFSA.

2.1.2. Data on food, animals and feed

All 28 MS submitted data and national zoonoses reports for 2013. The new MS Croatia reported information for the first time in 2013. In addition, data and reports were submitted by the three non-MS: Iceland, Norway and Switzerland. For the ninth consecutive year, countries submitted data on animals, food, feed and food-borne outbreaks using a web-based zoonoses reporting system maintained by EFSA. In addition, many countries submitted their data electronically to the EFSA zoonoses database, through EFSA's Data Collection Framework (DCF).

In 2013, data were collected on a mandatory basis for the following eight zoonotic agents in animals, food and feed: *Salmonella*, *Campylobacter*, *Listeria monocytogenes* (*L. monocytogenes*), verocytotoxigenic *Escherichia coli* (VTEC), *Mycobacterium bovis* (*M. bovis*), *Brucella*, *Trichinella* and *Echinococcus*. In addition, based on the epidemiological situations in MS, data were reported on the following agents and zoonoses: *Yersinia*, *Toxoplasma*, *Lyssavirus* (rabies), *Coxiella burnetii* (Q fever), West Nile virus (WNV), *Cysticerci*, *Francisella*, *Chlamydia* and *Sarcocystis*, and *Bacillus*. Data on *Staphylococcus*, Meticillin-resistant *Staphylococcus aureus* (MRSA) and antimicrobial resistance in indicator *E. coli* and enterococci isolates were also submitted. Furthermore, MS provided data on certain other microbiological contaminants in food – histamine, staphylococcal enterotoxins and *Enterobacter sakazakii* (*Cronobacter* spp.), for which food safety criteria are set down in EU legislation.

The deadline for data submission was 31 May 2013. Two data validation exercises were implemented, by 20 June 2014 and by 25 July 2014, and reporting countries had the opportunity to resubmit revised data by 8 September 2014. Most validated data on food, animals, and feed used in the report were extracted from the EFSA zoonoses database on 12 September 2014. Few subsets of data still needed further corrections after 8 September 2014 before being fully validated and were extracted by 12 December 2014.

The draft EU Summary Report was sent to MS for consultation on 24 November 2014 and comments were collected by 8 December 2014. The utmost effort was made to incorporate comments and data amendments within the available time frame. The report was finalised by 18 December 2014 and published online by EFSA and ECDC on 28 January 2015.

In this report, data are presented on the eight mandatory zoonotic agents and also on rabies, *Toxoplasma*, Q fever, WNV, *Yersinia*, *Francisella*, *Cysticercus* and *Sarcocystis*.

For each pathogen, an overview table presenting all MS reported data is available. However, for the summary tables, data from industry own-control programmes and Hazard Analysis and Critical Control Point (HACCP) sampling and, unless stated otherwise, data from suspect sampling, selective sampling and outbreak or clinical investigations are excluded. More details regarding the 2013 zoonoses models for data entry and the picklists (qualitative classifications) of variables are available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm). As regards the number of samples of investigations, there was no restriction and also smaller sample sizes, of fewer than 25 units, are included in all tables. It is acknowledged that sampling biases and imprecision due to limited numbers of specimens examined preclude extending findings to reflect actual prevalence or accurate prevalence estimations.

The detailed description of the terms used in the report is available in the EFSA's manual for reporting on zoonoses (EFSA, 2014b).

2.1.3. Data on food-borne outbreaks

Twenty four MS and three non-MS reported data on food-borne outbreaks during 2013. No outbreak data were reported by Bulgaria, Cyprus, Italy and Luxembourg. The non-reporting of food-borne outbreak data does not necessarily mean that no outbreaks were notified in non-reporting countries.

In rare cases, MS did not provide any information on the number of human cases, hospitalisation and/or deaths. In these cases, the number of human cases, hospitalisation and/or deaths was assumed to be zero.

Data on food-borne outbreaks used in the report were extracted from the EFSA zoonoses database on 12 December 2014.

The detailed description of the terms used in the report is available in the EFSA's manual for reporting on food-borne outbreaks (EFSA, 2014c).

2.2. Statistical analysis of trends over time

2.2.1. Human data

Routine surveillance data from TESSy were used to describe two components of the temporal pattern (secular trend and seasonality) of human zoonoses cases for the EU and by MS.

Only confirmed human cases (with the exception of West Nile Fever, for which total numbers of cases were used) reported consistently by MS, throughout the study period 2009–2013, were included in the time series analysis. Diseases were analysed by month. Of the date variables available (date of onset, date of diagnosis, etc.), the date chosen by the MS as the official 'Date used for statistics' was selected.

For assessing the temporal trends at EU level and by MS, moving averages were applied. Linear regression was applied where appropriate to test the significance of trends. The level of statistical significance was set at 5 %. All analyses were performed using Stata® 12.

2.2.2. Food, animals and feed data

No statistical analyses were carried out as regards trends of zoonotic agents in food or animals, in the EU Summary Report 2013 on zoonoses and food-borne outbreaks.

2.3. Cartographic representation of data

2.3.1. Animal data

ArcGIS from the Economic and Social Research Institute (ESRI) was used to map animal data. Choropleth maps with graduated colours over a continuous scale of values were used to map the proportion of positive samples across EU and other reporting countries.

For *Lyssavirus* and WNV the number of positive samples, rather than the proportion, was displayed using proportional circles, while for *Trichinella* in wild animals a simple absence/presence map was produced.

For disease status data a simple colour code was selected to represent the official status of each country as defined in the legislation (free or not free).

2.4. Data sources

In the following sections, the types of data submitted by the reporting countries are briefly described. Information on human surveillance systems is based on the countries reporting data to ECDC for 2013.

2.4.1. *Salmonella* data

Humans

The notification of non-typhoidal salmonellosis in humans is mandatory in most MS, Iceland, Norway and Switzerland, except for six MS where reporting is based on a voluntary system (Belgium, France, Luxembourg, the Netherlands and Spain) or other system (the United Kingdom). In the United Kingdom, although the reporting of food poisoning is mandatory, isolation and specification of the organism is voluntary. The surveillance systems for salmonellosis have full national coverage in all MS except three (Belgium, the Netherlands and Spain). The coverage in Spain in 2013 is estimated to be 30 % and in the Netherlands 64 %. These proportions of populations were used in the calculation of notification rates for Spain and the Netherlands. Diagnosis of human *Salmonella* infections is generally done by culture from human stool samples. The majority of countries perform serotyping of strains (ECDC, 2012a).

Food

Salmonella in food is notifiable in 17 MS (Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Italy, Latvia, Romania, Slovakia, Slovenia, Spain and Sweden) and in two non-MS (Norway and Iceland). Information was not provided from Cyprus, Greece, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal and Switzerland.

Commission Regulation (EC) No 2073/2005[9] on microbiological criteria for food lays down food safety criteria for *Salmonella* in several specific food categories. This Regulation came into force in January 2006 and was modified by Regulation (EC) No 1441/2007,[10] entering into force in December 2007. Sampling schemes for monitoring *Salmonella* in food, e.g. place of sampling, sampling frequency and diagnostic methods, vary between MS and according to food types. For a full description of monitoring schemes and diagnostic methods in individual MS, refer to the national reports. The monitoring schemes are based on various types of samples, such as neck skin samples, carcase swabs and meat cuttings; these samples were collected at slaughter, at processing plants, at meat cutting plants and at retail. Several MS reported data collected as part of HACCP programmes based on sampling at critical control points. These targeted samples could not be directly compared with those that were randomly collected for monitoring/surveillance purposes and were not included in data analysis and tables. Information on serotype distribution was not consistently provided by all MS.

Animals

Salmonella in *Gallus gallus* (fowl) and/or other animal species is notifiable in all MS, except for Hungary, and also in three non-MS (Iceland, Norway and Switzerland). In Denmark, detection of *Salmonella* is notifiable in broiler and laying hen flocks of *Gallus gallus* and in other animals. In France, *Salmonella* detection is mandatory only for breeding flocks and laying hens of *Gallus gallus*, and in Malta for broilers and laying hen flocks of *Gallus gallus*. In Poland and in Romania, the notification of *Salmonella* is mandatory only in poultry (only for findings of *Salmonella* Enteritidis (*S*. Enteritidis), *S*. Typhimurium, *S*. Pullorum and *S.* Gallinarum in Poland, and for findings of *S.* Enteritidis and *S.* Typhimurium in Romania).

The monitoring of *Salmonella* in animals is mainly conducted through passive, laboratory-based surveillance of clinical samples, active routine monitoring of flocks of breeding and production animals in different age groups, and tests on organs during meat inspection. Community Regulation (EC) No 2160/2003[11] prescribes a sampling plan for the control of *S.* Enteritidis, *S.* Typhimurium, *S.* Infantis, *S.* Virchow and *S.* Hadar in breeding flocks of *Gallus gallus* and for the control of *S.* Enteritidis and *S.* Typhimurium in laying hen flocks and broiler flocks of *Gallus gallus* and for turkey flocks to ensure comparability of data among MS. Non-MS (European Free Trade Association members) must also apply the Regulation in accordance with the Decision of the EEA Joint Committee No 101/2006.[12] No specific requirements for the monitoring and control of other commercial poultry production systems or in other animals were applicable in 2013.

Details of monitoring programmes and control strategies in breeding flocks of *Gallus gallus*, laying hen flocks, broiler flocks and breeding and production turkey flocks are available in the national reports.

9 Commission Regulation (EC) No 2073/2005 of 15 November 2005 on microbiological criteria for foodstuffs. OJ L 338, 22.12.2005, p. 1–26.

10 Commission Regulation (EC) No 1441/2007 of 5 December 2007 amending Regulation (EC) No 2073/2005 on microbiological criteria for foodstuffs. OJ L 322, 7.12.2007, p. 12–29.

11 Regulation (EC) No 2160/2003 of the European Parliament and of the Council and Regulation of 17 November 2003 on the control of Salmonella and other specified food-borne zoonotic agents. OJ L 325, 12.12.2003, p. 1–15.

12 Decision of the EEA Joint Committee No 101/2006 of 22 September 2006 amending Annex I (Veterinary and phytosanitary matters) to the EEA Agreement. OJ L 333, 30.11.2006, p. 6–9.

Feed

There is no common sampling scheme for feed materials in the EU. Results from compulsory and voluntary monitoring programmes, follow-up investigations and industry quality assurance programmes, as well as from surveys, are reported. The MS monitoring programmes often include both random and targeted sampling of feed that are considered at risk. Samples of raw material, materials used during processing and final products are collected from batches of feed of domestic and imported origin. The reported epidemiological units were either 'Batch' (usually based on pooled samples) or 'Single' (often several samples from the same batch). As in previous years, most MS did not report separately data from the different types of monitoring programmes or data from domestic and imported feed. Therefore, it must be emphasised that the data related to *Salmonella* in feed cannot be considered national prevalence estimates. Moreover, owing to the lack of a harmonised surveillance approach, information is not comparable among countries. Nevertheless, data at country level are presented in the same tables. Information was requested on feed materials of animal and vegetable origin and on compound feed (mixture of feed materials intended for feeding specific animal groups). Data on the detection of *Salmonella* in feed material of land animal origin, marine animal origin, cereals, oil seeds and products, and compound feed for cattle, pigs and poultry in 2013 are presented. Single-sample and batch-based data from the different monitoring systems are summarised.

2.4.2. *Campylobacter* data

Humans

The notification of campylobacteriosis is mandatory in most MS, Iceland, Norway and Switzerland, except for seven MS, where notification is based on a voluntary system (Belgium, France, Italy, Luxembourg, the Netherlands and Spain) or other system (the United Kingdom). No surveillance system exists in Greece and Portugal. The surveillance systems for campylobacteriosis have full national coverage in all MS except five (Belgium, France, Italy, the Netherlands and Spain). The coverage of the surveillance system is estimated to be 20 % in France, 52 % in the Netherlands and 30 % in Spain. These proportions of populations were used in the calculation of notification rates for these three MS. Diagnosis of human infection is generally based on culture from human stool samples and both culture and non-culture methods (Polymerase-Chain Reaction (PCR)-based) are used for confirmation. Biochemical tests or molecular methods are used for species determination of isolates submitted to the National Reference Level Laboratory.

Food

In food, *Campylobacter* is notifiable in the following 12 MS: Austria, Belgium, the Czech Republic, Estonia (only *C. jejuni*), Germany, Italy, Latvia, the Netherlands, Poland, Slovakia, Slovenia and Spain. *Campylobacter* is also notifiable in Iceland and Norway. Information on *Campylobacter* notification was not provided from Cyprus, France, Lithuania, Luxembourg, Malta, Portugal and Romania. Bulgaria did not test for *Campylobacter*. At processing, cutting and retail, sampling was predominantly carried out on fresh meat. Food samples were collected in several different contexts, i.e. continuous monitoring or control programmes, surveys and as part of HACCP programmes implemented within the food industry. Samples reported as HACCP or own controls were not included for analysis and, unless stated differently in the specific section, data from suspect and selective sampling and outbreak or clinical investigations were also excluded.

Animals

Campylobacter is notifiable in *Gallus gallus* in the Czech Republic, Finland, Slovenia, Iceland and Norway, in cattle in Germany and in all animals in Belgium, Estonia (only *C. jejuni*), Ireland, Latvia, the Netherlands, Spain and Switzerland. Information on *Campylobacter* notification was not provided from Cyprus, France, Lithuania, Malta and Poland. Bulgaria did not test for *Campylobacter*. The most frequently used methods for detecting *Campylobacter* in animals at farm, slaughter and in food were bacteriological methods (ISO, 2006; NMKL, 2007) as well as PCR methods. In some countries, isolation of the organism is followed by biochemical tests for speciation. For poultry sampled prior to slaughter, faecal material was collected either as cloacal swabs or as sock samples (faecal material collected from the floor of poultry houses by pulling gauze over footwear and walking through the poultry house). At slaughter, several types of samples were collected, including cloacal swabs, caecal contents and/or neck skin.

2.4.3. *Listeria* data

Humans

The notification of listeriosis in humans is mandatory in most MS, Iceland, Norway and Switzerland, except for three MS, where notification is based on a voluntary system (Belgium, Spain, and the United Kingdom).

No surveillance system exists in Portugal. The surveillance systems for listeriosis have full national coverage in all MS except Spain, where the estimated coverage is 30 %. This population proportion was used in the calculation of notification rates for Spain. Diagnosis of human infections is generally done by culture from blood, cerebra-spinal fluid and vaginal swabs.

Food

Notification of *Listeria* in food is required in 12 MS (Austria, Belgium, Estonia, France, Germany, Hungary, Italy, Latvia, the Netherlands, Slovakia, Slovenia and Spain); however, several other MS reported data. Commission Regulation (EC) No 2073/2005 on microbiological criteria for foodstuffs lays down food safety criteria for *L. monocytogenes* in ready-to-eat (RTE) foods. This Regulation came into force in January 2006. Surveillance in RTE foods was performed in most MS. However, owing to differences in sampling and analytical methods, comparisons from year to year were difficult.

Animals

Listeriosis in animals was notifiable in 13 MS (Belgium, the Czech Republic, Estonia, Finland, Germany, Greece, Latvia, Lithuania, the Netherlands, Slovakia, Slovenia, Spain and Sweden), Switzerland and Norway (information is missing from Bulgaria, Cyprus, Ireland, Malta and Poland). The monitoring of *Listeria* in animals is mainly conducted through passive, laboratory-based surveillance of clinical samples, active routine monitoring or random national surveys.

2.4.4. VTEC data

Humans

The notification of VTEC infections is mandatory in most MS, Iceland, Norway and Switzerland, except for six MS, where notification is based on a voluntary system (Belgium, France, Italy, Luxembourg and Spain) or other system (the United Kingdom). No data were reported from Liechtenstein and no surveillance system exists in Portugal. The surveillance systems for VTEC infections have full national coverage in all MS except three (Belgium, France and Italy). In France, the VTEC surveillance is centred on paediatric Haemolytic-uremic syndrome (HUS) surveillance. Diagnosis of human VTEC infections is generally done by culture from stool samples although diagnosis by direct detection of the toxin or the toxin genes, without strain isolation, is increasing.

Food and animals

VTEC is notifiable in food in 11 MS (Austria, Belgium, Estonia, Germany, Italy, Latvia, the Netherlands, Romania, Slovakia, Slovenia and Spain) and in animals in eight MS (Belgium, the Czech Republic, Estonia, Finland, Latvia, Lithuania, Spain and Sweden)

(information is missing from Bulgaria, Cyprus, the Czech Republic, Denmark, Greece, Hungary, Lithuania, Malta, Poland, Portugal and Switzerland for food, and from Bulgaria, Cyprus, France, Germany, Greece, Ireland, Malta, Poland, Portugal and Romania for animals).

Samples were collected in a variety of settings, such as slaughterhouses, cutting plants, dairies, wholesalers and at retail level, and included different types of samples such as carcase surface swabs, cuts of meats, minced meat, milk, cheese, and other products. The majority of investigated products were raw but intended to undergo preparation before consumption. The samples were taken as part of official control and monitoring programmes as well as random national surveys. The number of samples collected and types of food sampled varied among individual MS. Most of the animal samples were collected at the slaughterhouse or at the farm.

2.4.5. *Yersinia* data

Humans

Notification of yersiniosis in humans is mandatory in most MS, Iceland, Norway and Switzerland. Belgium, France, Italy, Luxembourg and Spain have a voluntary notification system and the United Kingdom has another system. No surveillance system exists in Greece, the Netherlands and Portugal. The estimated coverage of the sentinel surveillance for yersiniosis in Spain is 30 %, and this population proportion was used in the calculation of notification rates. Diagnosis of human gastrointestinal infections is generally done by culture from human stool samples.

Food and animals

Yersinia is notifiable in food in 10 MS (Austria, Belgium, Estonia, Germany, Italy, Latvia, the Netherlands, Slovakia, Slovenia and Spain), and in animals in seven MS (Belgium, Ireland, Latvia, Lithuania, the

Netherlands, Slovenia and Spain) and Switzerland. Information was not provided from Bulgaria, Cyprus, the Czech Republic, Denmark, France, Greece, Hungary, Lithuania, Malta, Portugal, Romania and Switzerland for food, and from Bulgaria, Cyprus, France, Germany, Greece, Malta and Poland for animals. Primarily, domestic animals were tested. The reporting of specific human pathogenic serotypes/biotypes found in food and animals is often lacking and differences in sampling and analytical methods make comparison between countries difficult.

2.4.6. Tuberculosis data

Humans

The notification of tuberculosis in humans is mandatory in all MS, Iceland, Norway and Switzerland. In France, the notification system for human tuberculosis, however, does not distinguish between tuberculosis cases caused by different species of *Mycobacterium*. Therefore, no reporting of cases due to *M. bovis* is available from France.

Animals

Tuberculosis in animals is notifiable in 25 MS, Norway and Switzerland (information was not provided from Bulgaria and Malta). In Cyprus, Greece, Hungary, Poland and Romania only bovine tuberculosis is notifiable, and in Ireland only tuberculosis in ruminant animals is notifiable. Rules for intra-EU bovine trade, including requirements for cattle herds and country qualification as officially free from tuberculosis, are laid down in Council Directive 64/432/EC,[13] as last amended by Commission Decision 2007/729/EC.[14] More detailed information regarding the 2013 status of EU MS, Norway and Switzerland and regions thereof in relation to cattle tuberculosis can be found in European Commission's DG SANCO's '2013 annual report on bovine and swine diseases (EC, online).

2.4.7. *Brucella* data

Humans

The notification of brucellosis in humans is mandatory in all MS, Iceland, Norway and Switzerland except Belgium, Denmark and the United Kingdom. Both the voluntary surveillance system in Belgium and the one in United Kingdom however have full national coverage. In Denmark, brucellosis is not notifiable and no surveillance system is in place.

Food

The notification of *Brucella* in food is mandatory in 10 MS (Austria, Belgium, Finland, Germany, Italy, Latvia, the Netherlands, Slovenia, Spain and the United Kingdom). Information was not provided from Bulgaria, Cyprus, the Czech Republic, Denmark, France, Greece, Lithuania, Luxembourg, Malta, Poland, Portugal, Romania, Slovakia and Switzerland.

Animals

Brucellosis in animals is notifiable in 24 MS, Norway and Switzerland (information was not provided from Bulgaria, Cyprus and Malta). Rules for intra-EU bovine trade, including requirements for cattle herds and country qualification as officially free from brucellosis, are laid down in Council Directive 64/432/EC, as last amended by Commission Decision 2007/729/EC. Rules for intra-EU trade of ovine and caprine animals and country qualification as officially free from ovine and caprine brucellosis, caused by *B. melitensis* (ObmF), are laid down in Council Directive 91/68/EEC,[15] as last amended by Council Directive 2008/73/EC.[16] More detailed information regarding the 2013 status of EU MS, Norway and Switzerland and regions thereof in relation to cattle brucellosis can be found in European Commission's DG SANCO's '2013 annual report on bovine and swine diseases (EC, online).

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13 Council Directive 64/432/EEC of 26 June 1964 on animal health problems affecting intra-Community trade in bovine animals and swine. OJ L 121, 29.07.1964, p. 1977–2012.

14 Commission Decision 2007/729/EC of 7 November 2007 amending Council Directives 64/432/EEC, 90/539/EEC, 92/35/EEC, 92/119/EEC, 93/53/EEC, 95/70/EC, 2000/75/EC, 2001/89/EC, 2002/60/EC, and Decisions 2001/618/EC and 2004/233/EC as regards lists of national reference laboratories and State institutes. OJ L 294, 13.11.2007, p. 26–35.

15 Council Directive 91/68/EEC of 28 January 1991 on animal health conditions governing intra-Community trade in ovine and caprine animals. OJ L 46, 19.2.1991, p. 19–36.

16 Council Directive 2008/73/EC of 15 July 2008 simplifying procedures of listing and publishing information in the veterinary and zootechnical fields and amending Directives 64/432/EEC, 77/504/EEC, 88/407/EEC, 88/661/EEC, 89/361/EEC, 89/556/EEC, 90/426/EEC, 90/427/EEC, 90/428/EEC, 90/429/EEC, 90/539/EEC, 91/68/EEC, 91/496/EEC, 92/35/EEC, 92/65/EEC, 92/66/EEC, 92/119/EEC, 94/28/EC, 2000/75/EC, Decision 2000/258/EC Directives 2001/89/EC, 2002/60/EC and 2005/94/EC. OJ L 219, 14.8.2008, p. 40–54.

2.4.8. *Trichinella* data

Humans

The notification of *Trichinella* infections in humans is mandatory in all MS, Iceland, Norway and Switzerland, except Belgium, Denmark, France and the United Kingdom. Belgium, France and the United Kingdom have voluntary surveillance systems for trichinellosis with full national coverage in France and the United Kingdom. No surveillance system for trichinellosis exists in Denmark. In humans, diagnosis of *Trichinella* infections is primarily based on clinical symptoms and serology (indirect enzyme-linked immunosorbent assay (i-ELISA) and Western blot). Histopathology on muscle biopsies is rarely performed.

Food and animals

Trichinella in food is notifiable in 17 MS and Norway. Ireland and Switzerland report that *Trichinella* is not notifiable. Information was not provided from Bulgaria, Cyprus, the Czech Republic, Denmark, Latvia, Lithuania, Luxembourg, Malta and the Netherlands.

Trichinella infections in animals are notifiable in all MS except Hungary (information was not provided from Malta) and Switzerland.

Rules for testing for *Trichinella* in slaughtered animals are laid down by Commission Regulation (EC) No 2075/2005.[17] In accordance with this Regulation, all finisher pigs, sows, boars, horses, wild boars and some other wild species must be tested for *Trichinella* at slaughter. The Regulation allows MS to apply for status as a region with negligible risk of *Trichinella* infestation in animals. Denmark is the only MS to have been assigned this status. Some MS reported using digestion and compression methods as described in Council Directive 77/96/EEC.[18]

2.4.9. *Echinococcus* data

Humans

Cases of both cystic and alveolar echinococcosis are reported jointly to ECDC as echinococcosis since the EU case definition does not distinguish between the two forms of the disease. ECDC can differentiate between the two forms in the data only by analysing the reported species. The notification of echinococcosis in humans is mandatory in most MS, Iceland and Norway. Four MS (Belgium, France, the Netherlands and the United Kingdom) have a voluntary surveillance system for echinococcosis. Denmark and Italy have no surveillance system for echinococcosis. Mandatory notification of the disease was introduced in Iceland in 2012. In Switzerland, echinococcosis in human is not notifiable.

Food and animals

Echinococcus is notifiable in food in 11 MS (Austria, Belgium, Estonia, Finland, Hungary, Italy, Latvia, the Netherlands, Slovenia, Spain and Sweden) and Norway and not notifiable in food in Ireland, Slovakia and the United Kingdom. Information was not provided from Bulgaria, Cyprus, the Czech Republic, Denmark, France, Greece, Germany, Lithuania, Luxembourg, Malta, Poland, Portugal, Romania and Switzerland. *Echinococcus* is notifiable in animals in 18 MS (Austria, Belgium, Denmark, Estonia, Finland, Germany, Greece, Italia, Latvia, Lithuania, the Netherlands, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom), Norway and Switzerland and not notifiable in animals in the Czech Republic, France, Hungary and Luxembourg (information was not provided from Bulgaria, Cyprus, Ireland, Malta and Poland).

Guidelines for the control of *E. granulosus* through meat inspection of animal carcases for human consumption are provided through Council Directive 64/433/EC,[19] whereby visual inspection of all slaughtered animals is carried out by official veterinarians examining organs and muscles intended for human consumption. Whole carcases or organs are destroyed in cases where *Echinococcus* cysts are found.

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[17] Commission Regulation (EC) No 2075/2005 of 5 December 2005 laying down specific rules on official controls for *Trichinella* in meat. OJ L 338, 22.12.2005, p. 60-82.

[18] Council Directive 77/96/EEC of 21 December 1976 on the examination for trichinae (trichinella spiralis) upon importation from third countries of fresh meat derived from domestic swine. OJ L 26, 31.1.1977, p. 67–77.

[19] Council Directive 64/433/EC of 26 June 1964 on health problems affecting intra-Community trade in fresh meat. OJ L 121, 29.7.1964, pp. 2012–2032.

2.4.10. *Toxoplasma* data

Humans

Data on congenital toxoplasmosis in the EU in 2013 are not included in this report but will be published in the ECDC Annual Epidemiological Report 2015 (in preparation).

Animals

Toxoplasmosis is a notifiable disease in Latvia, Poland and Switzerland in all animals and in Finland in all animals except hares, rabbits and rodents; no active monitoring programmes are in place in Switzerland. In Germany, toxoplasmosis is notifiable in pigs, dogs and cats. In Austria, Denmark, and Sweden toxoplasmosis is not notifiable (information is missing from Belgium, Bulgaria, Cyprus, the Czech Republic, Estonia, France, Greece, Hungary, Ireland, Italy, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Romania, Slovakia, Slovenia, Spain and the United Kingdom).

2.4.11. Rabies data

Humans

The notification of rabies in humans is mandatory in most MS, Iceland, Norway and Switzerland. Belgium has a voluntary notification system and the United Kingdom has another system. Most countries use the EU case definition apart from Belgium, Denmark, Finland, France, Germany and Italy who have other/non specified case definitions. Most countries examine human cases based on blood samples or cerebrospinal fluid, and saliva. However, in the case of post- mortem examinations, the central nervous system is sampled. Identification is mostly based on antigen detection, viral genome detection by Real Time-Polymerase Chain Reaction (RT-PCR) and/or isolation of virus.

Animals

Rabies is a notifiable disease in all MS and Switzerland. In animals, most countries test samples from the central nervous system. Identification is mostly carried out using the fluorescent antibody test (FAT), which is recommended by both World Health Organization (WHO, 1996) and World Organisation for Animal Health (OIE, 2009), and the mouse inoculation test. However, ELISA, PCR, and histology are also used.

2.4.12. Q-fever data

Humans

The notification of Q fever in humans is mandatory in 23 MS, Iceland, Norway and Switzerland. The disease is not notifiable in Austria, Denmark and Italy. Belgium, France, Spain and the United Kingdom have a voluntary system, which for Belgium and Spain is based on sentinel surveillance. The population covered by the sentinel surveillance system is estimated to be 30 % for Spain and unknown for Belgium, but both are reportedly constant over the study years. Cases are reported in an aggregated format by Bulgaria and Croatia, and case based for the other countries. Countries use EU case definitions apart for Belgium, Finland, France, Germany and Romania (not specified).

Animals

C. burnetii in animals is notifiable in 15 MS (Bulgaria, the Czech Republic, Denmark, Finland, France, Germany, Greece, Italy, Latvia, Lithuania, the Netherlands, Poland, Slovenia, Spain and Sweden) and Switzerland. In Austria, *C. burnetii* in animals is not notifiable (information is missing from the remaining 11 MS and Norway).

Data reported are mostly based on suspect sampling due to an increase in abortions in the herd and identification is mostly carried out using serological testing methods as ELISA or immunofluorescence assay (IFA) tests or direct identification methods such as real-time PCR.

2.4.13. West Nile Virus data

Humans

The notification of West Nile fever in humans is mandatory in 21 MS, Norway and Switzerland. The disease is not notifiable in Denmark, Germany and Portugal. Belgium, France and the United Kingdom have a voluntary system, which in Belgium and France is based on sentinel surveillance, and in the United Kingdom on another, unspecified, surveillance system. The population covered by the sentinel surveillance systems is unknown, but in both cases is reportedly constant over the study years. EU case definitions are used by most countries apart for Belgium, Finland, Italy and the United Kingdom (not specified). Cases are reported in an aggregated format by Croatia, and case-based for the other countries.

Total case numbers for West Nile fever were used because case confirmation according to the EU case definition is usually carried out only when cases occur in previously unaffected areas. Subsequent cases are usually diagnosed with laboratory methods for probable cases. Thus, both probable and confirmed cases reflect more accurately the epidemiological situation. This approach is also used for the seasonal real-time monitoring of West Nile cases in the EU carried out by ECDC.

Animals

Reporting of West Nile virus in animals is not mandatory. But where the epidemiological situation in a MS so warrants, West Nile virus in animals shall also be monitored. West Nile virus infection is notifiable in horses in Great Britain and in animals in Switzerland.

2.4.14. Tularaemia data

Humans

The notification of tularaemia in humans is mandatory in most MS, Norway and Switzerland (information is missing from Denmark, Iceland and Liechtenstein). Two MS (Belgium and the United Kingdom) have a voluntary surveillance system for tularaemia in humans.

Animals

The notification of tularaemia in animals is mandatory in Switzerland.

2.4.15. Other zoonoses and zoonotic agents data

Food and animals

Cysticercus in food and animals: Monitoring is carried out as a visual inspection (macroscopic examination) of carcases at the slaughterhouse by meat inspection according to Regulation (EC) No 854/2004,[20] or by specific serological tests.

2.4.16. Food-borne outbreaks data

Food-borne outbreaks are incidents of two or more human cases of the same disease or infection in which the cases are linked or are probably linked to the same food vehicle. Situations in which the observed human cases exceed the expected number of cases and where the same food source is suspected are also indicative of a food-borne outbreak.

For 'weak-evidence' food-borne outbreaks, the causative agent, as well as the number of human cases, hospitalisations and deaths, should be reported. For the 'strong-evidence' food-borne outbreaks, more detailed information is collected, including food vehicle and its origin, nature of evidence linking the outbreak cases to the food vehicle, type of outbreak, setting, place of origin of the problem and contributory factors. All food-borne outbreaks are included in the general tables and figures. The denominators used for the calculation of the reporting rates were the human populations from the EUROSTAT as extracted on 12 December 2014.

2.5. Terms used to describe prevalence or proportion positive values

In the report a set of standardised terms are used to characterise the proportion of positive sample units or the prevalence of zoonotic agents in animals and food:

- Rare: < 0.1 %
- Very low: 0.1 % to 1 %
- Low: > 1 % to 10 %
- Moderate: > 10 % to 20 %
- High: > 20 % to 50 %
- Very high: > 50 % to 70 %
- Extremely high: > 70 %

[20] Regulation (EC) No 854/2004 of the European Parliament and of the Council of 29 April 2004 laying down specific rules for the organisation of official controls on products of animal origin intended for human consumption. OJ L 139, 30.4.2004, p. 206-320.

3. Assessment

This report section provides the EU assessment of the specific zoonoses during 2013. It is descriptive in essence.

3.1. *Salmonella*

The Appendix contains hyperlinks to all data summarised for the production of this section, for humans, food, animals and feed, and for food-borne outbreaks. It also includes hyperlinks to *Salmonella* summary tables and figures that were not displayed in this section because they did not trigger any marked observation. The summarised data are presented in downloadable Excel and PDF files, and are listed by subject. Moreover, all submitted and validated data by the MS are available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm).

3.1.1. Salmonellosis in humans

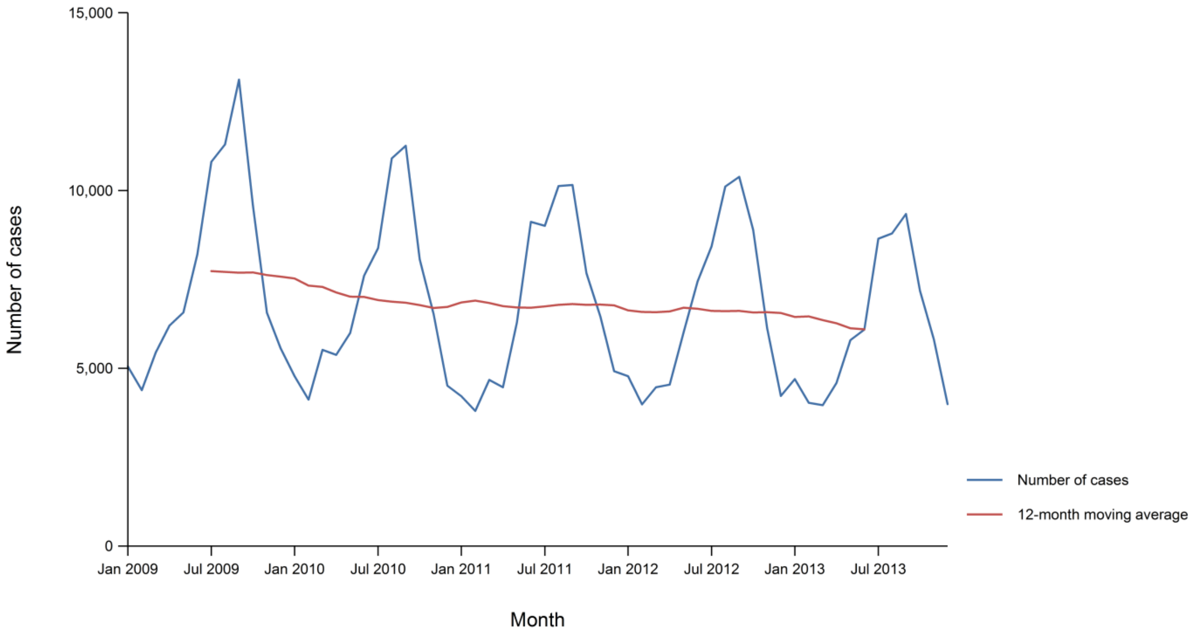
A total of 85,268 salmonellosis cases were reported by 27 EU MS in 2013, with 82,694 confirmed cases and an EU notification rate of 20.4 cases per 100,000 population (Table 2). This represented a 7.9 % decrease in the EU notification rate compared with 2012, with decreasing rates reported in 21 reporting MS. The highest notification rates in 2013 were reported by the Czech Republic (93.1 cases per 100,000 population) and Slovakia (70.3 per 100,000), while the lowest rates were reported by Portugal and Greece (≤ 4 per 100,000). The proportion of domestic cases versus travel-associated cases varied markedly between countries, with the highest proportion of travel-related cases, > 70 %, in the Nordic countries, including Finland, Sweden and Norway (Table SALMHUMIMPORT).

Table 2. Reported cases and notification rates per 100,000 of human salmonellosis in the EU/EEA, 2009–2013

Country	2013					2012		2011		2010		2009	
	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	1435	1404	16.6	1773	21.1	1432	17.0	2179	26.0	2775	33.2
Belgium[(b)]	N	C	2528	2528	-	3101	-	3177	-	3169	-	3113	-
Bulgaria	Y	A	812	766	10.5	839	11.5	924	12.5	1154	15.5	1247	16.7
Croatia[(c)]	Y	A	1254	-	-	-	-	-	-	-	-	-	-
Cyprus	Y	C	79	79	9.1	90	10.4	110	13.1	136	16.6	134	16.8
Czech Republic	Y	C	9959	9790	93.1	10056	95.7	8499	81.0	8209	78.5	10480	100.5
Denmark	Y	C	1137	1137	20.3	1207	21.6	1170	21.0	1608	29.1	2130	38.6
Estonia	Y	C	186	183	13.9	249	18.8	375	28.2	381	28.6	261	19.5
Finland	Y	C	1986	1986	36.6	2199	40.7	2098	39.0	2421	45.2	2327	43.7
France	Y	C	8927	8927	13.6	8705	13.3	8685	13.4	7184	11.1	7153	11.1
Germany	Y	C	18986	18696	22.8	20493	25.1	23982	29.4	24833	30.4	31395	38.4
Greece	Y	C	417	414	3.7	404	3.6	471	4.2	297	2.7	403	3.6
Hungary	Y	C	5122	4953	50.2	5462	55.2	6169	62.8	5953	60.4	5873	59.5
Ireland	Y	C	326	326	7.1	309	6.7	311	6.8	349	7.7	335	7.4
Italy[(d)]	-	-	-	-	-	1453	-	4464	7.5	5305	9.0	5715	9.7
Latvia	Y	C	394	385	19.0	547	26.8	995	48.0	877	41.4	795	36.8
Lithuania	Y	C	1199	1199	40.4	1762	58.7	2294	75.2	1962	62.4	2063	64.8
Luxembourg	Y	C	120	120	22.3	136	25.9	125	24.4	211	42.0	162	32.8
Malta	Y	C	84	84	19.9	88	21.1	129	31.1	160	38.6	125	30.4
Netherlands[(e)]	N	C	979	979	9.1	2198	20.5	1284	12.0	1447	13.6	1204	11.4
Poland	Y	A	7577	7307	19.0	7952	20.6	8400	21.8	9257	24.3	8529	22.4
Portugal	Y	C	171	167	1.6	185	1.8	174	1.7	205	2.0	220	2.1
Romania	Y	C	1404	1302	6.5	698	3.5	989	5.0	1285	6.4	1105	5.5
Slovakia	Y	C	4026	3802	70.3	4627	85.6	3897	72.3	4942	91.7	4182	77.7
Slovenia	Y	C	316	316	15.4	392	19.1	400	19.5	363	17.7	616	30.3
Spain[(f)]	N	C	4537	4537	32.4	4224	36.1	3786	32.5	4420	38.0	4304	37.2
Sweden	Y	C	2842	2842	29.7	2922	30.8	2887	30.7	3612	38.7	3054	33.0
United Kingdom	Y	C	8465	8465	13.2	8812	13.9	9455	15.1	9670	15.6	10479	17.0
EU Total	**-**	**-**	**85268**	**82694**	**20.4**	**90883**	**22.1**	**96682**	**20.9**	**101589**	**22.1**	**110179**	**24.0**
Iceland	Y	C	49	49	15.2	38	11.9	45	14.1	34	10.7	35	11.0
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	1362	1361	26.9	1371	27.5	1290	26.2	1370	28.2	1235	25.7
Switzerland[(g)]	Y	C	1271	1271	15.8	1242	15.6	1301	16.5	1177	15.1	1302	16.9

(a): Y: yes; N: no; A: aggregated data; C: case-based data;-: no report.
(b): Sentinel surveillance; no information on estimated coverage. Thus, notification rate cannot be estimated.
(c): All cases of unknown case classification.
(d): No report for 2013 and provisional data for 2012.
(e): Sentinel system; notification rates calculated with an estimated population coverage of 64 %.
(f): Notification rates calculated with an estimated population coverage of 30 % in 2013 and 25 % in 2009-2012.
(g): Switzerland provided data directly to EFSA.

There was a clear seasonal trend in confirmed salmonellosis cases reported in the EU in 2009-2013, with most cases reported during summer months. There was a declining trend of salmonellosis in the EU/European Economic Area (EEA) in the five-year period, although not statistically significant when analysed by month (p=0.349 with linear regression) (Figure 3).



Source: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Lithuania, Luxembourg, Malta, Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom. Bulgaria, Croatia, Italy, Latvia, Poland and Romania did not report data over the whole period in the level of detail needed for the analysis.

Figure 3. Trend in reported confirmed cases of human non-typhoidal salmonellosis in the EU/EEA, 2009-2013

Twelve MS provided information on hospitalisation for some or all of their cases. Slovakia and Spain reported hospitalisation status for the first time in 2013, increasing the proportion of confirmed cases with known hospitalisation status from 10.1 % to 26.4 % and resulting in a decrease of the proportion of cases hospitalised from 45.1 % to 36.0 %. The highest hospitalisation proportions were reported in Cyprus, Romania, Greece and Portugal (80–95 % of cases hospitalised). Three of these countries also reported the lowest notification rates of salmonellosis, which indicates that the surveillance systems in these countries primarily capture the more severe cases.

Fourteen MS provided data on the outcome of their cases in 2013, and, among them, nine MS reported a total of 59 fatal cases. This gives an EU case-fatality rate of 0.14 % among the 40,976 confirmed cases for which this information was reported (49.6 % of all confirmed cases).

Information on *Salmonella* serovars from cases of human infection was available from 25 MS (Bulgaria, Croatia and Poland reported no case-based serovar data) and two non-MS. As in previous years, the two most commonly reported *Salmonella* serovars in 2013 were *S.* Enteritidis and *S.* Typhimurium, representing 39.5 % and 20.2 %, respectively, of all reported serovars in confirmed human cases (N=73,627) (Table 3). *S.* Enteritidis continued to decrease, with 4,760 fewer cases reported in the EU in 2013 than in 2012 and with a decrease in confirmed cases of 19.3 % compared with 2011. In the two-year period from 2011 to 2013, cases of *S.* Typhimurium decreased by 26.0 %. Cases of monophasic *S.* Typhimurium 1,4,[5],12:i:-, however, increased by 68.8 %, with four additional countries reporting this variant in 2013 compared with 2011. Adding the cases of *S.* Typhimurium and its variants, including monophasic strains (3rd most common serovar), a decrease of 11.1 % was observed from 2011 to 2013.

Salmonella Infantis, the fourth most common serovar, increased in the EU/EEA in 2013 by 26.5 % compared with 2011 (Table 3). Several countries contributed to this increase, and the most notable increase in 2013 was observed in Germany, where twice as many *S.* Infantis cases (685 confirmed cases) were reported compared with the average of the previous two years. The increase could be largely attributed to a large food-borne outbreak from pork products eaten raw, involving 267 cases in four German federal states. Insufficient hygiene measures in the slaughterhouse were identified as the most probable cause of the prolonged transmission of *S.* Infantis (Schroeder et al., 2014).

The increase observed in *S.* Derby, the fifth most common serovar in 2013, could partly be explained by a local outbreak in Berlin, Germany, and surrounding areas in December 2013/January 2014 (Frank et al., 2014). The outbreak occurred in hospitals and nursing homes with 145 elderly patients affected and one fatal case. The suspected vehicle of infection was raw fermented pork spread ('teewurst'). A local outbreak in Brittany, France, in the same period further contributed to the increase in this serovar. The outbreak involved a common meal where a cross-contamination of the meat (beef and pork) during the preparation of the meal was suspected to have occurred (Nathalie Jourdan, French Institute for Public Health Surveillance – Institut de Veille Sanitaire (InVS), personal communication, October 2014). Among the 64 exposed persons, 45 developed symptoms and *S.* Derby was identified in laboratory-confirmed cases.

Owing to the multi-country outbreak of *S.* Stanley in the EU linked to contamination in the turkey production chain, this serovar increased in 2011, peaked in 2012 and then decreased somewhat in 2013, although remaining at higher levels than before the outbreak. In 2014, human clusters were still being reported with the outbreak strain, suggesting that it was still circulating in the European food market (ECDC and EFSA, 2014).

The largest increase in the period 2011-2013 among other serovars on the top 20 list was observed for *S.* Muenchen (139.6 %). Germany accounted for a large proportion of the increase in 2013 with 164 confirmed cases reported in June and July 2013 only.

Table 3. Distribution of reported confirmed cases of human salmonellosis in the EU/EEA, 2011–2013, by the 20 most frequent serovars in 2013

Serovar	2011			2012			2013		
	Cases	MS	%	Cases	MS	%	Cases	MS	%
Enteritidis	36064	27	44.6	33850	27	41.2	29090	27	39.5
Typhimurium	20068	27	24.8	18216	27	22.2	14852	27	20.2
Monophasic Typhimurium 1.4.[5].12:i:-	3739	10	4.6	5932	12	7.2	6313	14	8.6
Infantis	1760	25	2.2	2007	26	2.4	2226	25	3.0
Derby	710	22	0.9	732	21	0.9	818	21	1.1
Stanley	516	22	0.6	1115	20	1.4	813	21	1.1
Newport	803	23	1.0	770	21	0.9	714	21	1.0
Kentucky	579	22	0.7	647	23	0.8	651	23	0.9
Agona	476	21	0.6	470	18	0.6	581	24	0.8
Virchow	495	25	0.6	544	20	0.7	571	22	0.8
Muenchen	187	18	0.2	253	20	0.3	448	17	0.6
Napoli	320	14	0.4	376	16	0.5	434	14	0.6
Bovismorbificans	423	19	0.5	421	20	0.5	412	20	0.6
Saintpaul	384	18	0.5	372	18	0.5	401	18	0.5
Montevideo	375	18	0.5	298	18	0.4	375	18	0.5
Panama	259	14	0.3	705	14	0.9	352	16	0.5
Brandenburg	272	13	0.3	303	17	0.4	290	17	0.4
Oranienburg	371	18	0.5	315	16	0.4	274	15	0.4
Hadar	291	18	0.4	307	20	0.4	267	19	0.4
Rissen	250	17	0.3	293	19	0.4	266	20	0.4
Other	12690	-	15.7	14550	-	17.7	13745	-	18.7
Total	**80782**	**27**	**100.0**	**82183**	**27**	**100.0**	**73627**	**27**	**100.0**

Source: 25 MS and two non-MS-Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

3.1.2. *Salmonella* in food, animals and feedingstuffs

Comparability of data

It is important to note that results from different countries are not directly comparable owing to between-country variation in the sampling and testing methods used. In addition, EU-level, overall results are highly influenced by the reporting MS and the sample sizes in their investigations, both of which vary between the years. Moreover, it should be taken into consideration that the proportion of positive samples observed might have been influenced by the sampling season, because *Salmonella* are known to be more prevalent in animals during summer (Hald and Andersen, 2001; Zdragas et al., 2012).

Only results for the most important food products and animals that might serve as a source for human infection in the EU are presented.

Food

Twenty-seven MS and three non-MS reported data on *Salmonella* in various foodstuffs. Most MS reported data on *Salmonella* in food of animal origin, primarily broiler meat, pig meat and bovine meat (Table SALMOVERVIEWFOOD).

Compliance with microbiological criteria

The *Salmonella* criteria laid down by Regulation (EC) No 2073/2005 have been in force since 1 January 2006 (revised by Regulations (EC) No 1441/2007 and 1086/2011[21]). The regulations prescribe sampling and testing requirements, and set limits for the presence of *Salmonella* in specific food categories. According to these criteria, *Salmonella* must be absent in relevant products when placed on the market, during their shelf-life. Absence is defined by testing five or 30 samples of 25 g per batch, depending on the food category; however, the definition of a batch varies widely and in official controls, often only single samples are taken to verify compliance with the criteria.

An evaluation of compliance with the *Salmonella* criteria at the EU level for 2011-2013 is summarised in Figure 4 (Tables SALMCOMPLFOODand SALMCOMPLPOULTRYMEAT). The evaluation includes only investigations where the sampling unit (single samples or batches) and sampling stage at the retail level have been reported for the relevant food types. As in previous years, the highest levels of non-compliance with *Salmonella* criteria generally occurred in foods of meat origin, which are intended to be cooked before consumption; however, even here the overall levels of non-compliance were low (< 10 %, Figure 4). Minced meat and meat preparations from poultry intended to be eaten cooked had the highest level of non-compliance (6.3 % of single samples and 5.6 % of batches). Low non-compliance was also reported for meat products from poultry meat intended to be eaten cooked (1.6 % of single samples and 1.7 % of batches) and for minced meat and meat preparations from animal species other than poultry intended to be eaten cooked (0.7 % of single samples and 3.1 % of batches). The occurrence of *Salmonella* in foods of meat origin intended to be eaten raw is of particular relevance because of the risk such foods pose to human health. There were only a few non-compliant findings of meat products, minced meat and meat preparations intended to be eaten raw.

Since December 2011, a *Salmonella* criterion for *S.* Enteritidis and *S.* Typhimurium (including monophasic *S.* Typhimurium strains with the antigenic formula 1,4,[5],12:i:-) in fresh poultry meat (including fresh meat from breeding flocks of *Gallus gallus*, laying hens, broilers and breeding and fattening flocks of turkeys) has been in force (Regulation (EC) No 1086/2011). Compared with 2012, the reported non-compliance decreased from 0.5 % to 0.2 % of single samples and from 0.7 % to 0.2 % of batches, which is a very encouraging trend, indicating that the continued investment of MS in *Salmonella* control is yielding noticeable results.

All samples/batches of dried infant formulae and dried dietary foods for medical purposes, milk and whey powder, and cooked crustaceans and molluscan shellfish were found to be compliant with the *Salmonella* criteria. Low non-compliance was reported for live bivalve molluscs and live echinoderms, tunicates and gastropods (2.0 % of single samples and 1.0 % of batches) and for RTE sprouted seeds (0.8 % of single samples). The proportion of non-compliant samples for the other food categories was low to very low, as observed in previous years.

[21] Commission Regulation (EU) No 1086/2011 of 27 October 2011 amending Annex II to Regulation (EC) No 2160/2003 of the European Parliament and of the Council and Annex I to Commission Regulation (EC) No 2073/2005 as regards salmonella in fresh poultry meat. OJ L 281, 28.10.2011, p. 7–11.

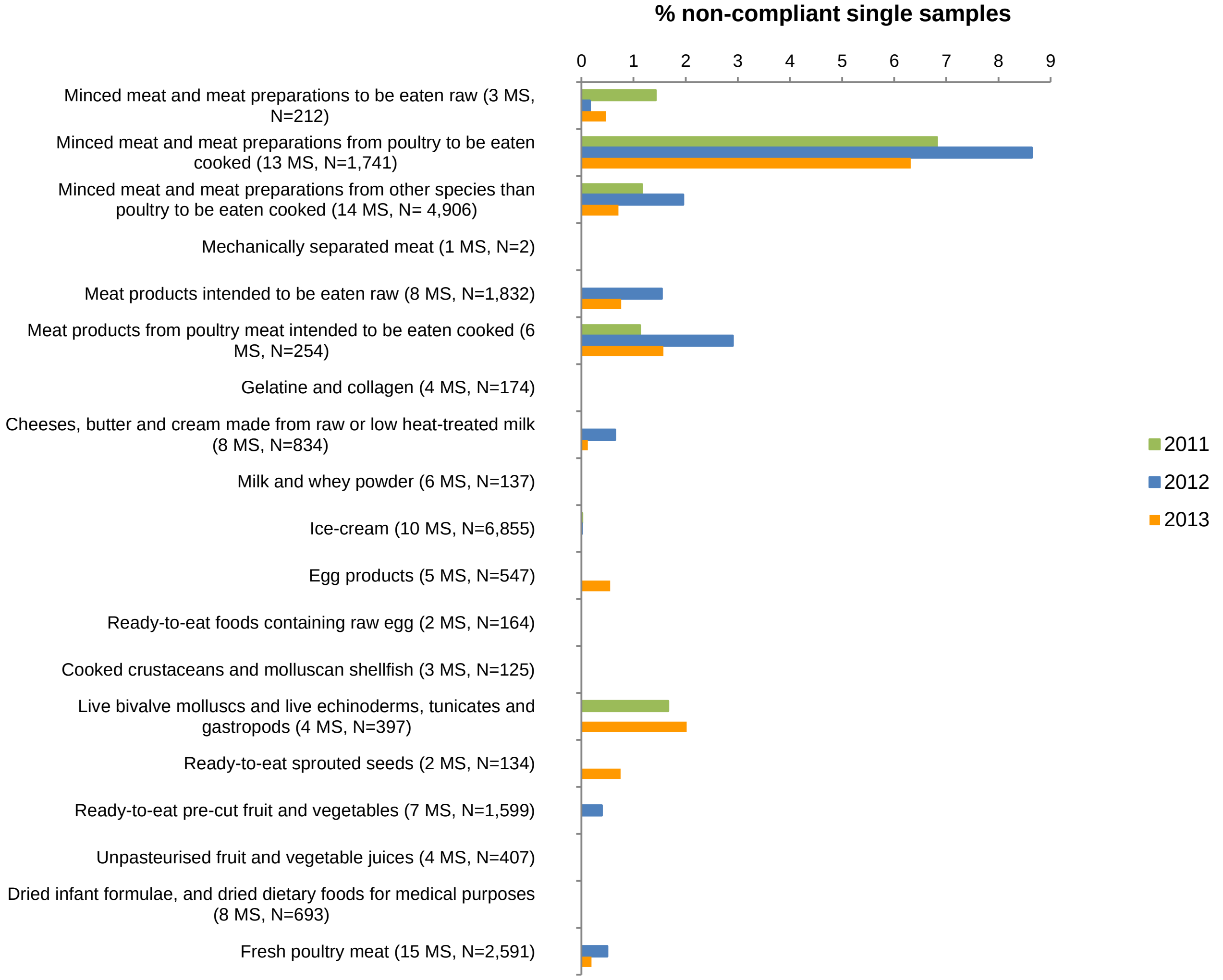
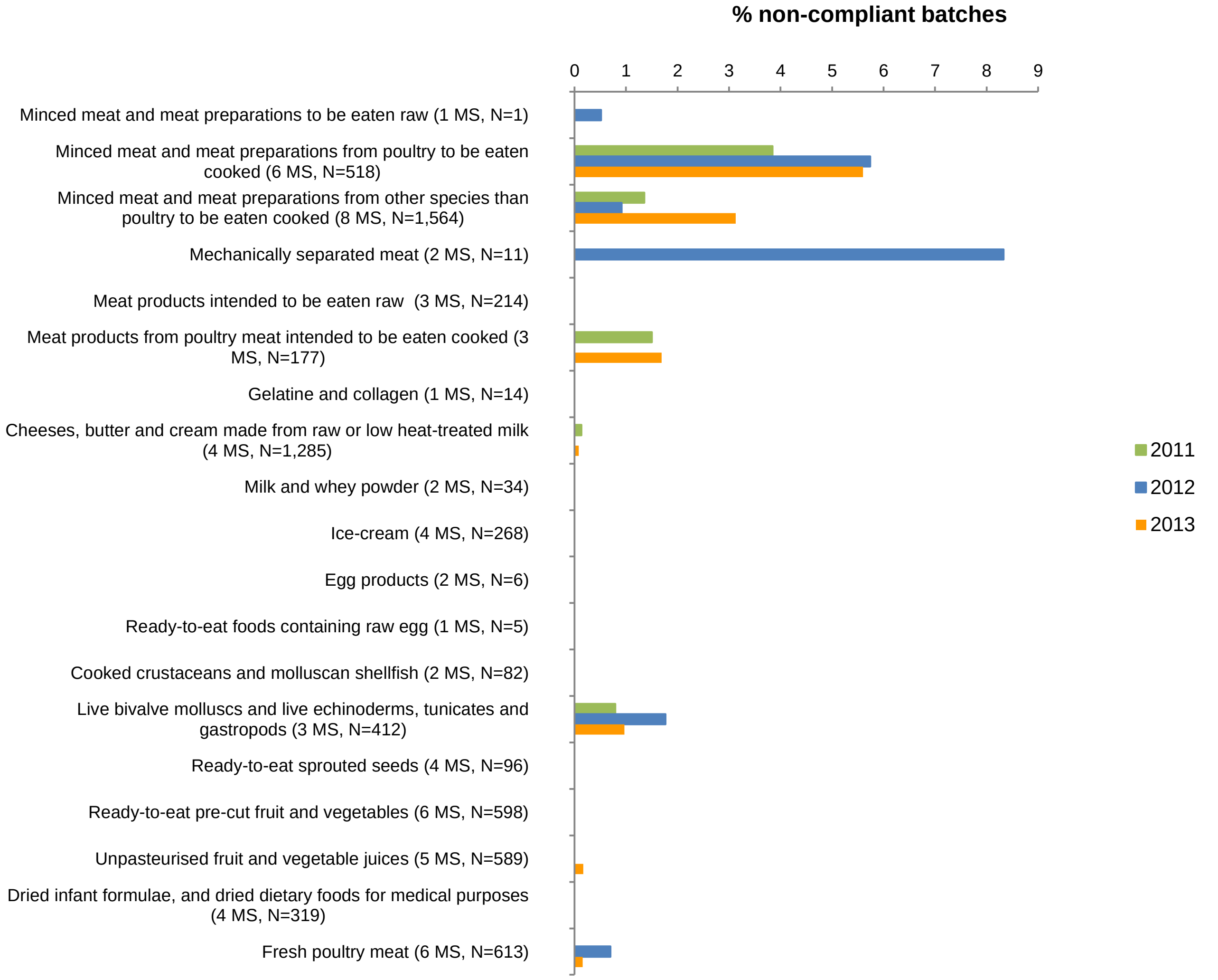


Figure 4. Proportion of units (single samples and batches) not complying with the EU* Salmonella *criteria, 2011-2013



Number of included MS and tested units indicated for 2013. Includes investigations where the sampling unit (single samples or batches) and sampling stage at retail (also catering, hospitals and care homes) has been specified for the relevant food types.
The number of reporting MS and tested samples (in brackets after the food categories) refers to 2013 data.

Figure 4 (cont). Proportion of units (single samples and batches) not complying with the EU* Salmonella *criteria, 2011-2013

Broiler meat and products thereof

Monitoring activities and control programmes for *Salmonella* in fresh broiler meat are based on sampling at the slaughterhouse (mainly neck skin samples) and/or at processing or cutting plants and at retail, where meat samples are usually collected.

Overall, *Salmonella* was detected in 3.5 % of the 66,458 units tested (2.9 % of single samples and 5.6 % of batches), which is comparable to the findings in 2012. At retail, the overall proportion of *Salmonella*-positive samples was 7.5 %, higher than at slaughterhouse (4.9 %) and at the processing plant (2.6 %) level (Table 4). These results are heavily influenced by Poland's reports of large investigations at slaughterhouses and at processing plants, which constituted about 80.5 % of the samples of fresh broiler meat. At retail, Hungarian data heavily influenced the overall results because of reporting 106 (33 % of 325 samples) of the total 208 *Salmonella*-positive samples.

Ten MS reported at all three sampling stages, although, in some cases, the main monitoring or surveillance activities were clearly at one or two sampling stages, with only a smaller number of samples obtained at the other levels. Generally, MS that reported higher proportions of positive samples did so for all sampling stages.

In 2013, *Salmonella* was found in 0.3 % of the 4,776 samples of RTE broiler meat products tested at retail or at processing (0.1 % of single samples and 1.9 % of batches). Ireland provided very detailed information on the origin of samples of imported meat, but none of these tested positive (Table SALMRTEBROIL).

Table 4.* Salmonella *in fresh broiler meat at slaughter, processing/cutting level and retail level, 2013

Sampling stage	Country	Matrix	Description	Sample origin	Sample unit	Sample weight	Tested	Positive	Percent positive
Retail	Austria	fresh	food sample, Surveillance	Austria	single	25 g	127	14	11.02
						50 g	1	0	0
				European Union	single	25 g	12	1	8.33
				Unknown	single	25 g	5	1	20
	Belgium	fresh	Surveillance		single	25 g	317	10	3.15
	Bulgaria	fresh	food sample - meat, Surveillance	Bulgaria	batch	25 g	73	2	2.74
					single	25 g	3	1	33.33
	Cyprus	fresh	food sample - meat, Surveillance		single	25 g	7	0	0
	Czech Republic	fresh	food sample, Surveillance	Czech Republic	batch	25 g	31	0	0
				European Union	batch	25 g	58	0	0
				Non-EU	batch	25 g	2	0	0
	Estonia	fresh	food sample - meat, Surveillance		single	25 g	20	1	5
	Germany	fresh	food sample - meat, Monitoring	Germany	single	25 g	496	20	4.03
	Hungary	fresh	food sample, Surveillance		single	25 g	325	106	32.62
	Ireland	fresh	food sample - meat, Surveillance	Unknown	single	25 g	1	0	0
	Italy	fresh	food sample, Surveillance	Italy	single	25 g	10	0	0
	Latvia	fresh	food sample, Surveillance		single	25 g	150	4	2.67
	Luxembourg	fresh	food sample - meat, Surveillance	Unknown	single	25 g	30	2	6.67
	Netherlands	fresh	food sample - meat, Surveillance	Netherlands	single	25 g	600	19	3.17
	Portugal	fresh, chilled	food sample, Surveillance	Portugal	batch	25 g	45	0	0
	Romania	fresh	food sample - meat, Surveillance		batch	25 g	94	9	9.57
		fresh, chilled	food sample - meat, Surveillance		batch	25 g	96	4	4.17
	Slovakia	fresh	food sample, Surveillance	European Union	single	25 g	20	0	0
				Slovakia	batch	25 g	31	0	0
					single	25 g	14	0	0
				Unknown	single	25 g	4	0	0
		fresh, chilled	food sample, Surveillance	European Union	batch	25 g	25	2	8
				Slovakia	batch	25 g	24	0	0
		fresh, frozen	food sample, Surveillance	European Union	batch	25 g	7	0	0
	Slovenia	fresh, chilled	food sample, Monitoring	Slovenia	batch	25 g	54	9	16.67
	Spain	fresh	food sample - meat, Surveillance	Unknown	single	25 g	82	3	3.66
	Iceland	fresh, breeding flocks	food sample - neck skin, Surveillance	Iceland	batch	25 g	18	0	0
Slaughter batch							0	0	0
Batch							540	26	4.81
Single							2224	182	8.18
Total Retail							2764	208	7.53

Table 4 (cont).* Salmonella *in fresh broiler meat at slaughter, processing/cutting level and retail level, 2013

Sampling stage	Country	Matrix	Description	Sample origin	Sample unit	Sample weight	Tested	Positive	Percent positive
Processing plant	Austria	fresh	food sample, Surveillance	Austria	single	25 g	8	0	0
	Belgium	fresh	Surveillance		single	25 g	113	3	2.65
		fresh, chilled	Monitoring		single	25 g	758	49	6.46
	Bulgaria	fresh	food sample - meat, Surveillance	Bulgaria	batch	25 g	366	17	4.64
					single	25 g	15	0	0
	Cyprus	fresh	food sample - meat, Surveillance		single	25 g	190	10	5.26
	Czech Republic	fresh	food sample - meat, Surveillance	Unknown	single	25 g	290	15	5.17
	Estonia	fresh	food sample - meat, Monitoring	Estonia	batch	25 g	11	0	0
	Greece	carcase, frozen	food sample, Surveillance		single	25 g	10	2	20
		fresh	food sample, Surveillance		single	25 g	30	5	16.67
	Hungary	fresh	food sample, Surveillance	Hungary	single	25 g	263	61	23.19
	Ireland	fresh	food sample - meat, Surveillance	Ireland	batch	25 g	20	0	0
					single	25 g	1	0	0
				Netherlands	single	25 g	3	0	0
				Poland	single	25 g	2	0	0
			food sample - neck skin, Surveillance	Ireland	batch	25 g	10	0	0
					single	25 g	2	0	0
		fresh, frozen	food sample - meat, Surveillance	Unknown	batch	25 g	5	0	0
	Luxembourg	fresh	food sample - meat, Surveillance	Unknown	single	25 g	3	0	0
	Poland	fresh	food sample - meat, Surveillance		batch	25 g	4696	317	6.75
					single	1000 g	1415	9	0.64
						25 g	12275	316	2.57
			food sample - neck skin, Surveillance		batch	25 g	52	1	1.92
					single	25 g	23250	358	1.54
	Portugal	fresh	food sample - meat, Surveillance	Portugal	single	25 g	39	0	0
	Romania	fresh, chilled	food sample - meat, Surveillance		batch	25 g	36	3	8.33
	Slovakia	carcase	food sample - neck skin, Surveillance	Unknown	batch	25 g	2	1	50
		fresh	food sample, Surveillance	Non-EU	single	25 g	4	0	0
				Slovakia	single	25 g	3	0	0
		fresh, chilled	food sample, Surveillance	Unknown	batch	25 g	16	2	12.5
	Spain	fresh	food sample - meat, Surveillance	Unknown	single	25 g	73	2	2.74
	Sweden	fresh	food sample - meat, Control and eradication programmes		batch	25 g	828	0	0
Slaughter batch							0	0	0
Batch							6042	341	5.64
Single							38747	830	2.14
Total Processing plant							44789	1171	2.61

Table 4 (cont). Salmonella *in fresh broiler meat at slaughter, processing/cutting level and retail level, 2013*

Sampling stage	Country	Matrix	Description	Sample origin	Sample unit	Sample weight	Tested	Positive	Percent positive
Slaughterhouse	Austria	fresh	food sample, Surveillance	Austria	single	25 g	10	0	0
	Belgium	carcase	Monitoring		single	1 g	232	5	2.16
		fresh	Monitoring		single	1 g	234	32	13.68
	Bulgaria	carcase	food sample - neck skin, Surveillance	Bulgaria	batch	25 g	346	39	11.27
	Cyprus	carcase	food sample - meat, Surveillance		single	25 g	55	10	18.18
			food sample - neck skin, Surveillance		single	25 g	200	20	10
	Czech Republic	carcase	food sample - neck skin, Surveillance	Unknown	single	25 g	105	4	3.81
		carcase, chilled	food sample - neck skin, Monitoring	Czech Republic	single	25 g	625	73	11.68
	Denmark	carcase	food sample - neck skin, Surveillance	Denmark	batch	300 g	288	0	0
	Estonia	carcase	food sample - neck skin, Monitoring	Estonia	batch	25 g	14	0	0
	Finland	carcase	food sample - neck skin, Control and eradication programmes	Finland	batch	25 g	222	0	0
	Germany	carcase	food sample - neck skin, Monitoring	Germany	slaughter batch	25 g	323	37	11.46
	Hungary	carcase	food sample - neck skin, Surveillance	Hungary	single	25 g	213	37	17.37
	Ireland	carcase	food sample - neck skin, Surveillance	Ireland	single	25 g	184	9	4.89
		carcase, spent	food sample - neck skin, Surveillance	Ireland	single	25 g	20	0	0
		fresh	food sample - meat, Surveillance	Ireland	single	25 g	1	0	0
			food sample - neck skin, Surveillance	Ireland	batch	25 g	5	0	0
					single	25 g	1	0	0
	Latvia	carcase	food sample - neck skin, Surveillance	Latvia	single	25 g	100	0	0
	Lithuania	carcase	food sample - neck skin, Surveillance	Lithuania	batch	.	128	6	4.69
	Poland	carcase	food sample - meat, Surveillance		single	25 g	135	0	0
			food sample - neck skin, Surveillance		batch	125 g	243	117	48.15
						25 g	4973	159	3.2
					single	200 g	385	2	0.52
						25 g	6047	312	5.16
	Romania	carcase	food sample - neck skin, Surveillance		batch	25 g	104	15	14.42
		carcase, chilled	food sample - neck skin, Surveillance		batch	25 g	68	4	5.88
		fresh, chilled	food sample - meat, Surveillance		batch	25 g	111	6	5.41
	Spain	carcase	food sample - meat, Surveillance	Unknown	single	25 g	262	28	10.69
	Sweden	carcase	food sample - neck skin, Control and eradication programmes		single	25 g	3120	0	0
	Iceland	carcase	food sample - neck skin, Surveillance	Iceland	batch	25 g	716	2	0.28
Slaughter batch							323	37	11.46
Batch							6502	346	5.32
Single							11929	532	4.46
Total Slaughterhouse							18754	915	4.88
Border inspection	Cyprus	fresh, frozen	food sample - meat		single	25 g	5	0	0
	Portugal	fresh	food sample - meat, Surveillance	Unknown	batch	25 g	140	29	20.71
Batch							140	29	20.71
Single							5	0	0
Total Border inspection							145	29	20
Unspecified	Sweden	fresh	food sample - meat, Surveillance		single	25 g	6	0	0
Slaughter batch							0	0	0
Batch							0	0	0
Single							6	0	0
Total Unspecified							6	0	0
Slaughter batch							323	37	11.46
Batch							13224	742	5.61
Single							52911	1544	2.92
Total (MS)							66458	2323	3.5

Turkey meat and products thereof

In total, 6,639 samples of fresh turkey meat were tested and, overall, 5.4 % were *Salmonella*-positive (5.1 % of single samples and 6.7 % of batches) (Table SALMTURKMEAT). Most of the samples were taken at the slaughterhouse and processing plant (92.8 %) level and only a small proportion of samples were taken at retail (6.6 %). The majority of the tested units were from Poland, which reported in total, as a result of five investigations, 65.5 % of all units tested in the EU MS.

Of the 2,100 tested units of RTE products from turkey meat, only one single sample in each of two investigations at retail and one single sample in an investigation at an unspecified sampling stage were found to be *Salmonella*-positive (0.1 % in total) (Table SALMRTETURK).

Eggs and egg products

According to EU legislation, from 1 January 2009, eggs shall not be used for direct human consumption as table eggs unless they originate from a commercial flock of laying hens subject to a national *Salmonella* control programme (Regulation (EC) No 1237/2007[22]).

In total, 0.1 % of the 23,441 tested table egg units were found to be *Salmonella*-positive (0.03 % of single samples and 0.5 % of batches) (Table SALMEGGS). Most of the tested units were tested in Germany (80.9 %), and Germany conducted some very large investigations including testing of table eggs, shells, whites and yolks at retail, at the processing plants and at an unspecified sampling stage. The occurrence of *Salmonella* in the German samples from table eggs was in all cases very low (< 1 %).

It should be noted that what constituted a batch or single sample varied considerably in terms of weight (25-600 g) and content among the MS. This may have an impact on the results from the investigations and should be kept in mind when comparing the results.

Pig meat and products thereof

Most of the national monitoring programmes for *Salmonella* in pig meat and products thereof are based on sampling at the slaughterhouse by swabbing an area of the carcase and/or at the processing or cutting plants where meat samples or environmental samples are usually collected.

Within the EU, a total of 78,624 units of fresh pig meat were tested, of which 0.7 % tested *Salmonella*-positive (Table SALMPIGMEAT). Most of the samples were tested at the slaughterhouse level (81.2 %) and were mainly reported by five MS, accounting for 90.1 % of samples tested at this stage. Of the total number of samples tested, 49.0 % were from Poland, and Poland reported data from some very large investigations at the slaughterhouse and processing plant stages.

In 2013, 0.8 % of the 27,662 tested samples of RTE minced meat, meat preparations and meat products from pig meat tested positive for *Salmonella* (Table SALMRTEPIG). Most of these samples were tested at the processing plant (85.4 %) level, where investigations conducted in Poland included the majority of the tested units (76.8 % of RTE foods of pig meat origin tested at processing). Six MS tested 1,161 samples of fermented sausages at the retail level, and three of them reported 11 positive samples; of these, two were *S.* Typhimurium-positive and one was positive for the monophasic variant of *S.* Typhimurium.

Bovine meat and products thereof

Data from the testing of fresh bovine meat mainly originates from surveillance programmes, where samples are collected at slaughterhouses (carcase swabs or meat samples) and/or at processing plants, at retail or during border inspections (meat samples).

The overall proportion of positive samples among the 40,268 samples of fresh bovine meat tested in MS was 0.3 % (Table SALMBOVINEMEAT). Most of the samples were tested at the slaughterhouse (63.2 %), where very large investigations on carcases were reported by five MS, accounting for 92.7 % of samples tested at this stage.

None of the 1,480 units of RTE minced meat, meat preparations and meat products from bovine meat tested in the MS was found to be *Salmonella*-positive (Table SALMRTEBOVINE).

Salmonella in other foodstuffs

Of the 5,915 samples of vegetables tested, 0.1 % were *Salmonella*-positive (Table SALMVEGET). Several investigations included imported vegetables, generally specified as originating from other EU countries or

[22] Commission Regulation (EC) No 1237/2007 of 23 October 2007 amending Regulation (EC) No 2160/2003 of the European Parliament and of the Council and Decision 2006/696/EC as regards the placing on the market of eggs from *Salmonella* infected flocks of laying hens. OJ L 280, 24.10.2007, p 5-9.

from non-EU states. Ireland, exceptionally, provided detailed information on the country of origin. Most units were tested at retail (81.9 %) and positive samples were obtained by only three MS: Denmark found *Salmonella* in one batch of leafy greens imported from another MS and in two batches of baby corn of non-EU origin; Ireland reported one positive single sample from an unspecified product imported from Italy; and Italy reported two positive samples from an unspecified product of domestic origin.

In fruits, of the 1,558 tested units, *Salmonella* was found in only two investigations, in one of 85 single samples of pre-cut RTE fruit tested at a processing plant in Greece, and in one single sample at an unspecified stage in the Netherlands (0.8 % in total) (Table SALMFRUIT). Of the 427 samples reported as 'Fruit and vegetables', the proportion of positive samples was 0.2 % and only one sample from a pre-cut product tested positive at retail (Table SALMFRUITVEG).

No positive samples were observed out of the 157 tested units of dried seeds (Table SALMDRIEDSEED). In sprouted seeds, 0.8 % of the samples tested at the EU level were positive and *Salmonella* was detected by three MS in four investigations (three at retail and one at an unspecified sampling stage) (Table SALMSPRSEED).

In the 4,295 samples of spices and herbs tested for *Salmonella*, 0.4 % tested positive. Of the 15 positive samples, three were of products originating outside the EU (Table SALMHERBS).

In total, 1,225 units of live bivalve molluscs were tested and, in three investigations conducted in different countries at retail, *Salmonella* was found in low levels (1.8 %-6.3 %) (Table SALMBIVMOLLUSC).

In 2013, 1,620 samples of egg products were tested and 12 (0.7 %) were found to be positive (one at processing, three at retail and eight at an unspecified sampling stage).

Animals

All MS and three non-MS reported data on *Salmonella* in various animal populations (Table SALMOVERVIEWANI).

EU MS have compulsory or voluntary *Salmonella* control or monitoring programmes in place for a number of farm animal species. To protect human health against *Salmonella* infections transmissible between animals and humans, EU Regulation (EC) No 2160/2003 obliges MS to set up national control programmes for *Salmonella* serovars in poultry and pigs, which are deemed to be of particular importance for public health. The animal populations which are currently targeted include breeding flocks, laying hens, broilers of *Gallus gallus* and breeding and fattening turkeys. The National Control Programmes are established in individual MS to achieve EU reduction targets to decrease the *Salmonella* prevalence in those animal populations at the primary production level. National control programmes have to be approved by the EC. The results of the programmes have to be reported to the EC and EFSA as part of the annual zoonoses report.

Breeding flocks of Gallus gallus

The year 2013 was the seventh year in which MS were obliged to implement *Salmonella* control programmes in breeding flocks of *Gallus gallus* in accordance with Regulation (EC) No 2160/2003 and Regulation (EC) No 200/2010.[23] The control programmes for breeding flocks aim to meet a reduction target of 1 % or less of positive flocks for the following serovars: *S.* Enteritidis, *S.* Typhimurium, *S.* Infantis, *S.* Virchow and *S.* Hadar, including monophasic *S.* Typhimurium. The target was set for all commercial-scale adult breeding flocks, during the production period, comprising at least 250 birds. However, MS with fewer than 100 breeding flocks would attain the target if only one adult breeding flock remained positive.

In 2013, 26 MS and three non-MS reported data within the framework of the programme. This is because two MS (Luxembourg and Malta) do not have breeding flocks of *Gallus gallus*. During 2013, *Salmonella* was found in 1.9 % of adult breeding flocks in the EU at some stage during the production period (Table 5), compared with 3.0 % in 2012.

[23] Commission Regulation (EC) No 200/2010 of 10 March 2010 implementing Regulation (EC) No 2160/2003 of the European Parliament and of the Council as regards a Union target for the reduction of the prevalence of *Salmonella* serotypes in adult breeding flocks of *Gallus gallus*. OJ L 61, 11.3.2010, p. 1–9.

Table 5.* Salmonella *in breeding flocks of* Gallus gallus *during the production period (all types of breeding flocks, flock-based data) in countries running control programmes in accordance with Regulation (EC) No 2160/2003, 2013

Country	Tested	Percent positive	Five target serovars %(a)	S. Enteritidis %	S. Typhimurium %	S. Infantis %	S. Virchow %	S. Hadar %	Other than target %
Austria	130	5.38	0.77	0.77	0	0	0	0	4.62
Belgium	551	2.18	0.36	0.36	0	0	0	0	2.36
Bulgaria	194	1.03	1.03	0	0	0.52	0	0.52	0
Croatia	118	0	0	0	0	0	0	0	0
Cyprus	36	8.33	0	0	0	0	0	0	8.33
Czech Republic	647	5.26	0.93	0.93	0	0	0	0	4.33
Denmark	165	0.61	0.61	0	0.61	0	0	0	0
Estonia	10	0	0	0	0	0	0	0	0
Finland	173	0.58	0.58	0	0.58	0	0	0	0
France	1818	0.11	0.11	0.06	0.06	0	0	0	0
Germany	705	2.13	1.56	0.28	0.28	0.99	0	0	0.57
Greece	547	2.93	0.73	0.73	0	0	0	0	2.19
Hungary	890	1.91	1.57	0.79	0.34	0.45	0	0	0.34
Ireland	163	0	0	0	0	0	0	0	0
Italy	1287	3.81	0.31	0	0.16	0.16	0	0	6.14
Latvia	26	0	0	0	0	0	0	0	0
Lithuania	68	0	0	0	0	0	0	0	0
Netherlands	140	0	0	0	0	0	0	0	0
Poland	1578	2.22	1.77	1.39	0.06	0.32	0	0	0.44
Portugal	508	1.77	0.2	0	0	0	0	0.2	1.57
Romania	386	6.74	0	0	0	0	0	0	6.74
Slovakia	163	0	0	0	0	0	0	0	0
Slovenia	139	2.88	0	0	0	0	0	0	2.88
Spain	1783	1.18	0.39	0.17	0.17	0	0	0.06	0.79
Sweden	155	0	0	0	0	0	0	0	0
United Kingdom	1766	0.85	0.11	0	0.11	0	0	0	0.74
Iceland	42	2.38	0	0	0	0	0	0	2.38
Norway	158	0	0	0	0	0	0	0	0
Switzerland	74	0	0	0	0	0	0	0	0
Total (MS)	14145	1.9	0.61	0.34	0.11	0.13	0	0.02	1.56

Luxembourg and Malta do not have breeding flocks of *Gallus gallus*. Target is set up at 1 % for all countries.
(a): *S.* Enteritidis, *S.* Typhimurium including monophasic *S.* Typhimurium, *S.* Infantis, *S.* Virchow, *S.* Hadar.

The prevalence of the five targeted *Salmonella* serovars (*S.* Enteritidis, *S.* Typhimurium, *S.* Infantis, *S.* Virchow and *S.* Hadar) was 0.6 % in 2013 (Table 5), as in 2012 and 2011, down from 1.4 % in 2007 to 0.7 % in 2010 (Figure SALMTRENDBREED). A total of 11 MS and three non-MS reported no positive flocks for the target serovars.

In total, 22 MS and three non-MS met the target of 1 % set for 2013. The MS that did not meet the target were Poland, Hungary, Germany and Bulgaria, with the highest flock prevalence of 1.77 % reported by Poland (Figures SALMTARGETBREED and SALMMAPBREED).

The most commonly reported target serovar in breeding flocks of *Gallus gallus* in 2013 was *S.* Enteritidis (0.34 %), reported by nine MS, followed by *S.* Infantis (0.13 %) and *S.* Typhimurium (0.11 %) (Table 5). Monophasic *S.* Typhimurium, which is counted as a target serovar, was reported in five breeding flocks of *Gallus gallus* in 2013: in France (one flock) and in Italy and Spain (two flocks each).

Laying hen flocks

The EU target for laying hens is defined in Regulation (EC) No 517/2011[24] as an annual minimum percentage of reduction in the number of adult laying hen flocks (i.e. in the production period) remaining positive for *S.* Enteritidis and/or *S.* Typhimurium by the end of the previous year. The annual targets are proportionate, depending on the prevalence in the preceding year, but the ultimate EU target is defined as a maximum percentage of adult flocks remaining positive at 2 %. Any reporting of monophasic *S.* Typhimurium is included within the *S.* Typhimurium total and as such is counted as a target serovar. However, MS with fewer than 50 flocks of adult laying hens would attain the target if only one adult flock remained positive.

[24] Commission Regulation (EU) No 517/2011 of 25 May 2011 implementing Regulation (EC) No 2160/2003 of the European Parliament and of the Council as regards a Union target for the reduction of the prevalence of certain *Salmonella* serotypes in laying hens of *Gallus gallus* and amending Regulation (EC) No 2160/2003 and Commission Regulation (EU) No 200/2010. OJ L 138, 26.5.2011, p. 45–51.

In 2013, all MS had control programmes approved by the EC. In total, 28 MS and three non-MS reported data within the framework of the laying hen flock programme for 2013. Overall, the EU level prevalence of adult laying hen flocks positive with *Salmonella* spp. was 2.8 % (Table 6), compared with 3.5 % in 2012.

The reported EU level prevalence of adult laying hen flocks positive with *S.* Enteritidis and/or *S.* Typhimurium decreased further to 1 % from 1.3 % in 2012, following the decreasing trend observed since 2008 (Figure SALMTRENDLAY). Five MS and two non-MS reported no flocks positive with *S.* Enteritidis and/or *S.* Typhimurium (Table 6).

Overall, 27 MS and three non-MS met their 2013 reduction targets. Estonia and Latvia met the target even with a proportion of positive flocks higher than 2 % (their target), as they tested fewer than 50 flocks of adult laying hens and reported only one positive flock. Croatia did not reach the absolute target (2 %), but the achievement of the relative reduction target for 2013 cannot be evaluated, as 2013 was the first year of reporting for this MS (Figures SALMTARGETLAY and SALMMAPLAY).

The most common of the target serovars in laying hen flocks was *S.* Enteritidis (0.8 % compared with 0.2 % *S.* Typhimurium). Monophasic *S.* Typhimurium was detected in France, the Netherlands, Poland and the United Kingdom (one flock each), and in Italy and Spain (two flocks each).

Table 6.* Salmonella *in laying hen flocks of* Gallus gallus *during the production period (flock-based data) in countries running control programmes, 2013

Country	Tested	Percent positive	S. Enteritidis S. Typhimurium %[(a)]	S. Enteritidis %	S. Typhimurium %	Other than SET %
Austria	2731	2.12	0.84	0.51	0.33	1.54
Belgium	606	5.94	1.82	1.65	0.17	4.62
Bulgaria	455	1.32	0	0	0	1.32
Croatia	322	2.8	2.8	2.8	0	0
Cyprus	40	87.5	7.5	7.5	0	80
Czech Republic	471	2.55	1.49	1.49	0	1.06
Denmark	373	1.07	1.07	0.27	0.8	0
Estonia	33	3.03	3.03	0	3.03	0
Finland	844	0	0	0	0	0
France	4974	0.6	0.6	0.34	0.26	0
Germany	5338	2	1.18	0.75	0.43	0.82
Greece	432	6.71	1.16	1.16	0	6.02
Hungary	1055	6.45	1.99	1.8	0.19	4.45
Ireland	208	0	0	0	0	0
Italy	2277	2.55	1.27	1.01	0.26	8.83
Latvia	44	2.27	2.27	2.27	0	0
Lithuania	97	0	0	0	0	0
Luxembourg	7	0	0	0	0	0
Malta	85	49.41	1.18	1.18	0	48.24
Netherlands	3457	0.72	0.72	0.55	0.17	0
Poland	2413	3.98	2.4	2.2	0.21	1.57
Portugal	383	6.27	1.57	1.57	0	5.22
Romania	557	14.9	1.44	1.44	0	13.46
Slovakia	396	1.26	0.25	0.25	0	1.01
Slovenia	182	3.85	1.1	1.1	0	2.75
Spain	2135	8.76	1.87	1.55	0.33	6.89
Sweden	636	1.1	1.1	0	1.1	0
United Kingdom	4012	0.92	0.07	0.05	0.02	0.85
Iceland	30	0	0	0	0	0
Norway	747	0	0	0	0	0
Switzerland	901	0.22	0.22	0.11	0.11	0
Total (MS)	34568	2.8	1.04	0.79	0.24	2.3

Target (production period) is calculated from the prevalence reported in 2012. Target is set up at 2.0 % for most of the countries, with the exception of the following: Cyprus (11.0 %), Malta (5.5 %), Luxembourg (3.2 %) and Poland (2.6 %). Croatia did not have the relative reduction target for 2013, as 2013 was the first year of reporting for this MS.
(a): *S.* Typhimurium includes monophasic *S.* Typhimurium.

Broiler flocks

The EU target for broiler flocks is defined in Regulation (EC) No 200/2012[25] as a maximum percentage of broiler flocks remaining positive for the target serovars *S.* Enteritidis and/or *S.* Typhimurium (including monophasic *S.* Typhimurium) of 1 % or less. Positive flocks have to be counted and reported once only (flock level prevalence), irrespective of the number of sampling and testing operations.

In 2013, all MS had control programmes approved by the EC. Twenty-seven MS and three non-MS reported data on broiler flocks before slaughter. France reported the number of tested flocks (60,367), but the number of positive flocks is not available. In 2013, the EU level prevalence of broiler flocks positive with *Salmonella* spp. was 3.7 % (Table 6), compared with 3.2 % in 2012.

The reported prevalence of *S.* Enteritidis and *S.* Typhimurium in the EU was 0.2 %, slightly lower than in 2012 (0.3 %), continuing the decreasing trend observed since 2009 (0.7 %) (Figure SALMTRENDBROIBS). Eight MS and three non-MS reported no flocks positive with *S.* Enteritidis and/or *S.* Typhimurium (Table 7).

In 2013, 26 MS and three non-MS met the target of 1 % or less of broiler flocks positive for *S.* Enteritidis and/or *S.* Typhimurium. The MS that did not achieve the 2013 *Salmonella* reduction target was the Czech Republic (Figures SALMTARGETBROIBS and SALMMAPBROIBS).

The most common target serovar in broiler flocks was *S.* Enteritidis (0.12 % compared with 0.07 % *S.* Typhimurium). Monophasic *S.* Typhimurium was detected in 13 broiler flocks in 2013: in the Czech Republic, Italy, Malta and the Netherlands (one flock each), Portugal and Spain (two flocks each) and the United Kingdom (five flocks).

Table 7. Salmonella in broiler flocks of Gallus gallus before slaughter (flock-based data) in countries running control programmes, 2013

Country[(a)]	Tested	Percent positive	S. Enteritidis S. Typhimurium %[(b)]	S. Enteritidis %	S. Typhimurium %	Other than SET %
Austria	3581	2.99	0.47	0.06	0.42	2.6
Belgium	8664	2.09	0.15	0.08	0.07	2.08
Bulgaria	2373	0.42	0	0	0	0.42
Croatia	3053	0.29	0.29	0.16	0.13	0
Cyprus	978	1.23	0	0	0	1.23
Czech Republic	4671	5.03	3.15	3.08	0.06	1.88
Denmark	3498	0.97	0.37	0	0.37	0.63
Estonia	571	0	0	0	0	0
Finland	3439	0.03	0	0	0	0.03
Germany	22216	1.53	0.03	0	0.03	1.5
Greece	6252	0.21	0.02	0.02	0	0.19
Hungary	7873	16.18	0.09	0.04	0.05	16.09
Ireland	21	9.52	0	0	0	9.52
Italy	22267	10.23	<0.01	0	<0.01	10.37
Latvia	598	0	0	0	0	0
Lithuania	186	0	0	0	0	0
Luxembourg	8	0	0	0	0	0
Malta	519	15.22	0.58	0.19	0.39	14.64
Netherlands	15929	4.83	0.21	0.05	0.16	4.61
Poland	28941	0.29	0.19	0.18	<0.01	0.1
Portugal	11130	0.38	0.1	0.05	0.04	0.28
Romania	7725	13.89	0.44	0.38	0.06	13.45
Slovakia	2282	2.1	0.18	0.09	0.09	1.93
Slovenia	2218	2.25	0.14	0.09	0.05	2.12
Spain	34003	3.29	0.07	<0.01	0.06	3.22
Sweden	3276	0.03	0.03	0	0.03	0
United Kingdom	37721	2.25	0.05	0	0.05	2.2
Iceland	640	2.34	0	0	0	2.34
Norway	5217	0.04	0	0	0	0.04
Switzerland	629	0.95	0	0	0	0.95
Total (MS)	233993	3.68	0.18	0.12	0.07	3.63

25 Commission Regulation (EC) No 200/2012 of 8 March 2012 concerning a Union target for the reduction of *Salmonella enteritidis* and *Salmonella typhimurium* in flocks of broilers, as provided for in Regulation (EC) No 2160/2003 of the European Parliament and of the Council. OJ L 71, 9.3.2012, p. 31–36.

Target is set up at 1 % for all countries.
(a): French 2013 data for broiler flocks are not included, as the number of positive flocks out of the tested flocks (60,367) is not known.
(b): *S.* Typhimurium includes monophasic *S.* Typhimurium.

Breeding and fattening turkeys

In 2012, a final annual *Salmonella* reduction target for turkey flocks came into force. This target was an extension of the transitional target implemented in the period of 2010–2012. The EU definitive target for turkey flocks is defined in Regulation (EU) No 1190/2012[26] as a maximum percentage of breeding and fattening turkey flocks remaining positive for the target serovars *S.* Enteritidis and/or *S.* Typhimurium (including monophasic *S.* Typhimurium) of 1 % or less. Positive flocks have to be counted and reported once only (flock level prevalence), irrespective of the number of sampling and testing operations. For MS with fewer than 100 flocks of adult breeding or fattening turkeys, the EU target is that no more than one flock of adult breeding or fattening turkeys may remain positive. All results are presented at flock level.

For breeding turkeys, 14 MS and two non-MS reported data from *Salmonella* testing in adult flocks in 2013 (Table 8), as in 2012. Data show that 93.1 % of the 1,567 turkey breeding flocks at the EU level were reported by France, Germany, Hungary, Italy and the United Kingdom, whereas few flocks were reported by the other countries. The overall EU prevalence of *Salmonella* was 4.9 % (Table 8), which was higher than in 2012 (4.6 %).

Overall, the EU level prevalence for the target serovars was 0.3 %, which is slightly lower than in 2012 (0.5 %) but still higher than the prevalence observed in 2011 (0.2 %) (Figure SALMTRENDBREEDTURK). Only two MS (France and Germany) reported flocks positive for the target serovars.

In total, all 14 reporting MS and two non-MS met the target prevalence of *S.* Enteritidis and/or *S.* Typhimurium set for adult turkey breeding flocks in 2013, which is one MS more than in 2012. Germany met the target even though the proportion of positive flocks was higher than 1 %, as it tested fewer than 100 flocks of adult breeding flocks of turkeys and reported only one positive flock (Figures SALMTARGETBREEDTURK and SALMMAPBREEDTURK).

The most common of the target serovars in breeding turkey flocks was *S.* Typhimurium (0.26 % compared with 0.06 % *S.* Enteritidis). Monophasic *S.* Typhimurium was detected in only one flock in France.

Table 8.* Salmonella *in breeding flocks of turkeys (adults, flock-based data) in countries running control programmes, 2013

Country	Tested	Percent positive	S. Enteritidis S. Typhimurium %[a]	S. Enteritidis %	S. Typhimurium %	Other than SET %
Bulgaria	4	0	0	0	0	0
Croatia	8	0	0	0	0	0
Czech Republic	9	0	0	0	0	0
Finland	8	0	0	0	0	0
France	707	0.57	0.57	0.14	0.42	0
Germany	79	2.53	1.27	0	1.27	1.27
Greece	3	33.33	0	0	0	33.33
Hungary	212	24.06	0	0	0	24.06
Ireland	3	0	0	0	0	0
Italy	235	3.83	0	0	0	3.83
Slovakia	33	0	0	0	0	0
Spain	36	19.44	0	0	0	19.44
Sweden	4	0	0	0	0	0
United Kingdom	226	1.33	0	0	0	1.33
Iceland	4	0	0	0	0	0
Norway	15	0	0	0	0	0
Total (MS)	1567	4.91	0.32	0.06	0.26	4.59

Target is set up at 1 % for all countries.
(a): *S.* Typhimurium includes monophasic *S.* Typhimurium.

For fattening turkeys, in total, 23 MS and three non-MS provided data from flocks before slaughter. France reported the number of tested flocks (10,653), but the number of positive flocks is not available. In 2013, the

[26] Commission Regulation (EU) No 1190/2012 of 12 December 2012 concerning a Union target for the reduction of *Salmonella* Enteritidis and *Salmonella* Typhimurium in flocks of turkeys, as provided for in Regulation (EC) No 2160/2003 of the European Parliament and of the Council. OJ L 340, 13.12.2012, p. 29–34.

EU level prevalence of turkey fattening flocks positive with *Salmonella* spp. was 11.5 % (Table 9), which is a decrease compared with 2012, when a prevalence of 14.6 % was reported.

The overall prevalence at the EU level for the target serovars was 0.2 % (Table 9), lower than in 2012 (0.4 %), continuing the decreasing trend observed since 2011 (0.5 %) (Figure SALMTRENDFATTURKBS). Ten MS and three non-MS reported no flocks positive with *S.* Enteritidis and/or *S.* Typhimurium.

In 2013, 21 MS and three non-MS met their 2013 reduction targets set for fattening turkeys. Slovakia met the target even though the proportion of positive flocks was higher than 1 %, as it tested fewer than 100 adult breeding flocks of turkeys and reported only one positive flock. Two MS (Croatia and the Czech Republic) did not achieve the 2013 *Salmonella* reduction target (Figures SALMTARGETFATTURKBS and SALMMAPFATTURKBS).

The most common of the target serovars in fattening turkey flocks was *S.* Typhimurium (0.12 % compared with 0.06 % *S.* Enteritidis). Monophasic *S.* Typhimurium was detected only in Italy (three flocks) and Portugal (two flocks).

Table 9.* Salmonella *in fattening flocks of turkeys before slaughter (flock-based data) in countries running control programmes, 2013

Country[(a)]	Tested	Percent positive	S. Enteritidis S. Typhimurium %[(b)]	S. Enteritidis %	S. Typhimurium %	Other than SET %
Austria	356	10.11	0.28	0	0.28	9.83
Belgium	191	1.57	0.52	0	0.52	1.05
Bulgaria	3	0	0	0	0	0
Croatia	202	1.49	1.49	0	1.49	0
Cyprus	7	28.57	0	0	0	28.57
Czech Republic	267	10.49	1.12	1.12	0	9.36
Denmark	56	3.57	0	0	0	3.57
Finland	324	0.62	0.62	0	0.62	0
Germany	3879	0.54	0.08	0.03	0.05	0.46
Greece	52	0	0	0	0	0
Hungary	2456	35.67	0.04	0.04	0	35.63
Ireland	18	16.67	0	0	0	16.67
Italy	4747	23.76	0.06	0	0.06	32.72
Lithuania	25	0	0	0	0	0
Netherlands	273	0.37	0	0	0	0.37
Poland	4852	2.58	0.27	0.16	0.1	2.31
Portugal	813	0.98	0.49	0	0.49	0.49
Romania	146	1.37	0	0	0	2.74
Slovakia	15	20	6.67	6.67	0	13.33
Slovenia	137	2.92	0	0	0	2.92
Spain	2898	9.32	0.17	0.03	0.14	9.14
Sweden	193	0	0	0	0	0
United Kingdom	2954	8.67	0.07	0	0.07	8.6
Iceland	29	6.9	0	0	0	6.9
Norway	223	0	0	0	0	0
Switzerland	41	2.44	0	0	0	2.44
Total (MS)	24864	11.51	0.18	0.06	0.12	13.11

Target is set up at 1 % for all countries.
(a): French 2013 data for turkey fattening flocks are not included, as the number of positive flocks out of the tested flocks (10,653) is not known.
(b): *S.* Typhimurium includes monophasic *S.* Typhimurium.

Ducks and geese

In 2013, the overall EU prevalence in flocks of ducks and geese was 8.4 % for *Salmonella* spp. and 4.9 % for *S.* Enteritidis and *S.* Typhimurium (Table SALMDUCKGEESE). Owing to differences in types of flocks sampled (breeding or meat production flocks), sampling strategy and sample type, prevalence is not comparable across MS.

Pigs

The overall EU *Salmonella* prevalence from the bacteriological monitoring of pigs was 8.1 %, which is higher than in 2012 (6.3 %). At the herd and slaughter batch levels, the *Salmonella* prevalence was 14.9 % and 30.0 %, respectively; it was lower at the individual animal level (7.4 %) (Table SALMPIGSBACT).

Investigations were reported from breeding and fattening pigs and unspecified animal categories, and from different sampling stages: at the farm, slaughterhouse or unspecified sampling stage. Sample types reported were faeces, lymph nodes, organ or tissue samples, carcase swabs or nasal swabs, or sample types were unspecified.

In the United Kingdom a study to estimate the prevalence of *Salmonella* in pigs was carried out in 2013. The study design was consistent, where possible, with the technical specifications for the EU baseline survey for *Salmonella* in slaughter pigs (Commission Decision 2006/668/EC[27]). The study was carried out at the 14 largest abattoirs of the 169 approved premises in the United Kingdom, who process 80 % of pigs slaughtered in the United Kingdom.

Overall, 619 caecal samples and 624 carcase swabs were tested for the presence of *Salmonella*. After accounting for within-farm clustering, the prevalence of *Salmonella* in the caecal samples was 30.5 % (95 % confidence interval (CI) 26.5-34.6) and the prevalence in the carcase swab samples was 9.6 % (95 % CI 7.3-11.9). The proportion of positive ceacal samples was expected to represent the level of infection in the pigs, and it varied from 11.3 % to 46.8 % in the abattoirs, whereas carcase contamination ranged from 0 % to 21 %. For all but two abattoirs the prevalence of caecal carriage was higher than the carcase contamination. However, it should be noted that some of the prevalence data are based on small sample sizes and the method of comparison is crude, but the variation in the levels of *Salmonella* carcase contamination between abattoirs suggests potential differences in how processing, in particular decontamination by scalding and singeing, as well as general hygiene, is applied.

An age specific difference was also observed as the proportion of *Salmonella* caecal samples was 25.9 % in pigs aged less than 6 months up to 40.7 % in pigs aged over 12 months. The overall contamination rate of carcases in UK pigs was significantly higher in 2007 compared with this study (15.1 % versus 9.6 %).

Source: The United Kingdom National Zoonoses Report, 2013

Cattle

The overall proportion of *Salmonella*-positive samples from the bacteriological monitoring of cattle was 3.7 %, which is higher than in 2012 (2.4 %). The *Salmonella* prevalence was similar at the herd, slaughter batch and animal levels, ranging from 2.7 % to 3.7 %. Higher prevalence was observed in one investigation carried out in Italy in 17 holdings (41.2 %) (Table SALMCATBACT).

Investigations were reported from breeding animals, dairy cows or calves, or were unspecified, and were from farms or slaughterhouses. Tested sample types were faeces, lymph nodes, organ or tissue samples or carcase swabs, or sample types were unspecified.

Other animal species

Salmonella was also investigated in other animal species and detected in cats, dogs, sheep, goats, domestic solipeds, birds, parrots, pigeons, reptiles, snakes, hedgehogs, badgers, minks and other wild animals.

Feedingstuffs

Data on *Salmonella* in feedingstuffs collected by MS are generated from various targeted surveillance programmes as well as from unbiased reporting of random sampling of domestic and imported feedingstuffs. The presentation of single sample and batch-based data from the different monitoring systems has therefore been summarised and includes both domestic and imported feedingstuffs.

The overall level of *Salmonella* contamination in animal- and vegetable-derived feed material in 2013, was low, with 1.4 % of positive samples of 15,315 samples tested (Table SALMDERIVEDFEED). The highest proportion of positive samples in individual investigations was reported for the feed category ‘Feed material of oil seed or fruit origin’, mainly rape seed-derived, soya (bean)-derived, sunflower seed-derived and cotton seed-derived feed. But moderate to high contamination was also detected in ‘Feed material of marine animal origin (fish meal)’ and ‘Feed material of land animal origin (meat meal)’. In meat and bone meal, *Salmonella* contamination is to be considered only an indicator, and it does not pose any risk to food-producing animals because meat and bone meal is still prohibited for feeding food-producing animals, although it is used in pet foods.

In compound feedingstuffs (the finished feed for animals), the overall EU proportion of *Salmonella*-positive findings in 2013 was low for all animal populations: 1.8 % of 1,091 tested samples for cattle, 1.6 % of

[27] Commission Decision 2006/668/EC of 29 September 2006 concerning a financial contribution from the Community towards a baseline survey on the prevalence of *Salmonella* in slaughter pigs to be carried out in the Member States. OJ L 275, 6.10.2006, p. 51–61.

1,590 tested samples for pigs and 1.9 % of 2,551 tested samples for poultry (Tables SALMCOMPFEEDCATTLE, SALMCOMPFEEDPIGS and SALMCOMPFEEDPOULTRY). The proportion of positive samples ranged among the reporting MS from 0 % to about 10 %, with only a few exceptions. It should be highlighted that the reported proportions of positive samples might not always be representative of feedingstuffs on the national markets, as some reports might reflect intensive sampling of high-risk products, and representative sampling of feedingstuff is difficult.

Serovars

Data on the 10 most commonly reported *Salmonella* serovars per major animal population or food/feed category are presented in Table 10. A total of 20,870 isolates were reported and 55.8 % were from *Gallus gallus*, meat thereof and feed for *Gallus gallus*.

The amount of serovar information available and the within country serovar distributions varied considerably between the reporting MS and non-MS. When comparing results in a stable-to-table perspective, it should be kept in mind that all MS and non-MS did not report for all sources. In the following, the percentages of serovars are calculated on the total number of isolates serotyped per each animal population, food/feed category. Serovars reported as 1,4,5,12:i:-, monophasic, 4,5,12:i:-, 4,12:i:- and Typhimurium monophasic will be referred to as monophasic variants of *S.* Typhimurium.

For *Gallus gallus*, *S.* Infantis was the most frequently reported serovar in isolates from *Gallus gallus* (included breeding flocks, broilers and laying hens) (22.7 %) and in isolates from broilers (26.0 %). In broiler meat 37.4 % of the isolates was reported as *S.* Infantis and 37.6 % was reported as *S.* Enteritidis. *S.* Senftenberg was the serovar most often reported from feed for *Gallus gallus* (19.5 %), followed by *S.* Typhimurium (17.1 %).

In turkeys, *S.* Saintpaul was the most frequently reported serovar (30.9 %), followed by *S.* Newport (16.2 %), *S.* Blockley (16.1 %) and *S.* Derby (13.6 %). Italy reported 65 % of all findings in turkeys. In turkey meat, there was a tendency for one MS to report majority of isolates within a serovar, e.g. for the three most commonly reported serovars, Romania reported 37 of 38 *S.* Derby isolates, Poland reported 33 of 34 *S.* Typhimurium isolates and Hungary reported 22 of 28 *S.* Stanley isolates.

As in previous years, *S.* Typhimurium was the most frequently reported serovar in pigs (47.8 %) and pig meat (30.7 %) followed by *S.* Derby (14.8 % and 27.1 %, respectively) and monophasic variants of *S.* Typhimurium. Germany reported 52.0 % of all isolates from pigs. *S.* Senftenberg was the serovar most often reported from pig feed, with four of the 18 isolates serotyped from this source (22.2 %), followed by *S.* Typhimurium (16.7 %).

In cattle, *S.* Typhimurium was the most common serovar (38.6 %), followed by *S.* Dublin (29.4 %), and no other serovars accounted for more than 10 % of the isolates. Also in bovine meat, *S.* Typhimurium was the most frequently reported serovar (20.7 %) followed by *S.* Enteritidis (20.7 %) and *S.* Derby (19.5 %). Compared to the number of isolates from bovine meat (N=87), serovar information was available for a much larger number of isolates from cattle (N=4,859), which might partly explain why *S.* Dublin was only reported in 9.2 % of the isolates from bovine meat, as two MS, where *S.* Dublin was dominant in cattle, did not report on bovine meat (the United Kingdom) or only had a few isolates to report from this source (Ireland). *S.* Infantis was the serovar most often reported from feed for cattle (54.6 %) out of the 22 isolates serotyped.

Detailed data on the 10 most common *Salmonella* serovars in specific food/feed categories and animal populations are shown in tables referenced in the Appendix.

Table 10. Top 10 most commonly reported Salmonella *serovars per animal population or food/feed category in EU MS, 2013*

Animal population, food/feed category	Number of isolates	Number of isolates serotyped	Top 10 serovars per animal population, food/feed category[(a)(b)]									
			1	2	3	4	5	6	7	8	9	10
Gallus gallus [(c)]	9971	5660	Infantis **22.7%**	Mbandaka **14.8%**	Enteritidis **11.1%**	Thompson **10.6%**	Livingstone **4.0%**	Typhimurium **3.9%**	Kentucky **2.8%**	Agona **2.7%**	Kedougou **2.7%**	Montevideo **2.7%**
Broilers	8622	4613	Infantis **26.0%**	Mbandaka **17.3%**	Thompson **12.6%**	Enteritidis **5.9%**	Livingstone **4.4%**	Montevideo **3.2%**	Kedougou **3.2%**	Typhimurium **2.8%**	Agona **2.8%**	1,3,23:i **2.6%**
Broiler meat	3436	1329	Enteritidis **37.6%**	Infantis **37.4%**	Kentucky **4.1%**	1,4,5,12:i:- **3.5%**	Typhimurium **2.6%**	Paratyphi B **2.6%**	Indiana **1.5%**	Virchow **1.3%**	Ohio **1.3%**	Heidelberg **1.1%**
Feed for *Gallus gallus*	47	41	Senftenberg **19.5%**	Typhimurium **17.1%**	Djugu **12.2%**	Oranienburg **9.8%**	Nyborg **9.8%**	1,4,5,12:i:- **7.3%**	Montevideo **7.3%**	Anatum **4.9%**	Hadar **4.9%**	Lille **2.4%**
Turkeys	2852	1195	Saintpaul **30.9%**	Newport **16.2%**	Blockley **16.1%**	Derby **13.6%**	Hadar **3.7%**	Infantis **2.3%**	Kottbus **2.3%**	Kedougou **2.3%**	Typhimurium **2.1%**	Kentucky **1.7%**
Turkey meat	495	206	Derby **18.5%**	Typhimurium **16.5%**	Stanley **13.6%**	Kentucky **12.1%**	Infantis **9.7%**	Newport **6.3%**	Saintpaul **6.3%**	Bredeney **3.4%**	Enteritidis **3.4%**	Grampian **2.4%**
Pigs	35850	2145	Typhimurium **47.8%**	Derby **14.8%**	1,4,5,12:i:- **9.8%**	Group B **3.7%**	4,5,12:i:- **2.5%**	Choleraesuis[(d)] **2.5%**	4,12:i:- **2.0%**	Infantis **1.9%**	Group C **1.9%**	Enteritidis **1.6%**
Pig meat	1397	706	Typhimurium **30.7%**	Derby **27.1%**	4,5,12:i:- **6.1%**	1,4,5,12:i:- **5.5%**	Infantis **3.5%**	4,12:i:- **3.5%**	Rissen **3.4%**	Enteritidis **2.4%**	Brandenburg **2.1%**	Monophasic Typhimurium **1.1%**
Feed for pigs	32	18	Senftenberg **22.2%**	Typhimurium **16.7%**	Hadar **11.1%**	Enteritidis **11.1%**	Enterica, enterica **5.6%**	Havana **5.6%**	Tennessee **5.6%**	Montevideo **5.6%**	Derby **5.6%**	Cerro **5.6%**
Cattle	5931	4859	Typhimurium **38.6%**	Dublin **29.4%**	Group B **8.2%**	Agona **5.6%**	Give **3.3%**	Goldcoast **3.0%**	Infantis **2.3%**	Group D **1.5%**	Group C **1.3%**	Enteritidis **1.2%**
Bovine meat	181	87	Typhimurium **20.7%**	Enteritidis **20.7%**	Derby **19.5%**	Dublin **9.2%**	Altona **4.6%**	4,5,12:i:- **4.6%**	Newport **4.6%**	Infantis **2.3%**	Montevideo **2.3%**	1,4,5,12:i:- **2.3%**
Feed for cattle	21	11	Infantis **54.6%**	Livingstone **9.1%**	Typhimurium **9.1%**	Loenga **9.1%**	Anatum **9.1%**	Mbandaka **9.1%**				

(a): The percentages are calculated on the total number of isolates serotyped per each animal population, food/feed category.
(b): The monophasic variants of *S.* Typhimurium are not included in *S.* Typhimurium, but are reported separately.
(c): The animal category *Gallus gallus* includes breeding flocks, broilers and laying hens.
(d): Variant Kunzendorf.

3.1.3. *Salmonella* food-borne outbreaks

In 2013, 22 MS reported a total of 1,168 food-borne outbreaks of human salmonellosis (including one water-borne outbreak), which constituted 22.5 % of the total number of reported outbreaks of food-borne illness in the EU (Table 11). This represents a decrease of 23.8 % from 2012 to 2013.

The annual total number of *Salmonella* outbreaks within the EU has decreased markedly during recent years. From 2008 to 2013, the total number of *Salmonella* outbreaks decreased by 38.1 %, from 1,888 to 1,168 outbreaks. This reduction parallels the general decline in notified human salmonellosis cases observed within the EU over the same period.

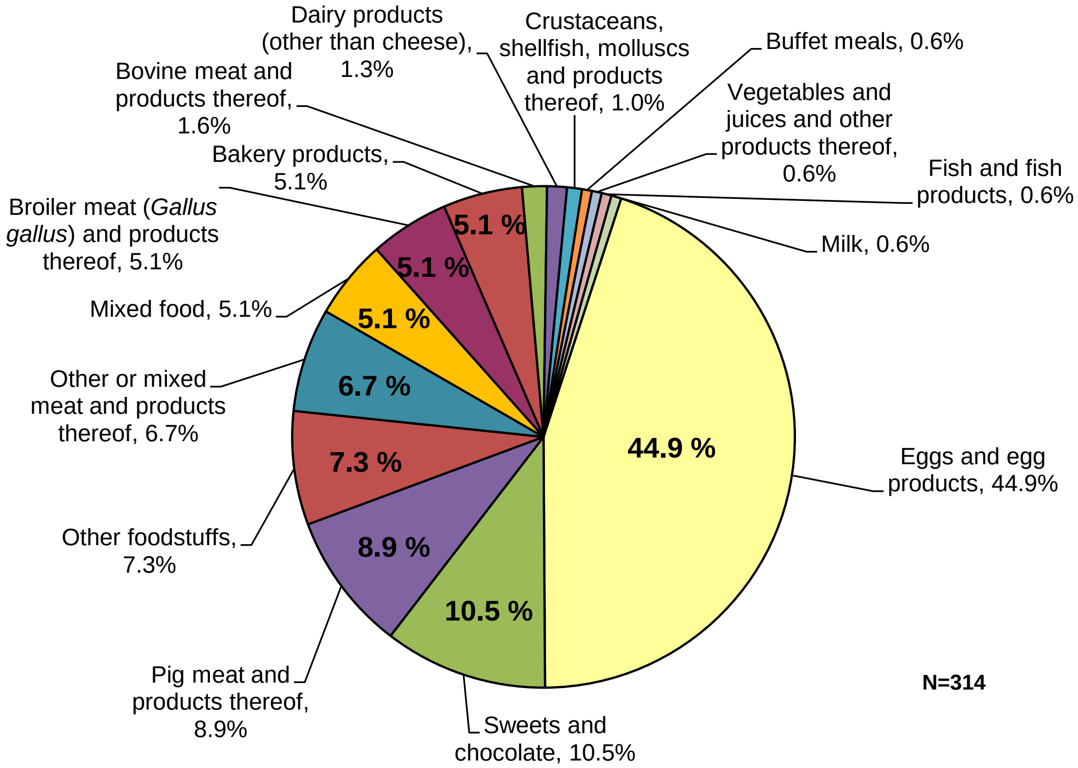
Detailed information on the distribution of the food-borne outbreaks (excluding water-borne outbreaks) of human salmonellosis in the different EU MS and non-MS, the number of cases, hospitalisations and deaths, are summarised in Table 11.

Table 11. Strong- and weak-evidence food-borne outbreaks caused by* Salmonella *(excluding strong-evidence water-borne outbreaks), 2013

Country	Strong-evidence outbreaks				Weak-evidence outbreaks				Total outbreaks	Reporting rate per 100,000
	N	Cases	Hospitalized	Deaths	N	Cases	Hospitalized	Deaths		
Austria	7	17	4	0	37	118	38	0	44	0.52
Belgium	1	3	2	0	10	35	15	0	11	0.1
Croatia	2	22	13	0	29	204	26	0	31	0.73
Czech Republic	0	0	0	0	15	245	48	0	15	0.14
Denmark	4	185	1	0	4	31	0	0	8	0.14
Estonia	1	28	2	0	8	19	8	0	9	0.68
Finland	1	9	1	0	1	4	0	0	2	0.04
France	68	475	72	1	28	351	30	0	96	0.15
Germany	12	712	273	2	146	628	159	0	158	0.2
Greece	0	0	0	0	10	50	21	0	10	0.09
Hungary	5	168	14	0	93	386	113	0	98	0.99
Ireland	0	0	0	0	4	9	3	0	4	0.09
Latvia	1	7	4	0	23	110	44	0	24	1.19
Lithuania	6	81	60	0	34	82	67	0	40	1.35
Netherlands	0	0	0	0	3	7	1	0	3	0.02
Poland	114	780	299	0	68	516	156	0	182	0.47
Romania	4	209	139	0	1	14	9	0	5	0.02
Slovakia	2	34	9	0	212	650	137	0	214	3.96
Slovenia	0	0	0	0	2	13	5	0	2	0.1
Spain	76	848	214	0	116	716	131	2	192	0.41
Sweden	1	14	0	0	5	28	1	0	6	0.06
United Kingdom	9	773	26	0	4	122	21	0	13	0.02
Iceland	0	0	0	0	1	3	0	0	1	0.31
Norway	1	26	0	0	1	34	0	0	2	0.04
Total (MS)	314	4365	1133	3	853	4338	1033	2	1167	0.27

Figure 5 shows the distribution of the most common food vehicles implicated in the strong-evidence *Salmonella* outbreaks in 2013. As in previous years, eggs and egg products were the most frequently identified food vehicles, associated with 44.9 % of these outbreaks. Most of these outbreaks were reported by three MS (Poland, Spain and France). The next most commonly implicated single food vehicle category in the *Salmonella* outbreaks was sweets and chocolates (10.5 % of strong-evidence outbreaks, mostly reported by Poland), followed by pig meat and products thereof (8.9 % of strong-evidence outbreaks, mostly reported by France). In 2013, only one strong-evidence *Salmonella* outbreak reported by Slovakia was associated with the consumption of cheese. This differed from what was observed in 2012, when cheese was the second most commonly implicated single food vehicle category.

In 2013, one water-borne outbreak caused by *Salmonella* was reported by France (data not included in Figure 5).



Data from 314 outbreaks are included: Austria (7), Belgium (1), Croatia (2), Denmark (4), Estonia (1), Finland (1), France (68), Germany (12), Hungary (5), Latvia (1), Lithuania (6), Poland (114), Romania (4), Slovakia (2), Spain (76), Sweden (1) and United Kingdom (9). Water-borne outbreaks excluded.
Other foodstuffs (N=23) include: canned food products (1), cheese (1), herbs and spices (1), and other foods (20).
Other or mixed meat and products thereof (N=21) include: turkey meat and products thereof (1), other or mixed red meat and products thereof (7), other, mixed or unspecified poultry meat and product thereof (1), meat and meat products (12).

Figure 5. Distribution of food vehicles in strong-evidence outbreaks caused by* Salmonella *in the EU, 2013

In 2013, 207 outbreaks with strong evidence were caused by *S.* Enteritidis, followed by *S.* Typhimurium (66.0 % and 9.6 % of the total, respectively, excluding water-borne outbreaks). As in previous years, most of the *S.* Enteritidis outbreaks were attributed to the consumption of eggs and egg products (59.9 %), while those caused by *S.* Typhimurium were mostly attributed to pig meat and products thereof (46.7 %). The distribution of food vehicles in strong-evidence outbreaks caused by *S.* Enteritidis and *S.* Typhimurium in the EU is shown in Figures FBOSALMENTVEHIC and FBOSALMTYPVEHIC.

Information on the setting was reported in all of the 314 *Salmonella* outbreaks, although, for 28 outbreaks, it was indicated as ‘Others’ (23 outbreaks) or ‘Unknown’ (five outbreaks). The most frequently reported settings were restaurant, café, pub, bar, hotel, catering service (18 outbreaks), followed by household (five outbreaks).

3.1.4. Discussion

Non-typhoidal salmonellosis in humans continued to decrease in 2013. Salmonellosis is nonetheless the second most common zoonosis in humans in the EU, with 1,173 food-borne outbreaks reported in 2013 involving 8,788 affected persons. The EU case-fatality rate was 0.14 % and 59 deaths due to non-typhoidal salmonellosis were reported in the EU in 2013.

The salmonellosis notification rates for human infections vary between the MS, reflecting differences in, for example, disease prevalence in the domestic animal population, food and animal trade between MS, the proportion of travel-associated cases and the quality and coverage of the surveillance system. One example of the last of these factors is that countries reporting the lowest notification rate for salmonellosis had the highest proportion of hospitalisation, which may indicate that the surveillance systems in these countries are focusing on the most severe cases.

The number of human cases of *S.* Enteritidis continued to decrease in 2013. *S.* Typhimurium and its variants also decreased in 2013. Together, these two serovars accounted for 68 % of the human cases with the serotype reported. Other serovars, however, increased in 2013 and were attributed to outbreaks in individual countries in several instances. Germany, in particular, accounted for a large proportion of the increasing numbers in some serovars, most likely reflecting the fact that the country has the largest population in the EU/EEA and a good surveillance system for salmonellosis. Considering that Germany in 2013, as in 2012, reported a large disease outbreak from raw fermented sausages in susceptible populations, it appears that the German recommendation against serving raw fermented meat products in institutional catering for vulnerable populations (Frank et al., 2014) needs to be reinforced.

The multi-country outbreak of *S.* Stanley which started in 2011 and peaked in 2012, affecting several MS and linked to the turkey production chain, declined in 2013. Cases of the outbreak strain were still reported in 2014, suggesting that the strain is still circulating in the European food market (ECDC and EFSA, 2014). This highlights the impact of any *Salmonella* contamination at the farm level and its potential effect on public health in the EU.

The continuing decrease in the numbers of salmonellosis cases in humans is likely to mainly be related to the successful *Salmonella* control programmes in fowl (*Gallus gallus*) populations that are in place in EU MS, although other control measures along the food chain might also have contributed to the reduction. The majority of MS met their *Salmonella* reduction targets for breeding flocks, laying hens and broilers of *Gallus gallus* and for turkey flocks in 2013, with an increase of MS that met the targets compared with 2012. The EU-level prevalence of the target serovars was further reduced in laying hens, broilers and in fattening turkeys, whereas it remained at a very low level, respectively 0.6 % and 0.3 % in breeding flocks of *Gallus gallus*, and in breeding turkeys. The EU-level reported proportion of non-compliance with the *Salmonella* criterion for *S.* Enteritidis and *S.* Typhimurium (established in 2011) decreased, which is a very encouraging tendency, indicating that the continued investment of MS in *Salmonella* control is yielding noticeable results. During 2008-2013, the number of reported *Salmonella* outbreaks within the EU decreased markedly. The most important source of food-borne *Salmonella* outbreaks in 2013 was again eggs and egg products, followed by sweets and chocolates, although largely reported by one MS, and then pig meat and products thereof.

As in previous years, *Salmonella* was most frequently detected in poultry meat and less often in pig or bovine meat. *Salmonella* was rarely found in table eggs or products of vegetable origin. The fact that eggs and egg products were still the most important source of food-borne *Salmonella* outbreaks in 2013 might be explained by the fact that, as mentioned in a recent EFSA BIOHAZ Panel opinion (EFSA BIOHAZ Panel, 2014), very large numbers of eggs are eaten and eggs are very important and complete foods not only for their nutritional aspects, but also for their functional properties, i.e. the coagulant capacity of proteins, the foaming capacity of albumen proteins, the emulsifying capacity of the yolk, etc. Moreover, these properties are used in different ways to produce and enrich many types of foods (e.g. bakery products including pastries, meat pies, sauces and dressings, sweets and pasta) and in several (homemade) dishes (e.g. mayonnaise, custard and ice cream). In such products eggs are often used raw or only lightly heat-treated. *S.* Enteritidis is considered the only pathogen currently posing a major risk of egg-borne diseases in the EU. The use of eggs and egg products is very diverse and the risk derived from egg-borne hazards such as *S.* Enteritidis is affected by the storage conditions of the eggs, such as temperature and time; however, the pooling of eggs is also important in household, food service and institutional settings. On the other hand, other foods such as broiler meat, that might also be a source of *S.* Enteritidis, are normally consumed cooked, mitigating the risk of human infection.

The highest levels of non-compliance with *Salmonella* criteria generally occurred in foods of meat origin, although at low levels, and, overall, non-compliance with the *Salmonella* food safety criteria was at a level comparable to the previous years. However, the overall trends are highly influenced by the reporting MS and the sample sizes in their investigations, both of which vary markedly between the years.

3.2. *Campylobacter*

The Appendix contains hyperlinks to all data summarised for the production of this section, for humans, food, animals and food-borne outbreaks. It also includes hyperlinks to *Campylobacter* summary tables and figures that were not displayed in this section because they did not trigger any marked observation. The summarised data are presented in downloadable Excel and PDF files, and listed by subject. Moreover, all submitted and validated data by the MS are available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm).

3.2.1. Campylobacteriosis in humans

Campylobacter has been the most commonly reported gastrointestinal bacterial pathogen in humans in the EU since 2005. The number of reported confirmed cases of human campylobacteriosis in the EU in 2013 was 214,779 (Table 12). The EU notification rate was 64.8 per 100,000 population which was at the same level as in 2012 (65.9). The highest country-specific notification rates were observed in the Czech Republic (173.7 cases per 100,000), Luxembourg (125.7), Slovakia (108.0) and the United Kingdom (104.0 cases per 100,000 population). The lowest rates were reported in Latvia, Romania, Poland and Bulgaria (< 2.0 per 100,000).

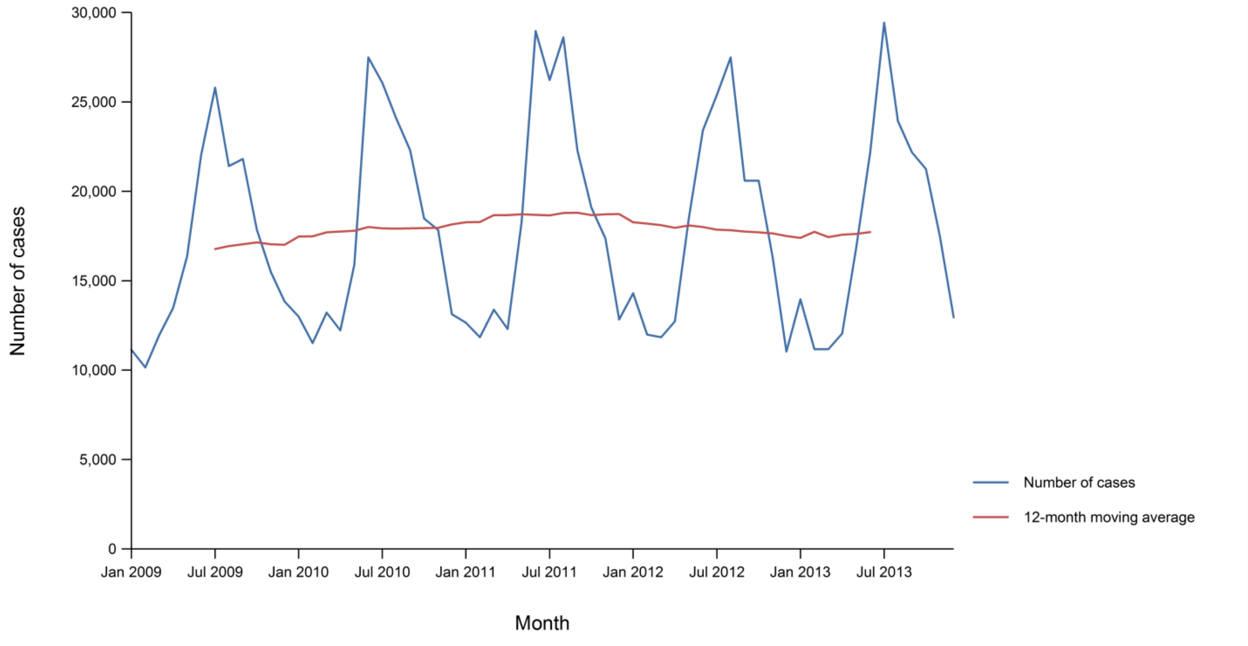
In many MS, campylobacteriosis was mainly a domestically acquired infection with ≥ 95 % domestic cases reported in, for example, Hungary, Latvia, Malta, Poland, Slovakia, the Czech Republic, Estonia and the Netherlands. The highest proportions of travel-associated cases were reported in the Nordic countries, including Sweden, Norway and Finland (≥ 50 % of the cases) (Table CAMPHUMIMPORT).

Table 12. Reported cases and notification rates per 100,000 of human campylobacteriosis in the EU/EEA, 2009–2013

	2013					2012		2011		2010		2009	
	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	5726	5726	67.7	4710	56.0	5129	61.0	4404	52.6	4502	53.9
Belgium[(b)]	N	C	8148	8148	-	6607	-	7716	-	6047	-	5697	-
Bulgaria	Y	A	124	124	1.7	97	1.3	73	1.0	6	0.1	26	0.3
Croatia[(c)]	Y	A	1379	-	-	-	-	-	-	-	-	-	-
Cyprus	Y	C	56	56	6.5	68	7.9	62	7.4	55	6.7	37	4.6
Czech Republic	Y	C	18389	18267	173.7	18287	174.1	18743	178.7	21075	201.5	20259	194.3
Denmark	Y	C	3772	3772	67.3	3720	66.7	4060	73.0	4037	72.9	3353	60.8
Estonia	Y	C	385	382	28.9	268	20.2	214	16.1	197	14.8	170	12.7
Finland	Y	C	4066	4066	74.9	4251	78.7	4267	79.4	3944	73.7	4050	76.0
France[(d)]	N	C	5198	5198	39.6	5079	38.9	5538	42.6	4324	33.5	3956	30.7
Germany	Y	C	63636	63271	77.3	62504	76.5	70812	86.8	65110	79.8	62787	76.7
Greece[(e)]	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	Y	C	7250	7247	73.5	6367	64.4	6121	62.4	7180	72.9	6579	66.6
Ireland	Y	C	2288	2288	49.8	2391	52.2	2433	53.2	1660	36.5	1810	40.0
Italy[(b)]	N	C	1178	1178	-	774	-	468	-	457	-	531	-
Latvia	Y	C	9	9	0.4	8	0.4	7	0.3	1	0.0	0	0.0
Lithuania	Y	C	1142	1139	38.3	917	30.5	1124	36.8	1095	34.9	812	25.5
Luxembourg	Y	C	675	675	125.7	581	110.7	704	137.5	600	119.5	523	106.0
Malta	Y	C	246	246	58.4	220	52.7	220	53.0	204	49.3	132	32.1
Netherlands[(f)]	N	C	4182	3702	42.4	4248	48.8	4408	50.9	4322	50.1	3782	44.1
Poland	Y	C	552	552	1.4	431	1.1	354	0.9	367	1.0	359	0.9
Portugal[(e)]	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	218	218	1.1	92	0.5	149	0.7	175	0.9	254	1.3
Slovakia	Y	C	5953	5845	108.0	5704	105.5	4565	84.7	4476	83.0	3813	70.8
Slovenia	Y	C	1027	1027	49.9	983	47.8	998	48.7	1022	49.9	952	46.8
Spain[(g)]	N	C	7064	7064	50.4	5548	47.4	5469	46.9	6340	54.6	5106	44.2
Sweden	Y	C	8114	8114	84.9	7901	83.3	8214	87.2	8001	85.7	7178	77.5
United Kingdom	Y	C	66465	66465	104.0	72560	114.3	72150	115.3	70298	113.2	65043	105.5
EU Total	**-**	**-**	**217242**	**214779**	**64.8**	**214316**	**65.9**	**223998**	**69.0**	**215397**	**67.0**	**201711**	**62.8**
Iceland	Y	C	101	101	31.4	60	18.8	123	38.6	55	17.3	74	23.2
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	3291	3291	65.2	2933	58.8	3005	61.1	2682	55.2	2848	59.3
Switzerland[(h)]	Y	C	7481	7481	93.1	8432	106.0	7963	101.2	6611	84.9	7803	101.3

(a): Y, yes; N, no; A, aggregated data; C, case-based data;-, no report.
(b): Sentinel surveillance; no information on estimated coverage. Thus, notification rate cannot be estimated.
(c): All cases of unknown case classification.
(d): Sentinel surveillance; notification rates calculated based on an estimated coverage of 20 %.
(e): No surveillance system.
(f): Sentinel surveillance; notification rates calculated based on an estimated coverage of 52 %.
(g): Sentinel surveillance; notification rates calculated based on an estimated coverage of 30 % in 2013 and 25 % in 2009-2012.
(h): Switzerland provided data directly to EFSA.

There was a clear seasonal trend in confirmed campylobacteriosis cases reported in the EU/EEA in 2009-2013 with peaks in the summer months. The 12-month moving average was fairly stable over the 5-year period with no statistically significant increasing or decreasing trend when analysed by month (p=0.334 with linear regression) (Figure 6).



Source: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Slovakia, Slovenia, Spain, Sweden, and United Kingdom. Croatia and Romania did not report data over the whole period at the level of detail required for the analysis. Greece and Portugal do not have surveillance systems for this disease.

Figure 6. Trend in reported confirmed cases of human campylobacteriosis in the EU/EEA, 2009-2013

Thirteen MS provided information on hospitalisation for some or all of their cases, which is one MS more than in 2012. However, information on hospitalisation was still available only for 12.7 % of all confirmed campylobacteriosis cases in 2013. The reason for this is that many MS have campylobacteriosis surveillance systems which are based on laboratory notifications where information on hospitalisation is usually not available. Of cases with known hospitalisation status, 43.6 % were hospitalised on average. The highest hospitalisation rates (71-99 % of cases) were reported in the United Kingdom, Cyprus, Lithuania, Poland, Romania and Latvia. Three of these countries also reported among the lowest notification rates of campylobacteriosis, which indicates that the surveillance systems in these countries primarily capture the more severe cases. The United Kingdom only provided information on hospitalisation for 6.5 % of its cases and the data may therefore be biased.

An increase from 31 deaths attributed to campylobacteriosis in 2012 to 56 deaths in 2013 was observed. This resulted in an EU case-fatality rate of 0.05 % (information provided for 52.9 % of all reported cases) which was the highest rate observed in the last five years (average 2009-2012: 0.03 %). The United Kingdom accounted for 33 of these 56 fatal outcomes.

Species information was provided for 48.1 % of confirmed cases reported in the EU, Iceland and Norway. Of these, 80.6 % were reported to be *C. jejuni*, 7.1 % *C. coli*, 0.22 % *C. lari*, 0.10 % *C. fetus* and 0.08 % *C. upsaliensis*. 'Other' *Campylobacter* species accounted for 11.9 % but the large majority of those cases were reported at the national level as '*C. jejuni*/*C. coli* not differentiated'. For the species distribution by country, see Table CAMPHUMSPECIES.

3.2.2. *Campylobacter* in food and animals

Comparability of data

It is important to note that results from different countries are not directly comparable owing to between-country variation in the sampling and testing methods used. In addition, it should be taken into consideration that the proportion of positive samples observed could have been influenced by the sampling season because, in many countries, *Campylobacter* infections are known to be more prevalent during the summer than during the winter.

Only results for the most important food products and animals that might serve as a source for human infection in the EU are presented.

Food

In 2013, 21 MS and one non-MS reported data on *Campylobacter* in food.

The number of samples tested within each food category ranged from a few to more than 1,000. Most of the MS reported data on food of animal origin, where the majority of tested units were from broiler meat.

Fresh broiler meat

Broiler meat is considered to be the main source of human campylobacteriosis. In 2013, the occurrence of *Campylobacter* in fresh broiler meat sampled at slaughter, processing and retail is presented in Table 13. In 2013, 31.4 % of the 8,022 tested units (single or batch) in every sampling stage were found *Campylobacter* positive, representing an increase by 33.0 % compared with 2012, when 23.6 % of samples was found to be positive out of the 7,663 samples tested. However, the apparent increase in the proportion of positive broiler meat samples from 2012 to 2013 is mainly due to the inclusion of findings from Croatia, who reported data for the first time in 2013.

In 2013, at retail, *Campylobacter* was detected in 9.8 % of the tested batches and 26.4 % of the tested single samples. At processing plant, 12.0 % of the tested single samples and none of the two tested batches were *Campylobacter*-positive. At slaughterhouse, 52.3 % of the tested slaughter batches and 49.9 % of the single samples tested positive for *Campylobacter*.

As in previous years, the proportion of *Campylobacter*-positive fresh broiler meat samples at all sampling stages varied widely among MS. The high proportion of positive samples observed at slaughterhouses in 2013 was mainly due to the inclusion of data from two Croatian investigations with notably high prevalence (51.0 % and 81.5 %) accounting for approximately half of all samples tested at slaughter and approximately two thirds of the positive samples obtained at this level (Table 13).

Table 13. **Campylobacter** *in fresh broiler meat, 2013*

Sampling stage	Country	Matrix	Description	Sample origin	Sample unit	Sample weight	Tested	Positive	Percent positive
Retail	Austria	fresh	food sample, Surveillance	Austria	single	25 g	82	58	70.73
				European Union	single	25 g	14	6	42.86
				Unknown	single	25 g	21	5	23.81
	Belgium	fresh	Surveillance		single	1 g	306	57	18.63
	Czech Republic	fresh	food sample	Czech Republic	single	25 g	13	0	0
				European Union	single	25 g	6	0	0
				Unknown	single	25 g	1	0	0
	Denmark	fresh, chilled	food sample - meat, Monitoring	Denmark	single	10 g	884	104	11.76
	Finland	fresh	food sample - meat, Survey	Finland	batch	25 g	185	21	11.35
	Germany	fresh	food sample - meat, Monitoring	Germany	single	25 g	483	181	37.47
	Hungary	fresh	food sample - meat		single	25 g	280	66	23.57
	Italy	fresh	food sample, Surveillance	Italy	single	25 g	2	0	0
	Luxembourg	fresh	food sample - meat	Unknown	single	10 g	23	17	73.91
	Netherlands	fresh	food sample - meat		single	25 g	602	190	31.56
	Slovakia	fresh	food sample, Monitoring	Slovakia	single	25 g	22	8	36.36
			food sample, Surveillance	European Union	batch	25 g	30	0	0
					single	25 g	20	0	0
				Slovakia	single	10 g	12	1	8.33
				Unknown	single	10 g	4	0	0
						25 g	4	2	50
	Slovenia	fresh, chilled	food sample, Monitoring	Slovenia	single	1 g	58	31	53.45
	Spain	fresh	food sample - meat	Unknown	single	25 g	50	35	70
Slaughter batch							0	0	0
Batch							215	21	9.77
Single							2887	761	26.36
Total Retail							3102	782	25.21
Processing plant	Austria	fresh	food sample, Surveillance	Austria	single	25 g	61	54	88.52
				Unknown	single	25 g	1	1	100
	Belgium	fresh	Surveillance		single	1 g	124	30	24.19
		fresh, skinned	Monitoring		single	1 g	376	22	5.85
		fresh, with skin	Monitoring		single	1 g	406	38	9.36
	Hungary	fresh	food sample - meat		single	25 g	243	60	24.69
	Luxembourg	fresh	food sample - meat	Unknown	single	10 g	3	3	100
	Poland	fresh	food sample - meat		single	25 g	19	2	10.53
						500 g	619	2	0.32
	Portugal	fresh	food sample - meat, Surveillance	Portugal	single	25 g	28	13	46.43
	Slovakia	fresh	food sample, Surveillance	European Union	single	10 g	3	0	0
				Non-EU	single	25 g	4	0	0
				Slovakia	batch	10 g	2	0	0
	Spain	fresh	food sample - meat	Unknown	single	25 g	15	4	26.67
Slaughter batch							0	0	0
Batch							2	0	0
Single							1902	229	12.04
Total Processing plant							1904	229	12.03

Table 13 (cont).* Campylobacter *in fresh broiler meat, 2013

Sampling stage	Country	Matrix	Description	Sample origin	Sample unit	Sample weight	Tested	Positive	Percent positive
Slaughterhouse	Belgium	carcase	Monitoring		single	1 g	206	45	21.84
	Croatia	carcase	food sample - neck skin	Croatia	single	25 g	757	617	81.51
			food sample - neck skin, Surveillance	Croatia	single	10 g	757	386	50.99
	Denmark	fresh, chilled	food sample - meat, Monitoring	Denmark	single	10 g	870	245	28.16
	Estonia	carcase	food sample - neck skin, Monitoring	Estonia	batch	25 g	12	0	0
	Germany	carcase	food sample - neck skin, Monitoring	Germany	slaughter batch	25 g	300	157	52.33
	Portugal	carcase	food sample - meat, Surveillance	Portugal	single	10 g	15	5	33.33
	Spain	carcase	food sample - meat	Unknown	single	25 g	96	51	53.13
Slaughter batch							300	157	52.33
Batch							12	0	0
Single							2701	1349	49.94
Total Slaughterhouse							3013	1506	49.98
Unspecified	Sweden	fresh	food sample - meat, Surveillance		single	25 g	3	0	0
Slaughter batch							0	0	0
Batch							0	0	0
Single							3	0	0
Total Unspecified							3	0	0
Slaughter batch							300	157	52.33
Batch							229	21	9.17
Single							7493	2339	31.22
Total (MS)							8022	2517	31.38

A source attribution study carried out in Switzerland indicated chicken as the main source of human campylobacteriosis cases, as described in the text box below.

A Swiss *Campylobacter* source attribution study (Kittl et al., 2013) included 730 *C. jejuni* and *C. coli* isolates from human cases, 610 isolates from chickens, 159 from dogs, 360 from pigs and 23 from cattle collected between 2001 and 2012. All isolates had been typed with multi locus sequence typing (MLST) and *fla*B-typing in parallel and their genotypic resistance to quinolones was determined. Results obtained with MLST and *fla*B data corresponded remarkably well; both indicated chickens as the main source for human infection for both *Campylobacter* species. Based on MLST, 70.9 % of the human cases were attributed to chickens, 19.3 % to cattle, 8.6 % to dogs and 1.2 % to pigs. Furthermore, a host independent association between sequence type (ST) and quinolone resistance was found.

Source: Swiss National Zoonoses Report, 2013

Other food

A considerable amount of other foods of animal origin was also analysed for the presence of *Campylobacter*. Twelve MS reported data on turkey meat and a moderate proportion of the 975 tested units were found to be *Campylobacter*-positive. The proportion of *Campylobacter*-positive samples (batch or single) of bovine meat and pig meat was generally low and the proportion of *Campylobacter*-positive units of milk (mainly unpasteurised or unspecified) was very low.

Detailed information on the data reported and on the occurrence of *Campylobacter* in the different food categories have been included in specific tables referenced in the Appendix.

Animals

In 2013, 21 MS and three non-MS reported data on *Campylobacter* in animals, primarily in broiler flocks, but also in pigs, cattle, turkeys, goats, sheep, horses, cats, dogs and a range of wild animals.

Broilers

In total, *Campylobacter* was found in 19.9 % of the 11,475 units tested in MS; 29.6 % of the tested slaughter batches, 15.1 % of the tested flocks and 30.4 % of the tested animals were *Campylobacter* positive. The prevalence in the investigations varied greatly between MS. The largest investigations were carried out in the Nordic countries, where the observed prevalences ranged from 0.6 % to 13.1 %. In these countries, *Campylobacter* control or monitoring programmes have been in place for several years and, in 2013, samples obtained in Denmark, Finland and Sweden constituted 73.2 % of the reported samples in the EU. Hungary, Poland and the United Kingdom reported investigations with very high proportions of positive samples (from 74.2 % to 80 %). Further details on the data reported and on the occurrence of *Campylobacter* in broilers are in Table CAMPBROILERS.

Other animals

Five MS and one non-MS reported data on *Campylobacter* in pigs ranging from 0 % to 92.7 % positive samples and seven MS reported prevalence data for cattle ranging from 0 % to 50.4 %.

The proportion of *Campylobacter*-positive cats and dogs was generally low, but in two clinical investigations from the Netherlands and Norway 40.4 % and 31.2 %, respectively, of the tested dogs were found to be *Campylobacter*-positive. Species information was reported by Norway, where 101 of the 119 *Campylobacter*-positive dogs were infected with *C. upsaliensis* and the rest of the findings were due to species more commonly causing human disease (*C. jejuni* in 12 dogs and *C. coli* in one dog).

Details on the data reported and on the occurrence of *Campylobacter* in the different animals have been included in specific tables referenced in the Appendix.

3.2.3. *Campylobacter* food-borne outbreaks

Within the EU, 16 MS reported a total of 414 food-borne *Campylobacter* outbreaks, a decrease compared with 2012, when a total of 501 outbreaks were reported. This represents 8.0 % of the total reported food-borne outbreaks in the EU, a decrease compared with 2012, when *Campylobacter* outbreaks constituted 9.3 % of the total reported food-borne outbreaks in the EU. Only 32 (7.7 %) *Campylobacter* outbreaks were classified as strong-evidence outbreaks. In addition, Switzerland reported one strong-evidence outbreak.

As in previous years, broiler meat was the most frequently identified food vehicle, associated with 50.0 % of these strong-evidence outbreaks. The proportion of strong-evidence *Campylobacter* outbreaks implicating broiler meat was higher than in 2012 (44.0 %). The next most commonly implicated food vehicle was 'other, mixed or unspecified poultry meat and products thereof', which was attributed to six outbreaks (18.8 %), followed by milk and mixed food.

The most frequently reported setting was 'Restaurant, café, pub, bar, hotel, catering service' (18 outbreaks), followed by household (five outbreaks).

Detailed information on strong- and weak-evidence *Campylobacter* outbreaks, as well as the distribution of the most common food vehicles implicated in the strong-evidence *Campylobacter* outbreaks, are summarised in Table FBOCAMP and Figure FBOCAMPVEHIC.

3.2.4. Discussion

Campylobacteriosis has been the most commonly reported zoonosis in humans in the EU since 2005. The EU notification rate did not change in 2013 compared with 2012, and no statistically significant increasing or decreasing trend could be observed in the period 2009-2013 when analysed by month.

The case-fatality rate of campylobacteriosis increased in 2013 compared to the period 2009-2012. The reason for this increase is unknown. The proportion of hospitalised campylobacteriosis cases was larger than expected taking into account that the symptoms are often relatively mild. An explanation for this could be that in some countries, the surveillance is focused on severe cases. In addition, the country with the most campylobacteriosis cases only reported hospitalisation status for a fraction of its cases, and of these, the majority were hospitalised. This fraction most likely represents cases reported from hospital doctors, while for cases reported from other sources, e.g. laboratories, information on hospitalisation status is often missing. Both these situations result in an overestimation of the proportion of hospitalised cases.

In 2013, just above 30 % of the tested samples of fresh broiler meat was *Campylobacter*-positive. It is important to note that the apparent increase in the proportion of positive broiler meat samples from 2012 to 2013 is mainly due to the inclusion of findings from Croatia, who reported data for the first time in 2013. There were large differences in the proportion of positive samples between the MS, however, it should be noted that data are not comparable as some MS are not reporting a yearly prevalence because they collect more samples during the high-prevalence summer period. As in previous years, in 2013 broiler meat was by far the most commonly identified source of outbreaks in the EU accounting for 16 out of 32 outbreaks of known source (50 %).

In 2013, around 20 % of all tested broiler samples were *Campylobacter*-positive. However, as for the results in broiler meat, the proportion of positive broiler samples varied greatly between MS and the majority of tested units were from the Nordic countries where the prevalence is at a low or moderate level.

Fourteen of the 16 MS reporting data on broilers also provided information on *Campylobacter* in broiler meat. In most MS the reported prevalence in animals was lower or at a similar level to the proportion of positive samples in the investigations of broiler meat.

EFSA has estimated that the public health benefits of controlling *Campylobacter* in the primary production will be greater than interventions at a later point in the food chain due to the spread of *Campylobacter* from broilers to humans by transmission routes other than consumption of broiler meat. Implementation of strict biosecurity in the primary production followed by Good Manufacturing Practice (GMP)/HACCP at slaughter is expected to be able to reduce the prevalence in broilers and the proportion of carcases contaminated during slaughter (EFSA BIOHAZ Panel, 2011).

3.3. *Listeria*

The Appendix contains hyperlinks to all data summarised for the production of this section, for humans, food and animals. It also includes hyperlinks to *Listeria* summary tables and figures that were not displayed in this section because they did not trigger any marked observations. The summarised data are presented in downloadable Excel and PDF files, and are listed by subject. Moreover, all submitted and validated data by the MS are available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm).

3.3.1. Listeriosis in humans

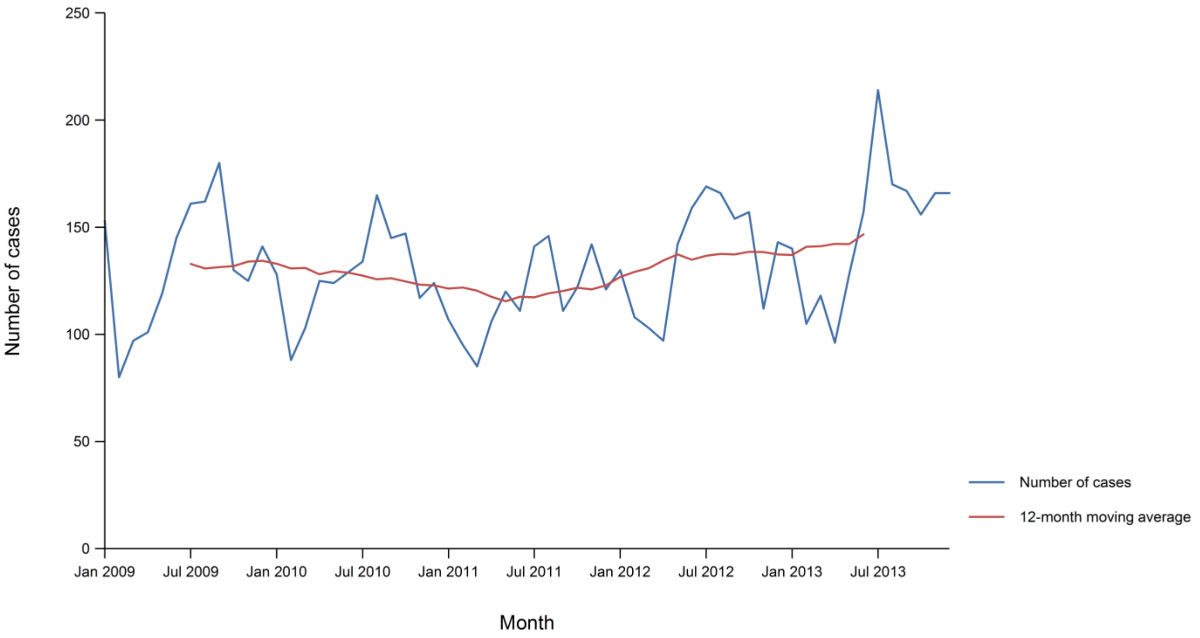
In 2013, 27 MS reported 1,763 confirmed human cases of listeriosis (Table 14). The EU notification rate was 0.44 cases per 100,000 population which was an 8.6 % increase compared with 2012. The highest MS-specific notification rates were observed in Finland, Spain, Sweden and Denmark (1.12, 1.00, 0.97 and 0.91 cases per 100,000 population, respectively). The vast majority of cases were reported to be domestically acquired (Table LISTHUMIMPORT).

Table 14. Reported cases and notification rates per 100,000 of human listeriosis in the EU/EEA, 2009-2013

Country	2013					2012		2011		2010		2009	
	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	36	36	0.43	36	0.43	26	0.31	34	0.41	46	0.55
Belgium	Y	C	66	66	0.59	83	0.75	70	-	40	0.37	58	-
Bulgaria	Y	A	3	3	0.04	10	0.14	4	0.05	4	0.05	5	0.07
Croatia[(b)]	Y	A	1	-	-	-	-	-	-	-	-	-	-
Cyprus	Y	C	1	1	0.12	1	0.12	2	0.24	1	0.12	0	0.00
Czech Republic	Y	C	36	36	0.34	32	0.31	35	0.33	26	0.25	32	0.31
Denmark	Y	C	51	51	0.91	50	0.90	49	0.88	62	1.12	97	1.76
Estonia	Y	C	2	2	0.15	3	0.23	3	0.23	5	0.38	3	0.23
Finland	Y	C	61	61	1.12	61	1.13	43	0.80	71	1.33	34	0.64
France	Y	C	369	369	0.56	348	0.53	282	0.43	312	0.48	328	0.51
Germany	Y	C	467	462	0.57	412	0.51	330	0.41	377	0.46	394	0.48
Greece	Y	C	10	10	0.09	11	0.10	10	0.09	10	0.09	4	0.04
Hungary	Y	C	48	48	0.49	13	0.13	11	0.11	20	0.20	16	0.16
Ireland	Y	C	8	8	0.17	11	0.24	7	0.15	10	0.22	10	0.22
Italy[(c)]	-	-	-	-	-	36	-	129	0.22	157	0.27	109	0.19
Latvia	Y	C	5	5	0.25	6	0.29	7	0.34	7	0.33	4	0.19
Lithuania	Y	C	6	6	0.20	8	0.27	6	0.20	5	0.16	5	0.16
Luxembourg	Y	C	2	2	0.37	2	0.38	2	0.39	0	0.00	3	0.61
Malta	Y	C	1	1	0.24	1	0.24	2	0.48	1	0.24	0	0.00
Netherlands	Y	C	72	72	0.43	73	0.44	87	0.52	72	0.43	44	0.27
Poland	Y	C	58	58	0.15	54	0.14	62	0.16	59	0.16	32	0.08
Portugal[(d)]	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	9	9	0.05	11	0.06	1	0.01	6	0.03	6	0.03
Slovakia	Y	C	18	16	0.30	11	0.20	31	0.58	5	0.09	10	0.19
Slovenia	Y	C	16	16	0.78	7	0.34	5	0.24	11	0.54	6	0.30
Spain[(e)]	N	C	140	140	1.00	109	0.93	91	0.78	129	1.11	121	1.05
Sweden	Y	C	93	93	0.97	72	0.76	56	0.60	63	0.67	73	0.79
United Kingdom	Y	C	192	192	0.30	183	0.29	164	0.26	176	0.28	235	0.38
EU Total	**-**	**-**	**1771**	**1763**	**0.44**	**1644**	**0.41**	**1515**	**0.33**	**1663**	**0.37**	**1675**	**0.37**
Iceland	Y	C	1	1	0.31	4	1.25	2	0.63	1	0.32	0	0.00
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	21	21	0.42	30	0.60	21	0.43	22	0.45	31	0.65
Switzerland[(f)]	Y	C	64	64	0.80	39	0.49	47	0.60	67	0.86	41	0.53

(a): Y, yes; N, no; A, aggregated data; C, case-based data;-, no report.
(b): Case of unknown case classification.
(c): No report for 2013 and provisional data for 2012.
(d): No surveillance system.
(e): Sentinel system; notification rates calculated with an estimated population coverage of 30 % in 2013 and 25 % in 2009-2012.
(f): Switzerland provided data directly to EFSA.

A seasonal pattern was observed in the listeriosis cases reported in the EU/EEA in the period 2009-2013, with large summer peaks and smaller winter peaks (Figure 7). There was a statistically significant increasing trend (p=0.018 with linear regression) of listeriosis in the EU/EEA over this period.



Source: Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Malta, Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom. Croatia, Italy and Luxembourg did not report data over the whole period at the level of detail required for the analysis. Portugal has no surveillance system for listeriosis.

Figure 7. Trend in reported confirmed cases of human listeriosis in the EU/EEA, 2009-2013

Fifteen MS provided information on hospitalisation for all or the majority of their cases (which represented 42.1 % of all confirmed cases reported in the EU) in 2013. On average, 99.1 % of the cases were hospitalised. This is the highest proportion of hospitalised cases of all zoonoses under the EU surveillance and reflects the focus of the EU surveillance on severe, systemic listeriosis infections. In order to assess the clinical manifestation of the disease, the variable 'Specimen type' was introduced as a surrogate. In cases with a known specimen type (41.1 %), 75.3 % of positive specimens were from blood, 17.3 % were from cerebrospinal fluid and 7.4 % were from another normally sterile site.

A total of 191 deaths due to listeriosis were reported in 2013 in the EU. Out of the 19 MS reporting outcome, 14 reported one or more fatal cases, with France reporting the highest number, 64 cases. The EU case-fatality rate was 15.6 % among the 1,228 confirmed cases for which this information was reported (69.7 % of all confirmed cases).

Seven EU MS and Norway provided information from conventional serotyping of *L. monocytogenes* (accounting for 23.3 % of all confirmed cases). The most common serotypes in 2013 were 1/2a (57.5 %) and 4b (34.3 %), followed by 1/2b (6.4 %), 1/2c (1.4 %), 3a and 3b (both 0.2 %). This was the second year that countries, which had changed to molecular-based techniques for serotyping, could report PCR serogrouping in TESSy. Six MS and Norway provided data on this variable in 2013 (accounting for 35.1 % of all confirmed cases). The most common PCR serogroup was IIa (44.7 %, corresponding to conventional serotypes 1/2a and 3a), followed by IVb (44.6 %, corresponding to conventional serotypes 4b, 4d, and 4e), IIb (7.8 %, corresponding to conventional serotypes 1/2b, 3b and 7) and IIc (2.9 %, corresponding to conventional serotypes 1/2c and 3c).

3.3.2. *Listeria* in food and animals

Comparability of data

It is important to note that results from different countries are not directly comparable owing to between-country variation in the sampling and testing methods used. The total in the summary tables might not be representative for the EU, because results are highly influenced by the reporting MS and the sample sizes in their investigations, both of which vary between years.

Only results for the most important food products and animals that might serve as a source for human infection in the EU are presented.

Food

In 2013, 26 MS and two non-MS reported data on *Listeria* in food. The number of samples tested within each food category, ranged from a few to several thousand. The data presented in this section focus on RTE foods, in which *L. monocytogenes* was detected in either qualitative investigations (absence or presence, using detection methods) and/or quantitative investigations (counts of colony-forming units per gram (CFU/g) using enumeration methods).

EU legislation (Regulation (EC) No. 2073/2005) lays down food safety criteria for *L. monocytogenes* in RTE foods. This regulation came into force in January 2006, and the criteria are described below. The data reported reflect the obligations of MS under this Regulation and the investigations have, therefore, focused on testing RTE foods for compliance with the legal microbiological criteria for food safety.

Microbiological criteria

A wide range of different foodstuffs can be contaminated with *L. monocytogenes*. For a healthy human population, foods where the levels do not exceed 100 CFU/g are considered to pose a negligible risk. Therefore, the EU microbiological criterion for *L. monocytogenes* is set as ≤ 100 CFU/g for RTE products on the market.

The reported results of *L. monocytogenes* testing in RTE food samples were evaluated in accordance with the *Listeria* criteria indicated in EU legislation applying certain assumptions, where appropriate.

Regulation (EC) No. 2073/2005 covers primarily RTE food products, and requires the following:

- In RTE products intended for infants and for special medical purposes *L. monocytogenes* must not be present in 25 g of sample.
- *L. monocytogenes* must not be present in levels exceeding 100 CFU/g during the shelf-life of other RTE products.
- In RTE foods that are able to support the growth of the bacterium, *L. monocytogenes* may not be present in 25 g of sample at the time of leaving the production plant; however, if the producer can demonstrate, to the satisfaction of the competent authority, that the product will not exceed the limit of 100 CFU/g throughout its shelf-life, this criterion does not apply.

For many of the reported data, it was not evident whether the RTE food tested was able to support the growth of *L. monocytogenes* or not. For the non-compliance analysis of samples collected at processing, the criterion of absence in 25 g was applied, except for samples from hard cheeses and fermented sausages (assumed to be unable to support the growth of *L. monocytogenes*) where the limit ≤ 100 CFU/g was applied. For samples collected at retail, the limit ≤ 100 CFU/g was applied, except for RTE products intended for infants and for special medical purposes, where presence in *L. monocytogenes* must not be detected in 25 g of sample.

The results from qualitative examinations using the detection method have been used to analyse the compliance with the criterion of absence in 25 g of sample, and the results from quantitative analyses using the enumeration method have been used to analyse compliance with the criterion ≤ 100 CFU/g.

Non-compliance in ready-to-eat products

In total, 22 MS reported data which were included in the evaluation for compliance with microbiological criteria. Compliance with the *L. monocytogenes* criteria in food categories in 2013 is presented in Figure 8 as well as in Table LISTERIACOMPL.

For RTE products on the market, very low percentages (< 1 %) were generally found to not comply with the criterion of ≤ 100 CFU/g. However, higher levels of non-compliance (primarily presence in 25 g) were reported in samples of RTE products at the processing stage, ranging from none to 4.6 % of single samples.

As in previous years, all samples of RTE food intended for infants and for medical purposes were compliant with the *L. monocytogenes* criteria both at processing (one MS) and at retail (four MS). All RTE milk samples collected at either processing (11 MS) or retail (seven MS) were also compliant.

As observed in the past two years, the food category with the highest levels of non-compliance at processing was RTE fishery products (4.6 % of single samples and 19.9 % of batches), mainly in smoked fish. Most of the tested units of RTE fishery products originated from Poland, and almost all non-compliant units originated from two MS. At retail, the levels of non-compliance (0.5 % of single samples and 2.6 % of batches) were generally lower than those observed at processing plants.

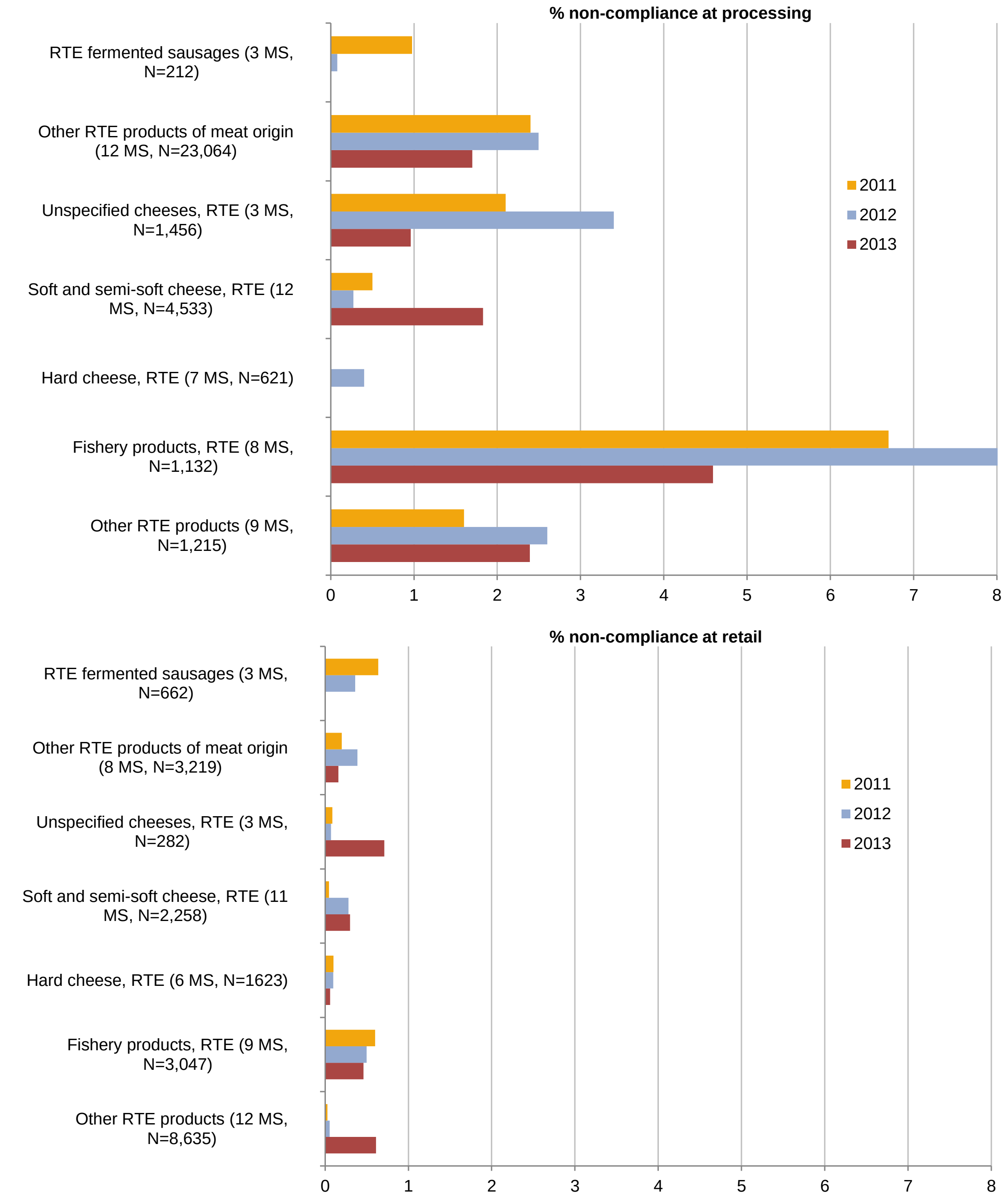
Among samples from RTE products of meat origin, other than fermented sausages, low levels of non-compliance were observed at processing (1.7 % of single samples and 2.8 % of batches), where non-compliance was reported from 11 MS. Poland reported the majority of units tested at processing (77 %). At retail, very low levels of non-compliance were reported (0.2 % of single samples and 0.1 % of batches), with a few non-compliant products reported by three MS.

In the case of fermented sausages, all tested products were found to meet the *L. monocytogenes* criterion (no levels exceeding 100 CFU/g) at both processing and retail.

For soft and semi-soft cheeses, low levels of non-compliance were observed in investigations at processing (1.8 % of single samples and 0.3 % of batches). Non-compliance primarily occurred in soft and semi-soft cheeses made from raw or low heat-treated cow's milk. At retail, the levels of non-compliance were very low (0.3 % of single samples and 0.4 % of batches), and the few non-compliant products were reported from three MS. Low levels of non-compliance were also observed in unspecified cheeses at processing (1 % of single samples) and at retail (0.7 %).

Hard cheeses are assumed not to support the growth of *L. monocytogenes*. All tested units complied with the criteria of levels not exceeding 100 CFU/g at processing and retail, except for one single sample of hard cheese made from pasteurised cow's milk sampled at retail.

Among samples of unspecified cheeses, low levels of non-compliance were observed at processing (1.0 % of single samples) and at retail (0.7 %). However, at retail, the level of *L. monocytogenes* non-compliance observed in unspecified cheese was the highest of all the RTE foods at the same sampling stage.



RTE, ready-to-eat. In parentheses, the total number of included samples (N) and MS in 2013. Includes data where sampling stage at retail (also catering, hospitals and care homes) and at processing (also cutting plants) have been specified for the relevant food types.

Figure 8. Proportion of single samples at processing and retail non-compliant with EU* L. monocytogenes *criteria, 2011-2013

Ready-to-eat fish and fishery products

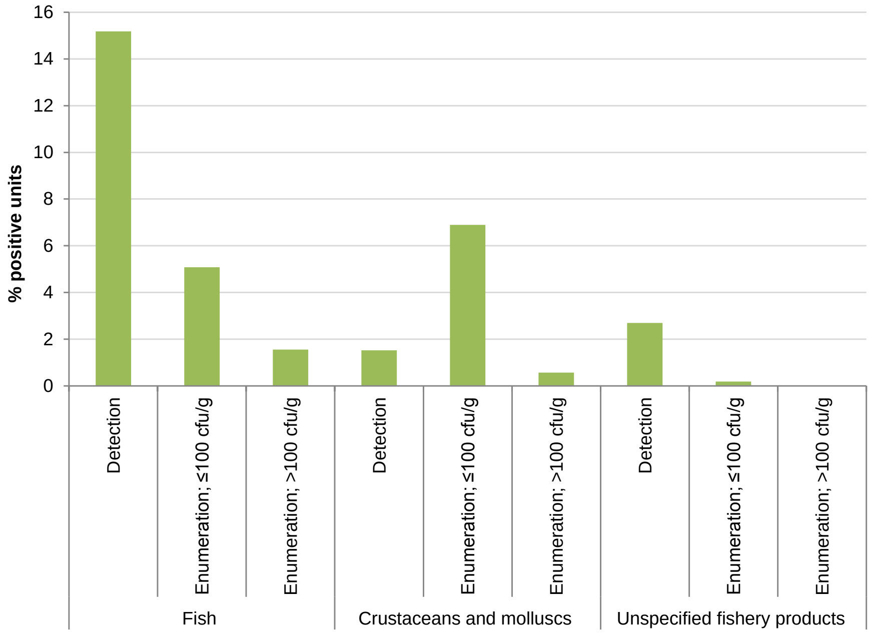
In total, 14,564 samples of fish were tested at retail or at processing plants in the MS and overall *L. monocytogenes* was found in 10.8 % of these. In the 6,495 samples tested using the enumeration method, *L. monocytogenes* was found in levels exceeding 100 CFU/g in 1.6 % of the samples.

The majority of the investigations in fish were carried out at processing plant level, where, overall, 12.9 % of the 9,433 samples tested positive for *L. monocytogenes*. *L. monocytogenes* was detected in 18.6 % of 5,850 units tested using the detection method, and found in levels exceeding 100 CFU/g in 2.2 % of the 3,489 units tested quantitatively. Almost half of all samples tested at this sampling stage were from one MS.

At retail, *L. monocytogenes* was detected in 5.6 % of the 198 units tested qualitatively and found in counts above 100 CFU/g in 0.5 % of the 2,767 samples tested quantitatively.

In 2013, 17 MS reported on *L. monocytogenes* in RTE fishery products. In total 1,649 samples of various fishery products, including shrimps, prawns and molluscan shellfish were tested and *L. monocytogenes* was found in 1.6 % of these (using both methods).

A summary of the proportion of *L. monocytogenes*-positive units in different types of fishery products is presented in Figure 9. As in previous years, *L. monocytogenes* was most often detected in RTE fish (mainly smoked fish), in which the highest percentage of units with *L. monocytogenes* counts of more than 100 CFU/g was also detected. Compared with previous years, in 2013, levels of *L. monocytogenes* between the detection limit and 100 CFU/g were found in a higher proportion of the tested crustaceans and molluscs; however, this was mainly the result of the influence of the findings from one investigation on cooked crustaceans in one MS.



Test results obtained by detection and enumeration methods are presented separately.
Fish includes data from Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Netherlands, Poland, Slovakia, Slovenia and Spain (detection: 14 MS; enumeration: 14 MS).
Crustaceans and molluscs include data from Austria, Bulgaria, Cyprus, Hungary, Ireland, Lithuania, Poland, Portugal, Romania and Spain (detection: 10 MS; enumeration: 4 MS).
Unspecified fishery products (including unspecified fishery products and surimi) include data from Austria, Belgium, Estonia, Germany, Ireland, Italy, Portugal, Romania, Slovakia, Slovenia and Sweden (detection: 10 MS; enumeration: 10 MS).
Data pooled for all sampling stages for all reporting MS (single and batch).

Figure 9. Proportion of* L. monocytogenes*-positive units in ready-to-eat fishery products, 2013

Further details on L. monocytogenes in samples from fish and fishery products can be found in Tables LISTERIAFISH and LISTERIAFISHPR.

Ready-to-eat meat products, meat preparations and minced meat

A summary of the proportions of units positive for *L. monocytogenes* in RTE products of meat origin is presented in Figure 10. Using detection methods, *L. monocytogenes* was most commonly detected in RTE products from pig meat. For samples tested using enumeration methods, the occurrence in pig meat products also appeared to be higher than the other meat types, but levels exceeding 100 CFU/g were most frequently observed in RTE products from broiler meat. A very large proportion of the reported samples of RTE products of broiler meat and pig meat all came from one MS and these results might therefore not be considered representative for the EU.

Poultry meat

L. monocytogenes was detected in 1.6 % of the 5,275 samples of RTE broiler meat tested qualitatively (Table LISTERIARTEBROIL). In total 2,479 samples were tested using enumeration methods, and in 1.0 % of these *L. monocytogenes* was found in concentrations above 100 CFU/g. The majority of samples were sampled at processing plant and mainly by Poland.

L. monocytogenes was detected in 0.4 % of the 1,705 samples of RTE products of turkey meat tested using detection methods (Table LISTERIARTETURK). One batch sampled at retail, representing 0.5 % of 188 units tested for enumeration, was found to exceed the criterion of 100 CFU/g.

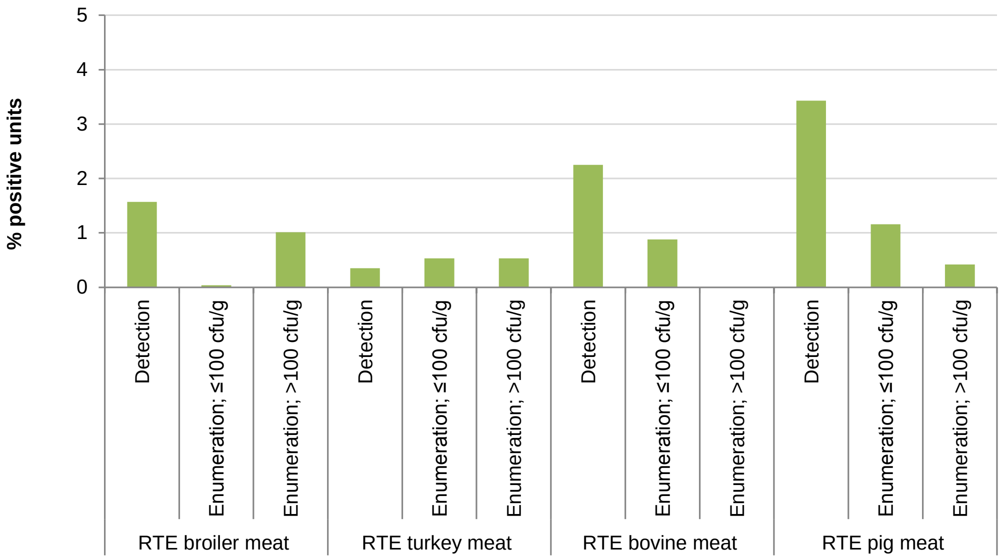
Bovine meat

In 2013, *L. monocytogenes* was found in 2.3 % of the 2,575 units of RTE bovine meat tested qualitatively and in 0.9 % of the 1,023 samples tested using enumeration methods, but levels above 100 CFU/g were not observed in any of the tested samples (Table LISTERIARTEBOVINE).

All tested samples from fermented sausages were found to meet the *L. monocytogenes* criterion at both processing and retail (≤ 100 CFU/g).

Pig meat

L. monocytogenes was detected in 3.4 % of the 36,511 samples of RTE pig meat or products thereof tested using detection methods (Table LISTERIARTEPIG). Among the 19,926 units tested using enumeration methods, *L. monocytogenes* was found at a level above 100 CFU/g in 0.4 % of the tested units. The majority of RTE meat products from pigs were sampled at processing plants.



Test results obtained by detection and enumeration methods are presented separately.
RTE broiler meat includes data from Belgium, Bulgaria, Czech Republic, Estonia, Hungary, Ireland, Italy, Lithuania, Luxembourg, Poland, Portugal, Romania, Slovakia and Sweden (detection: 13 MS; enumeration: 11 MS).
RTE turkey meat includes data from Cyprus, Czech Republic, Estonia, Hungary, Ireland, Luxembourg, Poland and Portugal (detection: 6 MS; enumeration: 6 MS).
RTE bovine meat includes data from Bulgaria, Cyprus, Czech Republic, Estonia, Germany, Hungary, Ireland, Italy, Luxembourg, Poland, Romania, Spain and Sweden (detection: 13 MS; enumeration: 8 MS).
RTE pig meat includes data from Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Luxembourg, Poland, Portugal, Romania, Slovakia, Spain and Sweden (detection: 19 MS; enumeration: 16 MS).
Data pooled for all sampling stages for all reporting MS (single and batch).

Figure 10. Proportion of L. monocytogenes-positive units in ready-to-eat meat categories in the EU, 2013

Ready-to-eat cheeses

A summary of tested units and the proportion of units positive for cheeses are presented in Figure 11. *L. monocytogenes* was more often detected in samples of soft and semi-soft cheeses made from raw or low heat-treated milk than in samples of cheeses made from pasteurised milk. Maybe slightly surprisingly, the proportion of samples positive with a concentration in the interval between the limit of detection and 100 CFU/g in hard cheese made from pasteurised milk was at a level similar to soft and semi-soft cheeses made from raw or low heat-treated milk, but this was mainly influenced by the results provided by one MS. The proportion of samples with levels of *L. monocytogenes* above 100 CFU/g was in general very low in cheese samples.

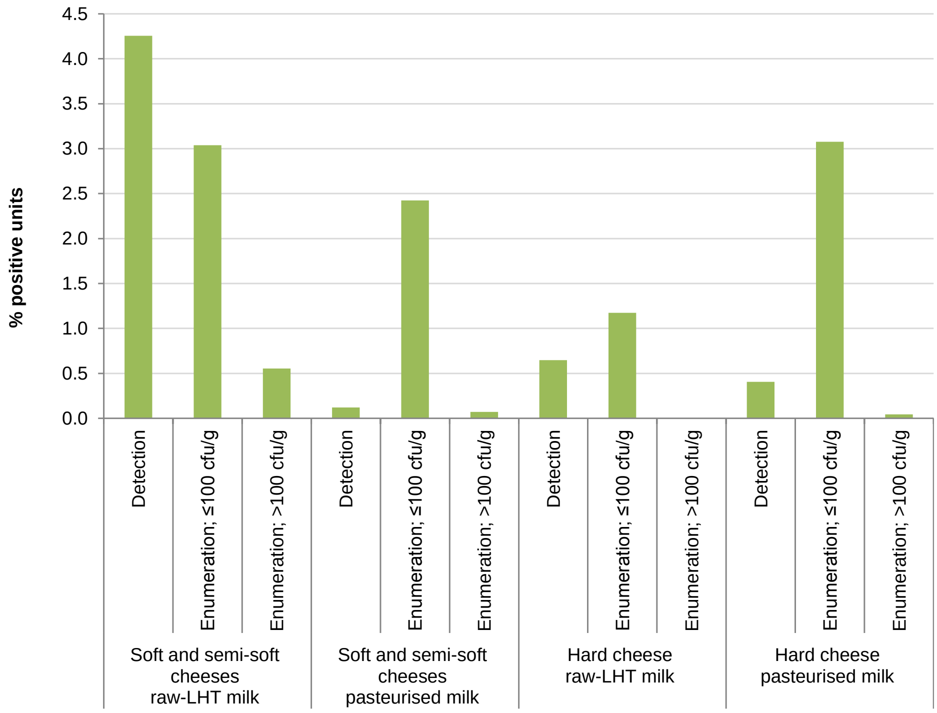
In soft and semi soft cheeses made from raw or low heat-treated milk, the proportion of positive samples for detection was higher in cow’s cheeses than in cheeses from other animal species, whereas the proportion of samples with *L. monocytogenes* greater than 100 CFU/g was higher in samples from sheep’s cheeses than in cheeses from other animal species. In hard cheeses made from raw and low heat-treated milk, *L. monocytogenes* was more often detected in samples from sheep's milk, followed by goat's milk, than in cheeses from cows or from mixed, unspecified or other animals. No major differences between animal species were observed in cheeses made from pasteurised milk.

Soft and semi-soft cheeses

In 2013, lower levels of *L. monocytogenes* were observed in soft and semi-soft cheeses made from pasteurised milk (0.1 % of the 8,895 samples tested qualitatively and 2.4 % of the 2,760 units tested quantitatively had concentrations ≤ 100 CFU/g, and 0.1 % exceeded 100 CFU/g) than in soft and semi-soft cheeses made from raw or low-heat-treated milk (4.3 % out of 2,538 samples tested qualitatively and 3 % of the 1,447 units tested quantitatively had concentration ≤ 100 CFU/g, and 0.6 % exceeded 100 CFU/g).

Hard cheeses

In 2013, *L. monocytogenes* was found in 0.6 % of the 1,704 samples of hard cheeses made from raw or low heat-treated milk tested for detection in MS. Counts between the detection limit and 100 CFU/g were found in 1.2 % of the 426 units tested quantitatively. In hard cheeses made from pasteurised milk, *L. monocytogenes* was found in 0.4 % of the 8,360 tested units, and, in 3.1 % of the 2,273 samples tested using the enumeration method, the concentration was between the detection limit and 100 CFU/g. Levels of *L. monocytogenes* above 100 CFU/g were not found in samples of hard cheeses (from raw or low heat-treated milk and from pasteurised milk), except for one sample of hard cheese made from pasteurised milk sampled at retail.



Test results obtained by detection and enumeration methods are presented separately. LHT, low heat-treated milk
Soft and semi-soft cheeses, made from raw-LHT milk include data from Austria, Belgium, Bulgaria, Czech Republic, Germany, Ireland, Italy, Netherlands, Poland, Portugal, Romania, Slovakia and United Kingdom (detection: 13 MS; enumeration: 10 MS).
Soft and semi-soft cheeses, made from pasteurised milk include data from Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Germany, Greece, Hungary, Ireland, Poland, Portugal, Romania, Slovakia, Spain and United Kingdom (detection: 15 MS; enumeration: 13 MS).
Hard cheese, made from raw-LHT milk include Austria, Bulgaria, Czech Republic, Estonia, Germany, Ireland, Netherlands, Poland, Portugal, Romania, Slovakia and United Kingdom (detection: 11 MS; enumeration: 7 MS).
Hard cheese, made from pasteurised milk include data from Austria, Bulgaria, Cyprus, Czech Republic, Estonia, Germany, Greece, Hungary, Ireland, Poland, Romania, Slovakia and Spain (detection: 13 MS; enumeration: 10 MS).
Data pooled for all sampling stages for all reporting MS (single and batch).

Figure 11. Proportion of* L. monocytogenes*-positive units in soft and semi-soft cheeses made from raw or low heat-treated milk, 2013

Detailed information on the data reported and on the occurrence of *L. monocytogenes* in the different cheese categories has been included in specific tables referenced in the Appendix.

Other ready-to-eat products

Results of a considerable number of investigations on *L. monocytogenes* in other RTE products, such as bakery products, fruits and vegetables, prepared dishes and salads were reported.

In 2013, 14 MS provided data from investigations on RTE fruit and vegetables (Table LISTERIAFRUITVEG). In total, 5,106 units were tested, where the majority were single samples sampled at retail, and *L. monocytogenes* was found in 1.4 % of samples collected at all sampling stages. In 0.4 % of the 2,494 samples tested quantitatively, the concentration exceeded 100 CFU/g (all sampled at retail).

Overall, 12 MS reported on bakery products, where *L. monocytogenes* was found in 4.5 % of the 3,731 analysed samples (Table LISTERIABAKERY). Of these, 1,687 samples was tested using enumeration, and 1.2 % was contaminated with *L. monocytogenes* in concentrations above 100 CFU/g.

L. monocytogenes was detected in 4.0 % of the 5,312 tested samples of RTE salads (Table LISTERIASALAD). In two MS, *L. monocytogenes* was found in salads at levels exceeding 100 CFU/g (in total, 0.1 % of the 3,370 units tested quantitatively). *L. monocytogenes* was found in 1 of the 302 tested samples of sauces (Table LISTERIASAUCE) and at levels between the detection limit and 100 CFU/g in two of the 506 samples of spices (Table LISTERIASPICES).

In the investigations of 'Other processed food products and prepared dishes' reported in 2013, *L. monocytogenes* was detected in sandwiches at retail and in sushi sampled at retail (Table LISTERIAPREPDISH).

In 2013, *L. monocytogenes* was not found in any of the relatively few reported investigations of confectionery products and pastes (Table LISTERIACONF), egg products (Table LISTERIAEGGPR or RTE milk (Table LISTERIAMILK).

Animals

In 2013, 12 MS and one non-MS reported qualitative data on *Listeria* in animals, including samples from investigations where suspect sampling had been applied and samples from clinical investigations. The majority of findings were reported as *L. monocytogenes* (234) or *Listeria* spp. (162), but a few findings of two additional *Listeria* species, *L. innocua* (4) and *L. ivanovii* (1), were also reported.

Findings of *Listeria* were most often reported in cattle, sheep and goats, but *Listeria* was also detected in laying hens and broilers, pigs, dogs, foxes, horses, African wild dogs and alpacas.

In total, 37,419 animals or flocks/herds were tested for *Listeria* and 2.0 % of these were found to be *Listeria* positive. The size of the investigations and the prevalence varied considerably.

Further details on the findings of *Listeria* in animals are included in Table LISTERIAANIMALS.

3.3.3. *Listeria* food-borne outbreaks

In 2013, a total of 12 *Listeria* outbreaks were reported by seven MS. This was slightly higher than in previous years (2012, nine outbreaks; 2011, eight outbreaks).

Seven of the outbreaks reported were supported by strong evidence. Crustaceans, shellfish and molluscs and products thereof were implicated in three strong-evidence outbreaks. In two of these outbreaks, the source was crab meat. The responsible food vehicles in the remaining four outbreaks belonged to four different food categories ('Cheese', 'Meat and meat products', 'Pig meat and products thereof', 'Vegetables and juices and other products thereof (mixed salad)').

Except for one outbreak related to meat and meat products with 34 cases, the *Listeria* outbreaks reported in 2013 involved two to four cases each, resulting in 51 cases, 11 hospitalisations and three deaths. Three *Listeria* strong-evidence outbreaks were responsible for one fatal case each. Specifically, one person died in each of the two strong-evidence general outbreaks associated with the consumption of crab meat. These two outbreaks were both reported as being related to mobile retailers or street vendors in the same MS. One fatal case was reported in a general outbreak associated with the consumption of mixed salad in a hospital or medical facility.

In addition, Norway reported one strong-evidence general outbreak, which was associated with the consumption of fish and fish products (half-fermented trout). The Norwegian outbreak affected three people, of which, one person died.

3.3.4. Discussion

Human listeriosis is a relatively rare but serious zoonotic disease, with high morbidity, hospitalisation and mortality rates in vulnerable populations. Of all the zoonotic diseases under EU surveillance, listeriosis caused the most severe human disease with 99.1 % of the cases hospitalised and 191 cases being fatal (case fatality rate 15.6 %). This also reflects the focus of EU surveillance on severe, systemic infections. In the last five years, there has been an increasing trend of listeriosis in the EU/EEA and, in 2013, the EU notification rate increased by 9.4 % compared with 2012.

In 2013, seven strong-evidence food-borne outbreaks caused by *L. monocytogenes* were reported by five MS. These outbreaks resulted in 51 cases, 11 hospitalisations and three deaths, i.e. 37.5 % of all deaths due to strong-evidence food-borne outbreaks reported in 2013. Three outbreaks were related to crustaceans, shellfish and molluscs and products thereof, and other sources were: mixed salad, meat and meat products, cheese and pig meat and products thereof. In addition, one non-MS reported one strong-evidence outbreak associated with the consumption of half-fermented trout and responsible of one fatal case.

L. monocytogenes is widespread in the environment and therefore a wide range of different foodstuffs can be contaminated. For a healthy human population, foods not exceeding the level of 100 CFU/g are considered to pose a negligible risk. Therefore, the EU microbiological criterion for *L. monocytogenes* in RTE food is set at ≤ 100 CFU/g for RTE products on the market.

In 2013, the non-compliance for different RTE food categories generally was at a level comparable to previous years and the proportion of non-compliant units at retail was lower than at processing, for all categories. As last year, at processing plants the level of non-compliance was highest in fishery products (mainly smoked fish). In 2013, the overall level of non-compliance for soft and semi-soft cheeses was considerably higher than in previous years, mainly due to one MS. This highlights the influence of the variations in the reporting MS and the sample sizes in their investigations.

As in previous years and consistent with the results of the EU baseline survey on the prevalence of *L. monocytogenes* in certain RTE foods at retail (EFSA, 2013a), the proportion of positive samples at retail was highest in fish products (mainly smoked fish), followed by soft and semi-soft cheeses, RTE meat products and hard cheeses.

Several MS reported findings of *Listeria* in animals. Most of the tested samples were from cattle, and to a lesser degree goats and sheep. Findings of *Listeria* were most often reported in these three animal species, but *Listeria* was also detected in fowl, pigs, dogs, foxes, horses, African wild dogs and alpacas. *Listeria* is widespread in the environment; therefore, isolation from animals is to be expected and increased exposure may lead to clinical disease in animals.

3.4. Verocytotoxigenic *Escherichia coli*

The Appendix contains hyperlinks to all data summarised for the production of this section, for humans, food, animals and food-borne outbreaks. It also includes hyperlinks to VTEC summary tables and figures that were not displayed in this section because they did not trigger any marked observation. The summarised data are presented in downloadable Excel and PDF files, and are listed by subject. Moreover, all submitted and validated data by the MS are available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm).

3.4.1. Verocytotoxigenic *Escherichia coli* in humans

In 2013, 6,112 cases of VTEC[28] infections, of which 6,043 were confirmed, were reported in the EU (Table 15). Twenty-four MS reported at least one confirmed case, two MS reported zero cases and one MS did not provide information on case classification. The EU notification rate was 1.59 cases per 100,000 population, which was 5.9 % higher than the notification rate in 2012. The highest country-specific notification rates were observed in Ireland, the Netherlands and Sweden (12.29, 7.06 and 5.77 cases per 100,000 population, respectively). The increase in Ireland in the last few years has primarily been due to non-O157 VTEC cases, and has coincided with continuing changes in diagnostics in primary hospital laboratories during this time (Patricia Garvey, Health Service Executive, Ireland, personal communication, October 2014). In the Netherlands, the notification rate of VTEC infections has increased considerably after the introduction of PCR for VTEC detection in stool samples (with many of the cases being asymptomatic) but also because increasing numbers of laboratories are able to identify serogroups other than O157 (Ingrid Friesma, RIVM, the Netherlands, personal communication, October 2014). The lowest rates were reported in Bulgaria, Cyprus, Greece, Latvia, Poland, Romania and Spain (< 0.1 cases per 100,000).

[28] Also known as verotoxigenic *E. coli*, verocytotoxigenic *E. coli*, verotoxin-producing *E. coli* and verocytotoxin-producing *E. coli* (VTEC), Shiga toxin-producing *E. coli* (STEC).

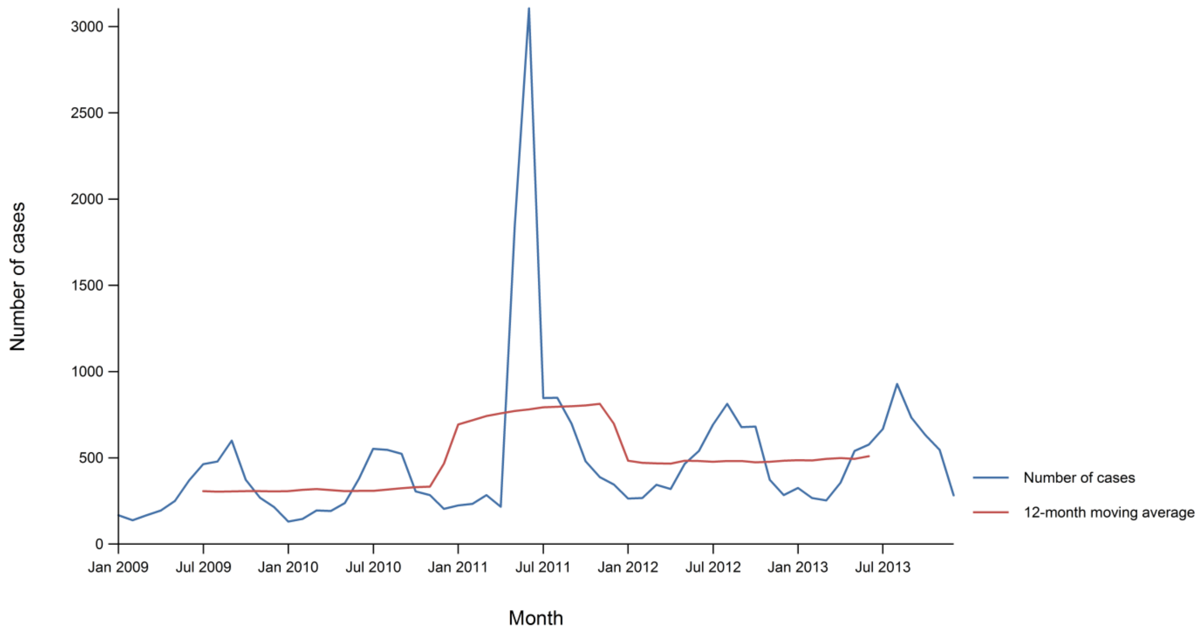
Table 15. Reported cases and notification rates per 100,000 of human VTEC infections in the EU/EEA, 2009–2013

	2013					2012		2011		2010		2009	
	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	130	130	1.54	130	1.55	120	1.43	88	1.05	91	1.09
Belgium[b]	N	C	117	117	-	105	-	100	-	84	-	96	-
Bulgaria	Y	A	1	1	0.01	0	0.00	1	0.01	0	0.00	0	0.00
Croatia[c]	Y	A	2	-	-	-	-	-	-	-	-	-	-
Cyprus	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic[d]	Y	C	17	17	0.16	9	0.09	7	0.07	-	-	-	-
Denmark	Y	C	199	191	3.41	199	3.57	215	3.87	178	3.22	160	2.90
Estonia	Y	C	8	8	0.61	3	0.23	4	0.30	5	0.38	4	0.30
Finland	Y	C	98	98	1.81	32	0.59	27	0.50	20	0.37	29	0.54
France[e]	N	C	218	218	-	208	-	221	-	103	-	93	-
Germany	Y	C	1673	1639	2.00	1573	1.93	5558	6.82	955	1.17	887	1.08
Greece	Y	C	2	2	0.02	0	0.00	1	0.01	1	0.01	0	0.00
Hungary	Y	C	13	13	0.13	3	0.03	11	0.11	7	0.07	1	0.01
Ireland	Y	C	581	564	12.29	412	8.99	275	6.02	197	4.33	237	5.24
Italy[b]	N	C	70	65	-	50	-	51	-	33	-	51	-
Latvia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Lithuania	Y	C	6	6	0.20	2	0.07	0	0.00	1	0.03	0	0.00
Luxembourg	Y	C	10	10	1.86	21	4.00	14	2.74	7	1.39	5	1.01
Malta	Y	C	2	2	0.48	1	0.24	2	0.48	1	0.24	8	1.95
Netherlands	Y	C	1184	1184	7.06	1049	6.27	845	5.07	478	2.88	314	1.91
Poland	Y	C	8	5	0.01	3	0.01	5	0.01	4	0.01	0	0.00
Portugal[f]	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	6	6	0.03	1	0.01	2	0.01	2	0.01	0	0.00
Slovakia	Y	C	7	7	0.13	9	0.17	5	0.09	10	0.19	14	0.26
Slovenia	Y	C	17	17	0.83	29	1.41	25	1.22	20	0.98	12	0.59
Spain	Y	C	28	28	0.06	32	0.07	20	0.04	18	0.04	14	0.03
Sweden	Y	C	551	551	5.77	472	4.98	477	5.07	334	3.58	228	2.46
United Kingdom	Y	C	1164	1164	1.82	1337	2.11	1501	2.40	1110	1.79	1336	2.17
EU Total	**-**	**-**	**6112**	**6043**	**1.59**	**5680**	**1.50**	**9487**	**2.58**	**3656**	**1.00**	**3580**	**0.98**
Iceland	Y	C	3	3	0.93	1	0.31	2	0.63	2	0.63	8	2.51
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	103	103	2.04	75	1.50	47	0.96	52	1.07	108	2.25
Switzerland[g]	Y	C	80	80	1.00	63	0.79	76	0.97	34	0.44	58	0.75

(a): Y, yes; N, no; A, aggregated data; C, case-based data; -, no report.
(b): Sentinel surveillance; no information on estimated coverage. Thus, notification rate cannot be estimated.
(c) : All cases of unknown case classification.
(d): Mandatory notification of VTEC in 2008 and reported to ECDC from 2011.
(e): Sentinel surveillance; only cases with HUS are notified.
(f): No surveillance system.
(g): Switzerland provided data directly to EFSA.

Most of the VTEC cases reported in the EU were infected within their own country (62.5 % domestic cases, 13.2 % travel-associated and 24.4 % of unknown origin) (Table VTECHUMIMPORT). Only Sweden reported a higher proportion of travel-associated cases than domestic cases (50.6 % vs. 47.4 %, 3.6 % unknown) with Turkey and Egypt the most common probable countries of infection (82 and 43 cases, respectively).

There was a clear seasonal trend in the confirmed VTEC cases reported in the EU in 2009-2013 with more cases reported in the summer months (Figure 12). A dominant peak in the summer of 2011 was attributed to the large enteroaggregative Shiga toxin-producing *E. coli* (STEC)/VTEC O104:H4 outbreak associated with the consumption of contaminated raw sprouted seeds affecting more than 3,800 persons in Germany and linked cases in an additional 15 countries (EFSA and ECDC, 2013). In the two consecutive years after the outbreak, there were still higher numbers of VTEC cases reported in the EU, which was possibly an effect of increased awareness and of more laboratories also testing for serogroups other than O157.



Source: Austria, Belgium, Bulgaria, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Slovakia, Slovenia, Sweden, and United Kingdom. Croatia, the Czech Republic, Spain and Romania did not report data over the whole period at the level of detail required for the analysis. Portugal does not have any surveillance system for this disease.

Figure 12. Trend in reported confirmed cases of human VTEC infections in the EU/EEA, 2009-2013

Sixteen MS, which is three more than in 2012, provided information on hospitalisation, covering 41.1 % of all confirmed VTEC cases in 2013. Of the cases with known hospitalisation status, 37.1 % of cases on average were hospitalised. The highest proportions of hospitalised cases were reported in Romania, Italy, Estonia, Slovenia, Lithuania and Slovakia (75-100 %). In 2013, 13 deaths due to VTEC infection were reported in the EU. Eight MS reported one to five fatal cases each, and ten MS reported no fatal cases. This resulted in an EU case-fatality rate of 0.36 % among the 3,582 confirmed cases for which this information was provided (59.3 % of all reported confirmed cases). The serogroups associated with fatal cases were O157 (2 cases), O26 (1), O55 (1), O103 (1), O111 (1), O145 (1), non-typable (2) and in four cases the serogroup was not specified.

Data on VTEC serogroups (based on O antigens) were reported by 22 MS, Iceland and Norway in 2013. As in previous years, the most commonly reported serogroup was O157 (48.9 % of cases with known serogroup) (Table 16). Serogroup O26, the second most common in 2013, increased by 65.1 % between 2011 and 2013. The proportion of non-typeable VTEC strains doubled in the same period (the non-typable include those strains where the laboratory tried but was not able to define the O-serogroup. The proportion of non-typable depends on how many sera/molecular tools are included in the typing panel of each laboratory). The serogroup which showed the largest relative increase between 2011 and 2013 was O182, which was reported by five countries in 2013 compared with only one in 2011 and 2012. It is not known if these are true increases in these serogroups or if they result from increased detection of serogroups other than O157. Only three cases of O104:H4 were reported in 2013 by three countries (Belgium, Denmark and the Netherlands) and eight cases of O104 with unknown H-group were reported by four countries (France, Germany, Ireland and the Netherlands) (data not shown).

Table 16. Distribution of reported confirmed cases of human VTEC infections in 2013 in the EU/EEA, 2011–2013, by the 20 most frequent serogroups

Serogroup	2011			2012			2013		
	Cases	MS	%	Cases	MS	%	Cases	MS	%
O157	2201	21	41.0	1981	19	54.9	1828	23	48.9
O26	289	17	5.4	417	17	11.6	477	17	12.8
O103	808	12	15.0	231	13	6.4	160	12	4.3
O145	80	12	1.5	112	11	3.1	96	11	2.6
O91	116	8	2.2	131	8	3.6	94	11	2.5
O111	52	9	1.0	66	10	1.8	78	13	2.1
O146	48	8	0.9	59	9	1.6	75	9	2.0
O128	54	9	1.0	37	8	1.0	41	8	1.1
Orough	28	4	0.5	24	5	0.7	41	5	1.1
Non-O157	16	1	0.3	21	3	0.6	36	3	1.0
O113	34	8	0.6	24	8	0.7	27	6	0.7
O117	17	5	0.3	22	6	0.6	24	8	0.6
O121	27	7	0.5	27	4	0.7	23	7	0.6
O177	18	5	0.3	4	3	0.1	22	7	0.6
O76	21	6	0.4	22	7	0.6	20	9	0.5
O63	26	2	0.5	12	2	0.3	18	3	0.5
O182	1	1	0.0	1	1	0.0	15	5	0.4
O5	22	5	0.4	7	4	0.2	15	5	0.4
O118	8	2	0.15	8	4	0.22	13	6	0.3
O92	4	1	0.07	4	1	0.11	13	2	0.3
NT (non typeable)	148	15	2.8	136	11	3.8	298	10	8.0
Other	1499	-	27.9	398	-	11.0	622	-	16.6
Total	**5369**	**24**	**100.0**	**3608**	**22**	**100.0**	**3738**	**24**	**100.0**

Source: 22 MS and two non-MS: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

3.4.2. Verocytotoxigenic *Escherichia coli* in food

Comparability of data

Data on VTEC detected in food and animals are reported annually on a mandatory basis by EU MS to the EC and EFSA, based on Directive 2003/99/EC. In order to improve the quality of the data from VTEC monitoring in the EU, EFSA issued technical specifications for the monitoring and reporting of VTEC in animals and food in 2009 (EFSA, 2009a). These guidelines were developed to facilitate the generation of data which would enable a more thorough analysis of VTEC in food and animals in the future. The specifications encourage MS to monitor and report data on serogroups defined by the BIOHAZ Panel as the most important regarding human pathogenicity. When interpreting the VTEC data it is important to note that data from different investigations are not necessarily directly comparable owing to differences in sampling strategies and the analytical methods applied. Different analytical methods were used by the MS: the new ISO 13136:2012 analytical method (ISO, 2012) recommended by the BIOHAZ Panel (EFSA BIOHAZ Panel, 2013a), which aims to detect any VTEC, and facilitate the isolation of strains belonging to VTEC serogroups O157, O111, O26, O103 and O145; the ISO 16654:2001 analytical method (ISO, 2001), which is designed to detect only VTEC O157; and finally other PCR–based methods. It is also important to note that the same MS can have used several different analytical methods depending of the investigation.

Only results for the most important animal species and foods that might serve as a source for human infection in the EU are presented.

Detailed information on the data reported and on the occurrence of VTEC in the different food categories has been included in specific tables referenced in Appendix.

In total, as regards food, 19 MS and one non-MS reported data on VTEC. Overall, nine MS reported using the new ISO 13136:2012 analytical method, 10 MS reported having used the ISO 16654:2001 analytical method and five MS reported using PCR. Of these, some MS have used more than one type of method. All MS and non-MS reporting VTEC in food have provided information of VTEC serogroups O157, non-O157 or other serogroups; where detailed information was provided on serogroups, the main reported VTEC serogroups were O157, O26, O103, O121 and O55.

Bovine meat and unpasteurized (raw) milk

Contaminated bovine meat is considered to be a major source of food-borne VTEC infections in humans. In 2013, twelve MS reported data on VTEC in fresh bovine meat; all from surveillance and monitoring programmes. A total of 3,898 samples (all single) were tested, and of these low proportions, respectively, 2.5 % and 1.3 % were positive for VTEC and for VTEC O157. Positive findings of serogroup O103 (Belgium and Slovenia), O26 (France), O87 and O113 (both Germany) in bovine meat were also reported.

MS reported VTEC information by sampling stage (slaughterhouse, processing plant and retail) and those were low to very low for VTEC and for VTEC O157. The testing results at sampling stage were influenced by the MS-specific results and by those MS that had conducted most of the testing, especially the Netherlands at retail and Spain at slaughterhouse level.

Nine MS tested 860 raw milk samples from bovine animals intended for direct human consumption and 2.3 % were VTEC-positive. In addition to three of the serogroups reported from bovine meat (O157, O103 and O26), O145 and O111 were also detected in milk samples. Eight MS also tested VTEC in non-raw milk and non-raw dairy products such as cheeses, and low to very low proportions, respectively 2.4 % and 0.2 % were positive for VTEC and for VTEC O157. Testing results at sampling stage were influenced by the MS-specific results and by those MS that had conducted most of the testing.

In Finland, every VTEC infection suspected to originate from cattle or farm environment initiates an investigation at the suspected source farm. In 2013 no VTEC outbreaks occurred in humans, but the investigation of four human VTEC O157 (sorbitol negative) sporadic cases related to farm visits and/or consumption of unpasteurised milk was traced back by sampling at the farm level (four different farms). In all cases, VTEC O157 (sorbitol negative) could be isolated from the samples. In three of these cases, indistinguishable pulsed field gel electrophoresis (PFGE) genotypes of the isolated strains and the patient strain suggested the farm as a source of the infection. The isolates recovered from the samples of the four farms had virulence profiles of *vtx*1+, *vtx*2+, *eae*+ and *hly*A+.

In addition, two human cases of a sorbitol-fermenting variant of VTEC O157 and one case each of VTEC O26 and O103 led to the trace back sampling on the farm level. These VTEC types could not be isolated from the farm samples and the origin of the infections in humans remained unknown. However, during the trace back investigations of one of the sorbitol- fermenting VTEC O157 infections, the farm was found positive for sorbitol negative VTEC O157.

Source: The Finnish National Zoonoses Summary Report, 2013

Ovine meat

Four MS tested in total 67 fresh ovine meat samples and eight (11.9 %) and two (3.0 %) samples tested positive for VTEC and VTEC O157, respectively. The Netherlands tested 34 samples from retail and found six (17.7 %) to be positive (all non-O157), and Spain tested eight samples and found one (O157) to be positive. Austria and Italy found no VTEC-positive samples.

Pig meat

In total, six MS reported testing of 447 fresh pig meat samples from processing plant, retail and slaughterhouse, with no positive findings of VTEC.

Vegetables and sprouted seeds

In 2013, ten MS reported data on VTEC in vegetables. In total, 1,895 samples were tested, of which Ireland has reported 51.6 % of the tested samples, Italy reported 20.4 %, Germany reported 6.8 % and Hungary reported 5.9 %. Only three samples were VTEC-positive (0.2 %); Ireland and Slovakia found one O157 positive sample each. Eight MS reported investigations of RTE sprouted seed with no positive findings.

VTEC serogroups in food

In total 12 MSs provided information on VTEC serogroups in 271 isolates (see submitted and validated data by the MS available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm). Italy, Spain and Ireland reported most of the data (34.3 %, 26.9 % and 10.7 % respectively). Depending on the analytical detection method used; Austria, Belgium, Estonia, France, Germany, Ireland and Italy reported several serogroups, while Hungary, Netherlands and Spain only reported VTEC O157 and non-O157. The most frequently reported serogroup was VTEC O157 (49.5 %) and these mainly originated from meat from bovine animals (42.5 %) (fresh meat, minced meat, meat preparations and meat products), meat from pigs (14.9 %) (minced meat, meat preparations and meat products) and mixed meat (13.4 %). The second most reported serogroup was VTEC O145 (7.8 %) and were mainly detected in cheese made from unspecified milk (57.1 %) and milk from cows (28.6 %). Serogroup VTEC O103 was mainly reported from bovine meat (fresh meat, minced meat, meat preparations and meat products) and cow milk, and serogroup O26 was mainly reported from cheese made from unspecified milk. Other reported serogroups were VTEC O15, O113, O2, O22, O78, O136, O146, O76, O87 and O178. Non-VTEC O157 was reported in 21.4 % of the isolates.

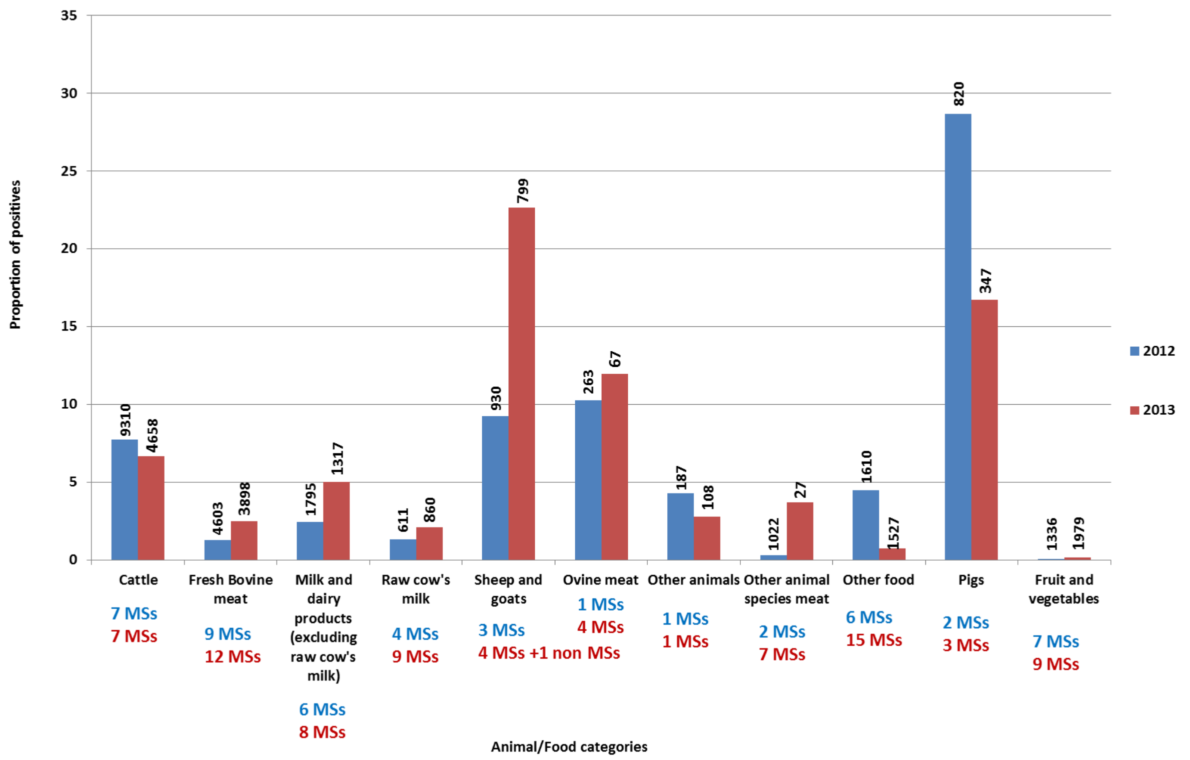
3.4.3. Verocytotoxigenic *Escherichia coli* in animals

In 2013, 12 MS and one non-MS provided data on VTEC in animals. Spain was the only MS using the new ISO 13136:2012 analytical method adapted to animal samples. Six MS reported having used the ISO 16654:2001 analytical method adapted to animal samples, which only detects VTEC O157. Italy and Sweden reported using PCR. Austria reported using a pre-enrichment (containing mitomycin) of rectoanal swabs that were tested for verocytotoxin production. Positive samples where verocytotoxin was detected were further processed by plating the enrichments on three different solid media and after incubation by testing up to five colonies per plate by PCR.

Detailed information on the data reported and on the occurrence of VTEC in the different animal categories has been included in specific tables referenced in Appendix.

Cattle

Seven MS reported data on VTEC in cattle in 2013. In total, 4,658 samples from both farms and slaughterhouses were tested, mainly as part of official sampling (19 out of 23 investigations). The overall proportion of positive VTEC units found in cattle was low as in 2012 (Figure 13).



Other animals: cats, dogs and *Gallus gallus* (laying hens).
Other meat: meat from pigs and poultry.
Other food: sprouted seed, live bivalve molluscs, juice, other food, spices, herbs and other processed dishes, ready-to-eat food.
Source 2012: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Romania, Slovenia, Spain, and Sweden.
Source 2013: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Italy, Netherlands, Norway, Poland, Slovakia and Spain.

Figure 13. Proportion of VTEC positive samples in animal/food categories in Member States and non-Member States, 2012-2013

In total, in 2013, 6.7 % of the units tested positive for VTEC, 4.3 % were positive for non-O157 and 1.4 % was positive for VTEC O157. In 2013, the highest proportion of positive findings in cattle was reported by Austria, who found 30.5 % of the cattle over two years old (59 samples) and 33.8 % of the cattle aged one to two years (71 samples) were positive for VTEC, using rectoanal swabs. The method is more sensitive than faecal culture, and this could be the reason why Austria reported a higher VTEC prevalence in cattle than other MS. In 2013, more than twenty different serogroups were reported from cattle, where the most frequently reported were O157 (96), O26 (12), O174 (8), O103 (7), O91 (5), O185 (3) and O22 (3).

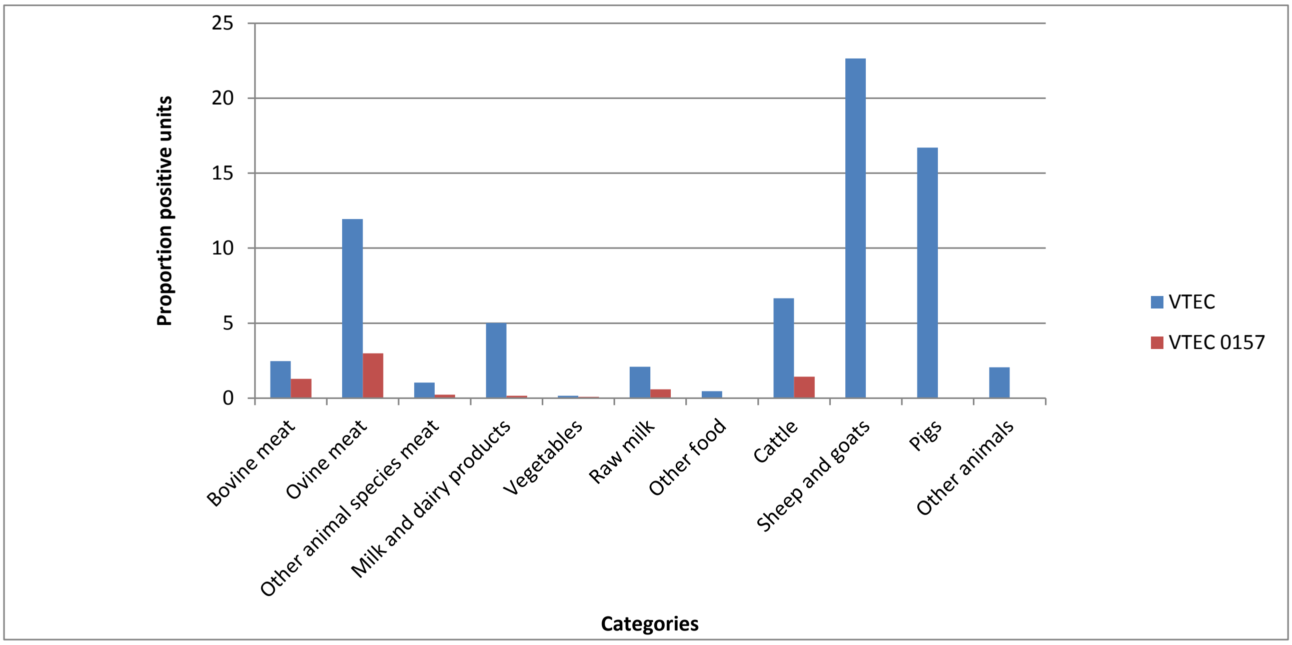
Pigs

In 2013, three countries reported data for pigs (Germany, Italy and the Netherlands), but only two of them found VTEC-positive results: the Netherlands (15.8 % positive pens) and Germany (23.0 % positive holdings and 17.0 % positive animals). The overall proportion of VTEC-positive units was 16.7 % (Figure 13). No positive samples for the O157 serogroup were reported and no further serogroup information was reported. In 2012 the overall proportion of VTEC-positive units was 28.7 % (Figure 13) and these data were reported by two MS (Germany and the Netherlands).

Sheep and goats

In 2013, four MS and one non-MS reported data from sheep and goats. In total, 799 units were tested and 22.7 % were positive for VTEC (none was O157-positive). In 2012, the proportion of positive VTEC units was 9.3 %. Extremely high (above 70 %) non-O157 VTEC-positive proportions in animals were reported in 2013 by the Netherlands in sheep and by Germany in goats. Besides serogroup O157, a range of serogroups were detected in sheep: O76, O146, O113, O103: O112, O121, O149 and others.

The serotype most commonly reported in the EU and often associated with both outbreaks and sporadic cases is undoubtedly VTEC O157, which has also been identified as the major cause of HUS in children (ECDC, 2013; EFSA BIOHAZ Panel, 2013a). Focus has therefore traditionally been on this serotype in many of the MS' surveillance programmes. In 2013, VTEC O157 was most commonly detected in ruminants and meat products thereof (Figure 14).



Other animal species meat: broilers, deer, goats, horses, other animal species unspecified, pigs, poultry, rabbits, turkeys and wild boars. Other food: bakery products, beverages non-alcoholic, cereals, crustaceans, egg and egg products, fish and fishery products, mixed red meat, infant formulae, juice, live bivalve molluscs, molluscan shellfish, mushrooms, nuts and nut products, other food unspecified, processed food and prepared dishes, ready-to-eat salads, sauces and dressings, snails, soups, spices and herbs, water. Milk and dairy products exclude raw milk.
Source 2013: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Italy, Netherlands, Norway, Poland, Slovakia and Spain.

Figure 14. Proportion of VTEC- and VTEC O157- positive samples in all food/animal categories in Member States and non-Member States, 2013

VTEC serogroups in animals

In total 13 and 1 non-MSs provided information on VTEC serogroups in 377 isolates (see submitted and validated data by the MS available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm). The reported VTEC isolates, where detailed information was provided on serogroups, originated mainly from cattle and from sheep (173 and 115 isolates, respectively). The most frequent reported serogroup in the reported isolates was VTEC O157 (25.1 %), and the majority of the isolates was detected in cattle (98.1 %). Other main serogroups reported from cattle was O26 (11 isolates), O174 (8 isolates), O103 (5 isolates), O91 (5 isolates) and O185 (3 isolates).

The distribution of serogroups reported from sheep was more diverse; the most frequent serogroups were O145 and O146 (17 isolates each), O5 (14 isolates), O76 and O87 (11 isolates each). Other main findings in sheep were serogroups O166 (8), O113 (7), O75 (4), O91, O128 and O174 (3 each).

Information on serogroups was provided on 48 pig isolates mainly reported by the Netherlands (60.4 %) and Latvia (31.3 %). All isolates were reported as non-O157 with no further information on the serogroup. Latvia was the only MS providing information on serogroups in isolates from dogs; 14 isolates of which 8 isolates were non-O157, O103 (4 isolates), O26 and O121 (1 isolate each). Latvia also provided information from 6 isolates originating from cats; all reported as non-O157.

3.4.4. VTEC food-borne outbreaks

In 2013, 11 MS reported a total of 73 outbreaks caused by VTEC (excluding one water-borne outbreak), representing 1.4 % of the total number of reported food-borne outbreaks in the EU. In 2012, nine MS reported a total of 41 food-borne outbreaks.

Only 12 of the reported outbreaks in the EU were supported by strong evidence. The main food vehicle was bovine meat and products thereof, reported in four strong-evidence outbreaks, followed by ‘Vegetables and juices and other products thereof’ (three outbreaks) and cheese (two outbreaks). Each of the remaining three outbreaks was associated with fish and fishery products, herbs and spices, and other foods.

Information on the setting was provided in all of the 12 strong-evidence outbreaks, although for three outbreaks the setting was reported as ‘Others’. Three outbreaks were associated with ‘Household’ and with ‘Restaurant, café, pub, bar, hotel, catering service’, while one outbreak was linked to ‘School or kindergarten’. Contributing factors were unprocessed contaminated ingredients in four outbreaks and storage time/temperature abuse in one outbreak. For seven outbreaks, the contributing factors were not reported, unknown or not specified (‘Other’).

In Belgium, an outbreak of bloody diarrhoea and HUS caused by *E. coli* O157:H7 (*vtx*2 *eae* positive) occurred in June-July 2013. The outbreak involved 18 disseminated cases, of which all were laboratory-confirmed and could be linked using molecular typing techniques such as IS629- typing. The source of the outbreak could be traced back to the processing plant by sampling. The patients were infected through the consumption of raw bovine meat products such as ‘Steak tartare’.

Source: The Belgian National Summary Report, 2013

3.4.5. Discussion

The EU notification rate of human VTEC infections increased in 2013 compared with 2012. The rates were also higher in 2012 and 2013 than in the years prior to the largest STEC/VTEC outbreak ever reported in the EU, which occurred in 2011. This could be an effect of increased awareness and of more laboratories also testing for serogroups other than O157, and this is possibly reflected by the increase in some non-O157 serogroups. It could also be due to a shift in diagnostic methods, as PCR is becoming more commonly used for the detection of VTEC in stool samples.

The number of countries reporting information on hospitalisation of their cases increased to sixteen in 2013. Of the VTEC cases with known hospitalisation status, more than one-third was hospitalised. Some countries reported very high proportions of hospitalised cases, but had notification rates that were among the lowest, indicating that the surveillance systems in these countries primarily capture the more severe cases. A low case-fatality rate (0.36 %; 13 deaths) was reported based on information provided by 18 MS covering almost 60 % of the confirmed VTEC cases. As in previous years, the most commonly reported serogroup was O157, followed by O26, O103, O145, O91, O111 and O146.

The EFSA BIOHAZ Panel concludes in the Scientific Opinion on VTEC-seropathotype and scientific criteria regarding pathogenicity assessment, that the new ISO/TS 13136:2012 analytical method improves the strategy for detecting VTEC in food by enlarging the scope of the previous standard to all types of VTEC (EFSA BIOHAZ Panel, 2013a). Several of the MS have already adopted this typing method in their surveillance systems, and this might provide more detailed information regarding VTEC serogroups in the future.

No trends were observed in the presence of VTEC in food and animals. Contaminated bovine meat is considered to be a major source of food-borne VTEC infections in humans. In 2013, 12 MS reported data on VTEC in fresh bovine meat and low proportions of single samples were positive for VTEC and for VTEC O157. A wide range of different VTEC serogroups, including the ones reported from human isolates, was reported from both cattle and small ruminants and their meat, indicating that both animal species can be the reservoirs of a diverse range of VTEC strains that are virulent to humans. Small ruminants were reported to be positive for non-O157 VTEC strains in extremely high proportions by two MS. This is consistent with sheep and goats to be considered an important source of VTEC strains that are virulent to humans. VTEC has been considered a hazard of high public health relevance for sheep and goat meat inspection (EFSA, 2013b). There were few reports of positive findings of VTEC in fresh ovine meat but not in fresh pig meat. According to the Scientific Opinion of the Panel on Biological Hazards on monitoring of VTEC, pigs have not been identified to be major sources of human VTEC infection in Europe (EFSA, 2007b).

In 2013, a total of 62 outbreaks caused by human pathogenic *E. coli* (including VTEC) were reported, of which 12 had strong evidence. The main food vehicle was bovine meat and products thereof, followed by 'Vegetables and juices and other products thereof' and cheese.

3.5. *Yersinia*

The Appendix contains hyperlinks to all data summarised for the production of this section, for humans, food, animals and food-borne outbreaks. It also includes hyperlinks to *Yersinia* summary tables and figures that were not displayed in this section because they did not trigger any marked observation. The summarised data are presented in downloadable Excel and PDF files, and are listed by subject. Moreover, all submitted and validated data by the MS are available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm).

3.5.1. Yersiniosis in humans

A total of 6,471 confirmed cases of yersiniosis were reported in the EU in 2013 (Table 17). The EU notification rate was 1.92 cases per 100,000 population, which was a decrease of 2.8 % compared with 2012. The highest country-specific notification rates were observed in Finland and Lithuania (10.12 and 8.82 cases per 100,000 population, respectively).

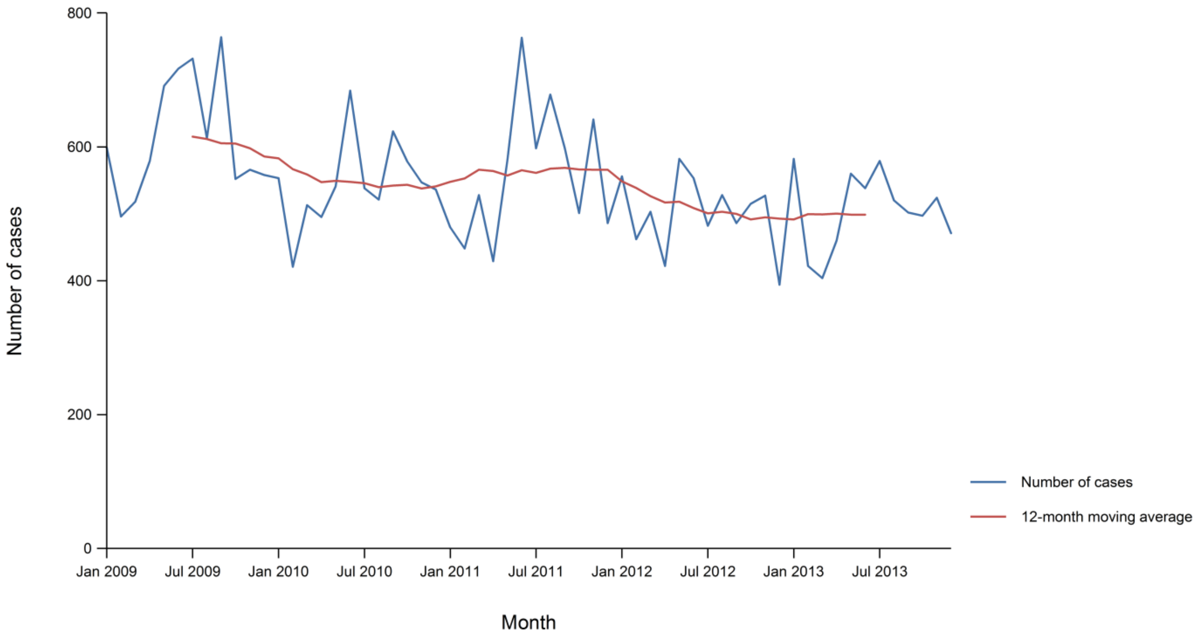
The majority of yersiniosis cases were reported to be domestically acquired. The largest proportion of travel-associated cases was reported from Sweden and Norway (Table YERSHUMIMPORT).

Table 17. Reported cases and notification rates of human yersiniosis in the EU/EEA, 2009-2013

Country	2013					2012		2011		2010		2009	
	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	159	158	1.87	130	1.55	119	1.42	84	1.00	140	1.68
Belgium[(b)]	N	C	350	350	-	256	-	214	-	216	-	238	-
Bulgaria	Y	A	22	22	0.30	11	0.15	4	0.05	5	0.07	8	0.11
Croatia[(c)]	Y	A	11	-	-	-	-	-	-	-	-	-	-
Cyprus	Y	C	1	1	0.12	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	526	526	5.00	611	5.82	460	4.39	447	4.27	463	4.44
Denmark	Y	C	345	345	6.16	291	5.22	225	4.05	193	3.49	238	4.32
Estonia	Y	C	72	72	5.45	47	3.55	69	5.19	58	4.35	54	4.04
Finland	Y	C	549	549	10.12	565	10.46	554	10.31	522	9.75	633	11.88
France	N	A	430	430	-	462	-	294	-	238	-	208	-
Germany	Y	C	2590	2578	3.15	2686	3.29	3381	4.15	3346	4.10	3731	4.56
Greece[(d)]	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	Y	C	62	62	0.63	53	0.54	93	0.95	87	0.88	51	0.52
Ireland	Y	C	4	4	0.09	2	0.04	6	0.13	3	0.07	3	0.07
Italy[(b)]	N	C	25	25	-	14	-	15	-	15	-	11	-
Latvia	Y	C	25	25	1.24	28	1.37	28	1.35	23	1.09	45	2.08
Lithuania	Y	C	264	262	8.82	276	9.19	370	12.12	428	13.62	483	15.17
Luxembourg	Y	C	15	15	2.79	66	12.58	33	6.45	74	14.74	36	7.30
Malta	Y	C	0	0	0.00	0	0.00	0	0.00	1	0.24	0	0.00
Netherlands[(d)]	-	-	-	-	-	-	-	-	-	-	-	-	-
Poland	Y	C	199	199	0.52	201	0.52	235	0.61	205	0.54	288	0.76
Portugal[4]	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	43	43	0.22	26	0.13	47	0.24	27	0.14	5	0.03
Slovakia	Y	C	165	164	3.03	181	3.35	166	3.08	166	3.08	167	3.10
Slovenia	Y	C	26	26	1.26	22	1.07	16	0.78	16	0.78	27	1.33
Spain[(e)]	N	C	243	243	1.75	221	1.91	264	2.28	325	2.81	291	2.52
Sweden	Y	C	313	313	3.28	303	3.20	350	3.72	281	3.01	397	4.29
United Kingdom	Y	C	59	59	0.09	54	0.09	59	0.09	55	0.09	61	0.10
EU Total	**-**	**-**	**6498**	**6471**	**1.92**	**6506**	**1.98**	**7002**	**2.23**	**6815**	**2.19**	**7578**	**2.46**
Iceland	Y	C	0	0	0.00	-	-	-	-	-	-	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	55	55	1.09	43	0.86	60	1.22	52	1.07	60	1.25

(a): Y, yes; N, no; A, aggregated data; C, case-based data; -, no report.
(b): Sentinel surveillance; no information on estimated coverage. Thus, notification rate cannot be estimated.
(c): All cases of unknown case classification
(d): No surveillance system.
(e): Sentinel system; notification rates calculated with an estimated population coverage of 30 % in 2013 and 25 % in 2009-2012.

There was a statistically significant (p=0.001) decreasing five-year trend in the EU in 2009–2013 (Figure 15). More cases were normally reported between May and September compared with other months.



Source: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom. Bulgaria, Croatia, Iceland, France and Luxembourg did not report data over the whole period at the level of detail required for the analysis. Greece, the Netherlands and Portugal do not have any formal surveillance system for the disease.

Figure 15. Trend in reported confirmed cases of human yersiniosis in the EU/EEA, 2009–2013

Species information was reported for 6,395 (98.0 %) of the confirmed yersiniosis cases in the EU/EEA in 2013. *Y. enterocolitica* was the most common species reported, having been isolated from 98.66 % of the confirmed cases. It was followed by *Y. pseudotuberculosis*, which represented 0.94 %, while the remaining 0.41 % were other species. For species distribution by country, see Table YERSHUMSPECIES.

Twelve MS provided information on hospitalisation for some or all of their cases, accounting for 15.3 % of confirmed yersiniosis cases in the EU. Among these, almost half (48.4 %) were hospitalised in 2013. The EU case-fatality rate was 0.05 %; two fatal cases due to infections with *Y. pseudotuberculosis* were reported in 2013 among the 4,036 confirmed yersiniosis cases for which this information was reported (62.4 % of all confirmed cases). As for most diseases, however, the case-fatality rate should be interpreted with caution, as the final outcome of cases is often unknown after the initial sampling.

3.5.2. *Yersinia* in food and animals

Comparability of data

At present there is no harmonised surveillance of *Yersinia* in the EU and, when interpreting the *Yersinia* data, it is important to note that data from different investigations are not necessarily directly comparable owing to differences in sampling strategies and the used testing methods. A scientific report from EFSA suggested harmonised specifications for the monitoring and reporting of *Y. enterocolitica* in slaughter pigs (EFSA, 2009b). Only Austria, Belgium, Estonia and Slovakia provided information on the microbiological test used. They reported using the microbiological test ISO 10273:2003 (ISO, 2003), which is a horizontal method for the detection of *Y. enterocolitica* presumed to be pathogenic to humans. It is applicable to products intended for human consumption and the feeding of animals, and environmental samples in the area of food production and food handling.

Only results for the most important animal species and foods that might serve as a source for human infection in the EU are presented.

Food

In 2013, nine MS and one non-MS provided data on food tested for *Yersinia*, and particularly for *Y. enterocolitica*. Data were provided on samples from meat, milk, cheeses and other dairy products, vegetables, and other types of food and prepared dishes.

In 2013, five of six MS reported *Yersinia*-positive findings in pig meat and products thereof. Overall, 6.4 % of the tested 1,700 pig meat samples were positive for *Yersinia*. *Y. enterocolitica* was found in 102 (6 %) of the positive samples. Sampling was mainly carried out as part of surveillance or monitoring programmes. From retail, 478 samples were investigated and 5.4 % were found to be *Yersinia*-positive, mainly *Y. enterocolitica*. Serotypes O:3 and O:9 were detected in food, and both were mainly found in pig meat, being serotype O:3 the predominant one. Compared with 2012, where only four MS delivered data, the number of tested samples was considerably higher in 2013 (1,700 vs. 479 samples in 2012). In 2013, however, the proportion of samples with *Yersinia* was at a level comparable to 2012, albeit slightly lower (6.4 % vs. 7.7 % in 2012).

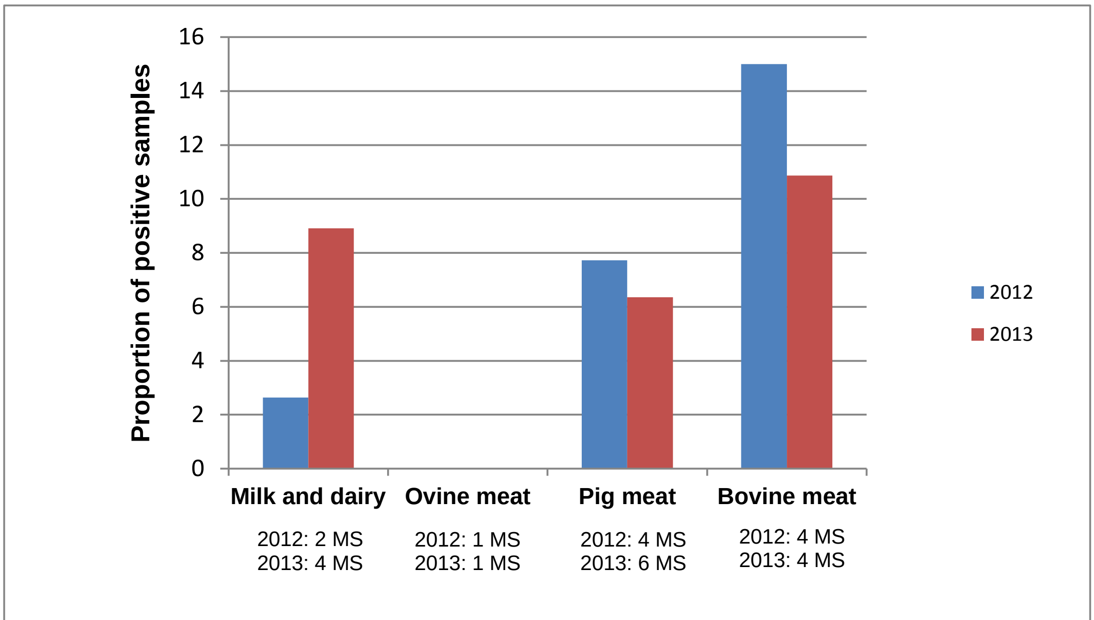
In 2013, four MS reported *Yersinia* in bovine meat or products thereof. In total, 46 samples (mainly surveillance) were tested and 10.9 % were found to be positive for *Yersinia* compared with 15.0 % in 2012 (Figure 16). Four MS reported on *Yersinia* in milk and dairy products and found 8.9 % to be *Yersinia*-positive out of 202 samples.

Only Spain reported testing of ovine meat in 2013 and had no positive findings.

Germany and Slovenia had *Yersinia*-positive findings in unpasteurised (raw) cow's milk intended for direct human consumption.

Four MS and one non-MS reported findings of *Y. pseudotuberculosis* in various foods (cow's and goat's milk, bovine meat and minced bovine and pig meat).

Detailed information on the data reported and on the occurrence of *Yersinia* in the different food categories has been included in specific tables referenced in the Appendix.



Source 2012: Belgium, Germany, Italy and Spain.
Source 2013: Austria, Belgium, Estonia, Germany, Italy, Slovakia, Slovenia and Spain.

Figure 16. Proportion of* Yersinia*-positive samples in food in Member States, 2012-2013

Animals

In 2013, 12 MS and one non-MS provided data from investigations in animals for *Yersinia*. Eight MS reported on *Yersinia* in pigs. In total, 6.9 % of 5,892 samples were positive. Most positive findings were reported as *Y. enterocolitica*. The number of tested pigs reported in 2013 was higher than the number reported in 2012, where 5,481 pigs were reported tested. In both years, the serotypes reported as detected in pigs were serotype O:3 and O:9.

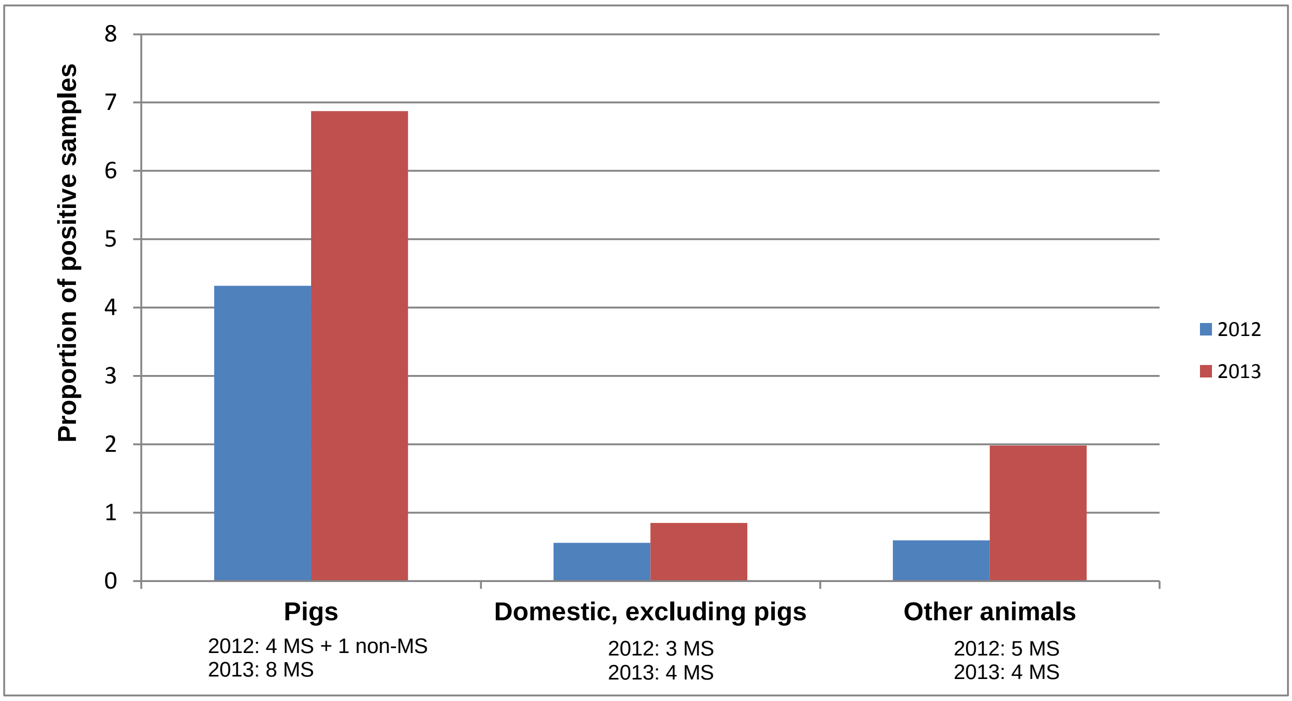
Generally, the proportion of positive samples found in pigs, domestic animals (other than pigs) and other animals was higher in 2013 than in 2012 (Figure 17). The observed increases might primarily reflect differences in reporting MS and the animal species being tested.

Four MS tested 6,644 samples and reported 62 positive findings of *Y. enterocolitica* in cattle (0.9 %). Three MS reported information on *Y. enterocolitica* in sheep and goats (961 tested units and 6 positive findings).

The predominant serotypes reported as detected in cattle were serotype O:3 and O:9, with serotype O:9 as the slightly predominant serotype.

Y. enterocolitica was also detected in dogs, deer, foxes, hares, roe deer, squirrels and hunted wild boars. Italy reported the only *Y. enterocolitica* serotype that was identified to be O:5, with 27 positive samples detected in wild boars.

Detailed information on the data reported and on the occurrence of *Yersinia* in the different animal categories has been included in specific tables referenced in Appendix.



Source 2012: Germany, Hungary, Italy, Latvia, Netherlands, Poland and Switzerland.
Source 2013: Bulgaria, Estonia, Germany, Hungary, Italy, Netherlands, Poland, Spain and United Kingdom.
Domestic animals, excluding pigs: cattle, *Gallus gallus*, goats, other poultry, sheep, solipeds and turkeys.
Other animal species: badgers, Cantabrian chamois, cats, deer, dogs, stray dogs, foxes, hedgehogs, monkeys, other animals, pigeons, squirrels, swans, wild animals, wild boars and zoo animals.

Figure 17. Proportion of* Yersinia*-positive samples in animals in Member States and non-Member States, 2012-2013

Spain has a monitoring programme in fattening pigs at slaughter, and, in 2013, *Y. enterocolítica* was detected in 38.7 % of the slaughter batches tested. All the strains belonged to biotype 4 serotype O:3.

Source: The Spanish National Summary Report, 2013

Switzerland carried out a *Yersinia* prevalence study in tonsils in slaughter pigs from March 2012 to February 2013 in accordance with the technical specifications for harmonised national surveys on *Y. enterocolitica* in slaughter pigs (EFSA, 2009b). In total, 229 of 410 tonsils of slaughter pigs were positive for *Y. enterocolitica* using culture methods in accordance with ISO 10273:2003 (56 %; 95 % Confidence interval (CI): 51-61 %). All isolates except one belonged to the potentially human pathogenic biotypes; 74 % were biotype 4/serotype O:3: and 16 % were biotype 3/serotype O:5,27. Other rare findings were biotypes 3/O:5, 3/O:9, 4/O:5 and 4/O:5,27. Biotype 1A was detected in only one sample.

Source: The Swiss National Summary report, 2013

In the United Kingdom a study to estimate the prevalence of *Yersinia* was carried out in 2013. The study design was consistent, where possible, with the technical specifications for the EU baseline survey for *Salmonella* in slaughter pigs, with a target sample size of 600 pigs. The study was carried out at the 14 largest abattoirs of the 169 approved premises in the United Kingdom, who process 80 % of pigs slaughtered in the United Kingdom.

Overall, 624 carcase swabs and 620 tonsil samples from 624 pigs were tested for the presence of *Yersinia*. For tonsil samples, the prevalence was 32.9 % (95 % CI: 28.8-37.0 %), after accounting for clustering within farms, and for carcase swabs the prevalence was 1.9 % (95 % CI: 0.8-3.0). Of the 620 pigs for which both sample types were collected, 10 (1.6 %) pigs tested positive in both samples, with the remaining 196 (31.6 %) pigs testing positive in only one sample.

The majority of the positive pigs (87.3 %) and carcases (91.7 %) were infected with *Y. enterocolitica*. A further 21 (10.3 %) of the positive pigs were infected with *Y. pseudotuberculosis*. Roughly one quarter of the pigs aged < 6 months and > 12 months were found to carry *Yersinia* in the tonsils, compared with roughly one-third of those aged 6-12 months. All the positive carcase swabs were from pigs aged 6-12 months.

Source: The United Kingdom National Summary Report, 2013

3.5.3. *Yersinia* food-borne outbreaks

In the period 2007–2012, a total of 104 food-borne *Yersinia* outbreaks were reported by the MS (14 with strong evidence). The food vehicle was identified in only ten outbreaks; in three outbreaks, the source was contaminated vegetables (raw grated carrot (one) and RTE salad (two)), one outbreak was due to pig meat and one outbreak was due to a RTE product contaminated with pig meat juice. Sources for five outbreaks were classified as ‘Other’ food or ‘Mixed food’. In 2013, eight outbreaks were reported in the EU; with 16 human cases involved, of which two hospitalised. The source was identified as meat and meat products in the one outbreak reported with strong evidence. In addition, in 2013, Norway and Switzerland reported one weak-evidence *Yersinia* outbreak each.

3.5.4. Discussion

Yersiniosis was the third most commonly reported zoonosis in the EU in 2013, even considering the significantly decreasing trend in 2009–2013. The highest notification rates were reported in MS in north-eastern Europe. Although *Y. enterocolitica* was the dominating species among cases, both fatal cases reported in 2013 were infected with *Y. pseudotuberculosis*.

Yersinia was not presented in the Zoonoses Summary report in 2012 and some of the data are presented in the current report and compared with data reported in 2013; however, there are not enough data to draw conclusions regarding trends between the years.

Pigs are considered to be a major reservoir for *Yersinia*, and pork products are considered to be the most important source for pathogenic *Y. enterocolitica* infection in humans. In 2013, five MS reported positive findings for *Yersinia* (mostly *Y. enterocolitica*) in pig meat and products thereof. Positive findings were also reported in bovine meat and unpasteurised (raw) cow’s milk intended for direct human consumption. Positive findings were also reported in other animal species, including wild animals, cattle, sheep, goats, dogs, cats, solipeds, etc.

According to the Opinion published by the BIOHAZ Panel in 2007 (EFSA, 2007c), the majority of human pathogenic *Y. enterocolitica* strains in Europe belong to biotype 4 (serotype O:3), followed by biotype 2 (serotype O:9 and O:5,27). Biotypes 1B, 3 and 5 are also human pathogenic, whereas biotype 1A is considered mainly to be nonpathogenic. Therefore, it is crucial that information is provided on the biotype of each *Y. enterocolitica* isolate in order to gauge its public health significance. It is recommended that biotyping, and preferably also serotyping, is increased in the future. Only a small amount of information is provided on serotypes in the reporting system for *Yersinia*. Hopefully, an increased focus on the reported *Yersinia* data and more sensitive methods will improve the detailed information on *Yersinia* in the future.

Two prevalence studies of *Yersinia* have been carried out by Switzerland and the United Kingdom; both studies had higher levels of *Yersinia*-positive samples in slaughter pigs than reported from the monitoring programmes in the EU. This discrepancy in findings might be due to the use of a more sensitive test in those prevalence studies, i.e. bacteriological examination of tonsils of slaughter pigs.

3.6. Tuberculosis due to *Mycobacterium bovis*

The Appendix contains hyperlinks to all data summarised for the production of this section, for humans and animals. It also includes hyperlinks to *M. bovis* summary tables and figures that were not displayed in this section because they did not trigger any marked observation. The summarised data are presented in downloadable Excel and PDF files, and are listed by subject. Moreover, all submitted and validated data by the MS are available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm).

3.6.1. *Mycobacterium bovis* in humans

In 2013, 134 confirmed cases of human tuberculosis due to *M. bovis* were reported in the EU by nine MS (Table 18). The EU notification rate was 0.03 cases per 100,000 population and did not change compared with 2012. Most cases were reported in Germany, the United Kingdom and Spain, while the highest notification rate, 0.13 cases per 100,000 population, was reported in Ireland.

Table 18. Reported cases and notification rates per 100,000 of human tuberculosis due to* M. bovis *in the EU/EEA, 2009-2013; OTF[(a)] status is indicated

Country	2013				2012		2011		2010		2009	
	National Coverage[(b)]	Data Format[(b)]	Confirmed		Confirmed		Confirmed		Confirmed		Confirmed	
			Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria (OTF)	Y	C	1	0.01	1	0.01	0	0.00	4	0.05	2	0.02
Belgium (OTF)	Y	C	12	0.11	4	0.04	5	0.05	9	0.08	3	0.03
Bulgaria	Y	C	0	0.00	0	0.00	2	0.03	0	0.00	0	0.00
Croatia	Y	C	0	0.00	0	0.00	-	-	-	-	-	-
Cyprus	Y	C	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic (OTF)	Y	C	0	0.00	0	0.00	4	0.04	0	0.00	0	0.00
Denmark (OTF)	Y	C	0	0.00	0	0.00	1	0.02	2	0.04	0	0.00
Estonia (OTF)	Y	C	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Finland (OTF)	Y	C	1	0.02	0	0.00	0	0.00	0	0.00	0	0.00
France (OTF)[(c)]	Y	C	-	-	-	-	-	-	-	-	-	-
Germany (OTF)	Y	C	45	0.05	50	0.06	47	0.06	47	0.06	57	0.07
Greece	Y	C	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Hungary	Y	C	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Ireland	Y	C	6	0.13	4	0.09	6	0.13	12	0.26	8	0.18
Italy[(d),(e)]	Y	C	6	0.01	9	0.02	15	0.03	15	0.03	6	0.01
Latvia (OTF)	Y	C	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Lithuania	Y	C	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Luxembourg (OTF)	Y	C	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Malta	Y	C	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands (OTF)	Y	C	9	0.05	8	0.05	11	0.07	13	0.08	11	0.07
Poland (OTF)	Y	C	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Portugal	Y	C	0	0.00	0	0.00	0	0.00	0	0.00	1	0.01
Romania	Y	C	0	0.00	0	0.00	1	0.01	0	0.00	0	0.00
Slovakia (OTF)	Y	C	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Slovenia (OTF)	Y	C	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Spain	Y	C	25	0.05	14	0.03	23	0.05	34	0.07	17	0.04
Sweden (OTF)	Y	C	0	0.00	5	0.05	2	0.02	2	0.02	5	0.05
United Kingdom[(f)]	Y	C	29	0.05	39	0.06	39	0.06	37	0.06	29	0.05
EU Total	**-**	**-**	**134**	**0.03**	**134**	**0.03**	**156**	**0.04**	**175**	**0.04**	**139**	**0.03**
Iceland [(g)]	Y	C	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Liechtenstein (OTF)	-	-	-	-	-	-	-	-	-	-	-	-
Norway (OTF)	Y	C	0	0.00	2	0.04	2	0.04	2	0.04	1	0.02
Switzerland[(h)]	Y	C	2	0.02	5	0.06	13	0.17	6	0.08	4	0.05

(a): OTF, officially tuberculosis free.
(b): yes; N, no; A, aggregated data; C, case-based data; -, no report.
(c): Not reporting species of the *M. tuberculosis* complex.
(d): In Italy, 6 regions and 15 provinces are OTF.
(e): All cases reported from Italy to TESSy in 2009–2013 were without laboratory results but were still included in the table, since they were reported as *M. bovis.*
(f): In the United Kingdom, Scotland is OTF.
(g): In Iceland, which has no special agreement concerning animal health (status) with the EU, the last outbreak of bovine tuberculosis was in 1959.
(h): Switzerland provided data directly to EFSA.

As tuberculosis is a chronic disease with a long incubation period, it is not possible to assess travel-associated cases in the same way as diseases with acute onset. Instead, the distinction is made between individuals with the disease born in the reporting country (native infection) and those moving there at a later stage (foreign infection). In a few cases, the distinction is also made based on nationality of the cases. On average, 61.2 % of the cases reported in 2013 were native to the reporting country, 35.8 % were foreign and 3.0 % were of unknown origin (Table MBOVHUMORIGIN). Among cases with known origin, there was a larger proportion (71.9 %) of native cases in countries not free of bovine tuberculosis than in countries that were officially tuberculosis free (54.5 %).

3.6.2. Tuberculosis due to *Mycobacterium bovis* in cattle

The officially tuberculosis free status (OTF) in 2013 is presented in Figure 18 and in Figure 19. As in 2012, Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, five Italian regions and 17 Italian provinces, Latvia, Luxembourg, the Netherlands, all administrative regions within the superior administrative unit of the Algarve in Portugal, Poland, Slovakia, Slovenia, Sweden, Scotland in the United Kingdom, Norway and Switzerland were OTF in accordance with EU legislation (Decision 2012/204/EU[29]). Liechtenstein has the same status (OTF) as Switzerland. In Iceland, which has no special agreement concerning animal health status with the EU, the last outbreak of bovine tuberculosis was in 1959.

MS Bulgaria, Croatia, Cyprus, Greece, Hungary, Ireland, Italy, Lithuania, Malta, Portugal, Romania, Spain and the United Kingdom did not yet achieve the country-level OTF status in 2013. Croatia, as a new MS, reported information for the first time in 2013.

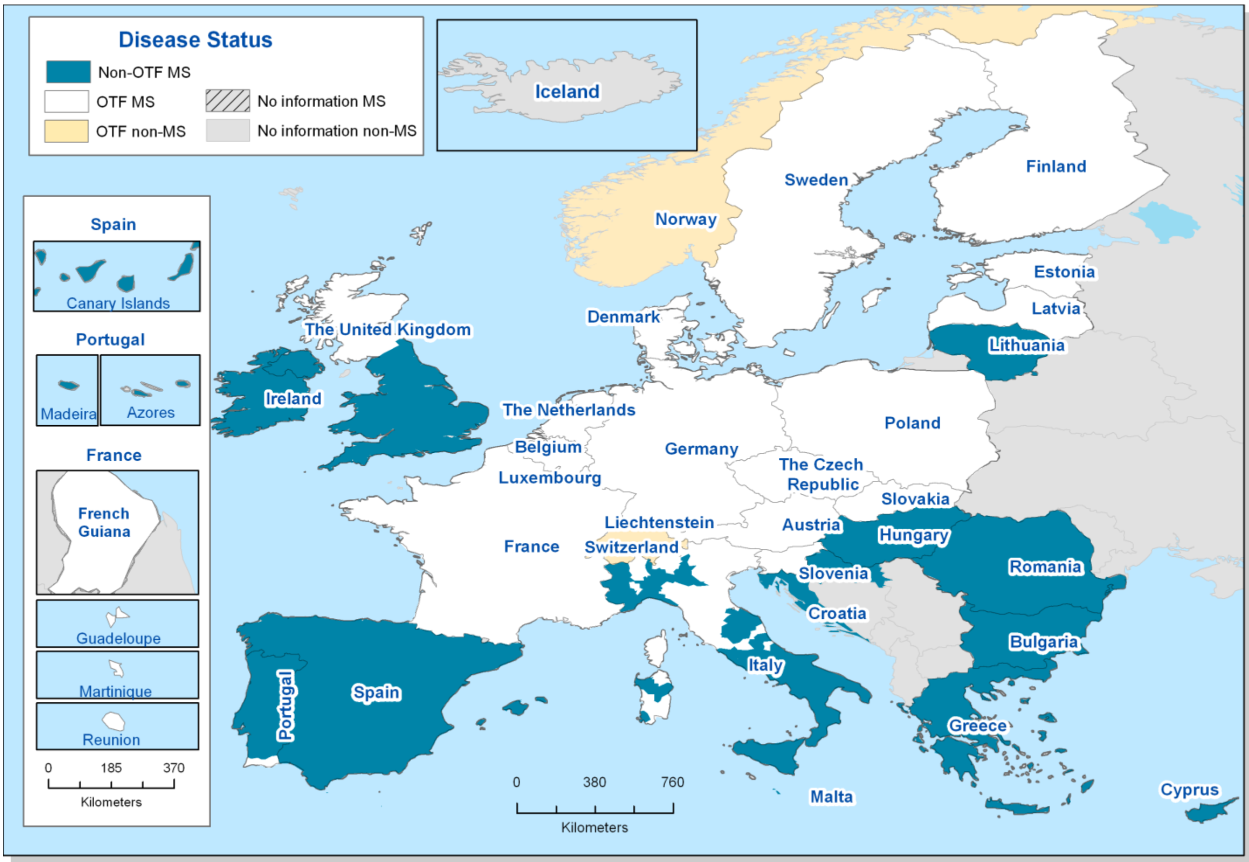
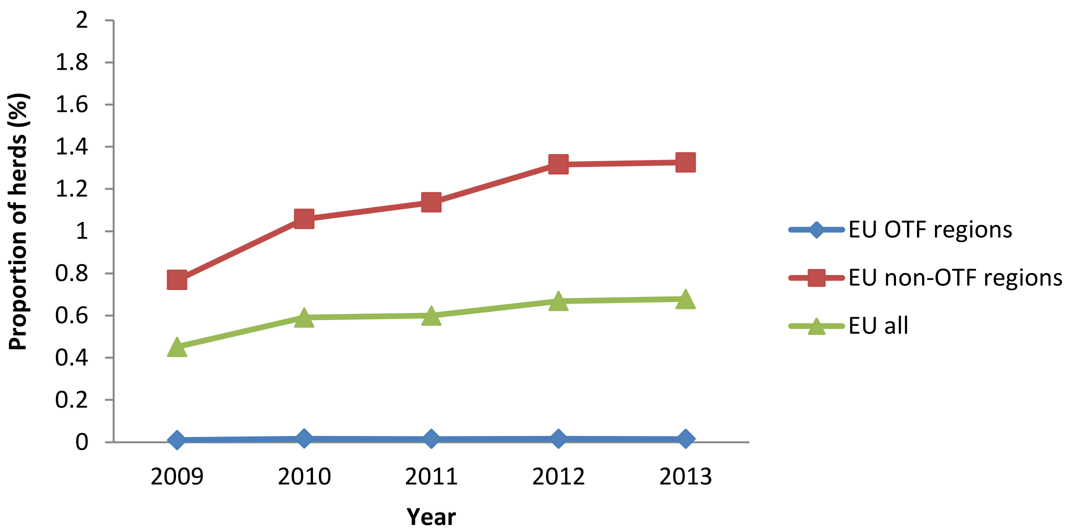


Figure 18. Status of countries regarding bovine tuberculosis, 2013

[29] Commission Implementing Decision 2012/204/EU of 19 April 2012 amending the Annexes to Decision 2003/467/EC as regards the declaration of Latvia as officially brucellosis-free Member State and of certain regions of Italy, Poland and Portugal as officially tuberculosis-free, brucellosis-free and enzootic-bovine-leukosis-free regions. OJ L 109, 21.4.2012, p. 26–32.

Proportions of *M. bovis*-positive cattle herds are displayed only if they are above the legal threshold of 0.1 %.
* Proportions relate to the non-OTF regions

Figure 19. Proportion of existing cattle herds infected with or positive for* M. bovis*, 2009-2013



Data reported by countries that are MS during the current year are included. The classification of the OTF and non-OTF status of a region is based on Figure 18.

Figure 20. Proportion of existing cattle herds infected with or positive for* M. bovis*, 2013

In the 15 OTF MS and in the OTF regions of non-OTF MS, annual surveillance programmes are carried out to confirm freedom from bovine tuberculosis. Bovine tuberculosis was not detected in cattle herds in 10 of the OTF MS, or in Iceland, Norway or Switzerland. However, in total, out of the 1,384,692 existing cattle herds in all OTF regions of the EU, Norway and Switzerland, 207 herds were infected with *M. bovis*: Belgium (9 herds), France (112 herds), Germany (46 herds), Veneto region of Italy (4 herds), the Netherlands (3 herds), Poland (20 herds), Scotland (3 herds) and Switzerland (10 herds). In the EU OTF regions, the proportion of herds infected with *M. bovis* was 0.015 % in 2013, which is the same as reported in 2012.

All 13 MS containing a non-OTF region have a national eradication programme for bovine tuberculosis in place. In 2013, the five MS Ireland, Italy, Portugal, Spain and United Kingdom received EU co-financing for their eradication programme and they reported the number of positive herds (Table DSTUBCOF), whereas MS not receiving EU co-financing reported the number of infected herds (Table DSTUBNONCOF). The non-cofinanced MS, Cyprus, Lithuania and Malta did not report any infected herd. Infected herds were reported by Bulgaria (9 herds), Croatia (53 herds), Greece (221 herds), Hungary (6) and Romania (50), whereas positive herds were reported by Ireland (4,640 herds), Italy (490 herds), Portugal (108 herds), Spain (1,526 herds) and the United Kingdom (10,956). In total, out of the 1,362,234 existing cattle herds in the EU non-OTF regions, 18,256 herds were infected with or positive for *M. bovis* in 2013. This group of infected/positive herds represents 1.33 % of the total number of herds in the EU non-OTF regions, which is similar to the 1.32 % reported in 2012 (Figure 20). Overall, in the EU OTF and non-OTF regions ('EU all' in Figure 20), the proportion of herds infected with *M. bovis* was 0.68 % in 2013, which is similar to the 0.67 % reported in 2012.

In 2013, 16 MS and two non-MS investigated animal species other than cattle for *M. bovis*. *M. bovis* was reported in 903 animals other than cattle: alpacas (34), badgers (270), bison (17), cats (26), deer (149), dogs (3), fox (1), goats (109), guinea pig (1), lamas (3), pet animal (1), pigs (35), sheep (6), wild boars (247) and zoo animal (1) (Table TUBOTHERAN). Seventeen MS and two non-MS investigated animals for *Mycobacterium* species other than *M. bovis*. M. tuberculosis was reported in one red deer and M. caprae was reported in 544 animals by four MS (Austria, Germany, Hungary and Spain): cattle (113), deer (1), fox (1), goats (351), sheep (3) and wild boar (75) (Table TUBOTHERSP).

3.6.3. Discussion

Tuberculosis due to *M. bovis* is a rare infection in humans in the EU, with 134 confirmed human cases reported in 2013. The case numbers in the EU have been stable over the last two years. There was no clear association between a country's status as OTF and notification rates in humans. This could be due to many of the cases in both OTF and non-OTF countries having immigrated to the country; thus, the infection might have been acquired in their country of origin. Cases native to the country could have been infected before the disease was eradicated from the animal population, as it may take years before disease symptoms develop.

The overall proportion of cattle herds infected with or positive for *M. bovis* remained very low in the EU (0.68 % of the existing herds in the EU), although there is a heterogeneous distribution of *M. bovis* in Europe. The prevalence ranges from absence of infected/positive animals in many OTF regions to a prevalence of 12.1 % in the non-OTF regions of the United Kingdom (England, Northern-Ireland and Wales). After a slight increase in the proportion of herds infected with or positive for *M. bovis* between 2009 and 2012 (0.45 % to 0.67 % of the existing herds), this number entered a plateau phase from 2012 to 2013. The number of herds infected with *M. bovis* reported by France was lower in 2013 than in 2012, whereas higher numbers were reported by Belgium, Germany, Italy and Poland. In the non-OTF regions, the number of herds infected with or positive for *M. bovis* was similar in 2012 and 2013 and no major changes were observed within the non-OTF MS or parts thereof.

3.7. *Brucella*

The Appendix contains hyperlinks to all data summarised for the production of this section, for humans, food, animals and food-borne outbreaks. It also includes hyperlinks to *Brucella* summary tables and figures that were not displayed in this section because they did not trigger any marked observation. The summarised data are presented in downloadable Excel and PDF files, and are listed by subject. Moreover, all submitted and validated data by the MS are available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm).

3.7.1. Brucellosis in humans

In 2013, 26 MS and two non-MS provided information on brucellosis in humans. Ten MS (Belgium, Croatia, Cyprus, the Czech Republic, Estonia, Finland, Hungary, Luxembourg, Romania and Slovenia) and Iceland reported no human cases. In total, 390 cases of human brucellosis, of which 357 were confirmed, were reported in the EU in 2013 (EU notification rate 0.08 cases per 100,000 population) (Table 19). This was a 9.5 % increase in notification rate compared with 2012, partly attributable to the exclusion of Italy in the notification rate calculations in 2013 owing to no reporting.

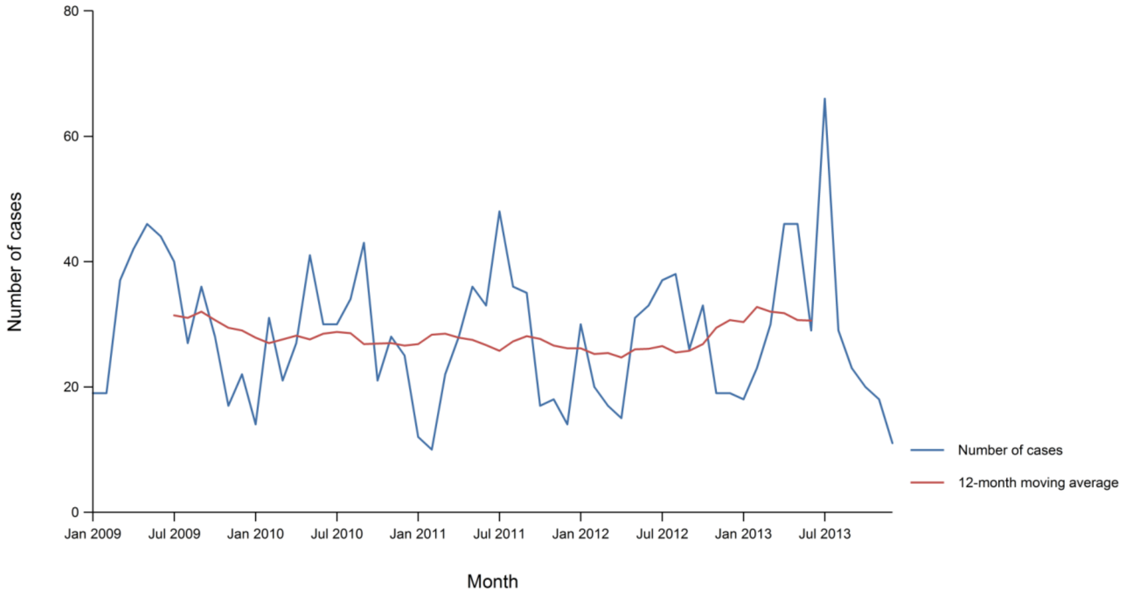
Table 19. Reported cases and notification rates per 100,000 of human brucellosis in the EU/EEA, 2009-2013; OBF and ObmF status[(a)] is indicated

Country	2013					2012		2011		2010		2009	
	National Coverage[(b)]	Data Format[(b)]	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 (OBF/ObmF)	Y	C	7	7	0.08	2	0.02	5	0.06	3	0.04	2	0.02
Belgium (OBF/ObmF)	Y	A	0	0	0.00	4	0.04	5	0.05	0	0.00	1	0.01
Bulgaria	Y	A	1	0	0.00	1	0.01	2	0.03	2	0.03	3	0.04
Cyprus	Y	C	0	0	0.00	0	0.00	-	-	-	-	-	-
Croatia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic (OBF/ObmF)	Y	C	0	0	0.00	0	0.00	0	0.00	1	0.01	0	0.00
Denmark[(c)] (OBF/ObmF)	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia (OBF/ObmF)	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Finland (OBF/ObmF)	Y	C	0	0	0.00	1	0.02	0	0.00	0	0.00	1	0.02
France[(d)](OBF)	Y	C	29	19	0.03	28	0.04	21	0.03	20	0.03	19	0.03
Germany (OBF/ObmF)	Y	C	28	26	0.03	28	0.03	24	0.03	22	0.03	19	0.02
Greece	Y	C	160	159	1.44	123	1.11	98	0.88	97	0.87	106	0.95
Hungary (ObmF)	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Ireland (ObmF)	Y	C	1	1	0.02	2	0.04	1	0.02	1	0.02	0	0.00
Italy[(e)]	-	-	-	-	-	53	0.09	166	0.28	171	0.29	167	0.28
Latvia	Y	C	1	1	0.05	0	0.00	0	0.00	0	0.00	0	0.00
Lithuania	Y	C	2	2	0.07	0	0.00	0	0.00	0	0.00	1	0.03
Luxembourg (OBF/ObmF)	Y	C	0	0	0.00	0	0.00	1	0.20	1	0.20	0	0.00
Malta	Y	C	1	1	0.24	0	0.00	0	0.00	0	0.00	0	0.00
The Netherlands (OBF/ObmF)	Y	C	5	5	0.03	3	0.02	1	0.01	6	0.04	3	0.02
Poland (ObmF)	Y	C	1	1	0.00	0	0.00	0	0.00	0	0.00	3	0.01
Portugal[(f)]	Y	C	34	22	0.21	37	0.35	76	0.73	88	0.85	80	0.77
Romania (ObmF)	Y	C	0	0	0.00	0	0.00	1	0.01	2	0.01	3	0.02
Slovakia (OBF/ObmF)	Y	C	1	1	0.02	1	0.02	0	0.00	1	0.02	0	0.00
Slovenia (ObmF)	Y	C	0	0	0.00	0	0.00	1	0.05	0	0.00	2	0.10
Spain[(g)]	Y	C	94	87	0.19	62	0.13	43	0.09	78	0.17	114	0.25
Sweden (OBF/ObmF)	Y	C	10	10	0.11	13	0.14	11	0.12	12	0.13	7	0.08
United Kingdom[(h)] (OBF/ObmF)	Y	C	15	15	0.02	14	0.02	25	0.04	12	0.02	17	0.03
EU Total	**-**	**-**	**390**	**357**	**0.08**	**372**	**0.07**	**481**	**0.10**	**517**	**0.11**	**548**	**0.11**
Iceland[(i)]	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway (OBF/ObmF)	Y	C	2	2	0.04	4	0.08	2	0.04	2	0.04	0	0.00
Switzerland[(j)]	Y	C	4	4	0.05	3	0.04	8	0.10	5	0.06	14	0.18

(a): OBF/ObmF, officially brucellosis free/officially *B. melitensis* free in cattle or sheep/goat populations.
(b): Y, yes; N, no; A, aggregated data; C, case-based data; -, no report.
(c): No surveillance system.
(d): In France, 64 departments are ObmF and no cases of brucellosis have been reported in small ruminants since 2003.
(e): In Italy, 10 regions and 11 provinces are OBF and 11 regions and 8 provinces are ObmF.
(f): In Portugal, six islands of the Azores and the superior administrative unit of the Algarve are OBF, whereas all nine Azores islands are ObmF.
(g): In Spain, two provinces of the Canary Islands, the Balearic Islands and Basque Country are OBF/ObmF; Murcia and La Rioja are OBF; and Asturias, Cantabria, Castile and Leon, and Galicia are ObmF.
(h): In the United Kingdom, England, Scotland and Wales in Great Britain and the Isle of Man are OBF, and the whole of the United Kingdom is ObmF.
(i): In Iceland, which has no special agreement concerning animal health (status) with the EU, brucellosis (*B. abortus*, *B. melitensis*, *B. suis*) has never been reported.
(j): Switzerland provided data directly to EFSA

As in previous years, low notification rates were observed in MS with the status 'officially free of bovine brucellosis' (OBF, Figure 22 and/or officially free of ovine and caprine brucellosis caused by *B. melitensis* (ObmF, Figure 25). The majority of brucellosis cases in these countries were reported to have been imported/travel-associated (Table BRUCHUMIMPORT). The highest notification rates of brucellosis were reported in the Mediterranean MS that are not officially brucellosis-free in cattle, sheep or goats; Greece (1.44 per 100,000 population), Malta (0.24/100,000), Portugal (0.21/100,000) and Spain (0.19/100,000), which together accounted for 75.4 % of all confirmed cases reported in 2013 (Table 19). The case in Malta was reported as imported/travel-associated. Italy did not report on human brucellosis cases in 2013 and had cases in 2012 and before.

There was some seasonality observed in the number of confirmed brucellosis cases reported in the EU in 2009–2013, with more cases reported in April to September, but no significant increasing or decreasing EU trend in the period (Figure 21).



Source: Austria, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and United Kingdom. Belgium, Bulgaria, Croatia, Italy and Luxembourg did not report data over the whole period at the level of detail required for the analysis. Denmark does not have a surveillance system for this disease.

Figure 21. Trend in reported confirmed cases of human brucellosis in the EU/EEA, 2009-2013

Nine MS provided data on hospitalisation, accounting for 55.2 % of confirmed cases in the EU. On average, 70.6 % of the confirmed brucellosis cases were hospitalised. Eleven MS, four more than in 2012, provided information on the outcome of the cases. One death due to brucellosis was reported in Austria in 2013. This resulted in an EU case-fatality rate of 0.99 % among the 101 confirmed cases for which this information was reported (28.3 % of all confirmed cases).

Species information was missing for 76.6 % of the 359 confirmed cases reported in the EU and Norway. Of the 84 cases with known species, 86.9 % were reported to be infected with *B. melitensis*, 10.7 % with *B. abortus* and 2.4 % with other *Brucella* species. For the species distribution by country, see Table BRUCHUMSPECIES.

3.7.2. *Brucella* in food and animals

Food

In 2013, two MS (Italy and Portugal) provided information on *Brucella* in cheeses, other dairy products and raw milk from cows and other animal species. Most of the 778 samples were collected through surveillance and none of them were found to be contaminated with *Brucella* (Table BRUCFOOD).

Cattle

The status regarding freedom from bovine brucellosis (OBF) and the occurrence of the disease in MS and non-MS, in 2013, are presented, respectively, in Figure 22 and in Figure 23. As in 2012, Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, 10 Italian regions and 11 Italian provinces, Ireland, Latvia, Luxembourg, the Netherlands, all administrative regions within the superior administrative unit of the Algarve as well as six of the nine islands of the Azores (Pico, Graciosa, Flores, Corvo, Faial and Santa Maria) in Portugal, Poland, Slovakia, Slovenia, Sweden, England, Scotland and Wales in the United Kingdom as well as the Isle of Man were OBF. In Spain, in 2013, in addition to the two provinces of the Canary Islands (Santa Cruz de Tenerife and Las Palmas) that were OBF, the Balearic Islands, Basque Country, Murcia and La Rioja were also declared OBF.

MS that did not yet gain in 2013 the country-level OBF status are Bulgaria, Croatia, Cyprus, Greece, Hungary, Italy, Lithuania, Malta, Portugal, Romania, Spain and the United Kingdom. Croatia, as a new MS, reported information for the first time in 2013.

Norway and Switzerland were OBF in accordance with EU legislation and Liechtenstein had the same status (OBF) as Switzerland. In the non-MS Iceland, which has no special agreement concerning animal health (status) with the EU, brucellosis (*B. abortus*, *B. melitensis*, *B. suis*) has never been reported.

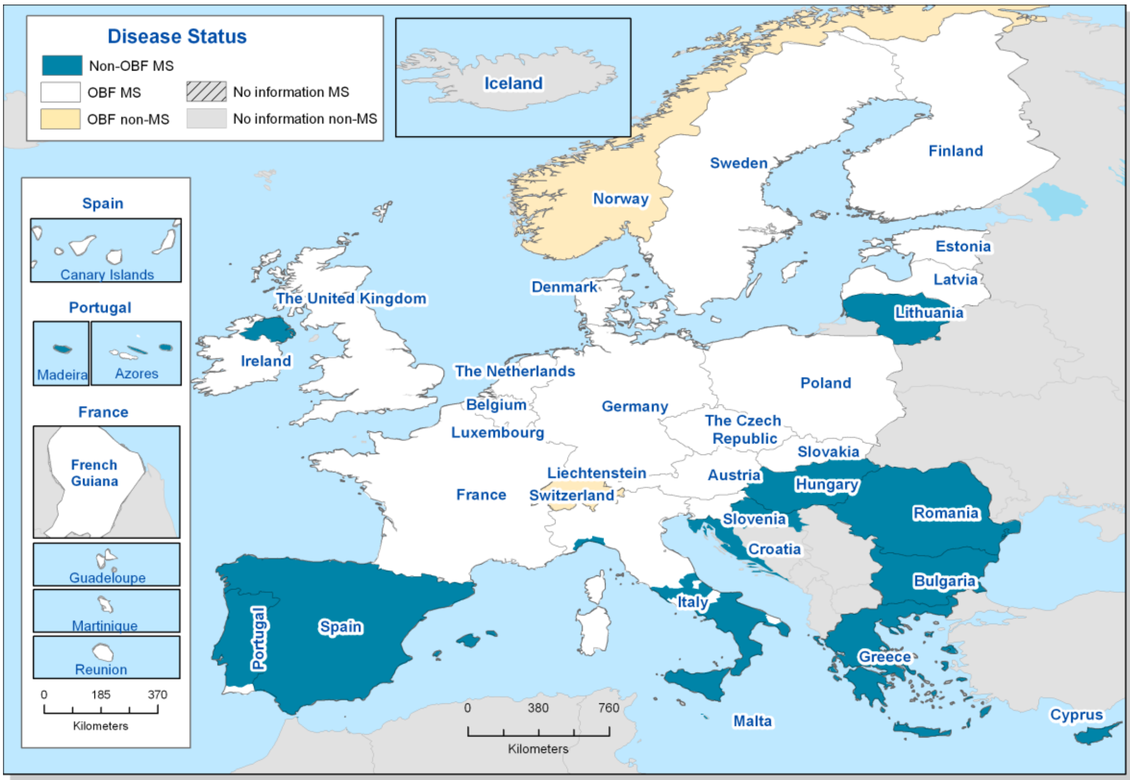


Figure 22. Status of countries regarding bovine brucellosis, 2013

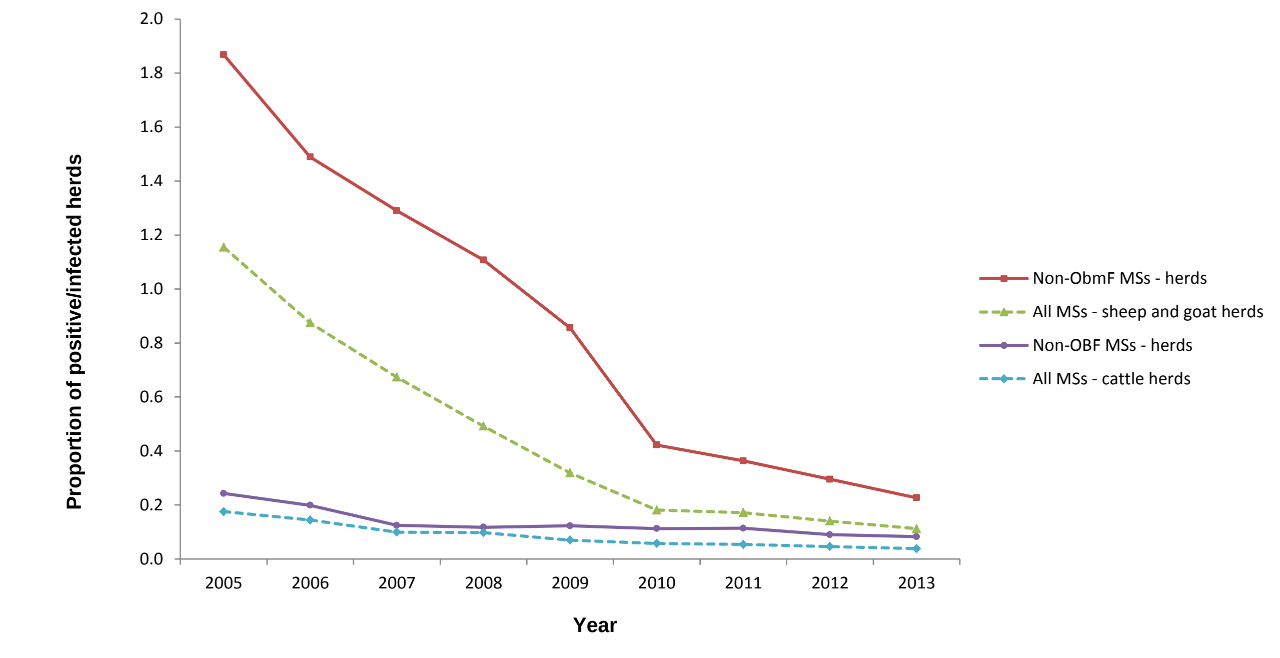
Proportions of *Brucella*-positive cattle herds are displayed only if they are above the legal threshold of 0.1 %.
(*) Proportions relate to the non-OBF regions.

Figure 23. Proportion of existing cattle herds infected with or positive for* Brucella*, 2013

Over 2005–2013, the overall proportion of existing brucellosis-infected or -positive cattle herds in the EU decreased steadily to very low levels, and, since 2007, bovine brucellosis has been rare, with the proportion of infected or positive herds in 2013 being 0.04 % (Figure 24). Overall, the percentage of existing infected or positive herds in the non-OBF MS, with a total of 1,305,445 bovine herds in 2013, decreased from 2005 and was also rare in 2013 (0.08 %).

In the 16 OBF MS and in the OBF regions of non-OBF MS, annual surveillance programmes are carried out to confirm the freedom from bovine brucellosis. During 2013, bovine brucellosis was detected in only one Belgian cattle herd out of the 1,375,934 existing herds in the 16 OBF MS, and it was not detected in Iceland, Norway or Switzerland.

In four of the 12 non-OBF countries (Italy, Portugal, Spain and the United Kingdom) eradication programmes for bovine brucellosis approved for European co-financing were carried out in 2013. However, all MS containing a non-OBF region have a national eradication programme for bovine brucellosis in place. In general, MS receiving EU co-financing for their eradication programme report the number of positive herds, whereas MS not receiving EU co-financing report the number of infected herds.



Bovine brucellosis: Missing data from one OBF MS (Germany (2008)) and non-OBF MS (Hungary (2005), Malta (2006) and Lithuania (2007)). Romania included data for the first time in 2007, Bulgaria in 2008 and Croatia in 2013.
Sheep and goat brucellosis: Missing data from Bulgaria (2005–2007), Germany (2005–2007, 2012, 2013), Hungary (2005), Lithuania (2005, 2007, 2010), Luxembourg (2005–2006, 2008–2009, 2011), Malta (2005–2006) and Romania (2005–2006, 2008). Romania reported data at the animal level in 2008.

Figure 24. Proportion of existing cattle, sheep and goat herds infected with or positive for* Brucella*, 2005-2013

From the eight non-OBF MS without EU co-financed eradication programmes, Bulgaria, Cyprus, Hungary, Lithuania, Malta and Romania did not report cases of infected herds. Croatia reported one infected herd out of 35,707 existing herds, whereas Greece reported 281 infected (0.72 %) out of 38,951 herds, which was lower than in 2012 (391 infected herds; 0.96 %). Fewer positive herds than in 2012 were reported by the co-financed non-OBF MS Italy (531 herds; 576 in 2012) and Portugal (88 herds; 108 in 2012); whereas a few more herds were reported by the co-financed non-OBFs Spain (91 herds; 83 in 2012) and the United Kingdom (28 herds; 23 in 2012) (Table DSBRUCOFCAT).

Sheep and goats

The status of the countries regarding freedom from ovine and caprine brucellosis caused by *B. melitensis* (ObmF) and the occurrence of the disease in MS and non-MS in 2013 are presented in Figure 25 and Figure 26. In 2013, as in 2012, Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, 64 departments in France, Germany, Hungary, 11 regions and eight provinces in Italy, Ireland, Latvia, Lithuania, Luxembourg, the Netherlands, the Azores Islands in Portugal, Poland, Romania, Slovakia, Slovenia, two provinces of the Canary Islands and the Balearic Islands in Spain, Sweden and the United Kingdom, were ObmF. In Spain, in 2013, in addition to the two provinces of the Canary Islands and the Balearic Islands that are ObmF, the Asturias, Cantabria, Castile and Leon, Galicia, and Basque Country, were also declared ObmF.

MS that in 2013 did not gain yet the country-level ObmF status are Bulgaria, Croatia, Cyprus, France, Greece, Italy, Malta, Portugal, and Spain. Croatia, as a new MS, reported information for the first time in 2013.

Norway and Switzerland were ObmF in accordance with EU legislation and Liechtenstein had the same status (ObmF) as Switzerland. In the non-MS Iceland, which has no special agreement concerning animal health (status) with the EU, brucellosis (*B. abortus*, *B. melitensis*, *B. suis*) has never been reported.

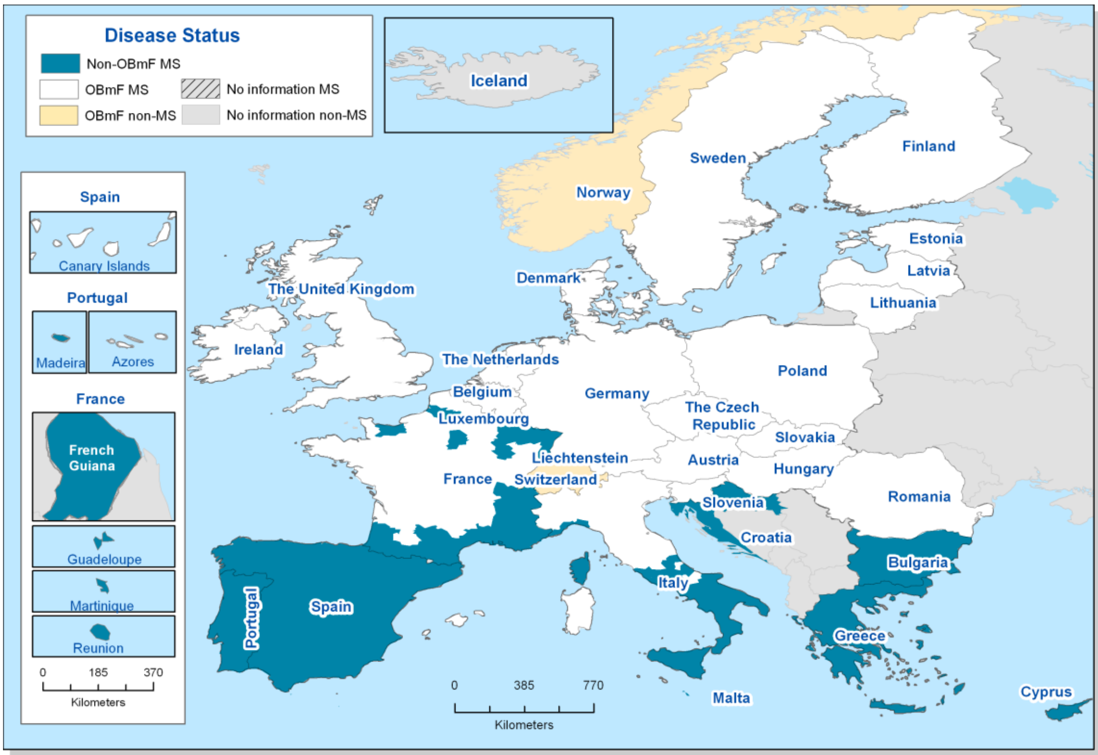


Figure 25. Status of countries regarding ovine and caprine brucellosis, 2013

Proportions of *Brucella*-positive sheep and goat herds are displayed only if they are above the legal threshold of 0.1 %.
(*) Proportions relate to the non-ObmF regions.

Figure 26. Proportion of existing sheep and goat herds infected with or positive for* Brucella*, 2013

Over 2005–2013, the overall proportion of existing sheep and goat herds infected with or positive for *B. melitensis* in the EU was at a very low level; it decreased until 2010 and then stabilised at a level of 0.17 % in 2011, with a further decrease in 2012 and 2013 (0.11 %). A further decrease was also observed in the proportion of existing sheep and goat herds infected with or positive for *B. melitensis* in the nine non-ObmF MS from 2010 (0.42 %) to 2013 (0.23 %) (Figure 24).

In the 19 ObmF MS and in the ObmF regions of non-ObmF MS, annual surveillance programmes are carried out to confirm the freedom from bovine brucellosis. During 2013, brucellosis due to *B. melitensis* was not detected in any of the 653,155 sheep and goat herds in the 19 ObmF MS, or in Iceland, Norway or Switzerland.

In five of the nine non-ObmF countries (Cyprus, Greece, Italy, Portugal and Spain), eradication programmes for ovine and caprine brucellosis approved for European co-financing were carried out in 2013. But all MS containing a non-ObmF region have a national eradication programme for ovine and caprine brucellosis in place. In general, MS receiving EU co-financing for their eradication programme report the number of positive herds, whereas MS not receiving EU co-financing report the number of infected herds.

From the four non-ObmF MS without EU co-financed eradication programmes, which have a total of 315,814 existing herds, Bulgaria, France and Malta did not report cases of infected herds, whereas Croatia reported one infected herd. From the five co-financed non-ObmF MS, Cyprus reported no single infected herd; fewer positive herds than in 2012 were reported by Italy (597 herds; 642 in 2012), Portugal (672 herds; 746 in 2012), Greece (21 herds; 33 in 2012) and Spain (153 herds; 272 in 2012) (Table DSBRUCOFOV).

Other animals

In 2013, 18 MS and two non-MS sampled animal species other than cattle, sheep or goats. *Brucella*-positive tests were reported in 7 pig herds out of the 839 tested. Of the 496,544 animals tested, positive results were reported for the following: water buffalos (1,884), wild boars (212), other wild ruminants (25), hares (16), pet dogs (7), pigs (3), wild alpine chamois (1) and dolphin (1) (Table BRUCOTHERAN).

3.7.3. *Brucella* food-borne outbreaks

In 2013, four weak-evidence *Brucella* outbreaks were reported by Greece and Germany. Out of 10 human cases involved in the seven outbreaks, seven were hospitalised. No strong-evidence outbreaks were reported.

3.7.4. Discussion

Brucellosis is a rare infection in humans in the EU. The highest notification rates and the majority of the autochthonous cases were reported from Mediterranean countries that are not officially brucellosis-free in cattle, sheep or goats. No significant increasing or decreasing trend of human brucellosis could be observed at the EU level in the last five years. Seventy per cent of the human brucellosis cases with known hospitalisation status had been hospitalised, but only one fatal case was reported in 2013.

There were no *Brucella*-positive findings in the surveillance samples of cheeses and other dairy products, or raw milk reported by two Mediterranean MS. However, the four reported weak evidence food-borne outbreaks in 2013 by two MS illustrate the health risk related to consumption of food contaminated with *Brucella*.

MS have national surveillance and/or eradication programmes in place. A further decreasing tendency was observed in the prevalence of both bovine and small ruminant brucellosis within the EU. In 2013, brucellosis remained a rare (bovine brucellosis) or very low frequency (ovine and caprine brucellosis) event at the EU level. Both bovine and small ruminant brucellosis cases of infected or positive herds are mostly reported by four Mediterranean MS Greece, Italy, Portugal and Spain. Bovine brucellosis was also reported by Northern Ireland in the United Kingdom in 28 cattle herds. Almost all non-OBF MS and non-ObmF MS reported fewer positive and/or infected herds than in 2012.

An overview of the control and eradication programme results of brucellosis in Italy, from 1998 to 2011, has recently been published (Graziani et al., 2013). The disease has been described in general and in detail, analysing the official data available in Italy from the surveillance in animals and in humans in that period. The report presents the integrated approach, under the "One Health, One Medicine" concept that Italy has followed for the control of the disease, emphasising the importance of such an approach and the need for extensive cooperation between public health and animal health professionals. It is intended as a tool for both scientists and authorities, providing them with the available knowledge of the disease and focussing on critical points and conditions that still affect the capacity for control of brucellosis in Italy.

3.8. *Trichinella*

The Appendix contains hyperlinks to all data summarised for the production of this section, for humans, food, animals and food-borne outbreaks. It also includes hyperlinks to *Trichinella* summary tables and figures that were not displayed in this section because they did not trigger any marked observation. The summarised data are presented in downloadable Excel and PDF files, and are listed by subject. Moreover, all submitted and validated data by the MS are available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm).

3.8.1. Trichinellosis in humans

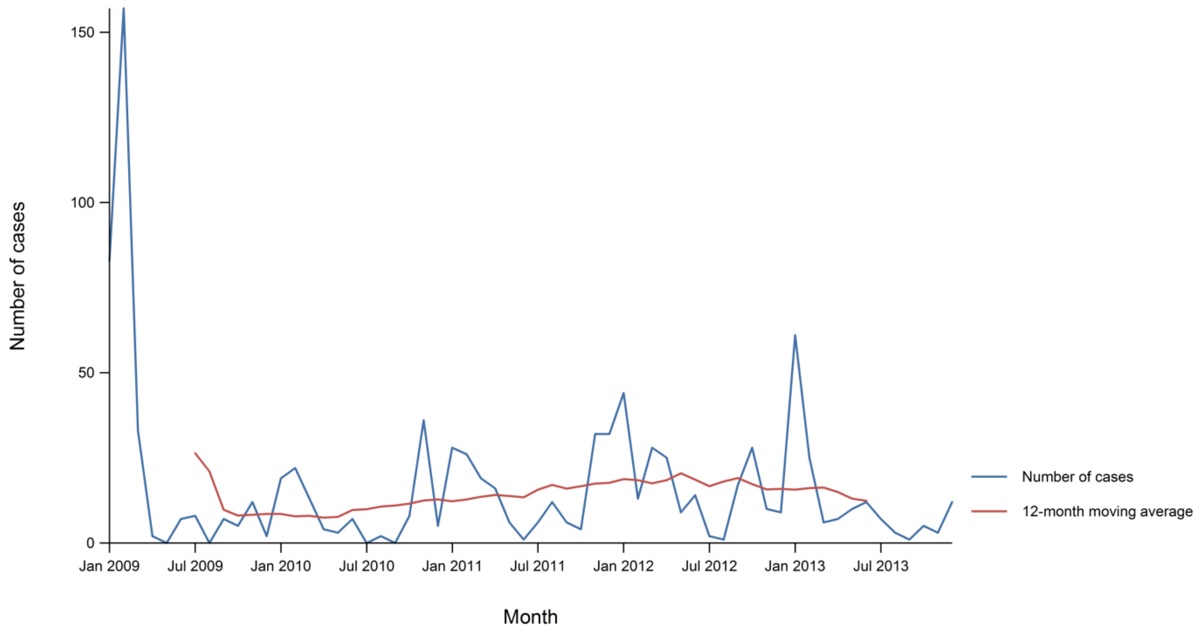
In 2013, 256 cases of trichinellosis, of which 217 were laboratory-confirmed, were reported by ten MS (Table 20). The EU notification rate in 2013 was 0.05 cases per 100,000 population which was a decrease of 17.7 % compared with 2012. The highest notification rates were reported in Romania, Latvia and Bulgaria (0.58, 0.54 and 0.49 cases per 100,000, respectively). These three countries accounted for 75.1 % of all confirmed cases reported in 2013. The increase observed in Germany was attributed to an outbreak caused by raw meat sausages made from *Trichinella*-positive wild boar meat which had accidentally entered the German market (Schink et al., 2014). Only one case of trichinellosis was reported as travel-associated and was related to travel to another EU country. The remaining cases were either reported as domestically acquired or of unknown origin (Table TRICHUMIMPORT).

Table 20. Reported cases and notification rates per 100,000 of human trichinellosis in the EU/EEA, 2009-2013

Country	2013					2012		2011		2010		2009	
	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	0	0	0.00	0	0.00	1	0.01	5	0.06	0	0.00
Belgium[(b)]	N	A	1	1	-	0	-	0	-	3	-	0	0.00
Bulgaria	Y	A	60	36	0.49	30	0.41	27	0.37	14	0.19	407	5.45
Croatia[(c)]	Y	A	1	-	-	-	-	-	-	-	-	-	-
Cyprus	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	0	0	0.00	1	0.01	0	0.00	0	0.00	0	0.00
Denmark[(d)]	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	1	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Finland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
France	Y	C	0	0	0.00	0	0.00	2	0.00	0	0.00	9	0.01
Germany	Y	C	14	14	0.02	2	0.00	3	0.00	3	0.00	1	0.00
Greece	Y	C	0	0	0.00	0	0.00	0	0.00	4	0.04	2	0.02
Hungary	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	9	0.09
Ireland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Italy[(e)]	-	-	-	-	-	33	0.06	6	0.01	0	0.00	1	0.00
Latvia	Y	C	11	11	0.54	41	2.01	50	2.41	9	0.42	9	0.42
Lithuania	Y	C	9	6	0.20	28	0.93	29	0.95	77	2.45	20	0.63
Luxembourg	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Malta	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	Y	C	0	0	0.00	0	0.00	1	0.01	0	0.00	1	0.01
Poland	Y	C	9	4	0.01	1	0.00	10	0.03	14	0.04	18	0.05
Portugal	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Romania	Y	C	116	116	0.58	149	0.74	107	0.54	82	0.41	265	1.31
Slovakia	Y	C	5	5	0.09	5	0.09	13	0.24	2	0.04	0	0.00
Slovenia	Y	C	1	1	0.05	1	0.05	1	0.05	0	0.00	1	0.05
Spain	Y	C	28	23	0.05	10	0.02	18	0.04	10	0.02	7	0.02
Sweden	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
United Kingdom	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
EU Total	**-**	**-**	**256**	**217**	**0.05**	**301**	**0.06**	**268**	**0.06**	**223**	**0.05**	**750**	**0.15**
Iceland	Y	C	0	0	0.00	-	-	-	-	-	-	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Switzerland[(f)]	Y	C	1	1	0.01	1	0.01	0	0.00	1	0.01	4	0.05

(a): Y, yes; N, no; A, aggregated data; C, case-based data; -, no report.
(b): Disease not under formal surveillance.
(c): Case of unknown case classification.
(d): No surveillance system.
(e): No report for 2013.
(f): Switzerland provided data directly to EFSA.

The temporal trend of trichinellosis in the EU in 2009–2013 was greatly influenced by a number of smaller and larger outbreaks (Figure 27), with peaks often occurring in January. The large peak at the beginning of 2009 was attributed to Romania, which reported 243 confirmed cases in January-March only.



Source: Austria, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden, and United Kingdom. Bulgaria, Croatia, Iceland, Italy, Lithuania and Spain did not report data over the whole period at the level of detail required for the analysis. Belgium and Denmark do not have any formal surveillance system for the disease.

Figure 27. Trend in reported confirmed cases of human trichinellosis in the EU/EEA, 2009-2013

Of the 12 MS that reported cases in 2013, seven provided information on hospitalisation for all of their cases (corresponding to 74.7 % of all confirmed cases reported in the EU). On average, 65.4 % of the cases were hospitalised. One death due to trichinellosis was reported in Latvia in 2013. The case was a hunter who had consumed wild boar meat (Antra Bormane, Centre for Disease Prevention and Control of Latvia, personal communication, October 2014).

T. spiralis was identified in 112 of the 217 confirmed cases. For the remainder of the cases, no species information was provided. See Table TRICHUMSPECIES for species distribution by country.

3.8.2. *Trichinella* in animals

Comparability of data

According to Commission Regulation (EC) No 2075/2005, carcases of domestic pigs, horses, wild boars and other farmed or wild animal species that are susceptible to *Trichinella* infestation, should be systematically sampled at slaughter as part of the meat inspection process and are tested for *Trichinella*. Animals (both domestic and wild) slaughtered for own consumption are not included in the regulation, but are subject to national rules, which differ per MS, as each MS can decide how to control *Trichinella* in this population (e.g. test or not, freeze or not). Therefore, data from such animals might not be comparable between MS. Some MS also report data from monitoring of *Trichinella* in wildlife not intended for human consumption, e.g. Belgium and Denmark, which are obliged to have monitoring programmes for wildlife in order to maintain their status as a region where the risk of *Trichinella* in domestic pigs is negligible in accordance with Regulation (EC) No 2075/2005.

Only results for the most important animal species that might serve as a source for human infection in the EU are presented.

Detailed information on the data reported and on the occurrence of *Trichinella* in the different animal categories has been included in specific tables referenced in Appendix.

In 2013, all MS and three non-MS provided information on *Trichinella* in farm animals (pigs, farmed wild boars and horses) and 10 MS reported positive findings. In pigs, a total of 357 positive findings out of 154,397,532 animals tested was reported (0.0002 %); 98.3 % of all the positive findings were reported from pigs not raised under controlled housing conditions (Figure 28). Positive findings were mainly (82.4 %) reported from eastern EU MS (Romania and Poland, and to a lesser extent Croatia and Bulgaria). In addition, Spain reported 15.4 % of all positive findings. Most of the positive findings were of *T. spiralis*

(66.4 %); the remaining was reported as unspecified *Trichinella*, except for a few findings of *T. britovi* from Romania, France and Poland.

Nine MS reported data on farmed wild boars. In total, 7,908 animals were tested, and Greece and Italy each reported one positive finding.

No positive findings were reported from 176,497 horses tested in the EU.

In Finland, the first diagnosis of *Trichinella* in domestic swine was made in 1954. There were very few pig cases annually until 1981, when the number of *Trichinella*-positive pigs started to increase, reaching more than 100 positive findings a year. In the 2000's, however, the number of positive animals decreased to a couple of animals a year, and, in 2005-2009, no cases were found. In 2010, only one *Trichinella*-positive pig was found and, between 2011-2013, no cases were found.

The infection was known in brown bear and other wildlife during the 1950s, but since the 1980s trichinellosis has also been found to be prevalent among wild carnivores, especially in the southern part of Finland, where all the four European species (*T. spiralis*, *T. nativa*, *T. britovi* and *T. pseudospiralis*) have been reported. The raccoon dog, *Nyctereutes procyonoides*, has been recognised as an important host, harbouring all four *Trichinella* species.

It appears that the *Trichinella* situation in Finland has been changing with decreasing incidence in swine. However, no sign of such changes in wildlife has been seen. The apparent reduction in swine may be due to pig production becoming more intensive with bigger industrialised units. In wildlife, a substantial proportion of infections are caused by *T. nativa*, the arctic species, which does not readily infect swine.

Source: The Finnish National Zoonoses Summary Report, 2013

In recent years, most Spanish *Trichinella* outbreaks have been due to the consumption of wild boar meat. Outbreaks from wild boar meat are increasingly frequent in certain regions of Spain and could be explained by ecological modifications in rural areas.

Source: The Spanish National Zoonoses Summary Report, 2013.

Twenty-three MS and one non-MS provided data on hunted wild boars. Fifteen MS reported 1,177 positive findings out of 872,203 animals tested, with an overall EU proportion of positive samples of 0.1 %. Most of the positive animals were reported by eastern EU MS (76.5 %); Poland reported 33.7 % and Romania 12.6 % (Figure 29). There was a tendency for the eastern EU MS to have a higher proportion of positive samples than central EU MS. In addition, Spain reported 21.8 % of the positive samples. Most findings were reported as *Trichinella* spp. (47.8 %) followed by *T. spiralis* (30.7 %) and *T. britovi* (20.9 %).

Twenty-two MS provided information about *Trichinella* in wildlife other than hunted wild boars, and reported a total of 647 positive findings from 11,520 animals tested (5.62 %) representing 11 different animal species. Most of the positive reporting was from eastern and north eastern EU MS (Figure 30).

Figure 28. Findings of Trichinella *in pigs not raised under controlled housing conditions, 2013*

Figure 29. Findings of Trichinella *in hunted wild boars, 2013*

Figure 30. Findings of* Trichinella *in wildlife (excluding hunted wild boars), 2013

The proportion of positive samples in different wildlife species from 2005 to 2013 is presented in Figure 31. Over the years, the highest proportion of positive samples has been reported for raccoon dogs, followed by bears. Most positive samples from raccoon dogs were from Finland, which reported between 19.9 % and 34.9 % positive samples each year. The decrease observed in the proportion of positive samples for raccoon dogs in 2012-2013 is due to the reporting of data from Denmark with no positive samples. In 2013, Finland reported 66.6 % of all positive findings in wildlife other than hunted wild boars, mainly in raccoon dogs and lynx.

Trichinella was also reported from badgers, bears, foxes, jackals, lynx, martens, polecats, rats, white-tailed eagles, wolves and wolverines.

Trichinella is found in large parts of Europe, as overall 19 MS and two non-MS reported positive findings.

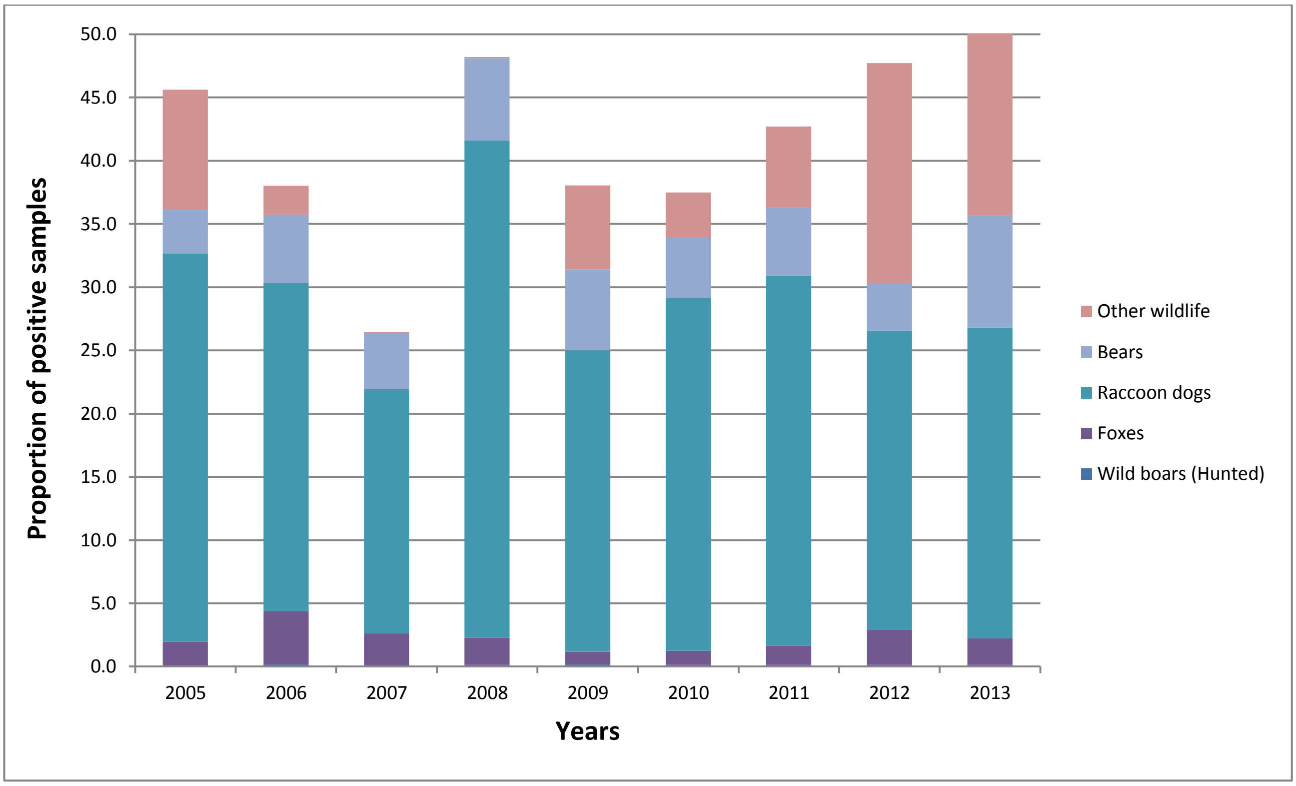


Figure 31. Proportion of* Trichinella*-positive samples in wildlife in Member States and non-Member States, 2005-2013

3.8.3. *Trichinella* food-borne outbreaks

In 2013, 22 *Trichinella* outbreaks were reported by six MS (Romania reported 12 outbreaks). Twenty of the outbreaks were supported by strong evidence. Pig meat was the most frequently reported food vehicle, reported in 15 of the 22 outbreaks (68.2 %). These findings are similar to previous years. For a large proportion of the strong evidence outbreaks (14) information on contributing factors was not provided. For the remaining outbreaks, inadequate heat treatment and unprocessed contaminated ingredients were reported as the main factors in four and two outbreaks, respectively.

3.8.4. Discussion

Trichinellosis is a rare disease in the EU/EEA. While the EU notification rate decreased in 2013 compared with 2012, the EU trend is not stable and is affected by the number and size of disease outbreaks each year. All cases reported in 2013 had acquired the infection within the EU and the three countries with the highest notification rates, Romania, Latvia and Bulgaria, accounted for 75 % of reported cases. On average, 65.4 % of the confirmed human trichinellosis cases were hospitalised and one death due to trichinellosis was reported in 2013, a hunter who had consumed wild boar meat.

Traditionally, pig meat has been one of the main sources of *Trichinella* infections in humans (Pozio and Murrell, 2006). In the EU, most pigs are subject to official meat inspection at slaughter in accordance with Regulation (EC) No 2075/2005; only pigs slaughtered for home consumption are not covered by the regulation. Only nine MS reported *Trichinella* in pig meat in 2013 with an EU prevalence of 0.0002 %, and the positive findings were mainly from pigs raised under non-controlled housing conditions. EFSA has identified that for domestic pigs this type of production system is the single main risk factor for *Trichinella* infections. In contrast, the risk of *Trichinella* infection in pigs from officially recognised controlled housing conditions is considered negligible (EFSA, 2011). Most humans become infected when consuming undercooked meat from pigs or wild boars that have not been taken to the local slaughterhouse for post-mortem inspection and sampling for detection of *Trichinella* spp. larvae.

Trichinella is found in large parts of Europe, as overall 19 MS and two non-MS reported positive findings.

Nine MS reported data on farmed wild boars and only two MS reported a positive finding. The prevalence in farmed wild boars is higher than in pigs, as controlled housing conditions are often not applied to this production. No positive findings were reported from solipeds in 2013.

Trichinella is commonly reported in wildlife by some northern and eastern European MS where *Trichinella* is circulating in the wildlife population. The proportion of positive samples in hunted wild boars was higher than in pigs and farmed wild boars in 2013. The proportion of positive samples from wildlife, other than wild boars, was highest in raccoon dogs, followed by bears. *Trichinella* was also reported from badgers, jackals, lynx, martens, polecats, white-tailed eagles, rats, wolves and wolverines. The increasing number of wild boars and red foxes and the spread of the raccoon dog from eastern to western Europe may increase the prevalence of *Trichinella* circulating among wild animals (Alban et al., 2011). Therefore, it is important to continue educating hunters and others eating wild game about the risk of eating undercooked game meat.

Twenty-two food-borne outbreaks caused by *Trichinella* were reported in six MS. Pig meat was the most frequently reported food vehicle among the 20 strong-evidence outbreaks. For the outbreaks where the source was known, consumption of inadequately heat-treated pig or wild boar meat or use of unprocessed contaminated ingredients were indicated as the main causes.

Generally, *Trichinella* is considered a medium risk for public heath related to the consumption of pig meat, and integrated preventative measures and controls on farms and at slaughterhouses can ensure an effective control of *Trichinella* (EFSA BIOHAZ, CONTAM and AHAW Panels, 2011). Infections of pigs occur when there are biosecurity failures, which increase the probability of pigs coming into contact with reservoirs. These include, for example, feeding pigs on food waste that potentially contains pig meat scraps, or exposure of pigs to carcases of dead pigs or infected wildlife. Pigs raised outdoors are at risk of contact with potentially *Trichinella*-infected wildlife. In pigs raised indoors, the risk of infection is mainly related to the lack of compliance with rules on the treatment of animal waste. In such farms, infection could also occur as a result of the breakdown of the biosecurity barriers around the farm, allowing the ingress of infected rodents (EFSA, 2011).

3.9. *Echinococcus*

The Appendix contains hyperlinks to all data summarised for the production of this section, for humans and animals. It also includes hyperlinks to *Echinococcus* summary tables and figures that were not displayed in this section because they did not trigger any marked observation. The summarised data are presented in downloadable Excel and PDF files, and are listed by subject. Moreover, all submitted and validated data by the MS are available online (http://www.efsa.europa.eu/en/zoonosesscdocs/zoonosescomsumrep.htm).

3.9.1. Echinococcosis in humans

Cases of both cystic and alveolar echinococcosis, caused by *E. granulosus* and *E. multilocularis* respectively, are reported jointly to ECDC as echinococcosis as the EU case definition does not differentiate between the two clinical forms of the disease. In 2013, a total of 811 echinococcosis cases, of which 794 were laboratory confirmed, were reported in the EU (Table 21). The EU notification rate was 0.18 cases per 100,000 population which was a decrease of 5.7 % compared with 2012. The highest notification rate was reported by Bulgaria with 3.82 cases per 100,000 followed by Lithuania with 0.77 cases per 100,000.

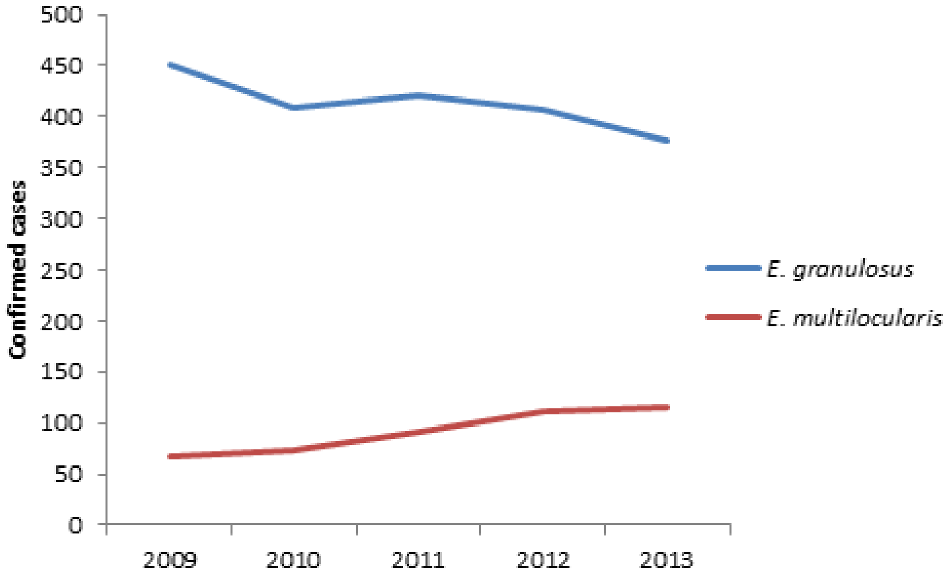
Table 21. Reported cases and notification rates per 100,000 of human echinococcosis in the EU/EEA, 2009-2013

Country	2013					2012		2011		2010		2009	
	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	11	11	0.13	3	0.04	7	0.08	21	0.25	20	0.24
Belgium	Y	A	15	15	0.13	6	0.05	1	0.01	1	0.01	0	0.00
Bulgaria	Y	A	278	278	3.82	320	4.37	307	4.17	291	3.92	323	4.33
Croatia[(b)]	Y	A	15	-	-	-	-	-	-	-	-	-	-
Cyprus	Y	C	0	0	0.00	0	0.00	2	0.24	0	0.00	1	0.13
Czech Republic	Y	C	2	2	0.02	0	0.00	0	0.00	5	0.05	1	0.01
Denmark[(c)]	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	3	3	0.23	3	0.23	0	0.00	0	0.00	0	0.00
Finland	Y	C	4	4	0.07	3	0.06	1	0.02	1	0.02	1	0.02
France	Y	C	34	34	0.05	49	0.08	45	0.07	33	0.05	27	0.04
Germany	Y	C	121	121	0.15	114	0.14	142	0.17	117	0.14	106	0.13
Greece	Y	C	10	10	0.09	21	0.19	17	0.15	11	0.10	22	0.20
Hungary	Y	C	5	5	0.05	6	0.06	11	0.11	9	0.09	8	0.08
Ireland	Y	C	1	1	0.02	0	0.00	0	0.00	1	0.02	1	0.02
Italy[(c)]	-	-	-	-	-	-	-	-	-	-	-	-	-
Latvia	Y	C	7	7	0.35	8	0.39	10	0.48	14	0.66	15	0.69
Lithuania	Y	C	25	23	0.77	23	0.77	24	0.79	23	0.73	36	1.13
Luxembourg	Y	C	0	0	0.00	0	0.00	1	0.20	1	0.20	0	0.00
Malta	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	Y	A	33	33	0.20	-	-	49	0.29	-	-	25	0.15
Poland	Y	C	39	39	0.10	28	0.07	19	0.05	36	0.09	25	0.07
Portugal	Y	C	3	3	0.03	2	0.02	1	0.01	3	0.03	4	0.04
Romania	Y	C	55	55	0.28	96	0.48	53	0.27	55	0.27	42	0.21
Slovakia	Y	C	20	20	0.37	3	0.06	2	0.04	9	0.17	4	0.07
Slovenia	Y	C	6	6	0.29	6	0.29	8	0.39	8	0.39	9	0.44
Spain	Y	C	94	94	0.20	96	0.21	53	0.11	82	0.18	86	0.19
Sweden	Y	C	16	16	0.17	16	0.17	19	0.20	30	0.32	12	0.13
United Kingdom	Y	C	14	14	0.02	7	0.01	9	0.01	7	0.01	7	0.01
EU Total	**-**	**-**	**811**	**794**	**0.18**	**810**	**0.19**	**781**	**0.18**	**758**	**0.18**	**775**	**0.18**
Iceland	Y	C	0	0	0.00	-	-	-	-	-	-	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	2	2	0.04	2	0.04	3	0.06	1	0.02	4	0.08

(a): Y: yes; N: no; A: aggregated data; C: case-based data; -: no report.
(b): All cases of unknown case classification
(c): No surveillance system.

The two forms of the disease can be differentiated in the data reported to ECDC by the reported species. Species information was provided from 14 MS and Norway out of the 23 countries that reported cases in 2013. Six MS (Bulgaria, Latvia, the Netherlands, Portugal, Slovenia and the United Kingdom) and Norway only reported cases of *E. granulosus*, two MS only reported cases of *E. multilocularis* (Estonia and France) and six MS (Austria, Belgium, Germany, Lithuania, Poland and Slovakia) reported both parasites in humans. In the EU/EEA, *E. granulosus* accounted for 427 cases (53.6 % of confirmed cases), *E. multilocularis* for 116 cases (14.6 %) and no information on species was provided for 253 cases (31.7 %). See Table ECHINOHUMSPECIES for species distribution by country.

Over the last five years, there was an increasing number of cases infected with *E. multilocularis* (alveolar echinococcosis) reported from the eight MS reporting this species during the five-year period (Figure 32). In contrast, there was a decreasing number of cases infected with *E. granulosus* (cystic echinococcosis) reported from the nine MS reporting this species throughout the period.



Source: TESSy data from countries reporting species for most or all their cases throughout the period. For *E. granulosus* from nine MS (Austria, Belgium, Bulgaria, Estonia, Germany, Latvia, Lithuania, Poland and Slovakia). For *E. multilocularis* from eight MS (Austria, Belgium, France, Germany, Latvia, Lithuania, Poland and Slovakia).

Figure 32. Reported confirmed cases of human echinococcosis by species in selected Member States, 2009-2013

Twelve MS provided information on hospitalisation for all or the majority of their cases, accounting for 22.7 % of the confirmed echinococcosis cases in 2013. On average, 70.6 % of the cases were hospitalised. There was no difference in the percentage of cases hospitalised between the two species.

Thirteen MS provided information on the outcome of the cases. Two deaths due to *E. multilocularis* were reported in 2013, one in Austria and one in Germany. This gives an EU case-fatality rate of 0.88 % among the 226 confirmed cases for which this information was reported (28.5 % of all confirmed cases).

3.9.2. *Echinococcus* in animals

Comparability of data

E. granulosus and *E. multilocularis* are two different tapeworms that are the causative agents of two zoonoses with different epidemiology. For *E. granulosus* the definitive hosts are dogs and, rarely, other canids, while the intermediate hosts are mainly livestock. For *E. multilocularis* the typical transmission cycle in Europe is wildlife based. The intermediate hosts for *E. multilocularis* are wild small rodents, while the definitive hosts in Europe are red foxes, raccoon dogs and, to a lesser extent, dogs and wolves.

As described earlier during the five-year period 2009-2013, there was an increasing number of (human) cases reported to be infected with *E. multilocularis* (alveolar echinococcosis) in the EU/EEA. Therefore, it is of particular importance to assess the occurrence and distribution of *E. multilocularis* in Europe in a more representative way. However, for *E. multilocularis*, findings rely on the surveillance or monitoring in place, which are not harmonised between MS. Data of *E. multilocularis* findings are therefore extremely difficult to compare between MS. Surveillance for *E. granulosus* is carried out at meat inspection (macroscopic (visual) examination of organs of relevant farm animals at slaughter) and these MS data should therefore be to some extent comparable given that compulsory notification is in place.

Proposals for harmonised schemes for the monitoring and reporting of *Echinococcus* in animals and foodstuffs can be found in an External Scientific Report submitted to EFSA (Boué et al., 2010). Several MS have had monitoring/surveillance programmes running for some years.

E. multilocularis in animals

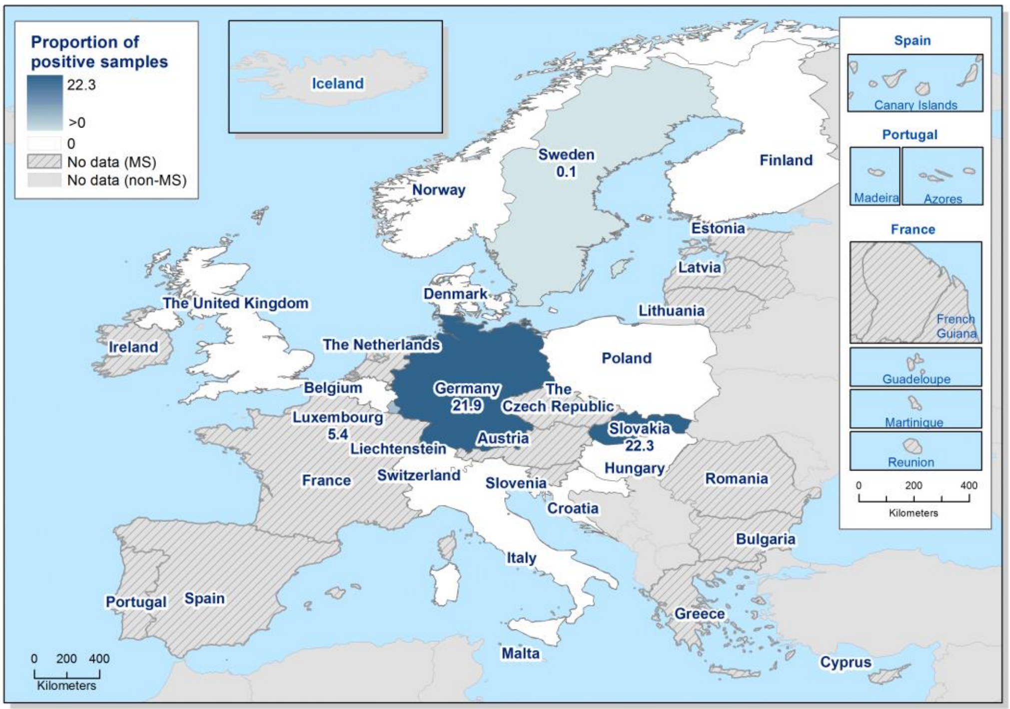
E. multilocularis is mainly monitored in foxes. In 2013, 12 MS and two non-MS reported data on 6,629 foxes examined for *Echinococcus* and seven MS reported positive findings of *Echinococcus*. Poland, Germany and Slovakia reported the highest proportion of positive samples, 32.8 %, 31.4 % and 22.3 %, respectively (Table ECHINOFOX2013).

Not all *Echinococcus*-positive samples were speciated. Slovakia and Germany reported the highest proportions of *E. multilocularis* positive samples, 22.3 % and 21.9 %, respectively (Figure 33), followed by Luxemburg (5.4 %) and Sweden (0.1 %). Germany reported 79.0 % of the *E. multilocularis*-positive samples at EU-level. For comparison, in 2012, 9.9 % of the tested foxes were positive for *E. multilocularis*, and Germany reported 68.3 % of the positive findings (Table ECHINOFOX2012).

Poland was the only MS to report *E. multilocularis* in other animal species; nine positive pigs out of 370 tested and one positive hunted wild boar (Table ECHINOOTHER2013)

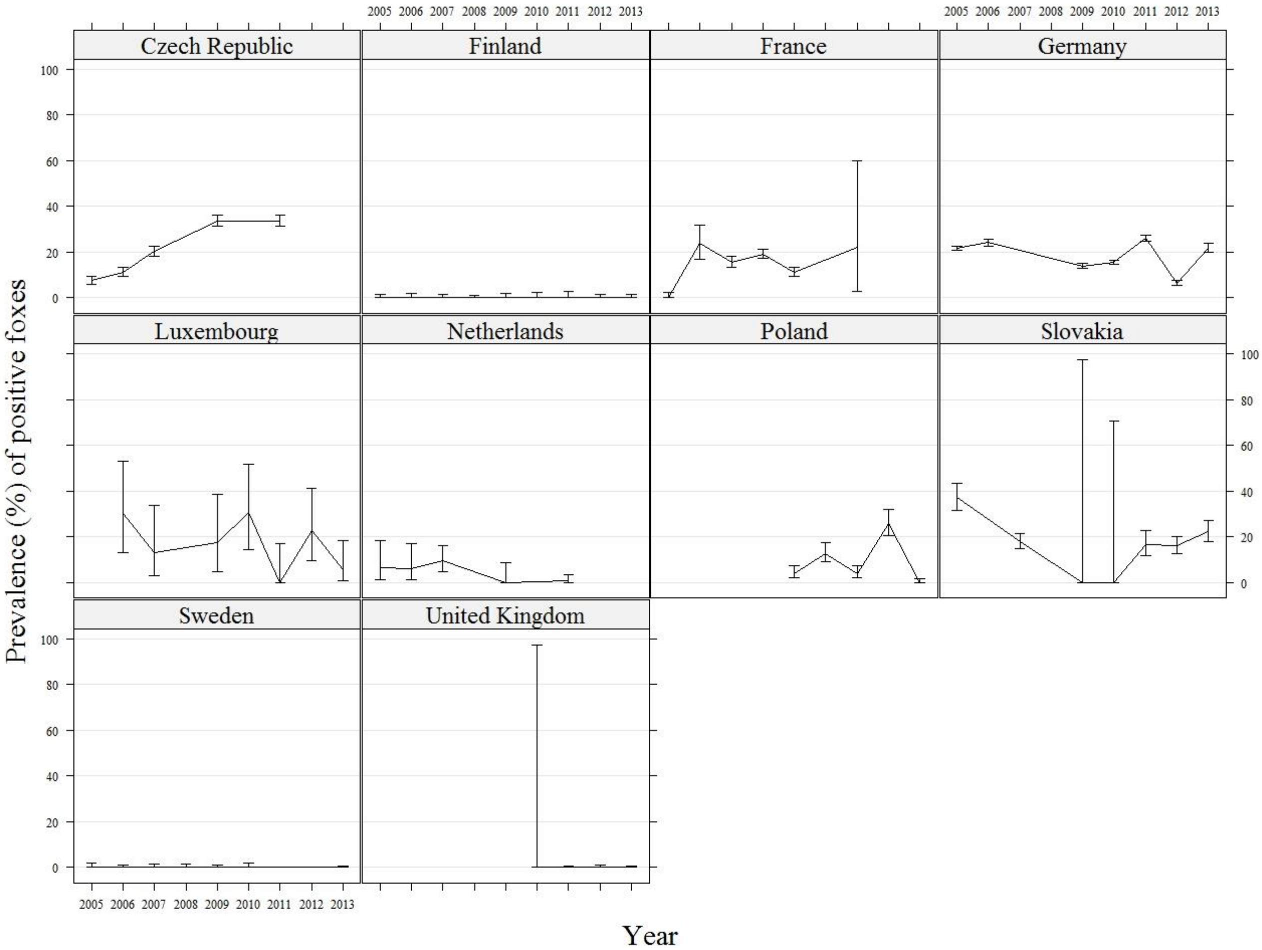
Eleven MS and one non-MS reported investigations of foxes as being part of a monitoring programme, the remaining countries reported data from surveys (2), clinical investigation (1) or unspecified (2).

Ten MS have reported data on *E. multilocularis* in foxes for a minimum of four consecutive years, from 2005 to 2013 (Figure 34). In this period, the Nordic countries (Finland and Sweden) reported no or very few positive findings in foxes. In the Czech Republic an increase in prevalence of *E. multilocularis* is observed during 2005-2011, as well as in Slovakia during 2010-2013. Findings from Germany, Luxembourg, the Netherlands and Poland have continued to fluctuate. In the light of the fact that, as mentioned above, these findings are extremely difficult to compare between MS, no overall trend graph for this group of MS was produced for *E. multilocularis* in foxes.



In addition, the Netherlands and France reported regional data on foxes. The Netherlands reported 22 positive animals out of 37 tested in the Zuid-Limburg region and France reported 18 positive animals out of 89 tested in the Lorraine region.

Figure 33. Findings of* Echinococcus multilocularis *in foxes, 2013



Vertical bars indicate the exact binomial 95 % CI. Only MS-level submitted data are considered in this figure. MS reporting data for at least four consecutive years are included.

Figure 34. Findings of* E. multilocularis *in foxes (including Member States providing data for at least four consecutive years), 2005-2013

Echinococcus findings in other animals

In 2013, 113,635,194 domestic animals (cattle, sheep, goats, pigs and horses) were tested for *Echinococcus* by 16 MS and two non-MS. Eight MS and one non-MS reported a total of 141,505 positive samples, mainly from sheep (76.9 %) and cattle (17.2 %). Spain, Italy, Greece and the United Kingdom reported respectively 58.8 %, 10.9 %, 4.7 % and 25.4 % of all positive samples. In total, 66.1 % of the positive samples were reported as *E. granulosus* and the remainder as *Echinococcus* spp. Seven MS and one non-MS reported findings of *E. granulosus* and *Echinococcus* spp. in foxes, wild boar, deer, water buffalos, reindeers, wolves, dogs, cats, beavers, monkeys and jackals (Table ECHINOOTHER2013).

Echinococcus is a large problem in Bulgaria and since 2000 there have been increases in the prevalence in bovine animals, sheep and pigs during meat inspection of carcasses at slaughter. The prevalence in bovine animals has increased from 9.2 % to 17.9 %, in sheep from 5.2 % to 7.5 % and in pigs from 0.8 % to 2.2 %.

The most important final hosts are sheep dogs, stray dogs, pet dogs and hunter dogs, with prevalence of, respectively, 78 %, 57 %, 31 %, and 16 %. Some of the main reasons for the large number of human cases are only partial registration of pet dogs and that not all pet dogs are treated with anthelmintics, many stray dogs live without any anthelmintic treatment and not all infected viscera is destroyed in rendering plants.

Source: The Bulgarian National Zoonoses Report, 2013

3.9.3. Discussion

The EU/EEA notification rate of confirmed human echinococcosis cases decreased in 2013 compared to 2012. Six MS and Norway only reported cases of *E. granulosus*, two MS only reported cases of

E. multilocularis and six MS reported both parasites in humans. The highest population-based risk was noted in Bulgaria (which only reported *E. granulosus*), where the notification rate was 21 times higher than the average rate at the EU level.

There were almost four times as many reported cases of *E. granulosus* than for *E. multilocularis* although the number of cases with the alveolar form of echinococcosis, caused by *E. multilocularis*, increased in 2009-2013. This increase is of concern as untreated alveolar echinococcosis is often fatal. Two deaths due to alveolar echinococcosis (*E. multilocularis*) were reported in 2013, resulting in an EU case-fatality rate of 0.88 %.

E. multilocularis is found in red foxes mainly in central Europe, the north of Denmark, the Netherlands, and Belgium, in eastern EU to the Baltic States and Slovakia, in the south to north eastern Italy and Hungary, and in the west to central France (EFSA, 2007a). Recently, *E. multilocularis* has been identified in the red fox in Sweden (Osterman et al., 2011). Surveillance of *E. multilocularis* in foxes is important in order to assess the prevalence in Europe, particularly as the distribution of *E. multilocularis* is increasing in Europe (Vervaeke et al., 2006; Berke et al., 2008; Takumi et al., 2008; Combes et al., 2012; Antolová et al., 2014). An increase in infected foxes can also lead to *E. multilocularis* being isolated from unusual intermediate hosts including beavers due to heavy environmental contamination with *E. multilocularis* eggs as has been observed in Switzerland and Austria (Janovsky et al., 2002).

E. multilocularis has never been found in Finland, Ireland, Malta and the United Kingdom, and in order to maintain the status of *E. multilocularis* freedom, these four countries are obliged to implement surveillance programme aimed at detecting the parasite in any part of the country (Regulation (EU) No 1152/2011[30]). Within five years the results must be critically assessed. In 2013, EFSA carried out the assessment and found that under the assumption of unbiased representative sampling (in the case of Finland, Ireland and the United Kingdom) and unbiased risk based sampling (in the case of Malta) and considering the sensitivity of the tests applied, all four MS have fulfilled the requirement of Regulation (EU) No 1152/2011 to the effect that the surveillance activities should detect a prevalence of *E. multilocularis* of 1 % or less at a confidence level of at least 0.95 (EFSA, 2013c). It should however be noted that *E. multilocularis* can occur at lower prevalences as reported in Sweden where about 0.1 % of foxes are infected with *E. multilocularis*.

In Czech Republic an increase in prevalence of *E. multilocularis* in foxes was observed during 2005-2011, as well as in Slovakia during 2010-2013.

Four MS reported almost all the positive findings of *E. granulosus*; mainly from domestic animals.

Information campaigns about *E. multilocularis* tend to focus on warnings against eating berries and mushrooms from areas where *E. multilocularis* has been detected in the wildlife population, while little consideration is given to ownership of dogs and contact with wild carnivores (Antolová et al., 2014). Several case–control studies have showed that having a dog and contact with wild carnivores are the most important risk factors (Stehr-Green et al., 1988; Kreidl et al., 1998; Craig et al., 2000; Kern et al., 2004).

The EFSA Panel on Animal Health and Welfare have stated in a scientific opinion that in many human cases the diagnosis is established only as echinococcosis, and the aetiological agent of the disease, *E. multilocularis* or *E. granulosus*, is not determined. Similarly, EFSA considers that the current data about the occurrence of human echinococcosis in MS do not provide an accurate picture of the epidemiological situation. In 2013, 31.8 % of human cases remained undetermined. Distinction between infections with *E. granulosus* and *E. multilocularis* would be beneficial because the two diseases require different management of prevention and treatment (EFSA AHAW Panel, 2013). Regarding animal data, the quality of the data reported on *Echinococcus* has improved in recent years, with more information being provided about the sampling context and more data reported at species level. Also in animals information on parasite speciation is very important for risk management efforts as *E. granulosus* and *E. multilocularis* have different epidemiologies and pose different health risks to humans.

3.10. *Toxoplasma*

The Appendix contains hyperlinks to all data summarised for the production of this section, for animals. It also includes hyperlinks to *Toxoplasma* summary tables and figures that were not displayed in this section because they did not trigger any marked observation. The summarised data are presented in downloadable Excel and PDF files, and are listed by subject. Moreover, all submitted and validated data by the MS are available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm).

[30] Commission Delegated Regulation (EU) No 1152/2011 of 14 July 2011 supplementing Regulation (EC) No 998/2003 of the European Parliament and of the Council as regards preventive health measures for the control of *Echinococcus multilocularis* infection in dogs. OJ L 296, 15.11.2011, p. 6-12.

3.10.1. Toxoplasmosis in humans

Data on congenital toxoplasmosis in the EU in 2013 are not included in this report but will be published in the ECDC Annual Epidemiological Report 2015 (in preparation).

3.10.2. *Toxoplasma* in animals

Comparability of data

Most of the reporting countries provided information on the type of specimen taken and the analytical method used in testing. This facilitated a better interpretation of the data. Some countries tested meat or other tissues for the presence of *Toxoplasma* cysts, while other countries serologically tested blood or meat juice samples for the presence of *Toxoplasma* antibodies. Furthermore, some results derive from monitoring and specific national surveys, while other results are from clinical investigations. Because of the use of different tests and analytical methods, as well as different sampling schemes, the results from different countries are not directly comparable.

Furthermore, it should be noted that the prevalence of *Toxoplasma* infection in farm animals is strongly influenced by the age of the tested animals and the type of husbandry conditions applied at the farm.

Animals

In 2013, 14 MS and two non-MS provided data on *Toxoplasma* in animals (Table TOXOOVER).

Only six MS and one non-MS reported data on *Toxoplasma* in pigs (Table TOXOPIGS). Most of these data derived from monitoring, objective sampling or specific surveys. France reported on the largest proportion (48.3 %) of the 3,208 tested pigs, followed by the United Kingdom (19.3 %) and Poland (17.7 %). The *Toxoplasma* positivity in pigs varied between the reporting MS. Italy reported 25.8 % positivity in pigs using ELISA, while Poland reported 14.7 % and 13.6 % positivity using PCR and direct agglutination tests, respectively. The United Kingdom detected 7.4 % positivity in pigs, but no specific details on the analytical method used were reported. Estonia and Germany did not find any *Toxoplasma*-positive pigs out of the 20 and 280 animals tested, respectively.

Five MS reported data on *Toxoplasma* in cattle in 2013 (Table TOXOCATTLE). As in the previous year, both Germany and Poland found low to moderate levels of samples to be positive. Italy and the United Kingdom reported high to very high proportions of serologically positive samples of cattle at farms.

Twelve MS and two non-MS reported information on *Toxoplasma* in sheep and goats, probably because of the clinical importance of the parasite in these animal species (Table TOXOOVINEGOAT). As in the previous year, high proportions of serological samples were found to be positive by several countries, particularly from clinical investigations and suspect sampling. The Netherlands also detected tissue cysts in samples from sheep and goats.

Nine MS and two non-MS provided data on *Toxoplasma* in cats and dogs, mainly from clinical investigations, and often found positive samples, using mostly serological tests (Table TOXOCATDOG).

In addition, several MS and two non-MS provided data on other animal species, reporting *Toxoplasma* positive samples from hares, finches, camels, dromedaries, llamas, donkeys, wild boars, water buffaloes and deer (Table TOXOOTHERAN). In particular, in wild boars, high proportions of seropositive samples were detected in Poland, while Italy reported less seropositive wild boars than in 2012. A high proportion of seropositive samples from deer were reported by Poland in 2013. In addition, Italy reported information on eight camels out of which seven were seropositive for *Toxoplasma*.

3.10.3. Discussion

As highlighted in the recent EFSA opinions on modernisation of meat inspection, *Toxoplasma* poses an important risk to human health, and has to be considered as a relevant hazard to be addressed in revised meat inspection systems for pigs, sheep, goats, farmed wild boars and farmed deer (EFSA BIOHAZ, CONTAM and AHAW Panels, 2011; EFSA BIOHAZ Panel, 2013b, c). *Toxoplasma* was reported by the MS from pigs, sheep, goats, hunted wild boars and hunted deer, during the period 2011-2013. In the same years, positive findings were also detected in cats (the natural hosts), cattle and dogs, as well as in several other animals, indicating the wide distribution of the parasite among different farm, domestic and wildlife animal species.

3.11. Rabies

The Appendix contains hyperlinks to all data summarised for the production of this section, for humans and animals. It also includes hyperlinks to rabies summary tables and figures that were not displayed in this section because they did not trigger any marked observation. The summarised data are presented in downloadable Excel and PDF files, and are listed by subject. Moreover, all submitted and validated data by the MS are available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm).

3.11.1. Rabies in humans

Generally, very few cases of rabies in humans are reported in the EU, and most MS have not had any autochthonous cases for decades. In June 2013 one travel-associated case of rabies was reported from the Netherlands (Table 22). The patient was a 51-year old man, exposed to an unknown source in Haiti.

Table 22. Human rabies cases in the EU/EEA, 2009-2013

Year	Country	Case
2009	Romania	1 fatal case: 69-year-old female from a rural area bitten by a fox. The patient did not visit a hospital or report it to the veterinary authorities.
2010	Romania	2 fatal cases: 10- and 11-year-old girls from rural areas. Possible transmission by cat bite and unknown source, respectively.
2011	Portugal	1 fatal case imported from Guinea-Bissau. Case was a 41-year-old woman bitten by a dog. No vaccine was available in the country at the time of the bite. The person visited the hospital in Portugal two and a half months after the bite.
2012	Romania	1 fatal case: a 5-year-old girl was bitten by a stray dog in a village in eastern Romania and was initially mis-diagnosed; she died in February 2012.
	United Kingdom	1 fatal case: a British woman died of rabies in May 2012 in the United Kingdom, contracted from a dog in India.
	Switzerland	1 fatal case: an American citizen died of rabies in July 2012; he was bitten by a bat in California 3 months before the symptoms started.
2013	Netherlands	1 fatal case: 51-year-old male died of rabies in June 2013; he was exposed to an unknown source in Haiti.

3.11.2. Rabies in animals

Rabies is a notifiable disease in all MS and Switzerland. In 2013, 12 MS had their annual or multi-annual plan of rabies eradication co-financed by the EC.[31] Eradication plans include oral vaccination of wild animals, sampling of wild and domestic animals (suspected of having been infected by rabies and/or those found dead) for rabies, and surveillance and monitoring of wild animals for vaccine efficacy. Co-financed oral vaccination campaigns were carried out in 2013 in Bulgaria, Finland, Greece, Estonia, Italy, Latvia, Lithuania, Hungary, Poland, Romania, Slovenia and Slovakia. Some of these vaccinations were applied in neighbouring third countries to reduce the influx of rabies via foxes.

Domestic animals and wildlife

The majority of samples from wild and domestic animals tested for rabies are taken based on the suspicion of rabies infection, including animals found dead. In addition, countries carrying out oral vaccination programmes of wildlife monitor the efficiency of vaccination campaigns. This involves the sampling of healthy (rabies unsuspected) hunted foxes and raccoon dogs randomly and homogeneously selected from the vaccination areas. These hunted animals are tested for vaccine intake and for specific immunity, as well as for the presence of the rabies virus.

Endemic rabies still occurs in foxes and other wildlife species in certain eastern parts of the EU, in particular Romania, with sporadic spill-over to domestic animals, mainly dogs and cats (pet and stray) and ruminants.

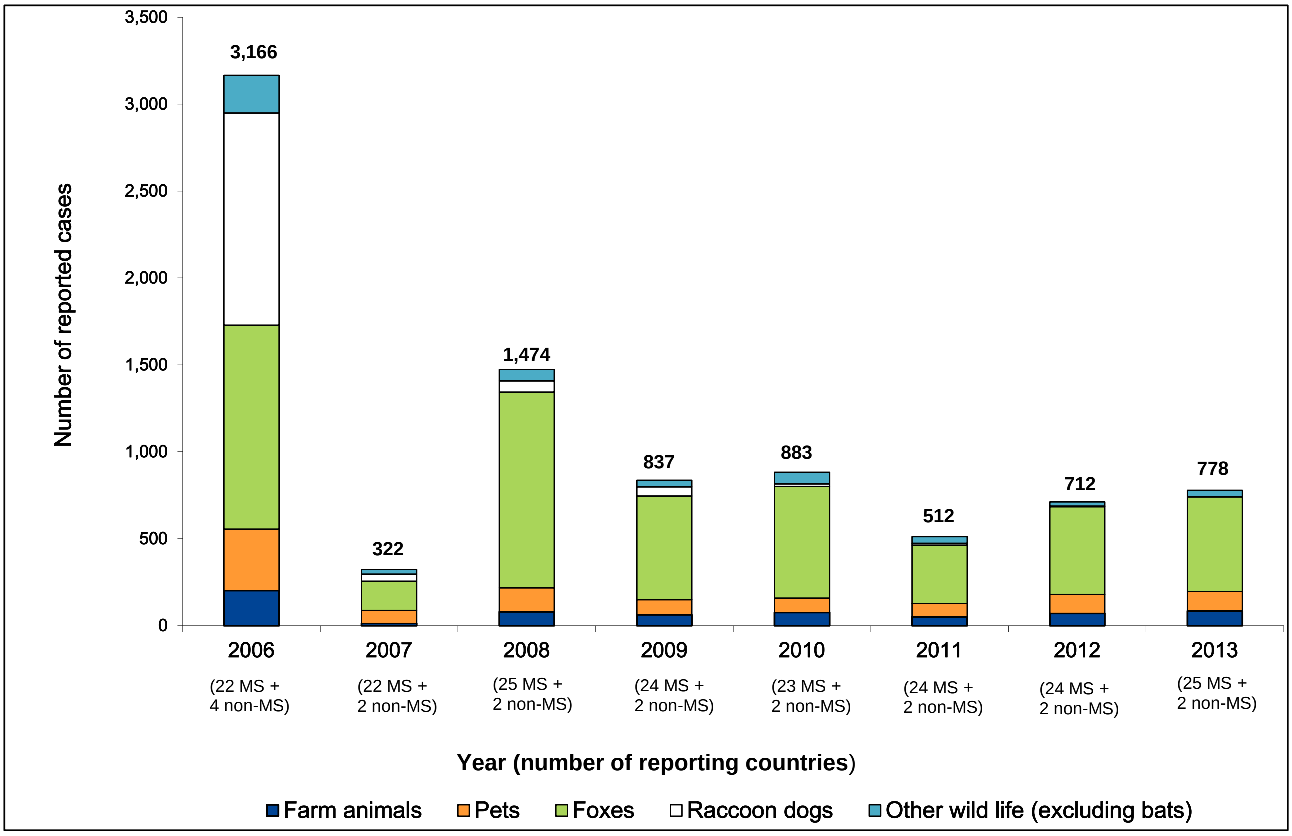
In Romania and Poland, the incidence in both domestic and wild animals has remained at the same level from 2012 to 2013. In Slovakia, a few cases were confirmed in a bordering area to Poland. A slight increase in fox rabies has been observed in Hungary and Greece (northern part) whereas the situation in Croatia has significantly improved (Source: The Croatian National Zoonoses Summary Report, 2013).

[31] Commission Implementing Decision (EC) No 2012/761/EU of 30 November 2012 approving annual and multiannual programmes and the financial contribution from the Union for the eradication, control and monitoring of certain animal diseases and zoonoses presented by the Member States for 2013. OJ L 336, 8.12.2012, p. 83–93.

Overall, in 2013, 778 animals other than bats tested positive for either classical rabies virus or unspecified *Lyssavirus*, in reporting countries, including two imported cases (see specific Tables in the Appendix). The number of cases reported in 2013 increased compared with 2012, when 712 cases where detected in animals other than bats (Figure 35).

In 2013, two MS reported, each, one imported case of rabies in pet animals: one case of rabies in cat imported from Morocco and one case in dog following illegal import from North Africa.

The geographical distribution of reported cases in foxes in 2013 is shown in Figure 36, while the distribution of cases in wild animals other than foxes and bats is shown in Figure RABIESMAPWILD.



The number of reporting MS and non-MS is indicated at the bottom of each bar. The total number of rabid cases is reported at the top of each bar. Imported cases are not included.
Source 2013: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom

Figure 35. Reported cases of classical rabies or unspecified* Lyssavirus *in animals other than bats, in the Member States and non-Member States, 2006-2013

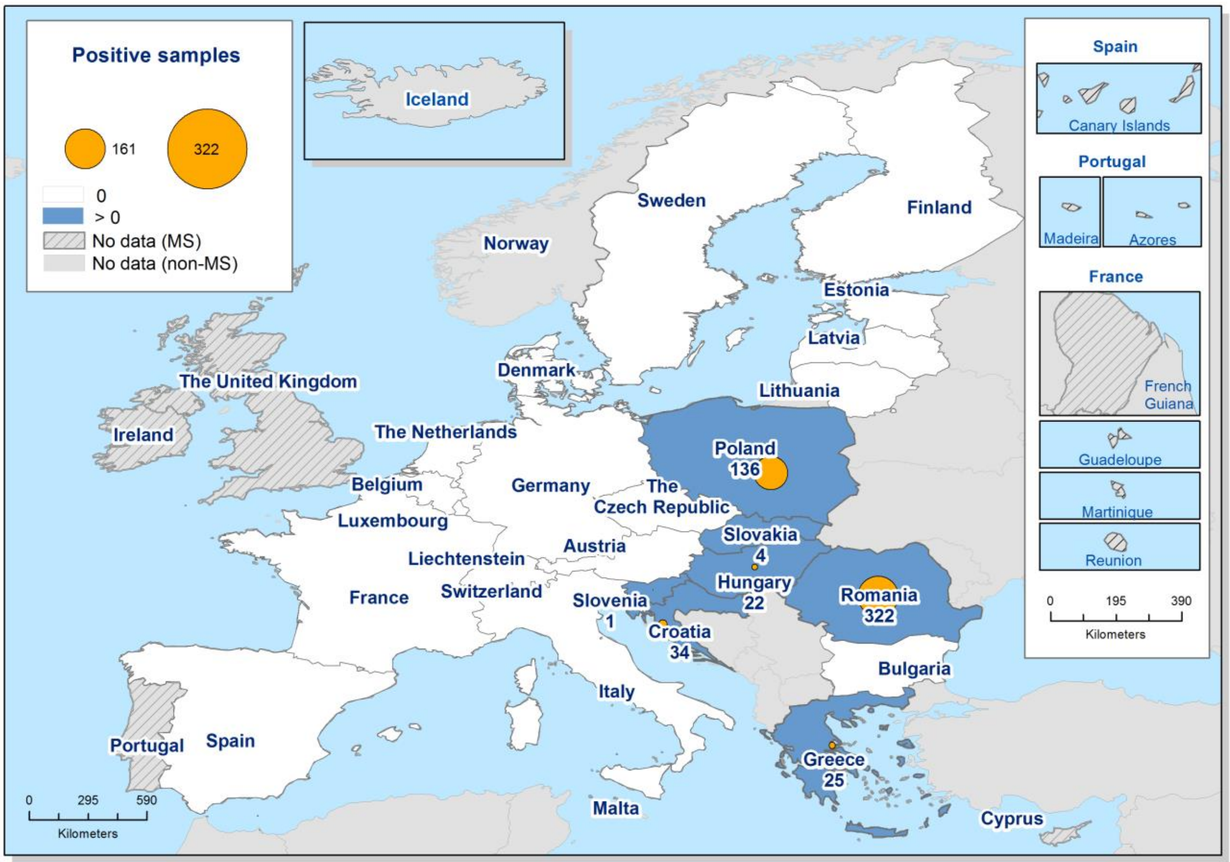


Figure 36. Classical rabies or unspecified Lyssavirus *cases in foxes, 2013*

Bats

Bats infected with rabies virus were found in six MS (France, Germany, Luxembourg, the Netherlands, Poland and Spain). In total, 19 positive cases were found out of 1,442 examined, the corresponding figures for 2012 being 33 and 1,971, respectively (Table RABIESBATS). Thus the rate of positive/examined cases has remained constant in this period.

The apparent prevalence varies from 0.2 % (France) to 8.4 % in Poland and 11.1 % in the Netherlands, but the numbers are probably too small to indicate clear differences between MS. The geographical distribution of classical rabies or unspecified *Lyssavirus* cases in bats in 2013 is shown in Figure 37.

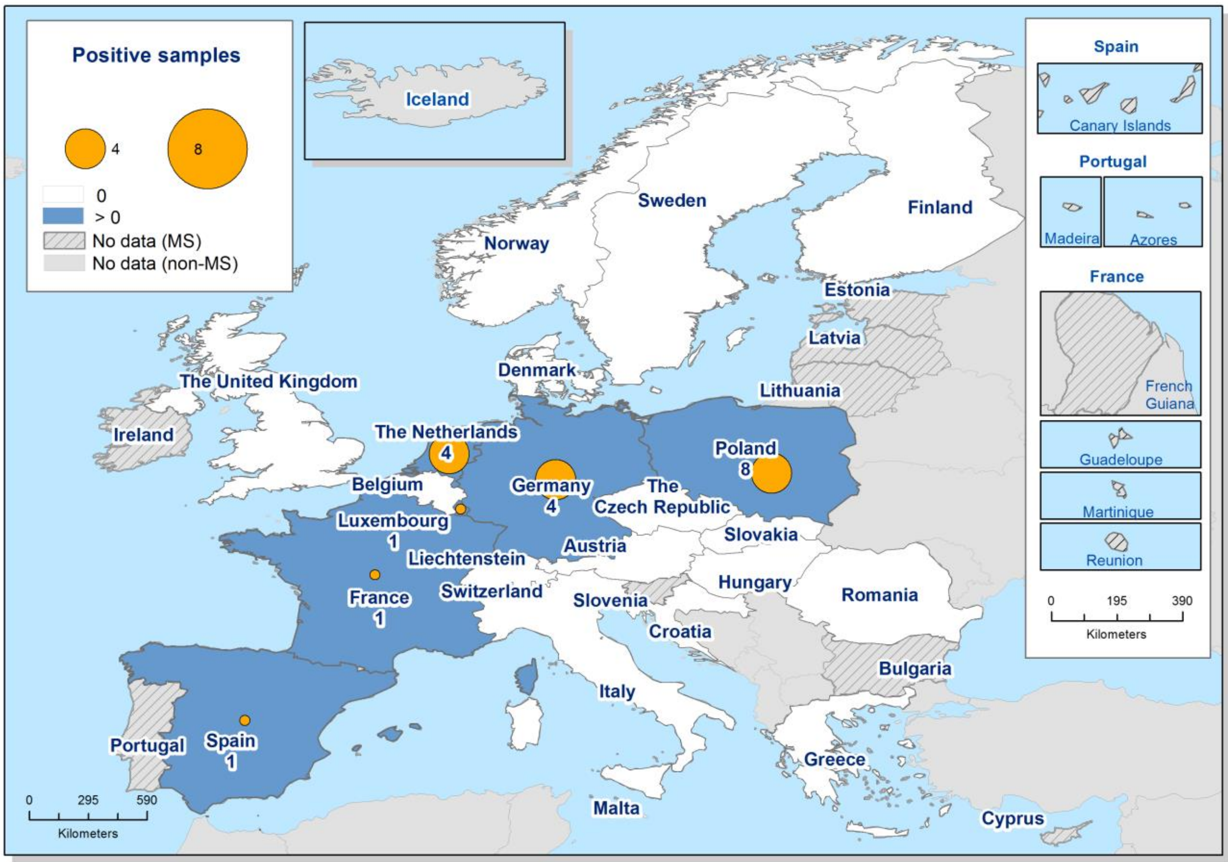


Figure 37. Classical rabies or unspecified **Lyssavirus** *cases in bats, 2013*

3.11.3. Discussion

Human rabies annually claims more than 50,000 lives worldwide. It is a rare and vaccine-preventable zoonosis in Europe but the disease is invariably fatal in infected humans once the first clinical symptoms are declared. Every year, one or two human cases are reported in European citizens, either travel-related or autochthonous. In 2013, one case in a patient who travelled to a third country endemic for rabies was reported in the EU. It remains important to inform and educate the public about the risk of contracting rabies if bitten by animals while travelling to rabies-endemic countries or in MS which have not eradicated the disease in their animal population.

The incidence of rabies in both domestic and wild animals in EU MS has been drastically reduced over the past decades following systematic oral vaccination campaigns and rabies cases have disappeared in western and most of central Europe. Thanks to EU co-financed eradication programmes, eastern European countries have also observed a rapid decline in the number of reported rabies cases in animals following their entry into the EU in 2004. Since 2010, the rate of EU funding for national rabies programmes has been increased up to 75 % of the costs incurred by each MS. About €20 million is spent annually on oral vaccination programmes in wildlife in the MS and bordering areas of neighbouring third countries, as the vast majority of rabies cases in the EU occur in those areas.[32] This is likely due to the fact that the continued presence of sylvatic rabies in neighbouring third countries may continue to feed the endemic cycle in certain areas.

At present, in several countries in eastern Europe, rabies remains a serious endemic disease. The recurrence of rabies in some countries highlights the fragility of rabies-free country status and the need for continuous surveillance. Mass vaccination of pets provides a first line of defence to prevent rabies in humans whereas oral vaccination of foxes has proved efficient for the long-term control and elimination of terrestrial rabies. Rabies control programmes for foxes should be complemented by appropriate management measures in stray dogs and cats (population control and vaccination). Rabies in pets imported from endemic

[32] Commission Implementing Decision (EC) No 2013/722/EU of 29 November 2013 approving annual and multiannual programmes and the financial contribution from the Union for the eradication, control and monitoring of certain animal diseases and zoonoses presented by the Member States for 2014 and the following years. OJ 328, 7.12.2013, p. 101-117.

countries is regularly reported in Europe, highlighting the need for continued vigilance concerning pet movements.

3.12. Q fever

The Appendix contains hyperlinks to all data summarised for the production of this section, for humans, and animals. It also includes hyperlinks to Q fever summary tables and figures that were not displayed in this section because they did not trigger any marked observation. The summarised data are presented in downloadable Excel and PDF files, and are listed by subject. Moreover, all submitted and validated data by the MS are available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm).

3.12.1. Q fever in humans

In 2013, 25 EU MS, Iceland, Norway and Switzerland provided information on Q fever in humans. Belgium has a sentinel surveillance system. In Spain, the data come from the microbiological surveillance system, which covers an estimated 30 % of the population. Seven MS (the Czech Republic, Estonia, Ireland, Lithuania, Luxembourg, Poland and Slovakia) reported no human cases. A total of 648 confirmed cases of Q fever in humans were reported in the EU, four in Norway and 27 in Switzerland (Table 23). The EU notification rate was 0.17 per 100,000 population. The highest notification rate (1.37 cases per 100,000 population) was reported by Hungary. The highest numbers of confirmed cases were reported by France and Hungary (158 and 135, respectively). France and Germany accounted for most of the number of confirmed cases reported in the last three years.

There was a decreasing EU trend of confirmed Q fever cases over the period 2009–2013 (Figure 38). The peak in 2009 was attributed to a large outbreak occurring in the Netherlands between 2007 and 2010 and involving more than 4,000 human cases (Van der Hoek et al., 2012), which is now considered over. There is a seasonal variation in Q fever cases with the peak occurring mostly between April and August. Hungary's increase in notification rate was largely due to an outbreak reported from Baranya county, southern Hungary, in June 2013, with 91 cases affected mainly by pneumonia (ISID, 2013). This increase, however, may have also been influenced by modified diagnostic processes and improved surveillance (Katalin Krisztalovics, Hungarian National Centre for Epidemiology, personal communication, 14 November 2013).

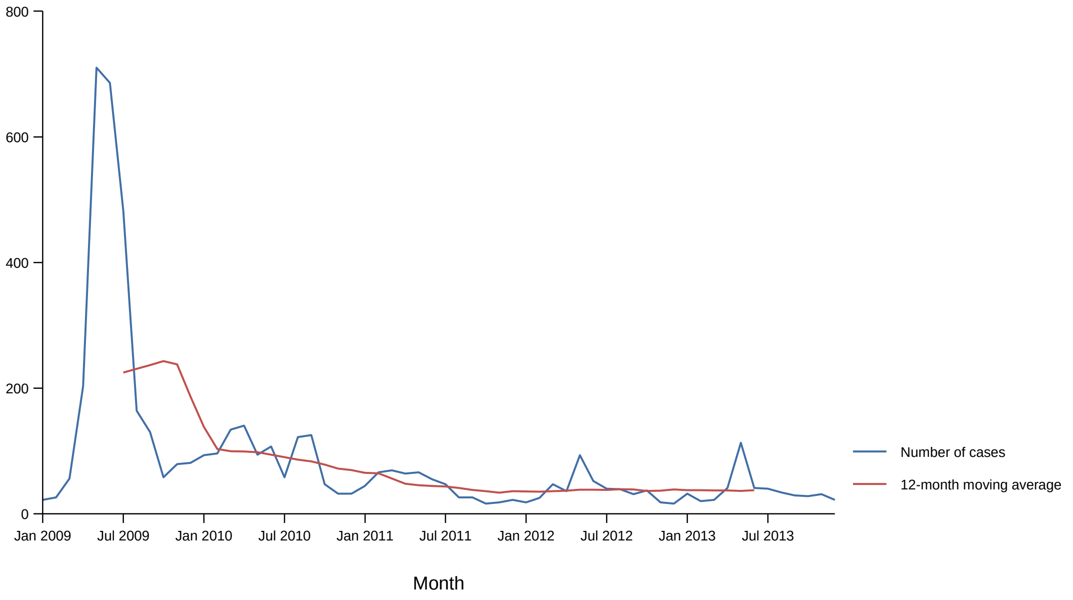
The large majority of cases in the EU were locally acquired (Table COXHUMIMPORT). Only Germany, the Netherlands, Norway, Sweden and the United Kingdom reported travel-associated cases. In Sweden and Norway, most or all cases were, respectively, imported. Of the 25 travel-associated cases reported in total, eight were acquired within another EU country, including six cases acquired in Spain.

Two deaths due to Q fever were reported in 2013, one by Germany and one by Latvia. This resulted in an EU case fatality rate of 0.61 % among the 335 confirmed cases with known outcome (51.2 % of all confirmed cases).

Table 23. Reported cases and notification rates per 100,000 of human Q fever in the EU/EEA, 2009-2013

Country	2013					2012		2011		2010		2009	
	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[(b)]	-	-	-	-	-	-	-	-	-	-	-	-	-
Belgium[(c)]	N	C	6	6	-	18	-	6	-	30	-	33	-
Bulgaria	Y	A	23	23	0.32	29	0.40	12	0.16	14	0.19	22	0.30
Croatia[(d)]	Y	A	25	-	-	43	1.02	-	-	-	-	-	-
Cyprus	Y	C	3	3	0.35	4	0.46	5	0.60	4	0.49	2	0.25
Czech Republic	Y	C	0	0	0.00	1	0.01	1	0.01	0	0.00	0	0.00
Denmark[(b)]	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Finland	Y	C	5	5	0.09	0	0.00	4	0.07	5	0.09	1	0.02
France	Y	C	158	158	0.24	168	0.26	228	0.35	286	0.44	-	-
Germany	Y	C	115	114	0.14	198	0.24	287	0.35	326	0.40	191	0.23
Greece	Y	C	11	11	0.10	11	0.10	3	0.03	1	0.01	3	0.03
Hungary	Y	C	175	135	1.37	36	0.36	36	0.37	68	0.69	19	0.19
Ireland	Y	C	0	0	0.00	5	0.11	4	0.09	9	0.20	17	0.38
Italy	-	-	-	-	-	-	-	-	-	-	-	-	-
Latvia	Y	C	1	1	0.05	1	0.05	1	0.05	2	0.09	0	0.00
Lithuania	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Luxembourg	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Malta	Y	C	2	2	0.48	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	Y	C	20	20	0.12	63	0.38	80	0.48	504	3.04	2354	14.28
Poland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	3	0.01
Portugal	Y	C	23	21	0.20	26	0.25	5	0.05	13	0.13	14	0.14
Romania	Y	C	24	24	0.12	16	0.08	6	0.03	7	0.04	2	0.01
Slovakia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Slovenia	Y	C	1	1	0.05	1	0.05	0	0.00	1	0.05	0	0.00
Spain[(e)]	N	C	75	75	0.54	58	-	33	-	69	-	34	-
Sweden	Y	C	3	3	0.03	2	0.02	5	0.05	11	0.12	5	0.05
United Kingdom	Y	C	46	46	0.07	12	0.02	43	0.07	30	0.05	19	0.03
EU Total	**-**	**-**	**716**	**648**	**0.17**	**692**	**0.16**	**759**	**0.20**	**1380**	**0.35**	**2719**	**0.88**
Iceland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	4	4	0.08	0	0.00	0	0.00	0	0.00	0	0.00
Switzerland[(f)]	Y	C	27	27	0.34	-	-	-	-	-	-	-	-

(a): Y, Yes; N, No; A, aggregated data; C, case-based data;-, no report
(b): Not notifiable, no surveillance system exists
(c): Sentinel surveillance; no information on estimated coverage. Thus notification rate cannot be estimated
(d): All cases of unknown case classification.
(e): Microbiological surveillance system; notification rates calculated based on estimated coverage of 30 %.
(f): Switzerland provided data directly to EFSA.



Source: Belgium, Cyprus, Czech Republic, Finland, Germany, Greece, Hungary, Ireland, Latvia, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden and United Kingdom. Estonia, Iceland, Lithuania, Luxembourg and Slovakia reported zero cases throughout the period. Austria, Croatia, Bulgaria, Denmark, France and Italy were excluded, as they did not report over the whole period, reported cases that were not confirmed or had an unknown month of occurrence.

Figure 38. Trend in reported confirmed cases of human Q fever in the EU/EEA, 2009-2013

3.12.2. *Coxiella burnetii* in animals

Comparability of data

EU MS can report animal cases of Q fever to the EC under Directive 2003/99/EC on the monitoring of zoonoses and zoonotic agents. This directive foresees that, in addition to a number of zoonoses and zoonotic agents, for which monitoring is mandatory, others shall also be monitored where the epidemiological situation so warrants. Because of the use of different tests and analytical methods, as well as different sampling schemes, the results from different countries are not directly comparable. Proposals for harmonised schemes for the monitoring and reporting of Q fever in animals can be found in an External Scientific Report submitted to EFSA (Sidi-Boumedine et al., 2010).

Animals

In 2013, 17 MS and two non-MS provided data on Q fever (*Coxiella burnetii*) in animals. Compared with the previous years, no general trend was observed as regards the number of samples tested and the number of positive samples.

Most of the reporting countries provided information on the type of specimen taken and the analytical method used in testing. Most countries serologically tested blood (serum) or milk samples for the presence of *C. burnetii* antibodies using ELISA or a complement fixation test (CFT). Furthermore, many investigations used direct methods such as testing tissues of aborted fetuses, still-born animals and placental swabs by fluorescent *in situ* hybridization (FISH), RT-PCR, and ImmunoHistoChemistry (IHC). Most of the samples were collected through active or passive monitoring schemes and clinical investigations.

In 2013, most samples from cattle were obtained from passive monitoring, followed by clinical investigations. Unlike in 2012, not all countries reported positive findings (Table COXCATTLE). Finland, Poland, Romania, Spain, and Norway did not detect *C. burnetii* in cattle samples. However, Romania and Spain provided reports with only limited sample sizes (< 15). Belgium, the Czech Republic, Malta, Slovakia and Switzerland tested high numbers of animals. Slovakia and Switzerland reported low percentages of positive samples (2.2 % and 1.6 %, respectively). The other three countries found that between 6 % and 13 % of samples tested positive. Most of these results came from serological testing; therefore, infection could have occurred in animals either in the past or in the present. Germany tested high numbers of animals at herd level; 20 %

of 1,000 herds were positive and reported as clinically affected.[33] Also, Belgium reported clinically affected herds.

The majority of the reports on investigations for Q fever in sheep and goats for 2013 originated from monitoring and clinical investigations. The Czech Republic, Denmark, Finland, Ireland, Latvia, Norway, Poland, Romania and Sweden (50 % of the reporting countries) did not report positive findings. Slovakia and Spain reported positive findings for goats but not sheep. Belgium, Cyprus and Germany reported a few clinically affected sheep and goat herds (Table COXOVINEGOAT).

Overall, all but three (Finland, Poland and Romania) of the 17 reporting MS, and also Switzerland, found animals testing positive to *C. burnetii* in their cattle, sheep or goat populations in 2013. Norway did not find any positive cattle, sheep or goats.

In addition, Germany reported one positive pig herd out of 18 tested, and two non-MS, Norway and Switzerland, provided data on a range of other farmed, domesticated, captive and wild animals and found no positive samples (Table COXOTHERAN).

In May 2013, a Q fever epidemic in people occurred in Baranya county in Hungary. The investigation carried out in cooperation between the human and animal health authorities identified a sheep farm as a possible source of the disease. During the investigation, 1,379 tests were carried out on samples taken from sheep, goat and cattle farms in the area around the sheep farm. In total, 72 bovine, 1 caprine and 34 ovine samples were positive. From the 161 dust samples, 112 (70 %) were positive. Diagnostic methods used were a CFT and an IHC test. There were no clinically affected herds.

Source: The Hungarian National Zoonoses Report, 2013

3.12.3. Discussion

In 2013, the notification rate of confirmed cases of Q fever in people continued to decrease by 0.01 per 100,000 population compared with 2012. France and Germany accounted for most of the number of confirmed cases reported in the last three years. Hungary experienced an outbreak in humans in May 2013 and a sheep farm was identified to be the source.

All but three of the 17 reporting MS found animals positive for *C. burnetii*, which demonstrates that the pathogen is widely distributed in the EU. Positive findings were detected in cattle and sheep, as well as in goats and in one pig herd. Few MS reported clinically affected herds.

3.13. West Nile virus

The Appendix contains hyperlinks to all data summarised for the production of this section, for humans and animals. It also includes hyperlinks to WNV summary tables and figures that were not displayed in this section because they did not trigger any marked observation. The summarised data are presented in downloadable Excel and PDF files, and are listed by subject. Moreover, all submitted and validated data by the MS are available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm).

3.13.1. West Nile fever in humans

In 2013, 24 MS and one non-MS provided information on West Nile fever (WNF) in humans. Belgium and France have sentinel surveillance systems, which cover only part of the population, so no rates could be calculated for these countries. Ten MS (Croatia, the Czech Republic, France, Greece, Hungary, Ireland, Italy, Romania, Slovenia and Sweden) reported human cases, which was two MS more than in 2012 (the Czech Republic, Ireland and Slovenia reported cases, while Bulgaria reported zero cases). In total, 250 cases of WNF in people, of which 186 were confirmed, were reported in the EU in 2013, acquired either locally or during travel in or outside of Europe. The EU notification rate was 0.08 cases per 100,000 population (Table 24). There was an increase of 0.01 per 100,000 population (10 %) in notification rate compared with 2012 (238 cases), and an increase of 0.04 (88 %) compared with 2011 (132 cases). However, the notification rate was lower than in 2010. As in previous years, Greece had the highest notification rate in 2013 (0.78 cases per 100,000 population); the type of cases reported varies however between countries, making the comparison difficult. Compared with 2012, notification rates increased, particularly in Croatia, by 0.34 (14 cases), in Italy, by 0.08 (51 cases) and in Hungary, by 0.2 (19 cases), but rates in Greece decreased by 0.68 (86 cases).

33 A herd is defined as clinically affected based on a combination of results from PCR and serological tests as described respectively for cattle and sheep/goats in the zoonoses reporting manual (EFSA, 2014b).

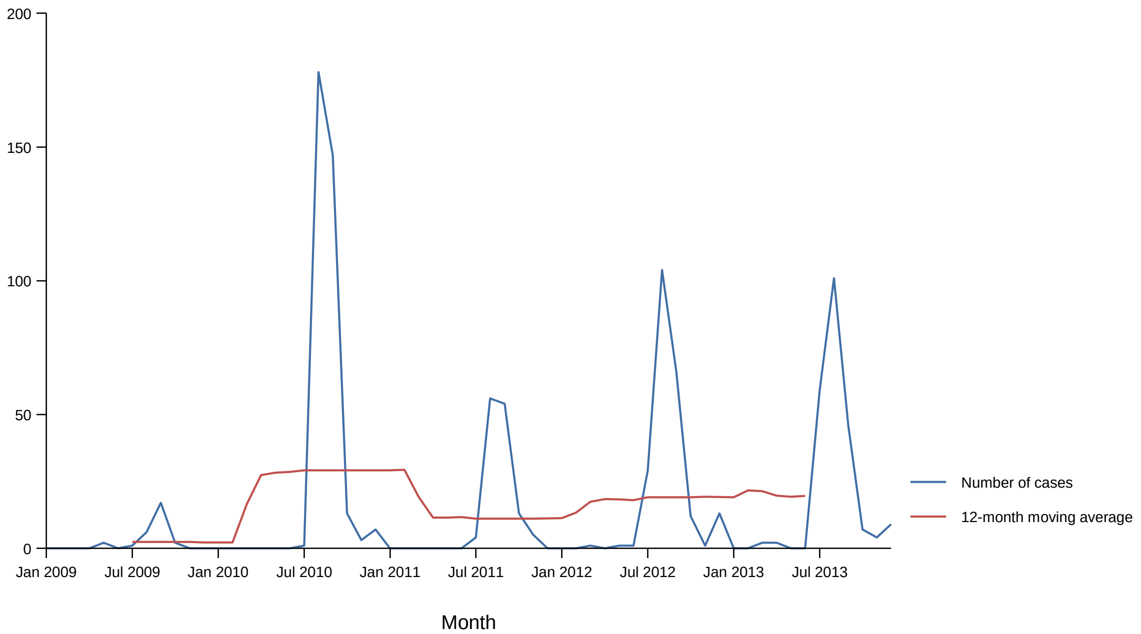
Table 24. Reported cases and notification rates per 100,000 of human West Nile fever in 2009-2013 (total cases)

Country	2013					2012		2011		2010		2009	
	National Coverage[a]	Data Format[a]	Confirmed Cases	Total cases & rates		Total cases & rates		Total cases & rates		Total cases & rates		Total cases & rates	
				Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	-	-	-	-	-	0	0.00	0	0.00	0	0.00	0	0.00
Belgium[b]	N	C	0	0	-	2	-	0	-	0	-	0	-
Bulgaria	Y	C	0	0	0.00	4	0.06	-	-	-	-	-	-
Croatia	Y	A	20	20	0.48	6	0.14	-	-	-	-	-	-
Cyprus	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	1	1	0.01	0	0.00	0	0.00	0	0.00	0	0.00
Denmark[c]	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Finland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
France[b]	N	C	1	1	-	3	-	1	-	3	-	1	-
German[c]	-	-	-	-	-	-	-	-	-	-	-	-	-
Greece	Y	C	48	86	0.78	162	1.46	100	0.90	262	2.34	0	0.00
Hungary	Y	C	12	36	0.37	17	0.17	4	0.04	19	0.19	7	0.07
Ireland	Y	C	1	1	0.02	0	0.00	1	0.02	0	0.00	0	0.00
Italy	Y	C	79	79	0.13	28	0.05	14	0.02	5	0.01	18	0.03
Latvia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Lithuania	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Luxembourg	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Malta	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	Y	C	0	0	0.00	0	0.00	1	0.01	1	0.01	0	0.00
Poland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Portugal[2]	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	22	24	0.12	15	0.08	11	0.06	57	0.28	2	0.01
Slovakia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Slovenia	Y	C	1	1	0.05	0	0.00	0	0.00	0	0.00	0	0.00
Spain	Y	C	0	0	0.00	0	0.00	0	0.00	2	0.00	0	0.00
Sweden	Y	C	1	1	0.01	1	0.01	0	0.00	0	0.00	0	0.00
United Kingdom	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
EU Total	**-**	**-**	**186**	**250**	**0.08**	**238**	**0.07**	**132**	**0.04**	**349**	**0.11**	**28**	**0.01**
Iceland	-	-	-	-	-	-	-	-	-	-	-	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Switzerland[d]	Y	C	1	1	0.01	1	0.01	0	0.00	0	0.00	0	0.00

(a): Y, Yes; N, No; A, Aggregated data; C, Case-based data; -, No report.
(b): Sentinel surveillance; coverage unknown and notification rate cannot be estimated.
(c): No surveillance system.
(d): Switzerland provided data directly to EFSA.

The vast majority of cases reported in Greece, Hungary, Italy and Romania were domestically acquired. France, Sweden and Switzerland reported only travel-associated cases, one case each. Italy and Hungary both reported locally acquired cases, as well as two and one travel-associated cases, respectively. Of the total of five travel-associated cases reported by EU MS, three were acquired within Europe (Serbia, Hungary and Former Yugoslav Republic of Macedonia) and two cases contracted the infection in Africa.

WNF has been reportable at the EU level since 2008. Since then, the number of cases has varied from year to year (Figure 39). However, a slight (not significant) increasing trend can be observed. Since 2009, in Hungary and Italy, case numbers have been increasing, while they have decreased in Greece. There was also strong seasonality in the number of WNF cases reported in the EU in 2009-2013, with most cases (82 %) being reported between July and September.



Source: Czech Republic, Greece, Hungary, Ireland, Italy, the Netherlands, Norway, Romania, Slovenia, Spain and Sweden. Belgium, Cyprus, Estonia, Finland, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Slovakia and United Kingdom reported zero cases throughout the period. Austria, Bulgaria and Croatia did not report data over the whole period or not at the level of detail required for analysis. Denmark, Germany and Portugal do not have a surveillance system for this disease.

Figure 39. Trend in reported total cases of human West Nile fever in the EU/EEA, 2009-2013

Three MS (Hungary, Romania and Slovenia) provided data on hospitalisation for all of their cases (20.8 % of the cases reported in the EU), with an average rate of hospitalisation of 91.7 %.

Six MS provided information on the outcome of the disease. The overall EU case-fatality rate was 3.4 % among the 227 probable and confirmed cases for which this information was reported (90.8 % of all cases). This is much lower than the 11.1 % EU case-fatality rate reported in 2012. However, case-fatality rates for the two most affected countries, Greece and Italy, remained similar over the last three years.

3.13.2. West Nile virus in animals

Comparability of data

In the EU, the reporting of WNV infections in animals is not mandatory. European MS can report WNV infections in animals to the EC under Directive 2003/99/EC on the monitoring of zoonoses and zoonotic agents. This directive foresees that, in addition to the number of zoonoses and zoonotic agents, for which monitoring is mandatory, others shall also be monitored when the epidemiological situation so warrants. Owing to heterogeneity in study design and analytical methods, the reported WNV prevalence in birds and solipeds from different countries is not directly comparable. Proposals for harmonised schemes for the monitoring and reporting of WNV in animals can be found in an External Scientific Report submitted to EFSA (Mannelli et al., 2012).

In 2013, a total of 21,223 animals (solipeds, birds and other animal species) were reported to be tested for WNV, which is an increase compared to 2012 when 18,460 animals were tested. Of these tested animals, the number of positive cases decreased, with 244 animals reported positive in 2013, as compared to 664 positive cases in 2012.

In 2013, 8,937 birds have been sampled for WNV in six MS (Belgium, Germany, Hungary, Italy, Spain and the United Kingdom) and six more in Switzerland. A total of 82 positive samples were reported by Hungary, Italy and Spain (Figure 40).

Figure 40. Findings of West Nile virus in birds in the EU, in 2013

Furthermore in 2013, 12,278 solipeds have been tested in 12 MS (Croatia, Cyprus, the Czech Republic, Finland, Germany, Greece, Hungary, Italy, Slovakia, Slovenia, Spain and the United Kingdom) and one more in Switzerland, in 2013. A total of 162 positive cases were detected in 10 MS: Croatia (9), Cyprus (1), the Czech Republic (5), Finland (35), Greece (18), Hungary (1), Italy (56), Slovenia (1), Spain (35) and the United Kingdom (1). But in Finland and the United Kingdom the positive horses were imported and are therefore not displayed in Figure 41.

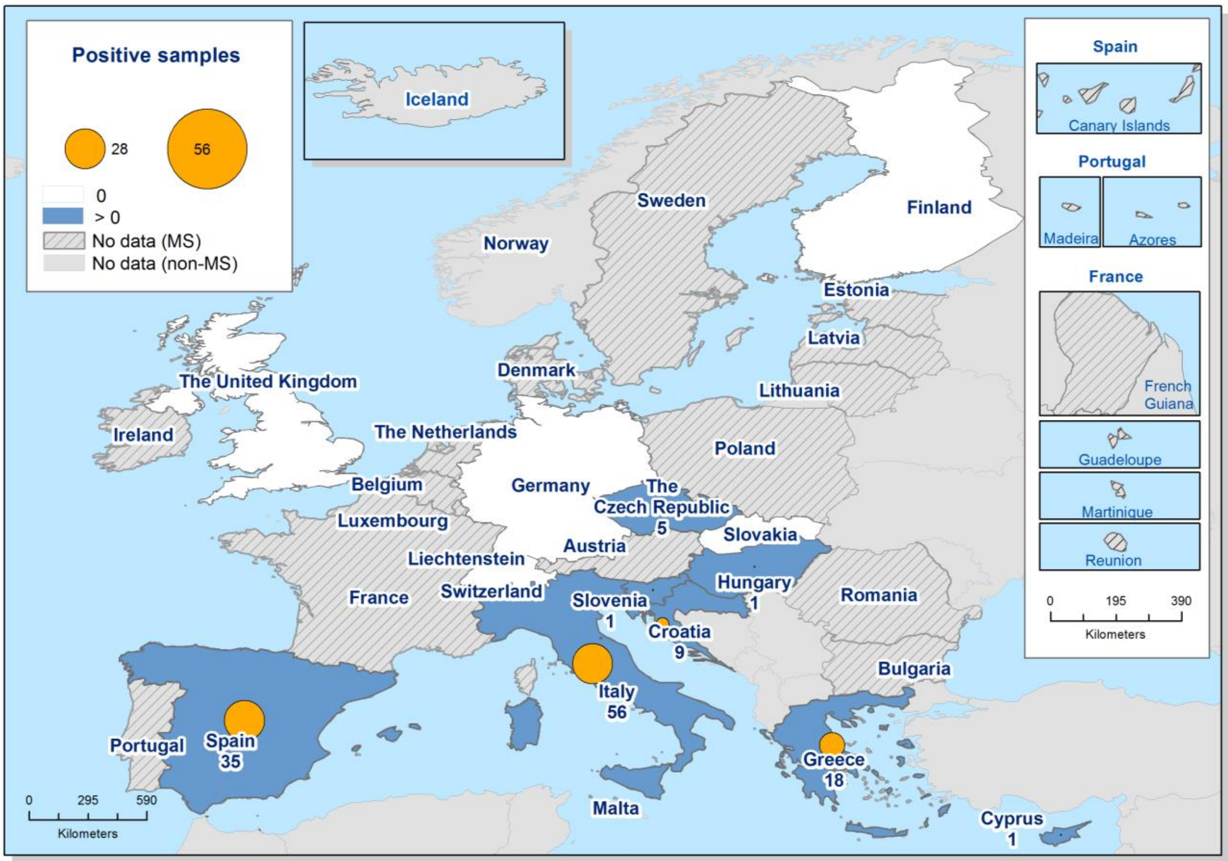


Figure 41. Findings of West Nile virus in domestic solipeds in the EU, in 2013

In Finland during the year 2013, 193 horses from intra-EU trade and eight horses imported from outside EU were tested negative by ELISA for IgM WNV antibodies (acute infection). IgG antibodies were found in 29 horses from intra-EU trade and six horses imported from outside EU (from US). The vaccination status for WNV was known only in one horse in intra-EU trade.

Source: The Finnish National Zoonoses Summary Report, 2013

In the United Kingdom, about 350 birds per year are sampled as part of the United Kingdom's WNV surveillance programme. Sampling is carried out from April to October during the mosquito season. Target species are sampled (small passerines, corvids, waterside birds), birds with neurological signs and mass mortality incidents. Horses are sampled post import or if clinical suspicion indicates sampling is necessary. In 2013, no WNV infection was detected during the year. In an imported horse, the results of testing were complement ELISA (cELISA)-positive but IgM ELISA negative so this case was considered either a historical infection or cross-reaction with unknown *Flavivirus*.

Source: The United Kingdom National Zoonoses Summary Report, 2013

3.13.3. Discussion

In 2013, the number of human cases of WNF reported in the EU/EEA increased slightly compared with 2012, but was lower than in 2010. Three countries in the EU (Hungary, Italy and Romania) have reported autochthonous cases for five consecutive years and the figures vary throughout the years. Greece, which has implemented enhanced surveillance for WNV infection in humans and animals, has been affected for four consecutive years but the notification rate seems to be going down. Croatia has reported cases to the EU for two consecutive years. New areas were affected in Italy, Hungary and Croatia, and the Czech Republic reported its first locally acquired case. Interestingly, the Czech Republic reported positive horses for the second year in 2013. Of 783 blood samples from horses, five were confirmed as serologically positive. There were, however, no clinical cases and cross reactivity of laboratory diagnostics with viral tick-borne encephalitis in the Czech Republic is considered to occur frequently.[34]

It is important to point out that variations and differences in case numbers are partly due to variations and differences in surveillance systems. In addition, the increase in case reports can be partly explained by the substantial efforts made to strengthen the level of detection in the affected countries or in newly affected countries, as soon as the first cases are identified. Health professionals (including blood safety authorities) are alerted at the beginning of the season, as are the stakeholders involved in animal and entomological surveillance. A detailed overview for both the EU and neighbouring countries, including at the regional level, is published on the ECDC website (ECDC, 2012b) with an epidemiological update summarising the WNF season and the last weekly update of the ECDC West Nile risk map.

In 2012, MS agreed to begin reporting WNV at the EU level under Directive 2003/99/EC on the monitoring of zoonoses and zoonotic agents. Although the number of tested animals increased in 2013 compared with the previous year, there were less than half as many cases detected in 2013 compared with 2012. In addition to the countries that had already reported WNV presence in animals in 2012, positive samples were also reported by Croatia, Cyprus and Finland in 2013. In Finland and the United Kingdom, these samples were from imported animals which tested negative for immunoglobulin IgM WNV antibodies but positive for IgG antibodies, so these cases can be considered either as historical infections or cross-reactions with unknown Flavivirus. In Croatia, on the other hand, nine out of 266 IgG-positive samples tested positive for IgM antibodies. Presumed acute infections in animals (IgM- or PCR-positive samples) were reported by only some of the Mediterranean countries and by the Czech Republic and Hungary.

3.14. Tularaemia

The Appendix contains hyperlinks to all data summarised for the production of this section, for humans and animals. It also includes hyperlinks to tularaemia summary tables and figures that were not displayed in this section because they did not trigger any marked observation. The summarised data are presented in downloadable Excel and PDF files, and are listed by subject. Moreover, all submitted and validated data by the MS are available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm).

3.14.1. Tularaemia in humans

In 2013, 24 MS, Iceland, Norway and Switzerland provided information on tularaemia in humans. Seven MS (Cyprus, Greece, Ireland, Latvia, Luxembourg, Malta and the United Kingdom) reported no human cases. A total of 279 confirmed cases of tularaemia in humans were reported in the EU, 28 in Norway and 30 were reported in Switzerland (Table 25). The EU notification rate was 0.07 per 100,000 population. There was a decrease in the EU notification rate of 0.13 per 100,000 population (-70 %) compared with 2012 (942 cases). As in the previous four years, the highest notification rate was observed in Sweden (1.13 cases per 100,000 population). The highest case numbers were reported from Sweden and Hungary (114 and 49, respectively). Notification rates vary across countries and within each country over time. The largest decreases in notification rate were observed in Finland, by 3.03 (-94 %) and Sweden, by 5.09 (-82 %).

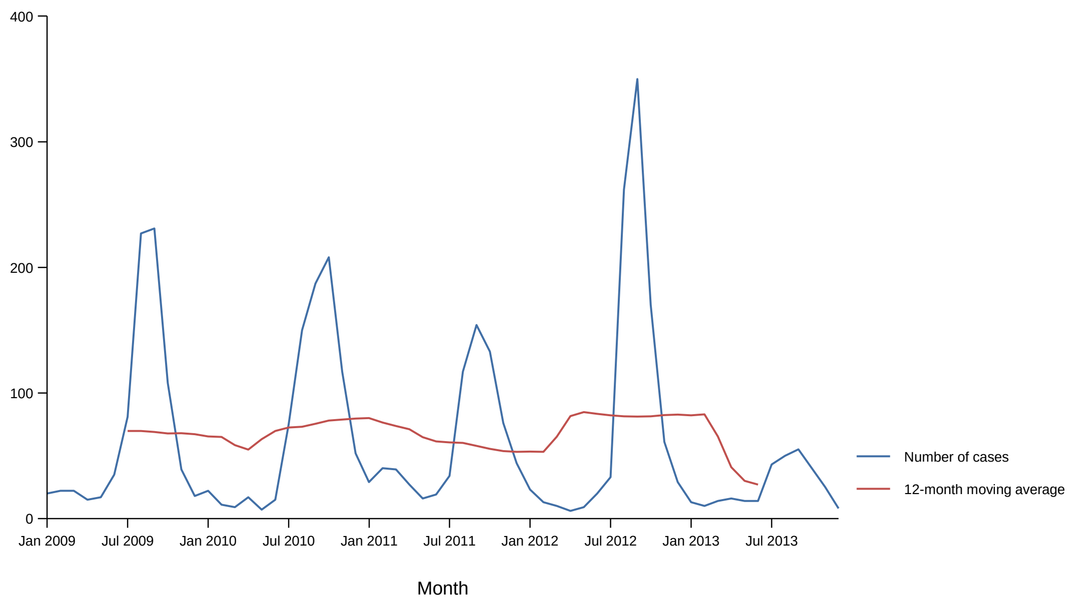
34 Source: The Czech Republic national zoonoses report.

Table 25. Reported cases and notification rates per 100,000 of human tularaemia in 2009-2013

Country	2013					2012		2011		2010		2009	
	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	2	2	0.02	2	0.02	0	0.00	3	0.04	2	0.02
Belgium	Y	A	1	1	0.01	0	0.00	0	0.00	0	0.00	0	0.00
Bulgaria	Y	A	1	1	0.01	0	0.00	0	0.00	3	0.04	7	0.09
Croatia	Y	C	2	2	0.05	1	0.02	-	-	-	-	-	-
Cyprus	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	36	36	0.34	42	0.40	57	0.54	50	0.48	64	0.61
Denmark[(b)]	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	1	1	0.08	0	0.00	2	0.15	0	0.00	0	0.00
Finland	Y	C	15	15	0.28	233	4.31	75	1.40	91	1.70	405	7.60
France	Y	C	40	21	0.03	5	0.01	16	0.03	22	0.03	16	0.03
Germany	Y	C	20	20	0.02	21	0.03	17	0.02	31	0.04	10	0.01
Greece	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Hungary	Y	C	49	48	0.49	18	0.18	15	0.15	126	1.28	38	0.39
Ireland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Italy	-	-	-	-	-	2	0.00	0	0.00	1	0.00	2	0.00
Latvia	Y	C	0	0	0.00	6	0.29	0	0.00	0	0.00	0	0.00
Lithuania	Y	C	4	4	0.14	3	0.10	0	0.00	1	0.03	1	0.03
Luxembourg	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Malta	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands[(b)]	-	-	-	-	-	-	-	-	-	-	-	-	-
Poland	Y	C	8	8	0.02	6	0.02	6	0.02	4	0.01	1	0.00
Portugal[(b)]	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	1	1	0.01	0	0.00	0	0.00	4	0.02	0	0.00
Slovakia	Y	C	9	9	0.17	8	0.15	5	0.09	17	0.32	22	0.41
Slovenia	Y	C	2	2	0.10	4	0.20	0	0.00	0	0.00	1	0.05
Spain	Y	C	2	0	0.00	1	0.00	1	0.00	1	0.00	12	0.03
Sweden	Y	C	114	108	1.13	590	6.22	350	3.72	484	5.18	244	2.64
United Kingdom	Y	C	0	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00
EU Total	**-**	**-**	**306**	**279**	**0.07**	**942**	**0.199**	**544**	**0.12**	**839**	**0.18**	**825**	**0.18**
Iceland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Liechtenstein[(b)]	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	28	28	0.55	50	1.00	180	3.66	33	0.68	13	0.27
Switzerland[(c)]	Y	C	30	30	0.37	40	0.50	15	0.19	14	0.18	4	0.05

(a): Y, yes; N, no; A, aggregated data; C, case-based data;-, no data.
(b): No surveillance system.
(c): Switzerland provided data directly to EFSA.

There was a decreasing EU trend (not significant) of confirmed tularaemia cases in 2009–2013 (Figure 42). The peak in 2012 was attributed to high case numbers occurring in Finland and Sweden. There is a seasonal variation in tularaemia cases, and the peak occurs mostly between July to October.



Source: Austria, Bulgaria, Czech Republic, Estonia, Finland, France, Germany, Hungary, Latvia, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom. Cyprus, Greece, Iceland, Ireland, Luxembourg and Malta reported zero cases throughout the period. Belgium, Croatia, Lithuania and Italy did not report data over the whole period at the level of detail required for analysis. Denmark, Netherlands and Portugal do not have a surveillance system for this disease.

Figure 42. Trend in reported confirmed cases of human tularaemia in the EU/EEA, 2009-2013

The majority of tularaemia cases in Europe were reported to be locally acquired (80.3 %) (Table TULARHUMIMPORT). Only Germany, Hungary and Norway reported travel-associated cases. Of the five travel-associated cases reported in total, four were acquired within another EU country, including two acquired in Sweden.

Eight MS provided data on hospitalisation for all or some of their cases which accounted for 26.9 % of the confirmed cases in the EU. On average, 52 % of confirmed tularaemia cases were hospitalised.

Nine MS provided information on the outcome of their cases which accounted for 46.3 % of all confirmed cases. No deaths due to tularaemia were reported in 2013.

3.14.2. *Francisella tularensis* in animals

Only one MS, Sweden, reported on the occurrence of *Francisella tularensis (F. tularensis)* in animals during 2012 and 2013. In 2013, Sweden investigated 37 wild hares submitted for necropsy and found 11 positive animals (29.7 %), similar to the level observed in 2012 when 12 positive hares (29.3 %) were detected out of 41 tested animals. Sweden also tested 238 wild rodents without positive findings. All the samples were derived from passive monitoring.

3.14.3. Discussion

The incidence of tularaemia is highly variable among MS. Most cases are usually diagnosed in Sweden and Finland, followed by Norway, Hungary and the Czech Republic. Southern European countries are more exceptionally affected. The increase in case numbers reported to TESSy from France is an artefact, probably due to differences in case definitions, as data displayed by the French public health website do not show this increase (InVS, 2014). The Netherlands do not report the disease to ECDC; however, since 2011, after more than 50 years without autochthonous cases, there have been five human cases of tularaemia and three confirmed cases in hares. Tularaemia cases were found at different locations throughout the Netherlands (Zomer et al., 2014).

Only Sweden reported to EFSA on the occurrence of *F. tularensis* in animals during 2012 and 2013, and positive findings were found in wild hares in both years. According with the OIE World Animal Health Information Database (WAHID), in addition to Sweden, four other MS and one non-MS have reported findings of *F. tularensis* in animals during the years 2012-2013.

3.15. Other zoonoses and zoonotic agents

Submitted and validated data by the MS are available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm).

3.15.1. *Cysticercus*

Belgium and Sweden reported information on *Cysticercus* in slaughter animals, during the period 2011-2013.

For *Taenia saginata (T. saginata)* cysts, in Belgium, 808,075 cattle were inspected at the slaughterhouse and 994 (0.12 %) carcases were found to be positive in 2013, of which 16 were heavily contaminated. In 2012 and 2011, the proportions of positive carcases reported were 0.15 % and 0.16 %, respectively.

In 2013, Sweden inspected 417,384 bovine carcases for *Cysticercus* cysts (*T. saginata*) and detected one positive, which is consistent with the data reported in 2012 and 2011.

Sweden also reported data on *T. solium* cysts in pigs at slaughter. As in 2011 and 2012, in 2013, none of the 2,550,712 tested pig carcases was found to be positive.

3.15.2. *Sarcocystis*

Belgium reported data on *Sarcocystis* in bovine carcases from meat production animals at the slaughterhouse in 2013. Of the 808,075 carcases inspected, 75 (0.009 %) were found to be positive, which is similar to what was reported in 2012 (0.007 %).

3.16. Food-borne outbreaks

The Appendix contains hyperlinks to all data summarised for the production of this section, for food-borne outbreaks. It also includes hyperlinks to food-borne outbreaks summary tables and figures that were not displayed in this section because they did not trigger any marked observation. The summarised data are presented in downloadable Excel and PDF files, and are listed by subject. Moreover, all submitted and validated data by the MS are available online (http://www.efsa.europa.eu/en/efsajournal/pub/3991.htm).

Comparability of data

It is important to note that the food-borne outbreak investigation systems at the national level are not harmonised among MS. Therefore, the differences in the number and type of reported outbreaks, as well as in the causative agents, may not necessarily reflect the level of food safety among MS; rather they may indicate differences in the sensitivity of the national systems in identifying and investigating food-borne outbreaks. In addition, some MS implemented changes in national systems over time, which had an impact on the number of outbreaks reported by the same MS in different years.

3.16.1. General overview

The reporting of investigated food-borne outbreaks has been mandatory for EU MS since 2003. Starting in 2007, harmonised specifications on the reporting of food-borne outbreaks at the EU level have been applied. Since 2010, revised reporting specifications for food-borne outbreaks were implemented and the distinction between 'verified' and 'possible' food-borne outbreaks was abandoned. Instead, outbreaks were categorised as having 'strong evidence' or 'weak evidence' based on the strength of evidence implicating a suspected food vehicle. In the former case, i.e. where the evidence implicating a particular food vehicle was strong, based on an assessment of all available evidence, a detailed dataset was reported for outbreaks. In the latter case, i.e. where no particular food vehicle was suspected or where the evidence for food-borne outbreaks implicating a particular food vehicle was weak, only a limited dataset was reported. This minimal dataset included the number of outbreaks per causative agent and the number of human cases, hospitalisations and deaths. In this section the term 'weak-evidence outbreak' also covers outbreaks for which no particular food vehicle was suspected.

Data from 2013 provide information on the total number of reported food-borne outbreaks attributed to different causative agents, including food-borne outbreaks for which the causative agent was unknown.

In this general overview, all reported food-borne outbreaks, including water-borne outbreaks, are included in the tables and figures. In Section 3.16.2, outbreaks are presented in more detail and are categorised by the causative agent, excluding strong-evidence water-borne outbreaks. All water-borne outbreaks with strong evidence are addressed separately in Section 3.16.3.

In 2013, 24 MS and three non-MS provided data on food-borne outbreaks, whereas no outbreak data were reported by Bulgaria, Cyprus, Italy and Luxembourg.

Types of evidence supporting the outbreaks

The classification of outbreaks as either strong- or weak-evidence outbreaks was based on an assessment of all available evidence, and more than one type of evidence is often reported in one outbreak. For strong-evidence outbreaks, the types of supporting evidence are:

- Epidemiological evidence:
  - Descriptive epidemiological evidence
  - Analytical epidemiological evidence
- Microbiological evidence:
  - Detection in the food vehicle or its component and detection of the indistinguishable causative agent in humans
  - Detection in the food chain or its environment and detection of the indistinguishable causative agent in humans
  - Detection in the food vehicle or its component and symptoms and onset of illness pathognomonic of the causative agent found in the food vehicle or its component or in the food chain or its environment
  - Detection in the food chain or its environment and symptoms and onset of illness pathognomonic of the causative agent found in the food vehicle or its component or in the food chain or its environment

The types of evidence reported for the strong-evidence outbreaks, including strong-evidence water-borne outbreaks, are presented in Table FBOEVID.

Number of outbreaks and human cases

In 2013, a total of 5,196 food-borne outbreaks, including both weak- and strong-evidence outbreaks, were reported by the 24 reporting MS. The overall reporting rate in 2013 at the EU level was 1.19 outbreaks per 100,000 population (Table 26), which was similar to the rate observed in 2012 (1.07).

As in the previous year, Latvia continued to have the highest reporting rate, followed by Slovakia (Table 26 and Figure 43). France reported the largest number of outbreaks and accounted for 23.5 % of all reported outbreaks, followed by Latvia with 11.5 % of the total outbreaks reported.

A total of 839 strong-evidence outbreaks were reported by 21 MS, representing 16.1 % of the total number of food-borne outbreaks recorded in 2013 (Table 26). This was 10 % higher than the number of strong-evidence outbreaks reported in 2012. As in previous years, the highest numbers of strong-evidence outbreaks were reported by France, Spain and Poland, accounting for 63.4 % of the total number of reported strong-evidence outbreaks in 2013 (Table 26). MS varied in the proportion of strong- and weak-evidence outbreaks reported in 2013 (Figure 44).

Overall, the 5,196 outbreaks reported by MS involved 41,962 human cases, 5,946 hospitalisations and 11 deaths. The 70 outbreaks reported in total by the non-MS (Iceland, Switzerland and Norway) comprised 1,236 human cases with 11 hospitalisations and one fatality. It is important to note that the number of human cases may be unknown for some outbreaks. With regard to the 839 strong-evidence outbreaks reported in the EU, a total of 13,524 human cases were involved and, of these cases, 1,811 people (13.4 %) were admitted to hospital and nine people died (0.07 %). In the non-MS, eight strong-evidence outbreaks were reported involving 133 human cases with nine hospitalisations and one fatality (Table 26).

In 2012 5,363 outbreaks (763 with strong-evidence) were reported by 25 MS, involving 55,453 human cases, 5,118 hospitalisations and 41 deaths, in 2012. The noticeable lower number of human cases during 2013 is mainly explained by one strong-evidence norovirus outbreak reported by Germany in 2012, which affected 10,950 people (EFSA and ECDC, 2014). This outbreak was reported as having school/kindergarten as a setting and was associated with one batch of frozen strawberries from China mainly distributed through one big catering company.

Of the nine fatalities related to strong-evidence outbreaks, three were associated with *Salmonella*, three with *Listeria* (under 'Other bacterial agents'), one with *Clostridium perfringens* (*C. perfringens*) toxins, one with mushroom toxins and one with an unknown agent (Table 27).

Further details on the number of food-borne outbreaks and human cases reported in the EU and in non-MS in 2013 can be found in Table 26.

Table 26. Number of all food-borne outbreaks and human cases in the EU, 2013

Country	Strong-evidence outbreaks				Weak-evidence outbreaks				Total outbreaks	Reporting rate per 100,000
	N	Cases	Hospitalised	Deaths	N	Cases	Hospitalised	Deaths		
Austria	24	262	34	0	109	306	74	0	133	1.57
Belgium	23	264	28	0	288	1048	66	0	311	2.79
Croatia	6	94	18	0	54	658	32	0	60	1.41
Czech Republic	0	0	0	0	19	350	50	0	19	0.18
Denmark	40	1590	53	0	29	385	7	0	69	1.23
Estonia	1	28	2	0	13	276	10	0	14	1.06
Finland	15	410	16	0	28	357	20	0	43	0.79
France	249	2558	152	2	972	7273	394	0	1221	1.86
Germany	33	865	290	3	375	1221	224	0	408	0.51
Greece	2	50	0	0	22	503	34	0	24	0.22
Hungary	9	409	27	0	110	1145	136	0	119	1.2
Ireland	5	51	17	0	20	155	28	0	25	0.54
Latvia	1	7	4	0	597	1818	1073	0	598	29.55
Lithuania	18	151	124	0	97	220	173	0	115	3.87
Malta	0	0	0	0	6	57	0	0	6	1.42
Netherlands	8	23	0	0	283	1442	6	0	291	1.73
Poland	125	949	397	1	321	4559	957	0	446	1.16
Portugal	18	372	25	0	0	0	0	0	18	0.17
Romania	19	428	316	0	1	14	9	0	20	0.1
Slovakia	4	235	14	0	454	2308	629	0	458	8.46
Slovenia	0	0	0	0	4	56	9	0	4	0.19
Spain	158	1769	239	0	266	2819	157	2	424	0.91
Sweden	16	476	3	0	270	1207	11	0	286	2.99
United Kingdom	65	2533	52	3	19	261	36	0	84	0.13
Iceland	0	0	0	0	3	34	1	0	3	0.93
Norway	4	114	8	1	55	1016	0	0	59	1.17
Switzerland	4	19	1	0	4	53	1	0	8	0.1
Total (MS)	839	13524	1811	9	4357	28438	4135	2	5196	1.19

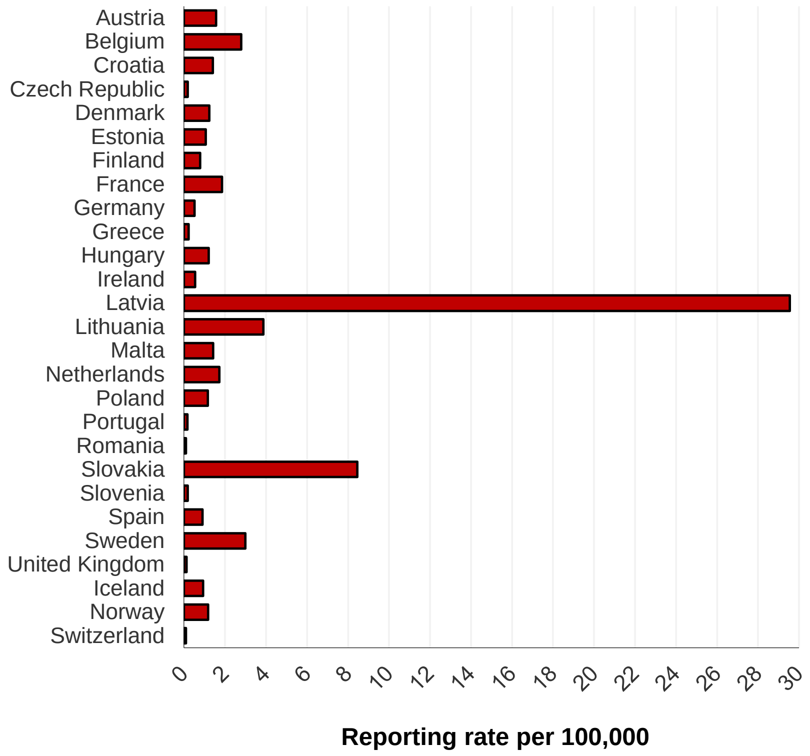


Figure 43. Reporting rate per 100,000 population in Member States and non-Member States, 2013

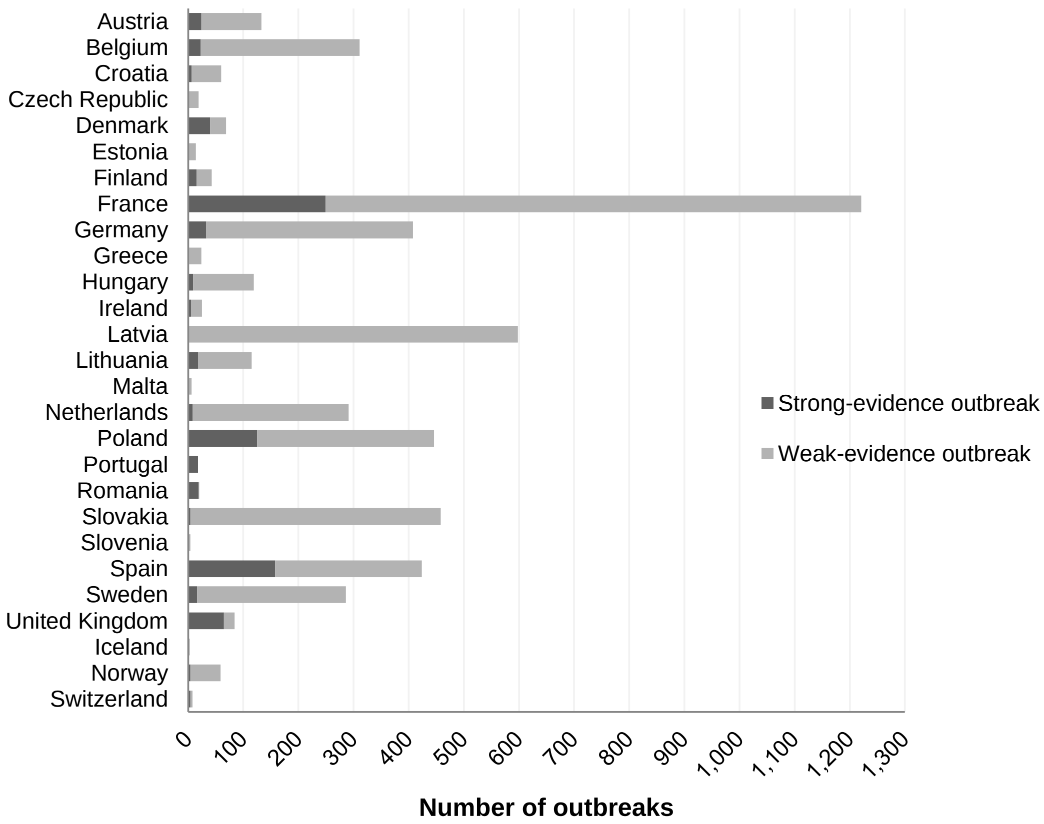


Figure 44. Distribution of food-borne outbreaks in Member States and non-Member States, 2013

Causative agents

Within the EU, the causative agent was known in 71.1 % of the total number of outbreaks reported (Table 27 and Figure 45). *Salmonella* remained the most commonly detected causative agent in the food-borne outbreaks reported (22.5 % of outbreaks), followed by virus, bacterial toxins and *Campylobacter*, which accounted for 18.1 %, 16.1 % and 8.0 % of the outbreaks, respectively. Other agents each accounted for 2.5 % or less of the food-borne outbreaks.

The total number of *Salmonella* outbreaks in 2013 decreased by 23.8 % compared to 2012, from 1,533 outbreaks to 1,168 outbreaks. Compared with 2008, when there were 1,888 outbreaks due to *Salmonella*, the number of outbreaks decreased markedly by 38.1 %. A decrease (by 17.4 %) was also observed in the number of reported outbreaks caused by *Campylobacter*, compared with 2012. In contrast, increases of 24.6 % and 7.3 % were observed in the numbers of outbreaks caused by viruses and bacterial toxins, respectively, compared with the previous year. The number of viral food-borne outbreaks within the EU varied importantly during the six-year period 2008 to 2013. After a peak in 2009, the number of reported viral food-borne outbreaks in the EU has notably increased (by 80.8 %) in the last three years. As regards bacterial toxins, the total number of reported outbreaks, 834 in 2013, has actually increased by 58.9 % since 2008, when there were 525 outbreaks. The number of outbreaks in which the causative agent was unknown also increased (by 1.6 %) in 2013 compared with 2012 (Figure 46).

Considering the outbreaks reported for each causative agent, the highest proportion of strong-evidence outbreaks was reported for parasites (58.5 %), followed by the group of ‘Other causative agents’ (57.6 %) and *Salmonella* (27.0 %). The single outbreak caused by pathogenic *E. coli* (non-VTEC) reported was supported by strong evidence (Table 27 and Figure 45).

The causative agent was known in 91.8 % of the reported strong-evidence outbreaks in the EU. *Salmonella* was the most frequent causative agent of strong-evidence outbreaks (37.5 % of outbreaks), followed by bacterial toxins and viruses, responsible for 24.8 % and 10.4 % of outbreaks, respectively (Table 27).

Further details of the number of food-borne outbreaks and human cases per causative agent reported in the EU in 2013 can be found in Table 27.

Food vehicle

The food vehicle was reported in all 839 strong-evidence outbreaks, even though in 64 outbreaks (7.6 %) it was reported as ‘Other foods’ with no additional information on the food vehicle. As in previous years, the most common single food vehicle categories implicated in strong-evidence outbreaks were eggs and egg products (18.5 %), followed by mixed food (10.7 %), and fish and fish products (8.5 %). In 2013, strong-evidence outbreaks associated with ‘Crustaceans, shellfish, molluscs and products thereof’ (7.3 %) increased by 74.3 % compared with the previous year. The majority of these outbreaks were reported by three MS and was caused by *Calicivirus*, followed by marine biotoxins and *Listeria*.

The distribution of the strong-evidence outbreaks by food vehicle in the EU is shown in Figure 47.

Setting

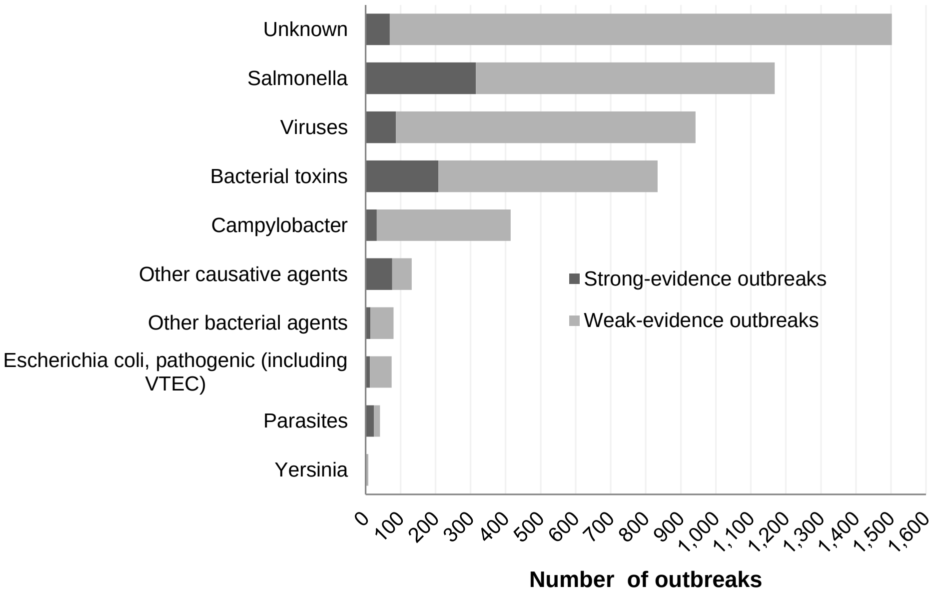
The setting was provided in all the 839 of strong-evidence outbreaks. However, for 73 outbreaks, the setting was reported as ‘Others’ (58 outbreaks) or ‘Unknown’ (15 outbreaks). The category ‘Household/domestic kitchen’ (38.5 %) was the most commonly reported setting, followed by ‘Restaurant, café, pub, bar, hotel’ (22.2 %). Apart from restaurants and households, the next most common settings in strong-evidence outbreaks were ‘Other settings’ (8.6 %) and ‘School, kindergarten’ (8.3 %). In 2013, there were no major changes in the distribution of the strong-evidence outbreaks by settings compared with 2012.

The distribution of the strong-evidence outbreaks by setting in the EU is shown in Figure 48.

Table 27. Number of outbreaks and human cases per causative agents in food-borne outbreaks in the EU (including strong evidence water-borne outbreaks), 2013

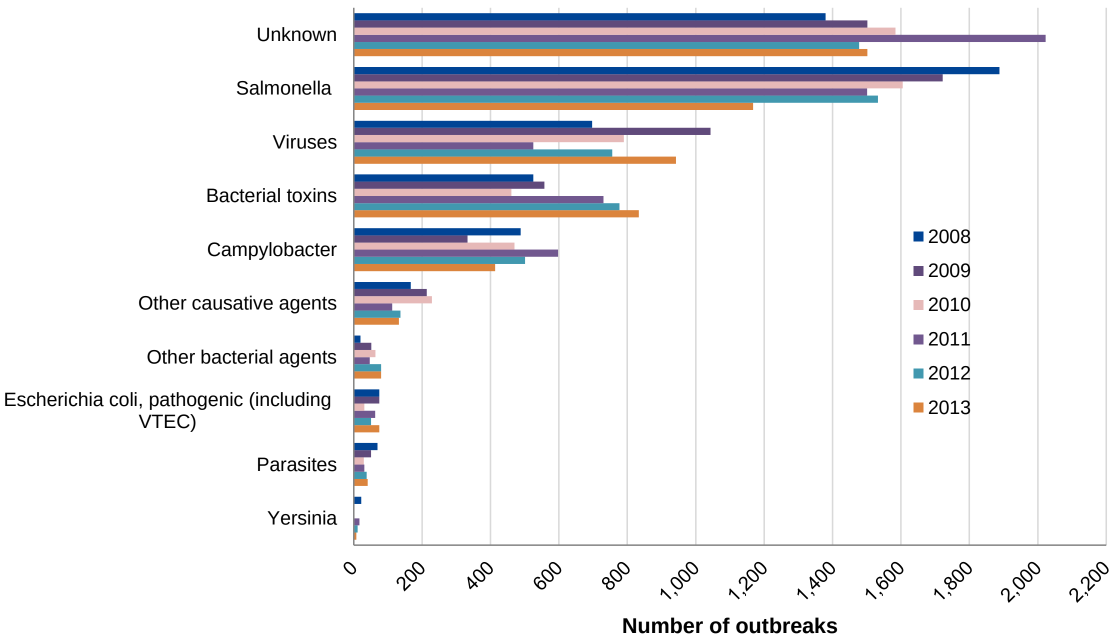
Causative agent	Strong-evidence outbreaks					Weak-evidence outbreaks					Total outbreaks	Total %
	N	%	Cases	Hospitalised	Deaths	N	%	Cases	Hospitalised	Deaths		
Salmonella	315	37.54	4371	1134	3	853	19.58	4338	1033	2	1168	22.48
Viruses	87	10.37	2023	126	0	855	19.62	7568	1841	0	942	18.13
Bacterial toxins	208	24.79	4006	163	1	626	14.37	5197	289	0	834	16.05
Campylobacter	32	3.81	478	15	0	382	8.77	1314	131	0	414	7.97
Other causative agents	76	9.06	520	46	1	56	1.29	445	27	0	132	2.54
Other bacterial agents	14	1.67	213	25	3	66	1.51	688	84	0	80	1.54
Escherichia coli , pathogenic - Verotoxigenic *E. coli* (VTEC)	12	1.43	154	36	0	62	1.42	353	70	0	74	1.42
Parasites	24	2.86	243	128	0	17	0.39	67	6	0	41	0.79
Yersinia	1	0.12	2	0	0	7	0.16	14	2	0	8	0.15
Escherichia coli , pathogenic (excluding VTEC)	1	0.12	128	0	0	0	0	0	0	0	1	0.02
Unknown	69	8.22	1386	138	1	1433	32.89	8454	652	0	1502	28.91
Total	839	100	13524	1811	9	4357	100	28438	4135	2	5196	100

Bacterial toxins include toxins produced by *Bacillus*, *Clostridium* and *Staphylococcus*. Food-borne viruses include calicivirus, hepatitis A virus, *Flavivirus*, *Rotavirus* and other unspecified viruses. Other causative agents include mushroom toxins, marine biotoxins, histamine, mycotoxins and escolar fish (wax esters). Parasites include primarily *Trichinella*, but also *Cryptosporidium*, *Giardia* and other unspecified parasites. Other bacterial agents include *Listeria*, *Brucella*, *Shigella*, *Vibrio* and other unspecified bacterial agents.



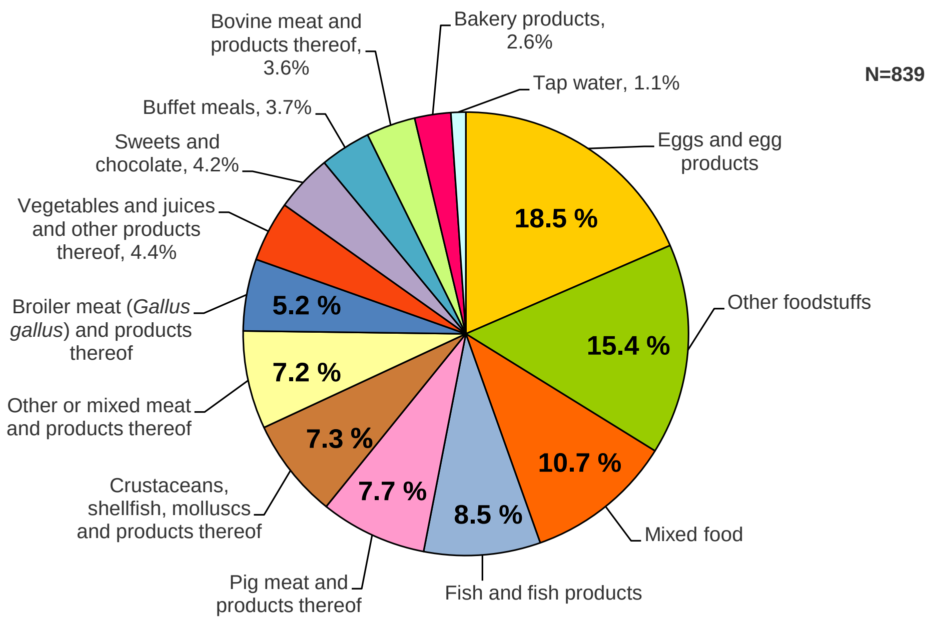
Bacterial toxins include toxins produced by *Bacillus*, *Clostridium* and *Staphylococcus*. Food-borne viruses include calicivirus, hepatitis A virus, *Flavivirus*, *Rotavirus* and other unspecified viruses. Other causative agents include mushroom toxins, marine biotoxins, histamine, mycotoxins and escolar fish (wax esters). Parasites include primarily *Trichinella*, but also *Cryptosporidium*, *Giardia* and other unspecified parasites. Other bacterial agents include *Listeria*, *Brucella*, *Shigella*, *Vibrio* and other unspecified bacterial agents. In this figure, the category '*Escherichia coli*, pathogenic (including VTEC)' also includes one strong-evidence outbreak due to pathogenic *E. coli* other than VTEC.

Figure 45. Distribution of all food-borne outbreaks per causative agent in the EU, 2013



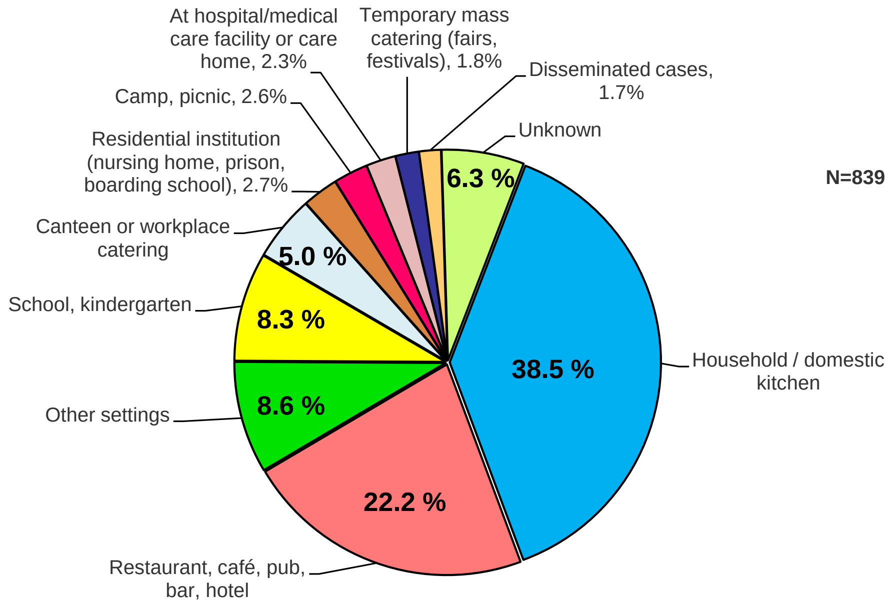
Bacterial toxins include toxins produced by *Bacillus*, *Clostridium* and *Staphylococcus*. Food-borne viruses include calicivirus, hepatitis A virus, *Flavivirus*, *Rotavirus* and other unspecified viruses. Other causative agents include mushroom toxins, marine biotoxins, histamine, mycotoxins and escolar fish (wax esters). Parasites include primarily *Trichinella*, but also *Cryptosporidium*, *Giardia*, *Anisakis* and other unspecified parasites. Other bacterial agents include *Listeria*, *Brucella*, *Shigella*, *Vibrio* and other unspecified bacterial agents. In this figure, the category '*Escherichia coli*, pathogenic (including VTEC)' also includes one strong-evidence outbreak due to pathogenic *E. coli* other than VTEC.

Figure 46. Total number of food-borne outbreaks in the EU, 2008-2013



Data from 839 outbreaks are included: Austria (24), Belgium (23), Croatia (6), Denmark (40), Estonia (1), Finland (15), France (249), Germany (33), Greece (2), Hungary (9), Ireland (5), Latvia (1), Lithuania (18), Netherlands (8), Poland (125), Portugal (18), Romania (19), Slovakia (4), Spain (158), Sweden (16) and United Kingdom (65).
Other foodstuffs (N=129) include: canned food products (3), cereal products including rice and seeds/pulses (nuts, almonds) (7), cheese (11), dairy products (other than cheese) (7), drinks (3), fruit, berries and juices and other products thereof (10), herbs and spices (4), milk (11), and other foods (73).

Figure 47. Distribution of strong-evidence outbreaks by food vehicle in the EU, 2013



Data from 839 outbreaks are included: Austria (24), Belgium (23), Croatia (6), Denmark (40), Estonia (1), Finland (15), France (249), Germany (33), Greece (2), Hungary (9), Ireland (5), Latvia (1), Lithuania (18), Netherlands (8), Poland (125), Portugal (18), Romania (19), Slovakia (4), Spain (158), Sweden (16) and United Kingdom (65).
Other settings (N=72) include: catering on aircraft or ship or train (1), farm (primary production) (2), mobile retailer, market/street vendor (6), take-away or fast-food outlet (5) and other settings (58).

Figure 48. Distribution of strong-evidence outbreaks by settings in the EU, 2013

3.16.2. Overview by causative agent

Specific information on food-borne outbreaks caused by *Salmonella*, *Campylobacter*, pathogenic *E. coli* (including VTEC), *Brucella* and *Trichinella*, can be found in the respective sections, while information on food-borne outbreaks caused by viruses, bacterial toxins, other causative agents, and parasites is summarised in this section. The figures of outbreaks presented here do not include water-borne outbreaks, which are addressed separately in Section 3.16.3.

Viruses

Twenty-one MS reported a total of 941 food-borne outbreaks caused by viruses (Table 28), excluding one strong-evidence water-borne outbreak. This represents 18.1 % of all outbreaks reported in the EU. At the national level, the number of outbreaks due to viruses continued to increase in Latvia (29 outbreaks in 2011, compared with 311 in 2012 and 439 in 2013). It is important to note that from 2012 Latvia has reported viral outbreaks with two or more cases, compared with only outbreaks with at least five human cases in 2011. The overall reporting rate in the EU was 0.23 outbreaks per 100,000 population. Latvia reported the majority of the outbreaks (46.7 %), followed by Poland (15.4 %). In addition, two non-MS reported 16 outbreaks (Table 28).

Only 86 (9.1 %) of reported viral outbreaks in the EU had strong evidence, and these were reported by 16 MS. Further information on the strong-evidence food-borne outbreaks caused by the different viruses can be found in

Table 29.

In strong-evidence outbreaks caused by viruses, 'Crustaceans, shellfish, molluscs and products thereof' was the most commonly implicated food vehicle (40 % of outbreaks). The second most frequently reported implicated single food vehicle was 'Buffet meals' (14.0 % of outbreaks), followed by 'Fruit, berries and juices and other products thereof' and 'Mixed food' (both 11.6 %).

Information on the type of outbreak was available for all the strong-evidence outbreaks: 68 were general outbreaks, and 18 were household/domestic kitchen outbreaks. The setting most frequently reported was 'Restaurant, café, pub, bar, hotel' (25 outbreaks), followed by household (21 outbreaks). The setting was either not reported or indicated as 'Others' for 20 outbreaks.

Seventy-six outbreaks were caused by calicivirus (all caused by norovirus), representing 88.4 % of all the viral strong-evidence outbreaks, excluding water-borne outbreaks. The distribution of food vehicles in strong-evidence outbreaks caused by norovirus in the EU is shown in figure FBOVIRUSVEHIC.

Table 28. Strong- and weak-evidence food-borne outbreaks caused by viruses (excluding strong-evidence water-borne outbreaks) in the EU, 2013

Country	Strong-evidence outbreaks				Weak-evidence outbreaks				Total outbreaks	Reporting rate per 100,000
	N	Cases	Hospitalised	Deaths	N	Cases	Hospitalised	Deaths		
Austria	7	135	13	0	7	36	4	0	14	0.17
Belgium	1	20	5	0	3	26	2	0	4	0.04
Croatia	0	0	0	0	11	295	3	0	11	0.26
Denmark	13	412	52	0	13	272	0	0	26	0.46
Estonia	0	0	0	0	1	248	0	0	1	0.08
Finland	7	154	13	0	7	170	2	0	14	0.26
France	23	249	5	0	43	530	8	0	66	0.1
Germany	3	21	4	0	23	73	12	0	26	0.03
Greece	0	0	0	0	1	3	3	0	1	0.01
Hungary	1	124	0	0	3	159	17	0	4	0.04
Ireland	2	23	13	0	2	72	0	0	4	0.09
Latvia	0	0	0	0	439	1356	813	0	439	21.69
Lithuania	2	6	6	0	14	31	31	0	16	0.54
Netherlands	4	14	0	0	12	200	0	0	16	0.1
Poland	1	10	3	0	144	2568	554	0	145	0.38
Portugal	2	96	0	0	0	0	0	0	2	0.02
Slovakia	1	5	5	0	92	904	387	0	93	1.72
Slovenia	0	0	0	0	1	33	0	0	1	0.05
Spain	9	92	6	0	12	238	2	0	21	0.04
Sweden	3	152	0	0	22	298	3	0	25	0.26
United Kingdom	7	336	1	0	5	56	0	0	12	0.02
Norway	2	85	5	0	13	517	0	0	15	0.3
Switzerland	0	0	0	0	1	21	0	0	1	0.01
Total (MS)	86	1849	126	0	855	7568	1841	0	941	0.23

Table 29. Strong-evidence food-borne outbreaks caused by viruses (excluding strong-evidence water-borne outbreaks) in the EU, 2013

Causative agent	Country	N outbreaks	Cases	Hospitalised	Deaths
Calicivirus - norovirus (Norwalk-like virus)	Austria	6	129	9	0
	Belgium	1	20	5	0
	Denmark	12	340	1	0
	Finland	6	139	2	0
	France	23	249	5	0
	Germany	2	16	0	0
	Hungary	1	124	0	0
	Netherlands	4	14	0	0
	Poland	1	10	3	0
	Portugal	2	96	0	0
	Spain	9	92	6	0
	Sweden	2	130	0	0
	United Kingdom	7	336	1	0
	Norway	1	78	0	0
Flavivirus	Lithuania	2	6	6	0
	Slovakia	1	5	5	0
Hepatitis virus - Hepatitis A virus	Austria	1	6	4	0
	Denmark	1	72	51	0
	Finland	1	15	11	0
	Ireland	2	23	13	0
	Sweden	1	22	0	0
	Norway	1	7	5	0
Rotavirus	Germany	1	5	4	0
Total (MS)		86	1849	126	0

Of particular note was the multinational Hepatitis A Virus (HAV) outbreak that began in May 2013 in EU/EEA countries (see text box).

On 8 May 2013, Germany reported seven cases of HAV genotype IA infection in persons with a travel history to ski resorts in northern Italy. Subsequently, Italy reported an increase in the number of HAV cases at the national level and declared an outbreak. At the EU level, confirmed and probable epidemic case definitions were adopted, with reference to the outbreak strain genotyping sequence result (GenBank accession number KF182323). Since 1 January 2013, 1,444 cases associated with this HAV outbreak have been reported by 12 EU/ EEA countries. Of these, 331 were confirmed cases. Italy reported 90 % of the cases. Dispersed or clustered cases without any travel history were also reported in Finland, France, Germany, Ireland, the Netherlands, Norway and Sweden. To date, no deaths associated with this outbreak have been reported; however, surveillance systems for HAV infections are not always able to capture this information.

HAV contamination was detected in frozen mixed berries (14 lots) and mixed berry cakes/pastries (2 lots) in Italy, France and Norway. In Ireland, the Netherlands and Sweden, analysis of food histories and questionnaires identified suspect berries and berry products consumed by confirmed cases. Tracing of food items in connection with the multinational HAV outbreak in the EU began with 38 lots/cases from Italy, Ireland and the Netherlands; an additional 5 lots/cases were added from France, Norway and Sweden in spring 2014. The tracing data were exchanged via the European Rapid Alert System for Food and Feed (RASFF). The final dataset comprises 6,227 transactions among 1,974 food operators. Bulgarian blackberries and Polish redcurrants were the most common ingredients in the traced lots/cases; however, Poland is the largest producer of redcurrants in Europe, and Bulgaria is a major exporter of frozen blackberries. No single point source of contamination linking all 43 lots/cases could be identified. HAV cases/lots in five countries could be linked to seven Polish freezing processors and/or to five frozen berry suppliers in Bulgaria. This indicates that HAV contamination could be occurring at the freezing processor or in primary production of berries and therefore compliance with Good Hygiene Practice, Good Manufacturing Practice and Good Agricultural Practice is recommended for countries producing berries for freezing. It is possible that contaminated products related to this outbreak could still be circulating in the food chain. Hence, for the public health domain, enhanced surveillance, risk communication, vaccination and further research are recommended.

Source: EFSA Scientific Report on 'Tracing of food items in connection to the multinational hepatitis A virus outbreak in Europe', 2014 (EFSA, 2014a).

Bacterial toxins

Bacillus toxins

In 2013, nine MS reported 278 outbreaks in which *Bacillus* toxins were the causative agent, representing 5.4 % of all outbreaks reported within the EU, which is more than in 2012 when 10 MS reported 259 outbreaks representing 4.8 % of all outbreaks. The overall reporting rate in the EU was 0.1 per 100,000 population. France reported the vast majority (84.9 %) of these outbreaks and reported that 2,099 human cases, 69 hospitalisations and no deaths were involved (Table 30).

Table 30. Strong- and weak-evidence food-borne outbreaks caused by* Bacillus *toxins (excluding strong-evidence water-borne outbreaks), 2013

Country	Strong-evidence outbreaks				Weak-evidence outbreaks				Total outbreaks	Reporting rate per 100,000
	N	Cases	Hospitalised	Deaths	N	Cases	Hospitalised	Deaths		
Belgium	5	35	0	0	0	0	0	0	5	0.04
Denmark	5	62	0	0	3	25	0	0	8	0.14
Finland	2	6	0	0	1	5	0	0	3	0.06
France	32	440	10	0	204	1659	59	0	236	0.36
Germany	3	12	0	0	1	19	0	0	4	0
Netherlands	3	7	0	0	10	22	0	0	13	0.08
Poland	2	106	73	0	1	34	34	0	3	0.01
Spain	2	25	0	0	1	3	0	0	3	0.01
Sweden	0	0	0	0	3	10	0	0	3	0.03
Total (MS)	54	693	83	0	224	1777	93	0	278	0.1

In the 54 strong-evidence *Bacillus* outbreaks, 'Mixed food' was the most commonly implicated food vehicle (29.6 % of outbreaks), followed by 'Vegetables and juices and other products thereof' (11.1 % of outbreaks), and 'Cereal products' (9.3 %). The distribution of food vehicles in strong-evidence outbreaks caused by *Bacillus* toxins is shown in Figure FBOBACILLUSVEHIC.

Information on the type of outbreak was available for all the *Bacillus* strong-evidence outbreaks: 51 were general outbreaks, and three were household/domestic kitchen outbreaks. The setting most frequently reported was 'School or kindergarten' (17 outbreaks), followed by 'Restaurant, café, pub, bar, hotel' (12 outbreaks). The setting was either not reported or indicated as 'Others' for nine outbreaks.

Clostridium toxins

Twelve MS reported 170 food-borne outbreaks caused by *C. perfringens*, *C. botulinum* or other *Clostridia* (Table 31). This represents 3.3 % of all outbreaks, almost the same as in 2012 when 13 MS reported 172 outbreaks representing 3.2 % of all outbreaks. France reported the majority (66.5 %) of the outbreaks (Table 29), representing an increase of 22.8 % compared with 2012. In France, one death was reported from a *C. perfringens* strong-evidence outbreak. In addition, one non-MS reported one weak-evidence outbreak. Details on the number of reported food-borne outbreaks and human cases caused by *Clostridium* toxins are summarised in Table 31.

Table 31. Strong- and weak-evidence food-borne outbreaks caused by* Clostridium *toxins (excluding strong-evidence water-borne outbreaks), 2013

Country	Strong-evidence outbreaks				Weak-evidence outbreaks				Total outbreaks	Reporting rate per 100,000
	N	Cases	Hospitalised	Deaths	N	Cases	Hospitalised	Deaths		
Belgium	2	88	0	0	0	0	0	0	2	0.02
Croatia	2	63	4	0	1	11	0	0	3	0.07
Czech Republic	0	0	0	0	1	31	0	0	1	0.01
Denmark	10	682	0	0	6	40	0	0	16	0.29
France	21	482	7	1	92	1235	36	0	113	0.17
Hungary	1	66	0	0	0	0	0	0	1	0.01
Lithuania	2	4	4	0	0	0	0	0	2	0.07
Poland	1	2	2	0	0	0	0	0	1	0
Portugal	2	8	8	0	0	0	0	0	2	0.02
Spain	3	32	2	0	7	179	2	0	10	0.02
Sweden	2	72	1	0	1	10	0	0	3	0.03
United Kingdom	14	510	0	0	2	15	0	0	16	0.03
Iceland	0	0	0	0	1	14	0	0	1	0.31
Total (MS)	60	2009	28	1	110	1521	38	0	170	0.06

‘Mixed food’ was the most commonly identified single food vehicle category, associated with 20.0 % of strong-evidence *Clostridium* outbreaks, followed by ‘Bovine meat and products thereof’ (18.3 %). The distribution of food vehicles in strong-evidence outbreaks caused by *Clostridium* toxins is shown in Figure FBOCLOSTRIDIUMVEHIC.

Information on the type of outbreak was available for 59 out of 60 strong-evidence outbreaks: 50 were general outbreaks, and nine were household/domestic kitchen outbreaks. The settings most frequently reported were ‘Household’ (10 outbreaks) and ‘Restaurant, café, pub, bar, hotel’ (nine outbreaks), followed by ‘Canteen or workplace catering’ (seven outbreaks) and ‘Residential institution’ (nursing home or prison or boarding school) (six outbreaks). The setting was unknown or not reported in 10 outbreaks.

In total, seven strong-evidence outbreaks caused by *C. botulinum* were reported by six MS. All were household outbreaks (except one for which the type of outbreak was unknown) and accounted for 14 human cases and 13 hospitalisations (Table 32).

Table 32. Strong-evidence food-borne outbreaks caused by* Clostridium botulinum *toxins (excluding strong-evidence water-borne outbreaks), 2013

Country	N outbreaks	Cases	Hospitalised	Deaths
Croatia	1	3	3	0
Lithuania	2	4	4	0
Poland	1	2	2	0
Portugal	1	1	1	0
Spain	1	2	2	0
Sweden	1	2	1	0
Total (MS)	7	14	13	0

In two outbreaks caused by *C. botulinum*, the implicated food vehicles were canned food products (home-made preserved mushrooms), while the other two outbreaks were associated with the consumption of meat and meat products (in one outbreak specified as ‘Homemade meat product, sausage’). Fish and fish products (smoked whitefish) were implicated in one outbreak, while the remaining two outbreaks caused by *C. botulinum* were associated with ‘Other foods’.

In Belgium, enterotoxigenic *C. perfringens* was found at levels up to 6 log CFU/g in leftovers of stew, which was at the origin of an outbreak that occurred in a residential institution and led to 70 cases of illness. The pathogenic strain was also isolated from human cases. After preparation of the stew, it was stored refrigerated for 24 hours and reheated just before consumption. Insufficient cooling of the stew before refrigerated storage probably caused perfect growth conditions for *C. perfringens* to reach such a high levels.

Source: The Belgian National Zoonoses Summary Report, 2013

Staphylococcal enterotoxins

In 2013, 12 MS reported 386 food-borne outbreaks caused by staphylococcal toxins (

Table 33). This represents 7.4 % of all outbreaks, an increase compared with 2012 when 14 MS reported 346 outbreaks caused by staphylococcal toxins. In 2013, the overall reporting rate in the EU was 0.13 per 100,000. France reported the vast majority (87 %) of the outbreaks (

Table 33), representing an increase of 12 % compared with 2012. In addition, one non-MS reported one weak-evidence outbreak caused by staphylococcal enterotoxins.

Details on the number of food-borne outbreaks and human cases caused by staphylococcal enterotoxins reported in 2013 are summarised in Table 33.

Table 33. Strong- and weak-evidence food-borne outbreaks caused by staphylococcal toxins (excluding strong-evidence water-borne outbreaks), 2013

Country	Strong-evidence outbreaks				Weak-evidence outbreaks				Total outbreaks	Reporting rate per 100,000
	N	Cases	Hospitalised	Deaths	N	Cases	Hospitalised	Deaths		
Belgium	4	59	0	0	0	0	0	0	4	0.04
Croatia	1	6	0	0	0	0	0	0	1	0.02
Denmark	2	104	0	0	1	10	3	0	3	0.05
France	63	680	23	0	273	1544	133	0	336	0.51
Germany	5	59	7	0	0	0	0	0	5	0.01
Hungary	1	17	13	0	0	0	0	0	1	0.01
Netherlands	0	0	0	0	5	133	0	0	5	0.03
Poland	1	9	0	0	4	94	20	0	5	0.01
Portugal	5	57	6	0	0	0	0	0	5	0.05
Slovakia	1	196	0	0	2	5	0	0	3	0.06
Spain	9	110	3	0	4	106	1	0	13	0.03
Sweden	2	7	0	0	3	7	1	0	5	0.05
Iceland	0	0	0	0	1	17	1	0	1	0.31
Total (MS)	94	1304	52	0	292	1899	158	0	386	0.13

The most commonly reported single food category in strong-evidence outbreaks was ‘Mixed foods’ (19.1 %), followed by ‘Vegetables and juices and other products thereof’ (12.8 %). The distribution of food vehicles in strong-evidence outbreaks caused by staphylococcal toxins is shown in Figure FBOSTAPHYLVEHIC.

Information on the type of outbreak was available for all the strong-evidence outbreaks caused by staphylococcal toxins: 70 were general outbreaks, 21 were household/domestic kitchen outbreaks and three outbreaks were classified as of ‘Unknown’ type. The setting most frequently reported was ‘Household’ (24 outbreaks), followed by ‘School or kindergarten’ (20 outbreaks) and ‘Restaurant, café, pub, bar, hotel’ (17 outbreaks). The setting was either not reported or indicated as ‘Others’ or ‘Unknown’ for nine outbreaks.

Other causative agents

In this report, the category ‘Other causative agents’ includes histamine, marine biotoxins, mushroom toxins, mycotoxins and wax esters (from fish).

In 2013, 11 MS reported a total of 132 food-borne outbreaks due to other causative agents (Table 34). This represents 2.5 % of all outbreaks reported at the EU level, similar to 2012. The reporting rate was 0.04 per 100,000 population. In total, 76 strong-evidence outbreaks were reported by nine MS, mostly by France.

The majority (55.3 %) of strong-evidence outbreaks due to other causative agents were caused by histamine and accounted for 44.4 % of human cases and 65.2 % of hospitalisations reported in these outbreaks. Other agents included marine biotoxins, mushroom toxins, mycotoxins, and wax esters (Table 35).

The majority of these outbreaks (69.7 %) were associated with the consumption of ‘Fish and fishery products’.

Information on the type of outbreak was available for all the strong-evidence outbreaks caused by staphylococcal toxins: 39 were general outbreaks, 31 were household/domestic kitchen outbreaks and six outbreaks were classified as of ‘Unknown’ type. The setting most frequently reported was ‘Household’ (30 outbreaks), followed by ‘Restaurant, café, pub, bar, hotel’ (27 outbreaks). The setting was either not reported or indicated as ‘Others’ or ‘Unknown’ for eight outbreaks.

Table 34. Strong- and weak-evidence food-borne outbreaks caused by other causative agents (excluding strong-evidence water-borne outbreaks), 2013

Country	Strong-evidence outbreaks				Weak-evidence outbreaks				Total outbreaks	Reporting rate per 100,000
	N	Cases	Hospitalised	Deaths	N	Cases	Hospitalised	Deaths		
Belgium	3	7	3	0	1	2	0	0	4	0.04
Croatia	1	3	1	0	1	23	1	0	2	0.05
Denmark	5	140	0	0	0	0	0	0	5	0.09
Finland	3	27	1	0	0	0	0	0	3	0.06
France	36	185	26	0	43	209	16	0	79	0.12
Germany	7	17	3	0	0	0	0	0	7	0.01
Latvia	0	0	0	0	1	2	0	0	1	0.05
Poland	3	9	9	1	0	0	0	0	3	0.01
Spain	15	111	3	0	7	195	0	0	22	0.05
Sweden	3	21	0	0	2	4	0	0	5	0.05
United Kingdom	0	0	0	0	1	10	10	0	1	0
Switzerland	3	7	1	0	0	0	0	0	3	0.04
Total (MS)	76	520	46	1	56	445	27	0	132	0.04

Table 35. Strong-evidence food-borne outbreaks caused by other causative agents (excluding strong-evidence water-borne outbreaks), 2013

Causative agent	Country	N outbreaks	Cases	Hospitalised	Deaths
Histamine	Belgium	3	7	3	0
	Croatia	1	3	1	0
	Finland	3	27	1	0
	France	14	71	22	0
	Germany	7	17	3	0
	Spain	11	85	0	0
	Sweden	3	21	0	0
	Switzerland	3	7	1	0
Marine biotoxins	France	22	114	4	0
	Spain	1	16	0	0
Mushroom toxins	Poland	3	9	9	1
	Spain	2	8	3	0
Mycotoxins	Denmark	5	140	0	0
Wax esters (from fish)	Spain	1	2	0	0
Total (MS)		76	520	46	1

Other bacterial agents

Under the category 'Other bacterial agents', outbreaks due to *Listeria*, *Shigella*, *Brucella*, *Vibrio parahaemolyticus* and other bacterial agents are reported. Outbreaks caused by *Listeria* and *Brucella* are discussed in the respective sections.

Two strong-evidence outbreaks caused by *Shigella sonnei* were reported by two MS, Denmark and Spain. The Danish outbreak was associated with the consumption of buffet meals and affected five people, who all had their meal in the same hotel in Turkey. The Spanish outbreak was associated with the consumption of broiler meat and involved 28 human cases, of which two were hospitalised. Both the setting and the type of outbreak were reported as 'Unknown' for the Spanish outbreak. In addition, 24 weak-evidence outbreaks caused by *Shigella* were reported by 10 MS.

Two strong-evidence general outbreaks due to *Vibrio parahaemolyticus* were reported by two MS, France and Spain. Both outbreaks were associated with the consumption of crustaceans, shellfish, molluscs and products thereof. Overall, 33 people were affected, but no one was hospitalised. The setting of the Spanish outbreak was 'Restaurant, café, pub, bar, hotel'; while no specific information on the setting (classified as 'Other') was reported for the French outbreak.

In addition, three strong-evidence general food-borne outbreaks due to other (unspecified) bacteria were reported by Austria. Of these, two outbreaks were associated with the consumption of mixed food, while one outbreak was attributed to the consumption of vegetables and juices and other products thereof. In total

96 people were affected, and 12 of them were hospitalised. Two different settings were reported: 'Restaurant, café, pub, bar, hotel' (two outbreaks) and 'Canteen or workplace catering' (one outbreak).

Parasites

Under the category 'Parasites', outbreaks due to *Trichinella*, *Cryptosporidium*, *Giardia* and *Taenia saginata* are reported. Outbreaks caused by *Trichinella* are discussed in the respective section.

One strong-evidence food-borne outbreak, caused by *Cryptosporidium* spp. was reported by Sweden. This outbreak affected 10 people and was linked to the consumption of salad. The outbreak setting was 'Household', but no specific information where reported on the type of outbreak (classified as 'Unknown'). Two weak-evidence food-borne outbreaks were also reported by Germany and Ireland. In addition, three strong-evidence water-borne outbreaks attributable to *Cryptosporidium* were reported by two MS (see Section 3.16.3).

Furthermore, 12 weak-evidence food-borne outbreaks of *Giardia* were reported by four MS, Germany (seven outbreaks), Ireland and Poland (two outbreaks each) and Latvia (one outbreak). Overall, these outbreaks involved 30 human cases and three hospitalisations.

One weak-evidence outbreak caused by *Taenia saginata* was reported by the Czech Republic and involved 24 human cases.

Unknown agents

In 2013, 19 MS reported 1,499 outbreaks (28.9 % of all outbreaks) in which the causative agent was unknown (Table OUT3), excluding 3 strong-evidence water-borne outbreaks. This represents an increase in the proportion of total outbreaks due to unknown agents compared with 2012 (N=1,478). Of these, 66 were supported by strong evidence (7.9 % of all strong-evidence outbreaks).

3.16.3. Water-borne outbreaks

In 2013, six MS reported nine strong-evidence water-borne outbreaks, compared to 16 strong-evidence water-borne outbreaks reported by four MS in 2012.

Five different pathogens were detected in these nine outbreaks: calicivirus (norovirus, Norwalk-like virus), verocytotoxigenic *E. coli* (VTEC O128), *Cryptosporidium parvum*, *Cryptosporidium hominis* and *Salmonella*. There were three water-borne outbreaks in which the causative agent was unknown.

The largest water-borne outbreak was caused by norovirus and occurred in Finland, where 174 people were affected, of whom seven hospitalised (see box below).

Three strong-evidence general water-borne outbreaks attributable to *Cryptosporidium* were reported by Ireland and the United Kingdom. The two Irish outbreaks were caused by *Cryptosporidium parvum* and affected 26 people in total, of whom three were hospitalised. The outbreak reported by the United Kingdom was caused by *Cryptosporidium hominis* and involved 39 disseminated human cases, of whom one was hospitalised.

Further details on the number of outbreaks and human cases, including information on the causative agents, reporting countries and settings can be found inTable 36.

In May–June 2013, more than 170 people in 10 different customer groups in Finland fell ill with gastroenteritis after visiting a remote hotel. The prolonged outbreak concerned several visiting groups at the hotel. One of the suggested causes for the outbreak, among foodstuff and human to human contacts, was drinking water.

The symptoms, incubation time and duration of the disease suggested norovirus, but patient samples analysed by conventional PCR diagnostic methods were negative for norovirus and sapoviruses. Further molecular biological analyses conducted by the National Institute for Health and Welfare found an unusual genotype 1 norovirus. The same type of virus was then found in a repeat analysis of a water sample taken in May and from swab samples taken from surfaces at the hotel. Drinking water extracted from the hotel's own borehole well was not treated before consumption. The outbreak was brought under control by setting boiling instructions for water, cleaning and disinfecting the household water system, and by enhancing the cleaning of the hotel premises to prevent secondary infections. The source for the contamination of water was not identified.

Source: The Finnish National Zoonoses Summary Report, 2013

Table 36. List of reported strong evidence water-borne outbreaks in 2013

Causative agent	Country	Settings	N outbreaks	Cases	Hospitalised	Deaths
Escherichia coli, pathogenic - Verotoxigenic *E. coli* (VTEC)	Austria	Household	1	2	1	0
Parasites	Ireland	Disseminated cases	2	26	3	0
	United Kingdom	Disseminated cases	1	39	1	0
Salmonella	France	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	1	6	1	0
Unknown	Finland	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	1	40	1	0
	Spain	Camp or picnic	1	15	0	0
		Unknown	1	3	0	0
Viruses	Finland	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	1	174	0	0
Total (MS)			9	305	7	0

3.16.4. Discussion

A total of 5,196 food-borne outbreaks were reported by the 24 reporting MS in 2013, compared with 5,363 outbreaks reported in total by 25 MS for 2012. The main causative agents in these outbreaks were *Salmonella*, bacterial toxins, viruses and *Campylobacter*. For 2013 43,183 human cases were reported compared with 55,453 human cases in 2012. This noticeable lower number of human cases during 2013 was mainly explained by one strong-evidence norovirus outbreak reported by Germany in 2012, which affected 10,950 people (EFSA and ECDC, 2014).

In 2013, compared with 2012, a decrease was observed in the number of reported outbreaks caused by *Salmonella* and *Campylobacter*, whereas the number of outbreaks due to bacterial toxins and viruses increased. Virus and bacterial toxins were the second and third most commonly reported causative agents in 2013. However, it should be noted that the increase in the number of outbreaks caused by bacterial toxins is mainly related to the reporting from one MS. During the six-year period from 2008 to 2013 within the EU, the annual total number of *Salmonella* outbreaks has decreased markedly by 38.1 %, whereas the annual total number of outbreaks due to bacterial toxins increased by 58.9 %. The number of reported viral food-borne outbreaks within the EU varied substantially during the six-year period from 2008 to 2013.

Overall, the outbreaks reported by MS involved 43,183 human cases, 5,946 hospitalisations and 11 deaths. Of the nine fatalities related to strong-evidence outbreaks, three were associated with *Salmonella*, three with *Listeria*, one with *Clostridium perfringens* toxins, one with mushroom toxins and one with an unknown agent.

The most frequently reported food vehicle categories implicated in strong-evidence outbreaks were eggs and egg products, followed by mixed food, and fish and fish products, as in 2012 and 2011. Interestingly, the number of strong-evidence outbreaks associated with 'Crustaceans, shellfish, molluscs and products thereof' increased compared with 2012. The majority of these outbreaks were reported by three MS and were caused by Calicivirus.

Most of the outbreaks implicating eggs and egg products were caused by *Salmonella*. Interestingly, sweets and chocolates represented the second most commonly reported food vehicle in *Salmonella* outbreaks in 2013, although that these outbreaks were mainly reported by one MS.

Broiler meat was the main food vehicle implicated in *Campylobacter* outbreaks, as in 2012. This is consistent with EFSA's BIOHAZ Panel Scientific Opinion (EFSA BIOHAZ, CONTAM and AHAW Panels, 2012) that handling, preparation and consumption of broiler meat may account for 20-30 % of human cases.

Of particular note was the multinational hepatitis A virus outbreak that occurred in 2013 in several EU/EEA countries, and was associated with the consumption of berries and berry products. As indicated in the EFSA's scientific report on the tracing of food items in connection with this multinational outbreak (EFSA, 2014a), hepatitis A virus contamination could be occurring at the freezing processor or in primary production of berries and therefore compliance with Good Hygiene Practice (GHP), Good Manufacturing Practice (GMP) and Good Agricultural Practice (GAP) is recommended for countries producing berries for freezing.

The number of reported strong-evidence water-borne outbreaks decreased compared with 2012. The largest water-borne outbreak was caused by norovirus and occurred in Finland, where 174 people were affected, of whom seven hospitalised.

As in previous years, the data reported on food-borne outbreaks demonstrate that reporting by a single or a small number of MS can have a strong influence on the apparent distribution of causative agents and food vehicles at the EU level. It also appears that, within the MS, there may be large differences with regard to the reported causative agents and implicated food vehicles between years.

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Abbreviations

AHAW	Animal Health and Welfare
BIOHAZ	Biological Hazards
cELISA	Complement enzyme-linked immunosorbent assay
CFT	Complement fixation test
CFU	Colony-forming unit
CI	Confidence Interval
CONTAM	Contaminants in the Food Chain
DCF	Data Collection Framework
EBLV	European bat *Lyssavirus*
EC	European Commission
ECDC	European Centre for Disease Prevention and Control
EEA	European Economic Area
EFSA	European Food Safety Authority
EFTA	European Free Trade Association
ELISA	Enzyme-linked immunosorbent assay
ESRI	Economic and Social Research Institute
EU	European Union
EURL	European Union Reference Laboratory
FAT	Fluorescent antibody test
FISH	Fluorescent *in situ* hybridization
g	Gram
GAP	Good Agricultural Practice
GHP	Good Hygiene Practice
GMP	Good Manufacturing Practice
HACCP	Hazard Analysis and Critical Control Point
HAV	Hepatitis A Virus
HUS	Haemolytic–Uraemic Syndrome
i-ELISA	Indirect enzyme-linked immunosorbent assay
IFA	Immunofluorescence assay
IHC	ImmunoHistoChemistry
InVS	Institut de Veille Sanitaire – the French Institute for Public Health Surveillance
ISO	International Organization for Standardization
LHT	Low heat-treated
MLST	Multi locus sequence typing
MRSA	Meticillin-resistant *Staphylococcus aureus*
MS	Member State
NMKL	Nordic Committee on Food Analysis
NT	Not typable

OBF	Official brucellosis-free status of Member States and regions of Member States as regards bovine herds
ObmF	Official brucellosis (*Brucella melitensis*)-free status of Member States and regions of Member States as regards ovine and caprine herds
OIE	World Organisation for Animal Health
OTF	Official tuberculosis-free status of Member States and regions of Member States as regards bovine herds
PCR	Polymerase chain reaction
PFGE	Pulsed field gel electrophoresis
RASFF	Rapid Alert System for Food and Feed
RTE	Ready-to-eat
RT-PCR	Real time polymerase chain reaction
ST	Sequence type
STEC	Shiga toxin-producing *Escherichia coli*
TESSy	The European Surveillance System
VTEC	Verocytotoxigenic *Escherichia coli*
WNF	West Nile Fever
WNV	West Nile Virus
WAHID	World Animal Health Information Database
WHO	World Health Organization

Country codes

Austria	AT	Luxembourg	LU
Belgium	BE	Malta	MT
Bulgaria	BG	Netherlands	NL
Croatia	HR	Norway	NO
Cyprus	CY	Poland	PL
Czech Republic	CZ	Portugal	PT
Denmark	DK	Romania	RO
Estonia	EE	Slovakia	SK
Finland	FI	Slovenia	SI
France	FR	Spain	ES
Germany	DE	Sweden	SE
Greece	GR	Switzerland	CH
Hungary	HU	United Kingdom	UK
Iceland	IS		
Ireland	IE		
Italy	IT		
Latvia	LV		
Lithuania	LT		

Appendix: List of usable data

Summary

Table abbreviation	Table name
ZOONHOSPITRATES	Reported hospitalization and case-fatality rates due to zoonoses in confirmed human cases in the EU, 2013

Figure abbreviation	Figure name
ZOONHUMRATES	Reported notification rates of zoonoses in confirmed human cases in the EU, 2013

3.1. *Salmonella*

Table abbreviation	Table name
SALMOVERVIEW	Overview of countries reporting data for *Salmonella*

3.1.1. Salmonellosis in humans

	Table abbreviation	Table name
Humans	SALMHUMRATES	Reported cases and notification rates for confirmed cases of human salmonellosis in the EU/ EEA, 2009–2013
	SALMHUMSEROVARS	Distribution of reported confirmed cases of human salmonellosis in the EU/EEA, 2011–2013, by the 20 most frequent serovars in 2013
	SALMHUMIMPORT	Proportion of confirmed salmonellosis cases associated with travel, domestic cases and cases with unknown travel information by country in 2013

	Figure abbreviation	Figure name
Humans	SALMHUMTREND	Trend in reported confirmed cases of human non-tuphodial salmonellosis in the EU/EEA, 2009-2013

3.1.2. *Salmonella* in food, animals and feed

	Table abbreviation	Table name
Food	SALMOVERVIEWFOOD	Overview of countries reporting food data for *Salmonella*
	SALMCOMPLFOOD	Compliance with the food safety *Salmonella* criteria laid down by EU Regulations 2073/2005 and 1441/2007 and 1086/2030
	SALMCOMPLPOULTRYMEAT	Compliance with the food safety *Salmonella* criteria laid down by EU Regulations 2073/2005 and 1441/2007and 1086/2030 (Fresh poultry meat)
	SALMBROILMEAT	*Salmonella* in fresh broiler meat at slaughter, processing/cutting level and retail, 2013
	SALMRTEBROIL	*Salmonella* in RTE products from broiler meat, 2013
	SALMTURKMEAT	*Salmonella* in fresh turkey meat at slaughter, processing/cutting level and retail, 2013
	SALMRTETURK	*Salmonella* in RTE products from turkey meat, 2013
	SALMPIGMEAT	*Salmonella* in fresh pig meat, at slaughter, cutting/processing level and retail, 2013

	Table abbreviation	Table name
Food	SALMRTEPIG	*Salmonella* in RTE products from minced meat, meat preparation and meat products from pig meat, 2013
	SALMBOVINEMEAT	*Salmonella* in fresh bovine meat, at slaughter, cutting/processing level and retail, 2013
	SALMRTEBOVINE	*Salmonella* in RTE products minced meat, meat preparations and meat products from bovine animals, 2013
	SALMEGGS	*Salmonella* in table egg samples, 2013
	SALMBIVMOLLUSC	*Salmonella* in live bivalve molluscs, 2013
	SALMFRUIT	*Salmonella* in fruit, 2013
	SALMFRUITVEG	*Salmonella* in fruit and vegetable, 2013
	SALMVEGET	*Salmonella* in vegetables, 2013
	SALMHERBS	*Salmonella* in spices and herbs, 2013
	SALMSPRSEED	*Salmonella* in seeds, sprouted, 2013
	SALMDRIEDSEED	*Salmonella* in seeds, dried, 2013
Animals	SALMOVERVIEWANI	Overview of countries reporting animal data for *Salmonella*
	SALMBREEDPROD	*Salmonella* in breeding flocks of *Gallus gallus* during the production period (all types of breeding flocks, flock-based data) in countries running control
	SALMLAYPROD	*Salmonella* in laying hen flocks of *Gallus gallus* during the production period (flock-based data) in countries running control programmes in accordance with Regulation (EC) No 2160/2003, 2013
	SALMBROIBS	*Salmonella* in broiler flocks of *Gallus gallus* before slaughter (flock-based data) in countries running control programmes1, 2013
	SALMBREEDTURK	*Salmonella* in breeding flocks of turkeys (adults, flock-based data) in countries running control programmes, 2013
	SALMFATTURKBS	*Salmonella* in fattening flocks of turkeys before slaughter (flock-based data) in countries running control programmes, 2013
	SALMAPBREEDEGGLINE	*Salmonella* in adult parent breeding flocks for the egg production line during the production period (*Gallus gallus*, flock-based data) in countries running control programmes in accordance with Regulation (EC) No 2160/2003,2013
	SALMAPBREEDMEAT	*Salmonella* in adult parent breeding flocks in the broiler meat production line (*Gallus gallus*, flock-based data) in countries running control programmes in accordance with Regulation (EC) No 2160/2003,2013
	SALMGPBREEDPROD	*Salmonella* in elite and grandparent breeding flocks of *Gallus gallus* during the production period (flock-based data) in countries running control programmes in accordance with Regulation (EC) No 2160/2003, 2013
	SALMDUCKGEESE	*Salmonella* in flocks of ducks and geese (flock-based data), 2013
	SALMPIGSBACT	*Salmonella* in pigs from bacteriological monitoring programmes, 2013
	SALMCATBACT	*Salmonella* in cattle from bacteriological monitoring programmes, 2013
Feed	SALMDERIVEDFEED	*Salmonella* in feedingstuffs, in the EU, 2013
	SALMCOMPFEEDCATTLE	*Salmonella* in compound feedingstuffs for cattle, in the EU, 2013
	SALMCOMPFEEDPIGS	*Salmonella* in compound feedingstuffs for pigs, in the EU, 2013

	Table abbreviation	Table name
Feed	SALMCOMPFEEDPOULTRY	*Salmonella* in compound feedingstuffs for poultry, in the EU, 2013
Serovars	SERBROMEAT	Distribution of the ten most common *Salmonella* serovars in broiler meat, 2013
	SERTURKMEAT	Distribution of the ten most common *Salmonella* serovars in turkey meat, 2013
	SERPIGMEAT	Distribution of the ten most common *Salmonella* serovars in pig meat, 2013
	SERBOVMEAT	Distribution of the ten most common *Salmonella* serovars in bovine meat, 2013
	SERGAL	Distribution of the ten most common *Salmonella* serovars in *Gallus gallus*, 2013
	SERBRO	Distribution of the ten most common *Salmonella* serovars in broilers, 2013
	SERTURK	Distribution of the ten most common *Salmonella* serovars in turkeys, 2013
	SERPIGS	Distribution of the ten most common *Salmonella* serovars in pigs, 2013
	SERBOV	Distribution of the ten most common *Salmonella* serovars in cattle, 2013
	SERMONT	Distribution of *S.* Typhimurium-like strains and monophasic *S.* Typhimurium detected in poultry flocks
	SERGALFEED	Distribution of the ten most common *Salmonella* serovars in compound feed for *Gallus gallus*, 2013
	SERPIGSFEED	Distribution of the ten most common *Salmonella* serovars in compound feed for pigs, 2013
	SERBOVFEED	Distribution of the ten most common *Salmonella* serovars in compound feed for cattle, 2013
	SEROVAR2013	Distribution and prevalence of *Salmonella* serovars in different food and animal categories in EU countries, 2013

	Figure abbreviation	Figure name
Food	SALMCOMPLCRITERIA	Proportion of units not complying with the EU *Salmonella* criteria, 2011-2013
Animals	SALMTRENDBREED	Prevalence of *S.* Enteritidis, *S.* Typhimurium, *S.* Infantis, *S.* Virchow and/or *S.* Hadar-positive breeding flocks of *Gallus gallus* during production in the EU, 2007-2013
	SALMTARGETBREED	Prevalence of *S.* Enteritidis, *S.* Typhimurium, S. Infantis, S. Virchow and/or S. Hadar-positive breeding flocks of *Gallus gallus* during the production period and target for Member States, Iceland, Norway and Switzerland, 2013
	SALMMAPBREED	Prevalence of the five target serovars (*S.* Enteritidis, *S.* Typhimurium, *S.* Infantis, *S.* Virchow and/or *S.* Hadar)-positive breeding flocks of *Gallus gallus* during the production period, 2013
	SALMTRENDLAY	Prevalence of *S.* Enteritidis and/or *S.* Typhimurium-positive laying hen flocks of *Gallus gallus* during the production period in the EU, 2008-2013
	SALMTARGETLAY	Prevalence of *S.* Enteritidis and/or *S.* Typhimurium-positive laying hen flocks of *Gallus gallus* during the production period and targets for Member States, Norway and Switzerland, 2013

	Figure abbreviation	Figure name
Animals	SALMMAPLAY	Prevalence of the two target serovars (*S.* Enteritidis and/or *S.* Typhimurium)-positive laying hen flocks of *Gallus gallus* during the production period, 2013
	SALMTRENDBROIBS	Prevalence of S. Enteritidis and/or S. Typhimurium-positive broiler flocks of *Gallus gallus* during the production period in the EU, 2009–2013
	SALMTARGETBROIBS	Prevalence of *S.* Enteritidis and/or S. Typhimurium-positive broiler flocks of *Gallus gallus* before slaughter and target for Member States, Iceland, Norway and Switzerland, 2013
	SALMMAPBROIBS	Prevalence of the two target serovars (*S.* Enteritidis and/or S. Typhimurium)-positive broiler flocks of *Gallus gallus* before slaughter, 2013
	SALMTRENDBREEDTURK	Prevalence of *S.* Enteritidis and/or *S.* Typhimurium-positive breeding flocks of turkeys during the production period, in the EU, 2010–2013
	SALMTARGETBREEDTURK	Prevalence of *S.* Enteritidis and/or *S.* Typhimurium-positive breeding flocks of turkeys during the production period and target for Member States, Iceland, Norway and Switzerland, 2013
	SALMMAPBREEDTURK	Prevalence of the two target serovars (*S.* Enteritidis and/or *S.* Typhimurium)-positive breeding flocks of turkeys during the production period, 2013
	SALMTRENDFATTURKBS	Prevalence of *S.* Enteritidis and/or *S.* Typhimurium-positive fattening flocks of turkeys, in the EU, 2010–2013
	SALMTARGETFATTURKBS	Prevalence of *S.* Enteritidis and/or *S.* Typhimurium-positive fattening flocks of turkeys and target for Member States, Iceland, Norway and Switzerland, 2013
	SALMMAPFATTURKBS	Prevalence of the two target serovars (*S.* Enteritidis and/or *S.* Typhimurium)-positive fattening flocks of turkeys, 2013

3.2. *Campylobacter*

Table abbreviation	Table name
CAMPOVERALL	Overview of countries reporting data for *Campylobacter*, 2013

3.2.1. Campylobacteriosis in humans

	Table abbreviation	Table name
Humans	CAMPHUMIMPORT	Proportion of confirmed campylobacteriosis cases associated with travel, domestic cases and cases with unknown travel information by country in 2013
	CAMPHUMRATES	Reported cases and notifciation rates of human campylobacteriosis in the EU/ EEA, 2009–2013
	CAMPHUMSPECIES	Species distribution of confirmed campylobacteriosis cases in 2013

	Figure abbreviation	Figure name
Humans	CAMPHUMTREND	Trend in reported confirmed cases of human campylobacteriosis in the EU/EEA, 2009-2013

3.2.2. *Campylobacter* in food and animals

	Table abbreviation	Table name
Food	CAMPBOVMEAT	*Campylobacter* in fresh bovine meat, 2013
	CAMPBOVPROD	*Campylobacter* in ready-to-eat bovine meat products, 2013
	CAMPBROILMEAT	*Campylobacter* in fresh broiler meat, 2013
	CAMPBROILPROD	*Campylobacter* in ready-to-eat broiler meat products, 2013
	CAMPCHEESE	*Campylobacter* in cheeses, 2013
	CAMPMILK	*Campylobacter* in milk, 2013
	CAMPOTHERPOULMEAT	*Campylobacter* in fresh other poultry meat, 2013
	CAMPPIGMEAT	*Campylobacter* in fresh pig meat, 2013
	CAMPPIGPROD	*Campylobacter* in ready-to-eat pig meat products, 2013
	CAMPTURKMEAT	*Campylobacter* in fresh turkey meat, 2013
	CAMPTURKPROD	*Campylobacter* in ready-to-eat turkey meat products
	CAMPUNSPPROD	*Campylobacter* in ready-to-eat unspecified meat products, 2013
Animals	CAMPBROILERS	*Campylobacter* in broilers, 2013
	CAMPCATDOG	*Campylobacter* in cats and dogs, 2013
	CAMPCATTLE	*Campylobacter* in cattle, 2013
	CAMPOTHERAN	*Campylobacter* in other animals, 2013
	CAMPPIGS	*Campylobacter* in pigs, 2013
	CAMPTURKEYS	*Campylobacter* in turkeys, 2013

	Figure abbreviation	Figure name
Animals	CAMPBROIMEAT	Proportion of positive *Campylobacter* samples in broiler meat by sampling stage in Member States and non-Member States, 2008-2013

3.3. *Listeria*

Table abbreviation	Table name
LISTERIAOVER	Overview of countries reporting data for *Listeria*, 2013.

3.3.1. Listeriosis in humans

	Table abbreviation	Table name
Humans	LISTHUMIMPORT	Proportion of confirmed listeriosis cases associated with travel, domestic cases and cases with unknown travel information by country in 2013

	Table abbreviation	Table name
Humans	LISTHUMRATES	Reported cases and notification rates per 100,000 of human listeriosis in 2009-2013

	Figure abbreviation	Figure name
Humans	LISTHUMTREND	Trend in reported confirmed cases of human listeriosis in the EU/EEA, 2009-2013

3.3.2. *Listeria* in food and animals

	Table abbreviation	Table name
Food	LISTERIABAKERY	*L. monocytogenes* in RTE bakery products, 2013
	LISTERIACOMPL	Compliance with the *L. monocytogenes* criteria laid down by Regulation (EC) No 2073/2005 in food categories in the EU, 2020
	LISTERIACONF	*L monocytogenes* in RTE confectionary products and pastes, 2013
	LISTERIAEGGPR	*L. monocytogenes* in RTE egg products, 2013
	LISTERIAFISHPR	*L. monocytogenes* in RTE fishery products, 2013
	LISTERIAFISH	*L. monocytogenes* in fish, 2013
	LISTERIAFRUITVEG	*L. monocytogenes* in RTE fruit and vegetables, 2013
	LISTERIAHCCOWPM	*L. monocytogenes* in hard cheeses made from pasteurised milk from cows, 2013
	LISTERIAHCCOWRM	*L. monocytogenes* in hard cheeses made from raw or low heat treated milk from cows, 2013
	LISTERIAHCGOATPM	*L. monocytogenes* in hard cheeses made from pasteurised milk from goats, 2013
	LISTERIAHCGOATRM	*L. monocytogenes* in hard cheeses made from raw or low heat treated milk from goats, 2013
	LISTERIAHCMIXEDPM	*L. monocytogenes* in hard cheeses made from pasteurised milk from mixed, unspecified or other animal milk, 2013
	LISTERIAHCMIXEDRM	*L. monocytogenes* in hard cheeses made from raw or low heat-treated milk from mixed, unspecified or other animal milk, 2013
	LISTERIAHCSHEEPPM	*L. monocytogenes* in hard cheeses made from pasteurised milk from sheep, 2013
	LISTERIAHCSHEEPRM	*L. monocytogenes* in hard cheeses made from raw or low heat treated milk from sheep, 2013
	LISTERIAMILK	*L. monocytogenes* in RTE milk, 2013
	LISTERIAPREPDISH	*L. monocytogenes* in RTE other processed food products and prepared dishes, 2013

	Table abbreviation	Table name
Food	LISTERIARTEBOVINE	*L. monocytogenes* in RTE meat products from bovine animals, 2013
	LISTERIARTEBROIL	*L. monocytogenes* in RTE meat products from broilers, 2013
	LISTERIARTEPIG	*L. monocytogenes* in RTE meat products from pig, 2013
	LISTERIARTETURK	*L. monocytogenes* in RTE meat products from turkey, 2013
	LISTERIASALAD	*L. monocytogenes* in RTE salads, 2013
	LISTERIASCCOWPM	*L. monocytogenes* in soft and semisoft cheeses made from pasteurised milk from cows, 2013
	LISTERIASCCOWRM	*L. monocytogenes* in soft and semisoft cheeses made from raw or low heat treated milk from cows, 2013
	LISTERIASCGOATPM	*L. monocytogenes* in soft and semisoft cheeses made from pasteurised milk from goats, 2013
	LISTERIASCGOATRM	*L. monocytogenes* in soft and semisoft cheeses made from raw or low heat treated milk from goats, 2013
	LISTERIASCHEEPRM	*L. monocytogenes* in soft and semisoft cheeses made from raw or low heat-treated milk from sheep, 2013
	LISTERIASCMIXEDPM	*L. monocytogenes* in soft and semisoft cheeses made from pasteurised milk from mixed, unspecified or other animal milk, 2013
	LISTERIASCMIXEDRM	*L. monocytogenes* in soft and semisoft cheeses made from raw or low heat-treated milk from mixed, unspecified or other animal milk, 2013
	LISTERIASCSHEEPPM	*L. monocytogenes* in soft and semisoft cheeses made from pasteurised milk from sheep, 2013
	LISTERIASAUCE	*L. monocytogenes* in sauce and dressings RTE, 2013
	LISTERIASPICES	*L. monocytogenes* in RTE spices and herbs, 2013
Animals	LISTERIAANIMALS	*Listeria monocytogenes* and other species in animals, 2013

	Figure abbreviation	Figure name
Food	LISTERIACOMPLFIG	Proportion of single samples at processing and retail in non-compliance with EU *L. monocytogenes* criteria, 2011-2013
	LISTERIAMEAT	Proportion of *L. monocytogenes*-positive units in ready-to-eat meat categories in the EU, 2013
	LISTERIACHEESE	Proportion of *L. monocytogenes*-positive units in soft and semi-soft cheeses, and hard cheeses made from raw or low heat-treated milk and pasturised milk, 2013
	LISTERIAFISHFIG	Proportion of *L. monocytogenes*-positive units in ready-to-eat fishery products categories in EU, 2013

3.4. Verocytotoxigenic *Escherichia coli*

Table abbreviation	Table name
VTECOVERALL	Overview of countries reporting data for VTEC, 2013

3.4.1. VTEC in humans

	Table abbreviation	Table name
Humans	VTECHUMRATES	Reported cases and notification rates of human VTEC infections in the EU, 2009–2013
	VTECHUMIMPORT	Proportion of confirmed VTEC infections associated with travel, domestic cases and cases with unknown travel information by country in 2013
	VTECHUMSEROGROUP	Distribution of reported confirmed cases of human VTEC infections in the EU/EEA, 2011–2013, by the 20 most frequent serogroups in 2013

	Figure abbreviation	Figure name
Humans	VTECHUMTREND	Trend in reported confirmed cases of human VTEC infections in the EU/EEA, 2009-2013

3.4.2. VTEC in food and animals

	Table abbreviation	Table name
Food	VTECBOVINEMEAT	VTEC in fresh bovine meat, 2013
	VTECBROIMEAT	VTEC in fresh broiler meat, 2013
	VTECDAIRY	VTEC in milk and dairy products, excluding raw milk, 2013
	VTECFRUITS	VTEC in fruits, 2013
	VTECGOATMEAT	VTEC in fresh goat meat, 2013
	VTECOTHERFOOD	VTEC in other food, 2013
	VTECOTHERMEAT	VTEC in fresh meat from other animal species, 2013
	VTECOVINEMEAT	VTEC in fresh ovine meat, 2013
	VTECPIGSMEAT	VTEC in fresh pigs meat, 2013
	VTECRAWCOWMILK	VTEC in raw cows' milk, 2013
	VTECRAWGOATSMILK	VTEC in raw goats' milk, 2013
	VTECRAWSHEEPMILK	VTEC in raw sheep' milk, 2013
	VTECSEED	VTEC in sprouted seed, 2013
	VTECTURKMEAT	VTEC in fresh turkey meat, 2013

	Table abbreviation	Table name
Food	VTECVEGETABLE	VTEC in vegetables, 2013
Animals	VTECCATTLE	VTEC in cattle, 2013
	VTECOTHERANIMAL	VTEC in other animals, 2013
	VTECOVINEGOAT	VTEC in sheep and goats, 2013
	VTECPIGS	VTEC in pigs, 2013

	Figure abbreviation	Figure name
Animals	VTEC0157PROPORTION	Proportion of VTEC and VTEC 0157 positive samples in all categories in Member States and non-Member States, 2013
	VTECPROPORTION	Proportion of VTEC positive samples in animal/food categories in Member States and non-Member States, 2012-2013

3.5. *Yersinia*

	Table abbreviation	Table name
	YERSOVERALL2012	Overview of countries reporting *Yersinia* data, 2012.
	YERSOVERALL2013	Overview of countries reporting data for *Yersinia*, 2013

3.5.1. *Yersinia* in humans

	Table abbreviation	Table name
Humans	YERSHUMIMPORT	Proportion of confirmed yersiniosis cases associated with travel, domestic cases and cases with unknown travel information by country in the EU/EEA 2013
	YERSHUMRATES	Reported cases and notification rates per 100,000 of human yersiniosis in the EU, 2009-2013
	YERSHUMSPECIES	Species distribution of confirmed yersiniosis cases in humans, 2013

	Figure abbreviation	Figure name
Humans	YERSHUMTREND	Trend in reported confirmed cases of human yersiniosis in the EU/EEA, 2009-2013

3.5.2. *Yersinia* in food and animals

	Table abbreviation	Table name
Food	YERSPIGMEAT2012	*Yersinia* in pig meat and products thereof, 2012
	YERSPIGMEAT2013	*Yersinia* in pig meat and products thereof, 2013

	Table abbreviation	Table name
Food	YERSBOVINEMEAT2012	*Yersinia* in bovine meat and products thereof, 2012
	YERSBOVINEMEAT2013	*Yersinia* in bovine meat and products thereof, 2013
	YERSOVINEMEAT2012	*Yersinia* in ovine meat and products thereof, 2012
	YERSOVINEMEAT2013	*Yersinia* in ovine meat and products thereof, 2013
	YERSMILKDAIRY2012	*Yersinia* in milk and dairy products, 2012
	YERSMILKDAIRY2013	*Yersinia* in milk and dairy products, 2013
Animals	YERSPIGS2012	*Yersinia* in pigs, 2012
	YERSPIGS2013	*Yersinia* in pigs, 2013
	YERSDOMAN2012	*Yersinia* in domestic livestock other than pigs, 2012
	YERSDOMAN2013	*Yersinia* in domestic livestock other than pigs, 2013
	YERSOTHERAN2012	*Yersinia* in other animal species, 2012
	YERSOTHERAN2013	*Yersinia* in other animal species, 2013

	Figure abbreviation	Figure name
Animals	YERSANIMPROPORTION	Proportion of *Yersinia*-positive samples in animal in Member States and non-Member States, 2012-2013
	YERSFOODPROPORTION	Proportion of *Yersinia*-positive samples in food in Member States and non-Member States, 2012-2013

3.6. Tuberculosis due to *Mycobacterium bovis*

	Table abbreviation	Table name
	TUBOVER	Overview of countries reporting data for tuberculosis due to *M. bovis* for humans and for animals, 2013

3.6.1. *M. bovis* in humans

	Table abbreviation	Table name
Humans	MBOVHUMORIGIN	Proportion of confirmed cases of tuberculosis due to *M. bovis* associated with native and foreign cases and cases with unknown origin by country in 2013
	MBOVHUMRATES	Reported cases and notification rates per 100,000 of human tuberculosis due to *M. bovis* in 2009-2013

3.6.2. Tuberculosis due to *M. bovis* in cattle

	Table abbreviation	Table name
Animals	DSTUBCOF	*M. bovis* in cattle herds in co-financed non-OTF Member States, 2013
	DSTUBNONCOF	*M. bovis* in cattle herds in non-co-financed non-OTF Member States, 2013
	TUBOTHERAN	*M.bovis* in species other than cattle, 2013
	TUBCATTLE	Complementary reporting on *M.bovis* in cattle, 2013
	TUBOTHERSP	Mycobacteria other than *M. bovis*, in animals, 2013

	Figure abbreviation	Figure name
Animals	DSTUBPROPINF	Proportion of existing cattle herds infected with or positive for *M. bovis*, 2009-2013
	DSTUBMAP	Status of countries regarding bovine tuberculosis, 2013.
	DSTUBPROPMAP	Proportion of existing cattle herds infected with or positive for *M. bovis*, 2013.

3.7. *Brucella*

	Table abbreviation	Table name
	BRUCOVER	Overview of countries reporting data for *Brucella*

3.7.1. Brucellosis in humans

	Table abbreviation	Table name
Humans	BRUCHUMIMPORT	Proportion of confirmed brucellosis cases associated with travel, domestic cases and cases with unknown travel information by country in 2013
	BRUCHUMRATES	Reported cases and notification rates per 100,000 of human brucellosis in the EU/ EEA, 2009-2013;
	BRUCHUMSPECIES	Species distribution of confirmed brucellosis cases in 2013
	BRUCHUMTREND	Trend in reported confirmed cases of human brucellosis in the EU, 2009-2013

3.7.2. *Brucella* in food and animals

	Table abbreviation	Table name
Food	BRUCFOOD	*Brucella* in food, 2013
Animals	DSBRUCOFCAT	*Brucella* in cattle herds in co-financed non-OBF Member States, 2013

	Figure abbreviation	Figure name
Animals	DSBRUCOFOV	*Brucella* in sheep and goat herds in co-financed non-ObmF Member States, 2013
	BRUCOTHERAN	*Brucella* in species other than cattle, sheep and goat, 2013
	DSBRUCCATMAP	Status of countries regarding bovine brucellosis, 2013.
	DSBRUCCATPROPMAP	Proportion of existing cattle herds infected with or positive for *Brucella*, country-based data, 2013.
	DSBRUCOVCAPMAP	Status of countries regarding ovine and caprine brucellosis, 2013.
	DSBRUCOVCAPPROPMAP	Proportion of existing sheep and goats herds infected with or positive for *Brucella*, country-based data, 2013.
	DSBRUCPROPINF	Proportion of existing cattle, sheep and goat herdsinfected with or positive for *Brucella*, 2005-213

3.8. *Trichinella*

	Table abbreviation	Table name
	TRICHOVER	Overview of countries reporting data on *Trichinella spp.*, 2013

3.8.1. Trichinellosis in humans

	Table abbreviation	Table name
Humans	TRICHUMIMPORT	Proportion of confirmed trichinellosis cases associated with travel, domestic cases and cases with unknown travel information by country in 2013
	TRICHUMRATES	Reported cases and notification rates per 100,000 of human trichinellosis in 2009-2013
	TRICHUMSPECIES	Species distribution of confirmed trichinellosis cases in 2013

	Figure abbreviation	Figure name
Humans	TRICHUMTREND	Trend in reported confirmed cases of human trichinellosis in the EU/EEA, 2009-2013

3.8.2. *Trichinella* in animals

	Table abbreviation	Table name
Animals	TRICHPIGSNOT	Findings of *Trichinella* in pigs not raised under controlled housing conditions, 2013
	TRICHPIGS	Findings of *Trichinella* in pigs other than not raised under controlled housing conditions, 2013
	TRICHHORSE	Findings of *Trichinella* in domestic solipeds, 2013

	Table abbreviation	Table name
Animals	TRICHFARMEDWILDBOAR	Findings of *Trichinella* in farmed wild boar, 2013
	TRICHWILDWILDBOAR	Findings of *Trichinella* in hunted wild boar, 2013
	TRICHFOX	Findings of *Trichinella* in foxes, 2013
	TRICHBEARS	Findings of *Trichinella* in bears, 2013
	TRICHRACCOON	Findings of *Trichinella* in raccoon dogs, 2013
	TRICHOTHERWILD	Findings of *Trichinella* in other wildlife, 2013

	Figure abbreviation	Figure name
Animals	TRICHMAPPIGSNOT	Findings of *Trichinella* in pigs not raised under controlled housing conditions, 2013.
	TRICHMAPWILDWILDBOAR	Findings of *Trichinella* in hunted wild boar, 2013.
	TRICHMAPOTHERWILD	Findings of *Trichinella* in wildlife (including hunted wild boar), 2013.
	TRICHPROPORTION	Proportion of *Trichinella*-positive samples in animals in Member States and non-Member States, 2005-2013

3.9. *Echinococcus*

Table abbreviation	Table name
ECHINOOVER2012	Overview of countries reporting data on *Echinococcus* spp., 2012
ECHINOOVER2013	Overview of countries reporting data on *Echinococcus* spp., 2013

3.9.1. *Echinococcus* in humans

	Table abbreviation	Table name
Humans	ECHINOHUMRATES	Reported cases and notification rates per 100,000 of human echinococcosis in the EU/ EEA, 2009-2013
	ECHINOHUMSPECIES	Species distribution of confirmed echinococcosis cases in humans, 2013

	Figure abbreviation	Figure name
Humans	ECHINOHUMTREND	Reported confirmed cases by species in selected MS, 2009-2013

3.9.2. *Echinococcus* in animals

	Table abbreviation	Table name

Animals	ECHINOFOX2012	*Echinococcus* findings in foxes, 2012
	ECHINOFOX2013	*Echinococcus* findings in foxes, 2013
	ECHINOOTHER2012	Other *Echinococcus* findings in animals, 2012
	ECHINOOTHER2013	Other *Echinococcus* findings in animals, 2013

	Figure abbreviation	Figure name
Animals	ECHINOFOXMAP	Findings of *E. multilocularis* in foxes, 2013.
	ECHINOPROPORTION	Proportion of *E. multilocularis*-positive samples in foxes in Member States and non-Member States, 2005-2013
	ECHINOFOXTRELLIS	Findings of *E. multilocularis* in foxes (including Member States providing data for at least four consecutive years), 2005-2013

3.10. *Toxoplasma*

Table abbreviation	Table name
TOXOOVER	Overview of countries reporting data for *Toxoplasma*, 2013

3.10.1. *Toxoplasma* in animals

	Table abbreviation	Table name
Animals	TOXOPIGS	*Toxoplasma* in pigs, 2013
	TOXOCATTLE	*Toxoplasma* in cattle, 2013
	TOXOOVINEGOAT	*Toxoplasma* in sheep and goats, 2013
	TOXOCATDOG	*Toxoplasma* in cats and dogs, 2013
	TOXOOTHERAN	*Toxoplasma* in other animal species, 2013

3.11. Rabies

Table abbreviation	Table name
RABIESOVER	Overview of countries reporting data for Rabies, 2013

3.11.1. Rabies in humans

	Table abbreviation	Table name
Humans	RABHUMCASES	Human rabies cases in the EU/EEA, 2009-2013

3.11.2. Rabies in animals

	Table abbreviation	Table name

Animals	RABIESFARMED	Rabies in farmed animal, 2013
	RABIESCAT	Rabies in cats, 2013
	RABIESDOG	Rabies in dogs, 2013
	RABIESBATS	Rabies in bats, 2013
	RABIESRACCOON	Rabies in raccoon dogs, 2013
	RABIESFOX	Rabies in foxes, 2013
	RABIESWILD	Rabies in wildlife other than bats, foxes and raccoon dogs, 2013

	Figure abbreviation	Figure name
Animals	RABIESANIMEXCLBATS	Reported cases of classical rabies or unspecified *Lyssavirus* in animals other than bats, in the Member States and non-Member States, 2006-2013
	RABIESMAPBAT	European Bat *Lyssavirus* (EBLV) or unspecified *Lyssavirus* cases in bats.
	RABIESMAPFOX	European Bat *Lyssavirus* (EBLV) or unspecified *Lyssavirus* cases in foxes.
	RABIESMAPWILD	European Bat *Lyssavirus* (EBLV) or unspecified *Lyssavirus* cases in wild animals.

3.12. Q-fever

Table abbreviation	Table name
COXOVER	Overview of countries reporting data for Q-fever, 2013

3.12.1. Q-fever in humans

	Table abbreviation	Table name
Humans	COXHUMRATES	Reported cases and notifcation rates per 100,000 of human Q-fever in the Eu/ EEA, 2009-2013
	COXHUMIMPORT	Proportion of confirmed Q fever cases associated with travel, domestic cases and cases with unknown travel information by country in 2013

	Figure abbreviation	Figure name
Humans	COXHUMTREND	Trend in reported confirmed cases of human Q fever in the EU/EEA, 2009-2013

3.12.2. *Coxiella burnetii* in animals

	Table abbreviation	Table name

Animals	COXCATTLE	Q fever in cattle, 2013
	COXOVINEGOAT	Q fever in sheep and goats, 2013
	COXOTHERAN	Q fever in other animals species, 2013

3.13. West Nile Virus

	Table abbreviation	Table name
	WNVOVER	Overview of countries reporting data for West Nile Virus, 2013

3.13.1. West Nile Virus in humans

	Table abbreviation	Table name
Humans	WNFHUMRATES	Reported cases and notification rates per 100,000 of human West Nile fever in 2009-2013
	WNFHUMIMPORT	Proportion of West Nile fever cases associated with travel, domestic cases and cases with unknown travel information by country in 2013

	Figure abbreviation	Figure abbreviation
Humans	WNFHUMTREND	Trend in reported cases of human West Nile fever in the EU, 2009-2013

3.13.2. West Nile Virus in animals

	Table abbreviation	Table name
Animals	WNVSOLIP	West Nile Virus in solipeds, 2013
	WNVBIRDS	West Nile Virus in birds, 2013
	WNVOTHERAN	West Nile Virus in other animal species, 2013

	Figure abbreviation	Figure abbreviation
Animals	WNVBIRDSMAP	Findings of West Nile Virus in birds in the EU, 2013.
	WNVSOLIPMAP	Findings of West Nile Virus in solipeds in the EU, 2013.
	WNVPROPORTION	Proportion of West Nile Virus positive samples in Member States and non-Member States, 2013

3.14. Tularaemia

	Table abbreviation	Table name

	FRANCISELLAOVERALL	Overview of countries reporting data for *Francisella*, 2013

3.14.1. Tularaemia in humans

	Table abbreviation	Table name
Humans	TULARHUMIMPORT	Proportion of confirmed tularaemia cases associated with travel, domestic cases and cases with unknown travel information by country in 2013
	TULARHUMRATES	Reported cases and notifciation rates per 100,000 of human tularaemia in the Eu/ EEA, 2009-2013

	Figure abbreviation	Figure name
Humans	TULARHUMTREND	Trend in reported confirmed cases of human tularaemia in the EU/EEA, 2009-2013.

3.14.2. *F. tularensis* in animals

	Table abbreviation	Table name
Animals	FRANCISELLAANI	*Francisella tularensis* in animals, 2013

3.16. Food-borne outbreaks

3.16.1. General overview

Table abbreviation	Table name
FBOOVER	Overview of countries reporting data on food-borne outbreaks, 2013
FBOEVID	Evidence in strong-evidence food-borne outbreaks (including strong-evidence water-borne outbreaks) in the EU, 2013
NOFBOSTR	Number of outbreaks and human cases per causative agents in food-borne outbreaks in the EU (including strong-evidence water-borne outbreaks), 2013
NOOUTHUM	Number of all food-borne outbreaks and human cases in the EU, 2013

Figure abbreviation	Figure name
FBOCOUNTRYRATE	Reporting rate per 100,000 population in Member States and non-Member States, 2013
FBOCOUNTRYNUMOUT	Distribution of food-borne outbreaks in Member States and non-Member States, 2013
FBOAGENTNUMOUT	Distribution of all food-borne outbreaks per causative agent in the EU, 2013
FBOAGENTTREND	Total number of food-borne outbreaks in the EU, 2008-2013

Figure abbreviation	Figure name
FBODISTRIBFOODVEHIC	Distribution of strong-evidence outbreaks by food vehicle in the EU, 2013
FBODISTRIBSETTING	Distribution of strong-evidence outbreaks by settings in the EU, 2013

3.16.2. Agent specific outbreaks

Table abbreviation	Table name
FBOSALM	Strong- and weak-evidence food-borne outbreaks caused by *Salmonella* (excluding strong-evidence water-borne outbreaks), 2013
FBOCAMP	Strong- and weak-evidence food-borne outbreaks caused by *Campylobacter* (excluding strong-evidence water-borne outbreaks), 20133
FBOECOLI	Strong- and weak-evidence food-borne outbreaks caused by pathogenic *E. coli* (excluding strong-evidence water-borne outbreaks), 2013
FBOSTRVIRUS	Strong-evidence food-borne outbreaks caused by viruses (excluding strong-evidence water-borne outbreaks), 2013
FBOBACIL	Strong- and weak-evidence food-borne outbreaks caused by *Bacillus* toxins (excluding strong-evidence water-borne outbreaks), 2013
FBOCLOSTOX	Strong- and weak-evidence food-borne outbreaks caused by *Clostridium* toxins (excluding strong-evidence water-borne outbreaks), 2013
FBOBOT	Strong-evidence food-borne outbreaks caused by Clostridium botulinum toxins (excluding strong-evidence water-borne outbreaks), 2013
FBOSTAPH	Strong- and weak-evidence food-borne outbreaks caused by staphylococcal (excluding strong-evidence water-borne outbreaks), 2013
FBOVIRUS	Strong- and weak-evidence food-borne outbreaks caused by viruses (excluding strong-evidence water-borne outbreaks), 2013
FBOOTHER	Strong- and weak-evidence food-borne outbreaks caused by other causative agents (excluding strong-evidence water-borne outbreaks), 2013
FBOSTROTHER	Strong-evidence food-borne outbreaks caused by other causative agents (excluding strong-evidence water-borne outbreaks), 2013

Figure abbreviation	Figure name
FBOSALMVEHIC	Distribution of food vehicles in strong-evidence outbreaks caused by *Salmonella* in the EU, 2013
FBOSALMENTVEHIC	Distribution of food vehicles in strong-evidence outbreaks caused by *S.* Enteritidis in the EU, 2013
FBOSALMTYPVEHIC	Distribution of food vehicles in strong-evidence outbreaks caused by *S.* Typhimurium in the EU, 2013
FBOCAMPVEHIC	Distribution of food vehicles in strong-evidence outbreaks caused by *Campylobacter* (excluding strong-evidence water-borne outbreaks), 2013
FBOVIRUSVEHIC	Distribution food vehicles in strong-evidence outbreaks caused by calicivirus, including norovirus (excluding strong-evidence water-borne outbreaks), 2013
FBOBACILLUSVEHIC	Distribution of food vehicles in strong-evidence outbreaks caused by *Bacillus* toxins in the EU, 2013
FBOCLOSTRIDIUMVEHIC	Distribution of food vehicles in strong-evidence outbreaks caused by *Clostridium* toxins (excluding strong-evidence water-borne outbreaks), 2013
FBOSTAPHYLVEHIC	Distribution of food vehicles in strong-evidence outbreaks caused by staphylococcal toxins in the EU (excluding strong-evidence water-borne outbreaks), 2013

3.16.3. Water-borne outbreaks

Table abbreviation	Table name
FBOWATER	List of reported strong evidence water-borne outbreaks in 2013